

OXFORD

MINING FOR CHANGE

NATURAL RESOURCES
AND INDUSTRY IN AFRICA

Edited by
John Page and Finn Tarp

UNU-WIDER STUDIES IN DEVELOPMENT ECONOMICS

Mining for Change

UNU World Institute for Development Economics Research (UNU-WIDER) was established by the United Nations University as its first research and training centre and started work in Helsinki, Finland, in 1985. The mandate of the institute is to undertake applied research and policy analysis on structural changes affecting developing and transitional economies, to provide a forum for the advocacy of policies leading to robust, equitable, and environmentally sustainable growth, and to promote capacity strengthening and training in the field of economic and social policymaking. Its work is carried out by staff researchers and visiting scholars in Helsinki and via networks of collaborating scholars and institutions around the world.

*United Nations University World Institute for
Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6B, 00160 Helsinki, Finland
www.wider.unu.edu*

Mining for Change

Natural Resources and Industry in Africa

Edited by

JOHN PAGE AND FINN TARP

A study prepared by the United Nations University World Institute
for Development Economics Research (UNU-WIDER)

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

© United Nations University World Institute for
Development Economics Research (UNU-WIDER) 2020

World Institute for Development Economics Research of the United Nations University (UNU-WIDER),
Katajanokanlaituri 6B, 00160 Helsinki, Finland

The moral rights of the authors have been asserted

First Edition published in 2020

Impression: 1

Some rights reserved. No part of this publication may be reproduced, stored in
a retrieval system, or transmitted, in any form or by any means, for commercial purposes
without the prior permission in writing of Oxford University Press, or as expressly permitted by
law, by licence or under terms agreed with the appropriate reprographics rights organization.



This is an open access publication. Except where otherwise noted, this work is distributed under the terms of
a Creative Commons Attribution-Non Commercial-Share Alike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO),
a copy of which is available at <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/>.

Enquiries concerning reproduction outside the scope of this licence
should be sent to the Rights Department, Oxford University Press, at the address above

Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data

Data available

Library of Congress Control Number: 2019947626

ISBN 978-0-19-885117-2

DOI: 10.1093/oso/9780198851172.003.0001

Printed and bound in Great Britain by
Clays Ltd, Elcograf S.p.A.

Links to third party websites are provided by Oxford in good faith and
for information only. Oxford disclaims any responsibility for the materials
contained in any third party website referenced in this work.

Foreword

Africa is a region richly endowed with natural resources. More new discoveries in previously non-resource-abundant economies increase the prospect that a growing number of African countries will become resource exporters in the future. The sustainable exploitation of natural resources is a tremendous opportunity, but it is also one that carries considerable risks. To effectively manage the natural resource booms, and the vast revenues generated, will depend in large measure upon the critical choices that governments make as they put in place the institutions, policies, and public investments needed for successful structural transformation, economic growth, and job creation.

To focus on how better management of revenues and opportunities associated with natural resource discoveries could be used to accelerate diversification and structural change in low-income economies, in 2017 UNU-WIDER and the Brookings Institution launched a large collaborative research project—Natural Resources, Structural Change, and Industry in Africa—bringing in some of the field's most experienced researchers. This book before the reader is the distillation of that in-depth research work.

I hereby express my sincere gratitude to the book's editors, John Page and Finn Tarp, for their project leadership, and sound analytical and editorial skills. And to the book's many contributors for sharing their research expertise with us, the readers, on what is a hugely important area which holds so much promise for so many people.

UNU-WIDER gratefully acknowledges the support and financial contributions to its research programme by the governments of Finland, Sweden, and the United Kingdom. Without this vital funding our research and policy advisory work would be impossible.

Kunal Sen

*Director, UNU-WIDER
Helsinki, May 2019*

Acknowledgements

The twin concerns of ‘jobless growth’ and slow poverty reduction are central challenges on the policy agenda in Africa. Poverty in Africa continues to be high; and the region has the lowest responsiveness of poverty to per capita income growth of any of the world’s developing regions. In response, and as part of its 2014–18 work programme, UNU-WIDER pursued an ambitious set of research activities together with the Brookings Institution to address these issues. While a key question addressed up-front was ‘Why is there so little industry in Africa?’ the research went far beyond this starting point, aiming to broaden our understanding of the structural transformation challenge in Africa, link it to issues of employment creation and poverty reduction in a more systematic way, and provide practical guidance for policymakers.

A recent blog on the ins and outs of African industrialization contains a useful overview and an entry point to the results of almost a decade of work in this area.¹ In the blog, the reader will find both a summary overview of the many varied outputs we have produced in collaboration with a vast number of colleagues to whom we owe an enormous debt for their intellectual advice and many-faceted professional input to our joint work in the difficult nexus of policy, research, and practice. Links are also available in the blog to a wealth of open access material and information about associated activities including lectures, conferences, etc.

This book *Mining for Change: Natural Resources and Industry in Africa*—focused on the risks and opportunities natural resources offer African countries wishing to industrialize—is the last output in the series. We would like to express our most sincere gratitude to the chapter authors for their willingness to participate in this project and for their many insightful contributions. Warm thanks are also due to UNU-WIDER and Brookings as well as their respective staff for institutional support and never-failing collaboration.

We wish in particular to thank Lorraine Telfer-Taivainen, UNU-WIDER editorial and publishing associate, for advice, hard work, and making the collaboration with Oxford University Press run smoothly. Adam Swallow, economics and finance commissioning editor at Oxford University Press, and his colleagues provided expert guidance with the publication process, and we do

¹ See <https://www.wider.unu.edu/publication/ins-and-outs-african-industrialization>

wish to acknowledge the anonymous referee reports that helped sharpen our focus. Finally, a word of thanks to the donors of UNU-WIDER, Finland, Sweden, and the United Kingdom, for their core support to the work programme of UNU-WIDER without which this volume would not have been possible.

John Page and Finn Tarp

Washington and Copenhagen
May 2019

Contents

<i>List of Figures</i>	xi
<i>List of Tables</i>	xiii
<i>List of Abbreviations</i>	xv
<i>Notes on Contributors</i>	xxi

1. Overview	1
<i>John Page and Finn Tarp</i>	

PART I. FRAMING THE ISSUES

2. Understanding the Boom	27
<i>Mark Henstridge</i>	
3. The Construction Sector in Developing Countries: Some Key Issues	51
<i>Martina Kirchberger</i>	
4. Rowing against the Current: Economic Diversification in Africa	74
<i>John Page</i>	

PART II. COUNTRY STUDIES

5. The Boom, the Bust, and the Dynamics of Oil Resource Management in Ghana	97
<i>Ernest Aryeetey and Ishmael Ackah</i>	
6. The Construction Sector in Ghana	119
<i>Nkechi Srodah Owoo and Monica P. Lambon-Quayefio</i>	
7. Local Content Law and Practice: The Case of Ghana	139
<i>Charles Godfred Ackah and Asaah S. Mohammed</i>	
8. Mozambique—Bust before Boom: Reflections on Investment Surges and New Gas	161
<i>Alan R. Roe</i>	
9. The Construction Sector in Mozambique	183
<i>António S. Cruz, Francisco Fernandes, Fausto J. Mafambissa, and Francisco Pereira</i>	
10. Local Content and the Prospects for Economic Diversification in Mozambique	209
<i>Evelyn Dietsche and Ana Maria Esteves</i>	

11. Gas in Tanzania: Adapting to New Realities <i>Mark Henstridge</i>	232
12. The Construction Sector in Tanzania <i>Geraldine J. Kikwasi and Cecilia Escalante</i>	256
13. Local Content: Are There Benefits for Tanzania? <i>Mia Ellis and Margaret McMillan</i>	282
14. Uganda's Oil: How Much, When, and How Will It Be Governed? <i>Sebastian Wolf and Vishal Aditya Potluri</i>	304
15. Construction and Public Procurement in Uganda <i>Emanuele Colonnelli and Nicole Ntungire</i>	326
16. Enhancing Local Content in Uganda <i>Ritwika Sen</i>	349
17. The Boom–Bust Cycle of Global Copper Prices, Structural Change, and Industrial Development in Zambia <i>Robert Liebenthal and Caesar Cheelo</i>	374
18. The Construction Sector in Zambia <i>Caesar Cheelo and Robert Liebenthal</i>	397
19. Local Content in Zambia—a Faltering Experience? <i>Wilfred C. Lombe</i>	422

PART III. POLICY IMPLICATIONS

20. Implications for Public Policy <i>John Page and Finn Tarp</i>	449
<i>Index</i>	473

List of Figures

2.1. A sequence of asset transformations	29
2.2. The legal institutional context	32
2.3. The broader context: jobs and policy	39
2.4. Commodity prices	44
3.1. Demand shift with different supply elasticities	55
3.2. Price levels of GDP and construction	67
5.1. Petroleum reserves of Ghana's operating fields	101
5.2. Oil rents as a percentage of GDP in selected African countries	102
5.3. Petroleum management framework, Ghana	106
5.4. Ghana's inflation performance, 1990–2016	108
5.5. Petroleum revenues in Ghana, 2011–16	109
5.6. Petroleum revenue as a percentage of government revenue in Ghana	109
5.7. Share of petroleum output in GDP, 2011–16	110
6.1. Contribution of construction (and other subsectors) to Ghana's industry sector (% of GDP)	120
6.2. Growth rates of industry subsectors, 2007–16	121
6.3. Trends in exchange rates and housing prices, 2012–17	123
6.4. Trends in price index for plant and equipment, 2014–17	124
6.5. Trends in annualized price index for local labour, roads, and social infrastructure, 2014–17	125
6.6. Trends in price index for chippings, 2014–17	126
6.7. Inflation and prices 2012–17	127
7.1. Progress of local firm registration with Petroleum Commission	148
7.2. Foreign and local firms' supply of goods and services to Tullow Ghana Limited	149
7.3. Foreign and local firms' supply of goods and services to ENI Ghana Exploration and Production Limited	149
8.1. Investment shares of GDP, 2005–16	162
8.2. GDP growth rates, 1996–2017 (%)	165
8.3. Selected numbers from the 2016 projections of the Rovuma benefits	167
8.4. Selected fiscal trends, 2012–18 (% of GDP)	169
8.5. IMF debt sustainability assessments	170
9.1. Construction sector production chain	184

9.2. High-growth period on average for Mozambique, for about two decades up to 2014	187
9.3. Construction volume in the state budget is fluctuating, but was increasing up to 2013	190
9.4. Formal small construction companies correspond to 81.4% of the total (2014–15)	191
9.5. Formal housing construction costs are higher in Maputo than in neighbouring cities	197
11.1. Natural gas offshore Tanzania	235
11.2. Revenue projections in Tanzania	241
11.3. The costs of delay	243
12.1. Gross domestic product by kind of economic activity: percentage growth rates, 2007–17	257
12.2. Within industry and construction: percentage growth rates, 2007–17	257
12.3. Gross fixed capital formation by kind of economic activity at current prices, 2005–17	258
12.4. Trend of registration of architects, quantity surveyors, and allied disciplines, 2000–17	261
12.5. Trend of engineers' registration, 2000–17	262
12.6. Trend of registration of contractors, 2008–16	263
14.1. Projected cashflows for lender, international oil companies, national oil company, and GoU revenues	314
14.2. Government oil revenue sensitivity to oil price assumptions	314
16.1. Domestic suppliers in Uganda's natural resource value chain, FY 2014/15	361
16.2. Direct and indirect backward linkages from the oil and gas sector, FY 2014–15	363
16.3. Distribution of revenue/workers across select supply industries, logarithmic scale	368
17.1. Revenue forecasts in the MTEF	386
17.2. Fiscal and external balances and public debt	388
18.1. Public expenditure on physical assets	401
18.2. Real total investment and capital productivity	402
18.3. Percentage changes in GDP, by type of economic activity (constant prices)	403
18.4. Grading of construction firms in Zambia, by overall proportion (%)	404
18.5. Grading of construction firms, by number and ownership	405
18.6. Selected macroeconomic stability indicators	417
19.1. Classification of local supplier firms of goods and services	423
19.2. Market share of goods and services by supplier origin (US\$ millions)	432
19.3. Estimated composition of Zambia's mining procurement expenditure, 2012 (US\$ millions and %)	432

List of Tables

1.1. Structural characteristics of Africa's resource-abundant economies	5
3.1. Share of construction in value added, per cent	53
3.2. Gross fixed capital formation, per cent of GDP	54
3.3. Unit costs per kilometre of asphalt overlays of 40–59 mm	57
3.4. World Bank contract awards by borrower and supplier region	60
3.5. World Bank contract awards by borrower and supplier region, case-study countries	63
3.6. Differences in price levels across regions	66
6.1. Housing subsector classification	128
6.2. Roads subsector classification	129
7.1. Goods and services earmarked for indigenous Ghanaian companies	147
9.1. Construction growth was particularly dynamic up to 2015, %	188
9.2. Number and structure of construction companies in the formal sector, 2014	193
9.3. Number and structure of building materials companies	194
9.4. Household income distribution as a share of total population, 2014–15	196
9.5. Proportion of households benefiting from housing quality facilities	197
12.1. Distribution of contractors by categories and class as of December 2016	264
12.2. Class limit for any single contract (in million TZS)	265
12.3. Contractors' challenges	267
12.4. Construction skills shortages	273
12.5. Comparison of registered professionals, technicians, and potential employers	274
12.6. Challenges associated with construction materials and equipment	275
14.1. Large (>US\$100m) ongoing or planned public infrastructure projects in Uganda	311
16.1. Overview of legal requirements for local sourcing and supplier development	354
16.2. Oil and gas suppliers in Uganda: by sector and selected variables	365
16.3. Median firm by supply category and indicator, in 2015 US\$	369
17.1. Expenditure releases on selected recurrent budget items	392
18.1. Percentage distribution of households, by type of housing and tenancy	407
18.2. Most serious obstacles to firms' operations (2008)	408
18.3. Market structure, by construction firm category	410

18.4. Selected doing-business indicators	414
19.1. Visions and goals of certain economic and social sectors relevant to LC development	434
19.2. Growth and structure of GDP, 1960–85	438
19.3. Real GDP and sectoral growth over the period 1991–2015	439

List of Abbreviations

7NDP	Seventh National Development Plan (Zambia)
ABFA	annual budget funding amount (Ghana)
ACEP	Africa Centre for Energy Policy
ACEZ	Association of Consulting Engineers of Zambia
AfDB	African Development Bank
AFIC	Africa Freedom of Information Centre
AGI	Association of Ghana Industries
ANE	National Roads Administration (Mozambique)
AQRB	Architects and Quantity Surveyors Registration Board (Tanzania)
ASIP	Annual Survey of Industrial Production (Tanzania)
bcm	billion cubic metres
CA	current account
CABRI	Collaborative Africa Budget Reform Initiative
CAHF	Centre for Affordable Housing Finance in Africa
CDC	Central Development Corridor (Tanzania)
CDC	Commonwealth Development Corporation
CEE	Citizens Economic Empowerment (Zambia)
CIT	corporate income tax
CIP	Census of Industrial Production (Tanzania)
CRB	Contractor Registration Board (Tanzania)
DA	Development Agreement
DFE	domestic finance expenditure
DMO	Domestic Market Obligations (Tanzania)
DPL	Delayed Payment Law
EAC	East African Community
E & T	education and training
EBA-Lite	External Balance Assessment
EDC	Enterprise Development Centre (Ghana)
EITI	Extraction Industries Transparency Initiative
EIZ	Engineering Institution of Zambia
ERB	Engineers Registration Board (Tanzania)
ES	external sustainability
EWURA	Energy and Water Utility Regulatory Authority (Tanzania)
FEED	Front End Engineering Design
FDI	foreign direct investment
FFH	Housing Promotion Fund (Mozambique)
FID	Final Investment Decision
FISP	Farmer Input Support Programme (Zambia)
FLNG	floating liquified natural gas

FRA	strategic reserves (Zambia)
FRELIMO	Front for the Liberation of Mozambique
GDP	gross domestic product
GFCF	gross fixed capital formation
GHC	Ghanaian cedi
GHF	Ghana Heritage Fund
GNPC	Ghana National Petroleum Corporation
GoU	government of Uganda
GPF	Ghana Petroleum Funds
GREDA	Ghana Real Estate Developers Association
GSF	Ghana Stabilisation Fund
GUSIP	Ghana Upstream Internship Program
GVC	global value chain
HGA	Host Government Agreement
HIPC	Heavily Indebted Poor Country
HVAC	heating, ventilation, air-conditioning
ICOR	incremental capital-output ratio
IEC	Industry Enhancement Centre (Uganda)
IFC	International Finance Corporation
IGG	Inspectorate of Government (Uganda)
IIA	Invest in Africa
ILO	International Labour Organization
IMF	International Monetary Fund
IOCs	international oil companies
IPEME	Institute for the Promotion of Micro, Small and Medium Enterprises (Mozambique)
IPS	Industrial Policy and Strategy (Mozambique)
ISI	import-substitution industrialization strategy
ISO	International Organization for Standardization
JV	joint venture
LC	local content
LCC	Local Content Committee (Tanzania)
LCP	local content policies (Ghana)
LCU	local content unit
LDC	Least Developed Country
LGA	local government authority
LNG	liquified natural gas
MAGTAP	Mining and Gas Technical Assistance Programme (Mozambique)
MCTI	Ministry of Commerce, Trade, and Industry (Zambia)
MEF	Ministry of Economy and Finance (Mozambique)
MEM	Ministry of Energy and Minerals (Tanzania)
MEMD	Ministry of Energy and Mineral Development (Uganda)
MENA	Middle East and North African region
MFEZ	Multi-Facility Economic Zones (Zambia)
MHID	Ministry of Housing and Infrastructure Development (Zambia)

MIC	middle-income country
MIC	Ministry of Industry and Commerce (Mozambique)
MIREME	Ministry of Mineral Resources and Energy (Mozambique)
MLGH	Ministry of Local Government and Housing (Zambia)
mmbtu	million British thermal units
MMD	Movement for Multi-Party Democracy (Zambia)
MMD	As Metropolitan, Municipal, and District Authorities (Ghana)
MNC	multinational corporation
MOF	Ministry of Finance (Tanzania)
MOPHRH	Ministry of Public Works, Housing and Hydric Resources (Mozambique)
MoWTC	Ministry of Works, Transport, and Communication (Tanzania)
MPI	material project information
mscuf/d	million standard cubic feet per day
MSMEs	micro, small, and medium enterprises
MT	metical (Mozambique)
MTBF	Medium-Term Budget Framework (Uganda)
MTEF	Medium-Term Expenditure Framework
MVA	manufacturing value added
MW	megawatts
NBS	National Bureau of Statistics (Tanzania)
NCC	National Construction Council (Tanzania)
NCC	National Council for Construction (Zambia)
NEEC	National Economic Empowerment Council
NEMC	National Environment Management Council (Tanzania)
NFA	non-financial asset
NGL	natural gas liquid
NOC	National Oil Company (Ghana)
NPV	net present value
NRGI	Natural Resources Governance Institute
NRM	National Resistance Movement (Uganda)
NSD	National Suppliers Database
NWSC	National Water & Sewerage Corporation (Uganda)
O&G	oil and gas
OAG	Office of the Auditor General (Zambia)
OCTP	Offshore Cape Three Points field
PAU	Petroleum Authority of Uganda
PDE	procurement and disposal entity
PDU	procurement and disposal unit (Uganda)
PE	personal emolument
PEDP	Petroleum Exploration, Development and Production (Uganda)
PF	Patriotic Front (Zambia)
PFM	Public Financial Management Act (Uganda)
PHF	Petroleum Holding Fund (Ghana)
PIAC	Public Interest and Accountability Committee (Ghana)
PIH	permanent income hypothesis

PIP	Public Investment Plan (Uganda)
PMGSY	Pradhan Mantri Gram Sadak Yojana (India)
PPDA	Public Procurement and Disposal of Public Assets Authority (Uganda)
PPP	public-private partnership
PPRA	Public Procurement Regulatory Authority (Tanzania)
PRCTMS	Petroleum Refining, Conversion, Transmission and Midstream Storage (Uganda)
pre-FEED	pre-Front End Engineering Design
PRIR	Petroleum Revenue Investment Reserve (Uganda)
PRMA	Petroleum Revenue Management Act, Ghana
PSA	Production Sharing Agreement
PURA	Petroleum Upstream Regulatory Agency (Tanzania)
QSRB	Quantity Surveyors Registration Board (Zambia)
R&D	research and development
RDA	Road Development Agency (Zambia)
REER	real exchange rate model
RENAMO	National Resistance Party of Mozambique
RFB	Roads Fund Board (Tanzania)
SDL	Skill Development Levy (Zambia)
SEZ	Special Economic Zone
SSA	sub-Saharan African
TEITA	Tanzania Extractive Industries Transparency and Accountability Act
TEN	Tweneboa-Enyenra-Ntomme field (Ghana)
TFP	total factor productivity
TIZ	Transparency International Zambia
TPDC	Tanzania Petroleum Development Company
TRA	Tanzania Revenue Authority
UBOS	Uganda Bureau of Statistics
UFSA	Unidade Funcional de Supervisão de Aquisições (Functional Acquisition Supervision Unit, Mozambique)
UGX	Ugandan shilling
UNABCEC	Uganda National Association of Building and Civil Engineering Contractors
UNBS	Uganda National Bureau of Standards
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNRA	Uganda National Roads Authority
UNZA	University of Zambia
URA	Uganda Revenue Authority
WPM	Works Procurement Manual (Ghana)
WTO	World Trade Organization
YIEDIE	Youth Inclusive Entrepreneurial Development Initiative for Employment (Ghana)
ZCCM	Zambia Consolidated Copper Mines Ltd

ZCCM-IH	Zambia Consolidated Copper Mines-Investment Holdings
ZDA	Zambia Development Agency
ZIA	Zambia Institute of Architects
ZIPAR	Zambia Institute for Policy Analysis and Research
ZMLCI	Zambia Mining Local Content Initiative

Notes on Contributors

Charles Godfred Ackah is the director of the Centre for Social Policy Studies (CSPS) and a senior research fellow at the Institute of Statistical, Social and Economic Research (ISSER), both at the University of Ghana. He is a development economist with research interests in the effects of trade policy and globalization on poverty and inequality, private sector development, entrepreneurship and labour market issues, financial inclusion, gender and women studies. He holds a bachelor's degree in economics from the University of Ghana, an MSc (economics) in public policy from the University of Hull, UK, and a PhD in economics from the University of Nottingham, UK. Dr Ackah is external research fellow at the Centre for Research in Economic Development and International Trade (CREDIT) based in the School of Economics, University of Nottingham, UK.

Ishmael Ackah is the local content coordinator of the Ghana Energy Commission. He is an adjunct lecturer at the Institute for Oil and Gas Studies, University of Cape Coast and Department of Economics, Kwame Nkrumah University of Science and Technology. His research areas are energy policy, sustainable energy governance, and the political economy of petroleum revenue management.

Ernest Aryeetey is a professor of economics at the Institute for Statistical, Social and Economic Research and a former vice-chancellor of the University of Ghana. He is the secretary-general of the African Research Universities Alliance. He directed the Brookings Africa Growth Initiative during 2009–10, and continues as a non-resident senior fellow at Brookings. Professor Aryeetey has held academic appointments at the University of London, Yale, Cornell, and Swarthmore. His research areas include development economics, the informal sector, extractive resource governance, and microfinance.

Caesar Cheelo is the associate executive director at the Southern African Institute for Policy and Research, and a senior research fellow at the Zambia Institute for Policy Analysis and Research, Lusaka, Zambia. His main areas of research are macroeconomics, industrial organization, international trade, and political economy. He has fifteen years' experience as researcher, policy analysts, consultant, university lecturer, and research business developer.

Emanuele Colonnelli is an assistant professor of finance and Fama Faculty Fellow at the University of Chicago, Booth School of Business. He has a special research interest in high-growth entrepreneurship and talent allocation in emerging markets, and in the interaction between governments, institutions, and firms, and he is the recipient of a number of grants and awards. He holds a PhD in economics from Stanford University, a BSc in economics from the University of Siena, an MSc in economics from Bocconi University, and he spent an academic year visiting Pembroke College, Oxford University.

António S. Cruz is an independent researcher in economics collaborating with UNU-WIDER in Finland, and CEEG/Department of Economics at the University Eduardo

Mondlane (UEM) in Mozambique. He has worked before for the Ministry of Planning and Development and the UEM. He is carrying out research on applied economics, industrialization, social accounting matrix, and macroeconomic issues.

Evelyn Dietsche is a non-resident senior research fellow with UNU WIDER, based in Germany and in the United Kingdom. She has contributed to thought-leading research on resource-sector governance and sustainable development and has taught on these subjects at the University of Dundee and the University of Westminster. She advises companies and host governments on the systemic risks associated with investing in low-income resource-dependent countries.

Mia Ellis is a research assistant in the Development Strategy and Governance Division at the International Food Policy Research Institute. She works on research projects focused on manufacturing, industrialization, and private-sector development in East Africa.

Cecilia Escalante is currently a transport consultant at the World Bank Group. Previously she held positions of senior research associate at Innovations for Poverty Action and research assistant (transport) at Dartmouth College.

Ana Maria Esteves is founder and director of social impact management consultancy Community Insights Group, Mozambique-born, she is based in Groningen, the Netherlands. Her interests lie in research and development of approaches for resource-affected regions and communities to benefit from the presence of resource development. She is a visiting professor in the Department of Civil and Environmental Engineering at the University of Strathclyde in Glasgow, Scotland.

Francisco Fernandes is a senior consultant with focus on budgetary reform and management, strategic planning, public-sector reform and capacity building, and devolution and local development. He has worked as a World Bank team leader on a capacity-building project to strengthen public institutions to manage public investment, budget reform, and medium-term economic planning. He has exercised top management tasks on the public sector at central and local level, in the economic and social national planning and in the public works sector.

Mark Henstridge is chief economist and interim CEO of Oxford Policy Management. He currently directs a research programme on Institutions (EDI) and one on improving Education Systems (RISE). He has published extensively on non-renewable natural resources and economic development. He has also worked at Uganda's Ministry of Finance, the IMF, BP, and the International Growth Centre.

Geraldine J. Kikwasi is a senior lecturer at the Department of Building Economics, Ardhi University, Tanzania. Her research is based on the construction sector performance with a focus on construction management. She has published widely in the areas of skills, risk management, and health and safety.

Martina Kirchberger is the Ussher Assistant Professor in Development Economics at Trinity College Dublin. She is a development economist with a particular interest in urbanization, infrastructure, and spatial mobility. Her research investigates the welfare effects of large public infrastructure projects, differences in unit costs of road construction

across time and space, public procurement, and the role of the construction sector in the production of investment goods. Previously, she was an Earth Institute post-doctoral research fellow at Columbia University and received her DPhil in economics from the University of Oxford.

Monica P. Lambon-Quayefio is a lecturer at the Department of Economics, University of Ghana. Her research is the area of poverty and inequality with a focus on health and demographic economics. She has a specialty in spatial econometrics and has published widely in the field of development economics.

Robert Liebenthal is a development economist and manager with thirty-six years of management and field experience covering Africa, Europe, and Central Asia, as well as global and institutional policy issues, mainly at the World Bank. He recently retired from the position of senior country advisor for Zambia for the International Growth Centre.

Wilfred C. Lombe is a retired United Nations senior economic affairs officer, who spearheaded the establishment of the African Minerals Development Centre (AMDC) at the United Nations Economic Commission for Africa (UNECA), in Addis Ababa, Ethiopia. The AMDC was established as a policy think tank in minerals and development to implement the Africa Mining Vision of the African Union (AU). It was funded by the Australian and Canadian governments and operated as a collaborative effort between UNECA, the African Union Commission (AUC), United Nations Development Programme (UNDP), and the African Development Bank (AfDB). Dr Lombe has spent more than thirty years working on different aspects of mining and development issues in Africa.

Fausto J. Mafambissa is a research analyst at the Research Department of Economic and Financial Studies, in the Ministry of Economy and Finance, Mozambique. He is also an assistant lecturer at the Department of Economics, University Eduardo Mondlane. He is developing research on economic and social development with a focus on the enterprise development sector, environmental economics, and climate change issues.

Margaret McMillan is a professor of economics at Tufts University and senior research fellow at the International Food Policy Research Institute. She has published widely in the areas of international trade, investment, structural change, and economic growth focusing primarily on developing countries.

Asaah S. Mohammed is a lecturer at the Department of Community Development, University for Development Studies. His research interest is on extractive sector and development with a focus on community rights to resource extraction and local content and local participation in the extractive sector. Asaah has several publications in varied areas of development and has attended several international conferences where he presented papers.

Nicole Ntungire is the country economist for the International Growth Centre Uganda. Nicole's research interests are primarily in development economics with a focus on topics related to growth and poverty dynamics, as well as, monetary economics and macroeconomic policy in the context of developing and emerging economies.

Nkechi Srodah Owoo is a senior lecturer at the Department of Economics, University of Ghana. Her research is the area of microeconomics of development with a focus on health

and demographic economics. She has published widely in the field of development economics, in particular in the area of poverty and inequality in developing countries.

John Page is Senior Fellow, Global Economy and Development at the Brookings Institution and a non-resident senior fellow of UNU-WIDER. He is author of more than a hundred published articles on the economics of developing countries. He is co-author of *Made in Africa: Learning to Compete in Industry* (2016), and co-editor of *Industries without Smokestacks: Industrialization in Africa Reconsidered* (2018).

Francisco Pereira started his professional career in 1966 at the Mozambique Railway Company. He has a wide experience in the field of road planning, project design and management, asset evaluations, budgeting, works supervision and institutional studies. He has worked as a World Bank consultant in Mozambique and abroad. He has lectured at the Faculty of Architecture and Physical Planning and at the Higher Studies Institute for Transport and Communications, both in Mozambique. He was deputy minister for public works and housing between 2010–15.

Vishal Aditya Potluri was an economist at the Ministry of Finance in Uganda. Currently he is a post-graduate candidate at Harvard University.

Alan R. Roe has fifty years' experience as an academic economist and policy adviser. He has degrees from the Universities of Leeds, Wales, and Cambridge. He taught for many years at the University of Warwick and was also the chairman of the Department of Economics. In 1994 he took up an appointment at the World Bank. Now retired, he remains as a senior associate at Oxford Policy Management in the United Kingdom and a non-resident senior research fellow at UNU-WIDER.

Ritwika Sen is a PhD candidate in managerial economics and strategy at the Kellogg School of Management, Northwestern University. She has previously worked as a country economist for the International Growth Centre in Uganda (2016–18), and as an Overseas Development Institute fellow at the Ministry of Agriculture and Animal Resources in Rwanda (2014–16). Ritwika holds a BA in economics from St. Stephen's College (Delhi University), and an MSc in economics from the London School of Economics and Political Science. Her research interests are at the intersection of development, trade, and agriculture.

Finn Tarp is a professor at the University of Copenhagen (UCPH) and coordinator of the UCPH Development Economics Research Group (DERG). Director of UNU-WIDER from 2009–18, and now a non-resident senior fellow of UNU-WIDER. Professor Tarp is a leading international expert on development strategy and foreign aid, with an interest in poverty, income distribution and growth, micro- and macroeconomic policy and modelling, agricultural sector policy and planning, household/enterprise development, and economic adjustment and reform as well as climate change, sustainability, and natural resources. He has published widely in leading economics and development journals and books by international academic publishers.

Sebastian Wolf is an independent consultant on public financial management. He has studied East African economies working with the Overseas Development Institute as an advisor to the Ministries of Finance in Uganda and South Sudan, and as a country economist for the International Growth Centre.

1

Overview

John Page and Finn Tarp

1. Introduction

For a growing number of countries in Africa the discovery and exploitation of natural resources is a great opportunity. It is also an opportunity accompanied by considerable risks. There is an extensive cross-country literature linking natural resource dependence to poor economic performance, known as the ‘resource curse’.¹ Several important oil exporters—Iran, Iraq, Kuwait, Libya, Qatar, and Venezuela—have experienced negative growth during the last few decades, and OPEC saw a decline in GNP per capita. In Africa, countries dependent on oil, gas, and mining have tended to have weaker long-run growth, higher rates of poverty, and greater income inequality than less resource-dependent economies.²

One significant risk is the structure of resource-rich economies themselves. Relative prices tend to make it more difficult to diversify into internationally competitive activities outside the resource sector, limiting the scope for structural change. In 2017, the Brookings Institution and UNU-WIDER launched a joint research project, Natural Resources, Structural Change and Industry in Africa. While a great deal of literature is available on the issues of transparency and accountability in the management of resource revenues, our interest was further up- and downstream.³ We were particularly interested in how better management of the revenues and opportunities associated with natural resource discoveries could be used to accelerate diversification and structural change in a low-income economy.

This book presents the results of that research, structured in three main parts. Part I presents three essays that survey key themes—managing the boom, the construction sector, and linking industry to the resource. We chose these three topics because they are at the centre of the debate on how to use natural resources for structural change. Relative prices make it more difficult for resource-rich economies to diversify into tradable activities, but natural resources also generate

¹ See Gelb (1988); Sachs and Warner (1995); Gylfason et al. (1999); Sala-i-Martin and Subramanian (2003). Van der Ploeg (2011) gives a survey.

² See Eifert, Gelb and Tallroth (2003); Arbache and Page (2009).

³ For a survey of good practices in transparency and accountability, see the *Natural Resources Charter* at (<https://resourcegovernance.org/approach/natural-resource-charter>).

public revenues. For structural change to succeed, governments must make critical choices about how these revenues are spent. Managing the boom addresses the policies and institutions needed for public revenue management in a resource-abundant economy.

The construction sector determines the extent to which investment effort results in investment outcomes, and, thus, the capacity of the economy to realize growth-promoting investments. High construction costs reduce the amount of physical capital obtained from the investment budget, and they can bias project selection away from investments in higher cost sectors. In addition, high construction costs reduce the number of projects carried out in a given sector, lowering the ability of construction firms in the sector to expand.

Since the 2009 publication of the African Mining Vision, many African governments have viewed diversification through the lens of local content. Local content legislation often requires resource investors to create national employment opportunities, procure from local suppliers, open equity to local partners, and encourage technology transfer. However, success in linking domestic firms to the natural resources sector depends on more than legislation. It requires putting the institutional framework in place to forge a successful public-private partnership between government, local firms, and the extractive industry.

Part II consists of fifteen chapters on five African countries, covering the same three issues as the chapters in Part I. Four of these countries—Ghana, Mozambique, Uganda, and Tanzania—are dealing with newly discovered hydrocarbon resources. The fifth, Zambia, has a much longer history of natural resource dependence. While the country-level studies show a great diversity of approaches and experience, there are also some common threads. Among these is a tendency to overestimate the size of the potential resource boom and underestimate the time it takes for revenue to come on line. Construction is constrained by a lack of capable African firms, the cost and quality of inputs, lack of skilled technicians and artisans, and lack of access to finance. Local content initiatives have been more successful in promoting local ownership and employment than in linking industry to the resource. Local procurement regulations have met with mixed results for several reasons, including the scarcity of small and medium enterprises capable of meeting industry quality and price standards.

Part III sets out some policy implications of the research. It contains our concluding chapter on the role of public policy in supporting structural change in resource-abundant economies. We first address policies directed at the three themes that guided our research—managing the boom, the construction sector, and linking industry to the resource. We then propose some ideas for widening the options for structural change, including policy and institutional reforms to deal with Dutch disease, widening the perspective from industrialization to ‘industries without smokestacks’, and investing in knowledge.

2. Resource abundance, risk, and diversification

For the majority of resource-rich economies in Africa, economic structure matters for at least two reasons. The first is that countries whose exports are concentrated in one or two natural resources are vulnerable to significant risks of declining commodity prices and volatility. The second is that there is persuasive evidence that what an economy produces and exports matters for its long-term growth.⁴

2.1 Commodity prices and volatility

Concentration of output and exports in one or two commodities can expose resource-rich economies to long-run declines in commodity prices and price volatility. Global GDP growth has consistently outpaced the demand for commodities, and commodity prices are likely to continue their gradual downward path relative to manufactured goods and knowledge-intensive services. Long-term estimates of the rate of decline vary from -0.6 to -2.3 per cent per year. The reasons for this secular decline have been widely explored. They include low demand elasticities for primary commodities relative to manufactures and services, growth of substitutes, and rapid technological advances that have reduced the cost of extracting commodities (Dadush 2010).

Independently of their long-term trend, commodity prices are also likely to remain highly volatile. van der Ploeg and Poelhekke (2009) argue that volatility is a quintessential feature of the resource curse. The reasons for high volatility of commodity prices have also been widely discussed. They include low short-term income and price elasticities of demand and supply, long lead times before investment and supply respond to changing demand conditions, weather shocks, and policy-induced distortions that impede the orderly adjustment of commodity markets (Dadush 2010).

Historical data suggest that external shocks are especially important determinants of growth in resource-rich countries (Collier and Goderis 2007). While output variability in general is declining among African countries, the relative importance of external shocks as sources of output instability has increased in the past twenty years. Because of Africa's marked improvement in economic management, internal shocks—including conflicts and policy instability—have declined substantially. At the same time, there has been a relative increase in the vulnerability of output to external shocks, such as price volatility (Raddatz 2008).

⁴ See for example, Hausmann, Hwang, and Rodrik (2007); UNIDO (2009).

The defence against volatility is diversification. Economic diversification can increase the resilience of countries to external shocks (Haddad et al. 2013). Both export and output diversification are associated with lower output volatility. The effect is manifest in low-income countries, where output volatility diminishes by 0.5 percentage points in the wake of diversification spurts. The effect of diversification on output volatility is primarily caused by a more evenly balanced export basket. This remains true even in countries that are more open to international trade, as measured by the ratio of exports and imports to GDP (IMF 2014).

2.2 Resource abundance and structural change

Income from resource extraction increases the demand for all goods. In the case of traded goods and services, imports at international prices can satisfy increased demand. On the other hand, rising marginal costs usually characterize the production of non-tradable goods, and their price will generally increase relative to internationally traded goods. The foreign exchange market reflects this in a real exchange rate appreciation. Because of these relative price changes, diversification into tradable goods production outside the resource sector is difficult, even with prudent management of overall spending. This is the ‘Dutch disease’, and it can limit the potential range of industries and services in which a resource-abundant economy is internationally competitive.

In the early stages of development, structural change links closely with diversification. Because most low-income countries are largely specialized in a narrow range of agricultural and other resource-based activities, structural change through reallocation of resources involves diversification into a more balanced production structure (IMF 2014). In Africa’s resource-abundant economies, production and exports are highly concentrated and—apart from growth of non-traded services—there is little evidence of structural change. As a result, the shares of agriculture and manufacturing in GDP are lower in the resource-rich economies than in middle-income benchmarks, and the manufacturing deficit is particularly large (Table 1.1). Other industry, mainly extractives, dominates the structure of output but not employment. Mines and gas fields do not generate many direct jobs.

Three quarters of the exports of Africa’s resource-rich countries are in less than three sectors (UNCTAD 2016). This strong export concentration limits the potential for growth-enhancing structural change. Low-income countries with a more diversified export base experienced more rapid structural change over the period 1990–2010, and sectoral reallocations of resources tended to be more productivity enhancing. Moreover, diversified exporters experienced higher average within sector productivity growth (IMF 2014).

Table 1.1 Structural characteristics of Africa's resource-abundant economies

	Value Added Share				Labour Share			
	Agriculture	Other Industry	Manufacturing	Services	Agriculture	Other Industry	Manufacturing	Services
Upper middle-income benchmark	7.0	10.3	30.0	52.7	14.0	10.0	19.0	57.0
Lower middle-income benchmark	21.7	12.2	21.9	44.2	45.2	6.6	11.6	36.6
Africa resource-abundant	17.8	44.3	16.8	21.1	45.4	4.8	6.5	43.4
Africa low-income	27.8	11.8	11.1	49.3	63.1	5.1	6.6	25.2

Notes: Angola, Botswana, Cameroon, Republic of Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Mauritania, Mozambique, Namibia, Nigeria, and Zambia classified as resource-rich middle-income countries (World Bank 2012).

We constructed the benchmark economies by identifying a group of currently middle-income countries at the time at which they crossed the World Bank GNI threshold for middle income. The economic structure of the benchmark is simply the average of the shares of value added and employment in four broad sectors—agriculture, manufacturing, other industry, and services—in the benchmark year, for the following countries: China (2000), India (2007), Indonesia (2004), Korea (1968), Malaysia (1968), Philippines (1976), and Thailand (1987).

Sources: World Bank WDI database 2018; de Vries, Timmer, and de Vries (2013). Authors' calculations.

2.3 Implications for long-run growth

Growth and diversification correlate, although the relationship displays considerable cross-country heterogeneity. Initial diversification is on average positively associated with subsequent growth. The size of the growth boost associated with export and output diversification is economically significant. A one standard deviation increase in export product diversification in low-income countries raises their growth rate by about 0.8 percentage points. Similarly, a one standard deviation increase in output diversification raises the average annual growth rate by about 1.4 percentage points. In addition, large increases in diversification are associated with subsequent growth accelerations (IMF 2014).

One reason why diversity matters for growth is that diverse economies appear to be better able to take advantage of opportunities in global markets, as they emerge. Cross-country evidence suggests that output diversification leads to export diversification.⁵ This is consistent with the idea that economies build competence and then enter global markets in more complex and sophisticated products. Empirical studies (Hausmann, Hwang, and Rodrik 2007; UNIDO 2009) have found that there is a strong, positive relationship between the level of sophistication of a country's exports and its subsequent growth.⁶ Another reason why diversity spurs growth is that a wide range of activities provides a broad basis for the entry and exit of firms, and this 'churning' raises economy-wide productivity (Syverson 2011).

3. Understanding the boom

While the relative price changes that accompany natural resource extraction are unavoidable, public policy can mitigate them. Tradable goods production will expand or contract according to whether it is internationally competitive. This depends partly on the exchange rate and partly on the investments and institutional innovations that governments make to enhance competitiveness. Understanding the size and timing of the boom and putting in place the policies and institutional structures needed to manage resource revenues and public investments are essential first steps to support structural change in resource rich economies.

⁵ See Imbs and Wacziarg (2003) and Cadot, Carrere, and Strauss-Kahn (2011).

⁶ This research measures the degree of sophistication of a product or export based on the per capita incomes of the countries that 'intensively' export it. If mostly high-income countries export a product, the associated income level is high, and the classification of the product is sophisticated. Measured in this way, sophistication directly reflects higher productivity—firms that export goods characteristic of richer economies must have productivity levels greater than would be predicted from their host country level of income.

3.1 How much revenue and when?

The early questions posed by a natural resource discovery are mostly questions of public financial management. In chapter 2, Mark Henstridge argues that the first questions should be how big is the revenue boom likely to be and when will revenue come on line? These are often the questions least well understood by politicians and the public. Sometimes it can take a decade or more to take the steps that move an economy from the discovery of a new mineral deposit to a point where there is material mineral revenue showing up in the public finances.

Henstridge points out that in addition to uncertainty about the size and timing of the revenue flow, resource revenues can be highly volatile. Even if prices are stable and production volumes constant, revenues will often change from year to year. This is because the relationship between the value of production and the revenue associated with it can change as the fiscal regime accommodates a phase of cost recovery, or the capital allowances carried forward change, or the interest cost of finance changes. In Tanzania, for example, the central projection of revenue from the possible LNG project varies each year, even though the price assumption is constant and the assumption of volumes of production after a ramp-up phase is flat through to a period of decline.

The experiences of Ghana, Mozambique, Tanzania, and Uganda show that in general the size of the boom is overestimated and the delay in receiving revenues is underestimated. There has been almost no public discussion of the possible volatility of revenues to the treasury, in part because of lack of transparency regarding the terms of extraction agreements between the foreign investor and the government. This has frequently led to a great deal of confusion about the projected revenues, and at times suspicion of corruption.

Ghana experienced difficulties controlling fiscal expenditures in the face of optimistic revenue projections. In chapter 5, Ernest Aryeetey and Ishmael Ackah point out that in 2009 the World Bank estimated that Ghana would earn US\$20 billion in the period 2012–30 from oil production from its Jubilee field. In reality, petroleum has contributed less than 10 per cent to government revenue, averaging about 7.5 per cent for the first five years of oil production.

Writing in chapter 8, Alan Roe argues that in Mozambique inflated expectations about the availability and timing of future public revenues following the large hydrocarbon finds offshore in Cabo Delgado Province led to a debt crisis. The government contracted very large external loans to public companies and government-linked organizations on the assumption that Mozambique would quickly become a global gas exporter. Projections of future government revenues—including by the IMF—had assumed that development of the field would proceed quickly and used informed guesses of what the negotiated terms and cost structures might be. In fact, the timelines for the LNG projects were delayed several

times, and the most recent projections assume that additional resource revenues will not flow before 2023 at the earliest.

In chapter 11, Mark Henstridge projects that in Tanzania the revenue stream will peak in 2040 at about 1.9 per cent of GDP or US\$54 per person, if production of gas starts in 2021. Writing in chapter 14, Sebastian Wolf and Vishal Potluri project oil revenues in Uganda to begin in 2021 with peak revenue between 2025 and 2028. In per capita terms, they project revenues of up to US\$83 at peak oil extraction and US\$38 on average over thirty-three years. As a percentage of non-oil GDP, the oil revenue would be 13 per cent at peak and 6 per cent on average. In both cases the likely size and timing of the windfall suggests that it will not be large enough to be transformative.

Zambia is a country with a long history of copper mining, and a mixed history of managing copper revenues. In 2018 it found itself facing a bullish price outlook for copper and other commodities (notably cobalt). In chapter 17, Robert Liebenthal and Caesar Cheelo observe that the range of possible public revenue outcomes is large, and some projections do not forecast a significant increase in public revenues. Despite this uncertainty, fiscal balances in Zambia have deteriorated, as deficits have grown since 2014.

3.2 Save or spend?

Prudent public revenue management requires establishing how much public spending should increase and how much to save before resource revenues begin to accrue to the treasury. Sustainable development depends on converting rents from resource extraction into other sources of income. Accordingly, it is necessary to save and invest some revenue. In chapter 2, Henstridge argues that the widely used rules governing saving from non-renewable resources—such as those implied by the permanent income hypothesis, or the ‘bird-in-hand’ rule—tend to place excessive weight on the welfare of future generations and encourage the accumulation of foreign assets.

In a poor, capital-scarce economy he observes, this is inappropriate for two reasons. First, it is likely that future generations will be richer, making it reasonable for government to use a portion of the oil windfall to increase the consumption of today’s poor.⁷ Second, the returns to domestic investment in a capital-scarce economy should exceed those offered by foreign assets (Collier, van der Ploeg, Spence, and Venables 2010). Henstridge offers one very important qualification to this judgement: *provided funds are well invested*.

⁷ Indeed, one strand of the literature argues for the direct distribution of a share of oil revenues to citizens (Gelb and Majerowicz 2011).

3.3 Paying it forward: debt financing

The country studies reveal a new wrinkle in public expenditure management in emerging resource-exporters: some countries have responded to the news of a resource windfall by increasing public expenditure and accumulating debt well ahead of the income coming on stream. Ghana's external debt to GDP ratio increased from 37 per cent in 2009 to 50 per cent in 2016. Mozambique's debt to GDP ratio shot up from around 40 per cent in 2012 to now around 130 per cent. Heavy international and domestic borrowing has driven up public debt, and the government issued public guarantees of loans amounting to US\$2.3 billion (about 20 per cent of GDP) beginning in 2013. Public payments arrears have also become a problem. In Zambia, the public debt stock rose from 36 per cent of GDP in 2014 to 62 per cent in 2015, and the IMF predicts that it will reach 72 per cent of GDP by 2023. Both Mozambique and Zambia are classified by the IMF as at risk of debt distress. Ghana's medium-term debt trajectories have worsened, and gross financing needs are likely to remain elevated in the near term. As Alan Roe points out in chapter 8, any increased borrowing still needs to be cognizant of both the fiscal productivity of the extra spending—how much extra tax revenue it will generate and how quickly—and of the additional debt service in the period *before* the large expected extractive revenues actually accrue. Significant additional fiscal slippages could seriously jeopardize debt sustainability in all three countries.

In contrast, Tanzania and Uganda have successfully resisted the temptation to front-load public expenditures. In Tanzania, total public and publicly guaranteed debt was 36.2 per cent of GDP at end-2015/16. Although the share of commercial financing has increased to about 30 per cent, official bilateral and multilateral creditors continue to be the major financiers, accounting for more than two thirds of external debt at end-2015/16. Uganda's external debt was about 21 per cent of GDP in 2016. Although scaling-up of investment spending has increased fiscal pressure, revenue collection strengthened significantly over the last few years, albeit from a low base. Domestic debt is low. Public and publicly guaranteed debt is mostly concessional multilateral debt, and Uganda has made no effort to tap external private debt markets. The government plans to increase its debt stock further to 47.8 per cent by 2022 and expects future oil revenues to play an important medium-term role in debt management.

3.4 Setting the rules

Ironically, a long lead-time before revenues begin to flow—while it increases pressures to borrow and spend—can be beneficial to resource exporters. Countries with new discoveries have a window of opportunity to make decisions about savings rules and public expenditures and lock them in before pressures to

spend become irresistible. Henstridge reminds us that recognizing volatility matters as well, because it makes building a budget and managing fiscal and monetary policy harder. Ghana provides both a model of how governments can use this space to establish the institutional framework needed and a cautionary tale of how pressures to spend can undermine their efforts. Ghana's Petroleum Revenue Management Act 2011 together with its 2015 amendment were intended to establish the highest international standards of transparency and good governance in the management of petroleum revenue and savings. The law established processes for the collection, expenditure, investment, and accountability for the use of oil revenues, and a new Public Interest and Accountability Committee was set up to oversee the management of petroleum revenues.

Under the Act, the budget should receive 70 per cent or less of expected petroleum revenues based on a seven-year moving average price. The intention is that the residual is deposited in two institutions, the Ghana Stabilization Fund, designed to cushion government expenditure when there is a petroleum revenue shortfall and the Ghana Heritage Fund, a fund for future generations. Aryeetey and Ackah point out that weak fiscal management means that the rules are not followed. Successive finance ministers have used their power to 'cap' the Stabilization Fund and use the revenues released for debt service. This has led to the depletion of the Stabilization Fund to less than 20 per cent of its estimated value and rendered it incapable of smoothing government expenditure in case of oil revenue shortfalls.⁸

In Uganda, the five-year period after 2010 saw a substantial slow-down in activity in the oil sector. Wolf and Potluri note in chapter 14 that the government used the time to develop a more solid policy and legal framework for the oil sector. The Public Finance Management Act of 2015 included provisions for the management of oil resources and created a Petroleum Fund. Withdrawals from the fund support the annual budget, via transfers into the consolidated fund or investments in the Petroleum Revenue Investment Reserve, designed to be a sovereign wealth fund holding assets abroad. Appropriations to the reserve need authorization from parliament. The Medium-Term Budget Framework is required to outline expenditure priorities and clearly indicate expected annual withdrawals. The government has adopted the non-oil, non-grant deficit as a fiscal anchor, and every new parliament sets the deficit limit. While this allows government to react to unforeseen circumstances, it ties the fiscal rule to the political cycle. When a new government comes into power, the temptation to tap into the Investment Reserve fund to finance quick achievements is great.

⁸ See chapter 5.

3.5 The quality of public spending

The country studies suggest that two factors often undermine the quality of public spending out of resource revenues. These are the quality of project appraisal and selection and the budgeting of the recurrent costs of maintenance. In all the country cases, institutional structures and rules designed to address these issues appear to have been only partially successful.

In Ghana, the Petroleum Revenue Management Act lists several priority areas—agriculture, education, health, roads, alternative energy, security, potable water, sanitation, and environmental protection—in which the government can invest oil revenues. The minister of finance was to prioritize not more than four areas for the medium-term investment programme. Aryeetey and Ackah note that oil revenues were in practice spread over a wide range of projects outside the priority areas, leading to cost and time overruns. When the priority areas were set at five in 2018, a new challenge emerged, the need to ‘prioritize within priority expenditures.’ When government selects a priority area like agriculture, it is possible to spend funds for irrigation, fertilizer subsidies, seeds, agriculture training and extension, but there is no clear guidance as to how priorities among these are to be established.

Roe observes in chapter 8 that Mozambique’s recent poor record of debt management and growth reflects in part the consequences of three failures of decision-making in public investment. These were a failure to select public investments by reference to sound economic criteria, a systematic tendency to use overly optimistic predictions of prices, costs, and impacts, and a serious lack of information at the time of implementation on the likely rates of return on investments and their impact.

Liebenthal and Cheelo report that currently there is no public investment management system in place in Zambia.⁹ Although a Public Investment Planning Department has been established in the Ministry of National Development and Planning, it lacks authorizing legislation and capacity. No formal system for project identification, screening, or appraisal is in place, and economic analysis of proposed major investments is not undertaken. They conclude that mining revenues are likely to be pooled with other revenues towards honouring the public wage bill, interest payments on debt, and payments of arrears.

Frequently governments make public investments without adequate provision in the budget for recurrent costs of maintenance. On average about 30 per cent of the infrastructure assets of a typical African country needs rehabilitation (Briceño-Garmendia et al. 2008). This reflects a legacy of underfunding for infrastructure maintenance, and over time represents a major waste of resources, since

⁹ See chapter 17.

the cost of rehabilitating infrastructure assets is several times higher than the cumulative cost of sound preventive maintenance. In the roads sector, for example, many countries fail to cover basic maintenance and rehabilitation needs and find themselves in a downward spiral with respect to road quality.

Lack of adequate provision for maintenance is especially dangerous in the case of spending out of resource revenues. Poor maintenance can seriously degrade the returns to investments, but investments in the domestic economy must offer higher returns than foreign assets, if they are to meet the investment rule. Some reallocation of resources from investment to maintenance merit consideration, particularly in countries that show low levels of maintenance expenditure. Liebenthal and Cheelo argue that in Zambia, multi-year budgeting of investment projects and protection of funding is not taken seriously and no standardized procedures are in place for project monitoring. They argue that maintenance of existing assets deserves a higher priority than much new construction.

Uganda was one of the early adopters of the Medium-Term Expenditure Framework, which in principle should accommodate better planning of maintenance expenditures. In practice, it has been less successful. Uganda established a Road Fund in 2010 with the mandate of funding maintenance on all roads. Despite the Fund, adequate resources are not devoted to routine and periodic maintenance of the main road networks. In fact, Uganda is one of the countries in Africa that has the largest divergence between actual and required spending on road maintenance (Ranganathan and Foster 2012).

4. The construction sector

Investing resource revenues requires public expenditures that transform resources ‘below the ground’ into physical assets ‘above the ground’. The construction sector is central to this process. Writing in chapter 3, Martina Kirchbirger argues that construction determines the ability to transform investment effort into investment outcomes in at least three ways. First, higher construction costs decrease the amount of infrastructure a country can afford for a given investment budget and tend to reduce maintenance expenditures and the lifespan of assets. Second, higher costs may affect project selection. If a minimum rate of return criteria is relied on to select projects, high construction costs will decrease the likelihood of choosing a project in a high cost sector. If construction costs differ systematically by sector, this will affect the composition of public spending. Third, there are important potential feedback effects. High construction costs can reduce the number of projects implemented in a given sector. Because contractors must often prove that they have experience in handling similar projects in the past, this restricts the type of contracts that a given firm can take on, limiting its ability to expand.

Because of the diversity of construction activities, cross-country evidence on the impact of higher construction costs on investment outcomes is limited. There is, however, evidence from a large sample of countries that higher construction costs are significantly associated with poorer road infrastructure. A 10 per cent increase in unit road-construction costs, for example, is associated with a country-level reduction of 0.7 per cent in the kilometres of paved roads per person and a 0.4-point reduction in the quality of the trade- and transport-related infrastructure index component of the World Bank Logistics Performance Index (Collier, Kirchberger, and Söderbom 2016).

In addition to its role in determining the efficiency of public investment, construction has an important direct link to the natural resource sector itself. The construction phase of a resource project begins once a contractor makes what is widely known as a 'final investment decision' (FID). Oil and gas projects differ from mining in terms of their level and sequencing of demands on the construction sector. Henstridge notes that the construction phase of an oil and gas project is when the big capital investment takes place. In oil and gas, this can amount to several billion dollars, much of which might be offshore. In mining, capital expenditure is lower in the construction stage, but it will often continue during the life of the project. In both cases, some of the capital investment is on highly specialized precision engineering, while other components of these projects are construction activities such as bricklaying, carpentry, metal works, plumbing, and electrical. The extent to which the domestic economy can benefit from the construction phase depends on the capacity of the sector to respond in terms of price and quality to the standards of the natural resource investors.

4.1 Construction costs

Kirchbirger argues that measuring the cost of construction across countries is difficult for several reasons. The construction sector produces highly differentiated outputs, such as roads, buildings, and bridges, making direct comparisons difficult. Different types of construction methods may also lead to very different unit costs. Evidence on construction costs in our case-study countries varies substantially, reflecting differences in project selection, market structure, origin of supplying firms, and bidding procedures.

In chapter 12, Geraldine Kikwasi and Cecilia Escalante observe that foreign contractors carry out most large-scale construction in Tanzania. Local Tanzanian contractors have a market share of just 33 per cent against 67 per cent for foreign contractors. While this poses problems from the point of view of capability building in the domestic construction sector, it means that the supply price of construction services on major public investment projects is less sensitive to domestic

supply constraints.¹⁰ Caesar Cheelo and Robert Liebenthal, writing in chapter 18, argue that while entry barriers in road construction, civil works, and mining are moderate in Zambia, the sector is highly concentrated and comprised of a set of oligopolies across the differentiated construction product groups. Information asymmetries offer significant possibilities for collusion, raising bid prices. In Uganda, Emanuele Colonnelli and Nicole Ntungire report that construction costs, particularly for civil works and non-residential buildings, have outpaced overall inflation significantly and appear to be accelerating. Although prices for the construction sector as a whole fell by 0.4 per cent between December 2016 and December 2017 (dampened by a slump in residential housing prices), prices for civil works rose by 3.1 per cent, reflecting the surge in public investment.¹¹

Where construction inputs are largely imported, or foreign firms dominate the industry, costs are subject to macroeconomic shocks. In chapter 6, Nkechie Owu and Monica Lambon-Quayefio point to exchange rate volatility as a major source of price shocks in Ghana's construction sector. Heavy dependence on imported raw materials such as high-tensile steel and skilled and expatriate labour leads to higher costs during periods of exchange rate depreciation. Cheelo and Liebenthal find similar macro-driven price shocks in Zambia, including the adverse business shocks and uncertainty associated with the local currency collapse from mid-2015 through most of 2016.¹²

4.2 Firm capabilities in construction

Firm capabilities are the knowledge and working practices used by firms during production. Productivity is one dimension of capability. The other dimension is quality, which in construction embraces a much wider range of characteristics—for example design, adherence to standards, and ability to bid—than the technical characteristics of the product itself. Productivity and quality depend in turn on the knowledge of the individuals, both managers and workers, who make up the firm (Sutton 2012).

Because capabilities are hard to codify they are difficult to measure. To understand construction firm capabilities in Africa better, Kirchberger uses the World Bank major contracts award database which contains World Bank-financed prior-review contract awards from 2004–2018. She finds that sub-Saharan Africa lags other developing regions in supplying civil works to open bid contracts. Companies based outside the region supply about half of the contracts above US\$2 million in sub-Saharan Africa, and regional suppliers carry out less than one third of contracts of at least US\$50 million. Chinese and Indian firms have captured an increasing share of African contracts, while sub-Saharan African contractors are virtually inactive in other regions.

¹⁰ See chapter 12.

¹¹ See chapter 15.

¹² See chapter 18.

Zhang and Gutman (2015) suggest that most African construction firms lack the minimum capabilities needed to succeed in competitive bidding processes. Asher, Kirchberger, and Novosad (2018), for example, show that about 30 per cent of bids submitted for road maintenance contracts in Tanzania are disqualified immediately. Failure to conform to the terms, conditions, and specifications stipulated in the bidding documents is the main reason for disqualification. The requirement to submit all documents in English is an important barrier for smaller contractors.

The country studies provide further evidence of limited firm capabilities. In Tanzania, for example, clients perceive that contractors lack qualified staff, exhibit poor knowledge of tendering procedures, and lack financial and project management skills.¹³ In chapter 9, Antonio Cruz, Francisco Fernandes, Fausto Mafambissa, and Francisco Pereira identify lack of planning and management capacity as a major constraint to the growth of local construction firms in Mozambique. Specialized technical services for large projects—such as feasibility studies, inspections, surveys, laboratory tests, and quality control—must be imported.

In chapter 15, Colonnelli and Ntungire report the results of a survey of contractors in Uganda. The firms responding to the survey are relatively young. Sixty-five per cent of firms started operations after 2004 and only 10 per cent began operations before 2000. Interestingly, the majority of owners (62 per cent) also own or run an additional business. Most of the firms have some standard management practice in place, and close to 100 per cent of top managers regularly hold meetings to discuss efficiency and quality expectations with their construction teams.

Zambia grades construction firms based on a mix of criteria, including the firm's previous contracts, number of professional and technical staff, financial position, and level of technology. The grading system is numeric from 1 to 6, with 1 as the highest grade and 6 the lowest. The majority (88 per cent) of firms in Zambia's construction sector in 2017 were in grades 4–6. These lower graded firms were generally less successful in winning bids and invested less in modern construction methods, technology, and basic ICT than higher graded companies.¹⁴

4.3 Materials, skills, finance

If construction faces bottlenecks in production, any surge in demand may force up costs and prices. As the supply curve becomes less elastic, the same shift in demand leads to a smaller increase in the quantity produced at a higher price. A recurrent theme in the country studies is the extent to which access to material inputs, skilled labour—particularly in engineering, technical disciplines, and skilled artisans—and access to finance limit the ability of firms to expand production.

¹³ See chapter 12.

¹⁴ See chapter 18.

Kikwasi and Escalante note that while the manufacturing of local construction materials such as cement, reinforcement steel, paints, concrete, and roofing materials has been increasing in Tanzania, quality is a challenge. Interviews with contractors and clients indicate that both perceive the high cost and low quality of construction materials, whether domestic or imported, as problems. Cruz, Fernandes, Mafambissa, and Pereira report that only about 15 per cent of the upstream construction value-chain originates in Mozambique. Local material inputs include floors, frames, doors and windows, tiles, roof tiles, cement and stones, and sand. All other upstream components are imported. Colonnelli and Ntungire observe that in Uganda 96 per cent of firms report checking the quality of materials before using them in production.¹⁵

In construction, bricklayers, welders, electricians, and plumbers are complementary to unskilled labour and capital. Lack of these skills can limit supply. In Ghana there is a current shortfall of 60,000 skilled artisans in the construction sector, and the gap is projected to increase to as many as 250,000 by 2020. Although there are large numbers of informal sector artisans and construction workers, they lack the skills and training required for modern construction projects. Lack of skilled labour similarly constrains the construction sector in Mozambique. Kikwasi and Escalante note that Tanzania has few engineering or architectural technicians and few skills at the middle management level. Most artisans lack formal training, including knowledge of basic construction theory and drawings. Drawing on their survey of contractors in Uganda, Colonnelli and Ntungire report that more than one out of three firms lack on-the-job training for new hires.¹⁶

In the case of hydrocarbons projects, the construction phase is the period of peak demand for a range of semi-skilled and skilled workers, such as construction workers, bricklayers, metalworkers, carpenters, plumbers, and electricians. In chapter 11, Henstridge estimates, for example, that the construction of LNG facilities in Tanzania would directly create some 4,000–5,000 jobs. The country studies suggest that there is unlikely to be an elastic supply of such workers to fill this demand.

Lack of financing affects firms in the construction sector by making it difficult and costly to purchase or rent the equipment necessary to carry out a contract. As Colonnelli and Ntungire point out, rental markets for equipment are often missing. In Ghana, the Real Estate Developers Association identifies lack of affordable credit to the residential construction industry as a factor contributing to the increasing cost of housing. In Mozambique, surveys of contracting firms identify limited access to credit as a major constraint, and in Tanzania contractors lack the capital to acquire operating equipment and plant.¹⁷

¹⁵ See chapters 6, 9, 12, 15.

¹⁶ See chapters 6, 9, 12, 15.

¹⁷ See chapters 6 and 9.

In Uganda, Colonnelli and Ntungire find that lack of access to finance is especially acute for local construction firms. Rigidities in the domestic financial market and a lack of adequate collateral limit their ability to borrow. A survey of construction firms executing work on donor-financed road projects found that the typical amount of credit obtained by a foreign construction firm was twenty times larger than that obtained by a local construction firm. In Zambia, Cheelo and Liebenthal find that lower ranked firms in the national classification of contractors face significant challenges with access to finance.¹⁸

5. Rowing against the current: local content

In Africa's resource-abundant economies, production and exports are highly concentrated, and—apart from some non-traded services—there is little evidence of structural change. In addition, the extractive sectors in most sub-Saharan African countries have developed as enclaves. Local firms seldom make it to be suppliers and except for South Africa and Ghana, an indigenous service and supply sector for the mining industry has not developed to any significant extent. In response, as John Page notes in chapter 4, the African Heads of State and Government adopted the African Mining Vision (AMV) in 2009.

The Vision focused on the mining sector's potential to help transform economies through more diversified growth, and governments in resource-abundant countries have adopted a wide range of 'local content' and 'value addition' initiatives in pursuit of greater diversification. Local content regulations often require resource investors to expand national employment opportunities, procure from local suppliers, open equity to local partners, and encourage technology transfer. 'Value addition' concentrates on downstream processing of the extracted resource and promotion of related industries.

Ghana's local content and participation policy for oil and gas gives priority to Ghanaians in the award of oil blocks, oil field licenses, and in all projects awarding contracts in the oil and gas industry. In chapter 7, Charles Ackah and Asaah Mohammed note that Ghana also requires that all operators in the oil and gas industry must use goods and services made or sold in Ghana, as far as practicable. The policy further mandates that all petroleum operators provide training to Ghanaians in all aspects of petroleum sector technology and operations.

In chapter 10, Evelyn Dietsche and Ana Maria Esteves argue that in Mozambique, local content objectives are contained in a diverse range of policies, strategies, plans, laws, and regulations. Their objectives range from providing more short-term opportunities to local workers and enterprises to longer-term skills and enterprise

¹⁸ See chapters 15 and 18.

development. In addition, the government has chosen to interpret the term ‘corporate social responsibility’ (CSR) broadly. The government’s *Policy on Corporate Social Responsibility for the Mineral Resources and Extractive Industries* promotes local content at the sub-national and community level.

In chapter 13, Mia Ellis and Margaret McMillan point out that mining regulation in Tanzania has historically lacked specific instruments to promote local content. In 2017, however, the amended Mining Act started requiring that mineral right-holders give preference to goods produced or available in Tanzania, and to services provided by Tanzanian citizens or local companies. The 2015 Petroleum Act, the primary legislation governing the petroleum sector, contains requirements that license holders, contractors, and subcontractors give preference to goods produced or available in Tanzania and to services provided by Tanzanian citizens or companies.

Ritwika Sen reports in chapter 16, that the National Oil and Gas Policy in Uganda emphasizes expanding employment opportunities for citizens and supporting the development of national competencies to supply goods and services to the sector. In addition, the Production Sharing Agreements with licensed operators provide for the training and employment of suitably qualified Ugandans.

Efforts to increase local content have a long history in Zambia. The cornerstone of Zambia’s post-independence development was its state-led import substitution industrialization strategy (ISI). In chapter 19, Wilfred Lombe points out that in practice, public ownership of the mines and protection from import competition produced a local content development strategy for the mining sector. At its peak, it featured manufacturing of mining inputs such as rubber products, chemicals, non-metallic minerals, and metals and machinery. Privatization of the mining industry significantly reduced the scope for local content development. The current Development Agreements with the mining companies allow imports of capital equipment free of customs and excise and do not oblige mine owners to purchase inputs from Zambian suppliers.

5.1 The political economy of local content

Political pressures to ‘localize’ the benefits of a natural resources discovery are a reality faced by all governments of resource-abundant economies. The country case studies highlight two broad areas in which these political pressures are present. The first is pressure for policies favouring local employment, investment, and procurement along the extractives supply chain. These initiatives tend to reflect the interests of larger firms and more-skilled workers. The second emphasizes strengthening the link between the extractive sector and sub-national development, especially the development of communities where extractives operations are located.

Local content rules can be subject to abuse by ruling elites through awarding contracts, jobs, and opportunities to those supporting the ruling party or coalition. Ackah and Mohammed note that partisan politics has strongly influenced the Ghana Petroleum Commission—the body charged with implementing the local content initiative—since its establishment. Management and technical staff appointments to the Commission reflect party affiliation, and tenure in office depends on the tenure of the political party in power.¹⁹ Dietsche and Esteves contend that the Mozambique government has a range of laws in place to ensure that political elites and politically connected domestic entrepreneurs benefit from existing local content requirements.²⁰

In Tanzania, there are significant ties between politics and business, and there has been increasing concern that vested economic interests with ties to the ruling party will benefit from local content initiatives. The firms that participate in the extractive industries value chain are often relatively large, which means that benefits primarily accrue to a wealthier segment of the local population.²¹ In Zambia, the commonly held view is that while there is a proliferation of Zambians in labour-intensive jobs this is not so in technical and managerial roles. Non-industry stakeholders, including civil-society organizations, do not believe there is any well-defined career path for Zambians in the mining industry, and there are continuing questions concerning the value and effectiveness of supplier development programmes.²²

The sub-national dimension of development has become increasingly important for both host governments and the extractive industries themselves. Dietsche and Esteves note that in Mozambique, the political opposition is putting pressure on the government to devolve political power and promote local economic and social development. This pressure comes out in the recently approved *Implementation Guide* underpinning the government's *Policy on Corporate Social Responsibility for the Mineral Resources and Extractive Industries*, which provides guidance to firms on supporting local economic development.²³

Ackah and Mohammed describe how political pressures are building to address specific needs in affected communities in Ghana. Since the oil discovery, stakeholders, such as community leaders and civil society, have called for a share of the benefits of the oil industry to be channelled directly to communities affected by oil production and related activities. The petroleum MNCs have responded to the pressure. For example, all the 140 unskilled and semi-skilled workers employed in the contract for site preparation for the Onshore Gas Receiving Facility came from eighteen affected communities nearby. Companies from the same communities supplied catering services, driving, and hospitality services.²⁴

¹⁹ See chapter 7.

²⁰ See chapter 10.

²¹ See chapter 13.

²² See chapter 19.

²³ See chapter 10.

²⁴ See chapter 7.

5.2 Linking industry to the resource

The supply chains of multinational companies (MNCs) in resource extraction generally have a pyramid structure. The multinational company will have small number of lead subcontractors, many international and some local. Each lead subcontractor will then contract other companies to supply inputs. These are the so-called second-tier subcontractors or suppliers. The country studies indicate that the MNCs and their first-tier suppliers often prefer to operate almost exclusively with foreign second-tier suppliers, due to the limited capabilities of domestic firms.

Ackah and Mohammed find that most Ghanaian companies are concentrated at the lower end of the petroleum supply chain, competing to provide services such as catering and hospitality, logistics, freight forwarding, and waste management. Two notable exceptions are in metal fabrication, where some indigenous Ghanaian companies are making impressive strides, and in the installation of subsea infrastructure.²⁵ Dietsche and Esteves suggest that two types of firms are attempting to enter the resource value chain in Mozambique. One group includes specialist firms that offer geological, laboratory, logistics, transport maintenance, and waste management services. These companies tend to be larger and their capabilities, while not at the level of certified suppliers, are sufficiently high that targeted supplier development initiatives might be successful. The second group of firms—composed primarily of micro enterprises selling catering services, office consumables, construction materials, camping equipment, chemicals, and HVAC equipment—lacks the capabilities to benefit from targeted interventions.²⁶

Ellis and McMillan conclude that in Tanzania, the domestic industrial base cannot compete effectively with global suppliers. Based on analysis of the Industrial Census they show that foreign and jointly owned firms spend significantly more on imported materials than on locally sourced materials and that average spending on services is much greater than average spending on materials. They identify the ‘missing middle’—the small number of productive small and medium enterprises (SMEs) in manufacturing—as a major reason why the extractive companies have difficulty finding qualified local partners.²⁷

Ritwika Sen uses unit record transaction data to map the network of domestic suppliers in Uganda’s natural resource value chain. She finds that although there is a population of local goods and service providers that sell to the sector, retail and wholesale services dominate these transactions, including the purchase of imported products such as motor vehicle parts and accessories, motor vehicles, and machinery. The manufacturing sector ranks second among suppliers, in terms of connections in the network (about 10 per cent of the total). A handful of manufacturing firms dominate the supplier network. These include manufacturers of

²⁵ See chapter 7.

²⁶ See chapter 10.

²⁷ See chapter 13.

plastic products, fabricated metal products, batteries and accumulators, cement, and plaster and lime. She also finds that the accommodation and food service sector, and water supply, sewerage, and waste management are under-prepared to service the industry.²⁸

Wilfred Lombe finds that lack of access to engineering expertise and production technology and low-quality control standards limit backward linkages in Zambia. However, Zambia has had greater success in developing forward linkages to copper production. Copper exports are mostly in smelted and refined forms, representing several value-added stages beyond mining. Further downstream, one company has historically undertaken processing of refined copper into rods and wire, and reports state that a large Chinese investment has increased exports of semi-fabricates.²⁹

6. Conclusions

Natural resources represent a major opportunity for Africa's growing number of resource-abundant economies, and one accompanied by substantial risks. Success or failure in managing these risks largely depends on the investment of the rents from natural resource extraction. This fact places a burden on public financial management and public investment planning. The country studies show that some countries have responded to the news of a resource windfall by increasing public expenditure and accumulating debt. In addition, they have neglected two important areas of public expenditure management. The first is ensuring that the public investments selected are in fact sound. The second is making systematic provision in the budget for the recurrent costs of maintaining new assets. In chapter 20, we propose a set of institutional reforms designed to address these issues.

Investing resource revenues requires transforming resource rents into physical assets through public expenditures. The construction sector is central to this process. The country studies point to several constraints to the expansion of construction, beginning with a lack of capable African firms. Firms lack qualified staff, have poor knowledge of tendering procedures, and lack the financial management and project management skills needed to compete for major infrastructure projects. The cost and quality of material inputs, lack of skilled technicians and artisans, and limited access to finance also constrain the ability of construction firms to respond to demand increases. We address some initiatives needed to relieve these constraints in the concluding chapter.

Because they control access to the resource, governments can seek to integrate local suppliers into the resource value chain through local content and

²⁸ See chapter 16.

²⁹ See chapter 19.

value-addition initiatives. Our country studies indicate that these initiatives have not been uniformly successful. Most countries have had considerable success with the hiring and skilling-up of local labour. In contrast, local procurement initiatives have met with mixed results for several reasons, including the scarcity of small and medium enterprises capable of meeting industry quality and price standards in the procurement of goods and services. However, governments can take several initiatives to expand the options for diversification. We turn to those in chapter 20.

References

- Arbache, J. S., and J. Page (2009). 'How Fragile Is Africa's Recent Growth?' *Journal of African Economies*, 19(1): 1–24.
- Asher, S., M. Kirchberger, and P. Novosad (2018). 'The Cost of Infrastructure in Tanzania', Unpublished manuscript.
- Briceno-Garmendia, C., K. Smits, and V. Foster (2008). 'Financing Public Infrastructure in Sub-Saharan Africa: Patterns, Issues, and Options'. AICD, Background Paper, World Bank, Washington, DC.
- Cadot, O., C. Carrère, and V. Strauss-Kahn (2011). 'Export Diversification: What's behind the Hump?' *Review of Economics and Statistics*, 93(2): 590–605.
- Collier, P., and B. Goderis (2007). 'Prospects for Commodity Exporters: Hunky Dory or Humpty Dumpty?' *World Economics*, 8(2): 1–15.
- Collier, P., M. Kirchberger, and M. Söderbom (2016). 'The Cost of Road Infrastructure in Low-and Middle-income Countries'. *The World Bank Economic Review*, 30(3): 522–48.
- Collier, P., F. van der Ploeg, M. Spence, and A. Venables (2010). 'Managing Resource Revenues in Developing Countries'. *IMF Staff Papers*, 57(1): 84–118.
- Dadush, U. (2010). *In 2050, a World Transformed*. Tunis: African Development Bank.
- Eifert, B., A. Gelb, and N. B. Tallroth (2003). 'The Political Economy of Fiscal Policy and Economic Management in Oil-Exporting Countries'. In J. M. Davis, R. Ossowski, and A. Fedilino, *Fiscal Policy Formulation and Implementation in Oil Producing Countries*. Washington DC: IMF.
- Gelb, A. (ed.) (1988). *Oil Windfalls: Blessing or Curse?* Oxford: Oxford University Press.
- Gelb, A., and S. Majerowicz (2011). 'Oil for Uganda or Ugandans?' Working Paper No. 261. Washington, DC: Center for Global Development.
- Gylfason, T., T. T. Herbertsson, and G. Zoega (1999). 'A Mixed Blessing: Natural Resources and Economic Growth'. *Macroeconomic Dynamics*, 3: 204–25.
- Haddad, M., J. J. Lim, and C. Saborowski (2013). 'Trade Openness Reduces Growth Volatility When Countries Are Well Diversified'. *Canadian Journal of Economics*, 46: 765–90.

- Haussmann, R., J. Hwang, and D. Rodrik (2007). 'What You Export Matters.' *Journal of Economic Growth*, 12(1): 1–25.
- Imbs, J., and R. Wacziarg (2003). 'Stages of Diversification.' *American Economic Review*, 93(1): 63–86.
- IMF (2014). 'Sustaining Long-Run Growth and Macroeconomic Stability in Low-Income Countries—The Role of Structural Transformation and Diversification.' IMF Policy Paper Washington, DC: IMF.
- van der Ploeg, F. (2011). 'Natural Resources: A Curse or a Blessing?' *Journal of Economic Literature*, 49(2): 366–420.
- van der Ploeg, F., and S. Poelhekke (2009). 'Volatility and the Natural Resource Curse.' *Oxford Economic Papers*, 61(4): 727–60.
- Raddatz, C. (2008). 'Have External Shocks Become More Important for Output Fluctuations in African Countries?' In D. S. Go and J. Page (eds), *Africa at a Turning Point? Growth, Aid, and External Shocks*. Washington, DC: The World Bank.
- Ranganathan, R., and V. Foster (2012). 'Uganda's Infrastructure: A Continental Perspective.' Policy Research Working Paper 5963, Washington, DC: World Bank.
- Sachs, J. D., and A. M. Warner (1995). 'Natural Resource Abundance and Economic Growth.' NBER Working Paper No. 5398 (revised 1997, 1999). Cambridge MA: NBER.
- Sala-i-Martin, X., and A. Subramanian (2003). 'Addressing the Natural Resource Curse: An Illustration from Nigeria.' NBER Working Paper No. 9804. Cambridge, MA: NBER.
- Sutton, J. (2012). *Competing in Capabilities: The Globalization Process*. Oxford: Oxford University Press.
- Syverson, C. (2011). 'What Determines Productivity?' *Journal of Economic Literature*, 49(2): 326–65.
- UNCTAD (2016). *The State of Commodity Dependence 2016*. Geneva: UNCTAD.
- UNIDO (2009). *Industrial Development Report, 2009*. Vienna: UNIDO.
- de Vries, G. J., M. P. Timmer, and K. de Vries (2013). 'Structural Transformation in Africa: Static Gains, Dynamic Losses.' *GGDC Research Memorandum 136*, University of Groningen.
- World Bank (2012). *Africa's Pulse October 2012, Vol. 6*. Washington, DC: World Bank.
- Zhang, C., and J. Gutman (2015). 'Aid Procurement and the Development of Local Industry: A Question for Africa.' Global Economy and Development Working Paper 88. Washington, DC: The Brookings Institution.

PART I
FRAMING THE ISSUES

2

Understanding the Boom

Mark Henstridge

1. Introduction

A significant natural resource discovery creates excited popular expectations of imminent wealth. But those expectations run contrary to the conventional wisdom in social science that a resource boom confers a ‘curse’ on growth and development, with many people ending up worse off than they would otherwise have been. In general, the size of an anticipated boom is overestimated and the delay in receiving revenues is underestimated.

This chapter sets out a framework for thinking about the challenges presented by a natural resource boom. I first take stock of the sequencing, timing, and scale of the development of a natural resource endowment. I then review the ‘resource curse’ literature to set out the key challenges. The debate about the resource curse has run for decades. The last ten years has seen a closer focus on the variation of experience across resource-rich countries (Torvik 2009), rather than looking to explain the average experience of slower growth in resource-rich countries (Sachs and Warner 1995). Third, I look at some benchmarks of scale and timing so as to put some potential booms into the broader context of the challenges of growth and structural change in Africa. Finally, I gather together some observations on policy and institutional changes, which emerge from each section.

In sum, everything almost always takes longer than everybody at first thinks. The different counter-parties and interest groups then have dashed hopes. They also have different discount rates. Delay means that risks materialize as opportunities evaporate; that there are some potentially significant non-revenue dimensions to a resource boom means that a literature that revolves around the correlations of average effects of resource ‘intensity’, ‘abundance’, or ‘dependence’ is unlikely to provide any particular insight to the specific circumstances of any one resource-rich economy. Each country that finds the opportunity of natural resources disappointing does so in its own way. Equally, the path-dependence that early forms of regulation or rent-seeking can set up may condition the possibilities of prudent policy in the face of natural resource rents when they eventually arrive.

2. Sequence and timing

The conceptual foundation for thinking about sequencing is the observation that a natural resource endowment is best defined as an asset. This is the basis for the framing in Venables (2016). More specifically, with oil, gas, or minerals the focus is on a natural resource that is extracted on a non-renewable basis, as opposed to the natural asset of fertile arable land which yields production—and this echoes a key premise of Humphreys et al. (2007).

A mineral deposit below the ground which is an asset is still an asset when it is extracted to be above the ground. It is still an asset when it is transformed from mineral to money through processing and sale.

Holding fast to conceptual clarity means that what we refer to as the production of a mineral is actually a sequence of asset transformations. The labels ‘production’ and ‘revenue’ imply a flow of output or income, when those transactions are principally steps in a transformation of an asset from one form to another.¹ A sub-soil mineral asset is shifted to be above ground over time (‘production’). It remains an asset after processing and sale in exchange for money—a series of payments over time are a series of part-payments in the transformation of mineral into money (‘revenue’). Although the treatment in fiscal accounts shows these payments as revenue, conceptual fidelity would show them as asset transactions below the line in financing.² This financial asset should then finance public spending—in particular the public investment to create public capital goods, often most simply thought of as public infrastructure. So, mineral to money to public capital—a sequence of asset transformations.

However, somewhat inevitably, conceptual clarity gets messy in reality. Everything takes time; mineral production runs for decades. But it also takes time, sometimes a decade or more, to take the steps that move from the discovery of a new mineral deposit to a point where there is material mineral revenue showing up in the public finances. Setting out the steps in the chain of events that runs from exploration through to any accumulation of public capital assets helps make clear how much time matters to understanding the impact of a mineral sector on the economy, and the many interesting ways in which the opportunity of a conceptually clean and positive contribution to investment, and therefore growth and development, can fail to materialize.

¹ There is a nuance to this point, which is that some proportion of a natural asset converted into a financial asset could be identified as equivalent to an expected yield or return, and so constitutes income. It is the failure of many resource-rich developing economies to convert a sub-soil asset into sustained higher income that constitutes the idea of a ‘resource curse’—pointing to arguments that if the expected value of, or return on, a sub-soil asset is negative, then it should be left in the ground until there is the institutional architecture required to make the most of it (see Stevens et al. 2015).

² This is an argument that has been applied to the treatment of receipts from privatization.

I next set out those steps between exploration and production, and endeavour to illustrate the extent to which the formal institutional framework—by which I mean the laws, regulations, licences, contracts, and government ministries and agencies that are supposed to operate them—shapes the opportunities and risks from natural resources.

2.1 A sequence of asset transformations

Figure 2.1 lays out the steps of an asset transformation in terms of the key stages in the development of a natural resource extraction project, together with the duration of each stage of a project building up to production. The key differences between oil and gas extraction and mining are that ‘conventional’ hydrocarbon³ extraction is more capital-intensive up front, with capital investment in a mining project running throughout the life of the project instead of much of it taking place before production starts; there are usually more direct jobs in mining, which also has a bigger physical footprint, than in hydrocarbons.

To discover the sub-soil asset you have to go and look for it. Exploration is done in a mixture of ways: using geological mapping and modelling; using ground-

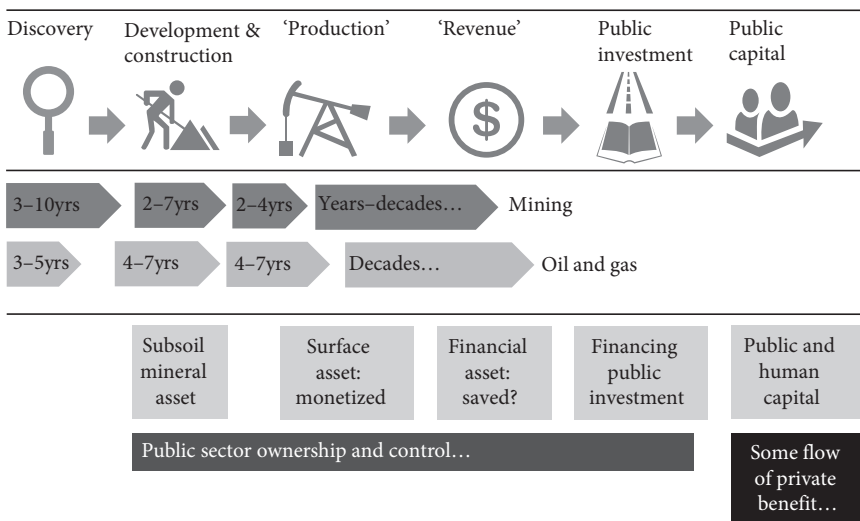


Figure 2.1 A sequence of asset transformations

Source: Adapted from Henstridge and Rweyemanu (2016) and AfDB (2015a).

³ ‘Conventional’ oil and gas are broadly defined as typical reservoirs consisting of a permeable reservoir rock with an overlying layer of impermeable rock (a trap or seal). This contrasts with reservoirs of ‘unconventionals’ such as shale and tight gas or oil that require constant stimulation through hydraulic fracturing (‘fracking’) and other techniques. This results in an ongoing need for investment that is more akin to mining.

sea-, or air-based surveys; generating seismic, magnetic, or gravity data to understand whether there are deposits and the associated geological phenomena that will trap hydrocarbons, or yield an ore body. The footprint of these activities is small. It is specialist, often with a focused international supply chain. If offshore, the footprint is limited to the seismic vessel, water, and airborne support crafts, an office, and a shore base. If onshore, then the exploration activity has more of an obvious presence, but seismic surveys are transitory activities rather than any permanent establishment, except in rare circumstances. The concentration of skills and experience in exploration is high, and usually imported along with the risk capital that gets sunk into such exploration.

Exploration is risky: it is a step into the unknown. As a result, the global pattern of mineral production reflects a long legacy of exploration around better understood geology. Only once something has been discovered does a prospective geological 'play' start to become de-risked. This explains the observation that there are more sub-soil assets, recorded as mineral reserves, in the OECD than in Africa (Collier 2010), when geology would provide for a more uniform global distribution across continents.

Most oil companies will only drill when they are reasonably sure they will have a result. As the risk is mainly geological it can be analysed down to a well-understood level. The footprint and cost of drilling is bigger than seismic activities. For hydrocarbons, there is then often the development of a programme to drill successive exploration wells. At this point there are more people involved, and some increase in the supply of services, both specialist foreign industry services and domestically sourced non-tradable services such as accommodation, transport, and catering. There will be an increment to employee income tax once a company staffs a permanent establishment.

If there are commercially viable discoveries, the investor will build up quite a large organization. If it is a multinational, it will tend to bring in established standard operating procedures, both of a specialist nature and as part of the regular running of a large business organization.

Commercial viability switches a project from the discovery phase to a development phase. At this point there will also be a switch in the basis for interacting with the state. The terms and conditions for exploration licences may be less complex than those typically associated with the production contracts and regulations, which may be subject to negotiation. At the same time, the first commercial discovery in a geological area quickly de-risks exploration strategies of other companies, and that shifts the balance between exploration risk and expected return for a mix of investors, and for the government.

The development phase switches to a construction phase once a contractor makes what is known as a 'final investment decision' (FID). By this point, there will often have been considerable investments in understanding the geological

characteristics and risks of a hydrocarbon deposit; in the engineering appraisals and designs, which also have 'technical' risks; and in commercial appraisals and market risks; as well as any 'non-technical' risks—for example, the largely political risk of future changes in fiscal terms and conditions. The FID means a commitment has been sunk into the project and country—a point of no return. This has considerable risk for the investor of a hold-up problem. There are also risks for the government if it turns out the deal is not seen to be somehow fair in the long run.

The construction phase of a conventional oil and gas project is when the big capital investment takes place. In oil and gas this can amount to several billion dollars, much of which might be offshore; in mining, capital expenditure is lower at this stage, but it will often be ongoing during the life of the project, with relatively less sunk up front. Some of the capital investment is on highly specialized precision engineering, but other components of these projects are literally construction, including bricklaying, carpentry, metal work, plumbing, and electrical works.

In oil and gas, if a large onshore facility is part of the project, such as a plant for cooling and liquefying natural gas, then there will be several thousand jobs during construction. Though it is also capital-intensive, mining creates relatively more jobs during the operations phase than oil and gas, which will only number in the few hundreds.

During the operations phase, natural resource projects will start to yield revenue. This goes in two stages: there is a period during which revenue to the government is depressed as the project takes a share of the profit to re-pay capital investment, known as 'cost recovery', or the contractors' corporation tax liability is zero owing to carried-forward capital investment allowances. Once that phase is completed, then most modern oil and gas projects will typically see a larger share of the rent being transferred to the government.

The management of revenue is part of the management of the public finances writ large. The debates about how much to save and how to save, and how much to spend, and on what, are centred on the phase which turns rent into public spending. This process is complex enough without the extra risk associated with large and sometimes volatile receipts.

It is also the case that in some countries even modest receipts, when set against gross domestic product (GDP), can represent large inflows against the other components of the balance of payments, or the balance sheet of the central bank, or even the banking sector as a whole, making for monetary policy challenges that are a corollary to fiscal policy challenges—a point on scale to which we will return. These asset transformations entail interactions between state regulation and public policy and the usually foreign private investment to finance investment at the scale needed by hydrocarbons and large-scale mining. It is this sequence of transformations of a state-held sub-soil mineral asset, through the

mix of public investment and private business activities, that unlocks the growth and development opportunities, and in which the risks to a positive development outcome can be found.

2.2 The legal and institutional context

Wrapped around that sequence of asset transformations is the institutional context—the laws, regulations, licences, contracts, and the ministries and agencies with the legal mandate to implement them. Figure 2.2 provides an illustration.

The specifics of this legal and institutional context will vary across countries. Figure 2.2 provides a stylized framework for gauging the institutional and policy challenges in an asset transformation. Exploration is typically governed by a law and a licence with one ministry as the policy authority.

Once a discovery is made, there is a process that engages a broader range of ministries and agencies, such as those covering the environmental impact.⁴ The contractual obligations are more complex for the development and production of a discovery. With each new government ministry or public agency involved, there are growing possibilities for inconsistency between legal mandates, regulatory

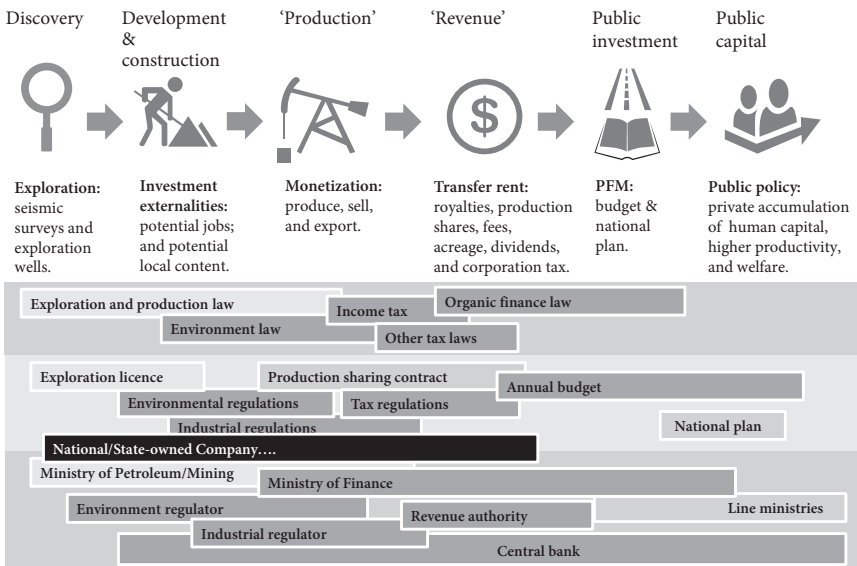


Figure 2.2 The legal institutional context

Source: Adapted from Henstridge and Rweyemanu (2016) and AfDB (2015b).

⁴ While environmental impact assessments (EIAs) are a requirement prior to any exploration activity (seismic and drilling) in all jurisdictions, once a discovery has been made the assessments relate to production, not just exploration.

authorization, and the agenda and interests of each particular organization. This elevates the stakes on interactions between the contracting company and a mix of government agencies.

A company will go to FID after working to assess and mitigate as much risk as possible—the geological, engineering, market, and non-technical risks associated with the political economy in which they will be operating. They will get to this point on the basis of detailed plans that will have had to secure government approvals. The construction phase broadens out the local supply chain. Indeed, for hydrocarbons this is the phase with the most direct hires. The project will then have an interface with the labour market and a broader mix of business suppliers, and the associated laws and regulations.

In many countries, one of the biggest components of this framework is the national or state-owned company. It may have no in-house capability to operate any stage of a natural resource project—though many do—yet will have an involvement for and on behalf of the government. In particular, it may hold any share of a consortium assigned to the state, led by one company as operator, in the development and production of a mineral asset. The administrative and policy complexity goes up as rents go into the fiscal arena. There is an interface between the exploration and production law and regulations and the law and regulations governing taxes more broadly, and in turn with the organic budget law and other instruments that govern the operations of public finances, which shape and constrain decisions.

Before going further into the economic context, I turn to the literature on the impact of natural resources on growth and development.

3. The literature

The literature that reviews the development trajectory of resource-rich economies highlights weak growth and disappointment. The initial focus was a debate on why, in an apparent paradox, resource wealth is a ‘curse’ for development. There have been two main threads of analysis contributing to this broad debate: first, is there actually an impact on growth and development? Second, if so, what are the transmission mechanisms—in other words, why is it that some countries have suffered, but not all?

The idea of a ‘resource curse’ was highlighted by Auty (1988, 1993), in particular with a review of the experience of the oil boom and crash in Trinidad and Tobago (Gelb 1988).⁵ The trajectories of a mix of other countries, such as Nigeria and Venezuela, had common elements, including a sharply appreciated real

⁵ Rick Auty coined the term ‘resource curse’ in 1993, building on the title of Alan Gelb’s edited volume (1988) asking whether resources were a ‘curse or blessing?’

exchange rate. A debate of now decades has been sustained, and has been subject to multiple surveys. More recently these include: Frankel (2010), van der Ploeg (2011), Ross (2012), Deacon (2011), Gilberthorpe and Papyrakis (2015), Venables (2016), and van der Ploeg and Poelhekke (2016). Badeeb et al. (2017) provide an overview of the evolution of the resource curse thesis, and conclude that ‘there is currently no consensus regarding the existence of a natural resource curse. If the curse is a relevant concern, the disparate literature certainly indicates that its ubiquity should not be exaggerated.’ The point is to explore what the literature might offer as an answer to the question: what follows for other countries which might be facing a potential resource boom?

The many papers prompted by Sachs and Warner (1995) using cross-country regressions were exploring average effects, and looking to hold some variables constant to isolate correlations that could point to causal mechanisms. The statistical problems with cross-country regressions, combined with endogeneity in the chosen variables, render this swathe of papers problematic. Van der Ploeg and Poelhekke (2016) argue that the quantitative evidence is at best mixed but not strong. The variables used to capture resource abundance, intensity, or dependence suffer for being endogenous (Brunnschweiler and Bulte 2008; van der Ploeg and Poelhekke 2009).

In any case, measures of the level of natural resources are trumped by the impact of volatility. It is hard to distinguish empirically between the effects of institutional quality, financial development, or the political environment because they are all correlated. In general, there are omitted variable biases and multiple confounding factors at work. More promising are approaches that use a mix of identification techniques, such as difference in differences on natural experiments, to get at statistical power in country-specific studies.

The attention of the literature has switched away from looking at average effects to explore in more specific terms the mechanisms that may mean an impact on growth and development from resources (Torvik 2009). There is a mix of possible mechanisms, but here I just look at two categories because each has a different class of policy responses. One is the impact of resource revenues and the associated fiscal and monetary policy choices for managing them. The other relates to the impact of resources on institutions, for which there are fewer textbook-type policy recommendations.

3.1 ‘Dutch disease’ and volatility

One common explanation of slow growth arising from natural resources is the Corden and Neary (1982) analysis of ‘Dutch disease’—when there was a manufacturing recession in the Netherlands once the natural gas from the Groningen gas field was associated with an appreciation of the real exchange rate,

which squeezed employment in tradables.⁶ The appreciation of the real exchange rate is a powerful change in relative prices. It can be driven by a surge in foreign direct investment (FDI), by an increase in volume of exports as production for export comes on-stream, or by a sharp increase in the price of the exported commodity—primary commodity prices being notoriously volatile. The impact of ‘Dutch disease’ has also been analysed by van Wjinbergen (1984), while the impact of volatility on growth was a key transmission mechanism for van der Ploeg and Poelhekke (2009).

There is an important distinction to be made between the real exchange rate change that is a fundamental consequence of an increase in natural resource exports, and changes in relative prices which are too sharp for the resulting reallocation of resources to be smoothly accomplished—such as could be driven by commodity price volatility. On the other hand, Lee (2018) argues persuasively that the permanent appreciation of the real exchange rate is an important consequence of raised natural resource export income, inducing stronger supply of non-tradable goods and services to meet demand. This happens with all export activities, not just natural resources. Investment in non-tradable production can be the major driver of job creation.

There is scope for economic policy to manage the impact by dampening the impact of changes in relative prices. This could be achieved through care in not spending sharp increases in revenue, or by using monetary policy to sterilize shifts in the balance of payments. That this is feasible does not mean it is easy. There are examples of careful management of surges of foreign inflows—which includes international aid transfers, which are sometimes as volatile as commodity prices. But the analysis involved in separating out volatility from underlying fundamental shifts in relative prices, and then the politics of deferring expenditure, especially in a low-income country, are especially difficult. The policy prescriptions for managing spending and savings decisions, such as those that apply the ‘permanent income hypothesis’ or the Hartwick Rule, or Hotelling’s Rule, also rely on such a decomposition, typically being illustrated by projections of fiscal receipts with constant commodity prices (see, inter alia, Collier et al. 2010; van der Ploeg and Venables 2013).

The challenges of introducing robustly valid theory to the reality of volatility and the challenge of sustaining technocratically strong policy positions in the face of popular expectations for more wealth quickly should not be underestimated. This is why ideas such as putting fiscal rules into law, having dedicated legislation to mandate savings, or creating stand-alone funds, while sound in principle, are problematic in practice. In the context in which they are needed to hold political pressure at bay, they would not survive; if they can be sustained because the political

⁶ The term ‘Dutch disease’ having been coined in *The Economist* in 1977 in an article on these developments.

environment protects their integrity, they are not needed.⁷ Such considerations of political context are also important when looking at the literature on the role of resources in shaping the institutions of public policy, with an impact, in turn, on growth and development.

3.2 Natural resources and institutions

There is a debate on the role of institutions as a mechanism for the resource curse. My focus is less on whether, on average, there is a role, and more on the thread of analysis of how such a mechanism might work. There are two main arguments. The first is that only initial conditions matter: if institutions were weak to start with, the impact of natural resources on growth and development will be negative.⁸ If they are strong, or simply strong enough, then there will not be a resource curse. The second argument is that the rents associated with natural resource extraction endogenously corrode the quality of institutions, which in turn affects growth. Of course, both effects could be in operation at the same time.

Lane and Tornell (1996) and Tornell and Lane (1999) cite dysfunctional institutions to explain disappointing economic performance in the wake of oil windfalls in Nigeria, Venezuela, and Mexico. Sala-i-Martin and Subramanian (2003) estimate the impact of the share of natural resource earnings in GDP on the quality of institutions and the impact of institutions on growth, concluding that ‘some natural resources—oil and minerals in particular—exert a negative and non-linear impact on growth via their deleterious impact on institutional quality’. Mehlum et al. (2006) distinguish between producer-friendly institutions, where rent-seeking and production are complementary activities, and grabber-friendly institutions, where rent-seeking and production are competing activities (the origins of these institutions are in turn explained by Acemoglu and Robinson 2012).

Alexeev and Conrad (2009) argue that the claims that natural resources negatively affect growth and that they degrade institutional quality are incorrect. They argue that the time frame used in cross-country regressions is too limited. And by using a prediction of a counterfactual GDP per capita in the absence of a high oil or mineral endowment, they argue that natural resources do not undermine the quality of existing institutions—which may have been weak to start with. As already argued, the study of *average* effects of natural resources on institutions and growth might be a fallacy in general, because institutional change itself is dependent on pre-existing institutions—we therefore have to understand the

⁷ For some analysis on this challenge, see Davis et al. (2003): an underlying concern is to avoid assuming the conditions exist for successful and sustained implementation of institutional remedies.

⁸ This argument is also applied with respect to foreign aid inflows by Bourguignon and Gunning (2016).

historical development of these (as discussed in the historical institutionalism literature).

Torvik (2009) argues that we have quite limited knowledge along which dimensions resource-abundant winners and losers differ, but proposes six that can shape outcomes:

- saving of resources income
- presidentialism vs. parliamentarianism
- institutional quality
- type of resources
- offshore vs. onshore oil
- early vs. late industrialization.

The way in which any one of these dimensions would work could be through the incentive that resource abundance provides to elites to demolish institutions because it is in their interest. For example, by reducing accountability by weakening checks and balances, and so allowing them to grab more rents (for examples, see Persson et al. 2000; Ross 2001). This might not always be driven by politicians/elites, but could also be favoured by voters, as in Acemoglu et al. (2013). Torvik (2016) argues that natural resources may still influence institutions on a case-by-case basis, and the question is why natural resources contribute to prosperity in some places and to more poverty in another? And the normative implications: what does it imply for the design of policy and institutions?

This literature also throws up some interim conclusions:

- *The various explanations of a 'resource curse' effect can often be linked: commodity price volatility can provoke sharp changes in the real exchange rate, elevating risks to investment; elite rent capture with weak accountability implies little space for technically strong economic management or careful long-term planning of public investments.*
- *There is some evidence that a key transmission mechanism of disappointment from natural resource discoveries is through the impact on politics, institutions, and structural change.* The corollary is that the sequence of events that follow discovery offers some opportunities for policy to shape or condition the economic and political impact of the transformation of mineral assets. Some countries have not fallen foul of the threatened curse. It may be difficult to avoid, but it is not inevitable.
- *Cross-country regressions with average correlations are unsatisfactory for using variables such as resource dependence or abundance, which not only risk being endogenous, but which also only capture one step in the sequence of asset transformations through which resources interact with the growth and development process.*

In sum, each country that finds the opportunity of natural resources disappointing does so in its own way. As Venables (2016) points out, there is no single reason why using natural resources for development has proven so difficult.

4. Magnitudes

While in general the size of an anticipated boom is overestimated and the delay in receiving revenues is underestimated, it is also the case that the steps for developing a resource discovery, the extent to which it has an impact, and the scale and timing of those steps are also often under-appreciated. Figure 2.1 showed that it can take decades to get from exploration to production, in both oil and gas and in mining—at least for large mining projects. Moreover, for hydrocarbons the biggest impact on direct employment comes during the construction phase rather than during operations. The big numbers on FDI are also ahead of production starting up, although much of FDI is likely to be international finance for capital goods imports rather than having a direct impact on the economy. These points on sequencing and timing are of relevance to the institutional environment into which revenue would eventually flow. If the elite have expectations of a boom that will arise when the revenue comes in, they will take early action so as to be nicely positioned to secure rents. The other aspect, to which we return in this section, is how sequencing and timing interact with expected scale—but not so much the magnitudes surrounding the project, rather the scale of economic impact.

First, however, two examples that show that the scale of a resource boom can be made to look big or small, depending on the comparators against which it is benchmarked. Perceptions of scale depend on the perspective one adopts. In 2012 there were inflated expectations about the prospects for oil in Uganda. It could be seen as really big: P50 proved reserves had been declared by Tullow Oil at 1.1 billion barrels. In 2012 the international price for Brent oil averaged US\$111 per barrel (BP 2017). A simple multiplication would therefore value those reserves at US\$122 billion, which was around four times the 2012 GDP. Big numbers, but misleading:

- First, you cannot get all the oil turned into cash all at once: it takes time to turn reserves into production—the life of most oil projects is around twenty-five years—even if the government and the private contractor are both in a hurry.
- Second, Ugandan oil is waxy and landlocked: it does not fetch the same price as Brent crude oil, and it is costly to export.
- Third, the sizeable capital costs involved in three interlocked projects—oil production, a refinery, and a heated export pipeline—required international investment. There was then a tough problem of coordination across those three large and risky projects, and it has been a persistent problem.

In fact, oil in Uganda is quite small as well as a distant prospect. Even just dividing the gross figure by total population, and so ignoring any costs involved in bringing a sub-soil asset above ground, reduces it to US\$3,500 per person. But getting realistic and allowing for time to develop and produce and export the oil, with all the costs associated with that, and using a more conservative price of US\$75/bbl, then Henstridge and Page (2012) show that total revenue to government would be equivalent to 5 per cent of non-oil GDP, and would only amount to US\$41 per person per year in 2030. Not insignificant, but not of itself transformational. Tanzania provides another example of a prospect that could be simultaneously very big and small (Henstridge and Rweyemamu 2016).

A broader perspective on the scale of a boom is to look at the scale of economic impact of each step in the sequence of asset transformations. For hydrocarbons there are a few direct points of contact, and relatively few directly created jobs; the broader impact of natural resources on structural change will be indirect, could start well ahead of any revenue flows, and will be mediated by a constellation of policy positions.

Figure 2.3 provides an illustration of the main linkages between a resources project and jobs—with some of the key mediating areas of public policy listed as well. It is calibrated for conventional hydrocarbons rather than mining, where there will be thousands of direct jobs during production, and capital investment will run through much of the lifetime of the project.

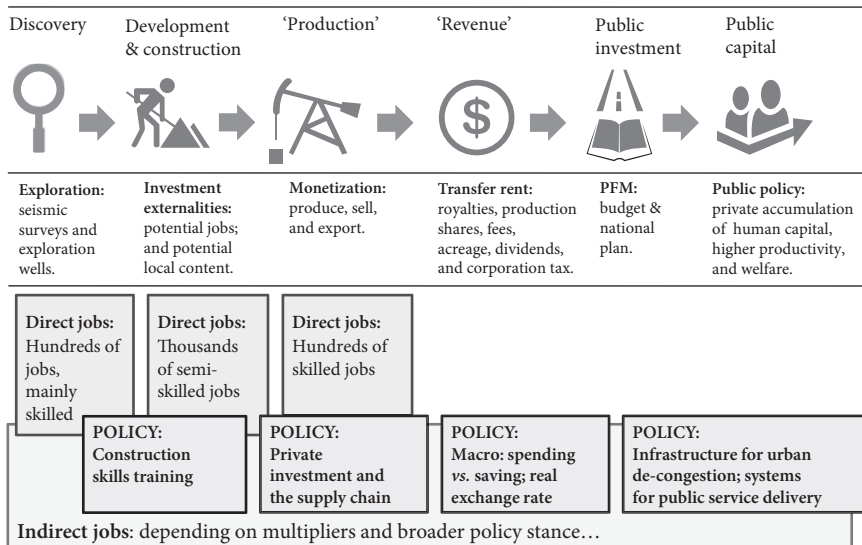


Figure 2.3 The broader context: jobs and policy

Source: Adapted from Henstridge and Rweyemamu (2016).

The calibration for conventional hydrocarbons serves to make a more stark point about the broader economic impact of a natural resources project when the direct job creation only swells to thousands of jobs during the construction phase of a project. It only takes a few hundred people to run some oil or gas projects, many of whom will be highly experienced industry specialists. It is, of course, a well-understood statement of the obvious that a hydrocarbon project does not of itself drive a shift in employment in a developing economy.

There is, however, scope for phases of policy to influence the indirect impact, including on jobs. The areas of policy of potential relevance are illustrated in Figure 2.3: (1) construction jobs and skills training; (2) the environment for private business investment—which can increase ahead of the development of the natural resource, and which includes ‘local content’ which seeks to support firms who can be part of an international supply chain; (3) appropriate fiscal policy management in the face of possibly large and volatile macroeconomic flows; and (4) the efficiency and focus of public investment, including in infrastructure and other forms of public capital.

4.1 The construction sector and jobs

Through the exploration phase and the development phase, direct economic impacts are limited to the hiring of a few hundred people, and some supplies for an office and an exploration programme. The construction phase sees the first material impact on jobs, many of which may be semi-skilled. What gets built may be limited to onshore facilities for offshore hydrocarbons, such as with the oil developments in Ghana. But it could include building or assembling a facility for the ‘trains’ which condense natural gas to a liquid by cooling it to -161°C (-260°F) so that it can be exported by ship as liquefied natural gas (LNG). In mining operations, the development phase could involve substantial ongoing employment.

Where construction is involved, there is likely to be a material impact on the labour market for a range of semi-skilled and skilled workers, such as construction workers, bricklayers, metal workers, carpenters, plumbers, and electricians. In a low-income country there is unlikely to be an elastic supply of such workers to fill some thousands of jobs. It was estimated that some 4,000–5,000 jobs would be created directly during construction of LNG facilities in Tanzania. This compares to a range of jobs on other LNG construction projects ranging from around 2,000 in Australia to 8,000 in Angola (OPM 2013).

Although a few thousand is a few jobs when the labour force numbers millions, there are not the skilled people to meet this demand. Training will be essential for secure project delivery, and it may well need a specific initiative. An example is provided by the analysis of the labour force in Tanzania in anticipation of large-scale LNG. An assessment of vocational and educational training needs

(VSO 2014) concluded, among other findings, that: (1) those graduating from ‘vocational education and training’ are not directly employable; (2) the trades which will be needed are not being taught; and (3) in any case, the training is low quality. However, most of the areas in which training would be needed to fill the jobs created as part of the investment in hydrocarbons were not sector-specific: the VSO assessment showed that a significant number of the skills needed are transferable. These include the skills needed in metal work, building works, civil engineering and infrastructure, mechanical work, and electrical work.

This is an important point for the economic impact of the boom when revenue starts. A natural resource boom leads to a construction boom: it is a facet of Dutch disease that the appreciation of the real exchange rate raises the returns to non-tradable activity, but also to non-traded capital, which is mainly structures. If the construction sector is weak, the supply of structures is inelastic, and the real estate boom is more in prices than buildings. If, however, there are growing numbers of people with transferable construction skills, then the supply of structures is more elastic. This points to a policy position that training to a standard good enough to work on the construction phase of a natural resource project means people with those skills will be in demand as the boom kicks in. That there is a shared interest in sufficient-quality training of more than enough people between the natural resource company and the government seems clear. Training tens of thousands, even if only a few thousand are needed, could provide mitigation for the risks associated with a sharp appreciation of the real exchange rate. It would mean running a training organization that could cope with 1,000+ people each year for more than ten years.

4.2 The environment for private business

There are three channels of impact from the natural resource sector to the broader private business environment. One is through expectations, another through the supply chain, and the third is broader, being conditioned by the array of policies that can affect industry and business.

First, the impact of the natural resource sector on private business can start with the discovery itself. There is evidence that the news of a discovery has an impact on private business because it can sharply shift expectations about future levels of national income. In a panel of 180 countries over the period 1970–2012, Arezki et al. (2017) show that investment rises robustly after the news of a giant discovery. There are contrary results from Poelhekke and van der Ploeg (2013) on the impact of resource rents on non-resource FDI in the period 1985–2002, who argue that resource rents depress non-resource FDI in the long run. This can be argued to be the Dutch disease, or the resource curse more broadly, in action, given that the effect is prompted by the rents from natural resources. But using

data taken during the more recent commodity boom between 2003–12, Toews and Vezina (2017) document a 58 per cent increase in non-resource extraction FDI in the two years following a giant natural resource discovery. They also use detailed multiple waves of household survey and firm census data to track the impact of a giant discovery of natural gas in Mozambique on further FDI for other business activities. They estimate that each FDI job results in 6.2 additional local jobs.

Second, to the extent that there is a potential supply base, the more an oil or gas or mining project has a potential role in elevating domestic firms to the standards of quality necessary for participation in an international supply chain. This is a point that has been well made by John Sutton in his series of *Enterprise Map* books.⁹ Part of the framework for this impact is provided by regulations and policy relating to ‘local content’. In some instances, there are requirements for the international contractor to buy inputs locally. However, in some instances that means that a domestically registered company proceeds to import goods and services, instead of the oil or gas or mining company, or one of their tier-one suppliers, importing directly. That serves to raise costs and offers scope for rent-seeking: only a few will be able to take up a coveted position as the domestically registered supplier. That there is a monopsonist compelled to buy locally likely limits competition.

Finally, the rate of private investment, business formation, and firm growth will be conditioned by an array of public policy positions which together constitute ‘industrial policy’. The impact of the natural resource sector on the broader business environment will come through the way in which policy is a consequence of accumulated interests which will shape the ‘institutions’ (in the Douglass North sense) of the economy. The argument here is that if the natural resource sector is significant, as it so often is in low-income countries, then the more that the activities which surround it are conducive to rent-seeking, the stronger will be the interests in reduced economic openness and competition. In these instances, they will strengthen interests in further elite rent-seeking, or ‘extractive institution’ formation (Acemoglu and Robinson 2012), or ‘closed order political settlements’ (in the language of North et al. 2009). In turn, the impact on economic openness, or a flexible or competitive economy, will be deleterious.

This point has further resonance when one considers that a long-term process of growth and structural change means huge reallocation of people and resources, perhaps most clearly in migration from rural and agricultural employment to urban service-sector jobs. Even in China, most modern sector jobs were non-tradable services jobs. Gollin et al. (2013) show that in natural resource-rich, low-income countries, cities are not centres of production for tradable goods, rather

⁹ See for example Sutton et al. for Enterprise Maps for Ethiopia (Sutton and Kellow 2010), Ghana (Sutton and Kpentey 2012), Tanzania (Sutton and Olomi 2012), Zambia (Sutton and Langmead 2013), and Mozambique (Sutton 2014).

they are 'consumption cities.' Lee and Vanino (2018) establish the important point for thinking about the role of extractive institutional settlements, and the long-run structural change of resource-rich economies, that rent-seeking and predation is a lot easier on non-tradable sectors than internationally tradable sectors. The logic is that squeezing a tradable activity, for example by raising costs, threatens the whole venture because of competition in international markets or the availability of imported substitutes. Non-tradable sectors do not have that existential threat and can be sustainably squeezed quite hard. Sustainable rent extraction is then compatible with sustaining extractive institutions, and hence an array of industrial policies which may not be good for sustained growth in competitive private business.

4.3 Fiscal and monetary policy management

Macroeconomic policy is at the heart of the literature analysing the 'resource curse', and offering advice on how to ward off the curse. This is because rents are central to thinking about natural resources and they mainly show up in the economy in the public finances. Macroeconomic flows shift as a natural resource project goes through its phases, and matter in different ways to different interested parties. The company as contractor is concerned about the flows that determine the commercial sustainability of the project as a business venture. The finance ministry is most interested in the revenue and other flows which have a fiscal impact. While the central bank will be most concerned with the balance of payments flows, and consequences for the exchange rate and inflation as targets for monetary policy.

The macroeconomic magnitudes that matter when scaling the impact of a natural resource project depend on the variable of concern. Initially, the scale of FDI being brought onshore could be big in relation to other components of the balance of payments. That impact will be of more immediate interest to the central bank than the ministry of finance. If there are material foreign inflows, they could be particularly big in relation to the central bank balance sheet, possibly also the consolidated balance sheet of the banking system in a low-income country, and hence be a handful for monetary policy to manage if there are threatened sharp movements in the exchange rate, reserves, or money.

If there is the sort of FDI boom that Toews and Vezina document for Mozambique, there will be a mini-boom in fiscal revenue from import duties, sales taxes or VAT, and income taxes. None will be immediately associated with the operations of the natural resource sector, and they will be well in advance of payments of rents from natural resources. Turning to the bigger, eventual, fiscal impact of resource revenues, they have an inescapable characteristic of volatility. Commodity prices are notoriously volatile (Figure 2.4).

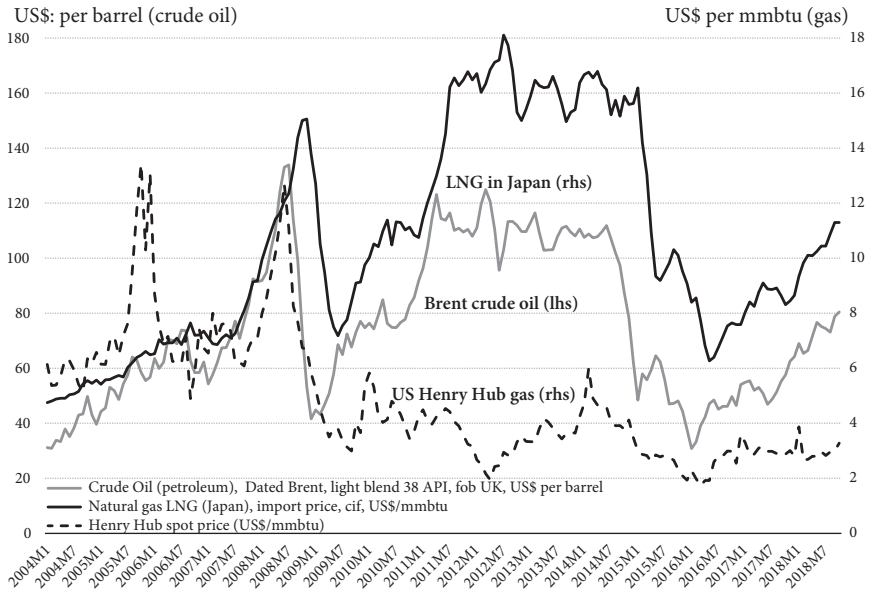


Figure 2.4 Commodity prices

Source: Author’s construction based on IMF Primary Commodity Prices database, available at <https://www.imf.org/external/np/res/commod/index.aspx> (accessed 23 December 2018).

But even if prices are absolutely flat, and production volumes constant, revenues will often change from year to year. This is because the relationship between the value of production and the revenue associated with it can change from year to year as the fiscal regime accommodates a phase of cost recovery, or the carried-forward capital allowances change, or the interest cost of finance changes. Figure 11.2 in Chapter 11 this volume carries some illustrative projections of revenues from the possible, but now unlikely, large-scale offshore gas and LNG projects in Tanzania. The central projection of revenue in the right-hand panel in Figure 11.2 varies each year, even though the price assumption is flat and the assumption of volumes of production after a ramp-up phase is flat through to a period of decline. Volatility matters for the impact of a boom because it makes building a budget and managing fiscal and monetary policy difficult, and because volatility means additional risk, if not outright uncertainty, for private investment, and that lowers growth and potentially contributes to a resource curse effect (see van der Ploeg and Poelhekke 2009).

Addressing these macroeconomic policy challenges is difficult overall, but some of them can be separated from the others by looking at a sequence of decision points. The decision on how much to spend, whether on consumption or investment, and how much to hold offshore is an early choice. This was a decision that was foreseen by the Petroleum Revenue Management Act (PRMA) in Ghana. The choice is one that is intermediated by the rate at which foreign inflows can be

absorbed. That in turn is a function of economic flexibility, in particular the supply elasticity of non-tradables (Adam and Bevan 2004). There is also an early choice on whether to bring forward new natural resource revenues by borrowing in advance against the security of future expected revenues. There is reasonable economic logic which would analyse the decision in terms of the relative costs of borrowing and the rate of return on early investment and the discount rate applied to early consumption spending. There is also a strong political logic: borrowing to bring forward access to rents is a tempting source of finance for a political strategy to retain power. That points to sub-optimal economic returns from early spending financed by borrowing. The various accounts of Chinese loans to Ghana—outside the purview of the PRMA in terms of fiscal prudence—provide an illustration.

On the spending decisions, there is a balance to be struck between raising consumption in line with increased permanent income, and further transforming the mineral asset by using the rent to invest in public capital, such as infrastructure. The importance of a coherent link between resource rents and savings and the broader public finances can be illustrated by thinking about the role of different categories of public expenditure in the accumulation of private capital assets, including personal health and education, as well as the building up of public assets. Private and public investment are of course complements—people will invest in trucks if there are the roads and bridges that enable trade, for example.

But equally important, the returns to public assets, infrastructure in particular, are high when operations and maintenance spending is sustained. Adam and Bevan (2014) show that the returns to operations and maintenance of existing, but poorly maintained, public infrastructure are higher in terms of their contribution to growth than building new infrastructure. Standard fiscal classification has operations and maintenance spending as recurrent expenditure rather than investment. Similarly, the public expenditure that contributes most directly to people's accumulation of their own human capital is recurrent, being the salaries of teachers and medical staff, and the medical supplies, that are all part of improving and maintaining education, skills, and health through public service delivery. But if there are rules which limit the spending of resource revenues to investment, then the returns on existing public assets and the opportunities for human capital development, all of which draw upon recurrent expenditure, may be sub-optimal.

5. Institutions and policy stance

A set of policy issues has emerged throughout this framing of a natural resource boom. But whether policy implications, recommendations, or recipes are ever actually relevant to the reality of a resource boom is more a function of the politics of policy than the analysis of evidence informing recommendations. The

political economy of natural resources mainly revolves around the rents involved. The extent to which rent-seeking succeeds, and then those who extract rent succeed in sustaining their position through their influence on the institutional foundations of the policy process, is therefore key to even just glimpsing appropriate policy.

There is a long literature on institutions, both where they come from or what shapes them, and what follows from different institutional configurations. I made reference earlier to the work of North et al. (2009) and Acemoglu and Robinson (2012), to which can be added the framework of Pritchett et al. (2017). In essence they all provide a framing of the way in which a political settlement shapes the institutional ‘rules of the game’, and drives the coordination of agents’ decisions and expectations. The settlement could be the suspension of a threat of violence (North et al. 2009), or it could be an equilibrium division of the spoils of rent capture.

Such an ‘extractive’ institutional configuration is consistent with the strands of the literature on the resource curse which look at the role of rents in shaping institutions which determine growth out-turns. But as the literature argues, a resource endowment is not destiny. The interesting element of the institutions literature is the bit that tries to focus on what changes the institutional configuration.

In essence there are two things that can represent positive change. One is the development of impersonal transactions among elites. This is the key threshold condition for North et al. for moving from a closed-order settlement to an open-order one. A second is an external shock that disrupts the equilibrium of political settlement. In a resource-rich economy this could be driven by sharp changes in commodity prices and the disruption in the flow of rents that follows, or it could be a technology shock—perhaps one that makes fast-growing services tradables rather than non-tradables.

That point links to two other observations on the political and institutional foundations for policy. One is that cities in resource-rich economies are ‘consumption cities’ that have grown on the increased national income arising from a resource boom, with a strengthened real exchange rate increasing the returns to non-tradable production, and to non-tradable capital—as represented by a construction boom (Gollin et al. 2013). The second is that it is easier for an elite to capture rents from non-tradable than tradable sectors (Lee and Vanino 2018). ‘Consumption cities’ might be efficient or they might be a symptom of growth-killing extractive institutions. If natural resource exports are very high, then it is expected and efficient for other exports to be low and for a lot of urban production to be focused on non-tradable services—consider Australia. However, if institutions are fundamentally extractive, with private individuals extracting rents from natural resources and from non-tradable producers in a way that pushes up costs and reduces competitiveness, then investment and production of

non-resource exports is indeed suppressed. This is inefficient and bad for growth—consider Nigeria. Observing a high level of resource exports and high employment in non-tradable production is not enough to distinguish between these two sets of conditions.

What follows from all that is that some policy choices made early on offer a different path forward to the institutional constraints that will shape or constrain subsequent policy decisions. Initial policy choices come right at the outset of the sequence of steps along a natural resource value chain.

These include the initial encounter between explorers and the relevant government ministry. If there are requirements for some elements of transparency and competition in awarding exploration licences, then there is already an openness to the governance of the sector. If a major discovery is made, then there will be a material economic impact in terms of FDI—and the experience of Mozambique implies that there is an opportunity for job creation at some scale. If the management of FDI provides for an open and competitive business environment, then the transactions between elites who might otherwise have sought to stitch up particular sectors—particularly non-tradables, such as brewing—may become more impersonal. Impersonal transactions among elites, particularly capital transactions, such as traded equity or debt, are a threshold condition for the switch from closed-order to open-order settlements. In a similar vein, a stitch-up of local content regulations may hold back inclusive open-order institutional settlements.

When eventually resource rents come into the line of sight of policymakers, the various macroeconomic policy choices will be better formulated and debated if the tone has been set towards openness and inclusive institutional settlements. This would be evidenced by elite consensus on wanting reasonable degrees of competition in markets for factors of production and non-tradables, as well as open trade.

Acknowledgements

I am grateful to Laura Brouwer for valuable research assistance, and to Benjamin Klooss, Stevan Lee, and Umar Salam for useful comments; the usual disclaimer applies.

References

- Acemoglu, D., and J. A. Robinson. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown.
- Acemoglu, D., J. A. Robinson, and R. Torvik. (2013). 'Why Do Voters Dismantle Checks and Balances?' *Review of Economic Studies*, 80: 845–75.

- Adam, C., and D. Bevan (2004). 'Aid and the Supply Side: Public Investment, Export Performance and Dutch Disease in Low-Income Countries'. Department of Economics Working Paper 201. Oxford: University of Oxford.
- Adam, C., and D. Bevan (2014). 'Public Investment, Public Finance, and Growth: The Impact of Distortionary Taxation, Recurrent Costs, and Incomplete Appropriability'. IMF Working Paper 14/73. Washington, DC: IMF.
- AfDB/BMGF (2015a). 'A Framework: Human Development and the Links to Natural Resources'. Background paper 1 to the flagship report: *Delivering on the Promise: Leveraging Natural Resources to Accelerate Human Development in Africa*. Abidjan: African Development Bank and Bill and Melinda Gates Foundation.
- AfDB/BMGF (2015b). 'Natural Resource Revenues and Macroeconomic Policy Choices' Background paper 3 to the flagship report *Delivering on the Promise: Leveraging Natural Resources to Accelerate Human Development in Africa*. Abidjan: African Development Bank and Bill and Melinda Gates Foundation.
- Alexeev, M., and R. Conrad (2009). 'The Elusive Curse of Oil'. *Review of Economics and Statistics*, 91(3): 586–98.
- Arezki, R., V. A. Ramey, and L. Sheng (2017). 'News Shocks in Open Economies: Evidence from Giant Oil Discoveries'. *Quarterly Journal of Economics*, 132(1): 103–55.
- Auty, R. (1988). 'Trinidad and Tobago: Windfalls in a Small Parliamentary Democracy'. In A. Gelb et al. (eds), *Oil Windfalls: Blessing or Curse?* Oxford: Oxford University Press.
- Auty, R. (1993). *Sustaining Development in Mineral Economies: The Resource Curse Hypothesis*. London: Routledge.
- Badeeb, A., H. H. Lean, and J. Clark (2017). 'The Evolution of the Natural Resource Curse Thesis: A Critical Literature Survey'. *Resources Policy*, 51: 123–34.
- BP (2017). *BP Statistical Review of World Energy, 2017*. London: BP.
- Bourguignon, F. and J.-W. Gunning (2016). 'Foreign Aid and Governance: A Survey'. EDI Working Paper 16/10. Oxford: Economic Development and Institutions.
- Brunnschweiler, C. N., and E. H. Bulte (2008). 'The Resource Curse Revisited and Revised: A Tale of Paradoxes and Red Herrings'. *Journal of Environmental Management*, 55(3): 248–64.
- Collier, P. (2010). *The Plundered Planet: How to Reconcile Prosperity with Nature*. London: Allen Lane.
- Collier, P., R. van der Ploeg, M. Spence, and T. Venables (2010). 'Managing Resource Revenues in Developing Economies'. *IMF Staff Papers* 57(1): 84–118.
- Corden, W. M., and P. Neary (1982). 'Booming Sector and De-industrialisation in a Small Open Economy'. *Economic Journal*, 92(36): 825–48.
- Davis, J., A. Fedelino, and R. Ossowski (2003). *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*. Washington, DC: IMF.
- Deacon, R. T. (2011). 'The Political Economy of the Natural Resource Curse: A Survey of Theory and Evidence'. *Foundations and Trends in Microeconomics*, 7(2): 111–208.

- Frankel, J. A. (2010). 'The Natural Resource Curse: A Survey'. NBER Working Paper 15,836. Cambridge, MA: NBER.
- Gelb, A., et al. (1988). *Oil Windfalls: Blessing or Curse?* Oxford: Oxford University Press.
- Gilberthorpe, E., and E. Papyrakis (2015). 'The Extractive Industries and Development: The Resource Curse at the Micro, Meso, and Macro Levels'. *The Extractive Industries and Society*, 2(2): 381–90.
- Gollin, D., R. Jedwab, and D. Vollrath (2013). 'Urbanization without Industrialization'. Working Paper IIEP-WP-2014–1. Washington, DC: Institute for International Economic Policy.
- Henstridge, M., and J. M. Page (2012). 'Managing a Modest Boom: Oil in Uganda'. OxCarre Research Paper 90. Oxford: OxCarre.
- Henstridge, M., and D. Rweyemamu (2016). 'Managing Hydrocarbon Resources'. In C. Adam, P. Collier, and B. Ndulu (eds), *Tanzania: Path to Prosperity*. Oxford: Oxford University Press.
- Humphreys, M., J. D. Sachs, and J. E. Stiglitz (eds) (2007). *Escaping the Resource Curse*. New York: Columbia University Press.
- Lane, P., and A. Tornell, (1996). 'Power, Growth and the Voracity Effect'. *Journal of Economic Growth*, 1(2): 213–41.
- Lee, S. (2018). 'Natural Resources and Inclusive Growth'. Working Paper, Oxford Policy Management.
- Lee, S., and E. Vanino (2018). 'Non-tradeables and Inclusive Growth'. *Economic Letters* 170: 10–17.
- Mehlum, H., K. Moene, and R. Torvik (2006). 'Institutions and the Resource Curse'. *The Economic Journal*, 116(508): 1–20.
- North, D., J. Wallis, and B. Weingast (2009). *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge: Cambridge University Press.
- OPM (2013). 'A Preliminary Assessment of the Macro-Level Economic and Wider Socio-Economic Impacts of a Potential Off-Shore LNG Project in Tanzania'. Unpublished.
- Persson, T., G. Roland, and G. Tabellini (2000). 'Comparative Politics and Public Finance'. *Journal of Political Economy*, 108(6): 1121–61.
- Poelhekke, S., and F. van der Ploeg (2013). 'Do Natural Resources Attract Non-Resource FDI?' *Review of Economics and Statistics*, 95(3): 1047–65.
- Pritchett, L., K. Sen, and E. Werker (eds) (2017). *Deals and Development: The Political Dynamics of Growth Episodes*. Oxford: Oxford University Press.
- Ross, M. L. (2001). *Timber Booms and Institutional Breakdown in Southeast Asia*. New York: Cambridge University Press.
- Ross, M. L. (2012). *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton, NJ: Princeton University Press.

- Sachs, J. D., and A. W. Warner (1995). 'Natural Resource Abundance and Economic Growth'. Development Discussion Paper 517a. Cambridge, MA: Harvard Institute for International Development.
- Sala-i-Martin, X., and A. Subramanian (2003). 'Addressing a Natural Resource Curse: An Illustration from Nigeria'. NBER Working Paper 9804. Cambridge, MA: NBER.
- Stevens, P., G. Lahn, and J. Kooroshy (2015). 'Resource Curse Revisited'. Research Paper. London: Chatham House.
- Sutton, J. (2014). *An Enterprise Map of Mozambique*. London: International Growth Centre.
- Sutton, J., and N. Kellow (2010). *An Enterprise Map of Ethiopia*. London: International Growth Centre.
- Sutton, J., and B. Kpentey (2012). *An Enterprise Map of Ghana*. London: International Growth Centre.
- Sutton, J., and G. Langmead (2013). *An Enterprise Map of Zambia*. London: International Growth Centre.
- Sutton, J., and D. Olomi (2012). *An Enterprise Map of Tanzania*. London: International Growth Centre.
- Toews, G. and P.-L. Vezina (2017). 'Resource Discoveries and FDI Bonanzas: An Illustration from Mozambique'. OxCarre Working Paper 199. Oxford: Oxford Centre for the Analysis of Resource Rich Economies, University of Oxford.
- Tornell, A., and P. Lane (1999). 'The Voracity Effect'. *American Economic Review*, 89(1): 22–46.
- Torvik, R. (2009). 'Why Do Some Resource-Abundant Countries Succeed While Others Do Not?' *Oxford Review of Economic Policy*, 25(2): 241–56.
- Torvik, R. (2016). 'Formal Institutions and Development in Low-Income Countries: Positive and Normative Theory'. EDI Working Paper. Oxford: Economic Development and Institutions.
- van der Ploeg, F. (2011). 'Natural Resources: Curse or Blessing?' *Journal of Economic Literature*, 49(2): 366–420.
- van der Ploeg, F. and S. Poelhekke (2009). 'Volatility and the Resource Curse'. *Oxford Economic Papers*, 61(4): 727–60.
- van der Ploeg, F. and S. Poelhekke (2016). 'The Impact of Natural Resources: Survey of Recent Quantitative Evidence'. *The Journal of Development Studies* 53(2): 205–16.
- van der Ploeg, F. and A. Venables (2013). 'Absorbing a Windfall of Foreign Exchange: Dutch Disease Dynamics'. *Journal of Development Economics* 103: 229–43.
- van Wijnbergen, S. (1984). 'The Dutch Disease: A Disease after All?' *Economic Journal*, 94(373): 233–50.
- Venables, T. (2016). 'Using Natural Resources for Development', *Journal of Economic Perspectives*, 30(1): 161–84.
- VSO (Voluntary Service Overseas) (2014). *Pathway to Vocational Employment in the Emerging Tanzanian Gas Sector*. Report. Dar es Salaam: VSO, with VETA.

The Construction Sector in Developing Countries

Some Key Issues

Martina Kirchberger

1. Introduction

The construction sector plays a central role in the economy of any country, providing essential structures such as public and private infrastructure and housing. Even the most advanced economies would be incapable of maintaining a high standard of living without continuous investments in infrastructure, such as for waste management, water provision, or transport. A poorly functioning sector has two primary consequences: first, it tends to translate into high prices, leading to low levels of output for a given level of expenditure. For instance, if a kilometre of road costs US\$1 million in country A and US\$2 million in country B, the latter can afford exactly half the length of road. This chapter will show that such differences in unit costs are fairly common, and differences in unit costs frequently exceed a factor of 2. Second, when local capacity is low, countries need to purchase construction services from foreign firms, limiting local employment generation and local content. Many developing countries have low levels of infrastructure and often the existing infrastructure is not well maintained. How productive the construction sector is in translating a given amount of input into output has therefore wide-ranging consequences for the provision of basic infrastructure and services.

The aim of this chapter is to survey the current state of knowledge on key issues of the construction sector. Overall, there is little systematic knowledge on the construction sector in Africa. With an aim of contributing towards filling this gap, I draw on evidence from a wide range of sources, including journal articles, industry reports, and enterprise maps (Sutton and Olomi 2012). Further, to show general trends and patterns, I use data from National Accounts Statistics (United Nations 2018), the World Development Indicators (World Bank 2018a), databases of unit costs (World Bank 2006), the World Bank Procurement database (World Bank 2018b), as well as the International Comparison Project 2011 (World Bank 2015).

The chapter is structured as follows. Section 2 sets the stage. It starts by reviewing some of the key characteristics of the sector that distinguish it from any other sector of the economy. It then shows trends in the share of construction in value added, and gross fixed capital formation, both for the world, as well as for the countries selected for five case studies: Ghana, Mozambique, Tanzania, Uganda, and Zambia.¹ I discuss why the construction sector might be under particular pressure in natural resource-rich countries, and how this affects prices depending on the slope of the supply curve of the construction sector. Section 3 reviews what we know about differences in the unit cost of constructing infrastructure and discusses how construction costs affect the link between investment efforts and investment outcomes. Section 4 discusses some of the key bottlenecks in the construction sector. Section 5 outlines policies to improve the sector's ability to respond to surges in demand. Section 6 draws some conclusions.

Throughout the chapter I focus on the more formal aspects of the construction sector, in the measurement of the size of the sector across time and space, price levels, and capacity of the sector. This is not a statement about the relative importance of the formal versus the informal segment of the market; rather, it is driven by the availability of data. Arguably, when considering large-scale infrastructure construction, this is the relevant segment of the sector to analyse. While some of the issues touched upon in this chapter will apply to all subsectors within construction, I make sure to highlight whether an issue is particularly important for a certain subsector.

2. Background

The construction sector has a number of characteristics that, when considered together, distinguish it from other sectors in the economy (Moavenzadeh 1978). First, goods in the construction sector are highly differentiated, often purpose-built, and financed by the customer. Contrast this with manufacturing, where products are traditionally designed by the producer, built by the producer, and then sold to the customer. In particular in developing countries, financing is frequently provided by external parties, who have a substantial influence on the procurement and construction process of the infrastructure. Second, stockpiling of infrastructure is seldom possible, and most products are difficult to transport across space. Third, due to the high level of differentiation, size of projects, and limits to stockpiling infrastructure, the construction of infrastructure frequently responds precisely to demand. Overall, these features lead to unstable demand that depends on resource availability and often political factors. Fourth, maintenance

¹ These country case studies are presented in this volume by Owoo and Lambon-Quayefio (chapter 6), Cruz et al. (chapter 9), Kikwasi and Escalante (chapter 12), Colonnelli and Ntungire (chapter 15), and Cheelo and Liebenthal (chapter 18).

Table 3.1 Share of construction in value added, per cent

	1995	2000	2005	2010	2015
Panel A: Aggregates					
sub-Saharan Africa	3.4	3.5	3.7	4.5	6.0
East Asia	7.6	6.4	5.5	5.6	6.2
South Asia	5.4	6.0	7.7	8.1	7.3
South America	5.7	5.4	5.1	6.6	6.5
World	5.9	5.5	5.7	5.5	5.8
Panel B: Case-study countries					
Ghana	4.8	5.5	5.6	8.5	13.5
Mozambique	3.0	4.1	1.5	2.1	2.5
Tanzania	4.2	5.3	8.3	8.3	14.6
Uganda	3.7	4.8	5.6	6.2	8.0
Zambia	3.8	4.4	7.7	10.6	10.6

Source: Author's calculation based on United Nations (2018) data.

of the constructed good has a strong effect on the return on a piece of infrastructure. Finally, it is worth mentioning that governance issues—for example, transparency in project selection, procurement, and construction—pose challenges for countries across all levels of development.

Table 3.1 shows the shares of value added as a percentage for five different years between 1995 and 2015. Across sub-Saharan Africa (SSA), value added in the construction sector accounted for about 3.4–6.0 per cent and has been increasing over time. In 2015, value added in the construction sector in SSA is slightly above the average value added for the world, which is 5.8 per cent. Over the two decades 1995–2015 there has been an increase in value added in construction in South Asia and a decrease in East Asia.

Turning to the case-study countries, there is a marked increase in value added in construction in Ghana, Tanzania, Uganda, and Zambia. For instance, in Tanzania value added in construction has increased from 4.2 per cent in 1995 to 14.6 per cent in 2015; Ghana saw a similar increase. The share of value added generated in the construction sector being relatively low in Mozambique (between 1.5–4.1 per cent).

I next investigate gross fixed capital formation, which measures the additions to fixed capital in an economy, including land improvements, plant, machinery, and equipment purchases, and the construction of fixed infrastructure. Panel A in Table 3.2 shows aggregates for gross capital formation. The table shows that SSA experienced an increase in gross capital formation as a percentage of gross domestic product (GDP) in the past two decades, from 17 per cent to almost 21 per cent. This level remains lower than the average for South Asia and East Asia and the Pacific, which have capital formation levels of close to 30 per cent or more

Table 3.2 Gross fixed capital formation, per cent of GDP

	1995	2000	2005	2010	2015
Panel A: Aggregates					
sub-Saharan Africa	16.5	15.2	15.4	19.9	20.5
South Asia	24.7	23.8	30.5	30.7	27.7
East Asia and Pacific	31.2	29.1	30.7	31.5	31.8
Latin America and Caribbean	18.7	18.8	18.6	20.1	19.9
World	23.3	23.5	24.0	23.1	23.4
Panel B: Case-study countries					
Ghana	21.1	23.1	29.0	24.7	23.8
Mozambique	19.9	22.1	13.2	17.9	32.0
Tanzania	19.6	16.4	25.2	28.7	34.3
Uganda	16.4	19.2	22.2	25.2	24.2
Zambia	–	–	–	25.9	38.5

Source: Author's calculation based on World Bank (2018a) data.

for the past two decades. In 2015, SSA's gross capital formation is in line with the level found in Latin America and the Caribbean.

Panel B shows that there is a substantial amount of heterogeneity across both time and space in the countries studied in more detail. In 2015, all case-study countries show gross capital formation at a level above the SSA average, ranging from 39 per cent in Zambia to 24 per cent in Ghana and Uganda. Mozambique and Tanzania have levels of gross fixed capital formation of 32–34 per cent, which are close to the level prevailing in East Asia and the Pacific. Table 3.2 shows that, across time, there is substantial variation across the five-year periods shown. Mozambique is the only country in which value added in construction and gross fixed capital formation do not move together. A possible explanation is that this is due to the fact that gross fixed capital formation includes land improvements as well as plant, machinery, and equipment purchases, and this has been the main driver of the rise in gross fixed capital formation.

There are several reasons for a link between natural resource discovery or exploitation and the construction sector. First, infrastructure investments might be driven by an anticipation of future exploitation. Expectations of future discoveries might further drive investment in private and public infrastructure in an area. Second, new infrastructure might be required to facilitate the discovery or exploitation of natural resources, such as housing for workers, or roads and railroads to bring machinery in and take resources out. Third, natural resources lead to additional spending capacity at the level of governments. Particularly when countries lack basic infrastructure, governments might want to use the additional fiscal space to build new and upgrade existing infrastructure. All these factors imply that there is an increase in the demand for goods produced by the

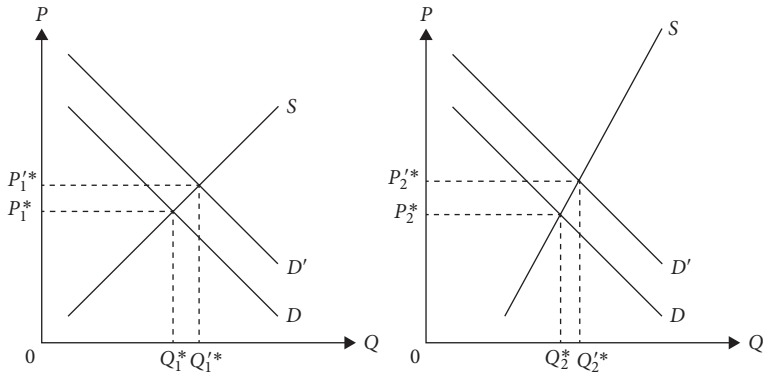


Figure 3.1 Demand shift with different supply elasticities

Source: Author's illustration.

construction sector. Whether this increase in demand leads to an increase in the unit price and the extent of that increase depends on the slope of the supply curve, as illustrated in Figure 3.1.

The left-hand graph in Figure 3.1 shows the effect of an increase in the demand for goods produced in the construction sector when the supply curve is unit elastic. The increase in demand leads to a shift in the quantity produced from Q_1^* to $Q_1'^*$. The equilibrium price shifts up from P_1^* to $P_1'^*$. The right-hand graph shows the same shift in the demand curve, but now with a supply curve that is less elastic. The graph shows that the same increase in demand leads to a smaller increase in the quantity produced, which shifts from Q_2^* to $Q_2'^*$ but at a higher price. Therefore, a given increase in the demand for goods produced in the construction sector can lead to different levels of new equilibrium prices and quantities. Note that the graphs show aggregate supply. One important concern for policymakers is the composition of local and foreign firms, which in turn has effects on employment generation and likely dynamic effects on local capacity. An increase in the number of firms in construction following a natural resource discovery might also lead to a shift of the supply curve to the right, exerting downward pressure on prices.

3. Construction costs across time and space

This section discusses our basic knowledge of construction costs across countries and time. I start by highlighting measurement issues when aiming to measure unit costs in construction, where a core difficulty is to find comparable projects. I then review recent evidence on the cost of road infrastructure across ninety-nine low- and middle-income countries.² Finally, I discuss how construction costs affect the link between investment efforts and investment outcomes.

² See Collier et al. (2016) for a review of the literature on differences in unit costs.

3.1 What do we know about differences in unit costs?

Measuring the cost of construction across space is difficult for a number of reasons. First, the construction sector produces highly differentiated goods, such as roads, buildings, and bridges. Considering only one type of good makes comparisons slightly more feasible. However, there are still enormous differences. For example, consider building a non-paved road and a four-lane highway. These two types of infrastructure are likely to include a different set of raw materials, equipment, and types of labour. Comparing narrowly defined work activities—such as an asphalt overlay of a specific thickness—is one possible way forward. Still, different types of construction methods (e.g. labour-intensive versus capital-intensive) might still lead to very different unit costs.

For building construction, comparisons are even more difficult: a database might consist of costs of different types of buildings, including residential buildings, public buildings such as schools and hospitals, and industrial buildings. Several margins could be responsible for differences in costs. First, all of these will have different specifications that likely manifest themselves in differences in unit costs. Safety requirements will differ across these different building types, affecting the materials chosen and type of labour involved in the construction. Even within a category, comparison of costs is complicated by differences in building codes across time and space which might lead to differences in costs of a particular project that are due to different specifications, even when holding construction unit costs constant. Knowledge of differences in building codes is not readily available, such that it is difficult to control for them. Even if they exist, compliance with building codes might vary across countries and be correlated with factors that also drive the costs of construction, such as corruption.

Second, there are different types of costs: estimated costs, which are typically estimated by construction engineers familiar with the project; contracted costs, which is the amount that figures in the contract with the construction firm; and actual costs, which are the sum of contracted costs and cost adjustments such as cost overruns. Cost overruns are fairly typical in the construction sector, such that the differences in these cost types can be substantial and one needs to be careful when making comparisons across them. Finally, rarely are data on costs stored centrally. Most commonly, they are part of reports held by different ministries and entities, making comparison difficult. The lack of overview of the costs of construction for a particular country also means that it is difficult to compare a set of bids for a project with similar projects. To illustrate the magnitude in differences in construction costs for similar activities, Table 3.3 (reproduced from Collier et al. 2015) shows the unit cost per kilometre of an asphalt overlay of 40–59 mm across countries. The upper panel shows projects undertaken in the period 1996–8 and the lower panel shows activities undertaken between 2005–7. These years are shown together to allow comparability and to minimize differences in costs that are due to exchange rate fluctuations or changes in input prices. All costs are in 2000 US dollars.

Table 3.3 Unit costs per kilometre of asphalt overlays of 40–59 mm

Country	Cost per kilometre (US\$1,000)	Number	Year	Country	Cost per kilometre (US\$1,000)	Number	Year
Work activities undertaken 1996–8							
Dominican Republic	33.5	1	1997	Argentina	69.7	1	1997
Ghana	42.9	5	1998	Brazil	74.4	1	1998
Lithuania	44.4	1	1996	Argentina	74.9	1	1996
Indonesia	48.5	1	1996	Cameroon	76.8	4	1997
Lithuania	49.7	1	1998	Bangladesh	79.1	26	1998
Mexico	50.7	1	1997	Vietnam	79.6	2	1998
Ghana	52.7	1	1996	Bangladesh	83.6	1	1997
Costa Rica	57.9	1	1996	Panama	84.1	1	1997
Armenia	60.7	1	1997	Nigeria	95.1	1	1997
Brazil	62.5	2	1996	El Salvador	102.2	1	1998
Bolivia	67.4	1	1997	Pakistan	105.0	1	1997
India	68.1	3	1997	Tanzania	111.7	1	1996
Work activities undertaken 2005–7							
Paraguay	31.2	1	2005	Botswana	68.0	1	2006
India	35.9	2	2006	Nigeria	73.0	1	2007
Bulgaria	40.7	1	2006	Argentina	76.2	3	2006
Ecuador	41.6	1	2005	Georgia	82.6	1	2006
India	45.6	1	2005	Brazil	82.9	2	2005
Burkina Faso	48.0	1	2007	Georgia	84.9	1	2005
Brazil	55.2	3	2006	Vietnam	85.4	1	2005
Brazil	58.2	1	2007	Macedonia	85.7	1	2007
Thailand	59.5	1	2005	Rwanda	90.6	1	2006
Philippines	60.8	1	2006	Philippines	94.8	1	2005
Bosnia and Herzegovina	61.9	2	2006	Chile	98.9	1	2006
Nepal	63.1	1	2006				

Notes: all costs are in 2000 US dollars; number denotes the number of work activities in a given country over which a simple average is taken.

Source: Collier, Kirchberger, and Söderbom (2015), World Bank. <https://openknowledge.worldbank.org/handle/10986/22664> reproduced under license: CC BY 3.0 IGO.

The table shows that differences in unit costs are large: an asphalt overlay of 40–59 mm for 100 km of road would cost US\$3.3 million in the Dominican Republic, compared to US\$10.5 million in Pakistan and US\$11.1 million in Tanzania. Ghana is somewhat in the middle, with activities costing US\$4.3–5.2 million. There are large differences in unit costs even in the same country. In the period 2005–7, an asphalt overlay for a length of 100 km in Brazil could cost between US\$55.2 and US\$82.9 million. Some of the dispersion in the database could be explained by differences in the measurement of roads—for example, using costs per square metre compared to costs per metre—or estimated versus contracted or actual costs. Collier et al. (2016) show that the ranking is largely unaffected when using different levels of unit costs. What drives these differences in the costs of construction and maintenance projects across countries? The next section discusses evidence on drivers of costs.

3.2 How do construction costs affect the link between investment effort and investment outcomes?

In light of the scarce knowledge on construction costs across space, literature on the link between investment effort and investment outcomes is even more scarce. Theoretically, higher costs of infrastructure affect outcomes in at least three ways. First, they mechanically decrease the amount of infrastructure a country can afford to get for a given budget. Consider that the annual budget available for road construction of country *C* amounts to *b*. Assume that the unit cost per kilometre is *p*, and for simplicity, assume that there are no fixed costs. The country will then be able to afford $r = b/p$ kilometres of roads. The higher *p*, the lower the number of new roads a country is able to afford. Second, costs might affect project selection. Assume that projects are selected if they have a certain rate of return. High construction costs will decrease the likelihood that a particular project is selected. If construction costs differ systematically by sector, this will have an effect on spending across sectors. Third, there are important possible dynamic effects. High costs in the construction sector might reduce the number of projects being carried out in the sector, lowering the ability of the sector to expand its capacity. If maintenance costs are high, this might reduce expenditures on maintenance and thereby reduce the lifespan of a piece of infrastructure and thereby its rate of return.

4. Key bottlenecks in the construction sector

This section discusses key bottlenecks in the construction sector. I start by discussing the capabilities of the sector by analysing data from the World Bank's

Procurement Database. I present some key facts about origin of suppliers for projects carried out by different borrower regions. I show that SSA fares poorly compared to all other regions in terms of regional firms winning contracts, in particular when contract size increases. What constrains growth of firms in the construction sector? I discuss institutional constraints such as procurement and financing, the role of critical inputs, and governance and corruption.

4.1 Organization and capabilities

There is little systematic knowledge about the market structure of the construction industry in Africa, as well as the origins of construction sector firms operating in SSA.³ This is important: when competition is limited, firms can extract rents, increasing the cost of infrastructure. Further, the construction sector has the possibility to create large numbers of jobs. If local firms cannot participate in the sector, these effects will be limited. To shed some light on this question in the broader regional context and to provide more detail on the case-study countries, I use the major contracts award database, which contains World Bank-financed prior-review contract awards from the period 2004–18 (World Bank 2018b).

This is a selected number of projects and likely not representative of the universe of projects. Still, it is likely a good proxy for the capabilities of the sector in successfully bidding for World Bank projects that are auctioned off via internationally competitive tendering. For each project, the database contains the name of the country borrowing, the supplier country, the amount of the contract, and further details on the sector and procurement method. The country listed as the supplier represents the place where the supplier is registered, so this may or may not be the supplier's actual country of origin. For example, if a firm sets up a subsidiary in a foreign country and employs mainly staff from its origin, this would look in the data as if the country has substantial local capacity. The figures might therefore be overestimating local capacity. I select projects in civil works that were tendered via international competitive bidding to examine the relationship between borrowing country and supplier country.

Table 3.4 tabulates the percentage of projects by region that are carried out by different suppliers. Panel A shows all contracts in the database. It shows that at least 74 per cent of civil works contracts tendered via international competitive bidding are carried out by suppliers within the same region, suggesting that there is capacity within each region for the type of civil works carried out under World Bank contracts.

³ One notable exception is Zhang and Gutman (2015), who construct a dataset from the World Bank's Summary and Detailed Borrower Procurement Reports.

Table 3.4 World Bank contract awards by borrower and supplier region

Borrower region	Supplier region						
	East Asia and Pacific	Europe and Central Asia	Latin America and Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa	North America
Panel A: All awards							
East Asia and Pacific	97.87	1.51	0	0	0.41	0	0.21
Europe and Central Asia	2.45	95.24	0.29	1.52	0.15	0	0.34
Latin America and Caribbean	0.49	8.09	90.02	0.33	0	0	1.06
Middle East and North Africa	0.88	13.44	0	84.8	0.44	0.22	0.22
South Asia	7.74	7.59	0.56	0.56	83.26	0	0.28
Sub-Saharan Africa	11.48	8.9	0.24	1.59	2.98	74.65	0.16
Total	21.8	28.58	13.3	5.52	8.07	22.38	0.36
Panel B: Awards > US\$2,000,000							
East Asia and Pacific	97.27	1.82	0	0	0.68	0	0.23
Europe and Central Asia	5.42	91.13	0.37	2.71	0.37	0	0
Latin America and Caribbean	0.26	6.45	92.13	0.52	0	0	0.65
Middle East and North Africa	1.55	17.05	0	80.23	0.78	0	0.39
South Asia	10.84	8.92	0.72	0.96	78.07	0	0.48
Sub-Saharan Africa	21.28	14.59	0.37	1.86	5.76	55.95	0.19
Total	27.97	24.77	17.18	6.1	9.42	14.28	0.28

Panel C:
Awards >
US\$50,000,000

East Asia and Pacific	93.75	6.25	0	0	0	0	0
Europe and Central Asia	8.22	83.56	0	6.85	1.37	0	0
Latin America and Caribbean	0	32.26	67.74	0	0	0	0
Middle East and North Africa	12.5	62.5	0	12.5	12.5	0	0
South Asia	18.87	13.21	0	0	67.92	0	0
Sub-Saharan Africa	43.55	24.19	0	0	4.84	27.42	0
Total	31.8	37.46	7.42	2.47	14.84	6.01	0

Source: Author's calculations based on World Bank (2018b) data.

The region that carries out most of its projects through regional suppliers is East Asia and the Pacific, where 9 per cent of projects are carried out by a supplier in the region. In Europe and Central Asia, as well as Latin America and the Caribbean, 90 per cent or more of contracts are awarded to suppliers within the region. The region with the lowest percentage of overall contracts being awarded to suppliers in the same region is SSA, where one out of four contracts gets procured outside the continent. Given that contracts have varying sizes, I next explore whether there is heterogeneity in this dimension. The database contains information on the size of the contract (in US dollars, based on the US Treasury's rate of exchange) when it was awarded.⁴ Therefore, this does not include cost overruns. Unless cost overruns are so substantial that they lead to a country being placed in a different category, this does not affect the results. The asymmetry in borrower-supplier relationships becomes more pronounced when exploring borrower and supplier origins for contracts above US\$2 million. Table 3.4 shows that while the fractions remain relatively similar for most regions, in SSA about one out of every two contracts gets supplied by a company outside SSA when looking at contracts above US\$2 million.

In panel C, I limit contracts to a size of at least US\$50 million. There are 276 contracts in the database for this amount. Even for contracts of this size, East Asia and the Pacific, as well as Europe and Central Asia, procure more than 94 and 83 per cent, respectively, from companies in the region. For both the Middle East and North Africa and SSA there are big shifts in the region of suppliers. Out of

⁴ I use the consumer price index (CPI) of the United States to deflate the contract amount to the base year 2010. For 2018 the CPI data were not yet available so I use the same value as 2017.

the sixty-two contracts in SSA, about one-quarter are carried out by suppliers in the region. For this size of contract in SSA, 44 per cent are carried out by suppliers from East Asia and the Pacific, and about 24 per cent are carried out by suppliers from Europe and Central Asia. It is also worth pointing out that SSA suppliers are virtually inactive in other regions. These regional averages mask important heterogeneity across countries.

Table 3.5 shows country-level heterogeneity for the case-study countries for the 515 contracts taking place there. The first panel again shows all contracts, while the second limits contracts to those above US\$2 million, which is about the median contract value for the civil works in the database for our case-study countries. The third panel shows contracts above US\$10 million.

The first panel shows that about 65 per cent of all contracts awarded across the case-study countries are carried out by suppliers in the region, which is lower than the average across all SSA countries. There are significant differences across countries: in Mozambique 47 per cent of the contracts were awarded to suppliers from SSA, compared to Tanzania where 82 per cent were awarded to regional suppliers. In Zambia and Uganda, 77 per cent and 66 per cent of contracts were carried out by suppliers from SSA, compared to Ghana, where just over half of the contracts were carried out by suppliers from SSA. Suppliers from East Asia and the Pacific deliver about one out of every five contracts in these countries.

When looking at the 257 contracts above US\$2 million, Tanzania still procures the highest fraction of contracts using suppliers from the region, compared to Ghana where only 40 per cent of contracts are carried out by suppliers from the region. An equal number of contracts are carried out by suppliers from East Asia and the Pacific. In Mozambique, Tanzania, and Uganda, between one-fifth and one-third of contracts are carried out by suppliers from East Africa and the Pacific. In Zambia, the most important supplier regions apart from SSA are South Asia and East Asia and the Pacific, carrying out more than one-quarter of contracts above US\$2 million.

Panel C shows data for the seventy-one contracts above US\$10 million. At this threshold, only one out of every six contracts is supplied locally, while about half of the contracts are supplied by firms from East Asia and the Pacific and South Asia. About one in five contracts is supplied by firms from Europe and Central Asia.

The database also records the major sector in which the project is carried out. I therefore examine heterogeneity with respect to whether a supplier is from the same region as a borrower across sectors in the five case-study countries. Among the 515 contracts for the five case-study countries, there are four sectors that have more than fifty contracts: energy and extractives; the transport sector; water, sanitation, and waste management; and public administration. The data suggest that local suppliers are chosen in only 35 per cent of the contracts in the energy and extractives sector and the transport sector. About 63 per cent of suppliers come

Table 3.5 World Bank contract awards by borrower and supplier region, case-study countries

	Supplier region					
	East Asia and Pacific	Europe and Central Asia	Latin America and Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
Panel A: All contracts						
Ghana	27.63	6.58	0	3.95	6.58	55.26
Mozambique	33.04	16.07	0	0.89	2.68	47.32
Tanzania	10.26	4.27	0	0.85	2.56	82.05
Uganda	17.78	7.41	2.96	2.22	3.7	65.93
Zambia	6.67	0	0	5.33	10.67	77.33
Total	19.22	7.38	0.78	2.33	4.66	65.63
Panel B: Awards > US\$2,000,000						
Ghana	40.38	9.62	0	3.85	5.77	40.38
Mozambique	31.03	22.41	0	1.72	3.45	41.38
Tanzania	20.34	8.47	0	1.69	3.39	66.1
Uganda	33.9	6.78	6.78	3.39	8.47	40.68
Zambia	13.79	0	0	6.9	13.79	65.52
Total	29.18	10.51	1.56	3.11	6.23	49.42
Panel C: Awards > US\$10,000,000						
Ghana	66.67	16.67	0	0	0	16.67
Mozambique	42.11	31.58	0	0	5.26	21.05
Tanzania	44.44	22.22	0	5.56	11.11	16.67
Uganda	50	18.75	12.5	6.25	12.5	0
Zambia	50	0	0	0	0	50
Total	49.3	21.13	2.82	2.82	7.04	16.9

Source: Author's calculations based on World Bank (2018b) data.

from the same country as the borrower in the water, sanitation, and waste management sector, and about 85 per cent in civil works in public administration.

Finally, I explore whether there are differences across the study countries in the proportion of suppliers that are from the same country. I construct a dummy variable that is equal to 1 if a supplier comes from the same country as the borrower. I then regress this on a set of country dummy variables. I use Tanzania as the base country, where 79 per cent of suppliers come from Tanzania. The

country fixed effects are statistically significant for Ghana, Mozambique, and Uganda, who are 33 per cent, 45 per cent, and 14 per cent, respectively, less likely to have a supplier that is from their country.

This section brought together evidence from World Bank procurement of civil works that underwent an internationally competitive tendering process. These findings are in line with Zhang and Gutman (2015), who find that SSA is an outlier in participation in supplying civil works. They show that as a share of total contracts, SSAn suppliers have actually lost market share since 1995. More comprehensive data are needed to get a fuller understanding of the capabilities of the sector, as well as to understand differences across sectors within countries and how they relate to differences in procurement rules. One dimension that has not been taken into account in this section due to data availability is the role of sub-contracting, a common practice in the construction sector. It would be helpful to know to what extent different government organizations, and local and foreign contractors sub-contract differentially with local suppliers.

4.2 Institutional constraints

4.2.1 Procurement

Governments willing to invest in infrastructure usually award contracts via national and international competitive bidding. Mostly these contracts are one-off contracts. This poses several constraints for local suppliers. First, they might be constrained in the preparation of the bidding documents. For example, Asher et al. (2018) collected 381 Procurement Evaluation Reports for road maintenance projects from six regional offices in Tanzania. They show that about 30 per cent of bids submitted for road maintenance contracts get disqualified immediately. Failure to conform to the terms, conditions, and specifications stipulated in the bidding documents is the main reason for this disqualification. Language—such as being required to submit all documents in English—can become an important barrier in particular for smaller contractors with lower levels of knowledge. Second, when contracts are based on price only, local contractors in Africa are often unable to win bids due to lack of access to financing, as I discuss in more detail below. Third, contractors often have to prove that they have experience in handling a similar project in the past, limiting the type of contracts a given firm can take on.

The fact that contracts tend to be one-off contracts has further consequences. First, it fails to internalize design decisions during construction and resulting maintenance costs if the firm that carries out the construction is different from the firm that maintains an asset. Second, it leads to a discontinuous and unpredictable workflow for contractors. Third, it results in hold-up problems: once a

contractor wins a project and starts construction, the bargaining power has shifted. A further dimension that is important in determining costs is the role of competition. Unfortunately, the procurement database used in this chapter only contains information on the company winning the bid, but does not contain information on the name and origin of all bidders, and the value of their bids.

4.2.2 Financing

Financing is often mentioned as a key constraint for local firms, in particular when trying to compete with international firms. One reason for this is that international firms might have access to lines of credit at low interest rates, making it impossible for local firms to compete. This appears to be a major issue in particular in trying to compete with Chinese firms (Zhang and Gutman 2015).

Lack of upfront financing affects firms in the construction sector by making it difficult to purchase or rent the equipment necessary to carry out a contract. Rental markets for equipment are often missing due to failures of banks to provide access to finance. Sometimes it is the government itself that is failing to pay contractors. In 2012, the Tanzanian government reported owing US\$300 million to firms (Sutton and Olomi 2012). Delays in payments are particularly problematic for smaller contractors as they do not have the necessary liquidity to purchase further materials or pay their workers. They are further negatively affected by being forced to have equipment idle at construction sites until they receive payment. There is anecdotal evidence that firms prefer contracts by international donors for the reason that they know they will be paid on time, and charge higher prices to government in anticipation of payment delays. It would be helpful to have systematic evidence on this.

4.3 Critical inputs

The availability and cost of critical inputs is an important determinant of the slope of the supply curve in the construction sector. Frequently discussed constraints include the availability of skilled labour, raw materials, and the cost of hiring and purchasing equipment. There is little knowledge to what extent these different factors affect the slope of the supply curve in the construction sector. One helpful comparable measure for the overall price level of key inputs into construction is the data collected by the International Comparison Project (World Bank 2015). Eurostat–OECD countries and CIS countries followed a bill-of-quantities approach in which hypothetical projects were priced.⁵

⁵ See World Bank (2015) for more detail on how the construction sector purchasing power parities were constructed.

Table 3.6 Differences in price levels across regions

Panel A: Aggregates		
Regional rank	Region	Price level (world = 100)
1	Eurostat–OECD	184.6
2	Commonwealth of Independent States	154.7
3	Latin America	84.8
4	Asia and the Pacific	60.5
5	Africa	55.8
6	Western Asia	55.2

Panel B: Case-study countries		
Case-study rank	Region	Price level (world = 100)
1	Mozambique	82.9
2	Zambia	51.7
3	Ghana	36.8
4	Uganda	30.9
5	Tanzania	28.9

Notes: Panel A shows the regional aggregate provided by the International Comparison Program, Panel B shows country-level data.

Source: Author's calculation based on World Bank (2015) data.

Table 3.6 shows differences in price levels across regions and the case-study countries. The benchmark price level is the world, which is set equal to 100. Price levels in construction are 85 per cent and 55 per cent higher in the Eurostat–OECD and CIS areas, respectively, compared to the global average. In light of the fact that the CIS and Eurostat–OECD regions use a different methodology to compute construction sector prices, the comparison is likely more relevant across the remaining regions that use a similar method. For completeness, I leave them in the analysis.

Africa and Western Asia have the lowest price levels, about 45 per cent lower than the global average. When looking at the case-study countries, price levels in the construction sector are highest in Mozambique, at 83 per cent of the global level. Zambia, where price levels in construction are about 50 per cent of the global level, is roughly in line with the African average. Overall construction price levels are much lower in Ghana, Uganda, and Tanzania, at 37, 31, and 29 per cent of world levels, respectively. Further research outlining heterogeneity in input costs across space would be useful to better understand differences in price levels.

One interesting dimension to consider is the relationship between the price level in the construction sector and the price level in general in a country. Figure 3.2 plots the price level of GDP versus the price level in construction for all African countries in the International Comparison Project, again considering the world as the benchmark.

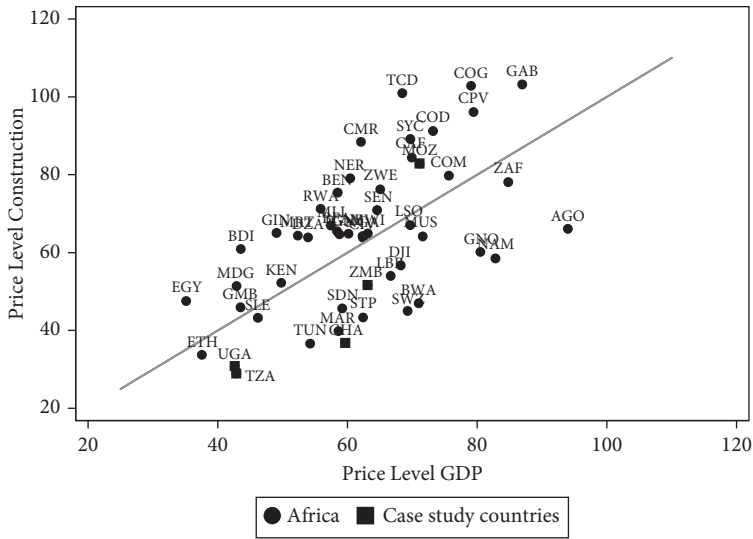


Figure 3.2 Price levels of GDP and construction

Source: Author's illustration based on World Bank (2015) data.

The diagonal shows the 45-degree line. The closer countries are to the line, the more similar are price levels of GDP and construction. The upper triangle shows countries that have price levels in construction exceeding GDP price levels, and vice versa for the lower triangle. The figure shows that the only case-study country in which construction has higher price levels than GDP is Mozambique; all other countries are in the lower triangle. Overall, within Africa, the ratio of the price level of GDP to construction is lowest (between 0.6 and 0.7) in Ghana, Swaziland, Botswana, Tunisia, Tanzania, Morocco, Sao Tome, and Principe, and highest (between 1.3 and 1.4) in the Congo, Niger, Guinea, Egypt, Burundi, Cameroon, and Chad.

4.4 Governance and corruption

Public works contacts and construction have been found to be the most corrupt sectors globally (Transparency International 2011), and this might significantly affect costs in the construction sector (Kenny 2009; World Bank 2011).⁶ Collier et al. (2016) use data on 3,322 unit costs of work activities collected by the World Bank to examine correlates of construction costs, with a focus on government

⁶ Arguably, corruption has detrimental effects on the quality of infrastructure as well, as shown by Olken (2007). It might also affect project selection, either directly or via an increase in costs, thereby lowering rates of return.

capacity, corruption, and political stability. They control for drivers of unit costs related to the ruggedness of the terrain as well as market access. Using various measures for corruption and conflict, they find that both more corrupt countries and those in conflict have significantly higher unit costs of construction. Costs are on average about 30 per cent higher in conflict countries. They are 6.8 per cent higher when moving a country from the twenty-fifth percentile of corruption to the seventy-fifth percentile. There are a number of channels through which conflict or corruption might affect unit costs. First, higher levels of corruption might drive up costs as firms' prices take into account any additional side payments that are required to the government to be selected as a contractor. Second, contractors might inflate costs and take the difference in costs as payments.

Political instability and conflict can have severe consequences for construction costs, arising through various mechanisms: staff security, supply chains, disputes, and industrial organization. Companies operating in conflict countries might require higher awards to cover security of their staff on site. Disruptions to supply-side networks might delay arrival of important inputs, leading to higher costs as machinery stands idle on the construction site. Benamghar and Iimi (2011) analyse 155 rural road upgrading contracts in Nepal and find that cost overruns and delays in project completion were significantly correlated with security incidents. Bidders appear to anticipate these costs by submitting higher bids. Disputes over land rights might slow down the construction process. Finally, political instability might affect the market structure of the construction industry, leading to fewer firms and lower competition. In these circumstances, few of the operating firms will be able to capture the rents.

All these discussed bottlenecks might prevent countries from being able to facilitate increased levels of investment. The ability of a country to translate an additional unit of investment into outcomes in times of accelerated growth in investment is known as absorptive capacity. Presbitero (2016) shows that a 3 per cent increase in the ratio of public investment to GDP with respect to its five-year average is correlated with a 3.9 percentage-point reduction in project outcomes, as measured by the World Bank. While project outcomes are not telling us about the relationship between surges in demand and costs, this suggests that there are limits to the capacity of the construction sector when there is an increase in demand.

5. Policy options

This section discusses some policy options to enhance the sector's ability to respond to surges in demand. Ofori (2012) highlights that many of the bottlenecks prevailing in the construction sector, some of which were discussed in section 4, have not changed over the past decades. Much more research is needed on the effects of different policies on the quality and quantity of construction.

5.1 Institutional and regulatory reforms

An institutional feature of the construction sector is that it often lacks strong representation in government (Ofori 2012). In a study on the Zambian construction sector, Uriyo et al. (2004) state that, 'A number of Studies have been conducted and recommendations made, but with limited success in implementation, due to absence of an institution to champion and steer the industry.' In an effort to bring together actors in the construction sector and promote a set of priorities in the sector, several countries have established such representations, known as national construction councils. These have been established in a number of countries, including Tanzania in 1979 and Zambia in 2003.

In a seminal paper on corruption in construction projects, Olken (2007) evaluates different approaches to monitoring construction works on road construction in Indonesia. He conducts a randomized controlled trial in which 600 communities were selected. Some villages were told that an audit was to take place with certainty. The second experiment involved bottom-up monitoring by inviting villagers to accountability meetings and distributing comment forms along with the invitations. He then used an innovative measure of missing expenditures based on core samples of the roads. Olken (2007) finds that the audit experiment reduced missing expenditures by 8 per cent, while bottom-up monitoring did not reduce missing expenditures significantly. An important dimension to consider might be the effect of audits on subsequent procurement behaviour: Gerardino et al. (2017) find that audits led to more instances of direct contract selection. Using data from Italy, Decarolis (2014) presents evidence that suggests that first-price sealed bid auctions are suitable when contracts are enforceable.

One possibility to improve corruption in procurement is to use technology to augment state capacity via electronic procurement. However, one concern is that this might exclude smaller firms that are still unable to access procurement information. Lewis-Faupel et al. (2016) investigate bidding data for roads constructed under India's Pradhan Mantri Gram Sadak Yojana (PMGSY) programme and for construction and consulting services in Indonesia. They find that the shift to e-procurement has no effect on costs in both countries, but improves quality (India) and reduces delays (Indonesia).

An important initiative is the Construction Sector Transparency Initiative (CoST), a multi-stakeholder effort to increase transparency in the construction sector (Construction Sector Transparency Initiative 2011). The core idea is that greater transparency reduces corruption in the construction sector and thereby improves the quality of construction sector outcomes. Kenny (2010) discusses the costs and benefits of increased levels of transparency in the sector and possible implementation issues. While strong regulatory frameworks are important, a report by the Construction Sector Transparency Initiative (2011) shows that there can be substantial gaps between legal requirements and what information is

actually disclosed in the eight pilot countries, with procuring entities claiming to 'always disclose' about 51 per cent of the material project information (key project information) that the law prescribes ought to be published. Knowledge appears to be a significant barrier, along with the availability of suitable systems for storage and retrieval of information. In 2015, CoST expanded to fifteen members.

5.2 Procurement and local content

Purchasing construction goods from companies abroad allows countries to build their infrastructure even when local capacity is low. This means countries do not have to wait until they have developed local capacity to put in place key pieces of infrastructure. However, when local participation in the sector is low, possible additional benefits of infrastructure construction, such as employment and income generation, are lost. Wells and Hawkins (2008) argue for changes in demand-side policies, namely changes related to procurement rules which make participation of local companies difficult to impossible. The authors argue for changes in the regulatory frameworks in a number of areas. First, a move away from the requirement of donors that goods and services ought to be bought from donor countries. More data are required to get a better understanding of the scale of this problem. Second, access to capital at reasonable rates. In most countries this is a significant factor constraining firms. Third, examining potential disadvantages in fiscal policies which discriminate against local firms. It is possible that large firms are also at an advantage, for example, in their capacity to file for tariff exemptions.⁷ Governments might also want to consider tying contracts over time rather than space, resulting in smaller-sized contracts and a more steady workflow, allowing mid-size contractors to compete. To understand to what extent a lack of skills are constraining the sector, more evidence is needed on different types of firm training and vocational training, with a focus on the construction sector.

6. Conclusion

The construction sector is unique in the types of goods that are produced. At the same time, it also has a unique position in providing the key structures for an economy and employing large numbers of people. For several reasons, the construction sector faces increasing demand in resource-rich countries. The slope of the supply curve plays a key role in determining to what extent increased demand

⁷ See Wells and Hawkins (2008) for a number of concrete policy proposals.

leads to increases in output and what the effect on prices is. The capacity of the local sector to meet the increased demand determines to what extent local firms can participate in the boom led by a natural resource boom.

There are a number of bottlenecks in procurement, financing, and corruption. Some of the discussed policies appear straightforward to fix, such as governments paying according to the schedule stipulated in the contract with the company, allowing companies to carry out projects on time. Donors could take a lead in publishing details of all contracts carried out in the infrastructure construction sector, including bidding data and why a certain contractor was awarded a contract, as well as cost overruns and reasons behind them. Providing assistance in the development of information management systems would be a further way to support countries recording information on contracts that are not financed by donors. If donors take building local capacity seriously, eliminating aid that is tied to the donor country is a natural consequence. With regard to other types of measures that promote the sector, much more knowledge of the relative importance of bottlenecks and the effects of policies is required.

Natural resource-rich countries have an advantage in the construction sector that other countries do not have. They typically have experience with local content policies and what works and does not work. They can view the construction sector as an important sector employing workers that were involved in projects directly related to the natural resources, taking advantage of the willingness of firms in the natural resources sector to train workers. An improved understanding of the sector and linkages with the rest of the economy will be useful to inform policymakers who aim to put in place a policy environment in which the construction sector can flourish.

Acknowledgements

For helpful comments I thank Keelan Beirne, Nicola Mastrococco, Richard Newfarmer, and Gerhard Toews, as well as participants of the UNU-WIDER workshop on Natural Resources, Structural Change, and Industrial Development. All errors are my own.

References

- Asher, S., M. Kirchberger, and P. Novosad (2018). 'The Cost of Infrastructure in Tanzania'. Unpublished manuscript.
- Benamghar, R., and A. Iimi (2011). 'Efficiency in Public Procurement in Rural Road Projects of Nepal'. World Bank Policy Research Working Paper 5736. Washington, DC: World Bank.

- Collier, P., M. Kirchberger, and M. Söderbom (2015). 'The Cost of Road Infrastructure in Low and Middle Income Countries.' Policy Research Working Paper 7408. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/22664>.
- Collier, P., M. Kirchberger, and M. Söderbom (2016). 'The Cost of Road Infrastructure in Low- and Middle-Income Countries.' *The World Bank Economic Review*, 30(3): 522–48.
- Construction Sector Transparency Initiative (2011). 'Report on Baseline Studies: International Comparison.' Technical Report. London: Construction Sector Transparency Initiative.
- Decarolis, F. (2014). 'Awarding Price, Contract Performance, and Bids Screening: Evidence from Procurement Auctions.' *American Economic Journal: Applied Economics*, 6(1): 108–32.
- Gerardino, M. P., S. Litschig, and D. Pomeranz (2017). 'Can Audits Backfire? Evidence from Public Procurement in Chile.' Technical Report. Cambridge, MA: National Bureau of Economic Research.
- Kenny, C. (2009). 'Measuring Corruption in Infrastructure: Evidence from Transition and Developing Countries.' *The Journal of Development Studies*, 45(3): 314–32.
- Kenny, C. (2010). 'Publishing Construction Contracts and Outcome Details.' World Bank Policy Research Working Paper 5247. Washington, DC: World Bank.
- Lewis-Faupel, S., Y. Neggers, B. A. Olken, and R. Pande (2016). 'Can Electronic Procurement Improve Infrastructure Provision? Evidence from Public Works in India and Indonesia.' *American Economic Journal: Economic Policy*, 8(3): 258–83.
- Moavenzadeh, F. (1978). 'Construction Industry in Developing Countries.' *World Development*, 6(1): 97–116.
- Ofori, G. (2012). *New Perspectives on Construction in Developing Countries*. London: Routledge.
- Olken, B. A. (2007). 'Monitoring Corruption: Evidence from a Field Experiment in Indonesia.' *Journal of Political Economy*, 115(2): 200–49.
- Presbitero, A. F. (2016). 'Too Much and Too Fast? Public Investment Scaling-Up and Absorptive Capacity.' *Journal of Development Economics*, 120: 17–31.
- Sutton, J., and D. Olomi (2012). *An Enterprise Map of Tanzania*. London: International Growth Centre.
- Transparency International (2011). 'Bribe Payer's Index 2011'. Technical Report. Berlin: Transparency International.
- United Nations (2018). 'National Accounts Data.' Available at: <https://unstats.un.org/unsd/snaama/dnlList.asp> (accessed April 2018).
- Uriyo, A., J. Mwila, and L. Jensen (2004). *Development of Contractor Registration Scheme with a Focus on Small Scale Civil Works Contractors*. Lusaka: National Council for Construction.

- Wells, J., and J. Hawkins (2008). 'Increasing Local Content in the Procurement of Infrastructure Projects in Low Income Countries'. Briefing Note. London: Institution of Civil Engineers.
- World Bank (2006). *Road Costs Knowledge System (ROCKS) Version 2.3 User's Guide*. Washington, DC: Transport and Urban Development Department, World Bank.
- World Bank (2011). 'Curbing Fraud, Corruption, and Collusion in the Roads Sector'. Technical Report. Washington, DC: World Bank.
- World Bank (2015). 'Purchasing Power Parities and the Real Size of World Economies: A Comprehensive Report of the 2011 International Comparison Program'. Washington, DC: World Bank.
- World Bank (2018a). 'World Development Indicators'. Available at: <http://databank.worldbank.org> (accessed April 2018).
- World Bank (2018b). 'Procurement Database'. Available at: <https://finances.worldbank.org/Procurement/Major-Contract-Awards/kdui-wcs3/data> (accessed April 2018).
- Zhang, C., and J. Gutman (2015). 'Aid Procurement and the Development of Local Industry: A Question for Africa'. Brookings Global Working Paper. Washington, DC: Brookings Institute.

4

Rowing against the Current

Economic Diversification in Africa

John Page

1. Introduction

Although precise data are not available, it is likely that Africa holds about 30 per cent of the world's reserves of minerals, oil, and gas. The exploitation of natural resources is a huge opportunity, but it also carries considerable risks. One such risk lies in the structure of resource-abundant countries themselves. Relative prices in resource-exporting economies tend to push them towards economic structures in which a high share of output is concentrated in the resource sector and non-tradable services (UNIDO 2009). Economic structure matters because greater diversity in production and exports is associated globally with more rapid and sustained economic growth (IMF 2014). Diversifying beyond the natural resource sector is, therefore, critical to sustaining development once natural resources are depleted.

The extractive sectors in most sub-Saharan African countries have developed as enclaves, weakly linked to the rest of the national economy. Local suppliers are seldom used, and except for South Africa and Ghana, an indigenous service and supply sector for the mining industry has not developed to any significant extent (Hanlin 2011). Most countries continue to export a disproportionate share of their resources in raw form, and royalty and fiscal transfer systems have historically not yielded much benefit to the communities in which resource extraction takes place.

The African Mining Vision (AMV) adopted by African heads of state and government in 2009 focused on the mining sector's potential to help transform economies through more diversified growth, and governments in resource-abundant countries have adopted a wide range of 'local content' and 'value-addition' initiatives. Local content regulations often require resource investors to expand national employment opportunities, procure from local suppliers, open equity to local partners, and encourage technology transfer. 'Value addition' concentrates on downstream processing of the extracted resource and promotion of related industries.

This chapter explores several ways to achieve structural change and diversification in a resource-rich economy. Section 2 gives a brief history of diversification efforts in Africa's major resource exporters. Section 3 describes the relative price changes that accompany a resource boom and suggests policies and public investments to mitigate their impact. Section 4 explores some of the issues that influence the participation of local firms in the resource value chain. Section 5 argues for broadening the options for diversification through the development of tradable services and agro-industries and investments in knowledge. Section 6 concludes.

2. Diversification initiatives

In an effort to achieve the vision of more diversified growth from natural resources, resource-rich economies across Africa are introducing requirements for local content and value addition in their policy, legislative, and regulatory frameworks for the natural resources sector. A local content requirement is a regulation that requires domestic procurement of a specified fraction of a final good or service. Usually, legislation, regulations, or mineral extraction agreements set minimum targets for employment of local staff, purchases from national suppliers of goods and services, investment in local enterprise development, and support for local economic development around extractive activities. Value-addition initiatives include efforts to develop 'beneficiation' of raw commodities and promotion of related downstream industries.

Africa's earliest local content initiatives in the mineral, oil, and gas sectors date to the 1960s and 1970s. Increasing backward linkages from extractive companies to local manufacturers was a key component of Zambia's post-independence industrialization strategy, pursued through a combination of preferential procurement from the state-owned Zambia Consolidated Copper Mines (ZCCM) and import substitution. Strong linkages between ZCCM, its suppliers, and public research and training institutions developed during the 1980s, but during the 1990s, with the privatization of the nationally owned mines and the introduction of trade and investment liberalization measures, Zambia's manufacturing capabilities in the mining supply chain largely eroded (Fessehaie 2012). Recently, the government has again attempted to expand local content. Zambia's Mineral Resource Development Policy, 2013 and the revised Mines and Mineral Development Act, 2015 contain requirements for preferences in employment and procurement of goods and services (OECD 2017).

The Nigerian oil industry was originally the exclusive domain of the international oil companies. In 1971, the government established the National Oil Corporation to promote indigenization of the industry, but little actually changed until the turn of the twenty-first century. Local content ranged from 3 to 5 per cent

of the value of production from the 1970s to the 1990s (UNCTAD 2006). In 2000, the government included commitment to the development of Nigerian expertise in oil operations and development of input suppliers among the criteria for award of concessions. In addition, petroleum contracts were revised to include training and local employment obligations. Local content requirements became more stringent in 2005, and by 2009 Nigeria had reached 39 per cent local content in petroleum operations (Tordo 2009). Nigeria has gradually developed some important upstream industries—particularly in fabrication and well construction—linked to the oil and natural gas value chain (Oyejide and Adewuyi 2011). Deeper forms of cooperation aimed at improving quality, delivery, and reliability are evolving, including developing quality assurance systems, upgrading technology, and training labour.

The Petroleum Activity Law of 1976 assigned sole ownership of Angola's hydrocarbon resources and mining rights to the Angolan state, which manages the sector through Sonangol, the national oil company. Sonangol sees itself as an active investor in oil extraction and in forward processing along the lines of Petrobras in Brazil. It is also responsible for developing linkages to the petroleum value chain for locally owned firms. State ownership of the resource and concession rights gives the government significant bargaining power for preferential treatment of national firms in the supply of goods and services along the value chain (Morris et al. 2011). Sonangol requires that unless the price of local inputs exceeds the price of imports by more than 10 per cent, all goods and services not requiring vaguely defined 'large capital investments and specialized know-how' must be sourced from firms having more than 51 per cent of share capital owned by Angolan citizens (Teka 2011).

Ghana has a long history of gold mining, and a supplier industry linked to the mining value chain has developed gradually. First-tier suppliers include global mine construction companies, international mining equipment companies, input suppliers, and agents and distributors. Local firms are smaller first-tier and second-tier suppliers in metals and metalworking, chemicals and plastics, civil engineering, business services, and logistics. Since 2010, Ghana has introduced a series of local content policies in both mining and the oil and gas sector. Its Minerals and Mining Regulations of 2012 focused explicitly on employment and promotion of the local workforce and procurement of locally produced inputs (Morris et al. 2011). Between 2009 and 2012, employment of Ghanaian nationals in the mining sector increased by 65 per cent (ECA 2013). Companies engaged in resource extraction allocate staff to identify local suppliers and build capacity, and several have introduced programmes designed to increase local procurement from communities based close to the mines. The Petroleum Local Content and Local Participation Regulations 2013 define Ghana's expectations of local content in oil and gas. The regulations set out detailed targets for minimum local employment and procurement of services and goods in the oil and gas sector that gradually increase over ten years (OECD 2017).

In Tanzania, the 1997 Mineral Policy and the 2012 Mineral Act emphasized developing backward linkages to the mining sector, but failed to set out targets, incentives, or penalties, leaving implementation largely to voluntary compliance. In gold exploration, local content is limited to drilling services and logistics, while in gold mining it is limited to fuel, equipment repair and maintenance, and basic services. Most goods and services are imported. The limited ability of local firms to meet the quality and price standards of lead suppliers and the multinational mining companies is one reason for lack of participation in the mining value chain. Potential suppliers also face a major policy-driven disadvantage: import tariff exemptions for mining inputs have been granted to the mines but not to components imported by their domestic suppliers (ECA 2013). Major new discoveries of natural gas have further complicated Tanzania's efforts to develop linkages in the natural resources value chain. The Petroleum (Local Content) Regulations 2017 give priority to maximizing local participation in the gas sector—including in highly specialized operations—over developing linkages with other sectors. It is uncertain whether Tanzania has sufficient gas reserves to justify investing in the development of highly specialized skills or the production of goods and services of use only to the gas sector, and there is little information on local capabilities (Roe 2017; Scurfield et al. 2017).

Mozambique has identified several areas in which resource-extraction firms are required to make special efforts to increase local participation. Mining firms are obliged to have between 5 and 20 per cent of their equity held by Mozambicans. Local content requirements are set out in the Mining Law and Petroleum Law, both of 2014. These require that contracts for the procurement of goods and services give preferential treatment to 'the purchase of local goods and services when such goods and services are internationally comparable in terms of quality, availability, and quantity required and are offered at prices inclusive of taxes not higher than ten percent of the available imported goods'. The legal framework is at an early stage in terms of defining objectives and the means to achieve them. Recent regulatory reforms seek to increase the participation of Mozambicans in the mining sector gradually, without obliging firms to adhere to numerical targets, and a number of suppliers' development programmes have been instituted with varied success (OECD 2017).

South Africa has significant expertise in mining and mining-related supply industries. It has several globally competitive suppliers and has developed clusters of firms that provide world-class goods and services to the global mining industry (Kaplan 2012). Some 89 per cent of spending by mining firms is local, and the local content of exports of mining equipment is estimated at 90 per cent. South African suppliers are global leaders in a number of areas, such as underground locomotives, mining fans, and submersible pumps (ECA 2013). South Africa's Broad-Based Black Economic Empowerment Act of 2003 is a post-apartheid effort to promote local ownership among historically disadvantaged citizens. Its local content requirements include employment quotas at all levels, ownership

requirements, procurement targets, mandatory expenditure on training, and suppliers' development. Mining rights holders are encouraged by the Mining Charter (2004) to procure an increasing percentage of their capital goods, consumables, and services from Black Economic Empowerment suppliers (OECD 2017).

Botswana has pursued the idea of processing uncut diamonds since the 1980s, when government pressure on De Beers led to the establishment of three cutting and polishing factories. A major opportunity to ratchet up the pressure for forward linkages came in 2005, when De Beers' twenty-five-year mining licence was due for renewal. The government insisted that for De Beers to renew its licence it should use its considerable market power to help Botswana create a globally competitive diamond cutting and polishing industry. In 2006, the government invited some of the world's leading cutting and polishing companies to establish factories in Botswana. To promote the transfer of cutting and polishing skills to local citizens, the companies receive rough diamond allocations on the condition that they hire and train locals in cutting and polishing skills. The sixteen factories currently in operation employ more than three thousand people, most of whom are Botswanan citizens. Policies designed to enhance capabilities further down the value chain—for example, in jewellery manufacture and trading—are still under development (Mbayi 2011).

Overall, progress in increasing local content and value addition has been mixed. Most countries have succeeded in introducing and enforcing requirements for the employment and gradual skilling-up of nationals. Changes in mining technology, however, mean that direct employment in mining is on the decline. The hydrocarbon sector is highly capital- and skill-intensive and offers limited prospects for the employment of large numbers of national workers. These technology-driven realities make employment requirements increasingly difficult to enforce, raising questions about the primacy of the employment objective in local content legislation.

Local procurement regulations have met with limited success for several reasons, including the small size of local markets and the scarcity of small and medium enterprises capable of satisfying industry standards in the procurement of goods and services. In many countries the private sector has been too weak to respond to local content policy initiatives (Ramdoo 2015). Poor implementation of local content policies has also been a common problem, and in several countries programmes aimed at the natural resources sector lack coherence with broader economic development policies (Morris et al. 2011).

3. Dealing with Dutch disease

The relative price changes that occur in a resource-abundant economy make diversification into tradable goods production outside the natural resources

sector difficult. During a commodity boom, the income from resource extraction increases the demand for all goods. In the case of internationally traded goods, imports can meet the increased demand, but because non-traded goods are subject to increasing marginal costs, the relative price of non-tradables tends to rise. The foreign exchange market reflects the increase in a real exchange rate appreciation. This ‘Dutch disease’ tends to make the development of manufacturing and other tradable goods and services outside the minerals sector more difficult.

International competitiveness, however, is not solely determined by the exchange rate. Governments can enhance the productivity of private investments outside the natural resource sector by undertaking institutional and regulatory reforms and making public investments that lower the costs of producing tradable goods; in short, by improving the ‘investment climate’ (Stern 2001). The investment climate has come to be broadly and somewhat vaguely defined, but three of its key elements are particularly relevant to dealing with Dutch disease—regulation, infrastructure, and skills. Well-designed regulatory reforms, reliable electrical power, lower costs of transport, and workers better able to perform their jobs increase the potential productivity of all firms (Newman et al. 2016). Thus, governments can complement direct efforts to link domestic firms to the resource value chain with broader investments and reforms to improve the investment climate. An added benefit is that the investment climate reforms will help domestic firms attempting to enter the natural resource value chain.

3.1 Regulatory reform

Reforms that reduce regulatory compliance costs and encourage firm entry and exit can have high payoffs. Surveys of firms in resource-abundant African countries highlight a wide range of areas in which regulatory or administrative burdens raise costs and reduce competitiveness. In Uganda, for example, inadequate regulatory capacity and an unclear framework increase the regulatory burden. Senior managers of manufacturing firms spend more than thirteen days each year on average dealing with government officials, and 40 per cent of the manufacturing firms surveyed complained that regulations were not interpreted consistently (Henstridge and Page 2012). In Mozambique, business regulations—and the opportunities for corruption engendered by the regulatory regime—increase firms’ costs and reduce competitiveness (World Bank 2009a). In Kenya, which has recently discovered oil, almost one-third of firms ranked corruption—ranging from payments for utility hook-ups to informal payments in public procurement—among the top three problems faced. Three-quarters of Kenyan firms reported having to make payments to public officials to ‘get things done’, and the more often inspectors visited firms, the more likely they were to ask for informal payments (World Bank 2009b).

Reforms that encourage the entry and exit of firms can have a positive impact on productivity. In open economies, imports should provide competition in domestic markets, yet World Bank *Enterprise Surveys* often find that formal-sector firms in Africa do not feel pressed by competition. More than 70 per cent of African countries rank in the bottom half on the perceived intensity of local competition (World Bank 2016b). Changes to rules that make markets more open and contestable—by facilitating imports, supporting entry in production or operation, and giving all firms an opportunity to compete on common ground—can reduce concentration and the likelihood of anticompetitive practices. Building capacity to help strengthen competition authorities and increase the effectiveness of competition policy is also important.

Institutional and regulatory reforms should be undertaken soon after natural resources are discovered. This is because they may prove more difficult to initiate and sustain in resource-rich countries once resource revenues start to flow. Incumbent workers and firms benefit from lack of competition and have little incentive to support improvements in the regulatory regime. Normally pressures for regulatory reform would come from other interest groups in society, but there is evidence that rent-seeking interests gradually make competing interest groups less successful in changing policy in resource-exporting countries (Collier and Hoeffler 2008).

3.2 Infrastructure and skills

The revenues that flow from natural resources open fiscal space for governments of resource-abundant economies to address two of the fundamental constraints to competitiveness in Africa: lack of infrastructure and skills. African firms pay a substantial productivity penalty because of poor infrastructure (Escribano et al. 2010). Sub-Saharan Africa lags at least 20 percentage points behind the average for low-income countries on almost all major infrastructure measures. In addition, the quality of service is low, supplies are unreliable, and disruptions are frequent and unpredictable (Newman et al. 2016). The quality of electricity service is ranked as a major problem by more than half of the firms in more than half of the African countries in the World Bank's *Investment Climate Assessments*. Transport comes a close second to power across the region. Road infrastructure has received little attention, as, until recently, have ports and railways.

Investments in trade-related infrastructure can make an important contribution to diversification. By reducing both the variable and fixed costs of exporting, trade facilitation increases the exports of those firms already involved in international trade, while enabling new firms to export for the first time. Global value chains in activities from manufacturing to horticulture are highly demanding of trade logistics. The nine currently resource-rich African countries have an

average trade-related infrastructure (ports, rail, road, and telecommunications) ranking of 125 out of 160 countries in the World Bank Trade Logistics Index (World Bank 2016a). Seven are in the bottom third of the global distribution and four are in the bottom quintile. Public investments in power, transport, and trade logistics can boost competitiveness.

Despite significant gains in average levels of schooling, the region's workforce is the least skilled in the world (World Bank 2017). In many countries, the skills constraint is felt most strongly in more productive and export-oriented firms. Firms with at least 20 employees—those that are generating employment in growing economies—are feeling the skills shortage as well. Employers in the region are increasingly demanding workers with multiple skills. More than half of the firms surveyed as part of the School to Work Transition surveys in several African countries reported that technical, interpersonal, and higher-order cognitive skills (problem-solving and decision-making) are important to them. Because poor learning outcomes diminish the foundational skills of workers, improvements in quality at all levels are needed. Investments in demand-driven technical and vocational education and training, higher education, entrepreneurship, and business training programmes can spur productivity growth (World Bank 2017). In an increasingly austere aid environment, governments can use resource revenues to address the skills gap.

Unmet needs in infrastructure and skills increase pressures for spending following new discoveries, but prudent revenue management requires establishing how much public spending should increase and how much to save. Not all infrastructure and education projects will have the same impact. Careful cost-benefit analysis of infrastructure investments is essential, and governments should have a prioritized list of vetted projects ready for funding. Applying this rule is actually more complex than it appears. It is difficult to appraise the possible catalytic effect of investments in infrastructure and human capital on private investment. Nevertheless, problems with addressing externalities should not be an excuse for failure to evaluate the vast majority of investment projects. For example, rigorous assessments of the cost effectiveness of proposed skill development programmes can be undertaken. Once the overall volume of spending consistent with prudent public investment is set, the revenue that remains should be parked in investments overseas.

Because the needs in infrastructure and skills are large and the timing of revenues is uncertain, governments face strong pressures to borrow in anticipation of the arrival of resource revenues. Careful debt management is essential. In the case of Ghana, for example, the government ramped up infrastructure spending before resource revenues were in place, raising the public debt burden through sovereign borrowing. Sovereign debt generally comes with high costs and short maturities. This may adversely affect the ability to borrow in the future. In situations in which governments face external credit constraints, it may even make sense to use a

portion of the resource windfall to repay foreign debt (van der Ploeg and Venables 2011).

4. Linking industry to the resource

In resource-rich countries, foreign investors are often competing to gain access to the resource. This gives an opportunity to governments to attempt to integrate local companies into the supply chains of the multinational resource-extraction firms. One widely used policy has been to require preferential local procurement, but simple rules of thumb—like domestic content legislation—are frequently ineffective. Backward linkages to input suppliers and forward linkages to processors are often a function of the age and the scale of the resource sector in the country (ECA 2013). Ghana and South Africa's relative success in integrating mineral development with the rest of the economy is due to historical circumstances. Nigeria's, Mozambique's, and Tanzania's efforts in building resource-based industrialization using oil and gas have not been as effective. Botswana's success in diamond cutting and polishing mainly reflects its market power in the global diamond market.

The supply chains of multinational companies (MNCs) in resource extraction generally have a pyramid structure. The multinational company will have a small number of lead subcontractors, some international and some local. Each lead subcontractor will then contract other companies to supply inputs. These are the second-tier subcontractors. Only a small number of local firms can play the lead subcontractor role in any area of activity, and the MNCs may prefer to operate almost exclusively with foreign lead subcontractors. Even where local capability is available, local suppliers may not have the opportunity to tender. For example, in 2013 the *Zambian Association of Manufacturers* reported that mining procurement managers in the Copperbelt were unaware of local manufacturing of roofing sheets, a significant and competitive metal fabrication industry (Fessehaie et al. 2016).

Governments and the public, on the other hand, frequently have inflated expectations of how many domestic firms can be integrated into the resource-related value chain. There is a tendency for policymakers to focus upstream on opportunities for local engineering, fabrication, assembly, and construction firms to participate in the new extractive investments. Downstream, the emphasis tends to be on further processing of the resource. Ghana's industrial development strategy, for example, calls for the establishment of new industries such as petrochemicals, fertilizer, and liquefied petroleum gas (LPG) cylinder production linked to its oil and gas industry. This is an overly narrow view of what kinds of firms can benefit from the resource boom and runs the risk of concentrating on capital-intensive sectors that generate little employment. It also diverts attention from other

opportunities, some as mundane as cleaning, catering, security, and personnel transport, which are often locally outsourced in African resource-producing countries (Morris et al. 2011).

4.1 Building a public–private partnership

Integration of local firms into the resource value chain depends on addressing the priorities and concerns of both the MNCs and the government. This is a more complex undertaking than legislating or regulating local content. It depends on the ability of government and industry to develop an effective public–private partnership. Most major resource-extraction multinationals devote considerable resources to the management of local content development and systematically analyse patterns of local procurement with a view to improving their processes. A major Zambian mining MNC, for example, has created a local business development programme that focuses on improving delivery time, increasing access to finance, providing skills and technical expertise, and developing quality assurance systems (ECA 2013).

From the public-sector side, well-designed institutions to negotiate and manage local participation are critical to success. Sutton (2012) advocates creating an institutional focal point—located within the office of the head of state or government—to act as the broker between the MNCs and domestic firms.¹ The agency should have deep familiarity with the range of capabilities of domestic companies and be staffed with professionals with the ability to deal on equal terms with executives in the procurement divisions of the MNCs. Its primary functions are to propose realistic targets for integrating local firms into each area of operation and to take the lead role in establishing qualification schemes for domestic firms to achieve ‘approved vendor’ status, including the design of appropriate training programmes. Some staff should have industry experience, while others require a public-sector background to facilitate coordination across government agencies.

A high-level champion is crucial to success. Because the agency is responsible for leading negotiations with the MNCs, it needs to have—and be seen to have—support at the highest political level. A senior sponsor in government can also be useful in resolving conflicts among the multiple interests that are engaged in local content issues. The programme and the agency should be subject to periodic reviews and evaluated against observable outcomes—for example, the rate of growth of jobs. It should also be subject to a sunset clause: requiring that a programme expire unless a review recommends that it be extended places the burden on advocates to show why it remains relevant (Page and Tarp 2017).

¹ He calls it a ‘Local Content Unit (LCU)’.

4.2 Improving coordination and reducing complexity

Efforts aimed at building local capabilities are crosscutting and require balancing different, sometimes conflicting, priorities. Because the development of local content is part of the overall planning process, a clear link to the planning ministry is needed. One benefit of having an institutional focal point and a high-level champion in government is improved incentives for coordinated behaviour across ministries. Lack of coordination among different government entities and levels of government may result in conflicting regulations, increased administrative costs, delays in project execution, and in some cases may create an incentive for rent-seeking behaviour. In Angola, for example, industrial policy is the responsibility of the industry ministry, while policy towards the oil sector (including backward linkages) is the responsibility of the Ministry of Petroleum and Sonangol. There are no joint-working arrangements in policy design and implementation (Teko 2011).

In many resource-rich countries, local content regulations are complex, adding to the administrative costs of firms and exceeding the capacity of the regulators. In Ghana and South Africa, resource companies appear to have been sending large volumes of documents to regulatory bodies, knowing that the capacity of these bodies to read and digest them is limited (ECA 2013). Especially for small businesses, assimilating and complying with complex administrative and/or technical rules can create an unreasonable burden. One attractive feature of creating a focal agency is that it can reduce complexity by concentrating reporting requirements on specific constraints identified by the MNCs and the local private sector.

4.3 Training

Because initially only a small number of local firms may be able to play a role in any area of activity along the resource value chain, training programmes for potential supplying firms—covering both technical and business management subjects—are needed. The objective of training is to raise the capabilities of local firms to the minimum level required to allow them to become ‘approved vendors’ and enter the MNC value chains. For training to succeed, the government and the resource-extraction companies need to agree on the design of training, and on the qualification process through which a firm achieves approved vendor status. Supplying training without buy-in by both parties is unlikely to lead to good outcomes. Ghana, for example, established an Enterprise Development Centre (EDC) to enhance the capacity of indigenous firms to participate in the oil and gas industry, but only a few well-established medium- to large-scale Ghanaian enterprises have been able to take advantage of the opportunities provided (Ablo 2015).

Randomized experiments suggest that management training at the firm level is a potential channel for building the capabilities of local firms (Bloom et al. 2013), but they also raise some red flags. The results of most training programmes targeted at micro, small, and medium enterprises (MSMEs) have been disappointing (McKenzie and Woodruff 2012). The challenge is to identify firms that can benefit most from training. These are likely to be higher-capability firms (Otsuka and Sonobe 2014). If firms have failed to adopt good management practices out of ignorance, training programmes in basic management, like inventory and quality control, targeted to higher-capability firms offer a potentially substantial payoff in terms of increased productivity. Unless incentives are right, however, training may not achieve its full potential. When firms lack competitive pressure, they often fail to see the need to improve performance (Bloom et al. 2013).

Because the number of domestic firms hoping to benefit from a resource boom is potentially large, choosing those eligible for training must balance selectivity against effectiveness. Narrow or opaque selection criteria may encourage rent-seeking, while broad criteria may result in attempting to train too many low-capability firms. This can be addressed by setting up a process that allows any local firm to apply but specifies in advance a set of criteria that will be used in selecting applicants. Oversight of the programme, ideally by an independent watchdog organization composed of public-sector, private-sector, and civil-society representatives with a reputation for probity and public disclosure of their findings can help to diminish concerns of abuse.

5. Widening the options

Although new discoveries of natural resources make the process of diversification more challenging, they also offer new opportunities. This section explores two. The first is to broaden the perspective on diversification from a focus on manufacturing to include other tradable goods and services. The second is to develop knowledge, either linked to the resource itself or in areas in which a resource-abundant economy may have geographical or other location-specific sources of comparative advantage.

5.1 Industries without smokestacks

As Africa enters its next phase of development, it confronts a global economy substantially different from previous 'late industrializers'. Our understanding of industry is changing. Today, new technologies have spawned a growing number of services and agro-industries—including horticulture—that share many characteristics with manufacturing. They are tradable, have high value added per

worker, and can absorb large numbers of workers. Like manufacturing, these ‘industries without smokestacks’ benefit from technological change, productivity growth, scale, and agglomeration economies.² They may provide an alternative path towards diversification.

Since the 1980s, global trade in services has grown faster than merchandise trade. Modern service exports (computer and information services, financial services, business services, and communication) are growing especially rapidly. In 2014, the tourism industry provided an estimated 277 million jobs and accounted for about 9.8 per cent of global gross domestic product (GDP) (Daly and Gereffi 2018). In horticulture, a logistics-based revolution has occurred: once efficient logistics are in place, countries with suitable agroecological conditions are able to produce high-value products, such as cut flowers and fresh vegetables, which formerly needed to be grown near their point of consumption. As a result, horticultural exports increased to around 12 per cent of global agricultural exports in 2014 (Fukase and Martin 2018).

Where the service sector has the characteristics attributed to manufacturing—strong linkages, productivity growth, and technological innovations—it can act as an engine of structural change.³ Several modern service sectors—such as information and communications technology (ICT) services, transport, and logistics—have become leading sectors in a number of countries (Lavopa 2015; Lavopa and Szirmai 2014). In tourism and horticulture, leading firms connect customers and service providers along global value chains that push suppliers to upgrade product quality, respond to changing tastes, and reduce costs. Participation in global value chains is a significant driver of labour productivity. An increase of 10 per cent in the level of global value chain participation increased average productivity by close to 1.7 per cent (Constantinescu et al. 2017).

Chile, the world’s leading copper producer, was a pioneer in diversifying through industries without smokestacks. Its abundant lakes and rivers are ideal for the cultivation of salmon, and its climate and topography are well suited to the production of wine. By 2000, Chile had become the world’s second-largest producer of Atlantic salmon and the world’s fourth largest exporter of wine. African resource exporters may also find opportunities to diversify into horticulture, agro-industry, or tradable services, where geography or other endowments provide a comparative advantage.

Because industries without smokestacks share many firm characteristics with ‘smokestack’ industries—tradability foremost among them—it is possible to develop a diversification strategy that applies broadly to manufacturing, tradable services, agro-industry, and horticulture. The strategy has two components—investment climate reforms and an ‘export push.’ Investment climate reforms have

² See Ghani and Kharas (2010).

³ See, for example, Ghani and O’Connell (2014), Szirmai and Verspagen (2015), and Tregenna (2015).

the potential to raise the productivity of firms in industries without smokestacks, as well as in manufacturing.⁴ The regulatory regime in telecommunications is vital to IT-enabled services. Tourism is strongly dependent on how the air transport system is regulated and is sensitive to the behaviour of public officials ranging from immigration inspectors to the police. Horticultural exports are perishable and particularly vulnerable to delays in shipping caused by inefficient or corrupt inspection procedures at airports. Because productivity in services has an important impact on productivity levels across the economy, encouraging a competitive environment is essential.

Lack of infrastructure and skills limits the ability to diversify. Trade-related infrastructure directly affects the competitiveness of manufactured and horticultural exports. High-speed data transmission is critical to exporting a wide range of services and especially to IT-intensive exports. Most African countries lack adequate backbone IT infrastructure because they went straight to mobile networks without investing in connectivity first. Tourist-related infrastructure is a necessary condition for fully leveraging tourism potential (Daly and Gereffi 2018). In sub-Saharan Africa, many hotels have to provide their own infrastructure services, such as power, water filtration and treatment, solid waste removal and sewage treatment and disposal, to compensate for unreliable public services. Such investments raise capital and operating costs and adversely affect competitiveness (World Bank 2014).

In Kenya, attempts to expand the IT-enabled services industry rapidly have encountered constraints due to a lack of software development and project management skills (Nguai Muchai and Kimuyu 2018). Senegal's rank among the top fifty potential suppliers of outsourcing services has fallen significantly in the last five years due to weakness in the quality and quantity of human resources (English 2018). The skills needed to interact with tourists and to provide the many 'back office' services that are inputs into the production of high-quality tourism are essential to further development of the tourism industry (Daly and Gereffi 2018).

For most countries in Africa, regional and global export markets represent the best option for rapid growth of manufacturing and industries without smokestacks. Exports permit firms to realize economies of scale, and in low-income countries the act of exporting raises firm-level productivity through learning (Harrison and Rodriguez-Clare 2010). Because individual firms in resource-abundant economies face high costs of entering export markets, governments need to develop an 'export push'—a coherent package of trade policies, public investments, regulatory reforms, and institutional changes to support new exporters.

⁴ It is important to keep in mind that each activity has some unique characteristics that imply generic, and 'one size fits all' policymaking may be ineffective. Complementary sector-specific public actions may also be required.

A critical component of the export push is prudent macroeconomic management of the resource windfall. While some appreciation of the exchange rate is unavoidable, public expenditures must be managed to reduce excessive upward pressure. The structure of protection plays an important role in ensuring that exporting is as attractive as producing for the local market. Duty drawback, tariff exemption, and VAT reimbursement schemes are often complex and poorly administered; these can be reformed. Investments and institutional reforms to improve trade logistics are essential, including institutional reforms at the regional level to improve transnational transport corridors. Market structure in the transport sector and inappropriate regulations can also impede exports, and should be addressed.

5.2 Investing in knowledge

In addition to investments in general production skills, there is a strong case for attempting to build specialist knowledge linked to the extractive industries themselves. The South African mining supplier industry has developed globally competitive capabilities based on serving its domestic mining industry. South Africa is a world leader in a wide range of mining equipment products, including spirals for washing coal, water pumps, underground locomotives, and ventilation. The area in which South African expertise is particularly advanced is in turnkey deep-level mine design and operation. At the time oil was discovered, Norway had no expertise in the oil industry. The Norwegian government invested in building specialist knowledge about deep-sea oil exploration through its universities. Now, Norway's knowledge-based oil service industry is a major source of income in its own right. Qatar's expertise is in dealing with the environmental consequences of oil spills. Qatari companies have developed a global reputation that has involved them in such high-profile containment and clean-up operations as the BP spill in the Gulf of Mexico. Initially, resource-abundant economies should attempt to strengthen the geology and engineering departments of universities, with the goal of developing more technically qualified staff and, perhaps, a services export industry. A recent public-private partnership between the Jubilee Partners and Takoradi Polytechnic in Ghana, the Jubilee Technical Training Center (JTTC), is an example. The first batch of petroleum engineering trainees graduated in 2014.

Resource exporters may also have the opportunity to use knowledge for diversification into industries without smokestacks. IT-enabled services, horticulture, and tourism all depend on knowledge of potential markets and production. In Chile, the main drivers of growth in both salmon and wine were investments in the generation and diffusion of production knowledge across firms. The initiative

was led by an innovative public–private partnership, the Fundación Chile, and eventually involved private firms, government at all levels, universities, and specialist research institutes (Kjöllerström and Dallto 2007). Similar three-way partnerships with the private sector, universities, and specialist research institutions can be developed around tradable services or agro-industries in which resource-abundant economies have location-specific comparative advantage.

6. Conclusions

Discoveries of oil, gas, and minerals represent an unparalleled opportunity for Africa's resource-abundant economies, but one accompanied by substantial risks. For the typical resource-rich economy in Africa, natural resources are not sufficiently abundant to ignore economic structure, and diversification is important. It helps to establish the basis for long-term growth and development once the resource has been depleted. The relative price changes that occur in resource-exporting economies—symptoms of Dutch disease—place them at a disadvantage with respect to diversification. The public revenues accruing to governments from resource extraction—together with complementary institutional and policy reforms—can be used to offset this disadvantage through improvements in the investment climate. Institutional and regulatory reforms and investments in infrastructure and skills can help to raise the productivity of firms outside of the resource sector.

Beyond investments in institutions, infrastructure, and skills, African governments have a range of options for diversification. The common approach is to use the presence of the resource to acquire firm capabilities from global resource investors. Because they control access to the resource, governments can seek to integrate local suppliers into the resource value chain. This is closest in spirit to the concept of local content held by most African policymakers, but it is not a trivial task. It requires a deep understanding of the current capabilities of domestic firms and a strong commitment to develop the institutional framework needed to expand them.

Governments can widen the options for diversification to include 'industries without smokestacks'. Agro-industry, tourism, and tradable services may prove less vulnerable to appreciation of the real exchange rate than task-based manufactured exports. And, because they share many characteristics in common with manufacturing, a common diversification strategy based on investment climate reforms and an export push can be effective. Governments can also use resource revenues to develop specialized knowledge, linked either to the resource itself or in industries with geographical or other country-specific sources of comparative advantage to develop non-traditional exports.

References

- Ablo, A. (2015). 'Local Content and Participation in Ghana's Oil and Gas Industry: Can Enterprise Development Make a Difference?'. *The Extractive Industries and Society*, 2(2): 320–27.
- Bloom, N., B. Eifert, A. Mahajan, D. McKenzie, and J. Roberts (2013). 'Does Management Matter? Evidence from India'. *Quarterly Journal of Economics*, 128(1): 1–51.
- Collier, P. and A. Hoeffler (2008). 'Testing the Neo-Con Agenda: Democracy and Natural Resource Rents'. *European Economic Review*, 53(3): 293–308.
- Constantinescu, C., A. Mattoo, and M. Ruta (2017). 'Does Vertical Specialization Increase Productivity?' Policy Research Working Paper 7978. Washington, DC: World Bank.
- Daly, J., and G. Gereffi (2018). 'Trade in Services: Opening Markets to Create Opportunities'. In R. Newfarmer, J. Page, and F. Tarp (eds), *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford: Oxford University Press.
- ECA (2013). *Making the Most of Africa's Commodities: Industrializing for Growth, Jobs and Economic Transformation*. Addis Ababa: UNECA.
- English, P. (2018). 'Senegal: A Service Economy in Need of a Boost'. In R. Newfarmer, J. Page, and F. Tarp (eds), *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford: Oxford University Press.
- Escribano, A., J. L. Guasch, and J. Pena. (2010). 'Assessing the Impact of Infrastructure Quality on Firm Productivity in Africa: Cross-Country Comparisons Based on Investment Climate Surveys from 1999 to 2005'. Policy Research Working Paper 5191. Washington, DC: World Bank.
- Fessehaie, J. (2012). 'What Determines the Breadth and Depth of Zambia's Backward Linkages to Copper Mining? The Role of Public Policy and Value Chain Dynamics'. *Resources Policy*, 37(4): 443–51.
- Fessehaie, J., Z. Rustomjee, and L. Kaziboni (2016). 'Can Mining Promote Industrialization? A Comparative Analysis of Policy Frameworks in Three Southern African Countries'. WIDER Working Paper 2016/83. Helsinki: UNU-WIDER.
- Fukase, E., and W. Martin (2018). 'Agro-Processing and Horticultural Exports from Africa'. In R. Newfarmer, J. Page, and F. Tarp (eds), *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford: Oxford University Press.
- Ghani, E., and H. Kharas (2010). 'The Service Revolution in South Asia: An Overview'. In E. Ghani (ed.), *The Service Revolution in South Asia*. Oxford: Oxford University Press.
- Ghani, E., and S. D. O'Connell (2014). 'Can Service Be a Growth Escalator in Low Income Countries?'. Policy Research Working Paper 6971. Washington, DC: World Bank.
- Hanlin, C. (2011). 'The Drive to Increase Local Procurement in the Mining Sector in Africa: Myth or Reality?'. MMCP Working Paper 4. Cape Town: University of Cape Town and Open University.

- Harrison, A., and A. Rodriguez-Clare (2010). 'Foreign Investment and Industrial Policy for Developing Countries'. In D. Rodrik and M. Rosenzweig (eds), *Handbook of Development Economics*, vol. 5. Amsterdam: North-Holland.
- Henstridge, M., and J. Page (2012). 'Managing a Modest Boom: Oil in Uganda'. OxCarre Research Paper 2/6. Oxford: Oxford Centre for the Study of Resource Rich Economies.
- IMF (2014). 'Sustaining Long-Run Growth and Macroeconomic Stability in Low Income Countries: The Role of Structural Transformation and Diversification'. IMF Policy Paper. Washington, DC: IMF.
- Kaplan, D. (2012). 'South African Mining Equipment and Specialist Services: Technological Capacity, Export Performance and Policy'. *Resources Policy*, 37(4): 425–33.
- Kjällerström, M., and K. Dallto (2007). 'Natural Resource-Based Industries: Prospects for Africa's Agriculture'. In United Nations Department of Economic and Social Affairs (ed.), *Industrial Development for the 21st Century: Sustainable Development Perspectives*. New York, NY: United Nations.
- Lavopa, A. (2015). 'Technology-Driven Structural Change and Inclusiveness: The Role of Manufacturing: Inclusive and Sustainable Development'. Working Paper 14/2015. Vienna: United Nations Industrial Development Organization.
- Lavopa, A., and A. Szirmai (2014). 'Structural Modernization and Development Traps: An Empirical Approach'. UNU-MERIT Working Paper 2014/76. Maastricht: United Nations University, Maastricht Economic and Social Research Institute on Innovation and Technology.
- Mbayi, L. (2011). 'Linkages in Botswana's Diamond Cutting and Polishing Industry'. MMCP Discussion Paper 6. Cape Town: University of Cape Town and Open University.
- McKenzie, D., and C. Woodruff (2012). 'What Are We Learning from Business Training and Entrepreneurship Evaluations around the Developing World?'. Policy Research Working Paper 6202. Washington, DC: World Bank.
- Morris, M., R. Kaplinsky, and D. Kaplan (2011). 'Commodities and Linkages: Industrialisation in Sub-Saharan Africa'. MMCP Discussion Paper 13. Cape Town: University of Cape Town and Open University.
- Newman, C., J. Page, J. Rand, A. Shemeles, M. Soderbom, and F. Tarp (2016). *Made in Africa: Learning to Compete in Industry*. Washington, DC: Brookings Institution Press.
- Ngui Muchai, D. and P. Kimuyu (2018). 'Prospects for Information and Communications Technology-enabled Services in Kenya: The Case of the Mobile Money Transfer Industry'. In R. Newfarmer, J. Page, and F. Tarp (eds), *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford: Oxford University Press.
- OECD (2017). *Local Content Policies in Minerals: Exporting Countries—Case Studies*. Paris: OECD.

- Otsuka, K., and T. Sonobe (2014). *Cluster-Based Industrial Development: KAIZEN Management for MSE Growth in Developing Countries*. New York, NY: Palgrave Macmillan.
- Oyejide, T. A., and A. O. Adewuyi (2011). 'Enhancing Linkages of Oil and Gas Industry in the Nigerian Economy'. MMCP Discussion Paper 8. Milton Keynes: Open University.
- Page, J., and F. Tarp (2017). *The Practice of Industrial Policy: Government–Business Coordination in Africa and East Asia*. Oxford: Oxford University Press.
- Ramdoo, I. (2015). 'Resource-Based Industrialization in Africa: Optimising Linkages and Value Chains in the Extractive Sector'. ECPDM Discussion Paper 179. Maastricht: European Centre for Development Policy Management.
- Roe, A. (2017). 'Tanzania: From Mining to Oil and Gas—Structural Change or Just Big Numbers?'. WIDER Working Paper 2017/175. Helsinki: UNU-WIDER.
- Scurfield, T., N. Woodroffe, and S. Olan'g (2017). *Localizing Tanzania's Gas Sector: Determining Optimal Policies for an Emerging Producer*. London: Natural Resources Governance Institute.
- Stern, N. (2001). *A Strategy for Development*. Beijing: China People's University.
- Sutton, J. (2012). *Competing in Capabilities: The Globalization Process*. Oxford: Oxford University Press.
- Szirmai, A., and B. Verspagen. (2015). 'Manufacturing and Economic Growth in Developing Countries 1950–2005'. *Structural Change and Economic Dynamics*, 34: 46–59.
- Teka, Z. (2011). 'Backward Linkages in the Manufacturing Sector in the Oil and Gas Value Chain in Angola'. MMCP Discussion Paper 11. Cape Town: University of Cape Town and Open University.
- Tordo, S. (2009). 'Exploration and Production Rights: Allocation Strategies and Design Issues'. Working Paper 179. Washington, DC: World Bank.
- Tregenna, F. (2015). 'Deindustrialisation, Structural Change and Sustainable Economic Growth: Inclusive and Sustainable Industrial Development'. Working Paper 02/2015. Vienna: United Nations Industrial Development Organization.
- UNCTAD (2006). *Creating Local Linkages by Empowering Indigenous Entrepreneurs: African Oil and Gas Services Sector Survey, Volume 1: Nigeria*. Geneva: UNCTAD.
- UNIDO (2009). *Industrial Development Report, 2009*. Geneva: United Nations Industrial Development Organization.
- van der Ploeg, F., and A. J. Venables (2011). 'Harnessing Windfall Revenues: Optimal Policies for Resource-Rich Developing Economies'. *Economic Journal*, 121(551): 1–30.
- World Bank (2009a). *Investment Climate Assessment of Mozambique*. Washington, DC: World Bank.
- World Bank (2009b). *An Assessment of the Investment Climate in Kenya*. Washington, DC: World Bank.

World Bank (2014). *Tourism in Africa: Harnessing Tourism for Growth and Improved Livelihoods* Washington DC: World Bank.

World Bank (2016a). *Connecting to Compete, 2016*. Washington, DC: World Bank.

World Bank (2016b). *Breaking down Barriers: Unlocking Africa's Potential through Vigorous Competition Policy*. Washington, DC: World Bank.

World Bank (2017). *Africa's Pulse*, vol. 16. Washington, DC: World Bank.

PART II
COUNTRY STUDIES

The Boom, the Bust, and the Dynamics of Oil Resource Management in Ghana

Ernest Aryeetey and Ishmael Ackah

1. Introduction

‘Even without oil, we are doing so well. With oil as a shot in the arm, we’re going to fly.’¹ These were the words of President John Kufuor, under whose administration in 2007 oil was discovered in Ghana in commercial quantities. The announcement came with huge expectation throughout Ghana. Indeed, throughout the world petroleum discoveries inspire hope. This hope is derived from what the discoveries and revenues are expected to do. According to Ross (2012), oil discoveries and the revenues associated with them have the characteristics of ‘scale and superiority’. No matter how modest the finds are, they have consequences for the structure of the economy, the environment, and other social implications (Ablo 2015).

Exploration for oil in Ghana began in the then Gold Coast in the nineteenth century. Chitor (2012) reports that a limited exploration for petroleum began in 1896 in the Tano basin.² After the early attempts, oil discovery was first made in the Saltpond basin in the 1970s. The Saltpond discovery was not in commercial quantities, producing an average of about 600 barrels in 2009–10 (Gyampo 2010).

After discovering oil in commercial quantities in 2007, production began at the Jubilee field in December 2010. The field was estimated to produce 120,000 barrels per day. Petroleum reserves for the Jubilee field were calculated to be between 600 million and 1.8 billion barrels (Ayelazuno 2014). The World Bank estimated in 2009 that Ghana would earn US\$20 billion from oil production in the period 2012–30 from the Jubilee field. These expectations notwithstanding, the contribution of petroleum to government revenue has been less than 10 per cent, averaging about 7.5 per cent for the first five years of oil production (Benkenstein 2016). Ghana had only one field, the Jubilee, until two other fields started operation recently. The Tweneboa–Enyenra–Ntomme (TEN) and Sankofa fields started

¹ President John Kufuor made this observation in an interview in 2007 (see BBC 2007).

² Ghana has four main sedimentary basins. These are the Central basin (Saltpond), Western basin (Tano), the Eastern basin (Accra-Keta), and the inland Voltaian basin (Adda 2013).

production in 2016 and 2017, respectively. The TEN field is expected to produce 80,000 barrels of oil per day and 180 million standard cubic feet of natural gas per day when it reaches its full potential. According to the Ghana National Petroleum Corporation (GNPC 2016), the TEN field has an estimated reserve of 239 million barrels of oil and 360 billion cubic feet (bcf) of natural gas. In the case of the Sankofa field, the estimated reserve is 204 million barrels of oil and 1071 bcf of natural gas (GNPC 2016). In a report in 2016, the Public Interest and Accountability Committee (PIAC) declared that Ghana earned US\$3.2 billion in the first five years of oil production (see PIAC 2016).

This chapter shows that Ghana is a fairly modest producer of oil and has made some effort to learn proper oil governance from the experiences of other countries, but has not always managed to implement the lessons learned. While it has put in place a good number of institutions and sound regulations to ensure that the benefits from oil production are translated into broader-based development, this has not always worked. The management of oil revenues has not been protected from generally poor fiscal management.

The Africa Centre for Energy Policy (2014) reported that although transparency has been high in the petroleum sector, accountability and the collection of revenues, including surface rentals, have been poor. It called on the government to do more to spread the benefits of oil production.

There is enough experience from around the world to show that translating oil discoveries through production to revenues and inclusive growth is not necessarily a linear process. Inclusive growth has been particularly difficult to achieve in many places, and Ghana has been no exception so far. Can Ghana escape a resource curse?³ Our view is that it can, provided that it implements fully as soon as possible, and more diligently, the regulations that it has adopted.

The remainder of this chapter is divided into five sections. Section 2 provides an overview of petroleum resources in terms of size, including a comparison with other African oil producers. It also introduces Ghana's fiscal and petroleum legal regimes. In Section 3, the accountability and transparency mechanisms that have been put in place for effective oil resource governance are discussed. Section 4 examines the petroleum management framework. In Section 5, oil and macroeconomic performance is discussed. Finally, Section 6 concludes.

2. Petroleum production and exploration in Ghana

The central coastline along the Gulf of Guinea in West Africa is endowed with hydrocarbons to the extent that the estimated reserves, if produced, can meet the

³ The curse of petroleum resources occurs when countries with large endowments of such resources generally perform worse in terms of economic development and good governance than those countries with little or no petroleum resources (see Auty 2001; Sachs and Warner 1995, 1999; Gylfason et al. 1999).

petroleum needs of the European Union (Ayoade 2002). While Nigeria and Gabon have been producing oil since the twentieth century, Ghana is basically a frontier nation. But, as mentioned earlier, oil exploration is not new to Ghana. Edjekumhene et al. (2010) have indicated that the people of Nzema started reporting oil seepages around the onshore Tano basin around the 1800s, and this led to exploration by the West African Oil and Fuel Company. The government intensified the oil search by passing the Oil and Mining Regulations, 1957 (LI 221), the Mineral (Offshore) Regulations, 1963 (LI 257), and the Minerals (Oil and Gas) Regulations, 1965 (LI 257). These regulations and international collaborations led to the discovery of the first non-commercial oil in 1970 by Signal and Amoco Oil Company Limited at the Saltpond offshore field (Aratuo 2012). The Saltpond offshore field, which was estimated to have rather limited reserves, started production in 1978 by Agripetco, with a daily average output of 4,800 barrels. In 1985, production declined to 580 barrels per day (Takyiwa 2014).

According to the GNPC (2013), the first natural gas discovery in Ghana was in 1973, around the offshore Cape Three Points by Zapata Oil Company Limited. Takyiwa (2014) has classified the history of oil exploration in Ghana into four phases. The first phase, spanning 1896–1969, was characterized by wildcat drilling and non-systematic exploration activities. This phase also witnessed the acquisition of the first two-dimensional seismic coverage in 1968. The second phase, spanning 1970–84, focused more on international oil companies-led offshore exploration activities. The first offshore deep water well was drilled by Philips Petroleum in 1978. The third phase saw the establishment of the GNPC and the involvement of a national oil company in exploration. There was an increase in two- and three-dimensional seismic coverage in 1985–2000. The current phase, 2001 to date, has involved restructuring and resourcing of the national oil company and the passing of appropriate legislations.

2.1 Regulating exploration and production

Prior to 2007, the major laws and regulations governing the petroleum sector in Ghana included the Ghana National Petroleum Corporation Act, 1983 (Provisional National Defence Council (PNDC) Law 64), the Petroleum Exploration and Production Act, 1984 (PNDC Law, 84), and the Petroleum Income Tax Law, 1987 (PNDC Law 188). A new petroleum and exploration law was passed in 2016 to replace the old one (PNDC Law 84). The weakness of the old law was, among other things, the limited transparency provisions. According to the Africa Centre for Energy Policy (2016), the current Exploration and Production Law (Act 919) has many positive attributes including a provision for an open and competitive public tender for the allocation of petroleum rights, a requirement for publication by the Minister for Energy and Petroleum, the reasons for vetoing the outcome of a competitive public tender, and the establishment of a public register for

the disclosure of petroleum agreements, authorizations, and permits. These transparency provisions notwithstanding, Ndi (2018) has suggested that there are pockets of opposition to the law because of changes to the fiscal terms from production-sharing to hybrid or tax/royalty system. However, Kankam and Ackah (2014) have argued that the choice of hybrid fiscal system allows the state to meet revenue maximization as well as socio-economic objectives.

The main elements of Ghana's petroleum hybrid fiscal regime include royalty, corporate income tax, surface rentals, carried and participating interest, and additional oil entitlements (AOEs) (Sasraku 2016). According to Amoako-Tuffour and Owusu-Ayim (2010), the royalty rate is not fixed and ranges from 4 to 12.5 per cent of gross production of oil. In the case of natural gas, the royalty ranges from 3 to 10 per cent. There are clear discrepancies in the various laws. Petroleum corporate tax has been set at 35 per cent for all fields currently operating. This notwithstanding, the Petroleum Income Tax Law sets corporate tax at 50 per cent whereas Ghana's Income Tax Law, 2015 (Act 896) states income tax as 25 per cent. Section 10 of the Model Petroleum Agreement provides for an AOE. The AOE is triggered if the contractor's post-tax rate of return (ROR) exceeds the prescribed target for that year. The trigger points for the AOE are 12.5, 17.5, 22.5, and 27.5 per cent ROR. Surface rental is an additional source of revenue for the government. The Ghana Model Petroleum Agreement provides for a minimum of 10 per cent initial carried interest in all petroleum agreements and a negotiated participating interest thereafter. The GNPC holds and manages the carried and participating interest on behalf of the state.

2.2 The state of oil production

The Jubilee field produced a total of 161.9 million barrels of oil between 2010–15. The Ghana Energy Commission reported in 2017 that the Jubilee field produced 26.9 million barrels in 2016; that is, 94,200 barrels per day on average. This was lower than the 2015 average, which was 106,939 barrels per day. With regard to prices, the average price at which Ghana sold its oil was US\$51 per barrel in 2015 and US\$40 per barrel in 2016.

Ghana's three operating fields had a total estimated reserve of 2279 bcf of natural gas and 898 million barrels of oil as at the end of 2016 (GNPC 2016). The Jubilee field has an estimated 455 million barrels of oil and 568 bcf of associated and non-associated natural gas. The TEN field contains an estimated 239 million barrels of oil and 353 bcf of associated and non-associated natural gas. Finally, the Sankofa field contains an estimated 204 million barrels of oil and 1358 bcf of associated and non-associated natural gas. Figure 5.1 presents a summary of the petroleum reserve estimates of Ghana.

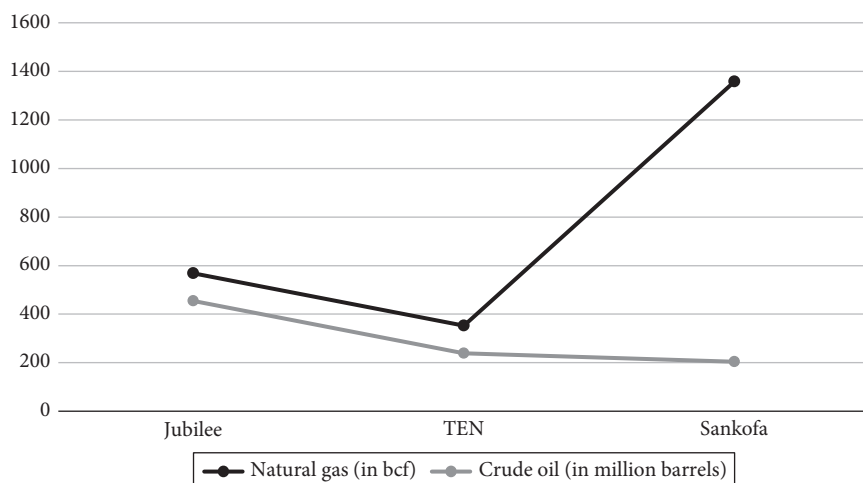


Figure 5.1 Petroleum reserves of Ghana's operating fields

Source: Authors' illustration based on data from GNPC (2016).

2.3 Comparing production with other African countries

Africa has an estimated reserve of 129.1 billion barrels, representing 7.6 per cent of the total global reserve in 2015 (see BP 2016). Libya and Nigeria have the largest petroleum reserves in Africa with an estimated value of 48.4 billion and 37.1 billion barrels, respectively, in 2015. Angola and Algeria follow with 12.2 and 12.7 billion barrels, respectively. Together, Libya and Nigeria contribute 5 per cent of global reserves and 66.2 per cent of Africa's total reserve. With regard to production, Africa produced 8.4 million barrels per day in 2015, contributing 9.1 per cent of global production. Nigeria was the highest producer with 2,352,000 barrels per day (Ghana's production for twenty-two days), followed by Angola with 1.82 million barrels per day and Algeria with 1.58 million barrels per day (BP 2016). These statistics dwarf Ghana's production effort. Ghana's average production in 2015 was only 1.3 per cent of Africa's total and 4.5 per cent of Nigeria's production.

By 2015, Africa had 7.5 per cent of global natural gas reserves and contributed 6 per cent of global production. Cumulatively, Africa holds 496.7 trillion cubic metres in reserves and produces 211.8 billion cubic metres as of 2015. Nigeria, Algeria, Egypt, and Libya account for 92.1 per cent of Africa's natural gas reserves and 93 per cent of the continent's natural gas production. Figure 5.2 presents the contribution of oil rents to the gross domestic product (GDP) of selected countries in sub-Saharan Africa (SSA).

On average, oil rents contributed 8.23 per cent of the GDP of SSA between 2010 and 2015. Oil rents had contributed 12.09 per cent in 2011 but this declined to 2.38 per cent in 2015 in SSA due to reduced oil prices. Among the countries

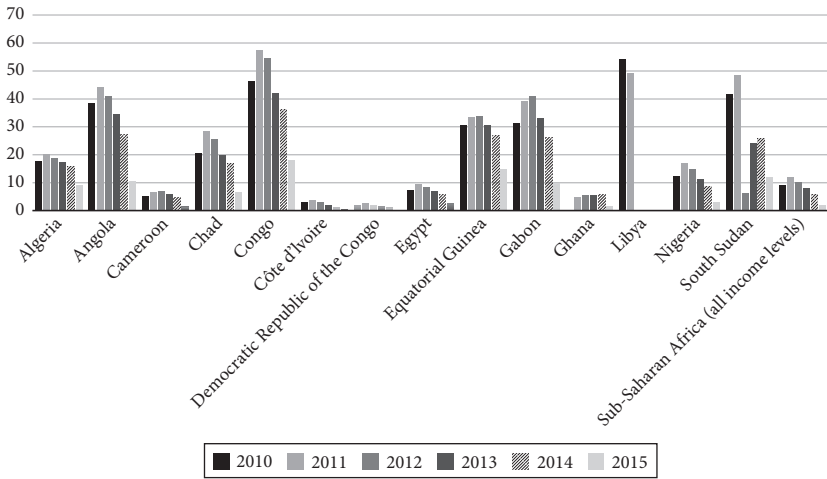


Figure 5.2 Oil rents as a percentage of GDP in selected African countries
Source: Authors’ illustration based on data from the World Development Indicators (2018).

compared, Angola recorded the highest average contribution of oil rent to GDP with 32.72 per cent. This was followed by Gabon with 30.16 per cent, South Sudan with 26.42 per cent, Algeria with 16.50 per cent, Nigeria with 11.02 per cent, Cameroon with 5.06 per cent, and Ghana with 3.92 per cent, over the period 2010–15. The implication is that oil price shocks should technically not have as much impact on economies such as those of Ghana, Cote d’Ivoire, and Cameroon. However, for Ghana, that has not been the case. The oil price fall in 2015 led to the request for an International Monetary Fund (IMF) facility, and a huge cut to the capital budget by an estimated 52.4 per cent.

2.4 Negotiating petroleum agreements in Ghana

Acheampong et al. (2016) have suggested that the Ghana Model Petroleum Agreement serves as the basis on which all petroleum agreements are negotiated. The GNPC represents the country and holds the carried and participating interest in all contracts. Thus, there is a high private-sector participation in Ghana’s petroleum industry. However, the equity share of the private sector depends on the contract. In the case of the Jubilee contract, Ghana has 13.64 per cent carried and participating interest and receives 5 per cent royalty, 35 per cent corporate tax, and surface rentals (PIAC 2016). The private-sector participants in the Jubilee field are Tullow (the operator who owns 35.64 per cent), Kosmos Energy (24.08 per cent), Anadarko (24.08 per cent), and Petro SA (2.73 per cent)

(see Tullow 2018). In the case of the TEN field, the operator Tullow has a share of 47.18 per cent, while Kosmos has 17 per cent; Anadarko, 17 per cent; GNPC, 15 per cent; and Petro SA, 3.82 per cent. Finally, the project partners for the Sankofa field include ENI (44.4 per cent), GNPC (20 per cent), and Vitol (35.56 per cent) (see ENI et al. 2017).

One of the biggest challenges in negotiating oil agreements is how to take adequate care of the interests of local people. According to Ross (2012), some of the challenges faced by local people in oil-bearing communities include land, air, and water pollution, loss of livelihoods, and the increased cost of living. These challenges, if not properly managed, can lead to conflicts and other social tensions. In order to manage these and promote value addition, Ghana passed the Petroleum Local Content and Local Participation Regulation (LI 2204) in 2013. According to Acheampong et al. (2016), Ghana's local content regulations seek to achieve direct employment for Ghanaians, technology transfer, use of locally produced materials, and procurement of local goods and services. These regulations aim at the promotion of benefits to the broader economy through its forward and backward linkages. They further seek to promote value addition and to create jobs through the use of local expertise, goods and services, business, and finance in the petroleum industry value chain in Ghana.

The passing of the Petroleum Commission Act, 2011 (Act 821) created an independent upstream regulator for the petroleum sector. The Act mandates the Ghana Petroleum Commission to regulate and manage the deployment of petroleum resources and to perform functions such as licensing and monitoring of the implementation of the local content regulations. Section 10(2) of the Act clearly extricates the commission from the influence of the Ministry of Energy and Petroleum. The commission is governed by a seven-member board with a chairperson. Other members include the chief executive of the commission, the chief executive of the Ghana National Petroleum Company, and four other persons, at least one of whom should be a woman. The president appoints the chief executive officer of the commission.

3. Transparency and accountability measures

Transparency has often been considered as the central pillar around which the fight against corruption in the petroleum sector revolves. According to Mehlum et al. (2006), corruption in the form of rent-seeking is a key factor behind the oil curse. McPherson and MacSearraigh (2007) identified the many forms of corruption in the petroleum industry. These include: policy corruption, administrative corruption, commercial corruption, and diversion of massive amounts of money through the diversion of production, products, or revenues. This is generally referred to as grand corruption. In order to promote good governance and limit

the incidence of corruption, Ghana joined the Extractive Industries Transparency Initiative (EITI) in 2003. In 2007, Ghana became a candidate country by producing and publishing its first EITI report covering the period 2004–6. The country finally assumed the status of a compliant country after completing the validation process in 2010. The country has since been implementing the standard to the mining sector and later extended to cover the petroleum sector. On 24 February 2016, Ghana was honoured at the 2016 Global EITI Conference in Lima, Peru for turning recommendations in its EITI reports into policy reforms (see EITI 2016).

In addition to joining and implementing the recommendations of EITI, the Exploration and Production Law, 2016 (Act 919), the Petroleum Revenue Management Act (PRMA), 815 (2011) (amended in 2015 as Act 893), Petroleum Commission Law, 2011 (Act 821), and the Petroleum Local Content and Local Participation Regulation (LI 2204) all make provision for transparency and accountability. For instance, Section 56 (1 and 2) of the Petroleum Exploration and Production Law, 2016 (Act 919) mandates the Ghana Petroleum Commission to establish and maintain a public register of all petroleum licences, agreements, authorizations, and permits and requires the commission to make the information open to the public. Further, Section 39 (a and b) of the Petroleum Local Content and Local Participation Regulation (LI 2204) grants the public access to local content information held by the commission.

Ghana's PRMA made similar transparency provisions. For instance, Section 49(1) of the Act states that the management of petroleum revenue and savings shall always be carried out with the highest internationally accepted standards of transparency and good governance. This may be seen in one of the new creations of the Act, which is the establishment of the PIAC, armed with the objective of playing a watchdog role in the management of petroleum revenues. PIAC is charged under Section 51 of the PRMA to monitor and evaluate compliance with the Act. In addition, Section 48(2)(b) of the amended PRMA, 2011 (Act 815) mandates the minister for finance to publish the status of implementation of oil-funded projects annually. The minister for finance is required to report on the status of implementation and completion of oil-funded projects to parliament. Section 8 (1, 2, and 3) of the PRMA requires that, for the purpose of transparency and accountability, the records of petroleum receipts in whatever form shall be published by the minister for finance simultaneously in the *Gazette* and in at least two state-owned daily newspapers, within thirty calendar days after the end of the applicable quarter and that the information required to be made public shall also be published online on the website of the ministry and presented to parliament on the date of the *Gazette* publication. The minister for finance is also required to publish the total petroleum output lifted and the reference price in the same manner as provided in sub-sections (1) and (2).

In addition to the above requirements, the PRMA also requires Bank of Ghana to present to the minister for finance and to the Investment Advisory Committee

quarterly reports on the performance and activities of the Ghana Stabilization Fund (GSF) and the Ghana Heritage Fund (GHF) no later than the end of the month following the end of each quarter and to publish semi-annual reports on the GSF and the GHF no later than 15 February and 15 August each year. The report is required to be presented to parliament and published in the national dailies and also on the website of the bank. In the minds of the lawmakers these provisions were essential for the purpose of fast-tracking economic development and promoting equal and inclusive development with petroleum resources.

4. Petroleum revenues framework

Petroleum revenue has the potential to contribute significantly to economic development, if properly managed. However, petroleum revenue has four distinct qualities that can have negative macroeconomic implications. These are volatility, potential Dutch disease, exhaustibility, and the assumption that petroleum revenue is free money (Ossowski and González-Castillo 2012; Ross 2012; Schubert 2006). Caballero (2000) has suggested that oil revenues are volatile and can lead to poor investments and negative impact on the economy due to unpredictable government revenue. According to Elder and Serletis (2010), changes in oil prices affect the macro economy through three main transmission channels. The first is the monetary and real balance channel that occurs when oil price increases lead to increases in the overall level of prices, thereby reducing real money balances held by households and firms and ultimately reducing aggregate demand. The second is the income transfer channel, where it is assumed that oil-importing countries transfer money to oil-exporting countries when prices are high. Finally, high or low energy prices have an effect on labour and capital productivity. Indeed, Elder and Serletis' (2010) assumption of a symmetric relationship between oil prices and the macro economy can best be identified in oil-importing countries. Regarding oil-exporting countries, Farzanegan and Markwardt (2009) studied the impact of oil price shocks on the Iranian economy and found that the Iranian economy was very vulnerable to the negative shocks of oil prices. The real effective exchange rate fell significantly (domestic currency depreciated) when there were negative oil price shocks. On the other hand, positive oil price shocks increased the real exchange rate and appreciated the domestic currency. According to Husain et al. (2008), fiscal policy is the main transmission mechanism of oil price shock in oil-producing countries.

PRMA 2011 (Act 815) and its 2015 amendment (Act 893) discussed earlier were intended to help avoid the oil curse and ensure that petroleum revenues promote inclusive development (Ghanney and Amoako-Tuffour 2016: 61–90; Graham et al. 2016). The law established processes for the collection, expenditure, investment, and accountability of the use of oil revenues. The role of the PIAC has been

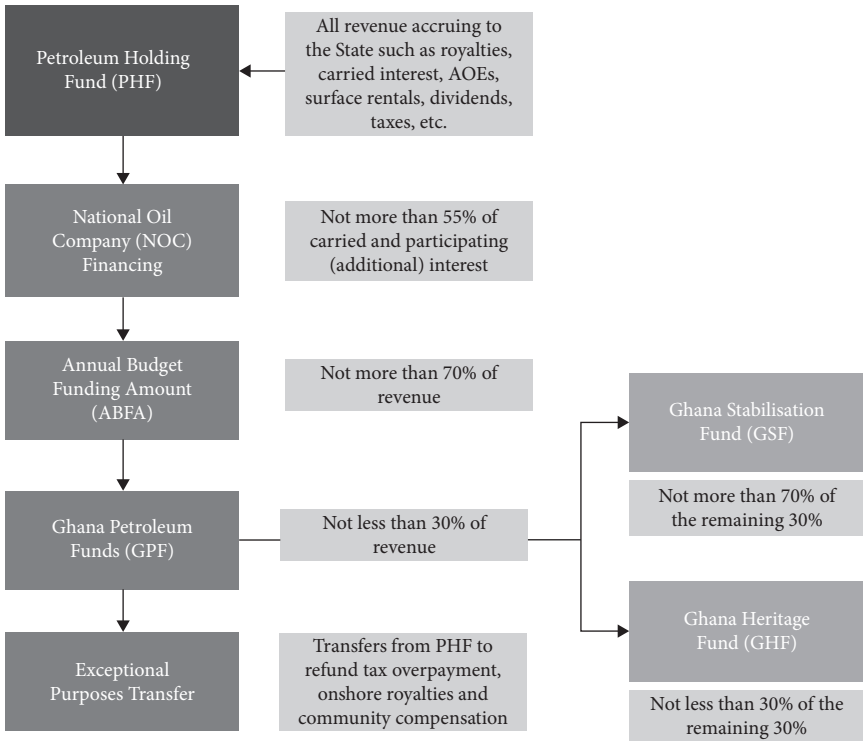


Figure 5.3 Petroleum management framework, Ghana

Source: Based on PIAC (2018: Figure 2.3), reproduced with permission.

discussed earlier. Figure 5.3 provides the framework for the Petroleum Revenue Management Law. All petroleum revenues (from corporate tax, royalties, carried and participating interest, surface rentals, AOE, etc.) are deposited in the Petroleum Holding Fund (PHF). The PHF is an intermediary fund designed to collect and disburse petroleum revenues (Oshionebo 2018).

Under the PRMA, the GNPC receives 55 per cent or less of the carried and participating interest. The budget receives 70 per cent or less of the benchmark revenue. The benchmark revenue is the expected petroleum revenue based on a seven-year moving average.⁴ The percentage of petroleum revenue that goes into the budget is the annual budget funding amount (ABFA). The ABFA is shared between the priority areas, the Ghana Infrastructure Investment Fund and the PIAC. The remaining 30 per cent of the benchmark revenue goes to the Ghana

⁴ See the first schedule (Section 17) of the Petroleum Revenue Management Act (PRMA), 2011 (815) for the formula. According to Section 7 of the amended PRMA (Act 893), the minister for finance can recommend a revision of the benchmark revenue to parliament if it becomes evident that unexpected changes in price or quantity can lead to high over- or under-projection.

Petroleum Funds, which is shared between the GSF (21 per cent) and the GHF (9 per cent). The GSF is used to cushion government expenditure when there is a petroleum revenue shortfall, and an excess of the cap is sent to the sinking (debt repayment) and contingency funds. The GHF is an endowment for future generations. The PRMA sets out the framework to regulate the allocation and management of revenues realized from petroleum production in Ghana. The amendment of sections of the Act in 2015 was intended to strengthen it and make compliance easier.

5. Oil and macroeconomic performance

Petroleum production has affected Ghana's macroeconomic performance in different ways. On the positive side, oil contributed about US\$3.2 billion to the economy in the first five years of production, an average of 7.5 per cent of government revenue and about 4 per cent of GDP. According to Fosu (2017: 137), the petroleum sector contributed 30 per cent of industrial sector output in 2013 and 28.3 per cent of export revenue in 2014. The contribution of petroleum to export revenue fell to 18.7 per cent in 2015 and then to 12.2 per cent in 2016 on account of lower oil prices. In 2011, Ghana's GDP rose to 14 per cent from 7 per cent in 2010 (World Development Indicators 2018). However, the high growth was petroleum exploration-led and short lived as GDP growth declined to 3.9 per cent in 2015 and to 3.6 per cent in 2016. By the end of 2012, both the primary balance and the overall balance had plummeted by about 6 per cent (Younger 2016). This shortfall was caused, among others, by high oil revenue expectations, election-related over-expenditure, and the implementation of the single-spine salary structure.

According to Bawumia and Halland (2017), although the fiscal deficit fell from 6.2 per cent in 2010 to 4 per cent in 2011, it deteriorated again to 9.3 per cent in 2014. IMF (2014) estimates that although government taxes in Ghana averaged 18.9 per cent of GDP from 2010 to 2014, government expenditure increased from 20.1 per cent in 2010 to 28.2 per cent in 2014. The bulk of the increase in government expenditure went towards expenditure on goods and services, driven by the wage bill. Indeed, Younger (2016) has suggested that expenditure on personal emoluments increased by 1.6 per cent of GDP between 2010 and 2012 while the average contribution to GDP of oil over the same period was 1 per cent. Although Ghana chalked up some legal and regulatory successes in the initial stages of oil production, there were serious concerns about rising public debt, declining capital expenditure, and a deteriorating external payment position (Bawumia and Halland 2017). Figure 5.4 shows Ghana's inflation trends for 1990–2016.

Even though Ghana recorded single digit inflation in 2011 (8.73 per cent) and 2012 (9.16 per cent), there has been an upward trend since. In addition, the cedi depreciated by 31 per cent against the US dollar in 2014.

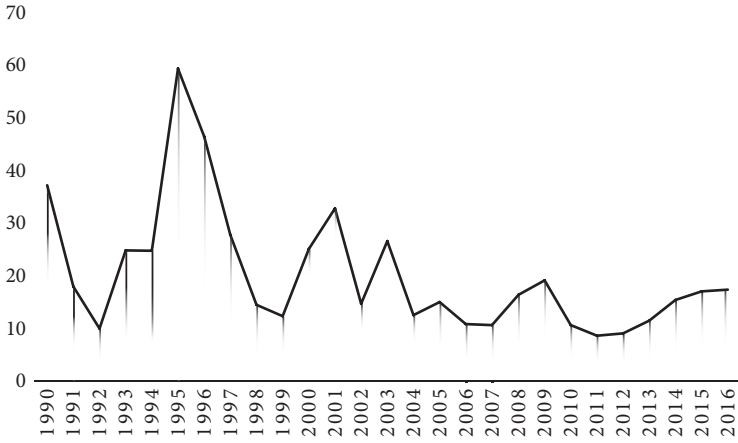


Figure 5.4 Ghana's inflation performance, 1990–2016

Source: Authors' illustration based on data from the World Development Indicators (2018).

5.1 Dutch disease

One of the biggest concerns for new oil economies is the Dutch disease. Under the Heckscher–Ohlin model, countries exporting natural resource are expected to specialize in their main export. However, when such export diversification is dominated by petroleum, there is little room for a spillover effect to other sectors (Ross 2012). Cordon and Neary (1982) have argued that this is due to currency appreciation and loss of competitiveness of the non-tradable sectors. That is, a boom in the oil sector can channel labour and capital from the non-tradable sectors through the resource movement effect. Coupled with this, currency appreciation associated with such a boom can lead to a high cost of inputs, thus making the output of the manufacturing and agriculture sectors relatively expensive.⁵ In addition, oil resources are non-renewable and will therefore be exhausted, given time and technology.

Ghana has always been aware of the possibility of the Dutch disease and policymakers have often mentioned the need to avoid that from the beginning of the oil journey. Learning from the experiences of countries such as Nigeria, Norway, and Trinidad and Tobago, the government organized a number of international conferences, regional and sub-national consultations, and study tours to discuss the best ways to avoid the Dutch disease. The aim was to learn lessons especially on how petroleum revenues have been managed in these

⁵ The combined effect of resource movement and currency movement is what is commonly referred to as the Dutch disease.

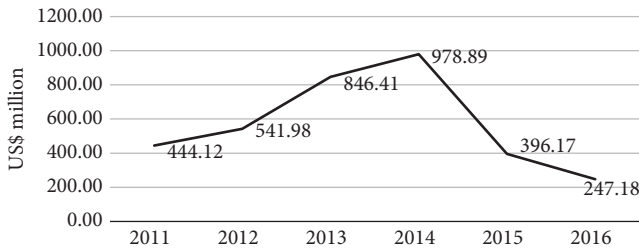


Figure 5.5 Petroleum revenues in Ghana, 2011–16

Source: Ministry of Finance (2018).

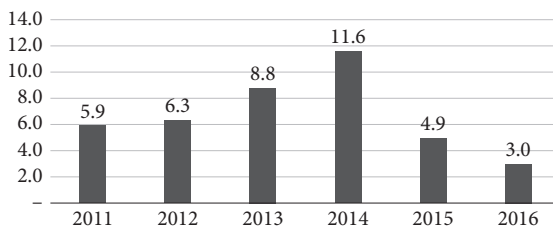


Figure 5.6 Petroleum revenue as a percentage of government revenue in Ghana

Source: Ministry of Finance (2018).

countries. Figures 5.5 and 5.6 show petroleum revenues from 2011 to 2016 and the contribution of petroleum to government revenues in Ghana, respectively.

The contribution of the petroleum revenue to government revenue has been significant, especially considering that donor support was dwindling over the same period. Many analysts have expressed the view that the management of petroleum resources has been less than satisfactory, despite the passing of good laws and regulations. The essential problem has been the recurring rapid rise in public consumption expenditures and, hence, the growing deficit. Ghana approached the IMF for a US\$900 million facility in 2014–15 and experienced a higher-than-budgeted-for cash fiscal deficit of 9.5 per cent of GDP and faced other fiscal challenges (IMF 2015). In the face of weak fiscal management, unstable petroleum revenues have not been of much use, and the elaborate rules have not been followed.

According to Bleaney and Halland (2016), there is no empirical evidence of a correlation between fiscal indiscipline and petroleum discovery and production. However, this assertion may not be the case in most oil-producing countries in Africa, as most of the fiscal challenges of oil-producing economies may be self-inflicted. Indeed, that is Ghana's story. Bawumia and Halland (2017) have recounted how the government did little to manage public expectations and also

hoped to earn political dividend from the petroleum discovery in 2007 with the impending 2008 national elections. This happened in three ways. First, the petroleum discovery gave false hope that there was more fiscal space than there really was. Second, institutional quality, in the form of nominal fiscal rules, independence of the central bank and regulatory entities were not supported by political consensus. Finally, there was selective compliance with the PRMA; for instance, Section 48(3) of the PRMA was never complied with until 2017–18. These factors affected macroeconomic stability. According to Witter et al. (2017), even though Ghana's real GDP growth has been modest between 2012 and 2016, the fiscal deficit averaged 9 per cent for the same period. In addition, inflation has been rising steadily since 2012, reaching 17.47 per cent in 2016.

Oil-producing countries recognize these fiscal challenges and deploy different strategies to minimize the impact of oil price shocks on their economies. These strategies include diversification, establishment of a stabilization fund, hedging, and application of fiscal rules (Bartsch 2006; Davis et al. 2003: 273–315). Ghana implemented similar strategies. The Ghana Petroleum Funds were established as a sovereign wealth fund charged with the responsibility of investing and saving petroleum revenues (Oshionebo 2018). These funds consist of the GSF and the GHF. The purpose of the stabilization fund is to cushion government expenditure during periods of unanticipated petroleum revenue shortfall. Figure 5.7 indicates that the contribution of petroleum to GDP reduced from 8 per cent in 2013 to 1.6 per cent in 2016 due to falling oil prices.

However, the Petroleum Revenue Management Law allows the minister for finance to cap the GSF. The excess from the cap can be used for debt repayment. Specifically, Section 5 of the amended PRMA, 2015 (Act 893) stipulates that there can be withdrawals from the GSF to offset petroleum revenue shortfall, to transfer into the contingency fund, or for debt repayment (sinking fund). According to PIAC (2016), the GSF should have had a balance of US\$604 million by December 2015. However, the fund was capped at US\$100 million in the 2016 budget. The Africa Centre for Energy Policy estimates that about 62.4 per cent of the GSF has been used to repay debt (AccraFM.com 2016). This clearly defeats the primary aim of the fund, which was to help government deal with oil price volatility.

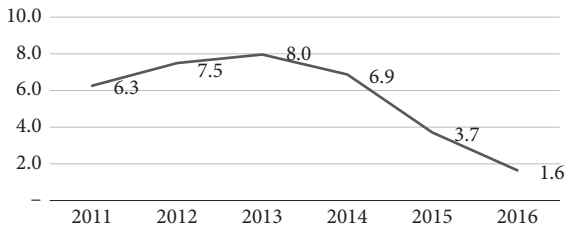


Figure 5.7 Share of petroleum output in GDP, 2011–16

Source: Ministry of Finance (2018).

Moreover, the government's commodity price risk management programme, which was expanded in May 2011 to deal with volatility, was cancelled in 2013, thereby exposing the country to significant oil price shocks (IFS 2015). The GHF seeks to satisfy intergenerational equity requirements of petroleum production by supporting the development for future generations when petroleum reserves have been depleted.

Another strategy Ghana employed to deal with the effect of oil price shocks on the economy was diversification. Section 21 of the PRMA lists a number of areas in which the government can invest its oil revenues. These priority areas were arrived at based on public consultations and include agriculture, education, health, roads, alternative energy, security, potable water, sanitation, and environmental protection. In selecting the priority areas, the budget process is followed. That is, the medium-term fiscal framework, the available fiscal space, and the strategic initiatives of the government are considered before the priority areas are proposed. The proposed priority areas are then sent to cabinet for discussion and preliminarily allocations. After the budget approval by parliament, ministries, departments, and agencies (that are chosen as priority areas) select specific projects that receive oil revenues. According to Section 21 (4 and 5), for any financial year, a minimum of 70 per cent of the ABFA shall be used for public investment expenditures consistent with the long-term national development plan. In order to maximize the impact of the use of the petroleum revenue, the finance minister is expected to prioritize not more than four areas for the medium term (over a three-year period) in the absence of a long-term development plan. This provision is to help diversify from oil and develop areas where Ghana has competitive advantage, such as agriculture. However, there have been reports that oil revenues are spread over too many projects (Reportingoilandgas.org 2016) that are outside of the priority areas.⁶ In addition, instead of complementing existing revenue sources to these sectors, oil revenue is gradually replacing traditional sources. There is always one broad priority area that is used to spread spending of oil revenues over many 'non-selected areas'. For instance, in the first three years of oil revenue spending (2011–13), 'roads and other infrastructure' always featured as a priority area. Under this category, government spent on housing, roads, rail, markets, coastal protection, education, and health, although they had not been earlier considered to be priority areas. This was repeated in the second triennium (2014–16). In the third triennium (2017–19), government selected another broad priority area, 'road, rail, and other critical infrastructure development'. The selection of broad priority areas and unconstrained spending within them are major reasons for the ABFA being thinly spread.

⁶ In the past, oil revenues have been allocated to the office of the president, parliament, Musicians Union of Ghana, and the Microfinance and Small Loans Centre among others that were not in the priority areas.

Furthermore, in establishing the PIAC, the aim of monitoring and evaluating compliance with the PRMA by government and other relevant institutions in the discharge of their duties, in relation to the use and management of petroleum revenues and resources, as required by law was paramount. The law expected PIAC to do the following:

- provide a formal active voice in the use and management of petroleum revenues, by providing space and a platform for the public to debate whether spending prospects and management of revenues adhere to development priorities
- provide independent assessments on the use and management of petroleum revenues and resources to assist parliament and the executive in the oversight and performance of related functions
- ensure that petroleum revenue is sustainably and efficiently managed.

Although a critical institution, PIAC's findings are often not implemented (Oshionebo 2018). It is perceived to be a critical accountability institution that has been turned into a report-writing body with little action.

5.2 Local content regulations

Ghana passed the local content regulations in 2013, ostensibly to ensure that the local oil industry generates benefits to the broader economy through its forward and backward linkages (Acheampong et al. 2016). An Enterprise Development Centre has been established to support local firms in the petroleum sector. According to the Petroleum Local Content and Local Participation Regulation (LI 2204), local content refers to the percentage of Ghanaian-produced materials, financing, personnel, goods, and services rendered to the oil and gas industry and can be measured in monetary terms. According to a report by the Ghana Petroleum Commission, as of 2014, the oil and gas industry employed 7,000 people out of which the international oil companies (IOCs) had 3,612 people. The distribution of employees by nationality was 80 per cent Ghanaian and 20 per cent expatriate. In the IOCs, a smaller proportion of Ghanaians were employed (64 per cent), while expatriates made up 36 per cent of persons employed.

According to Acheampong et al. (2016), the prescriptive nature of the local content regulations may create implementation challenges. Various supply chain and local content targets are set by the Petroleum Local Content and Local Participation Regulation (LI 2204) for operations in the oil and gas sector. As of December 2015, 474 companies were registered with the Ghana Petroleum Commission to provide both direct and indirect services. According to the

commission, 321 (68 per cent) of the firms were indigenous companies, 107 (23 per cent) had foreign ownership, and the remaining 46 (10 per cent) were joint-venture companies. Even though about 68 per cent of the companies registered to access contracts in the upstream petroleum value chain are Ghanaian owned, they received less than 25 per cent of the total value of the contracts awarded between 2010 and 2015. Out of a cumulative total value of US\$6,262,757,339 indigenous companies received only a little over US\$1 billion (Ghana Petroleum Commission 2016).

6. Conclusion

Oil resources are neither a curse nor a blessing. Sound management of these resources can make them beneficial or otherwise. Oil revenues can be used to finance economic development, if properly managed. In the same vein, oil production and revenues can lead to conflicts, corruption, stunted growth, and non-competitive and declining manufacturing and agricultural sectors. Ghana discovered oil in commercial quantities in 2007; the government, recognizing both negative and positive effects of petroleum production in neighbouring countries, organized a number of stakeholder consultations and study tours. One major outcome of these consultations and tours was the passing of the PRMA in 2011. Among other objectives, the PRMA seeks to provide a framework for the collection, allocation, and management of petroleum revenues in a responsible, transparent, efficient, accountable, and sustainable manner to ensure inclusive development in line with Article 36 of Ghana's 1992 constitution. Indeed, the PRMA created the Ghana Petroleum Funds, an independent PIAC, and placed transparency and accountability responsibilities on the minister for finance, PIAC, and Bank of Ghana.

In an effort to manage volatility and the Dutch disease, the PRMA created the GSF as an insurance against petroleum revenue shortfall and mandated the minister for finance to select four priority areas, in the absence of a long-term development plan to develop over a three-year period. In addition, the law satisfies an intergenerational equity requirement, by setting aside 9 per cent of the benchmark revenue to be invested in the GHF as an endowment for future generations.

Despite these provisions, it is reported that petroleum revenues are spread over too many projects. Apart from defeating the purpose of diversification, spreading thinly also leads to cost and time overruns. Indeed, oil revenues have been used to tackle many national projects (thinly spread), which has weakened the impact of petroleum investments on the social and economic development of the country. In addition, the law gives authority to the minister for finance to cap the GSF. This has led to the depletion of the GSF to less than 20 per cent of its estimated value and renders it incapable of cushioning the government in case of oil revenue

shortfall. Even though the priority areas have been reduced to four in 2018, the challenge has been the ‘thinly spread within priorities’. That is, when a priority area like agriculture is selected, funds may be spent on many expenditure lines such as irrigation, fertilizer subsidy, seeds, agriculture training, and extension.

On a positive note, the minister for finance, PIAC, and Bank of Ghana have been complying with most of the transparency requirements by publishing petroleum-related reports on their websites and/or in the newspapers. In the 2017 edition of the Natural Resource Governance Index, published by the Natural Resource Governance Institute, Ghana scored high in terms of petroleum sovereign wealth management, transparency, and management of the national oil company (Ghana National Petroleum Corporation) but scored low in oil revenue management through the budget and local impact of petroleum resources. Further, PIAC, which was facing financial challenges prior to 2016, now receives its budget from the ABFA. Finally, although thinly spread, oil revenues have been used to construct and maintain some roads, irrigation dams, schools, and other critical infrastructure.

In order to diversify and enhance sustainable growth, it is important that petroleum revenue expenditure is focused on a medium- to long-term inclusive development strategy that is based on proper needs assessment, global trends, and possible growth dynamics of the country. This will help convert petroleum revenues into long-lasting physical, human, and financial resources.

It should be possible to rationalize ABFA expenditure and develop investment and reporting guidelines to reduce within-priority expenditure to not more than three project/expenditure lines. This will help to identify and measure efficiency savings and improve petroleum revenue management.

There is a need for value addition through refining and active local participation to link the petroleum sector to other sectors. There should be fiscal adjustment by building the GSF to cushion the government in times of petroleum revenue shortfall, and policymakers should strive to effectively manage the non-oil economy through proper diversification.

References

- Ablo, A. D. (2015). ‘Local Content and Participation in Ghana’s Oil and Gas Industry: Can Enterprise Development Make a Difference?’ *The Extractive Industries and Society*, 2(2): 320–27.
- AccraFM.com (2016). ‘Stabilisation Fund: US\$376.9m Misapplied—ACEP’. Available at: <http://www.accrafm.com/1.9604725> (accessed August 2018).
- Acheampong, T., M. Ashong, and V. C. Svanikier (2016). ‘An Assessment of Local-Content Policies in Oil and Gas Producing Countries’. *The Journal of World Energy Law & Business*, 9(4): 282–302.

- Adda, G. W. (2013). 'The Petroleum Geology and Prospectivity of the Neo-Proterozoic, Paleozoic and Cretaceous Sedimentary Basins in Ghana'. *Search and Discovery Article*, 10544.
- Africa Centre for Energy Policy (2014). 'Three Years of Oil Revenue Management in Ghana'. Available at: <https://s3.amazonaws.com/oilmoney/CACHES/IMAGES/2017/11/27/10:59:04/ACEP-Report-PRMA-Final.pdf#targetText=v%20THREE%20YEARS%20OF%20PETROLEUM%20REVENUE%20MANAGEMENT%20IN%20GHANA&targetText=Ghana%20should%20apply%20both%20the,revenues%20from%20the%20oil%20industry>. (accessed 20 February 2018).
- Africa Centre for Energy Policy (2016). 'Ghana's Petroleum Act Puts Non-Passage of PIB in Limelight'. Available at: <http://www.acepghana.com/news/252/> (accessed 1 March 2018).
- Amoako-Tuffour, J., and J. Owusu-Ayim (2010). 'An Evaluation of Ghana's Petroleum Fiscal Regime'. *Ghana Policy Journal*, 4: 7–4.
- Aratuo, I. Z. (2012). 'Ghana's Oil Industry: The State, Operators and Local Frontier Communities'. Doctoral dissertation, University of Ghana.
- Auty, R. M. (2001). *Resource Abundance and Economic Development*. Oxford: Oxford University Press.
- Ayelazuno, J. A. (2014). 'The "New Extractivism" in Ghana: A Critical Review of its Development Prospects'. *The Extractive Industries and Society*, 1(2): 292–302.
- Ayoade, M. A. (2002). *Disused Offshore Installation and Pipelines: Towards 'Sustainable Decommissioning'*. The Hague: Kluwer Law International.
- Bartsch, M. U. (2006). 'How Much Is Enough? Monte Carlo Simulations of an Oil Stabilization Fund for Nigeria'. IMF Working Paper WP/06/142. Washington, DC: International Monetary Fund.
- Bawumia, M., and H. Halland (2017). 'Oil Discovery and Macroeconomic Management: The Recent Ghanaian Experience'. SSRN Policy Research Working Paper 8209. Washington, DC: World Bank.
- BBC (2007). 'Ghana "Will Be an African Tiger"'. BBC interview with President John Kufuor, 19 June. Available at: <http://news.bbc.co.uk/2/hi/africa/6766527.stm> (accessed August 2018).
- Benkenstein, A. (2016). 'Oil and Fisheries in Ghana: Prospects for a Socio-ecological Compact'. Southern Africa Institute of International Affairs Policy Papers. Available at: <https://www.africaportal.org/publications/oil-and-fisheries-in-ghana-prospects-for-a-socio-ecological-compact/> (accessed August 2018).
- Bleaney, M., and H. Halland (2016). 'Do Resource-Rich Countries Suffer from a Lack of Fiscal Discipline?' Washington, DC: The World Bank. Available at: <http://documents.worldbank.org/curated/en/461541468196749502/Do-resource-rich-countries-suffer-from-a-lack-of-fiscal-discipline> (accessed August 2018).
- BP (2016) 'BP Statistical Review of World Energy (2016)'. Full 2016 Report, June. Available at: <https://www.bp.com/content/dam/bp/pdf/energy-economics/>

- statistical-review-2016/bp-statistical-review-of-world-energy-2016-full-report.pdf (accessed August 2018).
- Caballero, R. J. (2000). 'Macroeconomic Volatility in Latin America: A View and Three Case Studies'. NBER Working Paper 7782. Cambridge, MA: National Bureau of Economic Research.
- Chitor, B. (2012). *Ghana's Transitional Oil and Gas Industry: Legal, Corporate and Environmental Aspects*. Accra: Binditi Chitor.
- Cordon, W. M., and J. P. Neary (1982). 'Booming Sector and De-industrialization in a Small Open Economy'. Collaborative Paper CP-82-58. Vienna: International Institute for Applied Systems Analysis.
- Davis, J., R. Ossowski, J. Daniel, and S. Barnett (2003). 'Stabilization and Savings Funds for Non-Renewable Resources: Experience and Fiscal Policy Implications'. In J. M. Davis, R. Ossowski, and A. Fedelino (eds), *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*. Washington, DC: International Monetary Fund.
- Edjekumhene, I., P. O. Agyeman, and P. Edze (2010). *Ghana's Emerging Oil Industry: What Stakeholders Need to Know*. Accra: Combert Impressions.
- EITI (2016). 'Winners of the 2016 EITI Chair Awards Announced'. Available at: <https://eiti.org/news/winners-2016-eiti-chair-awards-announced> (accessed August 2018).
- Elder, J., and A. Serletis (2010). 'Oil Price Uncertainty'. *Journal of Money, Credit and Banking*, 42(6): 1137-59.
- ENI, GNPC, and Vitol (2017). 'Sankofa: The First Oil from Ghana's OCTP Development'. Available at: https://www.eni.com/docs/en_IT/enicom/sustainability/eni-ghana2017.pdf (accessed August 2018).
- Farzanegan, M. R., and G. Markwardt (2009). 'The Effects of Oil Price Shocks on the Iranian Economy'. *Energy Economics*, 31(1): 134-51.
- Fosu, A. K. (2017). 'Oil and Ghana's Economy'. In E. Aryeetey and R. Kanbur (eds), *The Economy of Ghana Sixty Years after Independence*. Oxford: Oxford University Press.
- Ghana Petroleum Commission (2016). 'Local Content Development in the Upstream Sector'. Lecture presented by the chief executive officer at a local conference in Takoradi, 9 November.
- Ghanney, M. A., and J. Amoako-Tuffour (2016). 'Ghana's Petroleum Revenue Management Law: A Social Contract for Good Economic Governance and Possible Challenges'. In K. Appiah-Adu (ed.), *Governance of the Petroleum Sector in an Emerging Developing Economy*. London: Routledge.
- GNPC (2013). 'Oil Exploration and Production in Ghana'. Available at: <https://www.gnpcghana.com/speeches/gnpcug.pdf> (accessed 25 February 2018).
- GNPC (2016). 'Introduction to Ghana's Oil and Gas Industry: History, Current and Future Trends' [Speeches]. Available at: <https://www.gnpcghana.com/speeches/gnpcug.pdf> (accessed 21 February 2018).

- Graham, E., I. Ackah, and R. E. Gyampo (2016). 'Politics of Oil and Gas in Ghana.' *Insight on Africa*, 8(2): 131–41.
- Gyampo, R. (2010). 'Saving Ghana from its Oil: A Critical Assessment of Preparations So Far Made.' *African Research Review*, 4(3): 1–16.
- Gylfason, T., T. T. Herbertsson, and G. Zoega (1999). 'A Mixed Blessing: Natural Resources and Economic Growth.' *Macroeconomic Dynamics*, 3(2): 204–25.
- Husain, A., K. Tazhibayeva, and A. Ter-Martirosyan (2008). 'Fiscal Policy and Economic Cycles in Oil-Exporting Countries.' IMF Working Paper WP/08/253. Washington, DC: International Monetary Fund.
- IFS (2015). 'The Falling Crude Oil Prices: Mitigating the Risk.' Policy Brief Paper 1. Accra, Ghana: Institute for Fiscal Studies (IFS).
- IMF (2014). 'Article IV Consultation: Staff Report.' IMF Country Report 14/129. Washington, DC: International Monetary Fund (IMF).
- IMF (2015). 'Press Release: IMF Approves US\$918 Million ECF Arrangement to Help Ghana Boost Growth, Jobs and Stability.' Available at: <https://www.imf.org/en/News/Articles/2015/09/14/01/49/pr15159> (accessed August 2018).
- Kankam, D., and I. Ackah (2014). 'The Optimal Petroleum Fiscal Regime for Ghana: An Analysis of Available Alternatives.' *International Journal of Energy Economics and Policy*, 4(3): 400.
- McPherson, C., and S. MacSearraigh (2007). 'Corruption in the Petroleum Sector.' In J. E. Campos and S. Pradhan (eds), *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level*. Washington, DC: World Bank.
- Mehlum, H., K. Moene, and R. Torvik (2006). 'Institutions and the Resource Curse.' *The Economic Journal*, 116(508): 1–20.
- Ministry of Finance (2018). 'Fiscal Impact of "Lower for Longer" Petroleum Prices and Investment Outlook in Established and Prospective Petroleum Producers.' A presentation made at the IMF's Fiscal Management of Mining and Petroleum in West Africa Conference, 27 February.
- Ndi, G. (2018). 'Act 919 of 2016 and Its Contribution to Governance of the Upstream Petroleum Industry in Ghana.' *Journal of Energy & Natural Resources Law*, 36(1): 5–31.
- Oshionebo, E. (2018). 'Sovereign Wealth Funds in Developing Countries: A Case Study of the Ghana Petroleum Funds.' *Journal of Energy & Natural Resources Law*, 36(1): 33–59.
- Ossowski, R., and A. González-Castillo (2012). 'Manna from Heaven: The Impact of Non-Renewable Resource Revenues on Other Revenues of Resource Exporters in Latin America and the Caribbean.' IDB Working Paper Series IDB-WP-337. Washington, DC: Inter-American Development Bank.
- PIAC (2016). 'Five Years of Oil Production in Ghana: What the Citizens Want to Know?' Public Interest and Accountability Committee (PIAC) Report, Ghana Oil and Gas for Inclusive Growth (GOGIG) Programme.

- PIAC (2018). Simplified Guide to the Petroleum Revenue Management Law in Ghana. Available at http://www.piacghana.org/portal/files/downloads/simplified_guide_to_ghana's_petroleum.pdf (accessed August 2018).
- Reportingoilandgas.org (2016). 'PIAC: Stop Stretching Oil Money Thin' [News in Brief]. Available at: <http://www.reportingoilandgas.org/piac-stop-stretching-oil-money-thin/> (accessed August 2018).
- Ross, M. (2012). *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton, NJ: Princeton University Press.
- Sachs, J. D., and A. M. Warner (1995). 'Natural Resource Abundance and Economic Growth. NBER Working Paper 5398. Cambridge, MA: National Bureau of Economic Research.
- Sachs, J. D., and A. M. Warner (1999). 'The Big Push, Natural Resource Booms and Growth.' *Journal of Development Economics*, 59(1): 43–76.
- Sasraku, F. M. (2016). 'Petroleum Economics: Ghana's Petroleum Tax Regime and its Strategic Implications'. In K. Appiah-Adu (ed.), *Governance of the Petroleum Sector in an Emerging Developing Economy*. London: Routledge.
- Schubert, S. R. (2006). 'Revisiting the Oil Curse: Are Oil Rich Nations Really Doomed to Autocracy and Inequality?' *Oil and Gas Business*, 2006: 1–16.
- Takyiwa, J. A. (2014). 'Oil Discovery, In-Migration and Infrastructural Challenges in the Sekondi-Takoradi Metropolis'. MA dissertation, University of Ghana.
- Tulloch (2018). 'Operations in Ghana'. Available at: <https://www.tullochoil.com/operations/west-africa/ghana/ten-field> (accessed August 2018).
- Witter, S., N. Ruddle, A. Murray-Zmijewski, and N. Somji (2017). 'Promoting Inclusive Economic Growth in Ghana: Exploring the Potential Use of Oil and Gas Revenues to Fund the Social Sectors'. Report commissioned by Ghana Oil and Gas for Inclusive Growth Programme, September.
- World Development Indicators (2018). 'Oil Rents as a Percentage of GDP in Selected African Countries'. Available at: <https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS> (accessed 1 March 2018).
- Younger, S. D. (2016). 'Ghana's Macroeconomic Crisis: Causes, Consequences and Policy Responses'. *Ghanaian Journal of Economics*, 4(1): 5–34.

The Construction Sector in Ghana

Nkechi Srodah Owoo and Monica P. Lambon-Quayefio

1. Introduction

The discovery of oil in Ghana in commercial proportions in 2007 may be reasonably expected to have had significant consequences for the construction sector. Indeed, the production and export of oil have driven large-scale projects in the country's construction sector, such as investments in real estate (in order to provide accommodation for migrant workers and expatriates), the port in Takoradi, and other infrastructure projects around the country. Generally, construction refers to the creation, repair, maintenance, alteration, and demolition of buildings, highways, streets, bridges, roads, sewers, railways, and communication systems. Relevant construction subsectors in Ghana include housing and urban development (i.e. residential buildings; municipal and commercial buildings), infrastructure (i.e. water and sanitation; energy), and transport infrastructure (i.e. roads; airports; ports and harbours).

Government policy is critical to ensuring that there is sufficient investment in the construction sector, and that the sector is able to respond adequately to the oil-fuelled increase in demand for construction and infrastructural developments. Where the construction sector faces significant challenges that limit its ability to increase supply, the rising demand is likely to increase prices within the sector; these higher prices are often indicative of higher marginal costs within the sector. The importance of a country's construction industry stems from its robust linkages with other sectors within the economy (Park 1989; World Bank 1984). The construction industry is known to create significant multiplier effects through extensive backward and forward linkages with other sectors of the economy, although the interdependence tends to change over time. Increases in growth affect the level of construction within an economy; construction activity also generally leads to improvements in welfare since it increases levels of employment and income.

In Ghana, the construction sector appears to be performing well, and indeed contributes substantially to gross domestic product (GDP) and employment within the economy. For example, the demand for cement, a key indicator of construction activity, has increased consistently—from 4.8 million metric tonnes in 2010

to 5.5 million by 2012. According to Sutton and Kpentey (2012), the construction sector’s share of GDP increased from 5 per cent in 1975 to 15 per cent by 2007. According to the Ghana Statistical Service, between 2009 and 2013, the construction and real estate industry contributed on average about 14.34 per cent to the country’s GDP (GSS 2018). Given its labour-intensive nature, the construction sector is a major employer within the economy. For instance, the recent Ghana Living Standards Survey (GLSS) indicates that 0.2 per cent of young people who had been employed in the previous week worked in the construction sector. Additionally, the Ministry of Education (2010) puts the number of registered contractors at about 23,000.

Figure 6.1 describes the contribution to GDP of the various industry subsectors over the period 2006–16. In this period, the mining and quarrying subsector contributed little to GDP. This is not surprising, as there was no oil production in the country within this period. After 2010, however, following the discovery of oil, the proportion of the contribution made by the mining and quarrying subsector to the industry sector increased significantly. From 2006 to 2016, the proportion of the manufacturing sector’s contribution declined consistently, from 10.2 per cent in 2006 to 4.6 per cent by 2016. It is important to note the trends in the construction sector as well; the proportion contributed to GDP from 2006–16 demonstrates a steady upward trend, and the share of the construction subsector more than doubled from 5.7 per cent in 2006 to 13.7 per cent in 2016. Indeed, after 2010 the construction subsector contributed the largest share of industry GDP, while

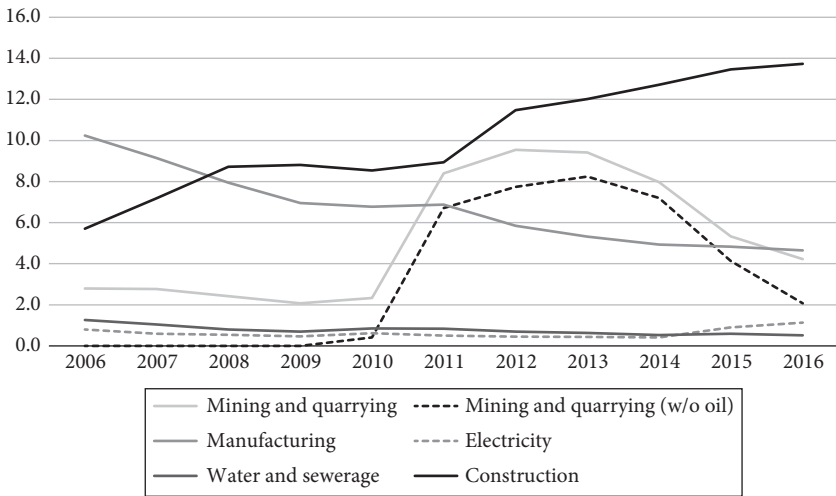


Figure 6.1 Contribution of construction (and other subsectors) to Ghana’s industry sector (% of GDP)

Source: Authors’ illustration based on data from GSS (2018).

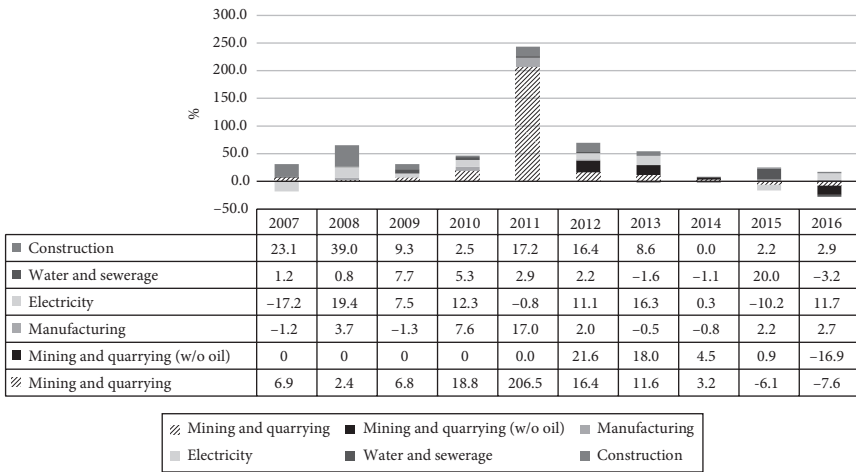


Figure 6.2 Growth rates of industry subsectors, 2007–16

Source: Authors' illustration based on data from GSS (2018).

the share of the mining and quarrying subsector (both including and excluding oil) has been on the decline.

In order to more closely examine changes in the contribution of the construction and other subsectors, Figure 6.2 illustrates growth rates between 2007–16. Although Figure 6.1 shows an upward trend in the proportion contributed to industry over time by the construction subsector, it is observed from Figure 6.2 that despite a spike in growth rates in construction in the country, since the discovery of oil in 2010 annual growth rates of the subsector have been falling. The growth of the construction sector declined, from 39 per cent in 2008 to 17.2 per cent in 2011 to 2.9 per cent in 2016. The high rates in 2007 and 2008 may be attributed to the massive infrastructure projects (stadiums, real estate, roads, etc.) that were undertaken to celebrate Ghana@50 in 2007 and to host the Africa Cup of Nations tournament and the African Union Heads of State conference in 2008 (Ackah et al. 2014).

Despite the declining contribution of the construction subsector in 2009 and 2010, with growth rates of 9.3 per cent and 2.5 per cent respectively, the increased production of crude oil in 2011 led to a significant growth rate in construction of 17.2 per cent. Not all subsectors demonstrated increased growth within this period, however, as evidenced by the dismal performance of the water and sewerage, and electricity subsectors, with recorded growth rates of 2.9 per cent and -0.8 per cent respectively in 2011. Although these subsectors are not the focus of the present chapter, it may be important to note the falling annual growth rates of the mining and quarrying sector (including oil) during 2011–16, eventually reaching negative growth rates in 2016.

The falling growth rates of the construction subsector provide some incentive to investigate the performance of the sector more closely. The present research study has three main objectives:

- What is the evidence on the marginal costs of construction?
- What, if any, are the key bottlenecks to the supply response of the construction sector?
- What institutional and policy reforms might be useful for improving the performance and output of the construction subsector?

2. Marginal costs of construction

This section examines how costs in the subsector respond to increases in output, with attention to how these marginal costs and expenditure shocks may vary among subsectors within the construction sector such as housing, roads, and social infrastructure such as drains. It also analyses the expenditure shocks that may occur as a result of inflation and price dynamics. Information in this section is compiled from interviews conducted with the Ghana Real Estate Developers Association (GREDA) and Ministry of Works and Housing. The section also includes a discussion on the structure of the construction sector as regards the distribution of firms by size and specialization; it concludes with a brief discussion of expenditure shocks and how these affect construction projects.

2.1 Analyses of subsector costs

2.1.1 The housing subsector

There is some evidence that the housing subsector in Ghana has experienced increasing costs of operations due to increased demand for housing units. As a result of the country's, and the industry's, heavy dependence on imported raw materials such as high-tensile steels and other equipment, continued and often rapid depreciation of the local currency often leads to higher costs. Figure 6.3 illustrates quarterly increases in housing prices between 2012–17, and the strong correlation between this and changes in the US dollar–Ghanaian cedi (GHC) exchange rate.

It is important to note that exchange rate volatilities also affect the costs of skilled and expatriate labour in the industry. Other sources of rising costs in the housing subsector include high import duties at the ports and rising fuel prices which increase firm costs due to increases in transportation and haulage expenses.

And it is interesting to note the industry's supply response to this situation of increasing marginal costs of production. There appears to be a preference for a

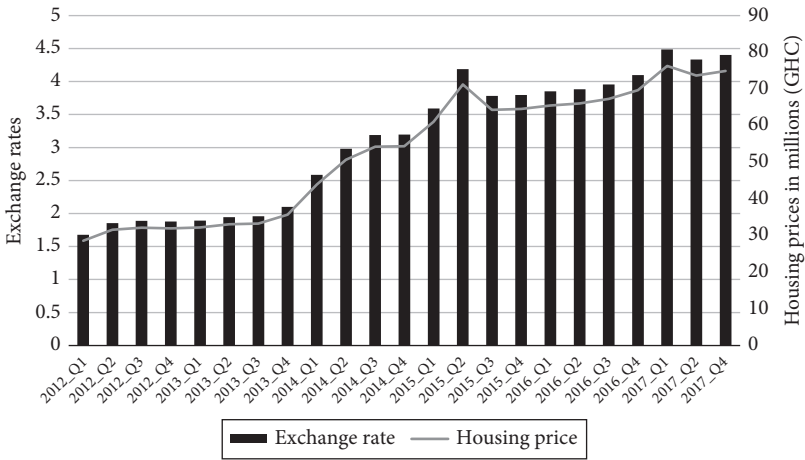


Figure 6.3 Trends in exchange rates and housing prices, 2012–17

Source: Authors' illustration based on exchange rate data (Bank of Ghana) and housing data (Trasacco Valley, a major industry player in Ghana's housing subsector).

particular section of the housing market, where profit margins are large enough to compensate for increasing costs. According to existing theory, higher costs may often translate into higher prices for housing units in the country, thereby constricting the quantity of units demanded. Despite the noted increases in costs, however, the demand response in the housing subsector appears to be varied. According to interviews with GREDA, there are generally three categories of housing market in Ghana: the high-end, middle-end, and low-end/'affordable housing' markets. The high-end market comprises units which cost US\$200,000 and above and are located in prime areas of the country; the middle-end market comprises housing units that range from US\$100,000 to US\$150,000; while the low-end/affordable housing market consists of housing units that cost below US\$100,000. Interviews with personnel from GREDA indicate that the industry is unable to adequately deal with the affordable housing deficit due to the continuously increasing cost of production, mostly fuelled by challenges such as the land tenure system and lack of affordable credit to finance the industry.¹ Although the provision of social infrastructure such as potable water and electricity is seen as the sole responsibility of government, most parts of the country still lack these basic amenities. Developers are therefore forced to take up the responsibility of providing these social facilities as they develop new areas for habitation. This significantly increases the cost of production, which makes it difficult to satisfy the increasing demand for affordable housing.

¹ The Ghana Housing Policy, launched in 2017 aims to accelerate efforts to address the national affordable housing deficit, estimated to be in excess of 1.7 million housing units.

Developers have found it more profitable to operate in the middle- to high-end markets in the industry, where there are relatively high profit margins. In these markets, despite high costs of production, production does not appear to be affected in significant ways and the supply of housing units is not constrained.

2.1.2 Roads, drainage, and other social infrastructure subsectors

Production costs in these subsectors have generally been increasing; costs of imported raw materials have experienced large upswings due to rapid depreciation of the local currency. These raw materials include bitumen and other equipment and machinery, which are often sourced from countries in South America (particularly Venezuela) and in Europe. As a result of the rapid depreciation of the cedi, contractors and other service providers tend to index their costs in a foreign currency (usually US dollars) which is expected to be more stable and predictable. For example, in the construction of feeder roads (i.e. roads connecting communities in rural areas) US\$250,000 and US\$100,000 are recent quotes for the construction of a kilometre of new bitumen road and the rehabilitation of existing road, respectively.

From interviews with the Ministry of Roads and Transport (responsible for roads and infrastructural construction in the country), the greatest proportion of costs in the roads and social infrastructure subsectors are associated with imported raw materials, including the use of skilled expatriate labour. Figures 6.4 and 6.5 graphically illustrate these increasing equipment and labour costs between 2014 and 2017.

Figures 6.4–6.6 show various indices used to track changes in the prices of construction inputs such as labour, machines, and equipment, as well as chippings

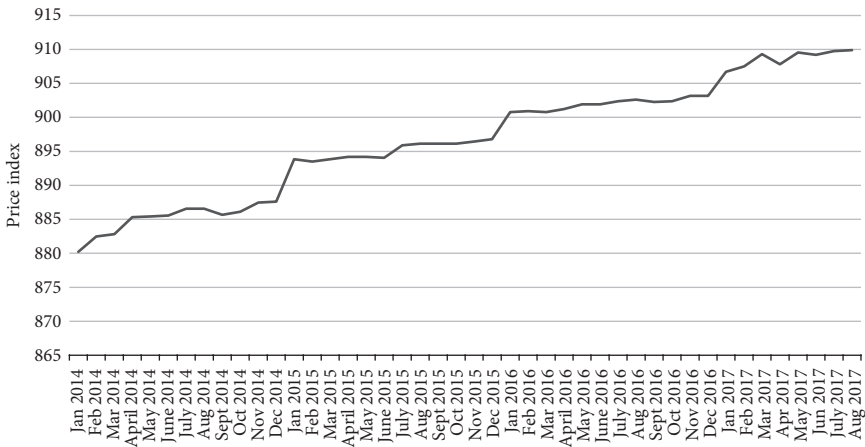


Figure 6.4 Trends in price index for plant and equipment, 2014–17

Source: Authors’ illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

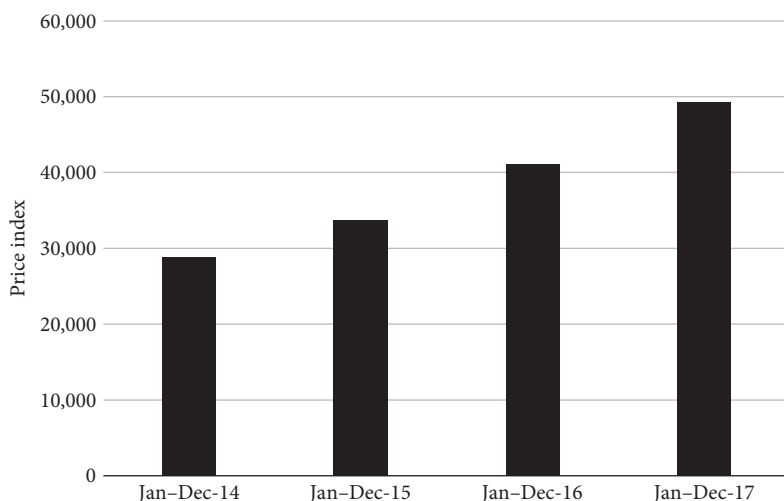


Figure 6.5 Trends in annualized price index for local labour, roads, and social infrastructure, 2014–17

Source: Authors' illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

for concrete works. The indices are constructed from the Works Procurement Manual (WPM).² Figure 6.4 displays the cost index for plant and equipment—such as earth-moving equipment (hydraulic excavator, dozer), road-making equipment (road paver, asphalt concrete plant), and hauling equipment (truck, tractor trailer)—employed in infrastructure projects. The index measures changes in the costs of providing and maintaining construction plant and equipment for a specified period of time. Between 2014–17, the index suggests a steady increase in equipment costs in the roads and social infrastructure subsectors. Figure 6.5 shows the price index for local labour, based on annualized data from 2014–17. Based on the data, the cumulative annual growth rate in labour cost between 2014–17 is approximately 26 per cent.

Chippings are a key ingredient in the construction of drains, tunnels, bridges, and other related infrastructure. The cost of high-grade chippings has also been on the rise, as evidenced by the trend observed in Figure 6.6. Often, irregularities in the supply of high-quality chippings necessitates the addition of quarry dust, which also drives up costs in the industry. From Figure 6.6, the price index

² The World Bank produces price adjustment formulae for civil engineering contracts. The Ministry of Roads and Transport modifies these formulae based on the local materials and inputs that are used in the construction industry to produce its localized version of the index. Annexes D–F of the Works Procurement Manual 3.2, Section 6, provide details of each index and how it is calculated. For details on the construction of the indices, see Working Group on Indices for Civil Engineering Contracts (1979).

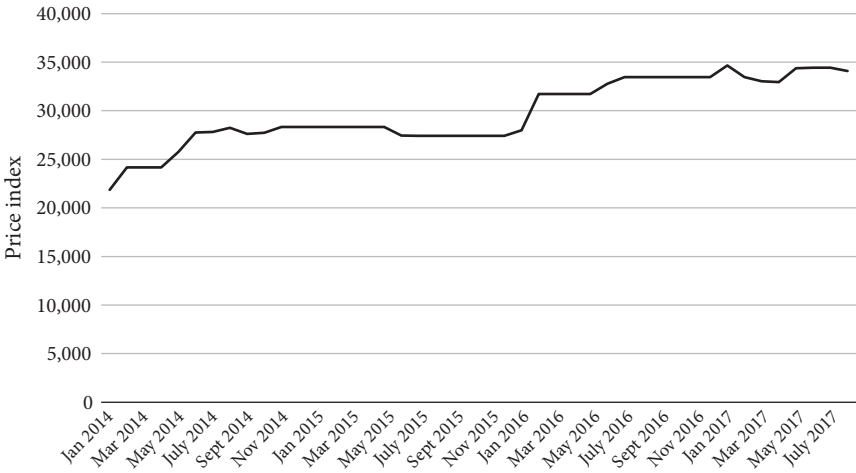


Figure 6.6 Trends in price index for chippings, 2014–17

Source: Authors’ illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

increased sharply in the first half of 2014, and remained stable throughout 2015. However, the price index for these high-grade chippings resumed its upward trend from the second half of 2016 to the first half of 2017.

2.2 Patterns of inflation and subsector costs

Figures 6.7a–6.7d compare the costs of housing and a series of construction costs with trends in year-on-year (YOY) inflation (INF) between 2012 and 2017, the period for which costs of construction components are available. Generally, inflation appears to have risen steadily between 2012 and 2015, but it fell in early 2016. The fall in inflation rates in 2016 may be attributed to some degree of stability in major drivers of inflation in that year, such as utility and transport prices. Prices of housing and construction in the various subsectors initially appear to follow trends in inflation closely but diverge around 2016.

Rising construction costs may be explained by exchange rate movements, as mentioned above. The increasing trend in the US dollar–Ghanaian cedi exchange rate and the subsequent higher cost of imported inputs may provide a plausible explanation for the increases in housing and construction prices over time, despite the decline in general price levels in 2016. Although local prices fell after 2016, contractors in the sector often peg prices to the dollar rate.

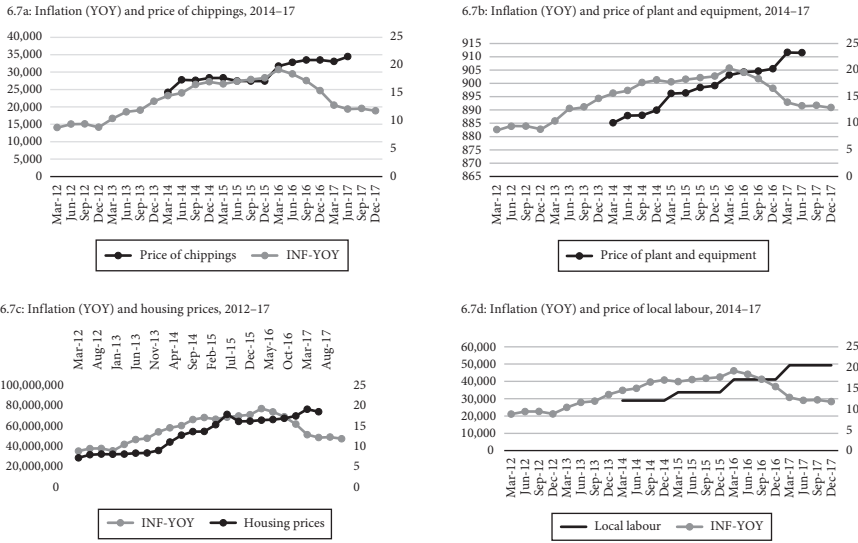


Figure 6.7 Inflation and prices 2012–17

Source: Authors’ illustration based on Ministry of Roads and Transport (Department of Urban Roads) data.

2.3 Structure of the construction industry

The construction industry in Ghana comprises building project consultants, engineers, architects, quantity surveyors, building contractors, and artisans. There is currently no national authority that governs and regulates the activities of the industry. In the absence of this authority, the various sectors within the industry have individual governing institutions. The Ministry of Works and Housing supervises all building and civil works in the country while the Ministry of Roads and Highways oversees the activities of players in the construction and maintenance of roads, highways, railways, airports, and other structures. These two ministries are therefore jointly responsible for the registration and classification of contractors within the industry. Nonetheless, there is no national database of industry players with information on the respective sizes and capabilities of the members.

Classification of contractors in both the housing and roads and civil works subsectors is primarily based on the financial resources, human resource capacities, and level of technology (i.e. type and efficiency of equipment employed) of firms. There are different classifications for contractors in the housing and roads subsectors. These are described below. Contractors in the housing subsector are grouped into four classifications, 1 to 4, depending on the value of the project to be implemented. As described in Table 6.1, class 1 contractors (DIK1) are contractors

Table 6.1 Housing subsector classification

Class	Project value	Proportion of contractors, %
Class 1 (D1K1)	> \$500,000	10
Class 2 (D2K2)	≤ \$500,000	20
Class 3 (D3K3)	≤ \$200,000	60
Class 4 (D4K4)	≤ \$75,000	10

Source: Authors' construction based on information provided by the Ministry of Works and Housing, 2018.

with the capacity to execute projects that are above US\$500,000 in value; class 2 contractors (D2K2) have the capacity to execute projects that are up to a value of US\$500,000; class 3 (D3K3) contractors have the resources to implement projects with a maximum value of US\$200,000; while class 4 (D4K4) contractors have the means to carry out projects with a maximum value of US\$75,000.

According to the Ministry of Works and Housing, the majority (roughly 60 per cent) of contractors in Ghana fall within the class 3 category, while only about 10 and 20 per cent fall within the first two categories, respectively. The remainder fall within the fourth classification. These classifications have direct implications for the types of projects that contractors within the sector can bid for, with varying degrees of competition from one classification to the other. Given the relatively lower concentration of contractors in class 1, the level of competition in this class appears to be more oligopolistic in nature. The level of competition in the class 3 category, however, where more contractors are concentrated, appears to be more competitive.

In spite of the preferential bidding that is typically reserved for lower-class Ghanaian contractors (intended to build their capacity in the industry), there is a recent trend of incursion by Chinese firms. According to the Association of Building Contractors and Civil Engineers, contractors involved in relatively low-value contracts such as the construction of classroom units within villages and other minor civil works within rural areas, which were initially reserved for class 4 contractors, are now having to deal with fierce competition from Chinese construction firms. These foreign firms are often fronted by local citizens, who enable them to win contracts intended for indigenous contractors. Once such contracts are won, Chinese construction firms typically rely on foreign labour (mainly Chinese) in order to execute the projects.

Contractors in the road's subsector are also classified into four categories, based on the financial assets of the firm. These are summarized in Table 6.2. Class 1 contractors are those that have no limit on their tender—they can implement projects of any value. Class 2 contractors are those with the resources to tender bids up to a maximum of US\$2.5m, class 3 contractors can tender bids up to a maximum of US\$1.3m, while class 4 contractors have a maximum of US\$500,000.

Table 6.2 Roads subsector classification

<i>Classification based on financial capabilities</i>	
<i>Class</i>	Project value
Class 1	No limit on tender
Class 2	≤ \$2.5m
Class 3	≤ \$1.3m
Class 4	≤ \$0.5m
<i>Classification based on nature of project</i>	
Class A	Major roads and highways
Class B	Bridges and culverts
Class C	Labour-intensive works and steel bridges
Class D	Rehabilitation and maintenance works

Source: Authors' construction based on information provided privately by the Ministry of Roads and Highways, 2018.

In addition to a classification based on financial capabilities, contractors are also classified according to the nature of project. A category A contractor can execute large projects such as major roads and highways, airports, and related structures; a category B contractor is able to execute projects such as bridges, culverts, and other structures. Contractors in categories C and D are able to implement projects relating to labour-intensive works and steel bridges, and rehabilitation and maintenance works, respectively.

Ghana's Road Fund was established in 1985 by an act of parliament to preserve the country's road network. Funds are obtained from multiple sources, including fuel levies; tolls from roads, bridges, and ferries; fees from vehicle licensing and inspection; and international transit fees collected from foreign vehicles entering the country. The Ghana Road Fund Secretariat is the governmental agency, under the Ministry of Roads and Highways, that is mandated to manage the Road Fund. Unlike the road and highways subsector, the housing subsector currently does not have any fund that allows for the maintenance and management of the country's housing structures.

2.4 Expenditure shocks and price dynamics

A major source of production interruptions in the construction sector is changes in local prices, mainly due to the instability of the exchange rate. As illustrated in Figure 6.3, these fluctuations have had direct bearings on the costs of production. Particularly in the area of road construction and other social infrastructure, the government is expected to bear the additional costs that arise, as this is often embedded in contract clauses. These unexpected price changes often culminate in delays or indefinite suspensions of construction projects.

A second source of expenditure shocks is the compensation that often needs to be made to individuals affected or displaced by construction projects. It is not uncommon for this compensation to run into millions of Ghanaian cedis. Prohibitive costs such as these often lead to projects being delayed for long periods. Projects such as the construction of highways and other urban construction activities are more often plagued by compensation challenges, compared with more rural projects. This is due to the fact that it is relatively easier to compensate people with farmlands in smaller towns and villages than those with businesses and houses in urban locations. A good example of this is the 52-kilometre Ayanfuri–Asawinso highway in the Central Region, which was funded by a development partner. Although originally scheduled to be completed within twenty-four months, the project was delayed for about two years due to issues of compensation. The delay stemmed from the government's inability to pay compensation to project-affected people in the construction path.

A third source of expenditure shocks is the presence of natural obstacles in the landscape. These obstacles may include large boulders and bodies of water in the path of a construction project, which may result in unanticipated interruptions in the implementation of a project while the most appropriate resolution to the problem is determined and carried out. Often, large boulders are required to be dug out and crushed before construction can resume. Additionally, depending on whether construction activities begin in the rainy season or the dry season, the water table may be higher than expected, causing interruptions in construction activities. In such situations, additional materials may be required to reinforce the ground before actual construction can begin, increasing time and financial costs.

The existing land administration system also poses a shock to expenditure in the construction sector. The activities of land developers are often halted for long periods due to prolonged land litigation issues. Such interruptions have direct cost implications for developers, especially in an environment where the prices of raw materials, indexed to the US dollar, experience price volatilities. Fluctuations in power supply have also been a major source of production interruptions in the construction industry, especially in the past couple of years, during which the country's power challenges have heightened. Interruptions caused by unreliable power supply often result in higher expenditure due to reliance on alternative, but often more expensive, power sources such as generators.

Finally, expenditure shocks may occur as a result of changes in government policy and the lack of continuity in projects. Projects begun by an outgoing government are not necessarily completed by the new administration. In rare cases where projects are indeed taken up by a new administration, funding can be delayed for long periods, leading to major interruptions to the original schedule. An example is the Borteyman Housing Project, which was commenced by the previous administration in 2006 but received little attention and financial assistance when the new government assumed office in 2008. The government only provided

support to revive this project in 2014, when challenges to affordable housing units had become topical. Interruptions in construction project schedules also occur during public–private partnership (PPP) arrangements, when delays in the realization of government pledges, in the form of tax refunds of about 5–10 per cent, occur.

3. Bottlenecks to the supply response of the construction sector

The presence of challenges to and limitations on demand-induced supply in the construction sector is likely (as mentioned earlier) to result in higher prices. In this section, particular attention is paid to institutional constraints such as access to land and permits; critical inputs such as skilled labour and raw materials; and organization and capability issues such as the structure of the sector and competition. These are discussed below.

3.1 Access to land and permits

A supply bottleneck in the construction sector is the difficulty of accessing land for productive activity. Despite the physical presence of land resources, the existing tenure systems restrict the availability of and access to these resources. Approximately 80 per cent of Ghana's land is communal land that is vested in chieftaincies, with communities holding land through allodial titles (USAID 2016). Land is therefore sold less frequently, and decisions about the use of the land are made by families and communities. The lack of documentation involved in these situations provides little evidential foundation for use rights. The situation is further complicated by the existence of parallel formal and legal systems of managing land, which are more common in southern Ghana, where traditional processes are less dominant. The result is therefore little tenure security, even if access is granted for land use—and the lengthy and bureaucratic procedures involved in registering plots of land often discourage this practice. The end result is often multiple land transactions for the same piece of land. Land developers are often saddled with multiple payments to multiple individuals in order to have legitimate access to the land, leading to increases in costs. The Ghana Housing Policy, launched in 2017, aims to provide solutions to these problems. In addition to the establishment of a land bank register to provide prospective investors with adequate information on land ownership status, location, availability, and other such data as will aid decisions on housing investment, another objective of this policy is to:

Facilitate private sector access to land banks through a programme of land ownership confirmation and guarantee arrangements with MMDAs [Metropolitan,

Municipal and District Authorities] and regional land bank registry. This would be done in collaboration with land owners in all regional and district capitals to reduce the associated risk and transaction costs.

(Government of Ghana 2015: 15)

Low access to land resources has noted direct implications for construction activity. Indirect effects are also present, as access to land and its proper documentation is often a major requirement for securing credit from financial institutions.

3.2 Access to critical inputs

3.2.1 Skilled labour

A major supply-side bottleneck of the construction subsector in Ghana is the nature of and capacity for skills development. Despite the large number of artisans and construction workers in the country, these individuals largely operate in the informal economy, with little skill and training to match the expertise required for modern construction projects. According to the GLSS 6, over 90 per cent of youth in the construction sector are found in the informal economy (GLSS 2014). An unfortunate consequence of this is that local artisans are often unable to bid for and win contracts in the construction sector.

In addition to training programmes organized by the national Council for Technical and Vocational Education and Training (COTVET), which provides technical training for artisans, the Ministry of Roads and Highways also organizes frequent competency-based skills training programmes for all levels of management and project implementation personnel and its stakeholders through its inter-ministerial training centre at Koforidua in the Eastern Region. The training centre provides training to both new and existing members in new skills and technologies in the construction industry. It also provides hands-on skills development training to personnel from other West African countries such as Togo and Burkina Faso.

Despite existing attempts at skills training, the skills gap remains relatively large, as has been noted by a number of researchers. Darvas and Palmer (2014), for example, found a shortfall of 60,000 skilled artisans in the construction sector, with the dearth projected to increase to as many as 250,000 by 2020. A large proportion of the Ghanaian construction industry's growth originates from its residential market, followed by commercial and retail shopping, heavy engineering (especially road works), and multi-storey and high-rise buildings. This translates into high demand for skills such as bricklaying, plastering, plumbing, roofing, steel-frame flooring, steep roofing, and architectural assistants at all levels. This demand is, however, not being met by a sufficient quantity, or quality, of labour with more sophisticated, frontier skills. The existing freeze on employment as a

condition of an International Monetary Fund (IMF) facility received by the country also has implications for the recruitment of various types of skilled labour, such as engineers and surveyors among others, necessary for providing supervision on a number of projects.

A result of the lower training and skills level of Ghanaian artisans is that they appear to face significant levels of competition from neighbouring Francophone countries in certain aspects of construction. Togolese artisans, for example, are noted for their superior 'finishing' skills, and are also often willing to work for lower wages than their Ghanaian counterparts. The limited skills development may be explained by factors such as the limited capacity of existing technical training institutions, a shortage of teaching and training staff, and misalignment between existing curricula and the current needs of the construction sector. The high mobility levels of artisans in the construction sector often serve to deter companies from training their staff, as they could easily be poached by other organizations and individuals (Fugar et al. 2013).

3.2.2 Raw materials

Another supply-side bottleneck is the rising cost, in Ghana, of raw materials for construction purposes, such as water, cement, and electricity, which contributes to increasing costs of production. The government of Ghana, in response to the situation, recently introduced waivers and tax concessions for contractors participating in particular infrastructure projects. A good example is the US\$1.5bn expansion of the Port of Tema, which is being carried out by the Ghana Ports and Harbours Authority, Netherlands-based APM Terminals, and French firm Bolloré Africa Logistics. Contractors received tax concessions valued at US\$832m, which include waivers on materials and equipment taxes, as well as a ten-year corporate tax exemption. It is important to note, however, that not all project contractors are beneficiaries of these fiscal incentives.

There is also an issue of adequate access to the necessary raw materials within the country. There are noted time delays in efforts to locate quality raw materials, and when these materials are found, there are transportation costs in moving them from source to construction destination. For instance, road construction projects in the northern part of the country often source quarry dust and chip-pings from the Brong-Ahafo region. The distance between these regions results in delays to construction, in addition to haulage costs, given rising fuel costs in the country.

There also appears to be a preference for foreign-supplied building and construction materials due to their perceived higher quality, despite the fact that similar materials are often produced domestically. Unfavourable changes in foreign exchange rates and the depreciation of the cedi, however, have had negative effects on imports of these raw materials, constraining their supply and access. Additionally, spikes in the prices of raw materials such as copper and aluminium

on the world market can also be disastrous for the construction sector. A reason often cited for the preference for foreign construction inputs is that locally produced raw materials are not of the level of sophistication that is required for more complex construction projects.

3.3 Organization and capacity

Noted delays in the payment of funds for government construction projects often limit the participation, and hence the development, of local firms. There are often financial obligations to contractors which lead to delays in completion or complete abandonment of infrastructure projects. Additionally, tax refunds (mainly promised to the private sector in PPPs) are usually not fulfilled. For example, delayed tax refunds from the government have been the main reason for the delays in the completion of the Segleme Housing Project in Prampram in the Greater Accra Region. As a result of these funding issues, larger foreign firms are often the beneficiaries of large-scale construction projects as they are more likely to have the necessary capital to remain in business in the event of delayed government payments. This situation predictably excludes many local contractors. Although it might be expected that local artisans would benefit through being employed by these large companies, this is not often the case. Many large-scale construction projects provide few opportunities for the training of artisans, unlike smaller domestic construction projects. Large foreign contractors which employ domestic firms may relegate them to shorter-term and more menial activities, as is common across Ghana's transport infrastructure subsector, such as in the construction of ports, oil refineries, and airports.

A second supply bottleneck in the construction sector may be the changing priorities of government, often linked with changes in political power. The provision of infrastructure often has a bearing on the budgetary allocation for the sector and therefore, depending on the priorities of the existing government, parts of the construction sector may receive little or no attention. An example is the prioritization of infrastructural growth during the 2012–16 Mahama government, while the current government appears more focused on a free-education agenda. This might explain the declines in budgetary allocation for roads and other infrastructure in recent periods.

Access to the prospect of large-scale projects tends to require political connections. This is due to the fact that government is the main supplier of construction projects in the country, a situation which may increase levels of bureaucracy, corruption, and other inefficiencies in the subsector. A number of reasons may be given for the flourishing of corruption in the construction sector. First, due to the large amount of funds that are often labelled for construction projects, it may be less detectable if additional funds are included for bribery purposes and

kick-backs. Second, the true amount of funds channelled directly into a project may not be apparent until long after the project is completed and payments are made. Finally, the lack of regulation within the subsector may exacerbate corruption. Due to the lack of an established regulating body within the subsector, the government serves as both the client and the regulator. It is not uncommon to find situations where government officials are themselves the owners of construction firms that are the final awardees of construction projects. The structure of the construction sector with respect to the awarding of contracts therefore serves as a deterrent to local artisans, as the processes involved in bidding and the awarding of contracts often lack transparency.

Corruption in construction projects may be present at any and all stages (i.e. planning, inspection, design, bid/contract signing, construction, service delivery, maintenance/management, subscription, billing, disconnection, fault redress, etc.) and can lead to lower efficiency and effectiveness of infrastructural services, as these final infrastructures may be unnecessary, unsuitable, defective, or dangerous.

4. Institutional and policy reforms in the construction sector

This section discusses some institutional and regulatory reforms necessary to eliminate the noted bottlenecks in the supply of construction within the country. These suggested policy reforms stem directly from the noted constraints in the construction sector.

An observation on Ghana's construction sector is the noted absence of a single government agency responsible for overseeing activities within the sector. Currently, the responsibility appears to be shared by three ministries—the Ministry of Water Resources, Housing, and Public Works; the Ministry of Transport; and the Ministry of Road and Highways. There also appear to be minimal legal mandate and enforcement mechanisms operating in the subsector. There has been some interest in the establishment of a regulatory body—the Construction Industry Development Authority, which is currently under review by the Ministry of Works and Housing and Ministry of Roads and Highways—to ensure safety, transparency, and professionalism within the industry, but this has not seen much progress. A major responsibility of this central agency would be to monitor and ensure transparency in the awarding of contracts, for example. It is believed that the lack of a regulator in the industry has led to the lack of enforcement of some laws, such as the preferential bidding for particular projects which in turn has led to the incursion of foreign players in a section supposedly reserved only for Ghanaian contractors.

The following are other avenues that could be explored to promote transparency in the bidding for, awarding of, and execution of construction projects: establishment of a national database of all stakeholders within the sector; random

auditing of public funds to increase transparency and monitor public expenditure; legislation to reduce the incidence of bribery and kick-backs; blacklisting of companies found engaging in acts of bribery; public disclosure of all project agreements; integrity pacts undertaken during both tender and project execution phases; prohibitive action taken on corrupt practices among trade or professional associations.

There is also a need to develop a comprehensive local content policy for the construction sector, similar to what exists in the mining subsector. This might involve reserving a proportion of and/or particular kinds of projects for local firms. There are several potential benefits to be derived from this. A local content law that makes collaboration essential between foreign and local firms could lead to critical skills transfer from the former to the latter, leading to increased capacity. This would also increase employment opportunities and incomes for local artisans. However, it should be noted that, as occurs under the existing local content law in the mining sector, the low skills levels of local artisans may present a challenge to successful collaborations between local and foreign firms.

Other policy reforms could be explored to raise the skills levels of local artisans in the construction sector. For instance, additional training could be provided for local artisans. Despite the fact that most artisans are trained under apprenticeship schemes, no additional professional training is received after apprenticeships, limiting access to knowledge of new techniques and equipment. The Youth Inclusive Entrepreneurial Development Initiative for Employment (YIEDIE) programme is an example of such an intervention. This is a five-year programme designed to create economic opportunities in Ghana's construction sector for disadvantaged youth (i.e. school drop-outs living in poverty). Established in 2017, the programme aims to provide training and better job placement for 23,700 young people, leading to an estimated 90 per cent increase in income levels. Over 14,000 youth will be given training in technical construction skills through participating in an apprenticeship programme, enhanced with entrepreneurship, life skills, and safety and health training. The remaining youth will receive entrepreneurship training relevant for participation in the construction sector, along with support in microenterprise start-up or growth. Financial literacy education is also provided to all youth. Despite the laudable components and aims of the programme, the focus on only disadvantaged youth may present a limitation, as other young and older people could also benefit from such training. Additionally, the programme presently targets only a few of the largest cities in the country (i.e. Accra, Kumasi, Sekondi-Takoradi, Ashaiman, and Tema), preventing it from reaching larger numbers of artisans who require training.

The issue of the late payment of contractors within the subsector is another subject for potential policy reform, as it has disastrous consequences particularly for small-scale local contractors. Due to delays in payment by government, local construction companies often pay high interest rates on loans contracted.

Additionally, in several instances, local firms default on these loans, leading to a perception among banks that loans for government projects are risky. This reduces the competitiveness of local firms, compared with that of their foreign counterparts, as they are unable to raise the required capital to bid for and execute projects. Even when these funds are secured, they are often at high rates of interest. There have been calls, therefore, for the passage of a Delayed Payment Law (DPL), not unlike what exists in countries such as the United Kingdom, Singapore, and Malaysia. Such a law would make it mandatory for government to make interest payments on all delayed construction payments, which would serve to compensate for delays and guarantee the survival of local firms, and would also perhaps act to deter late payment by the government in the first place.

To tackle the problems of irregular supply of construction materials, a reliable value chain could be put in place. For example, to make quarry products more accessible there is a need to encourage investment in the manufacture of chippings and quarry dust, which are both essential in the construction industry. Currently, the few quarries in Ghana are mainly located in the southern half of the country. Therefore, all construction in the northern belt is particularly constrained with respect to accessing cheap quarry raw materials. Investment in this area would be beneficial, particularly for construction projects in northern parts of the country. Despite the noted importance of free trade, imports of some building materials could also be restricted so as to encourage production by local individuals. For instance, Angola has banned the import of cement into the country in order to protect its local industries.

Effective collaboration between government and the other stakeholders (housing developers) in the area of providing social infrastructure should be encouraged. A construction fund should also be established as a means of easing the cost of operations. Such a partnership would enable the industry to deal more effectively with the rising demand for affordable housing. The establishment of a housing development fund would also be useful for developers, allowing them to access affordable long-term credit in order to reduce their operation costs and hence increase their ability to effectively deal with the affordable housing gap.

References

- Ackah, C., Adjasi, C., and Turkson, F. (2014). 'Scoping Study on the Evolution of Industry in Ghana. Learning to Compete'. Working Paper 18. Washington, DC: Brookings Institution.
- Darvas, P., and Palmer, R. (2014). 'Demand and Supply of Skills in Ghana: How Can Training Programs Improve Employment and Productivity?' Washington, DC: World Bank. Available at: <http://dx.doi.org/10.1596/978-1-4648-0280-5> (accessed 14 July 2018).

- Fugar, F. D. K., Ashiboe-Mensah, N. A., and Adinyira, E. (2013). 'Human Capital Theory: Implications for the Ghanaian Construction Industry Development'. *Journal of Construction Project Management and Innovation*, 3(1): 464–79.
- Government of Ghana (2015). *National Housing Policy*. Accra: Ministry of Water Resources, Works and Housing.
- GLSS (2014). *Ghana Living Standards Survey Round 6 (GLSS 6)*. Accra: GSS.
- GSS (2018). 'National Accounts'. Available at: <http://www.statsghana.gov.gh/> (accessed 14 July 2018).
- Ministry of Education (2010). 'Assessment Report of the Construction Industry Skills Demand and Supply in Ghana'. Accra: COTVET.
- Park, S. H. (1989). 'Linkages between Industry and Services and their Implications for Urban Employment Generation in Developing Countries'. *Journal of Development Economics*, 30(2): 359–79.
- Sutton, J., and Kpentey, B. (2012). 'An Enterprise Map of Ghana'. London: International Growth Centre.
- USAID (United States Agency for International Development) (2016). 'USAID Country Profile. Property Rights and Resource Governance: Ghana'. Available at: https://www.land-links.org/wp-content/uploads/2016/09/USAID_Land_Tenure_Ghana_Profile_0.pdf (accessed 8 June 2016).
- Working Group on Indices for Civil Engineering Contracts (1979). 'Price Adjustment Formulae for Civil Engineering Contracts: Guide to Application and Procedure'. London: HMSO.
- World Bank (1984). 'The Construction Industry: Issues and Strategies in Developing Countries'. Washington, DC: World Bank.

Local Content Law and Practice

The Case of Ghana

Charles Godfred Ackah and Asaah S. Mohammed

1. Introduction

Oil and gas were discovered in Ghana in 2007 and the country began to extract these resources in 2010. With subsequent discoveries the country has come to realize its long-time hope of boosting its socio-economic development with proceeds from oil and gas. Paradoxically, however, the oil sector globally has not helped to boost local economic development in producing countries, especially developing countries. This paradox, which has been christened the ‘paradox of plenty’ or ‘resource curse’, has become a catchphrase in international discussions on extractivism and development.

Ever since 2007, Ghana’s government has been developing strategies to both take advantage of the oil find and attempt to escape the resource curse. One such strategy was the policy and legislative development on local content and local participation in all facets of the oil and gas industry. To this effect, in 2010, a coherent policy was developed to regulate the nascent oil and gas industry. This aimed to ensure that Ghanaian citizens participate in the ownership of businesses in the oil and gas industry by giving priority in employment, in the award of oil blocks, oil field licences, and oil extraction licences, and in all oil and gas projects for which contracts are awarded. To ensure the effective implementation of the policy, legislation (LI 2204 [Petroleum (Local Content and Local Participation in Petroleum Activities) Regulations]) was passed in 2013 by the Parliament of Ghana. In both the legislation and policy, local content refers to the use of Ghanaian local expertise, goods and services, people, businesses, and financing in oil and gas activities. The regulation and policy not only aimed to maximize value-addition and job-creation in the petroleum sector through the use of local content, they also acted as a mechanism for the coordination, transparent monitoring, and governance of Ghanaian content. While local content policies (LCPs) and legislation have the potential to stimulate broad-based economic development, which is necessary to alleviate poverty, achieve prosperity, and ensure

sustainable economic and social outcomes in Ghana's oil and gas sector, their use has often achieved mixed results in many extractive developing countries.

It has now been over four years since Ghana passed the LI 2204. Its impacts are therefore worth examining to understand how the law has aided the utilization of Ghanaian goods and services, skills development, and the training and employment of Ghanaians. This chapter therefore seeks to review local content policy and legislation in Ghana and to assess their effectiveness since oil and gas production began in 2010. The chapter attempts to identify not only direct benefits but also indirect and induced benefits of local content through forward and backward linkages between the oil and gas industry and other sectors of the economy. The chapter also highlights some challenges hindering the effective implementation of the law.

The chapter relied largely on a qualitative desk review of existing literature, research papers, and institutional reports on local content law and practice in Ghana's oil and gas sector. Current local content policy and legislation were reviewed in terms of their suitability for achieving effective local participation in the oil and gas industry. Secondary information was sourced from company reports, legal and policy documents, academic publications, articles, and sector reports from civil-society organizations (CSOs), government ministries, international oil companies (IOCs), etc. First-hand information was collected from limited fieldwork conducted for the study. In-depth interviews were conducted with key informants in the oil and gas industry, including the local content secretariat of the Ministry of Energy and the Petroleum Commission, to augment the information contained in their institutional reports. Some former staff of the Enterprise Development Centre (EDC) and some international oil companies such as Tullow Ghana and Kosmos Energy were interviewed to obtain additional information.

2. Contextualizing natural resource extraction and national development

Most theoretical arguments, particularly in the 1960s and early 1980s, were that the presence of natural resources in any nation would lead to rapid development (Karl 2007; Rostow 1990). This led to a mad rush to discover and exploit natural resources, particularly those with high economic value at the time. Resources such as gold, diamonds, oil, and timber became the target of many developing countries (Rostow 1990). The argument linking natural resources to accelerated development was given its impetus by the development paradigm of developed countries such as Australia, the United States, and the United Kingdom. Its proponents, chiefly Rostow (1990), argued that natural resources extraction was positively correlated with industrial development, a prerequisite for infrastructural

and economic development. Drake (1980), cited in Rosser (2006), argued that the presence of natural resources would open domestic markets and ensure investment capital needed for industrial development. In his five-stage model for development, Rostow saw the presence of natural resources as a pre-condition for take-off.

In the 1980s, the extractive-led development argument continued, with the World Bank spearheading the agenda. From a liberal economic perspective, proponents of the extractive-led development paradigm argued that countries endowed with extractive resources such as oil and gas and gold would witness accelerated growth and development (Africa Development Bank 2009; Henstridge et al. 2012; World Bank 2004). Their view was supported by some studies, which found a positive correlation between growth in the oil and gas sector and GDP growth in countries in Africa, including Algeria, Angola, Nigeria, and Libya (Africa Development Bank 2009; King 2010; KPMG 2013).

Despite the developmental potential of natural resources for national growth, arguments emerged in the 1980s to question the contributions of the sector to the development of several developing countries. Auty (1993) argued that several developing countries lacked the capacity to manage the revenues from extractive resources, leading to corruption and mismanagement—a culture of rent-seeking common in developing countries. In Sierra Leone, Maconachie and Binns (2007) noted that due to poor management the country had remained one of the poorest African countries despite mining diamonds for several decades. Sachs and Warner (1995), using the economic growth rates of ninety-seven countries between 1970 and 1989, delved deeper in an attempt to understand how the presence of natural resources influenced their development. They found that countries with copious natural resources tend to grow less rapidly than those with few natural resources (Sachs and Warner 1995).

The fundamental assumption by liberal economists is that growth in the extractive sector will induce economic growth through increased government revenues, used to finance poverty alleviation programmes and facilitate the improvement of infrastructure (Campbell 2001; Henstridge et al. 2012; Karl 2007). Liberal economists believe that the indigenous population in extractive areas will have a comparative advantage to secure jobs and will receive trickle-down benefits because they live close to the resource extraction point. Moreover, sub-national governments are expected to witness an increase in revenues for sub-national development (O’Faircheallaigh 2013). What appears not conclusive in the liberal economic view is how these benefits will trickle down and who specifically will benefit at sub-national levels. A segment of the literature has concluded that the extractive sector is a curse rather than a blessing to developing countries across the world, and particularly those in Africa (Andersen and Aslaksen 2008; Auty 1993; Baland and Francois 2000; Bjorvatn et al. 2012; Brückner 2010; Brunnschweiler and Bulte 2008; Coxhead 2007; James and Aadland 2011; James

and James 2011; Karl 1997, 2007; Larsen 2005; Mainguy 2011; Neumayer 2004; Ogunleye 2008; Stevens and Dietsche 2008).

3. The oil and gas sector, local content, and local participation

From the liberal economic perspective, the extractive sector is expected to create employment for the local population, especially during the construction of infrastructure (Campbell 2001; Warhurst 2005; World Bank 2004). In 2002, the International Labour Organization (ILO) estimated that the oil industry employed more than 2 million workers in production and refining (World Bank 2004). The ILO further estimated that each job in oil production or refining indirectly generates between one and four jobs in related industries (World Bank 2004). In Ghana, for instance, Tullow Ghana estimated that 180–200 Ghanaians would be directly employed by their company, and another 600–800 by contractors during oil exploration and production (Tullow 2012).

While the oil industry is considered to be providing employment opportunities, some studies have observed that employment in the sector is generally falling in most parts of the world (Azapagic 2004). Other studies have observed that the majority of the jobs are not benefiting the communities in which the oil production is occurring. It is a common trend in the oil industry to fill the majority of extraction-related jobs with foreign workers, who can be exploited and denied legitimate claims to wages, benefits, and compensation (Karl 2007; Smith and Dorward 2014). Azapagic (2004) similarly argues that there is an increasing trend in the industry for companies to contract out or outsource labour. This implies that local people are less likely to benefit from new jobs and business opportunities. A typical example, according to him, is the ‘fly-in, fly-out’ operations that bring workers from different parts of the world to exploration sites on the pretext of a lack of a locally available skilled workforce.

The high expectation of employment in the oil sector often leads to a massive movement of people, especially the youth, to oil-producing areas. Many of these young people do not get employment and end up engaging in various social vices for their livelihood (Okuthe 2015). In the city of Sekondi-Takoradi, Obeng-Odoom (2014) observed that many of the young women who had migrated to the city since the discovery of oil in 2007 were in commercial sex work. Darkwah (2013) has observed that several young Ghanaians have rushed to acquire skills related to the oil industry and are still waiting to get employment in the sector. She, however, bemoaned that several of these young people are losing hope in the oil sector despite the high expectations they had had on the discovery of oil in 2007.

Due to the challenges in promoting local interests in business and employment in the oil and gas sector, the concept of local content and local participation has

now been emphasized in extractive sector policy. Local content refers to jobs or value-added that are created anywhere in the domestic economy as a result of the actions of an oil and gas company. It can also refer more narrowly to jobs that are created in the neighbourhood of the oil production plant. Local content may even refer to the provision, by the oil company, of infrastructure (schools, medical facilities) that is not an input into its own production but intended for the benefit of the local population—either of the nation generally or the neighbourhood of the installations (Tordo et al. 2013).

Increasing local content has therefore become a policy priority in many resource-rich developing countries, among both mature and recent entrants to the industry (Tordo et al. 2013). The purpose of LCPs in the oil and gas sector is generally to encourage the participation and development of national labour, goods and services, technology, and capital. LCPs are viewed from different perspectives. Tordo et al. (2013) have argued that LCPs should be concerned not only with an immediate increase in local content such as employment, but also with actions such as training in appropriate skills that will lead to a longer-term increase in employment and related benefits to local citizens.

4. Policy and legislative development on local content and local participation in Ghana's oil and gas value chain

4.1 Policy development process

In the quest to maximize benefits from oil and gas resources for Ghanaian citizens, the government embarked on policy and legislative development from the moment oil and gas were discovered, in 2007. Taking lessons from the mining and forestry sectors, where fiscal benefits had eluded the citizens of Ghana (Akabzaa et al. 2007; Ayelazuno 2014b; Ayine 2001), the state started to marshal policies to avert the paradox of plenty. Subsequently, a coherent policy with the following objectives was developed to regulate the nascent oil and gas industry (Ministry of Energy 2009):

- to maximize the benefits of oil and gas wealth generation on a comprehensive local content platform by maximizing the use of local expertise, goods and services, job creation for people, businesses and financing in all aspects of the oil and gas industry value chain and retention of the benefit within Ghana
- to develop local capability in all aspects of the oil and gas value chain through education, skills and expertise development, transfer of technology and know-how and an active research and development portfolio

- to achieve a degree of influence or control over development initiatives for local/domestic stakeholders
- to achieve at least 90 per cent local content and local participation in all aspects of the oil and gas industry value chain within a decade
- to increase the capabilities and international competitiveness of domestic businesses and industrial sectors
- to create oil and gas and related supportive industries that will sustain economic development.

A review of the 2010 local content policy suggests that the government has shown a commitment to ensuring that Ghanaian citizens participate in the ownership of businesses in the oil and gas industry. The policy specifically mandates that priority should be given to Ghanaians in the award of oil blocks, oil field licences, and oil extraction licences and in all projects for which contracts are awarded. In this regard, the government is committed to building the capacity of local firms to attain international competitiveness and enable them to contribute effectively to the growth of the nascent oil and gas industry.

In terms of goods and services provision, the policy mandates that all operators in the oil and gas industry shall as far as practicable use goods and services produced by or provided in Ghana for their operations in preference to foreign goods and services. It was the hope of the government that after the commencement of operations, the participation of Ghanaians in value-added would be at least 10 per cent initially, with a 10 per cent increase annually in the provision of goods and services.

Regarding the employment of Ghanaians, the policy mandates that all operators in the oil and gas industry should ensure that opportunities are given as far as is possible for the employment of Ghanaians having the requisite expertise or qualifications in the various levels of the operations. The operator should, within twelve months of the grant of a licence (or the effective date of a Petroleum Agreement), submit to the relevant regulatory agency for approval a detailed Annual Recruitment and Training Programme for the recruitment and training of citizens of Ghana in all job classifications and in all aspects of petroleum activities, which may be carried out in or outside the country. The policy mandates the operators to detail in their recruitment plans the following targets of employment of Ghanaians: at least 50 per cent of management staff at the beginning and 80 per cent after five years; at least 30 per cent of technical staff at the beginning and 80 per cent after five years; and 100 per cent of all other staff.

The policy also mandates that all operators should provide for the training of Ghanaians in all aspects and phases of petroleum production through scholarships, industrial training for students, and other financial support for education. To enhance the capacity of Ghanaians, the government intends to support local training and technical institutions to develop the requisite capacity, to international

standards, to train Ghanaians to the levels required by the industry in drilling, catering and housekeeping, and other support services. Special attention will be given to ensure the indigenization of oil and gas technologies. The policy also makes provisions to ensure equal opportunities for men and women in the oil and gas industry.

4.2 Legislative development process

Legislation on local content in petroleum activities in Ghana dates back to 1984, when the PNDC Law 84 enacted the Petroleum Exploration and Production Decree, 1984. Section 23 of the Decree provided for the employment of Ghanaians and the preference for Ghanaian goods and services in the exploration and production of petroleum in Ghana. In 2016, the PNDCL 84 was replaced by the Petroleum (Exploration and Production) Act 2016 (Act 919). Act 919 mandates that qualified Ghanaian citizens are to be given the opportunity of employment in all aspects of the petroleum industry. Section 61(1) of Act 919 further provides that Ghanaian firms are to be given preference in the supply chain of materials, equipment, machinery, and consumer goods.

In 2013, the Parliament of Ghana passed the Petroleum (Local Content and Local Participation in Petroleum Activities) Regulations, 2013 (LI 2204). This was aimed at developing local capacities in the petroleum industry's value chain for sustainable economic development (Ministry of Energy 2009). Local content refers to the use of Ghanaian local expertise, goods and services, people, businesses, and financing in oil and gas activities (Ministry of Energy 2009). The LI mandates that every Petroleum Agreement or petroleum licence between Ghana and a foreign company must have at least 5 per cent equity participation of indigenous Ghanaian companies. It is also meant to increase the capability and international competitiveness of domestic businesses and to create petroleum and related support industries to sustain Ghana's economic development. The LI also provides that entities in the petroleum industry must submit plans for their compliance with local content requirements regarding the provision of goods and services. In addition, it requires entities in the petroleum sector to transfer advanced technology and skills related to the petroleum activities and their recruitment and training programmes to the Ghana National Petroleum Corporation (GNPC) or the Petroleum Commission. Representatives of IOCs working in the local oil sector have pledged to cooperate with the state in the implementation of LI 2204 (Tullow 2012).

The government is seeking to rely on the regulation to achieve at least 90 per cent local participation in all aspects of the petroleum value chain by 2020. This expectation is, however, widely considered unrealistic. According to Olsen (2013), no country has ever achieved 90 per cent local content in the history of petroleum production. The highest ever achieved is 74 per cent by Norway in 1994. This

therefore raises questions about the workability of the local content legislation and whether any company can abide by the law in Ghana.

5. Implementation of the local content policy and law on oil and gas in Ghana

5.1 Institutional arrangements for local content implementation

To implement the local content law on oil and gas in Ghana, the Petroleum Commission was established in 2011 by the Petroleum Commission Act, 2011 (Act 821). The Commission is mandated to regulate, implement, manage, and coordinate activities in the upstream petroleum sector. The Commission has a designated department responsible for monitoring IOCs in the implementation of the local content law. The Commission is responsible for promoting and monitoring local content policy, advising the energy ministry on petroleum project negotiations, and monitoring and evaluating field appraisals, development, and production activities. To ensure effective monitoring of the implementation of the local content policy and law in Ghana, the Commission has broadly categorized the oil and gas industry as follows:

- International Oil Companies—international companies with petroleum agreements undertaking exploration and production activities
- International Service Companies—foreign companies providing services to IOCs
- Local Service Companies—local companies providing services in the oil industry.

The energy ministry is responsible for overseeing and ensuring full implementation of the local content and local participation policy. A Local Content and Local Participation Secretariat has been established, as well as a National Local Content Committee within the ministry, to oversee the implementation of the policy. An Oil and Gas Business Development and Local Content Fund has been established to support local capability development aspects of the local content framework. The fund will be used primarily for education, training, and research and development in oil and gas. Sources of the fund will include a contribution from licensed operators (at amounts specified in the applicable Petroleum Agreements), oil and gas revenue, levies, grants, and other support from Ghana's Development Partners. The Energy Ministry will oversee the disbursement of the fund.

CSOs, particularly NGOs and the media, play important roles in supporting good governance in the new oil era in Ghana. CSOs act as pressure groups to

force government and IOCs to abide by the local content law and policy. Notable CSOs playing such roles in Ghana include the Africa Centre for Energy Policy (ACEP), the Natural Resource Governance Institute, and the Civil Society Platform on Oil and Gas.

6. Current level of goods and services supplied by Ghanaian companies

In line with the local content policy and legislation, goods and services as shown in Table 7.1 are earmarked for indigenous Ghanaian companies.

As at the end of 2016, 776 companies were registered with the Commission to provide either direct or indirect services ranging from catering/hospitality services, logistics supplies, and freight forwarding to fabrication and waste management services. These consisted of 480 local companies (companies with at least 51 per cent Ghanaian equity ownership), 201 foreign companies, and ninety-five joint venture (JV) companies. Figures from the Petroleum Commission show progressive growth of local firm registration from 2012 (Figure 7.1).

The Africa Centre for Energy Policy (2017) has recorded that in 2016 the Jubilee/TEN Field Partners (Tullow Ghana Limited, Kosmos Energy, Anadarko, GNPC, and Petro SA) awarded contracts worth about US\$1.37 billion, out of which indigenous Ghanaian companies were awarded contracts worth US\$489 million (35 per cent) and non-indigenous Ghanaian companies US\$884 million (65 per cent). The ACEP report further noted that between 2014 and 2016, there was a significant and progressive increase in contracts awarded to indigenous companies: US\$152 million in 2014; US\$249 million in 2015; and US\$489 million in 2016. ACEP (2017) also reported that between 2014 and 2016 ENI Ghana Exploration and Production Limited spent a total of US\$6.3 billion in developing

Table 7.1 Goods and services earmarked for indigenous Ghanaian companies

Supply of petroleum products	Basic fabrication & construction	Supply of drinking & industrial water	Construction & civil works including general cleaning and gardening	Financial, banking & legal services
Manpower services	Vehicle leasing & rentals	Waste management	Supply of low-voltage cables, etc.	Scaffolding
Community relations & social investment	Fabric maintenance (painting)	Insurance & reinsurance services	Standard chemicals	

Source: Ministry of Energy (2009).

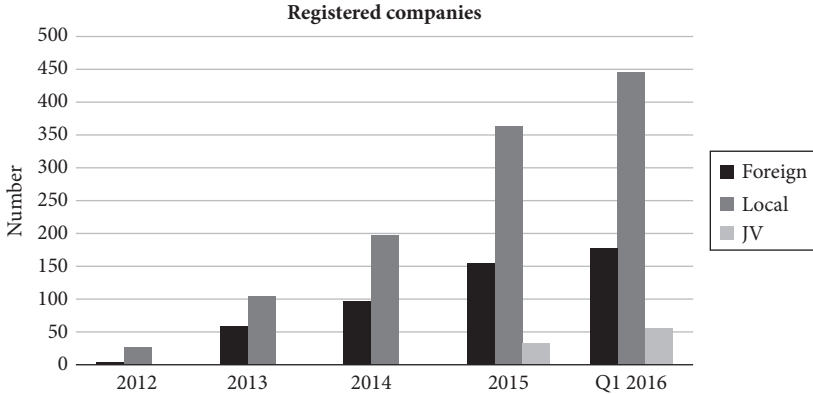


Figure 7.1 Progress of local firm registration with Petroleum Commission

Source: Petroleum Commission (2016), copied here with permission.

the Offshore Cape Three Points (OCTP) Field. Contracts worth about US\$1.76 billion (28 per cent) during this development process were awarded to indigenous Ghanaian companies, while contracts worth US\$4.54 billion (72 per cent) were awarded to international companies. In total, about 250 indigenous Ghanaian companies benefited from these contracts (companies with at least 51 per cent Ghanaian equity ownership). The Petroleum Commission in 2016 also reported specifically the value of services provided by local and international firms to two IOCs (Tullow and ENI); details are given in Figures 7.2 and 7.3.

In the area of fabrication, some indigenous Ghanaian companies are making impressive strides. For example, Belmet7 and Seaweld Engineering Services Limited participated in the fabrication of the suction piles and module stools, respectively, for the OCTP FPSO. Specifically, Belmet7 invested about US\$8 million in their fabrication yard at the Takoradi Port in 2013 and have since produced sixteen suction piles for the OCTP field and a gas export manifold for the TEN Field. According to ACEP, this development is the first of its kind in West Africa. Other companies, including JVC, Orsam, Harlequin, and Group Five, have fabricated jumpers, sleepers, mud mats, riser bases, and manifolds in Ghana. In all, over 15,000 tonnes of steel have been fabricated in Ghana for the oil and gas industry.

Installation of subsea infrastructure is another area of interest in local content development in Ghana. An indigenous Ghanaian company (Sri Emas Limited) won over US\$300 million worth of contracts for the transport and installation of subsea umbilicals, risers, and flowlines (SURF) as well as the transport and installation of the gas export sealine for the OCTP project. The project management and major procurement is led and carried out in-country by Ghanaians, and some other aspects of the scope of work are subcontracted to other Ghanaian companies (Africa Centre for Energy Policy 2017).

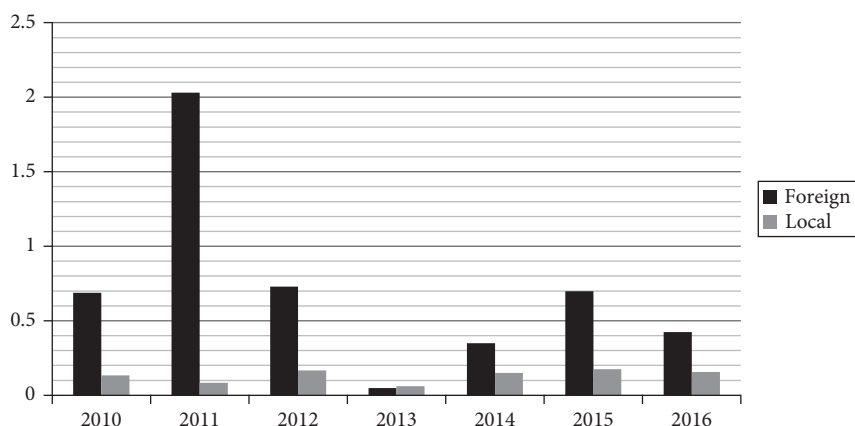


Figure 7.2 Foreign and local firms' supply of goods and services to Tullow Ghana Limited

Source: Petroleum Commission (2016), copied with permission.

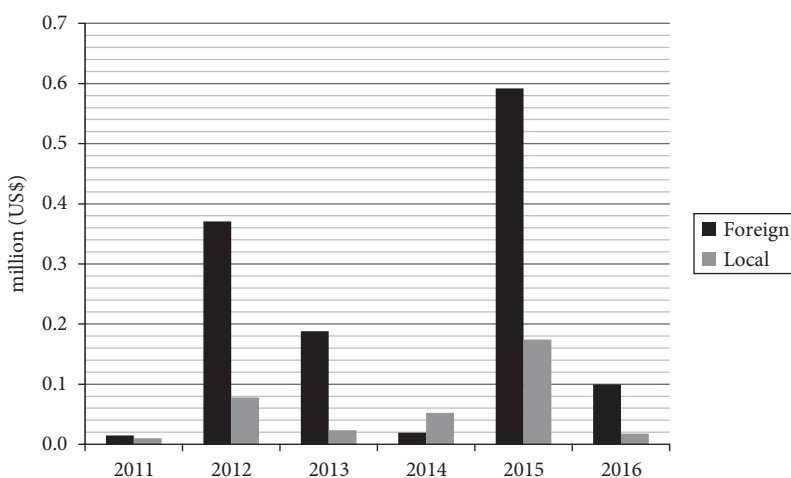


Figure 7.3 Foreign and local firms' supply of goods and services to ENI Ghana Exploration and Production Limited

Source: Petroleum Commission (2016), copied with permission.

As shown in Figures 7.2 and 7.3, although the picture appears promising, it is below the country's expectation in its local content policy objective of achieving 50 per cent of local participation in the supply chain within a decade. Several factors have contributed to this. The Petroleum Commission has noted that few indigenous companies participate in the middle and higher supply chain activities. Most indigenous companies are concentrated at the lower levels of the supply chain, supplying relatively low-value goods and services.

7. Recruitment, training, and promotion of Ghanaian nationals for jobs in the oil sector

Section 5.4 of the 2010 Local Content and Local Participation policy framework, which focuses on the employment of Ghanaians in the oil industry, stipulates the following milestones:

1. at least fifty per cent (50 per cent) of the management staff of IOCs are Ghanaians from the start of petroleum activities [and]
2. at least eighty per cent (80 per cent) within five (5) years after the start of the petroleum activities
3. at least thirty per cent (30 per cent) of the technical staff are Ghanaians from the start of petroleum activities of the licensee and the percentage shall increase to at least eighty per cent (80 per cent) within five (5) years after the start of petroleum activities and ninety per cent (90 per cent) within ten (10) years; and other staff are one hundred per cent (100 per cent) Ghanaians.

As at the end of 2015, the total number of people employed in the upstream sector was estimated at 6,940. Of these, 5,590 (81 per cent) were Ghanaians and 1,350 (19 per cent) expatriates (Buah 2016). In comparing the employment statistics with the local content targets, it is observed that the targets for management staff and other staff have been met. However, there is a huge gap in the area of technical staff, especially engineers and technicians (Ahwireng 2016). The Petroleum Commission has begun taking steps to bridge this gap. For example, the Commission negotiated for 20 per cent of the engineering design of SURF for the TEN project to be executed by Ghanaians through GNPC-Technip Limited (a JV company).

It is also worth noting that some of the IOCs are prioritizing Ghanaians in the execution of their projects. For instance, 25 per cent of engineering man hours for the construction of ENI's ongoing gas processing plant at Sanzule is being executed by Ghanaians. Also, both Kosmos Energy and Tullow Oil now have Ghanaians managing their Ghana offices in fulfilment of their local content commitments (Africa Centre for Energy Policy 2017).

It has been observed that there exist huge salary disparities between Ghanaian employees and foreign employees of IOCs. These disparities have recently led to protests among local staff of IOCs. The Petroleum Commission in its attempt to understand the reasons behind the disparities has come to the realization that most of the Ghanaian staff lack the requisite technical skills needed for the oil and gas industry. The Commission concluded that, although Ghanaians possessed academic qualifications, they lacked practical skills and competencies to fill engineering and technical areas of the oil and gas industry (Africa Centre for Energy Policy 2017).

8. 'Local local' content

'Local local' content is a term used to describe how local content initiatives are used to address specific needs at project-affected communities. Since the oil discovery and subsequent development of local content policy and law, several stakeholders, such as community leaders and civil society, have called for the oil industry to provide benefits to local communities likely to be affected by oil production and related activities. Although these calls have not been successful in several extractive countries, advocacy and agitation for this framework of local content have continued unabated.

The IOCs have responded in various ways to the 'local local' content debate in Ghana. For instance, in the contract for site preparation for the OCTP onshore gas receiving facility in Sanzule, all the 140 unskilled and semi-skilled workers were employed from the eighteen project-affected communities; catering, driving, and hospitality services were all provided by companies from the communities; and Sri Emas (an indigenous Ghanaian company) was awarded a contract worth US\$300,000 to construct a road bridge connecting the farming communities of Adubrim to the cocoa-growing areas of Ellembelle in the Western Region (Africa Centre for Energy Policy 2017). According to the community liaison officer of Kosmos Energy, the company has prioritized 'local local' companies in communities in the Western Region for the award of unrestricted contracts. For instance, it has prioritized local restaurants to supply food during workshops and meetings.

Although 'local local' content is being promoted in the extractive sector as a way of meeting local communities' interests, it is not prioritized in Ghana's local content and local participation policy and legislation, which has no specific references to 'local local' content. This has raised concerns among local actors in coastal communities in the Western Region, who have questioned their benefits from the oil find since they are likely to suffer from any negative consequences of the oil industry. The demand for local benefits of the oil industry by coastal communities in the Western Region has received much attention in the literature (Ackah-Baidoo 2013; Ayelazuno 2014a; Mohammed et al. 2014). The question, however, is how to ensure that 'local local' firms meet the standards of the IOCs. This may require a policy focus and commitment of the IOCs and the Petroleum Commission to support 'local local' firms in their efforts to contribute to the supply chain in the oil industry.

9. Challenges of local content implementation in Ghana's oil and gas sector

9.1 Local business capacities in the oil and gas industry

There is a constant assertion from IOCs that indigenous companies have challenges in meeting international standards in the industry. A body of literature

largely agrees that indigenous companies are poorly structured and have limited capacity to do business in the oil and gas industry in Ghana (Africa Centre for Energy Policy 2017; Asafu-Adjaye 2010; Asamoah 2012; Asante and Owusu 2014; Boyefio and Ochai 2014). The literature asserts that IOCs find it difficult to identify suitable Ghanaian suppliers because of limited information or records on them. Local SMEs are also challenged by limited information on supplying services to IOCs, which denies them opportunities to benefit from the supply chain of the oil industry.

Another fundamental challenge of local SMEs is that they lack skilled personnel to provide services that meet the standards of IOCs. Local SMEs are noted for not prioritizing skills training of their staff and do not invest enough to acquire the skilful manpower needed to deliver quality services on time. They have limited financial capacity to deliver on large contracts, which is largely due to the fact that financial institutions in Ghana do not trust their creditworthiness. A common feature of local SMEs, as noted in the literature, is that they are mostly not certified to international standards such as the International Organization for Standardization (ISO). International certification is a prerequisite for doing business with IOCs. Therefore, its absence is a disincentive for IOCs to engage with local SMEs. These standards apply to the environment, health, and safety (EHS), insurance requirements, and business ethics, including anti-bribery policies.

The Petroleum Commission has noted these challenges and is of the view that some indigenous companies have the capacity to supply some goods and services along the value chain of the petroleum industry. The Commission has begun several capacity-building efforts for indigenous companies to expedite the development of skills and know-how through the formation of joint ventures. The Commission also encourages partnerships and the pooling of resources among indigenous companies in order to deliver goods and services to the appropriate standards. The Commission is currently also developing an electronic portal to make information on upstream companies available to indigenous companies to enable them take advantage of upcoming opportunities. Some of these initiatives will be discussed in ensuing sections.

9.2 Discrimination against indigenous companies

Arguably, the dominance of international suppliers in the supply chain of the oil industry in Ghana gives the impression that the capacity of local SMEs is deliberately underutilized. As noted by Boyefio and Ochai (2014), the Ghanaian oil industry is currently dominated by foreign manufacturers or suppliers of goods and services that could ordinarily be made or supplied by local SMEs or firms. They noted that, although most IOCs profess support for local content, the reality is that they prefer to deal with their global suppliers for a number of reasons and

are reluctant to break such supplier relationships. There is a general perception among indigenous SMEs that it is difficult to identify the entry point(s) to the oil and gas value chain—where to begin and who to deal with at the IOCs. There is also a general perception that IOCs often deliberately refuse to patronize indigenous SMEs, which they believe do not have the requisite capacity to meet their standards; instead, they would rather contract similar services from Côte D'Ivoire. It is therefore important for further studies to understand the mode of operations of SMEs in Côte D'Ivoire which put them at an advantage over those in Ghana.

9.3 Regulatory institutional challenges

Despite the tremendous efforts by the Petroleum Commission to ensure effective implementation of the local content law, several concerns have been raised about the capacity of the Commission. In order to ensure strict compliance by IOCs, there is a need to establish measurable and monitorable indicators at the various IOCs. This calls for technical ability within the Petroleum Commission. The technical competence of the Commission in this regard is, however, questionable, since the Commission itself is relatively new and, more generally, the exposure of Ghanaian technical staff to the oil and gas industry is limited.

In addition to the technical challenges, the Petroleum Commission, since its establishment, has operated as a pure public-sector institution in Ghana. One current characteristic of Ghana's public sector is the high influence of partisan politics. The appointment of management and technical staff to the Commission is partisan and tenure in office depends on the tenure of the political party in power. For example, since the change of government in 2017, several management and technical staff of the Commission have been replaced. Institutional memory and learning therefore become questionable, and IOCs may take advantage of the inconsistency in monitoring resulting from leadership change to ill report progress on the implementation of local content policy. Interviews with the Commission's senior management suggest that some IOCs have provided distorted and inconsistent reports on local content implementation. The Commission, however, finds it difficult to verify the information due to a lack of institutional records coupled with an absence of designated officers to crosscheck for confirmation.

10. Options for increasing local participation in the oil and gas industry in Ghana

In the quest to enhance the capacity of Ghanaian firms to take advantage of local content policy and legislation, several initiatives have been instituted in the context of public–private partnership (PPP) arrangements. In 2015 the Petroleum

Commission, upon recognition that Ghanaians possessed academic qualifications but lacked practical skills and competencies to fill engineering and technical roles in the industry, began to conduct needs assessments. The Ghana Upstream Internship Program (GUSIP) was developed to recruit young school leavers as interns in selected oil companies to gain industry experience. Petroleum Commission records indicate that the first batch of interns recruited by Tullow Ghana Limited in 2016 has completed a one-year training programme (Africa Centre for Energy Policy 2017). The Commission also encourages upstream companies as part of local content development to organize supplier development programmes for their subcontractors.

With regard to financial assistance, Act 919 mandates the Commission to establish a Local Content Fund to provide financial resources for citizens and indigenous Ghanaian companies engaged in petroleum activities. The Commission has developed modalities for the establishment of this fund, which when completed will increase access to finance for indigenous companies. The Commission has also initiated discussions with the financial sector to ease the credit constraints and address the bane of prohibitive interest rates and other credit challenges for upstream companies.

One major government-initiated PPP promoting local content in the oil and gas sector was the Enterprise Development Centre (EDC), which started in 2013 and was spearheaded by the (then) Ministry of Energy and Petroleum and the Ministry of Trade and Industry. The five-year initiative was jointly sponsored by the Jubilee Partners (Tullow Oil, Ghana, Kosmos Ghana, Anadarko, Petro SA, and the GNPC) to provide capacity-building support to SMEs in Ghana interested in benefiting from the oil and gas supply chain. The EDC provided services such as business training, capacity-building programmes, advisory services, access to markets, and information, and also acted as a focal point for coordination between SMEs and the oil and gas companies and their contractors. The EDC had developed a comprehensive database of local SMEs and had trained and integrated about 400 SMEs into the supply chain of the oil industry. The activities of the EDC have, however, been suspended since August 2016 due to lack of funds. Records from the EDC office indicate that only about twenty-two of the 400 SMEs were ever awarded contracts by IOCs after receiving training. As discussed earlier, this situation is largely attributable to the discriminatory tendency of the IOCs against local SMEs and the poor capacity of those SMEs. Although the initiative had funding challenges and could not achieve as much as expected, the government and the IOCs need to revisit the concept with modifications and promote such support services to ensure the capacity development of local firms so that they may effectively participate in the oil industry in Ghana.

Another initiative is Invest in Africa (IIA), a cross-sector group of companies (local and international) working together to support local enterprises in Ghana. IIA established the African Partner Pool in October 2014 as an online

business-networking platform. This initiative connects credible local businesses to investors and provides capacity-building programmes for SMEs. A main activity of IIA is the Business Linkage Programme, which was launched in July 2015. The programme provides two years of expert business support to local businesses to help them win clients, access finance, meet international standards, and export to new markets. About thirty-one SMEs have benefited from this initiative so far.

The Supply Chain Development (SCD) programme is an initiative supported by the United States Agency for International Development (USAID) that seeks to improve the competitiveness of local SMEs operating in the oil and gas sector. The programme develops capacities of SMEs in the areas of EHS, procurement best practices, information technology, and quality management. So far, 394 individuals and 206 SMEs have been trained in SCD, and fifty-two training workshops have been run. Beneficiaries of the SCD programme have won fifty-six contracts worth over US\$16 million with oil and gas companies.

The Association of Ghana Industries (AGI) is another platform that helps SMEs take advantage of opportunities in the oil and gas sector. The AGI creates opportunities for businesses to interact and exchange business ideas, lower the cost of doing business in Ghana, and improve the local business climate. The AGI organizes support services for its members in variety of areas, including business plan preparation and business advocacy advice. The AGI has organized several exhibitions and conferences aimed at helping SMEs understand the local content issues in the oil and gas sector and to participate in the industry.

Ghana Supply Chain (Pyxera), a US-funded institution, also provides capacity-building programmes for SMEs in the industry. Pyxera has provided various technical training programmes for SMEs in the industry.

II. Conclusion and policy recommendations

While Ghana's local content policy and legislation on the oil and gas industry have the potential to stimulate broad-based economic development, which is necessary to alleviate poverty and ensure sustainable economic and social development, its implementation has had mixed results. Four years on from the passing of the Petroleum (Local Content and Local Participation in Petroleum Activities) Regulations (LI 2204), it can be said that the country has made limited progress in both the employment of Ghanaians and enabling local firms to enter the supply chain of the industry. The principal reasons for this slow development are that the oil industry uses specialized inputs and requires complex technologies, which are often in short supply in underdeveloped economies such as Ghana. It is therefore important for Ghana to beware of trying to meet local content targets at all cost, since that may reduce the effectiveness of the oil and gas supply chain.

Nevertheless, the available literature largely recognizes that the implementation of LI 2204 and the local content policy has yielded some positive results in terms of job creation and increased use of Ghanaian goods and services. It has brought IOCs closer to Ghanaian SMEs and has given many SMEs the confidence to approach IOCs and offer services. Between 2010–17, some 4,000 contracts and purchase orders worth over US\$1.3 billion were awarded to indigenous companies (Africa Centre for Energy Policy 2017). The requirement for foreign companies to form JVs with indigenous Ghanaian companies under regulation 4(6) of LI 2204 has granted a number of Ghanaian companies access to the technologies and operations of their international JV partners. As a result, Ghanaian participation in the award of contracts is currently over 20 per cent in both Tullow Ghana Limited and ENI Ghana Exploration and Production Limited (Africa Centre for Energy Policy 2017).

Despite increased local participation, however, indigenous companies continue to face various challenges, as enumerated above. Although LI 2204 specifies a sliding-scale target for increase in local participation over a period, the limited capacity of Ghanaian companies makes it difficult to achieve these targets. To make the situation worse, the majority of indigenous companies do not specialize in the industry and therefore end up investing little in efforts to increase capacity. Indigenous companies tend to concentrate on providing the ‘low-hanging fruits’ instead of venturing into the high-earning services that propel this industry.

To achieve the effective implementation of LI 2204 and local content policy, the following actions are recommended:

1. The Petroleum Commission should intensify its monitoring function and promote specialized skills development and transfer of technology to Ghanaians. It is further recommended that the government amends the local content regulations to bridge the salaries and wages gap between expatriates and Ghanaian employees, as has been done in Angola and in the Middle East and North African (MENA) region. This will minimize the incidence of labour upheavals in Ghana.
2. Lack of financial support is a common barrier to the operations of indigenous Ghanaian companies. Worse is the high cost of borrowing. Intense competition from international players with cheaper access to finance from international financial markets crowds out local companies. The need for specific financial support for local SMEs in the oil and gas supply chain is necessary to enhance their competitiveness in the industry. Enterprise development initiatives aimed at the stimulation, incubation, and promotion of local SMEs is necessary for the long-term involvement of local SMEs in the industry.

3. Revising some of the LI targets to more practical or reasonable levels considering the in-country capacity is also recommended. As noted earlier, some of the targets of the LI and policy are ambitious. For example, the LI's minimum targets for the employment of Ghanaians and participation of local companies are 90 per cent and 50 per cent, respectively. As noted by Olsen (2013), no country has ever achieved these targets in the oil industry—not even developed nations.
4. The need for strategic partnerships between local firms and foreign firms is also recommended. For example, foreign and local companies should be allowed to work together where the foreign company provides a technology transfer to the indigenous company.
5. The state should impose import and customs duties on specific goods in support of its local content policy. This will protect non-competitive local producers. Corporate income tax might also be used to incentivize local ownership. For example, in India domestic companies are subject to tax at a rate of 30 per cent, while foreign companies bear a 40 per cent rate.
6. Since IOCs generally avoid engaging local technical staff, it is recommended that minimum local employment obligations, minimum salaries, and training requirements are imposed on them through legislation. Some job categories could be reserved specifically for Ghanaians with special skills in such jobs. Exemption might, however, be granted on a case-by-case basis by the relevant state authority. This would promote local workforce recruitment and progression.

Acknowledgements

We are grateful to the African Centre for Energy Policy (ACEP), the Ministry of Energy, and the Petroleum Commission in Ghana for providing us with information and data.

References

- Ackah-Baidoo, A. (2013). 'Fishing in Troubled Waters: Oil Production, Seaweed and Community-Level Grievances in the Western Region of Ghana.' *Community Development Journal*, 48(3): 406–20.
- Africa Centre for Energy Policy (2017). 'The Implementation of Ghana's Local Content Regulations in the Upstream Sector: Achievements, Challenges, and Way Forward'. Accra: Africa Centre for Energy Policy.
- Africa Development Bank (2009). *Oil and Gas in Africa*. New York: Oxford University Press.

- Ahwireng, T. (2016). 'Local Content Development and Upstream Petroleum Activities.' Annual Local Content Workshop. Unpublished. Petroleum Commission, Ghana. Accra.
- Akabzaa, T. M., J. S. Seyire, and K. Afriyie (2007). *The Glittering Facade: Effects of Mining Activities on Obuasi and its Surrounding Communities*. Accra: Third World Network Africa.
- Andersen, J. J., and S. Aslaksen (2008). 'Constitutions and the Resource Curse.' *Journal of Development Economics*, 87(2): 227–46.
- Asafu-Adjaye, J. (2010). 'Oil Production and Ghana's Economy: What Can We Expect?' *Ghana Policy Journal*, 4(Special Issue on Ghana's Petroleum Industry: The Prospects and Potential Impediments towards Good Governance Standard): 35–49.
- Asamoah, J. (2012). *Making the Oil and Gas Find in Ghana a Blessing*. Accra: Joasa Publications.
- Asante, F. A., and P. Owusu (2014). 'Oil and Ghana's Development: Some Global Lessons in Governance and Institution Building.' In E. Aryeetey, R. D. Osei, and P. Quartey (eds), *Managing Ghana's Oil Boom for Structural Transformation*. Legon, Accra: Institute of Statistical, Social and Economic Research (ISSER).
- Auty, R. M. (1993). *Sustaining Development in Mineral Economies: The Resource Curse Thesis*. London: Routledge.
- Ayelazuno, J. (2014a). 'Oil Wealth and the Well-Being of the Subaltern Classes in Sub-Saharan Africa: A Critical Analysis of the Resource Curse in Ghana.' *Resources Policy*, 40(0): 66–73.
- Ayelazuno, J. (2014b). 'The "New Extractivism" in Ghana: A Critical Review of its Development Prospects.' *The Extractive Industries and Society*, 1(2): 292–302.
- Ayine, D. (2001). 'The Human Rights Dimensions to Corporate Mining in Ghana: The Case of Tarkwa District.' In *Mining, Development and Social Conflicts in Africa*. Accra: Third World Network Africa.
- Azapagic, A. (2004). 'Developing a Framework for Sustainable Development Indicators for the Mining and Minerals Industry.' *Journal of Cleaner Production*, 12(6): 639–62.
- Baland, J.-M., and P. Francois (2000). 'Rent-Seeking and Resource Booms.' *Journal of Development Economics*, 61(2): 527–42.
- Bjorvatn, K., M. R. Farzanegan, and F. Schneider (2012). 'Resource Curse and Power Balance: Evidence from Oil-Rich Countries.' *World Development*, 40(7): 1308–16.
- Boyefio, G., and Ochai, P. (2014). 'Another Look at Ghana's Petroleum (Local Content and Local Participation) Regulation: The Underlying Prospects and Intrigues.' *Orient Energy*, 3(4): 4–12.
- Brückner, M. (2010). 'Natural Resource Dependence, Non-Tradables, and Economic Growth.' *Journal of Comparative Economics*, 38(4): 461–71.
- Brunnschweiler, C. N., and E. H. Bulte (2008). 'The Resource Curse Revisited and Revised: A Tale of Paradoxes and Red Herrings.' *Journal of Environmental Economics and Management*, 55(3): 248–64.

- Buah, E. A. K. (2016). 'Transforming Ghana's Oil and Gas Industry'. *Meet the Press*. Accra: Ministry of Petroleum.
- Campbell, B. (2001). 'The Role of Multilateral and Bilateral Actors in Shaping Mining Activities in Africa'. In *Mining, Development and Social Conflicts in Africa*. Accra: Third World Network Africa.
- Coxhead, I. (2007). 'A New Resource Curse? Impacts of China's Boom on Comparative Advantage and Resource Dependence in Southeast Asia'. *World Development*, 35(7): 1099–119.
- Darkwah, A. K. (2013). 'Keeping Hope Alive: An Analysis of Training Opportunities for Ghanaian Youth in the Emerging Oil and Gas Industry'. *International Development Planning Review*, 35(2): 119–34.
- Henstridge, M., M. Cabello, D. Haglund, K. Lipschutz, M. Jakobsen, and R. Williams (2012). 'Enhancing the Integrity of the Oil for Development Programme: Assessing Vulnerabilities to Corruption and Identifying Prevention Measures—Case Studies of Bolivia, Mozambique and Uganda'. NORAD Report 7/12 Discussion. Oslo: Norwegian Agency for Development Cooperation (NORAD).
- James, A., and D. Aadland (2011). 'The Curse of Natural Resources: An Empirical Investigation of U.S. Counties'. *Resource and Energy Economics*, 33(2): 440–53.
- James, A. G., and R. G. James (2011). 'Do Resource-Dependent Regions Grow Slower Than They Should?' *Economics Letters*, 111(3): 194–6. doi:10.1016/j.econlet.2011.01.029.
- Karl, T. L. (1997). *The Paradox of Plenty: Oil Booms and Petro-States*. Berkeley, CA: University of California Press.
- Karl, T. L. (2007). *Oil-Led Development: Social, Political, and Economic Consequences*. Stanford, CA: Center on Democracy, Development, and The Rule of Law, Freeman Spogli Institute for International Studies, Stanford.
- King, R. (2010). *Baseline Study of Oil and Gas Communities in Ghana*. Network for Women's Rights in Ghana (NETRIGHT).
- KPMG (2013). *Oil and Gas in Africa: Africa's Reserves, Potential and Prospects*. Amstelveen: KPMG.
- Larsen, E. R. (2005). 'Are Rich Countries Immune to the Resource Curse? Evidence from Norway's Management of its Oil Riches'. *Resources Policy*, 30(2): 75–86.
- Maconachie, R., and T. Binns (2007). "'Farming Miners" or "Mining Farmers"?: Diamond Mining and Rural Development in Post-Conflict Sierra Leone'. *Journal of Rural Studies*, 23(3): 367–80.
- Mainguy, C. (2011). 'Natural Resources and Development: The Gold Sector in Mali'. *Resources Policy*, 36(2): 123–31.
- Ministry of Energy (2009). 'Local Content and Local Participation in Petroleum Activities'. Policy Framework for Ghana. Accra: Ministry of Energy.
- Mohammed, A. S., B. A. Kpieta, and E. Owusu-Sekyere (2014). 'Oil and Gas Production, Environmental Health and Livelihood Vulnerability in the West Coast of Ghana'. *African Journal of Sustainable Development*, 4(2): 157–73.

- Neumayer, E. (2004). 'Does the "Resource Curse" Hold for Growth in Genuine Income as Well?' *World Development*, 32(10): 1627–40.
- O'Faircheallaigh, C. (2013). 'Extractive Industries and Indigenous Peoples: A Changing Dynamic?' *Journal of Rural Studies*, 30: 20–30.
- Obeng-Odoom, F. (2014). 'Oil, Sex, and Temporary Migration: The Case of Vienna City, Sekondi-Takoradi, Ghana.' *The Extractive Industries and Society*, 1(1): 69–74.
- Ogunleye, E. K. (2008). 'Natural Resource Abundance in Nigeria: From Dependence to Development.' *Resources Policy*, 33(3): 168–74.
- Okuthe, I. K. (2015). 'Environmental and Social Challenges of Oil and Gas Exploration in Kenya.' *International Journal of Innovation and Scientific Research*, 17(1): 164–74.
- Olsen, A. (2013). 'No Country Has Achieved 90% Local Content.' *Offshore Ghana Magazine*, 11: 20–1.
- Petroleum Commission (2016). 'Local Content Development and Upstream Petroleum Activities.' Annual Local Content Workshop. Accra: Petroleum Commission.
- Rosser, A. (2006). *The Political Economy of the Resource Curse: A Literature Survey*. IDS Working Paper 268. Brighton: Institute of Development Studies, University of Sussex.
- Rostow, W. W. (1990). *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press.
- Sachs, J. D., and A. Warner (1995). *Natural Resource Abundance and Economic Growth*. Cambridge, MA: National Bureau of Economic Research.
- Smith, S. M., and P. T. Dorward (2014). 'Nationalised Large-Scale Mining, Trade Unions and Community Representation: Perspectives from Northern Madagascar.' *Resources Policy*, 40(0): 31–41.
- Stevens, P., and E. Dietsche (2008). 'Resource Curse: An Analysis of Causes, Experiences and Possible Ways Forward.' *Energy Policy*, 36(1): 56–65.
- Tordo, S., M. Warner, O. E. Manzano, and Y. Anouti (2013). 'Local Content Policies in the Oil and Gas Sector.' World Bank Study. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0.
- Tullow (2012). *Annual Corporate Social Responsibility Report*. Accra: Tullow Ghana.
- Warhurst, A. (2005). 'Future Roles of Business in Society: The Expanding Boundaries of Corporate Responsibility and a Compelling Case for Partnership.' *Futures*, 37(2–3): 151–68.
- World Bank (2004). *The Extractive Industries Review*. Washington, DC: World Bank.

Mozambique—Bust before Boom

Reflections on Investment Surges and New Gas

Alan R. Roe

1. Introduction

This chapter is a follow-up to an earlier paper that looked in broad terms at many of the issues that today face Mozambique—a country that is expected to shortly benefit from very large volumes of new natural gas discoveries (Roe 2018).

Section 2 below describes the investment surge that has already been prompted by the new gas discoveries. Section 3 summarizes some recent literature that examines the effects of such surges in other country contexts. Section 4 then looks at some of the economic numbers that have been attached to the likely boost to Mozambique's economic activity as a result of huge volumes of new gas production. Section 5 describes the main aspects of the disappointing economic outcomes that have so far been seen through 2018. Section 6 selectively analyses some of the implications of these outcomes for future policy. Section 7 concludes the chapter by exploring the epidemiology of a large public investment surge—an issue relevant to the further surge that is still anticipated. In following this sequence of argument, the chapter throws light on a number of more general questions that arise in the context of this volume. In particular: how well prepared are the authorities to deal with the revenue volatility associated with their resource wealth? Has public sector project selection been cognizant of the nature and time horizons of natural resource revenues? And is public expenditure management more generally well oriented to manage those resource revenues?

2. Mozambique's investment surge post-2010

First, what do the data show? National accounts data (Figure 8.1) for the period from 2005 through 2016 clearly indicate the unique nature of the period after 2010. Prior to that, the investment share of gross domestic product (GDP) in Mozambique had typically hovered at or below 20 per cent of GDP, with much

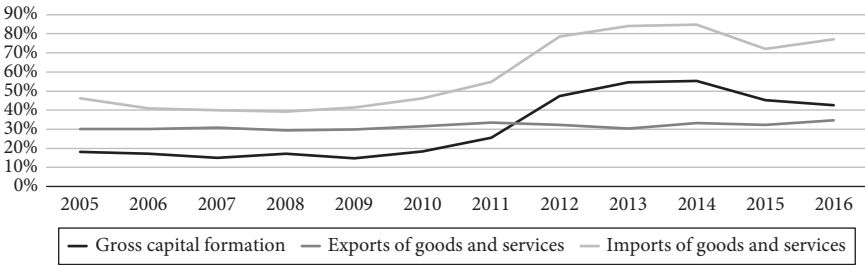


Figure 8.1 Investment shares of GDP, 2005–16

Source: Author's illustration, based on data for Mozambique from the United Nations Statistical Office, <https://unstats.un.org/unsd/snaama/resQuery.asp>.

lower figures in the years prior to the 1992 peace settlement: as low as 3–5 per cent (mid-1980s).¹ By contrast, in the five years after 2012, the investment share of GDP was well in excess of 40 per cent. Recent IMF projections suggest that even higher investment rates may be seen through 2019 (see later in this section). This big change was associated mainly with a strong surge in foreign direct investment (FDI) arising from the initial outlays for the LNG developments described in the earlier paper.

In a recent detailed analysis, Toews and Vezina (2017) assessed the relationships between the initial and large surge of FDI associated with the gas discoveries and the further FDI that has been attracted to Mozambique as a consequence. Specifically, using a project-level FDI data set compiled by fDi Markets,² they find across countries in general, ‘that in the two years following a large discovery, non-extraction FDI inflows increase by 58 per cent, the number of FDI projects increases by 30 per cent, the number of sectors targeted and of source countries increase by around 19 per cent and the number of jobs created increases by 54 per cent’ (Toews and Vezina 2017: 3).³ In short, an FDI surge based on extractives generally results in a parallel boost to non-extractive FDI. The underlying hypothesis based on earlier research by Alfaro and Charlton (2013) is that the development potential of FDI is often associated with quality FDI in the non-extractive sectors (especially services and manufacturing) rather than in the extractive industries alone: a point that was elaborated also in Roe (2018: section 3).

Additional to this FDI activity, Mozambique from about 2013 should have experienced a significant additional increase—this time in *public* investment activity—associated with the very large external loans to various government-linked organizations contracted on the assumption that Mozambique would quickly become a global gas exporter. In spite of audit activities subsequently

¹ But it occasionally exceeded 30 per cent in a few later years as particular mega-projects were developed.

² Part of the Financial Times Group; see fDi Intelligence (2016).

³ This is an effect that they further argue is stronger in poor countries with weak governance.

organized around the loans (reported to be as high as US\$2.32 billion), considerable uncertainty still surrounds them. They seem to have been contracted in complete disregard for the standard principles of good public project selection—a point relevant to one of the questions posed at the end of Section 1. Certainly there was a stark inconsistency in these loans, in terms of both their magnitudes and their maturity structures, relative to what was then known about the volume and timing of the revenues from natural gas.

These loans contracted at the end of the era of President Guebaza in 2013–14 are described in more detail in the earlier paper. In the absence of the audit results, it is not possible to numerically square the large amounts involved (~20 per cent of the country's GDP) with the already large investment boost that is visible in the national accounts data as shown in Figure 8.1. But certainly there should have been some further boost from the investments associated with them.

Significantly, a recent IMF *Regional Economic Outlook* (IMF 2018b) presents projections suggesting that the unusually high investment rate shown in Figure 8.1 may actually be exceeded in the period through 2019. Specifically, the investment rates shown by the IMF for Mozambique for 2018 and 2019 are 54.7 per cent and 86.3 per cent of GDP respectively.

3. The effects of an investment surge

The older literature on development based on early growth theories would have anticipated a strong and unambiguously positive effect of increased levels of investment on a country's rate of GDP growth.⁴ It is noted that Mozambique was a star performer, certainly in African terms, in the late 1990s and through the first decade of the new millennium. However, there is no evidence in the numbers shown above of the growth spurt that might have been expected to result from the large FDI inflows after 2010 and the other investments associated with significant new public borrowing. Paradoxically, growth in the period since about 2013 has been weaker than at any time in the past twenty years. Further, the projections from the IMF *Regional Economic Outlook* of April 2018 (IMF 2018b) suggest that the growth rate through 2019 will remain below 3 per cent.⁵

There are a variety of special factors than can account for at least some of the lacklustre growth record of the most recent past. These factors are described in the earlier paper. Nonetheless, the co-existence of a very high investment rate with weak growth outcomes remains a significant puzzle.

⁴ For example, in the so-called 'big push' models that were popular in the 1950s and 1960s, but also in most longer-term development plans that many developing economies were producing in that period and that some countries are still producing. See, for example, Rosenstein-Rodin (1961) and Murphy et al. (1989).

⁵ Although later IMF updates now anticipate a slightly better growth performance through 2018.

However, as the recent literature shows, such a combination is not in fact that unusual. In particular, a 2014 paper by Andrew Warner examines data for 124 low- and middle-income countries and probes in detail some twenty-four cases of identifiable *public*⁶ investment booms and their impact on GDP growth in the period 1960–2011.⁷ His results show some small instantaneous impact of the boom investments on GDP per capita. However, that impact is not sustained when the investment boom variable is lagged two to four years.⁸ So aside from the small instantaneous gains, there is little evidence of the ongoing productivity enhancements from increased investment levels that might be expected.

One possible rationale for his results is that the instantaneous gains come from Keynesian-type *demand* effects, especially in countries with under-used capacity. By contrast, the evidence from most of his sample countries is that the *supply*-side effects (of investment on the production function and productivity) are generally weak and more usually non-existent. Why might this be the case? Following examination of three investment boom cases in greater detail (Bolivia, Mexico, and the Philippines), Warner suggested several common features of decision-making in these countries that together result in low-productivity investment:

- a failure to select public investments by reference to sound economic criteria
- a systematic tendency to use over-optimistic predictions of prices, cost, and impacts
- a lack of information at the time of implementation to identify the likely (true) rates of return on investments
- inertia in investment programmes: investments once started are likely to continue to command finance even when the conditions needed for success deteriorate
- a high degree of vulnerability of public investment decisions to abuse for personal or political motives.

It is a plausible hypothesis that Mozambique's recent poor record reflects in part the consequences of most if not all of Warner's five common features of decision-making around public investment. A striking contrast to these three country cases is offered by the cases of Taiwan and South Korea that Warner also examined. He shows that these two countries in particular shared several *positive*

⁶ It is important to note that Warner's study relates to *public* investment. The results do not necessarily carry over to investment in general.

⁷ His methodology differs from earlier cross-country investment econometrics in that it did not seek to estimate the average relation between public capital and GDP over time but rather focused only on those time periods when there were major and identifiable investment drives.

⁸ The coefficients on these variables being statistically insignificant and occasionally with the wrong sign.

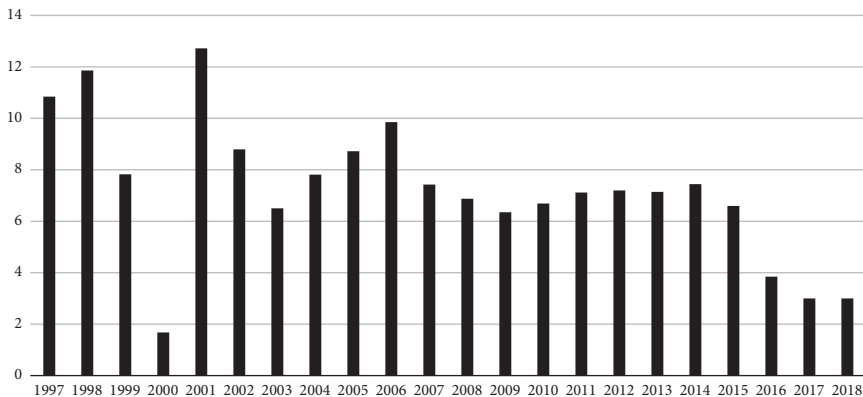


Figure 8.2 GDP growth rates, 1996–2017 (%)

Source: Author's illustration, based on data from the World Bank, <https://data.worldbank.org/indicator/NY.GNP>.

common features of higher levels of investment. In particular larger investments were highly focused, with clearly defined objectives and subject to high levels of discipline to control, for example, cost overruns.

Similar findings more directly relevant to an investment boom based on large oil and gas discoveries have been presented in a recent paper by James Cust and David Mihalyi (2017). They coin the term 'presource curse' to distinguish its propositions from those of the more familiar 'resource curse'.⁹ The presource curse deals with the period that is typically relatively short (but of uncertain duration) between the discovery of any new resource and the start of production. Specifically, they examine 236 giant discoveries of oil and gas (larger than 500 million barrels) in forty-six different countries in the period since 1988.

The results were mixed. Countries that the authors categorized as having weaker political institutions typically failed to achieve not only the IMF forecasts for growth, but also the average growth rates of the countries' own past, which is unfortunately the situation that applies to Mozambique (see Figure 8.2 and the following analysis). But other countries, with stronger institutions, typically see growth rates that at least match those of the past and also conform with the IMF forecasts. So it is a mixed story. Arguably, its most striking aspect is the absence of the *assured* growth bonanza that the public and politicians of most countries discovering new oil and gas reserves typically expect to see. Further, their results tell us that it is merely the *promise* of resource abundance rather than its actual realization that can give rise to any growth-retarding effects that are involved

⁹ The latter focuses on the long-term negative consequences for the economy from resource production and taxation, as a result of factors such as Dutch disease, the corruption of political processes, etc.

in this new variant of the resource curse. These results also seem directly and alarmingly relevant to what has been experienced in Mozambique!

4. Mozambique expectations and realities

In the past two decades, Mozambique has followed a pattern evident also in several other extractive-dependent low- and middle-income countries. Specifically in the period 1996–2012, the country saw a large increase in its percentage dependence on extractives activity measured in terms of exports. Back in 1996 the extractives share of the country's total export earnings was just 6 per cent (metals) and 8 per cent (when coal, oil, and gas are included). By 2012 those numbers had risen to 36 per cent and 72 per cent respectively—a pattern of increase seen also in several comparator countries, including Rwanda, Mali, Tanzania, and Burkina Faso (for details, see Roe and Dodd 2017). The export dependence of Mozambique on extractives further increased through 2014, in spite of much softer prices after 2012 and even though, by that stage, there had been no additional export boost from the newly discovered gas.

However, after 2010 and the new gas discoveries, strong expectations quickly emerged that the additional revenues from natural gas would hugely increase the country's already significant levels of extractive dependence—including in terms of both exports and government revenues. Within a few years of the initial discoveries, the IMF was sufficiently confident about these new prospects not only to construct but also to publish a model that projected the likely future levels of macroeconomic impacts from the natural gas and the associated LNG production (IMF 2016). In brief, they showed the following:

- Assuming LNG production began in 2021, the two main operators (Anadarko and ENI) could eventually construct a total of thirteen onshore LNG trains and four FLNG trains. The total production volume of LNG could reach 89 million tonnes per annum by 2028.
- The average annual growth rate of real GDP between 2021–5 could reach 24 per cent, and the share of the LNG projects in total nominal output of Mozambique could exceed 50 per cent by the mid-2020s.
- The total fiscal revenues from the LNG projects throughout the entire project period until 2045 could reach about US\$500 billion. By the late 2020s, the fiscal revenues from the gas projects could account for more than 50 per cent of total fiscal revenues.

A look back to the dismal growth numbers for the period 2016–18 (Figure 8.2 above) quickly confirms how dramatic the statement in the second of these bullets appears. A reference to IMF comparative data on the government revenue

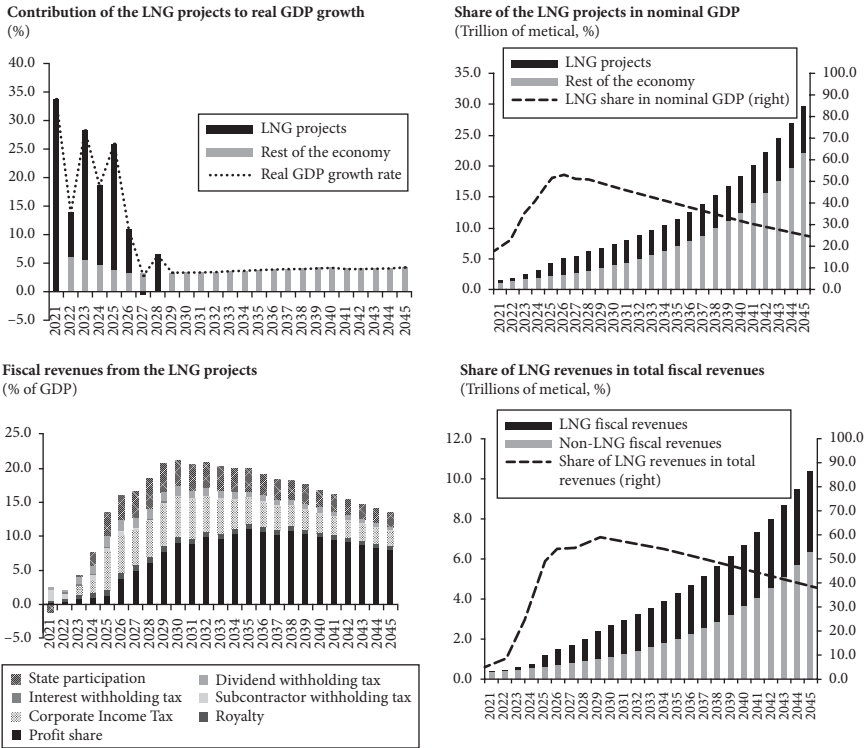


Figure 8.3 Selected numbers from the 2016 projections of the Rovuma benefits
 Source: IMF (2016a).

collections from extractives indicates that the achievement of the 50 per cent shown in the third bullet would turn Mozambique into a world leader in this particular respect.¹⁰

These and other, more detailed numbers from the IMF projections as published in January 2016 are shown in Figure 8.3. In terms of export revenues and the future balance of payments more generally, the IMF projections suggested that Mozambique’s dependence on exports of LNG alone would approach 75 per cent by the mid-2020s. This compares with the 68 per cent export dependence for *all* extractives products in 2014, shown in the Roe–Dodd analysis. With the benefit of hindsight, it is questionable whether the IMF should have published these very bullish numbers, given the question marks that would have qualified the projections at the time they were made. There is no hard evidence that the publication of the numbers impacted government decision-making, but certainly they are

¹⁰ In the IMF comparative data for the period 2000–13 (for countries that are either metals producers or have some combination of metals and oil and gas), the best-performing country in terms of the government revenue take from extractives was Botswana, with 45 per cent. No other country in the sample achieved a revenue-take greater than 30 per cent.

more, rather than less, likely to have fostered an optimistic mood within government that may have influenced expenditure and borrowing decisions.

Regrettably, that anticipated economic boost has not yet materialized; the small increase in GDP growth seen in 2017 (following the large collapse after 2015) is attributed mainly to improved coal exports and agricultural production (AfDB 2018). Indeed, in a very real sense, the ‘bust’ has come before the ‘boom’ that the IMF projections and most other commentators were expecting back in early 2016! The unprecedented high investment numbers described above have not been translated into anything approaching a boom. Indeed, they have foreshadowed what seems likely to be a sustained period of deep economic difficulty for the economy.

There is an obvious question about what might have been done differently to avoid, or at least moderate, the ‘irrational exuberance’ that has contributed to this difficult situation. The answer relates in part to specific decision-making processes in Mozambique about which we have insufficient knowledge to comment in detail. However, it is reasonable to suggest that these processes (at least through 2013–14) were impaired by some or all of Warner’s common failings of decision-making as listed earlier. So, the remedy going forward is to look in detail at these possible explanations and to make corrections as needed.

What we do know with certainty is that the problems to which the unfortunate (presource curse) reality gives rise are manifest most obviously in the country’s *fiscal* situation. We can examine this first in relation to *borrowing*. Standard economic reasoning would suggest that there is a perfectly legitimate case for increased public borrowing in the time period between any major new discovery and the actual start of production of that resource. However, any increased borrowing still needs to be cognizant of both the *fiscal* productivity of the extra spending (i.e. how much extra tax revenue will it generate and how quickly?), and the additional debt service in the period *before* the large expected extractive revenues actually accrue. If we relate this logic to the EMATUM bond issue of 2013, one problem is immediately obvious and should have been obvious at the time when the loan was contracted. The bond issue had a coupon rate of 6.305 and a maturity date of 2020. So even if the very optimistic projections of the IMF (Figure 8.3) had proven to be correct, that loan would have needed to be fully repaid *before* even one dollar of the additional gas revenues might have been available in the government coffers. Thus the servicing of the new loan (both interest and capital repayment) between 2013–20 had to impose itself fully on the pre-existing government revenues.¹¹

¹¹ Since that burden of additional debt service in the event could not be met, the solution has been to exchange the original bonds for notes but with a much higher coupon rate (10.5 per cent) and a bullet payment maturity date of 2023.

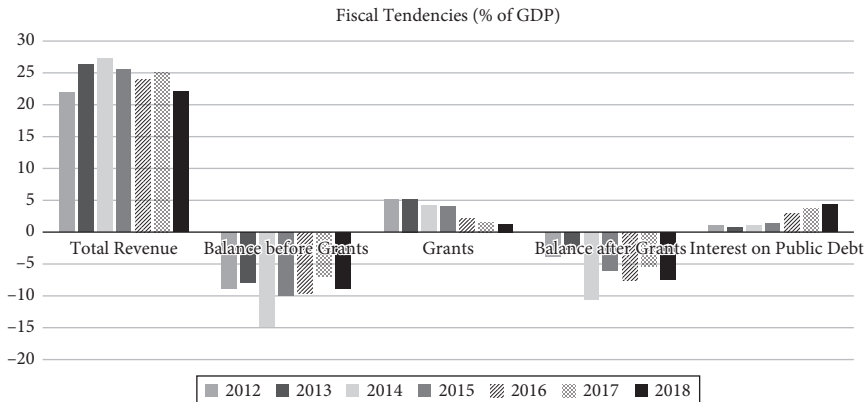


Figure 8.4 Selected fiscal trends, 2012–18 (% of GDP)

Source: Author's illustration, based on IMF (various).

This might not in itself have been such a problem if fiscal revenues more generally had responded in a buoyant fashion to the investment boom that we have described. But this did not happen, in part because there was at best only a limited *direct* tax yield from those investments, and partly because the *indirect* tax yield that might have been expected from an early boost to the growth of incomes and GDP has not materialized (Figure 8.2). Figure 8.4 documents some relevant trends in Mozambique's fiscal revenues in greater detail.

The left-hand panel in Figure 8.4 shows that since 2013–14 the levels of government revenues relative to GDP have been either flat or in decline. There has not been a boost to government revenues anything like sufficient to cover the extra debt service costs that are now called for. Specifically, the interest alone on public debt was already equal to some 20 per cent of total government revenues by 2018 (over 4 per cent of GDP as compared to 1 per cent or less in 2012 and 2013), and is projected to rise to well over 25 per cent of those revenues by 2019 (IMF 2018a). This clearly represents a huge shock to the fiscal accounts and one that has caused a remarkable readjustment of the IMF's own assessment of Mozambique's debt sustainability, as evidenced in the comparative graphics shown in Figure 8.5.

Specifically, the latest available (January 2018) assessment by the IMF suggests that the government now needs to commit almost 30 per cent of its total revenues (net of grants) to meet debt service obligations, but with an even higher level of revenue commitment when the EMATUM balloon payment is due in 2023.¹²

The situation could have been eased somewhat if the *grant receipts* from external donors had held up in the face of the changing situation. But as the third panel in Figure 8.4 indicates, these grants have in fact fallen substantially since 2012. In 2012, 2013, and 2014, grant receipts were the equivalent of 5.1 per cent,

¹² A situation made significantly worse by the rapid depreciation of the metical in 2014–16.

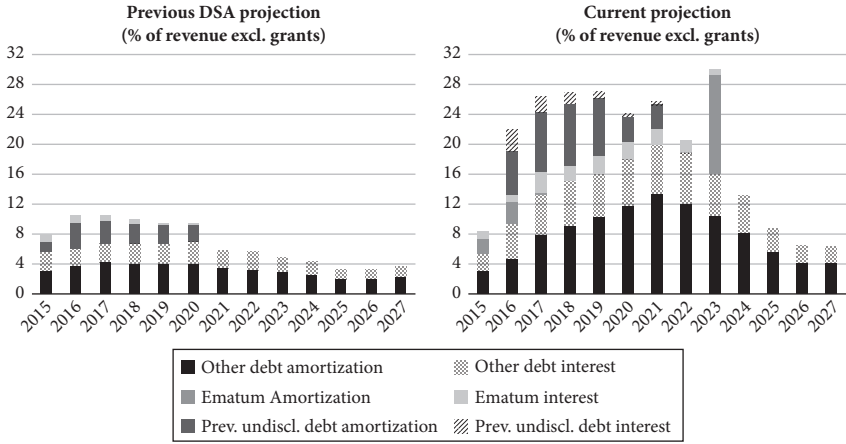


Figure 8.5 IMF debt sustainability assessments

Note: Debt sustainability assessments (DSAs) (left) December 2015, and (right) January 2018.

Source: IMF (2016a)

5.2 per cent, and 4.2 per cent of GDP, respectively. But in the four years to 2018 they have declined to the equivalent of only 1 per cent of GDP, with an even lower figure projected for 2020 (IMF 2018a). The April 2016 suspension of the IMF programme in Mozambique was followed fairly swiftly by similar suspensions or reductions in support from the World Bank and other donors such as the EU, France, the United Kingdom, and Canada. In July 2017, Japan announced that it too was freezing £100 million in grants and loans pending a new agreement with the IMF. Thus the direct fiscal impact of the new borrowing (~5 per cent of GDP of additional interest payments, as shown in Figure 8.4) has been compounded by the further hit (~4 per cent of GDP) associated with the reduction of grant receipts.

5. A few implications

There are many implications of the abrupt turn-about in Mozambique’s economic prospects since 2016. In this section we consider just a few of these.

5.1 The fiscal starting point

It is now a reasonable assumption that investment and production in both ENI’s Area 4 Coral project and the Area 1 project of Anadarko will be delayed with significant production now unlikely before about 2024. It is reasonable to assume that the profile of outcomes shown by the IMF projections will be broadly similar but with a much-delayed start date in terms of production and extra revenues to government—2024 or 2025 rather than 2021.

So Mozambique will begin the era of new gas production in a very different and much more difficult fiscal situation than was anticipated even three years ago. Specifically, it is likely to enter that era with a *primary* fiscal deficit of over 6 per cent of GDP and an overall deficit including interest payments of around 10 per cent of GDP¹³ (but as high as 12 per cent excluding grants).¹⁴ So, as of the time of writing (mid-2018), the country faces at least six more years during which further high rates of private investment will co-exist with a situation in which there will need to be severe fiscal restraint, ongoing high debt ratios, and initially low growth rates.

Even when the enlarged revenues from the new gas do eventually materialize, they most likely will need to be committed quite heavily to deal with the still high rates of debt and debt service. Indeed, economic theory suggests that it would be in the interests of the country to accept such a prioritization of its own expenditures. See, for example, van der Ploeg and Venables (2017: 10). This is not a proposition that would have been prominent in the Mozambique discussions back in 2016, but with a coupon rate on the newly restructured debt now in excess of 10 per cent and a poor record on domestic public investment decisions, it is difficult to argue against it.¹⁵

5.2 Foregone opportunities

Earlier, pre-2016, analysis had suggested that Mozambique's future gas revenues could enable the country to make a major dent in its chronic social welfare deficits. For example, Witter and Jakobsen (2015) compared the expected annual revenues from new gas—smoothed over a thirty-year period—with an independent assessment of the annual shortfalls of education and health spending.¹⁶ The results of this comparison for Mozambique and five other African countries with major new oil and gas or metals discoveries are shown as Figure 6 in Roe (2018) Mozambique was expected to be in strong position in this regard relative to most of the comparator African countries that were also assessed. Specifically, the anticipated annualized revenues from the new gas would have been fully equal to the size of Mozambique's estimated education financing gap (4 per cent of GDP annually) and to over 50 per cent of its larger health financing gap. Sadly, as we can see from Figure 8.4, these possibilities—at least in the medium-term future—have been fully extinguished by the loss of fiscal space associated with additional

¹³ IMF Article IV (2017a: Table 3).

¹⁴ IMF *Regional Economic Outlook* of April 2018 (IMF 2018b).

¹⁵ A point that gains weight from the fact that Mozambique is now in a weak bargaining position vis-à-vis its creditors.

¹⁶ Based on the amount of spending needed to achieve specific health and education outcomes as explained fully in their paper. See also Witter et al. (2015).

interest costs and the reduction of grant funding from donors: a total squeezing of fiscal space equivalent to some 9 per cent of GDP!

5.3 Macroeconomic choices

The starting point is much worse than was expected but some important principles still govern the macroeconomic choices that Mozambique will face. For example, intertemporal optimizing models of the type developed by van der Ploeg and Venables (2017) lead to the result that *the greater the capital scarcity in an economy, the bigger the fraction of any increment in total assets that should be allocated to domestic capital*.¹⁷ Notwithstanding the large new private inflows expected in relation to the new gas discoveries, the public sector in Mozambique will remain capital-constrained for several more years. Hence, based on this result, any gas surplus when it does begin to emerge should arguably be concentrated first on building domestic capital rather than accumulating balances in, for example, a sovereign wealth fund (see also section 5.4).

The caveats to this conclusion relate to two main factors, namely (1) the presently unsustainable level of the country's external debt, and the strong influence that this accords to external creditors; and (2) major questions about the capacity of the country to decide on, design, and implement sound public investments.¹⁸ The combination of these two factors suggests, first, that in the next few years at least any windfall revenues should be heavily committed to help reduce levels of debt; and second, that even in the absence of the debt-servicing problem, the country would be well advised to build a pipeline of good and economically viable public projects and improve its capacity effectively to manage these. The hard reality of the first of these points is confirmed by the August 2018 proposal by the so-called Global Group of Mozambique's Bondholders that they should be paid portions of Mozambique's future natural gas revenues as part of the restructuring of the country's Eurobonds.¹⁹

5.4 A sovereign wealth fund

The theoretical and practical arguments also combine to suggest implications for a possible sovereign wealth fund (SWF) in Mozambique. The establishment of an

¹⁷ In the limiting case where the country is completely shut out of capital markets, the whole of any increase in assets goes to *domestic* capital formation.

¹⁸ This capacity problem might include, for example, a lack of capacity to design and develop projects; weak arrangements for project selection and cost-benefit processes; and limited capacity to procure, implement, and monitor projects.

¹⁹ Reported in *Further Africa*, 5 August 2018. The group asked not to be identified on the grounds that their proposal had not been publicly announced.

SWF has become almost *de rigueur* for the newly oil-and-gas-rich economies of sub-Saharan Africa, including Mozambique and also Tanzania—a country that faces similar challenges. An SWF is taken as a signal to both local and international observers of a country's seriousness about managing its new resource wealth, including its capacity to resist short-term populist and political pressures to spend quickly. Unfortunately, the lofty rhetoric is often far removed from the realities that surround the setting up and operation of such a fund, and Mozambique's record over the past few years has already undermined its reputation in this regard. Many other things need to happen before the mere establishment of an SWF could play any sort of signalling role as to the country's financial probity.

Nonetheless, Mozambique in recent years has made several partial commitments to the establishment of an SWF. These are described in my earlier paper. However, the radical change in the country's fiscal circumstances means that there is now little possibility or indeed any credible case for establishing an SWF in Mozambique in the foreseeable future. The country now faces several years of significant budget deficits and, given these, it seems inconceivable that its budgetary and political processes would be able to commit even 0.5 per cent or 1 per cent of GDP annually into an SWF. Imagine the political infighting at budget time associated with preserving such an annual transfer (and far less the accumulating balance) untouched. Even in the unlikely event that this were to prove politically possible,²⁰ the amounts involved would be unlikely to be of any real significance to the future generations that they might be assumed to serve. Mozambique's population today is around 30 million, and it has a per capita income below US\$500. So, a 1 per cent annual contribution to an SWF would yield only about US\$150 million annually or US\$1.5 billion over a ten-year period, augmented by interest returns but reduced by administrative costs (that would be high in percentage terms). Given the anticipated rise in population over that ten-year period, this would deliver a per capita amount of around US\$35!²¹

The case against an SWF in the near future is further strengthened not only by the theoretical argument regarding capital-scarce economies, but also by the point that such funds have a number of different possible objectives as spelled out by, for example, van der Ploeg and Venables (2017) and in Roe (2018): to transfer funds to future generations; to establish a 'parking fund' pending a supply of sound investments; and to build a stabilization balance against future extractives volatility. Problematically, these three motives require quite different types of

²⁰ Similar challenges have proven too much for other countries, such as Ghana and especially Chad. See, for example, Bawumia and Halland (2017).

²¹ A 2016 blog compared the cases of Norway—the benchmark of successful SWFs—and Tanzania. In twenty-five years, the Norwegian SWF had accumulated assets that had grown to US\$1 trillion by the end of 2017. That is equivalent to US\$178,000 for every one of Norway's five million inhabitants (adults and children), or more than US\$700,000 for a typical family of four (Roe 2016). SWFs in Tanzania and *pari passu* Mozambique are in fundamentally different situations from that of Norway's SWF, and in no realistic sense can they draw on the Norwegian SWF as their model.

investment funds of foreign assets (e.g. short-term maturities for the ‘parking fund’ but longer-dated securities for supporting future generations). Not only does this complicate the administrative challenge of running the SWF, but it might also mean that the fund needs multiple legal structures and investment mandates, even if for reasons of administrative convenience these are all managed by the same government agency.

Once Mozambique has passed through the difficult medium-term period of fiscal adjustment that now seems unavoidable and there is some emerging fiscal space, there would be a case for establishing some sort of stabilization fund to help manage future gas/LNG price volatility. Thus far the authorities seem not to have adequately recognized the inherent difficulties of managing their risks of revenue volatility. But this does not seem to be an issue that can be addressed in the near-term future through the use of an SWF. Similarly, there may be a case for a parking fund—but only in the medium term—as gas revenues build. In the meantime, Mozambique needs to rely on more traditional counter-cyclical fiscal measures to address future commodity price cycles, but to do so subject to the pre-existing constraint of a major ongoing fiscal deficit.

5.5 Investing for structural transformation

Capital scarcity combined with the sobering experience of the poorly conceived public investments of 2013–14 conveys a strong message about the need for a significantly different Mozambique approach to public investment: an approach that would be both more strategic and more conscious of the longer-term objective of structural transformation. It must surely be recognized—notwithstanding the immediate pressures of the fiscal deficit—that *extractives activity and the revenues they will eventually bring can boost the economy significantly in the next several years, but should not be seen as the long-term future of the economy*. The extractives boost should rather be seen as an opportunity to stimulate a whole range of non-extractive activities that have the potential to continue to generate incomes and jobs into the very long-term future, when the present extractive resources are declining if not fully depleted. In other words, it should be seen as an opportunity to support a major structural transformation of the economy, a transformation that has been seen only intermittently in Mozambique’s past history.²²

²² As shown in the UNU-WIDER paper (Cruz and Mafambissa 2016), around 80 per cent of Mozambique’s labour force is still engaged in agriculture, livestock, forestry, and fisheries, and working with low-productivity technologies. Notwithstanding the high rates of GDP growth achieved in most years since the turn of the millennium, the manufacturing share of GDP stood at only 9.4 per cent by 2016 an almost identical figure to that recorded in 2001.

A recent Chatham House paper by Paul Stevens et al. (2015),²³ reminds us in general that extractives are always a depletable resource (even though the time horizon for depletion can be very long in some cases). Because of this reality, other productive activities will in time need to replace them. This reality opens up a very wide range of new policy challenges for Mozambique, as for other governments hosting major extractives resources. This is because it requires a significant level of buy-in by, and coordination between, a wide variety of government ministries and agencies, involving not only the mainstream agencies—finance, planning the central bank, etc.—but also the set of agencies that deal directly with petroleum, gas, and/or minerals (such as MIREM, ENH, INP, and ENHL).²⁴ This is particularly pertinent in relation to Mozambique’s national oil company, ENH, given its central role in the financing of the new gas investments, and the very large downstream investments for which it will be responsible.²⁵

A broader take on the transformation agenda is obtained by noting the lessons from international experience, as expounded by Östensson (2017), that in many countries such as Mozambique there is often a great deal of knowledge of exactly *why* rates of business start-ups and supply responses more generally are so relatively weak—even in spite of the stimulus of very large new investments in some few sectors such as extractives. The causes include the generally poor climate for doing business, the numerous additional constraints that confront small and medium businesses, the weaknesses of credit availability and costs, inadequate infrastructure, numerous disincentivizing weaknesses in the regulation and taxation of businesses, and more. Much of this litany certainly applies in the case of Mozambique. This being the case—and given the long-term vision referred to above—it may be much better to prioritize systematic programmes to address these business climate constraints than to emphasize apparently easier (but narrower) policy devices of, for example, fixing local content targets directed narrowly at a few extractives companies.

So to conclude on this point, the future public investment challenge for Mozambique can be argued to involve *three* main elements. First, it is vital to put in place much improved arrangements for the management of public investment in the context of a sound *overall* medium-term framework for public finance management. A useful recommendation for Mozambique to pin down greater

²³ As further developed by Lahn and Stevens (2017).

²⁴ Ministry of Mineral Resources and Energy; Empresa Nacional de Hidrocarbonetas EP; Instituto Nacional de Petróleo; and Empresa Nacional de Hidrocarbonetas Logistics, respectively.

²⁵ See also the useful analysis of national oil companies by Heller et al. (2014). In view of the present uncertainties about the timing of the gas investments in Mozambique, it is not fully clear how large will be the revenue take that will accrue at least initially to the ENH once the large LNG revenues begin to materialize. However, a limited insight into this is available from the IMF fiscal data projections shown in Figure 8.3. Even if ENH receives *only* the element of total revenues referred to in Figure 8.3 as ‘state participation’, it would still be receiving the equivalent of 3–5 per cent of GDP annually over the life of the LNG activities.

detail on this matter would be to arrange for a diagnostic (based on an application of the NREGI's well-tested Benchmarking Framework)²⁶ to identify where existing practices/processes most need improvement.²⁷

Second, there is a need for a high-level vision of the future structural possibilities based on the new gas and the country's need for long-term economic transformation. That vision would not only define the long-term economic future to which the country can aspire, but also try to find ways to sustain this vision consistently, in spite of the many short-term pressures, political factionalism, and election-driven incentives that will undoubtedly be capable of dislodging it.²⁸

Achieving an institutional structure that could produce and sustain such a vision would be no easy task in a country such as Mozambique, which struggles with many factional elements (some regionally based) in its governance arrangements. But recognizing the *need* for a change of approach among a core of senior politicians and administrators would be a useful first step. Further, at a time when the fiscal pressures will force many difficult decisions, it may well be opportune to look for a unity of long-term purpose that might otherwise be elusive. Some earlier Mozambican efforts relevant to this proposition are described in the earlier paper (Roe 2018).

Third, it would be useful in the context of an ambition to use extractives to catalyse more rapid structural change to develop a concerted attack on the many (known) constraints in the business environment that hold back a larger supply response to new opportunities. This is a more difficult policy agenda both to design and implement than would be a mandated programme of local content requirements. But given the numerous sectoral multiplier effect ripples that follow potentially from a large FDI boost in a sector such as extractives it would be likely to have a much larger pay-off in terms of both new jobs and broader development.

6. The epidemiology of the investment boom problem

This chapter has documented some of the seriously disappointing outcomes that have emerged in the wake of Mozambique's investment surge: a 'bust' has indeed

²⁶ It has so far been used in Ghana, Myanmar, Nigeria, Sierra Leone, and Tanzania, and in a partial fashion elsewhere.

²⁷ In addition (but not discussed in this chapter) is the significant challenge arising from the way the country is managed/administered from the capital down to the local level from a PFM perspective, both in terms of mitigating negative impacts and leveraging potential positive impacts.

²⁸ In drafting this paragraph, I am conscious of the present chapter's omission of any discussion of the many complex and dangerous political economy problems that have the capacity to derail even the best of economic strategies. This gap can be redressed in part by reference to several sources that focus on the presently difficult political economy of Mozambique, including the Bertelsmann Institute (2016). The problems to which that paper refers have been rendered much more worrisome by the intensification of violent attacks in 2018 (including house burnings and beheadings) by extremist groups, especially in the Macomia District in the northern Cabo Delgado province (Opperman 2018).

preceded any significant ‘boom’. All the indications now are that a further surge in investment will occur in the next few years as the production in the major natural gas fields begins. Given this outlook for the next few years, this chapter concludes by summarizing the epidemiology²⁹ of a public investment surge as discussed more fully in my earlier paper: namely the various linkages in the chain of events that run from a possible surge in private and public investment and into other components of a country’s macroeconomic and fiscal situation.

In conducting this analysis, this final section draws heavily on the modelling presented in a paper by Buffie et al. (2012) that was developed to enhance the IMF’s DSA.³⁰ Their model suggests several components/weaknesses of the transmission mechanisms (from an investment surge to economic growth) as follows.

6.1 Macroeconomic problems

A public investment surge (e.g. possibly in response to a new extractive discovery and the FDI that results from that) could in principle *crowd-in* further private activity and so be a very positive force for stimulating enhanced rates of growth. But that crowding-in effect will work in textbook fashion only if certain familiar macroeconomic difficulties are well managed: especially the following:

- Public investment choices are made to avoid poor (infra-marginal) projects with low rates of return.
- The absence of absorptive capacity constraints in the economy that can raise investment costs and lower the returns on any new public and private investment. Most economies will be pushed nearer to any such constraints by enhanced levels of FDI.
- The avoidance of a real exchange rate appreciation that would generate off-setting negative pressures on the economy’s traded sectors. Once again, in most economies enhanced levels of FDI will put some upward pressure on the real exchange rate and further public investment could easily work to exacerbate such effects.

To ward off the various potential problems suggested by this listing, Mozambique requires a high-quality capacity in economic analysis, modelling, and forecasting that could provide informative forward-looking information

²⁹ Epidemiology being ‘the study of how diseases occur and spread and the strategies that can be engaged to manage and limit the effects of such diseases’ (*British Medical Journal*).

³⁰ Their model uses a neoclassical production function in which both public and private capital are productive. But it also builds in parameters that recognize explicitly that spending on public investment does not always imply a commensurate increase in the *stock* of (productive) public capital: because of leakages caused inter alia by intra-marginal projects or possible absorption problems.

better to guide fiscal policy, but also macroeconomic policy more generally: for example, by anticipating the problems associated in particular with the second and third bullet points above.³¹ Such capacity is very rare in African countries, as was confirmed by the recent AfDB study on the topic (AfDB 2017). But the modelling technologies do exist and the capacity in the country could be developed/strengthened, provided there was a sufficiently strong commitment from senior policymakers.

6.2 Fiscal financing problems

In the absence of immediate and adequate new revenues from the extractives discoveries, the funding of any public investment surge requires by definition some mix of higher *tax* revenues, higher levels of *borrowing* (concessional, non-concessional, domestic, or external), or more *foreign aid*. However, that unavoidable reality runs into various problems including the following:

- The likelihood of an increased *tax-take* is undermined by the same caveats shown above, namely that there may be crowding-out effects, and in addition by the fact that most direct benefits from enlarged public investment—even if generally positive—accrue to the private sector. In reality, as in the case of Mozambique, the marginal collection rates (i.e. the tax collections on a typical extra unit of private activity) are typically low. See, for example, Toews and Vezina (2017).
- Although the imposition of user fees on new public infrastructure can mitigate the problem of low marginal rates of tax collection, such fees are rare in lower-income countries and collection rates even when user fees are imposed are typically poor.
- Some of the most strategically important public investment in the future will need to be in human capital and sub-national institutional changes, and such investment is unlikely to yield significant short-term gains in tax revenues.

The mitigation of problems in this area requires the modelling/projection capacity to incorporate realistic estimates of how particular possible public expenditures will influence future rates of growth, and the likely enhancement of the additional tax-take that may result from such growth, taking into account the

³¹ The absence of transparent revenue forecasting commonly results in unrealistic expectations of immediate benefits by both politicians and the public. The uncertainty about the nature of the realistic future is exacerbated by the lack of forecasting capacity in most African countries, as documented by the AfDB (2017). That report demonstrates how few African countries have the relevant models to adequately address the forecasting task.

inherent difficulties just listed. This enhancement would, of course, be complementary to ongoing efforts to improve the effectiveness of tax administration in general.

6.3 Transition problems

Even if any new public investment programme is self-financing in the long run, there may be difficult transition problems, such as a need for short-term increases in tax rates that could further harm private activity. As the Mozambican experience after 2014 illustrates, there are in principle several ways to deal with these transition problems including the following:

- Additional *concessional borrowing* (and/or aid) could in theory limit the need for a difficult fiscal adjustment. However, as evidenced by the actual outcomes in Mozambique after 2014 (see Figure 8.4), these sources of funding are just as likely to diminish as increase in amount following an extractive windfall.
- Additional *domestic borrowing* may also provide some help, but the magnitude of such help is seriously limited because: (1) it generates no additional resources for the country's balance of payments and so any *public* investment surge so financed is likely to be accompanied by declining *private* investment plus consumption; and (2) in thin financial markets such as those in Mozambique, significantly increased domestic borrowing seems certain to cause harmful interest rate increases.
- Additional *non-concessional borrowing*, as the Mozambican authorities have found, can limit the need for a difficult fiscal adjustment *initially*, but even so such borrowing has to be consistent in amount with various possible inefficiencies of the public investment if unsustainable debt dynamics are to be avoided.

This logic may not be of much immediate comfort to the policymakers who now need to deal with Mozambique's currently difficult macro and fiscal adjustment: any comfort they can draw from increased extractives revenues is still several years away. But at least that logic does help to emphasize one of the main messages from this chapter, namely that future public investment has to be much more carefully and strategically managed than in the past. In the absence of significant public funds to spend on development priorities such as improved public infrastructure and other public spending to complement the arriving FDI, the onus falls much more on *qualitative* improvements to the public sector institutional arrangements. These improvements in turn hinge on making any public spending and policy activity more productive in themselves and also more effective in

leveraging the many new opportunities that the future extractives boom will stimulate.

How exactly this general message about public policy translates into specific policies and actions is beyond the scope of the present chapter, but is addressed in some depth by other authors (see, for example, Dietsche and Esteves 2018). However, the component ingredients of the appropriate policies/actions would include skills development, general business development and support, arrangements for shared infrastructure and other partnering activities with the private sector, and a coherent structure for encouraging more downstream activity.

Finally, we can return to the various questions posed in our introduction to this chapter. The analysis above suggests that Mozambican policymaking to date has not been well attuned to the very difficult (and new) issues that are associated with a major increase in natural resource wealth—either in terms of the public expenditure choices that this increase requires or in terms of the broader long-term planning and new fiscal and other policy stances that are ideally called for. Hopefully this chapter provides a framework for thinking about the component issues and some embryonic ideas for improved arrangements in the future.

Acknowledgements

I am grateful for helpful comments on an earlier version of this chapter that was presented at the UNU-WIDER Workshop on Natural Resources, Industry and Structural Transformation in Africa, Helsinki, 24 May 2018, and to the informal Macro Scrum held at Oxford Policy Management in June 2018. The suggestions from Finn Tarp, Tony Addison, Chris Adam, Evelyn Dietsche, Gerhard Toews, and Alfred Pijuan were particularly helpful. Subsequent comments from John Page have led to some significant changes for which I am most grateful. I do of course accept full responsibility for any remaining errors of fact and interpretation.

References

- AfDB (2017). *Running the Numbers: How African Governments Model Extractives Projects*. Abidjan: AfDB.
- AfDB (2018). *Mozambique Economic Outlook, March 2018*. Abidjan: AfDB.
- Alfaro, A., and L. Charlton (2013). 'Growth and the Quality of Foreign Direct Investment.' In J. E. Stiglitz and J. Y. Lin (eds), *The Industrial Policy Revolution I: The Role of Government beyond Ideology*. London: Palgrave Macmillan.
- Bawumia, M., and H. Halland (2017). 'Oil Discovery and Macroeconomic Management: The Recent Ghanaian Experience'. Policy Research Working Paper 8209. Washington, DC: World Bank.

- Bertelsmann Institute (2016). *Mozambique Country Report*. Gütersloh: Bertelsmann Institute.
- Buffie, E. E., A. Berg, C. Pattillo, R. Portillo, L.-F. Zanna (2012). 'Public Investment, Growth and Debt Sustainability: Putting Together the Pieces'. IMF Working Paper 12/144. Washington, DC: IMF.
- Cruz, A. S., and F. J. Mafambissa (2016). 'Industries without Smokestacks: Mozambique Country Case Study'. WIDER Working Paper 158/2016. Helsinki: UNU-WIDER.
- Cust, J., and D. Mihalyi (2017). 'The Presource Curse: Oil Discoveries Can Lead First to Jubilation Then to Economic Jeopardy'. *Finance and Development*, 54(4): 37–40.
- Dietsche, E., and A. M. Esteves (2018). 'What Are the Prospects for Mozambique to Diversify its Economy on the Back of "Local Content"?' WIDER Working Paper 113/2018. Helsinki: UNU-WIDER.
- fDi Intelligence (2016). 'The fDi Report, 2016: Global Greenfield Investment Trends' Report. London: Financial Times Ltd
- Heller, P., P. Mahdavi, and J. Schreuder (2014). 'Reforming National Oil Companies: Nine Recommendations'. Report. New York: Natural Resource Governance Institute.
- IMF (2016a). *Republic of Mozambique: Selected Issues*. Country Report 16/10. Washington, DC: IMF.
- IMF (2018a). *2017 Article IV Consultation*. Staff Report. Washington, DC: IMF.
- IMF (2018b). *Regional Economic Outlook, Sub-Saharan Africa, Domestic Revenue Mobilization and Private Investment*. Washington, DC: IMF.
- Lahn, G., and P. Stevens (2017). 'The Curse of the One-Size-Fits-All Fix: Re-evaluating What We Know about Extractives and Economic Development'. WIDER Working Paper 21/2017. Helsinki: UNU-WIDER.
- Murphy, K. M., A. Shleifer, and R. W. Vishny (1989). 'Industrialization and the Bid Push'. *Journal of Political Economy*, 97(5): 1003–26.
- Opperman, J. (2018). 'Mozambique: Shadow Violence that Requires Level-Headed Invention'. *Daily Maverick* 13 June. Available at: <https://allafrica.com/stories/201806130833.html>.
- Östensson, O. (2017). 'Local Content, Supply Chains, and Shared Infrastructure'. WIDER Working Paper 96/2017. Helsinki: UNU-WIDER.
- Roe, A. R. (2016). 'Will Norway's Model of Sovereign Wealth Fund Work in Tanzania? A Reality Check'. Available at: www.wider.unu.edu/project/extractives-development-e4d?query=Roe (accessed August 2018).
- Roe, A. R. (2018). 'Extractive Industries and Development: Lessons from International Experience for Mozambique'. WIDER Working Paper 56/2018. Helsinki: UNU-WIDER.
- Roe, A. R., and S. Dodd (2017). 'Dependence on Extractive Industries in Lower-Income Countries: The Statistical Tendencies'. WIDER Working Paper 98/2017. Helsinki: UNU-WIDER.

- Rosenstein-Rodin, P. N. (1961). 'Notes on the Theory of the Big Push'. In H. S. Ellis and H. C. Wallich (eds), *Economic Development for Latin America*. New York: St. Martin's Press.
- Stevens, P., G. Lahn, and J. Kooroshy (2015). *The Resource Curse Revisited*. London: Chatham House.
- Toews, G., and P.-L. Vezina (2017). 'Resource Discoveries and FDI Bonanzas: An Illustration from Mozambique'. OxCarre Research Paper 199. Oxford: OxCarre.
- van der Ploeg, F., and A. J. Venables (2017). 'Extractive Revenues and Government Spending: Short- versus Long-Term Considerations'. WIDER Working Paper 45/2017. Helsinki: UNU-WIDER.
- Warner, A. M. (2014). 'Public Investment as an Engine of Growth'. IMF Working Paper 14/148. Washington, DC: IMF.
- Witter, S., and M. Jakobsen (2015). 'How to Use Natural Resource Revenues to Improve Health and Education in Africa'. Flagship Paper 4. Seattle, WA: African Development Bank, with the Bill and Melinda Gates Foundation.
- Witter, S., R. Outhred, A. Lipcan, and D. Nugroho (2015). 'How to Use Revenues from Extractive Industries to Improve Health and Education in Africa'. Flagship Report 4. Seattle, WA: Bill and Melinda Gates Foundation and AfDB.

The Construction Sector in Mozambique

*António S. Cruz, Francisco Fernandes, Fausto J. Mafambissa,
and Francisco Pereira*

1. Introduction

The construction sector in Mozambique has long played an important role in the economy, with an annual average growth rate of 12.8 per cent between 1993–2015. However, this sector proved to be vulnerable to economic fluctuations such as those which emerged after 2014 with the macroeconomic and debt crisis, and faces challenges which will have to be addressed through long-term sector policies.

International experience shows that investment in infrastructure and human capital can play a key role in economic development by enabling expansion in activities, deeper intersectoral integration, and structural transformation in the long run. However, when countries face high construction costs, this can negatively affect the quality of public infrastructures, as is the case for road networks. Moreover, bottlenecks affecting construction companies prevent them from expanding their production, which leads to an increase in costs and prices when there is a surge in demand.

As evidence indicates that Mozambique is experiencing similar trends to other countries, this study aims both at identifying the main bottlenecks affecting the construction sector, and at presenting policy measures that could reduce production costs and enable this sector to respond to increases in demand.

After the introduction, Section 2 presents the conceptual approach to construction and development, while Section 3 briefly describes the evolution of the Mozambican economy. Section 4 presents the construction sector's historical background, economic structure, and dynamics; the structure of construction and building materials companies; construction costs; and procurement issues. Section 5 identifies bottlenecks and advances recommendations, and Section 6 summarizes the findings of the study.

2. Construction and development: conceptual approach

The construction sector—civil and public works—has a broad value chain in terms of both production and labour market (Figure 9.1). The sector uses a wide

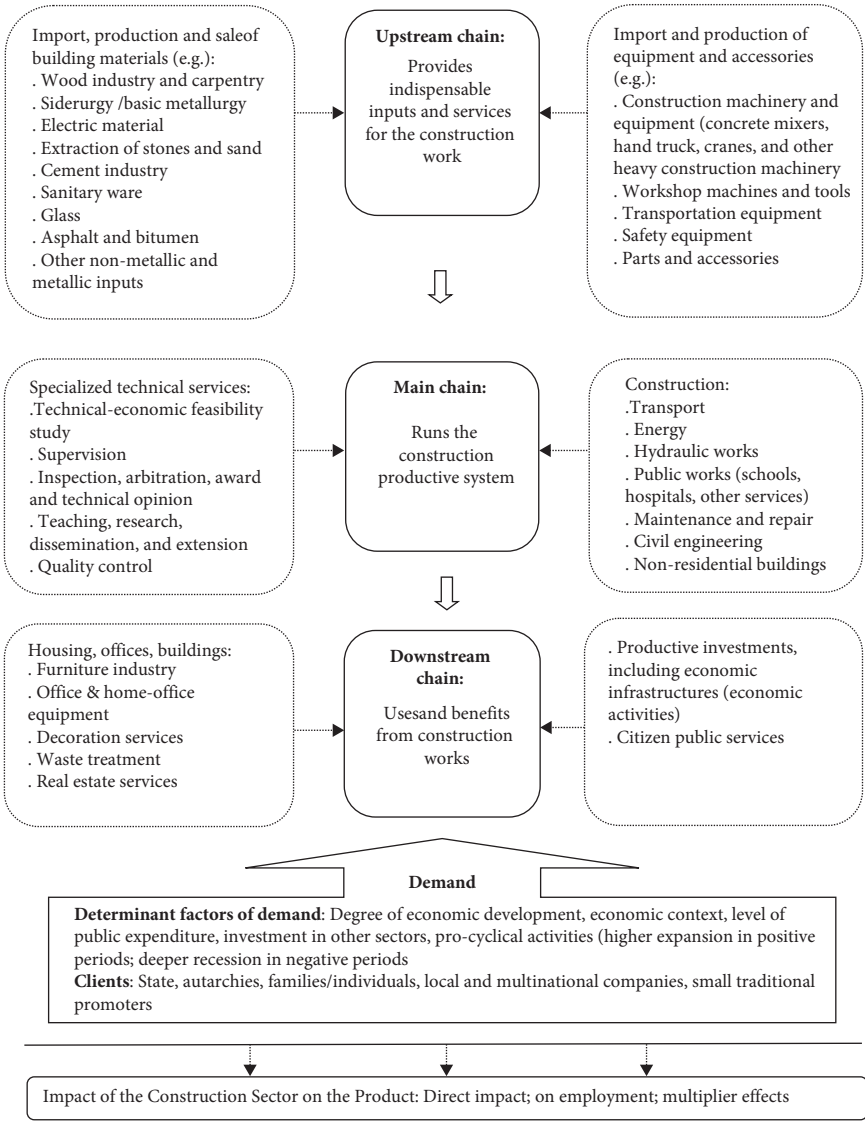


Figure 9.1 Construction sector production chain
 Source: Authors’ illustration based on personal experience and Perobelli et al. (2016).

network of inputs, while providing positive externalities to other activities and generating multiplier effects upstream and downstream due to features such as:

- wide and diversified range of clients—public, semi-public, and private large, medium, and small companies, down to self-construction
- diverse range of products, from traditional housing to roads, smart buildings, and dams

- multidisciplinary engagement of specialties and technologies to deal with concrete, water, electricity, soils, carpentry, and built-in machinery
- a diversified offer from companies with large means, capacities, and technology alongside companies with a limited use of advanced technologies but abundant use of labour.

The role of the construction sector in economic dynamics and structure has been studied for various countries (Perobelli et al. 2016). The following aspects are seen as relevant for Mozambique and are being further explored:

- While national economies experience cyclical trends, either positive or negative, construction tends to have a pro-cyclical reaction, with expansions more marked than those of the global economy in positive phases of the cycle and deeper recessions in negative periods.
 - Mozambique presents evidence of a 12.8 per cent average annual growth rate for the construction sector, when the gross domestic product (GDP) was expanding at 7.9 per cent in the period 1993–2014. More recently, construction grew 1.1 per cent in 2016, when GDP growth was decelerating at a rate of 3.8 per cent (INE 2017a).
- In developed countries there is a tendency to reduce the participation of the construction sector in GDP, with greater reliance on maintenance expenditures rather than on new investments. Conversely, in developing countries GDP growth can be accompanied by an over-growth of the construction sector, relying on greater demand for public works and works to support new economic units.
 - As illustrated in sections below, the construction sector has over-grown compared to GDP, in particular in 1993–2014. Although a lower degree of reliance on maintenance expenditures has been a policy trend for developing countries like Mozambique, it is debatable whether this is the best approach, or whether alternative policies would be feasible and might lead to better results.
- Promoting the integration of the construction sector with other sectors is a more effective policy instrument than promoting only direct expenditures on the sector.

Construction sector linkages with other sectors in the economy are shown in Figure 9.1. These linkages occur in the following stages:

- Upstream: the larger the capacity of building materials and equipment enterprises, the smaller the need to import.
- Main chain: the activity of the construction sector generates employment and creates added value.

- Downstream: the downstream chain comprises companies producing furniture, household and office equipment; supplying energy, water, sanitation, irrigation, and communication services; providing infrastructure maintenance, decoration, banking, finance, insurance, and legal services. This chain also includes the provision of education, health, and other services to citizens and businesses.

3. Overall evolution of the national economy since independence in 1975

After independence in June 1975, Mozambique went through three major transformations with deep implications for the income levels and general living conditions of its citizens. The first transformation was the implementation of a centrally planned economy based on a one-revolutionary-party state, run by Frelimo.¹ In 1976 an armed conflict began with the former Rhodesia and later with the Republic of South Africa, as well as a civil war² with Renamo.³ From 1975 to 1986 GDP per capita declined by 44.4 per cent, with the level of activity in the construction sector declining, as was happening in many other sectors (Sulemane 2002).⁴

The second transformation began in 1987 when the government introduced a structural adjustment programme,⁵ moving thus from a centrally planned to a market-oriented economic system. After the end of the civil war in 1992, the first democratic and multiparty elections followed in 1994. In the next two decades, political, economic, and social reforms were implemented, developing and strengthening democratic institutions and mechanisms. GDP grew at an average annual rate of 7.9 per cent from 1993 to 2014 (Figure 9.2), while general living conditions in the country improved gradually (Arndt et al. 2016; Committee of Counsellors 2013; GoM 2001; IMF 2004; PoM 2005; Ross 2014; Tarp et al. 2002). Construction activity boomed in this period.

The high-growth period was not enough to lift about half of the increasing population out of poverty (Castel-Branco 2012, 2015; Cunguara and Hanlon 2010; Mosca 2014). The poverty headcount index reduced from 69.4 per cent in 1996–7 to 49.2 per cent in 2014–15, but income distribution inequality increased, as indicated by the Gini coefficient, from 0.40 in 1996–7 to 0.47 in 2014–15, with even

¹ Frelimo is the Frente de Libertação de Moçambique (Mozambique Liberation Front), which has been in power since independence.

² The authors consider this armed conflict a civil war (Arndt and Tarp 2017; Cruz and Mafambissa 2016; Oeter 1997; Pereira 2017), even though there is polemic about it in the literature (Coelho 2004; Gersovitz and Kriger 2013; Ghaddar 2016).

³ Renamo is the Resistência Nacional de Moçambique (Mozambique National Resistance), the armed opposition to Frelimo. It has been the main opposition party in parliament since 1994.

⁴ The decline of 44.4 per cent refers to GDP/capita in 2003 constant prices.

⁵ Programa de Reabilitação Económica (PRE) in the Portuguese language.

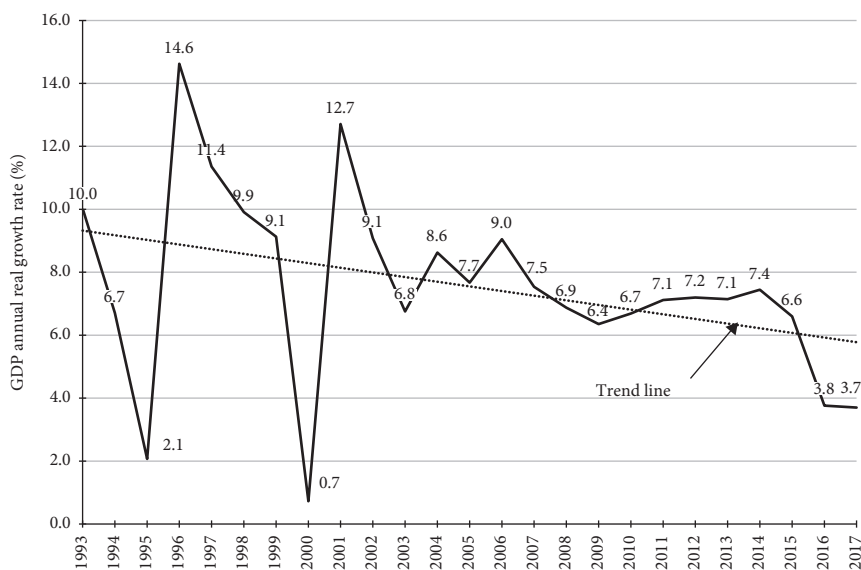


Figure 9.2 High-growth period on average for Mozambique, for about two decades up to 2014

Source: Authors' illustration based on INE (2017a, 2018b).

higher levels of inequality in the larger cities (MEF 2016: 10, 27). From a longer-term perspective, the positive economic and social developments did not yet represent a perceptible structural economic transformation of the country (Cruz and Mafambissa 2016).

From the early 2010s onwards, the policy focus shifted to high-value natural-resource exploitation and to the increase in demand for non-concessional loans for public investment and guaranties. In 2015, the country entered a macroeconomic crisis, mainly due to biased policies, which was aggravated in April 2016 after hidden government debt became known to the public (Francisco 2018; Hanlon 2016; IMF 2016; Wirz and Wernau 2016). At this stage the country had entered the third transformation cycle, with signs of a weaker democratic system. In 2016–17, the annual growth rate of GDP slowed to 3.8–3.7 per cent—close to the annual population growth rate of 3.4 per cent (IMF 2018; INE 2017a, 2018b, 2018c). The construction sector was particularly affected, growing only 1.1 per cent in 2016 (INE 2017a).

4. Construction sector analysis

4.1 Historical background in Mozambique

The construction industry in Mozambique was created in the first half of the 1900s, with the production of cement and bricks (Biggs et al. 1999; Maugeri et al. 2015).

The main construction activities were carried out by non-resident Portuguese companies or by foreign consortia of companies. As Portugal had a tradition of good-quality construction, it allowed the skills development of local craftsmen, which was a source of cheap labour.

In 1974–5, the Portuguese left Mozambique. This mass emigration of company owners, managers, and technicians left the network of companies almost deactivated, including construction companies. The Mozambican government took the opportunity to fill those positions with Mozambicans, by creating Management Commissions⁶ occupied by the most qualified personnel with support from technicians in the state bureaucracy. This decision allowed the companies to continue their operations, employing thousands of Mozambican workers. Construction companies were under the state supervision of the Public Works Ministry.

From the beginning of the regional conflict with neighbouring countries and the civil war in 1976 until the 1992 peace agreement, the construction market was constrained and localized due to the lack of both security and investment funding. These factors added to the inefficient running of state companies, and the restriction of foreign currency imposed by the central bank led to the bankruptcy of many dozens of companies.

After the peace agreement in 1992, the construction sector expanded and contributed to the economic growth in the country. The average share of construction sector value added in total GDP was 2.2 per cent for the entire period of 1993–2016 (Table 9.1). In 1993 this share was only 1.7 per cent, but it increased gradually afterwards, up to 2.3 per cent in 2015. The high rate of expansion of the construction sector between 1993 and 1998 was due to public investment in replacing infrastructures destroyed during the war, the return of private investment in infrastructures—such as the Maputo–Witbank Highway—and large-scale projects, like the rehabilitation of 1,750 km of energy power lines from Cahora Bassa

Table 9.1 Construction growth was particularly dynamic up to 2015, %

(Time periods)	1993–98*	1999–2004*	2005–15*	2016*	1993–2016*
Construction/GDP**	2.8	2.5	1.8	2.1	2.2
Construction value added growth rate***	21.0	6.1	12.0	1.1	12.3

Notes: *Annual arithmetic average in the column; **based on values at current prices; ***based on values at constant 2009 prices.

Source: Authors' calculation based on INE (2017a).

⁶ Comissões Administrativas de Gestão, in the Portuguese language.

Hydroelectric (HCB) power plant, feeding South Africa and Zimbabwe at a cost of US\$175 million (Murison 2003; Ross 2014).

Road networks, railways, and electric-energy lines were reopened and rehabilitated. Development corridors linking Mozambique to the hinterland countries of Malawi, Zambia, and Zimbabwe or to hinterland provinces of South Africa were reopened or newly constructed. Family savings gradually increased, allowing for the expansion of own-account construction. The number of construction and building materials companies increased across the country, and in particular in the Maputo province. Production of woodwork, cement, and metal products increased (Cruz et al. 2014).

Between 1998 and 2004, foreign direct investment (FDI) expanded for new projects: Mozal⁷ aluminium smelter in Beluluane, Maputo province, amounting to US\$1.34 billion; and Sasol natural gas exploitation in Temane, Inhambane province, costing US\$400 million (Andersson 2002; Ross 2014: 27, 28, 31). Most of the aluminium output is exported for the international market and the natural gas is sold to South Africa. These projects are capital-intensive, and are loosely integrated in the domestic economy.

After a period of slower growth in 1999–2004, the construction sector accelerated its growth rate again in 2005–15, to 12 per cent. Besides public investments in infrastructures, foreign capital has been directly invested in the Kenmare Heavy Sands project in Moma, Nampula province, since 2004, and in the Rio Tinto/Vale/JSPL/Beacon Hill mineral coal mines in Moatize, Tete province, since 2007. FDI reached US\$592 million in 2008 (Bank of Mozambique 2017). Since 2009, ENI and Anadarko have been investing in projects exploring natural gas in the Rovuma basin, offshore in the north of the country (Ross 2014). FDI reached a maximum value of US\$6.2 billion in 2013, equivalent to 38 per cent of GDP, and then declined to US\$3.1 billion in 2016 (Bank of Mozambique 2017; INE 2017a).

Up to 2014, the government invested in schools, hospitals, roads, railways, ports, communications, and administration services. Economic growth allowed, and was influenced by, the increase in public investment in infrastructures, contributing to construction activity expansion, in 2010–14 (Table 9.1; Figure 9.3). The influence of public investment on the dynamics of the construction sector has previously been documented (Lopes 2007).

Since 2015, Mozambique has faced a particularly unstable macroeconomic environment, in which economic activity has begun to decelerate, with inflation pressures and the sharp depreciation of the metical⁸ against the main foreign currencies. The metical/US\$ exchange rate⁹ depreciated by 42.6 per cent and

⁷ Mozal aluminium smelter construction phase I in 1998–9, expansion phase II in 2002–3.

⁸ The metical (MT) is the Mozambican currency.

⁹ This depreciation affected other main exchange rates, namely MT/euro and MT/rand.

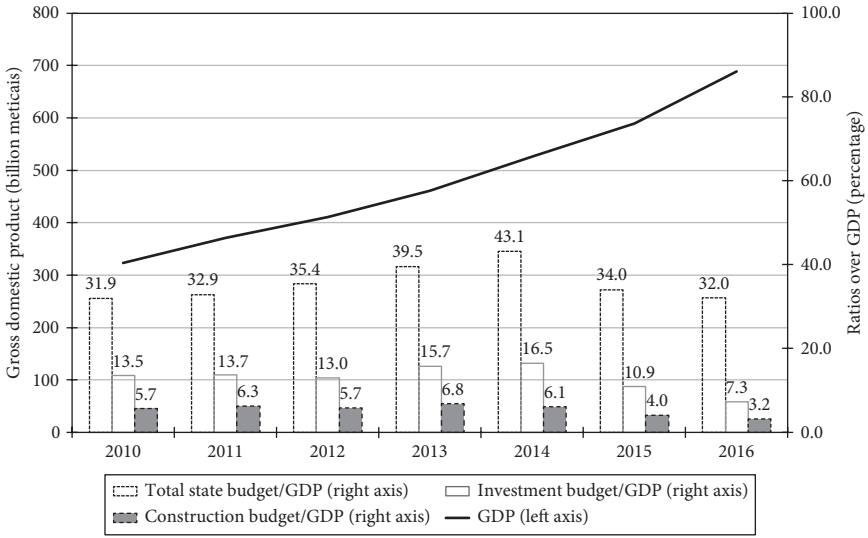


Figure 9.3 Construction volume in the state budget is fluctuating, but was increasing up to 2013

Source: Authors’ illustration based on GoM (2011–15, 2016a, 2017).

57.7 per cent in 2015 and 2016, respectively (Hanlon 2017). The annual inflation rate rose from 10.6 per cent in 2015 to 23.7 per cent in 2016 (INE 2016, 2017c).

Despite the low GDP growth rate of 3.7 per cent expected in 2017, the macroeconomic situation improved modestly, as the exchange rate of the metical against the US dollar appreciated during the year, and inflation decelerated to a single digit, 5.7 per cent in December 2017 (IMF 2018; INE 2018a, 2018b). Nevertheless, imports are still relatively expensive, and construction companies are facing a depressed market demand for building services. The underlying economic and financial crisis in Mozambique since 2015 has affected the construction sector (Table 9.1). The state investment budget has been significantly cut, while most of the private sector has held back new investments, thus reducing demand for construction activities (Figure 9.3). About half of the private contractors are facing pre-bankruptcy, according to the Mozambican Federation of Contractors, in 2018 (FurtherAfrica 2018).

4.1.1 Financing sources for construction projects

After independence in 1975, the main public infrastructures were built or rehabilitated through State Budget funding. From 1993 onwards, most of the funds came from international aid or international concessional loans. Throughout the past two decades, the contribution of domestic public funds gradually increased as a percentage of the investment State Budget (Ross 2014: 147). Exceptionally, the Maputo–Gauteng Transport Corridor was financed through a public–private partnership in the 1990s.

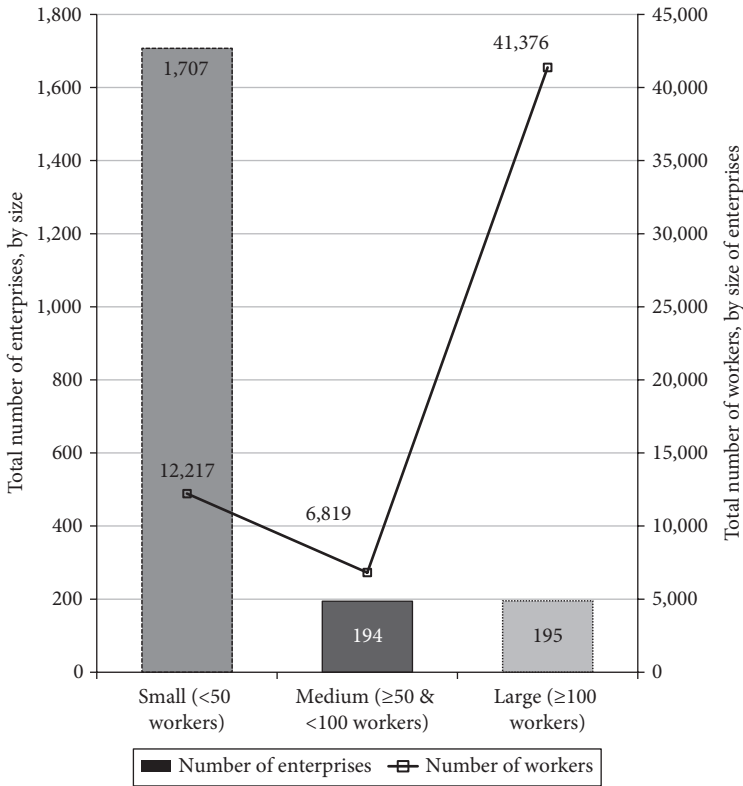


Figure 9.4 Formal small construction companies correspond to 81.4% of the total (2014–15)

Source: Authors’ calculation based on Salvucci (2018); the original income distribution classification comes from Allen and Johnsen (2008: 15).

In the 2000s and 2010s, private funds participated in financing investment in railways which were designed to transport mineral coal from the inland mines to the ocean ports for export (GoM 2014: 26).¹⁰ As of 2010, the government changed its policy and obtained external loans at market interest rates to finance selected public infrastructures (GoM 2014: 9; IMF 2010: 18, 19, 20, 41; Verdade 2010).¹¹

4.1.2 Structure of companies in the construction sector

In 2014–15, there were 2,097 construction companies¹² operating in the formal sector in Mozambique, according to the enterprises census (Figure 9.4). Small

¹⁰ Mozambique’s ‘Integrated Investment Plan (Program): Priority Infrastructures for 2014–2017’ has information on the dimension of public investments, such as road kilometres and power plants’ production capacity, and the total investment cost (GoM 2014: 30, 31, 32).

¹¹ Before 2010, non-concessional external borrowing was negligible (IMF 2010: 18).

¹² This figure includes all statistical units (enterprises and establishments): 2,097 = 1,707 + 194 + 195.

companies with fewer than 50 workers represent 81.4 per cent of the total. However, 68.5 per cent of construction workers are employed in large companies. The information on the total number of construction companies in the formal sector varies according to the source, signalling a shortfall in the quality of data publicly available. For instance, Maugeri et al. (2015) report a total number of 2,493 construction companies in the formal sector, based on a Ministry of Public Works, Housing and Hydric Resources (MOPHRH) source. One explanation for this disparity in the total number of formally registered companies could be the difference in classification.

The number and structure of construction companies in the formal sector, classified by activity type in 2014–15, is as follows:

- 1,164 companies (56 per cent) are dedicated to the construction of buildings.
- 680 companies (32 per cent) work on civil engineering, including services to large infrastructure projects, such as highways, roads, bridges, and water transportation networks.
- 253 companies (12 per cent) are specialized in construction activities, including demolition, preparation of construction sites, electric installations, plumbing, air conditioning, carpentry, plasterboard frames, floors, and various finishing services (INE 2017b: 14).

Companies are classified into seven classes according to various criteria. Two relevant classification criteria, ‘Maximum value of each work’ and ‘Minimum equity capital’, are reported in Table 9.2. In 2014, micro and small construction companies—classes 1–3—represented 67 per cent of the total number of construction companies in the formal sector in Mozambique (Table 9.2).

Most companies are located in Maputo, under classes 1–3 (MOPHRH 2014). The market size and dynamics allowed for a large number of class 1 companies—also considered micro—to operate in Maputo province. Micro companies also operate in large numbers in Sofala and Nampula provinces. Small companies of classes 2 and 3 are mostly attracted to Maputo city and province. The provinces of Inhambane, Nampula, and Sofala occupy the 2nd, 3rd, and 4th places for these small companies.

4.1.3 Institutional features

Construction companies need to be registered at the Registry Notary¹³ in order to develop their activities, presenting documented proof of their technical, economic,

¹³ Companies need to request permission to operate from MOPHRH. The permission—Alvará—should be granted by the Registration Committee. In Maputo city, the Registry Notary is called CREL.

Table 9.2 Number and structure of construction companies in the formal sector, 2014

Class	Classification criteria		Rate charged for issuing the permit*	Number of companies (units)	Share of total (%)
	Maximum value of each work (1,000 MT)	Minimum equity capital (1,000 MT)			
1	2,000	20	0.001	126	6
2	3,400	50	0.0008	210	10
3	10,000	150	0.00032	1,069	51
4	20,000	500	0.00030	272	13
5	60,000	1,500	0.00020	189	9
6	200,000	5,000	0.00012	42	2
7	+ 200,000	10,000	0.00018	189	9
Total				2,097	100

Note: *Applied to the maximum value of each work. The number of companies by class is estimated using the shares given by Maugeri et al. (2015) and applying this to the total of 2,097 construction companies in 2014–15 (INE 2017b). The information in Maugeri et al. (2015) is based on MOPHRH (2014).

Sources: Authors' calculation based on INE (2017b), Maugeri et al. (2015), and MOPHRH (2015).

and financial capacity (ACIS 2008; MOPHRH 2015; Sutton 2014). They pay a permit fee as detailed in Table 9.2.

At present, the Unique Registry falls within the competence of the Functional Unit for the Supervision of Acquisitions, which creates and maintains the Unique Registry of Contractors of Public Works, Suppliers of Goods and Service Providers, as well as providing instructions for the use, maintenance, and updating of the Unique Registry, including by electronic means (GoM 2016b: clause 4). These contractors are eligible to participate in contracting by the state.

National companies benefit from a preferential margin of 10 per cent of the value of the contract, without taxes, for public works contracts and service-rendering on public works tenders (GoM 2016b: clause 28).

In order to follow up on contract compliance regarding works, as well as the provision of goods and services, for state institutions, a National Council for Construction is currently being set up. This advisory body will aim at improving contracts and the quality of works, and promoting the participation of national contractors and technicians in large infrastructure projects.

Given the size of the public budget involved, a Roads Fund (FE) was created to manage public funds used to finance the construction and rehabilitation of roads and bridges. The FE operates with funds from international institutions (e.g. World Bank and African Development Bank) and other countries (e.g. European countries, United States, Canada, Japan), and public funds from Mozambique. This pool of funds finances the activities of the National Roads Administration (ANE), which is in charge of managing investment projects.

4.2 Building materials sector

In Mozambique, there are 184 companies operating in the formal building materials sector (MOPHRH 2014). This is a limited number of enterprises, given the size and dynamics of the construction industry. Only a few subsectors have scale economies, such as the cement companies. Most companies operate in areas with a large volume of activities, and a smaller number operate in fragmented and regional markets. There is a possibility that the number of companies is small due to the existence of other companies operating in the informal sector.

The number and structure of building materials companies in the country, classified by size, are shown in Table 9.3. As the data displayed in the table reveal, the building materials industry is skewed towards micro and small firms compared to the construction industry. In the latter, one-third of companies belong to class 4 or higher, which are medium and large companies. Conversely, 9 per cent of the companies are medium and large in the building materials industry. It is likely that micro and small companies tend to become informal, in order to survive financially.

The latest data¹⁴ from MOPHRH indicate three structural features of the construction sector in Mozambique:

- First, most of the companies operating in the construction and building materials industries are micro, small, and medium. Due to their size and level of experience, it is hard for these companies to compete with international companies from South Africa, Portugal, or China.
- Second, the building materials companies face strong competition from imported materials.
- Third, there is a high concentration of construction companies in Maputo province, while building materials companies are strongly represented in Sofala and Nampula. One hypothesis is that the latter can better compete

Table 9.3 Number and structure of building materials companies

Size	Share of total (%)	Estimated number of companies
Micro (1–9 full-time workers)	57.61	106
Small (10–49 full-time workers)	33.15	61
Medium (50–299 full-time workers)	7.07	13
Large (300 or more full-time workers)	2.17	4
Total	100.00	184

Source: Authors' calculation based on MOPHRH (2014).

¹⁴ Information based on interviews with officials from MOPHRH and working reports, in 2017–18.

with imports from South Africa, due to transportation costs to the centre and north of the country. Moreover, in these parts of the country there are relatively fewer companies in the formal sector.

4.3 Construction sector value chain

The value chain in the construction sector is complex, and imposes a significant cost on this industry. In order for the sector to develop, it would be necessary for upstream and downstream activities to operate in a synchronized way:

- About 15 per cent of the upstream value chain¹⁵ is produced in Mozambique, which includes the wood industry and carpentry, producing floors, frames, doors, and windows; the ceramic industry, producing tiles, roof tiles, and tubing; the cement industry; and the extraction of stones and sand.
- All other upstream components are produced outside the country and are imported, accounting for about 85 per cent of total upstream products. These other products are basic metals, ironmongery, pipes and fittings, sanitary ware, glass, electrical material, fuels, asphalts, bitumen, and other metallic and non-metallic inputs.

The main upstream value chain includes specialized technical services, such as studies and projects, inspection, surveys, laboratory tests, and quality control. For current projects, these services are 100 per cent supplied in the country. But for large projects such as large bridges, dams, or special buildings, these services have to be imported. The downstream value-chain activities are mentioned in Figure 9.1, above.

The importance of knowing the value chain lies in the fact that public policies and strategies can be formulated to encourage local production upstream, mainstream construction, and, sometimes, the national economy. Section 4.4 provides an analysis of the production costs, bottlenecks, and potential.

4.4 Construction costs, household income levels, and procurement issues

Among various construction costs, this study focuses on a selected few as follows:

- housing—representing private construction costs
- hospitals—public

¹⁵ Information based on interviews with officials from MOPHRH and working reports, in 2017–18.

Table 9.4 Household income distribution as a share of total population, 2014–15

Household monthly income level, US\$	% of total population
Up to \$150 (low income)	90.01
\$150–500 (low-middle)	8.75
\$500–1,000 (high-middle)	0.87
More than \$1,000 (high)	0.37
Total	100.00

Note: This income estimation is based on average household expenditure on consumption. Therefore, it may represent an underestimation of income levels.

Source: Authors' calculation based on Salvucci (2018); the original income distribution classification comes from Allen and Johnsen (2008: 15).

- boreholes—rural living conditions
- roads—public, and transaction costs in the economy.

Housing construction and financing is related to household income levels. Based on available information from 2014–15, Table 9.4 shows the household income distribution as a share of total population.

The FinMark Trust considers that formal bank credit benefits only the high-income group in the cities in Mozambique (Allen and Johnsen 2008). The Housing Promotion Fund (FFH) and microfinance institutions provide limited credit for a small share of households across different income levels.

Households in the low-income group in rural areas and in the cities build their own houses, mostly from local building materials. This construction can also be developed by informal building companies. The construction cost of this type of housing is relatively low compared with the cost in the formal construction sector. An international comparison indicates that in Mozambique there was a house-roofing improvement of about 20 per cent, against about 10 per cent in Tanzania and much lower results in Zambia and Nigeria, between the mid-1990s and the mid-2010s (MEF 2016: 81).

The indicators shown in Table 9.5 demonstrate that the proportion of households in Mozambique that benefited from housing quality facilities between 2002/3 and 2008/9 represents an improvement also for lower-income families.

Regarding formal-sector housing construction, an international comparison reveals that construction costs tend to be 34 per cent to 73 per cent higher in Maputo than in the closest neighbouring countries' major cities, Johannesburg and Dar es Salaam (Figure 9.5). In July 2017, a district hospital construction in Maputo city cost US\$2,500/m², which was 34 per cent higher than in Johannesburg, and was even 72 per cent higher than in Shanghai, China (AECOM 2017). Construction costs in Maputo are high due to the costs of importing building

Table 9.5 Proportion of households benefiting from housing quality facilities

Housing facilities	IAF 2002–3, % households	IOF 2008–9, % households
Durable roofing	25.8	30.2
Durable walls	14.2	17.9
Electric lighting	6.9	13.3
Toilet/latrine	11.2	16.0

Notes: Percentage of households out of total number of households at national level. IAF: 'household survey'; IOF: 'household budget survey'. IAF is also a household budget survey.

Source: Arndt et al. (2016) and MPD (2010).

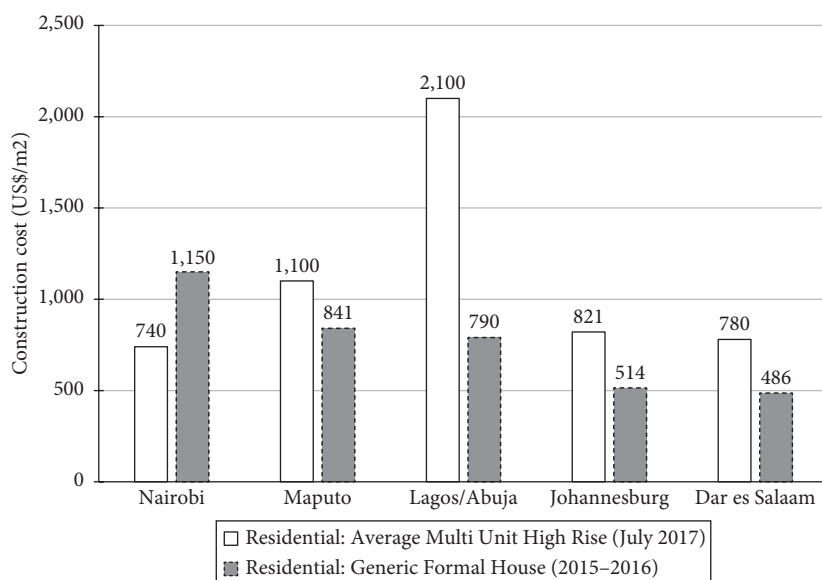


Figure 9.5 Formal housing construction costs are higher in Maputo than in neighbouring cities

Notes: (1) The methodology and sources of information to estimate construction costs are not provided in AECOM (2017). The website <http://www.aqs.org> contains additional information. (2) The 'generic formal house' is a 46m² house plus a 9m² balcony (total 55m²) (CAHF 2017).

Source: Authors' illustration based on AECOM (2017) and CAHF (2017).

materials, machinery, and equipment. Compliance costs (mainly engineers' fees and plan-drafting fees), marketing, finance, and holding costs are also particularly high in Maputo (CAHF 2017).

In 2009, the average cost of constructing a positive *water point* (*borehole*) in Mozambique was US\$8,981, including supervision for a depth of up to 43 metres

(UNICEF 2011). In 2008, the average cost of constructing a negative borehole was US\$13,032.¹⁶ UNICEF considered that construction costs in Mozambique were comparable to those in other countries, except for the cost of pumps, which were more expensive in Mozambique. Danert et al. (2009) provide information on prices or costs,¹⁷ but in some cases do not indicate the depth of the well:

- Kenya: US\$8,400 for a 70-metre-deep well, in 1996
- Niger: US\$10,000 for a 60-metre-deep well, in 2005
- Nigeria: US\$11,700 for a 60-metre-deep well, in 2006.

The World Bank (2005: 83) considered that sinking a borehole with a hand-pump cost:

- US\$10,000 per borehole: Mozambique
- US\$5,000–7,000 per borehole: Malawi, Tanzania, Zambia, and Ghana.

Road construction requires quite detailed specification to allow a meaningful comparison of costs. For instance, it would be hard to compare the average unit cost of US\$751/km for asphalt overlays for three roads—in Cabo-Delgado, Niassa, and Zambézia provinces—in Mozambique for the period 2014–16 with the unit cost of US\$110/km in Tanzania or US\$33/km in the Dominican Republic for asphalt overlays of 40–59 mm in the years 1996–8, since these are two different road types (Collier et al. 2013; MPD 2014).

Alexeeva et al. (2008) provide a useful international basis for comparison. With an average unit cost of US\$278.7/km (2007 dollars), Mozambique was the third-least expensive country among seven African countries for two-lane inter-urban road rehabilitation and reconstruction. Congo (DRC) was the least expensive country at US\$228.9/km, and Kenya the most expensive at US\$955.8/km. Mozambique has high maintenance costs: the average maintenance cost per km of a two-lane inter-urban road was US\$197.1/km in Mozambique, against US\$87.9/km in Zambia. From the same paper (Alexeeva et al. 2008), the average unit cost of asphalt concrete in Mozambique was US\$154.4/m³, while it was US\$182.8/m³ in Tanzania. Portland cement concrete cost US\$160.6/m³ in Mozambique and US\$177.8/m³ in Tanzania. When using a regression model to try to identify factors¹⁸ explaining the unit costs, the ‘government index’—measuring corruption

¹⁶ MCA (2013) and WASHCost (2011) present similar costs. A negative borehole is a ‘non-productive’ one, i.e. ‘dry, low yield, or saline’ (UNICEF 2017).

¹⁷ Danert et al. (2009: 2) mention the difference between price and cost: price = ‘cost + overheads, taxes, profit, and a margin for risk (e.g. dry holes, payment delays, insecurity, and breakdown)’. For the examples provided, it is not always clear if the authors are referring to cost or price (WASHCost 2011).

¹⁸ Alexeeva et al. (2008) discuss other factors which are not mentioned here, such as GDP/capita and fuel prices.

levels—influences the cost of asphalt concrete, and the ‘corruption perceptions index’ from Transparency International also influences both activities. In other words, the higher the corruption levels, the higher the unit cost. Average cost overruns for Mozambique were 18.6 per cent, compared with the lowest-cost county, Congo (DRC), with 12 per cent, and the highest-cost country, Nigeria, with 39.7 per cent.

Collier et al. (2013) also attempt to explain factors—or drivers—influencing road construction unit costs among different countries, and measure the relationship between changes in the drivers and percentage change in the unit costs. These factors are listed here, since they seem to be relevant to Mozambique. In summary, unit costs are higher where there is:

- a higher level of corruption
- more rugged terrain
- a longer distance to markets
- a higher level of country conflict
- weaker public investment capacity
- a poorer business environment
- worse infrastructure quality.

Measures to reduce corruption levels might shift the focus, but might not change the overall trend. For instance, auditing construction projects with regard to the content of cement or clay might lead to an increase in job positions within the projects for family members of officials. When governments implement transparency initiatives by publishing unit costs in order to prevent overpaying, firms tend to collude, creating cartels. This would also increase unit costs.

Examining ‘red flags’,¹⁹ Mozambique presents the highest number among twelve African countries (Alexeeva et al. 2008).²⁰ The highest-frequency red flags for Mozambique are:

- ‘delay in completion more than 30 per cent of the contract duration period’ (time overrun)
- ‘half or more firms buying bidding documents don’t bid’
- ‘contract value more than 20 per cent higher than estimate’
- ‘difference between contract price and read-out bid price is > 10%’.

¹⁹ Red flags are ‘alert indicators of the potential entry points of corrupt activities in the procurement of road sector projects’ (Alexeeva et al. 2008).

²⁰ The countries examined were Congo (DRC), Congo, Ethiopia, Ghana, Kenya, Madagacar, Malawi, Mozambique, Nigeria, Tanzania, Uganda, and Zambia. These comparisons could be more reliable considering that even in industrialized countries there are high-value public infrastructures, with longer delays and much higher construction costs than the original estimate.

Concluding from the literature review on construction costs:

- It is necessary to improve the quality of public information on input statistics, outputs, technical specifications, costs, market prices in Mozambique, and reliable international comparisons.
- Expansion and improvement in housing construction has occurred at all levels of household income. The informal sector seems to supply lower-income housing. Banking and formal-sector credit mostly benefit the smaller group at the top income level.
- Construction costs for formal-sector housing and public buildings tend to be higher than in neighbouring countries. One of the factors is the high import cost of machinery, equipment, intermediate materials, and specialized services.
- Road construction costs in Mozambique are about average compared with the costs for other African countries. However, maintenance costs are relatively high.
- There is a need to improve the business environment such that private companies can operate without fear of arbitrary penalties (Berkel et al. 2018).

5. Construction sector: bottlenecks and recommendations

The construction industry has great potential to act as a catalyst for comprehensive growth, job creation, capital formation, absorption, and technological development. But despite its potential for promoting structural transformation and economic development, the industry faces institutional barriers, among others, which appear to remain the biggest obstacle to its growth. Based on a 'strengths/weaknesses and opportunities/threats' (SWOT) analysis²¹ for the construction sector in Mozambique, a set of recommendations is presented below, following an illustration of such analysis:²²

- Issue: labour force
 - weaknesses:
 - lack of qualified personnel in companies, at various levels: manual worker, technician, and manager
 - lack of formal training, training programmes, and on-the-job training.
 - opportunities:
 - expansion of university education in the areas of engineering and management.

²¹ The SWOT analysis is based on authors' experience and interviews with MOPRH personnel in 2017–18.

²² This chapter does not present a SWOT table.

- threats:
 - inflow of foreign labour, with high costs, in the context of lack of training for locals
 - technical and professional education still does not respond to demand in quantity and quality.

Following the identification of bottlenecks which the construction sector is facing, the playing field in this sector can be improved through a set of policy measures, such as:

- A. Improvement of the state's organizational, technical, and human capacity to apply regulations and fight against corruption; and its supervision regarding, for instance, the licensing of the activity, licensing of works, conducting of tenders, importing of goods and services, and land use management:
 - i. improving the quality of tender documents, with clear rules on the criteria for qualification of tenderers and their tenders, such that ministries and UFSA²³ ensure that existing inspection systems are applied and that permanent improvements are introduced—considering grading technical proposals with more than 30 per cent weight over global evaluation score
 - ii. introducing up-to-date and efficient land registry systems, approving master and detailed plans, and reserving 30–40 ha of state land for future priority investments for each structure plan
 - iii. significantly improving surveillance systems²⁴ at all stages of the land allocation process—Land Use and Exploitation Rights (DUATs) or building permits
 - iv. creation by the state of appropriate legislation that allows banks to consider land as a guarantee in transactions, for example, by deepening the concept of capital gains and infrastructure improvements on the land.
- B. Establishment of clear policies and strategies to boost and develop the national construction industry and reduce the degree of dependence of the construction sector on the use of external inputs:
 - i. promoting policies and incentives to increase integration in the construction sector (national building materials and equipment industry, technical engineering services, construction services, public and private investments, and financing)
 - ii. continuing to improve the institutional rules and mechanisms for prioritizing and programming public investments, which have been published in the 'Integrated Investment Plan (Programme)'

²³ UFSA = Unidade Funcional de Supervisão de Aquisições (Functional Acquisition Supervision Unit).

²⁴ Considering the example of the Millennium Challenge Account programme in Mozambique.

- iii. systematically including a provision for public infrastructure maintenance in the state budget
 - iv. technical solutions and technologies for the use of available local materials, and innovation for the processing of local raw materials available in the building materials industry
 - v. establishing common programmes involving the organization of entrepreneurs, socio-occupational organizations, and partners for the national development of the sector
 - vi. tracking late payments by the state in construction contracts and taking policy measures for prevention and penalization
 - vii. ensuring that the recent VAT refund measures are carried out efficiently, foreseeing penalties for cases of negligence or corruption
 - viii. establishing more favourable agreements regarding the use of external financing rules.
- C. Promoting the acquisition of technologies and technical means as well as the technical quality of work, in order to obtain greater efficiency and higher productivity in the sector and allow for greater competitiveness:
- i. ensuring technology transfer and technical training through partnerships with external companies
 - ii. state investments in research into technologies and building materials appropriate to the country's conditions
 - iii. developing sustainable business-financing mechanisms, through public funds or concessional credit, while considering that this would be a temporary policy
 - iv. better-qualified intervention by associations of entrepreneurs and socio-professional associations, for capacity building and certification of companies and professional technical careers
 - v. promotion of qualification and retraining courses at all levels.

6. Conclusion

Since 1993, the construction sector in Mozambique has played a mixed role in GDP growth, improvement of living conditions, and structural transformation. The share of its value added over GDP increased from 1.7 per cent in 1993 to 2.3 per cent in 2015. The construction sector value added grew at an average annual rate of 12.8 per cent in 1993–2015, well above the GDP growth average of 7.9 per cent. From a qualitative point of view, this sector has contributed to long-term economic expansion, and to the creation of basic infrastructures by improving the health and education conditions for families and communities. Housing construction has been growing and its quality has been improving since 1993. Transportation and communications infrastructures have also been improving.

Buildings for private businesses, government, and other not-for-profit services have been expanding and improving in quality. Construction sector and building materials companies have been growing, with a learning-by-doing process in various construction industry skills for the national labour force.

However, significant challenges remain in terms of social and economic analysis for prioritizing and programming public investment projects; the analysis of investment projects and their impacts on agricultural, fisheries, manufacturing, and other services; supervising and improving the quality of infrastructure investments; creating a provision for public infrastructure maintenance in the State Budget; focusing on investing in training and its quality; and improving the provision of public information on input statistics, outputs, costs, and prices for domestic construction activities and reliable international comparisons.

Mozambican construction companies have not yet reached the stage of diversified and sustainable development that would enable them to weather the downturn of the business cycle. They have not been able, so far, to compete with other big international construction companies on large infrastructure projects. The business environment in the country is not yet conducive to the expansion of the formal sector to include larger numbers of micro, small, and medium companies, hence the need to reduce unnecessary interference and costs.

Acknowledgements

We are grateful to Finn Tarp, Fotini Antonopoulou, and Luke Finley for their comments on and revision of this paper. We appreciate John Page's dedication to industrial policy in particular in Africa.

References

- ACIS (2008). 'Legal Framework: For Construction Licensing in Mozambique', Edition I. Maputo: ACIS. Available at: <https://www.acismoz.com/wp-content/uploads/2017/06/Construction-Edition-1.pdf> (accessed 17 May 2018).
- AECOM (2017). 'Africa Property and Construction: Cost Guide 2017'. Architecture, Engineering, Consulting, Operations, and Maintenance (AECOM). Pretoria: AECOM. Available at: <http://www.aqs.org/pricing-data/pricing-data-general/aecom-cost-guide-2017> (accessed 17 May 2018).
- Alexeeva, V., G. Padam, and C. Queiroz (2008). 'Monitoring Road Works Contracts and Unit Costs for Enhanced Governance in Sub-Saharan Africa'. Transport Papers TP-21. Washington: World Bank. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/17418/467280NWP0Box334101B01PUBLIC10tp121.pdf?sequence=1&isAllowed=y> (accessed 28 May 2018).

- Allen, C., and V. Johnsen (2008). 'Access to Housing Finance in Africa: Exploring the Issues, No.7—Mozambique'. Johannesburg: FinMark Trust. Available at: http://www.housingfinance.org/uploads/Publicationsmanager/A2HF_Moz.pdf (accessed 17 May 2018).
- Andersson, P.-Å. (2002). 'Impacto dos megaprojectos na economia Moçambicana'. In C. Rolim, A. S. Franco, B. Bolnick, and P.-A. Andersson (eds), *A Economia Moçambicana Contemporanea: Ensaio*. Maputo: Gabinete de Estudos, Ministério do Plano e Finanças.
- Arndt, C., and F. Tarp (eds) (2017). *Measuring Poverty and Wellbeing in Developing Countries*. Oxford: Oxford University Press.
- Arndt, C., S. Jones, and F. Tarp (2016). 'Mozambique: Off-Track or Temporarily Sidelined?' In C. Arndt, A. McKay, and F. Tarp (eds), *Growth and Poverty in Sub-Saharan Africa*. Oxford: Oxford University Press.
- Bank of Mozambique (2017). 'Dados do sector externo'. Mimeo. Maputo: Mozambique.
- Berkel, H., M. Cardona, P. Fisker, J. Rand, R. Santos, and F. Tarp (2018). 'Survey of Mozambican Manufacturing Firms 2017'. Copenhagen: KU, CEEG, MEF, and UNU-WIDER. Available at: <https://www.wider.unu.edu/sites/default/files/Publications/Report/PDF/Mozambique-SME-report-IIM2017-EN.pdf> (accessed 28 May 2018).
- Biggs, T., J. Nasir, and R. Fisman (1999). 'Structure and Performance of Manufacturing in Mozambique'. Regional Program on Enterprise Development Working Paper 107. Washington, DC: World Bank.
- CAHF (Centre for Affordable Housing in Africa) (2017). 'Benchmarking Housing Construction Costs in Africa'. Available at: <http://housingfinanceafrica.org/dashboards/benchmarking-housing-construction-costs-africa/> (accessed 18 May 2018).
- Castel-Branco, N. C. (2012). 'Pensando nos "paradoxos" da economia de Moçambique de uma perspectiva de economia política: O sistema extractivo e poroso de acumulação'. Maputo: Palestra. Available at: http://www.iese.ac.mz/lib/noticias/2012/EconMocParadoxos_Agenda2025_v2_revCNCB.pdf (accessed 19 April 2018).
- Castel-Branco, N. C. (2015). 'Desenvolvimento empresarial e da capacidade produtiva no crescimento económico e na industrialização'. In C. N. Castel-Branco, N. Massingue, and C. Muianga (eds), *Questões sobre o desenvolvimento produtivo em Moçambique*. Maputo: IESE.
- Coeelho, J. P. B. (2004). *A 'Literatura Quantitativa' e a Interpretação do Conflito Armado em Moçambique (1976–1992)*. Maputo: Universidade Eduardo Mondlane. Available at: [https://www.ces.uc.pt/estilhocos_do_imperio/comprometidos/media/Mo%C3%A7ambique%20e%20a%20LQ%20pdf%20\(2\).pdf](https://www.ces.uc.pt/estilhocos_do_imperio/comprometidos/media/Mo%C3%A7ambique%20e%20a%20LQ%20pdf%20(2).pdf) (accessed 4 June 2018).
- Collier, P., M. Kirchberger, and M. Söderbom (2013). 'The Cost of Road Infrastructure in Developing Countries'. Oxford: Centre for the Study of African Economies (CSAE). Available at: http://www.soderbom.net/13_05_02_Unit%20cost%20paper.pdf (accessed 25 May 2018).
- Committee of Counsellors (2013). *Agenda 2025: Visão e Estratégias da Nação*. Maputo: Comité de Conselheiros.

- Cruz, A. S., and F. Mafambissa (2016). 'Industries without Smokestacks: Mozambique Country Case Study'. WIDER Working Paper 2016/158. Helsinki: UNU-WIDER.
- Cruz, A. S., D. Guambe, C. P. Marrengula, and A. F. Ubisse (2014). 'Mozambique's Industrialization'. WIDER Working Paper 2014/059. Helsinki: UNU-WIDER.
- Cunguara, B., and J. Hanlon (2010). 'Poverty Is Not Being Reduced in Mozambique'. Crisis States Working Papers, series 2, Working Paper 74. London: LSE.
- Danert, K., R. C. Carter, D. Adekile, and A. MacDonald (2009). 'Guidelines for Community Supply and Protection in Africa: Cost-Effective Boreholes in Sub-Saharan Africa'. Available at: <http://nora.nerc.ac.uk/id/eprint/9185/1/CEB%20Danert%20Draft%204%20UNESCO%2022%20April09.pdf> (accessed 24 May 2018).
- Francisco, A. (2018). 'Crise financeira e consolidação orçamental: O problema da des-orçamentação?'. Maputo: IESE. Available at: <http://omrmz.org/omrweb/wp-content/uploads/Conferencia-A.-Francisco-Como-est%C3%A1-Mo%C3%A7ambique.pdf> (accessed 28 May 2018).
- FurtherAfrica (2018). 'Half of the Mozambican Construction Contractors Are in Pre-Bankruptcy'. Available at: <https://furtherafrica.com/2018/06/01/half-of-the-mozambican-construction-contractors-are-in-pre-bankruptcy/> (accessed 1 June 2018).
- Gersovitz, M., and N. Kriger (2013). 'What Is a Civil War? A Critical Review of its Definition and (Econometric) Consequences'. *The World Bank Research Observer*, 28: 159–90. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/21428/wbro_28_2_159.pdf?sequence=1&isAllowed=y (accessed 4 June 2018).
- Ghaddar, H. (2016). 'Stop Calling the Syrian Conflict a "Civil War" It's Not'. *The Washington Post*, 14 December. Available at: https://www.washingtonpost.com/posteverything/wp/2016/12/14/stop-calling-the-syrian-conflict-a-civil-war-its-not/?noredirect=on&utm_term=.b01ff44c7ad9 (accessed 5 June 2018).
- GoM (Government of Mozambique) (2001). *Plano de Acção para a Redução da Pobreza Absoluta, 2001–2005*. Maputo: Government of Mozambique.
- GoM (2011–2015). 'Conta Geral do Estado', 2010–2014. Maputo: GoM. Available at: http://www.dno.gov.mz/docs/orc_estado/CGE/ (accessed 15 March 2013, 21 March 2017, 15–16 May 2018).
- GoM (2014). 'Programa Integrado de Investimentos: Infra-estruturas Prioritárias para 2014–2017'. Maputo: Ministério da Planificação e Desenvolvimento, 22 July. Available at: <http://www.mef.gov.mz/> (accessed 16 May 2018).
- GoM (2016a). 'Conta Geral do Estado, 2015'. Maputo: GoM. Available at: http://www.dno.gov.mz/docs/orc_estado/CGE/ (accessed 15–16 May 2018).
- GoM (2016b). 'Regulamento de Contratação de Empreitada de Obras Públicas, Fornecimento de Bens e Prestação de Serviços ao Estado'. Decree 5/2016, 8 March. Maputo: Council of Ministers. Available at: http://www.ufsa.gov.mz/Docs/BR_28_I_SERIE_SUPLEMENTO_2016.pdf (accessed 29 July 2018).
- GoM (2017). 'Conta Geral do Estado, 2016'. Maputo: GoM. Available at: http://www.dno.gov.mz/docs/orc_estado/CGE/ (accessed 15–16 May 2018).

- Hanlon, J. (2016). 'Mozambique Banks Hold Proindicus, Ematum Debt'. *Mozambique News Reports & Clippings*, 330 (11 July). Available at: <http://www.open.ac.uk/technology/mozambique/news-reports-clippings> (accessed 11 July 2016).
- Hanlon, J. (2017). 'Minimum Wage and Exchange Rate Supplement'. *Mozambique: News Reports & Clippings* 368, 19 April.
- IMF (International Monetary Fund) (2004). 'IMF Country Report 04/53'. Washington, DC: IMF. Available at: <https://www.imf.org/external/pubs/ft/scr/2004/cr0453.pdf> (accessed 1 June 2016).
- IMF (2010). 'IMF Country Report', 10/174. Washington, DC: IMF. Available at: <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Mozambique-Sixth-Review-Under-the-Policy-Support-Instrument-Second-Review-Under-the-23983> (accessed 16 May 2018).
- IMF (2016). 'Transcript of African Department Press Briefing'. 15 April. Washington, DC: IMF. Available at: <https://www.imf.org/external/np/tr/2016/tr041516a.htm> (accessed 2 June 2016).
- IMF (2018). 'IMF Staff Country Report', 18/65. Washington, DC: IMF. Available at: <http://www.imf.org/en/Publications/CR/Issues/2018/03/07/Republic-of-Mozambique-2018-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-45701> (accessed 7 March 2018).
- INE (Instituto Nacional de Estatística) (2016). 'Índice de Preços no Consumidor em Moçambique: Dezembro 2015'. Maputo: INE.
- INE (2017a). 'Contas Nacionais, 1991–2016'. Maputo: INE.
- INE (2017b). 'Empresas em Moçambique: Resultados do segundo censo nacional (2014–2015)'. Maputo: INE.
- INE (2017c). 'Índice de Preços no Consumidor em Moçambique: Dezembro 2016'. Maputo: INE.
- INE (2018a). 'Índice de Preços no Consumidor em Moçambique: Dezembro 2017'. Maputo: INE.
- INE (2018b). 'Informação rápida'. Available at: <http://www.ine.gov.mz> (accessed 25 July 2018).
- INE (2018c). 'Resultados preliminares, censo 2017 e definitivos de 2007 e 1997'. Available at: <http://www.ine.gov.mz> (accessed 10 April 2018).
- Lopes, M. A. R. F. (2007). 'Desafios e mudanças nas empresas de construção civil e as relações de trabalho'. *Cadernos de Estudos Africanos*, 11/12: 221–36. Available at: <http://journals.openedition.org/cea/952#tocto2n1> (accessed 19 December 2017).
- Maugeri, N., V. Nhabinde, and R. Quintella (2015). 'Background Study for a Strategy and Policy Framework to Support the Development of the Construction and Building Materials Industry in Mozambique'. Report C-36112-MOZ-1. Maputo: International Growth Centre. Available at: <https://www.theigc.org/wp-content/uploads/2016/07/Quintella-et-all-2015-Final-report.pdf> (accessed 23 November 2017).

- MCA (2013). 'Mozambique Monitoring and Evaluation Plan.' Millennium Challenge Account, Second Amended (Compact Closeout), 10 December. Available at: https://assets.mcc.gov/content/uploads/2017/05/ME_Plan_-_MOZ_-_V3_-_Dec13.pdf (accessed 24 May 2018).
- MEF (Ministry of Economy and Finance) (2016). 'Pobreza e bem-estar em Moçambique: Quarta avaliação nacional, IOF 2014–15'. Maputo: MEF.
- MOPHRH (Ministry of Public Works, Housing and Hydric Resources) (2014). 'Construction Sector Enterprise Data for 2014'. Mimeo. Maputo: MOPHRH.
- MOPHRH (2015). 'Regulamento do Licenciamento da Actividade de Empreiteiro de Construção Civil'. *Boletim da República*, Diploma Ministerial 77/2015, 22 May. Maputo: MOHRH. Available at: <http://www.lexlink.eu/FileGet.aspx?FileId=1149432> (accessed 17 May 2018).
- MPD (Ministry of Planning and Development) (2010). *Poverty and Wellbeing in Mozambique: Third National Poverty Assessment*. Maputo: National Directorate of Studies and Policy Analysis.
- MPD (2014). 'Programa Integrado de Investimentos: Infraestruturas prioritárias para 2014–2017'. Maputo: MPD. Available at: <http://www.mef.gov.mz/index.php/documentos/instrumentos-de-gestao/plano-integrado-de-investimento-pii/577-programa-integrado-de-investimentos-julho-2014/file> (accessed 16 May 2018).
- Mosca, J. (2014). 'Agricultura familiar em Moçambique: Ideologias e políticas'. CEsa Working Paper 127. Lisbon: Universidade Técnica de Lisboa. Available at: https://pascal.iseg.utl.pt/~cesa/files/Doc_trabalho/WP127.pdf (accessed 24 June 2016).
- Murison, K. (ed.) (2003). *Africa South of the Sahara 2004*. London: Europa Publications.
- Oeter, S. (1997). 'Civil War, Humanitarian Law and the United Nations'. In A. Bogdandy and R. Wolfrum (eds), *Max Planck Yearbook of United Nations Law*, Vol. 1. Heidelberg: Max Planck Institute for Comparative Public Law and International Law. Available at: http://www.mpil.de/files/pdf/mpunyb_oeter_1.pdf (accessed 4 June 2018).
- Pereira, A. C. (2017). 'Cada um caminha por onde pode, por onde lhe é possível caminhar: entrevista a João Ribeiro'. *Revista Lusófona de Estudos Culturais*, 3(2): 363–72.
- Perobelli, F., R. Campos, V. Cardoso, and V. Vale (2016). 'Avaliação do sector da construção civil para as principais economias mundiais: uma análise sistémica a partir de uma abordagem de insumo-produto para o período 1995–2009'. *Ensaíos FEE*, 37(2): 331–66.
- PoM (Parliament of Mozambique) (2005). 'Programa Quinquenal do Governo, 2005–2009'. Resolution 16/2005, of 11 May. Maputo: Assembleia da República.
- Ross, D. R. (ed.) (2014). 'Mozambique Rising: Building a New Tomorrow'. Washington, DC: IMF. Available at: <http://www.imf.org/external/pubs/ft/dp/2014/afr1404.pdf> (accessed 2 June 2016).

- Salvucci, V. (2018). 'Income Groups by Monthly Estimated Income per Household, 2014–2015'. Mimeo. Maputo: UNU-WIDER.
- Sulemane, J. (2002). 'Dados básicos da economia Moçambicana'. In C. Rolim, A. S. Franco, B. Bolnick, and P.-A. Andersson (eds), *A Economia Moçambicana Contemporânea: Ensaio*. Maputo: Gabinete de Estudos, Ministério do Plano e Finanças.
- Sutton, J. (2014). 'Mapa empresarial de Moçambique'. Maputo: International Growth Centre.
- Tarp, F., C. Arndt, H. T. Jensen, S. Robinson, and R. Heltberg (2002). *Facing the Development Challenge in Mozambique: An Economy-Wide Perspective*. Research Report 126. Washington, DC: International Food Policy Research Institute.
- UNICEF (2011). 'Cost-Effective Boreholes in Mozambique: An Analysis of Practice under the One Million Initiative 2008–2010'. New York: UNICEF. Available at: http://www.rural-water-supply.net/_ressources/documents/default/305.pdf (accessed 24 May 2018).
- UNICEF (2017). 'Development of an Index of Negative Boreholes: Madagascar'. Antananarivo: Madagascar. Available at: https://www.unicef.org/madagascar/eng/Technical_note_2_WASH_ENG.pdf (accessed 24 May 2018).
- Verdade (2010). 'Governo faz primeiro empréstimo não concessional', 16 June. Available at: <http://www.verdade.co.mz/economia/12049-governo-faz-primeiro-emprestimo-nao-concessional> (accessed 16 May 2018).
- WASHCost (2011). 'Costs of Rural Water Point Sources in Mozambique'. Briefing note C-03A. The Hague: WASHCost. Available at: https://www.ircwash.org/sites/default/files/washcost_c-03a_costs_of_point_sources_jan-jun_2011_mozambique_english.pdf (accessed 17 May 2018).
- Wirz, M., and J. Wernau (2016). 'Tuna and Gunships: How \$850 Million in Bonds Went Bad in Mozambique'. *The Wall Street Journal*, 3 April. Available at: <http://www.wsj.com/articles/tuna-and-gunships-how-850-million-in-bonds-went-bad-in-mozambique-1459675803> (accessed 5 April 2016).
- World Bank (2005). *Mozambique—Country Economic Memorandum: Sustaining Growth and Reducing Poverty*. Report 32615-MZ. Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/773351468279908360/pdf/326150MZ.pdf> (accessed 25 May 2018).

Local Content and the Prospects for Economic Diversification in Mozambique

Evelyn Dietsche and Ana Maria Esteves

1. Introduction

Mozambique has captured the attention of the international energy community because of the significant exploration successes achieved since 2010 in the offshore Rovuma Basin located along the country's northern coastline. However, prior to these successes, the country's extractive resources sector had already taken off, triggered by the liberalization of the country's economy in the late 1990s and the entry of regional energy players in the onshore oil and gas (O&G) sector. South African energy company Sasol has been producing and exporting natural gas from the onshore Pande and Temane fields in the Mozambique Basin from around 2004 (ILPI 2013). In addition, miners have invested in exploiting the country's hydropower capacity to produce aluminium from imported feedstock, as well as producing the country's coal and other mineral resources.

There are considerable expectations that the extractives sector will contribute to economic and social development by means of procuring locally produced goods and services and hiring Mozambicans. For example, Sutton et al. (2015: 10) suggest that 'the offshore gas industry offers Mozambique a unique opportunity to build up the country's industrial capability by integrating local companies into the supply chain of the multinational firms.' Looking at the policy environment, this chapter argues that the prospects for 'local content' to provide the link between the extractive industries and the economic diversification of the local economy are extremely challenging.¹ Improving the lives of ordinary Mozambicans will require much more than a booming natural resources sector.

Previous UNU-WIDER studies have underlined that most Mozambicans continue to survive on rural subsistence livelihoods 'working in agriculture, livestock,

¹ See Dietsche (2014, 2017) for a broader discussion on this subject.

forestry and fisheries, applying traditional manual and low-productivity technology' (Cruz and Mafambissa 2016: 1). At the same time, the country is known for its foreign-funded mega-projects exporting natural resources existing next to a very small formal private sector dominated by micro, small, and medium enterprises (MSMEs).² According to the 2016 *African Economic Outlook*, 99 per cent of all Mozambican enterprises are either run by individual entrepreneurs or comprise micro-enterprises with fewer than five employees (AfDB et al. 2016). The success in attracting foreign investors to pursue mega-projects has not been matched with equal success in transforming the domestic economy: for many citizens living conditions have hardly improved. The flipside to the country's industrial policy approach of supporting foreign-funded mega-projects is that it has failed to address more fundamental constraints to developing the domestic private sector, especially in relation to non-extractive natural resources and the (agro-)processing of these resources in-country.

Until the mid-2000s the country was broadly heading in the right direction—or so it seemed. After gaining independence from Portugal in 1975, Mozambique underwent several fundamental changes. Initially, it tried a centrally planned economy along the lines of nationalist and socialist principles, but then shifted towards developing a market economy in the mid-1980s. The country also experienced a brutal war that lasted nearly two decades, but then turned towards peace when the two opposing parties, FRELIMO and RENAMO, signed the Rome General Peace Accords in 1992. Elections held in 1994 marked the introduction of a multi-party presidential democracy, replacing the one-party system that had been adopted at independence.³ These developments gave the impression that the country was on the path to achieving socio-economic change.⁴ Economic growth rates have been impressive, and are presumed to have been driven by the country's ability to attract foreign investment.⁵

However, the most recent economic outlook offers a very different picture: the country faces a fiscal bust that materialized before the expected boom of its extractive resources sector has even taken off. This puts a serious dampener on the country's prospects for its significant hydrocarbon and other extractive resources contributing to economy diversification and lifting ordinary Mozambicans

² Sutton et al. (2015) found that thirteen firms account for three-quarters of the country's export earnings. More than 60 per cent of these earnings come from four primary industries, with one single firm dominating in each: aluminium (Moal); electricity (Hidro); ores (Kenmare); and gas (Sasol). These authors' analysis of a 'stratified' sample of forty dominant firms suggests that about one-third are of foreign origin, one-third are industrial start-ups that date back to pre-independence, and one-third are post-independence industrial start-ups.

³ See Addison (2003) for several chapters on the dynamics underpinning Mozambique's economic and political transitions from a centrally planned to a market economy and from war to peace, and the potential challenges already foreseen in the early 2000s.

⁴ See Hanlon (2017) for a critical assessment of these developments and the role that donors have played.

⁵ See also Roe (2018a).

out of poverty—particularly if one takes into account that these prospects are thought to arise primarily from wisely reinvesting the revenues generated by the sector. The question that this situation has given rise to is: what options are left for the incumbent government to ensure ordinary Mozambicans will benefit from the sector over the next decade—as opposed to the later 2030s when, realistically, the country could eventually see a meaningful increase in tax revenues arising *directly* from the sector?

The chapter starts with an introduction to the country and the generally positive outlook for its extractive resources sector, as well as a brief summary of its fiscal situation. Against this background, the chapter draws attention to some aspects of the country's policy environment that are relevant for the proposition that the country can diversify its severely skewed domestic economy on the back of the impending rise of its natural gas and broader extractive resources sector. The final section summarizes.

2. The country and its extractive industries

Undoubtedly, Mozambique remains one of the poorest countries in the world. With a gross domestic product (GDP) of US\$12.35 billion and GDP per capita of US\$1,300, it is ranked 222nd out of 229 countries.⁶ On the Human Development Index it ranks 181st out of 188 positions, sharing the ranking with South Sudan, and lower than the Democratic Republic of Congo (DRC) (UNDP 2016). About two-thirds of the population reside in mostly remote rural areas and survive on subsistence livelihoods. Of the country's 28 million inhabitants, roughly two-thirds are under the age of 25.⁷ Those living in urban areas are concentrated mainly around Maputo (around 1.2 million) and Matola (around 0.9 million). Only about one-third of urban employment is considered formal (Orre and Rønning 2017).

The country gained independence in 1975, following a decade-long liberation struggle that ended four centuries of Portuguese rule. Two years into exercising sovereign rule, the country slipped into a very brutal and economically devastating political war. Individual human development indicators have improved since the war ended in 1992, but the country started from a very low level and continues to trail behind the sub-Saharan African average. In 2015 the percentage of the population with at least some secondary education was only 2.8 per cent for women and 8.0 per cent for men, compared to the sub-Saharan African average of, respectively, 25.3 per cent and 33.9 per cent (UNDP 2016). Secondary school

⁶ See <http://www.cia.gov/library/publications/the-world-factbook/geos/mz.html> (accessed 12 March 2018).

⁷ See also <http://databank.worldbank.org/data/views/reports/reportwidget.aspx?Report%5FName=CountryProfile%26Id=b450fd57&tbar=y%26dd=y%26inf=n&zm=n%26country=MOZ> (accessed 12 March 2018).

enrolment is still well below 20 per cent and nearly half of the population above the age of 15 is considered illiterate.⁸

It is clear that in order to improve its human capital, the country needs to balance existing and prospective mega-projects with investment in domestic capital to boost its domestic economy. This poses a serious challenge for the public sector, because what might be good (enough) for large capital projects does not suffice to build the human and institutional assets required to support a more diversified, yet rural-based, economy.

In contrast to the country's challenging social background, the long-term outlook for the country's extractive resources sector remains distinctly positive, for three reasons.⁹ First, since 2010 the country has made international headlines because of the exploration successes achieved in the Rovuma Basin offshore of the Cabo Delgado Province:

- Italy-based ENI (25 per cent)—in partnership with ExxonMobil (25 per cent) and CNPC (20 per cent), as well as Galp Energia (10 per cent), Kogas (10 per cent), and the Mozambican state-owned oil company ENH (10 per cent)—are building a floating liquefied natural gas (FLNG) facility with a capacity of 3.4 mtpa (million tonnes per annum) to bring the first 5 tcf (trillion cubic feet) of the assessed 16 tcf of recoverable gas from Offshore Area 4 to the market. According to an ENI press release, this is the first FLNG facility to be built in sub-Saharan Africa, and only the third in the world.¹⁰ The facility is being built by contractors TechnipFMC and JGL Corporation, and is expected to be completed around 2022.
- US-based Anadarko (26.5 per cent)—in partnership with Mitsui (20 per cent), the state-owned ENH (15 per cent), Videsh (16 per cent), Bharat PetroResources (10 per cent), PTT E&P (8.5 per cent), and Oil India (4 per cent)—had worked towards reaching a final investment decision for an onshore *liquefied natural gas* (LNG) plant to produce the 75 tcf of recoverable gas that Offshore Area 1 has been assessed to hold.¹¹ At the time of completing this chapter, Occidental had bought Anadarko with an agreement that Total would acquire Anadarko's Mozambique assets.¹²

Although developing the above fields has taken longer than had initially been hoped for, the sector continues to evolve, and at a faster pace than in some other countries in the region.

⁸ See <http://uis.unesco.org/en/country/mz> (accessed 21 March 2018).

⁹ For example, these are summarized by Cooperação Alemã (2018).

¹⁰ See the press releases at: http://www.eni.com/en_IT/media/2017/06/eni-launches-coral-south-project-in-mozambique?lnkfrm=asknow (accessed 21 March 2018).

¹¹ The project website is available at: <http://www.mzlng.com/The-Project> (accessed 21 March 2018).

¹² See: <https://clubofmozambique.com/news/just-in-anadarko-mocambique-area-1-affirms-commitment-to-lng-project-press-release-139514/> (last accessed 28 August 2019).

Second, since 2004 the South African energy company Sasol has been producing and processing natural gas onshore in the country's more southerly Inhambane Province. Most of this gas has been exported to South Africa, where it is mainly used as feedstock for the chemicals industry. Some gas is also sold to markets in Mozambique, where it is mainly used for electricity generation, covering about 20 per cent of the country's demand. Although not in the same category as the developments in the northern Rovuma Basin, SASOL's early investments in the previously stranded Pande and Temane fields in the Mozambique Basin have contributed to the country learning about how the O&G sector works and to evolve the legal and regulatory framework governing the sector.¹³ In addition, Sasol's interests are located along the Maputo Development Corridor connecting the deep-water port in Maputo with the South African provinces of Gauteng, Northwest, Limpopo, and Mpumalanga, and with Gaborone in Botswana (Östensson 2017).

Third, despite already playing a significant role in the global production of several minerals, Mozambique's mining sector is still only considered to be at an early stage of development. Its potential is largely untapped, including gold deposits in the provinces of Niassa, Tete, and Manica. Mozambique holds some of the world's largest coal deposits, as well as commercially important deposits of graphite, iron ore, titanium, apatite, marble, bentonite, bauxite, kaolin, copper, and tantalum.

Vale, the Brazilian multinational mining company, has invested in producing coking coal and has been exporting since 2011. Coal concessions formerly held by Rio Tinto were bought by ICVL (65 per cent) and its partner Tata Steel (35 per cent) in 2014. They are producing and exporting thermal coal. Investments focusing on the mining and processing of heavy sands have been led by Kenmare Resources, BHP, and others. In international mining news, Mozambique also features as a country that is poised to gain from rising demand in those types of minerals that are required for the global transition to a low-carbon economy. Several companies are investing in graphite, for example, Syrah Resources (Australian) expected to commence production in 2018.¹⁴

In summary, the country's extractive resources industries are expecting a boom. This should be good news for the country, in theory. As highlighted by two related UNU-WIDER papers, these industries could significantly boost the economy for several years, if not decades (Roe 2018a, 2018b). This expectation builds on much the same logic that has underpinned the country's current economy,

¹³ *ex post* assessments of the agreements Sasol negotiated with the Mozambican government have raised several questions about the 'fairness' of the fiscal and commercial terms that came about in the early 2000s, when the respective gas fields discovered in the 1960s had been left stranded for decades and the surge in prices from the mid-2000s to its peak in 2014 had not yet unfolded. At that time, it was not a forgone conclusion that producing this gas would necessarily be commercially attractive.

¹⁴ See *Mining Weekly*, 5 December 2017.

where export-oriented mega-projects, financed and operated by foreign investors and exploiting the country's extractive resources, dominate the economy (Sutton et al. 2015).

A small counter-balance is provided by a limited number of also primarily foreign-financed companies engaged in construction and in light manufacturing for the domestic market, including some larger-scale and several smaller-sized investments exploiting non-extractive natural resources (e.g. agro-food, sugar, cotton industry). The rest of the economy consists of a mixed portfolio of largely informal micro- and small-sized Mozambican enterprises (Lachler and Walker 2018; Orre and Rønning 2017).

The idea that Mozambique's economy can be diversified on the back of its extractive resources sector would seem, *prima facie*, a rather theoretical and perhaps far-fetched proposition. More realistic would seem the suggestion of some observers who purport that, strategically, the country should balance its growing dependence on extracting and processing mineral resources with more proactive support for other, more labour-intensive industries. Cruz and Mafambissa (2016), for example, argue that Mozambique's 'industries without smokestacks' hold particular potential. They see it as a possibility that the country could feasibly achieve international competitiveness and create formal jobs and self-employment opportunities in the production of fruits and vegetables, in agro-processing, and in various tradable services. With most Mozambicans living in rural areas, it is these industries that can support the growth of MSMEs, producing goods and services for demand that is sustained independently and beyond the O&G sector. Lachler and Walker (2018) also suggest that transforming the rural economy is critical for Mozambicans to benefit from better jobs in the private sector.

3. Facing up to the fiscal crisis

As Roe (2018b) has outlined in detail, recent IMF Article IV consultations have concluded that the country's public finances are in a dire state (IMF 2018). The debt-to-GDP ratio has shot up to around 130 per cent from just around 40 per cent in 2012—notably after achieving Heavily Indebted Poor Country (HIPC) debt relief in the 1990s (IMF 2018: Figure 4). The annual fiscal deficit now stands at 8 per cent of GDP, and for the past three years the country has defaulted on its debt service. To restructure the public debt incurred with private lenders, the government needs to agree a respective programme with, and place its public finances under the watch of, the IMF. Invariably, this means constraining and reprioritizing public spending.

The sad part to this story is that after the large offshore hydrocarbon finds along the Cabo Delgado Province had become public knowledge, overtly promising projections were made about the future government revenues that would

arise from these fields.¹⁵ These projections were premised on (1) the assumption that field developments would go ahead, and (2) more or less informed guesses of what the negotiated fiscal terms, cost structures, and timelines of the envisaged developments might be. These projections contributed to inflated expectations about the availability and timing of future public funding and enticed the public authorities to relax their fiscal prudence and loosen control over financial management.

Public debt has been driven up by (1) higher public spending and heavy international and domestic borrowing, and (2) publicly guaranteed loans amounting to US\$2.3 billion (equivalent to 20 per cent of the country's GDP) incurred from around 2013. The latter remained undisclosed until 2016, when it transpired that state-owned enterprises had incurred these liabilities with commercial lenders. Not only did these loans breach the country's Constitution, but also its HIPC commitments and other fiduciary safeguards embedded in the public financial management system.¹⁶ An independent audit (the so-called Kroll investigation) has provided a good idea about what happened in that short period of just a couple of years. The full extent and use of the hidden loans—and who were the responsible decision-makers—has not been disclosed.

As Roe (2018b) has outlined, tight monetary and fiscal policies aimed at restoring fiscal sustainability will require reducing and reprioritizing public spending over the next decade. Meanwhile, the timelines for the development of the envisaged LNG projects have been pushed back several times. This suggests that additional revenues from the Rovuma Basin fields will not flow before the second half of the 2020s at the very earliest. Further, if and when they start to flow, they will likely already be earmarked for debt-reduction purposes. Perhaps it would be reasonable to assume that the country should not expect more meaningful increases in public revenue before some point in the 2030s.

For the domestic economy this means that the public debt burden is poised to crowd out even further the already weak local private sector. The signs pointing to this include high interest rates for MSMEs¹⁷ and a build-up of public-sector payment arrears, including the refunding of value-added tax (VAT).¹⁸ A recent

¹⁵ One such set of projections was provided by the IMF's FARI model (Fiscal Analysis of Resources Issues). These projections are discussed by Roe (2018a, 2018b).

¹⁶ Ironically, formal assessments of Mozambique's *de jure* public financial management have awarded the country high marks and commented on the country's impressive systems at the centre. However, *de facto* performance has not met expectations, because political-administrative capacities on the ground have undermined budget execution as set out in approved budgets and medium-term expenditure plans. Andrews (2013) provides a political-economic analysis of this.

¹⁷ In accordance with the *General Statute of Micro, Small and Medium Enterprises* (Law 44/2011), the definitions for MSMEs in terms of number of workers are the following: micro enterprises are companies with four or fewer employees; small enterprises are companies with 5–49 employees; and medium-sized enterprises are companies with 50–100 employees.

¹⁸ See Further Africa (2018a). This announcement cautioned that in the short term the government only had funds to pay less than 20 per cent of its accumulated arrears. In response, affected companies warned of the risk of mass bankruptcy.

survey has already picked up a decline in the stock of MSMEs (UNU-WIDER 2018). Thus, if prospects for Mozambican MSMEs did not look overtly good prior to the fiscal bust, they certainly do not look good now.

The business environment will worsen further if the provision of public goods and services deteriorates from already low levels. This will undermine investments in human and other forms of domestic capital, which is just what Mozambique desperately needs (Roe 2018b). There is a risk of a widening gap between the skills and entrepreneurial capabilities available in the country and those required by foreign investment projects and their supply chains (Östensson 2017). Such a prospect does not bode well for expectations that 'local content' can provide the silver bullet for diversifying the economy.

For foreign investors, the fiscal situation also increases their perceived political-economic and socio-political risks. Invariably, they will factor (or most probably already have factored) these into their project economics, with knock-on effects for the actual revenue that will (eventually) be collected from the sector. Several recent studies have attested to very low levels of domestic capacity in, and institutional barriers faced by those sectors that are relevant for the development of the extractive resources sector, such as the construction industry (Cardno 2015; Cruz et al. 2018; Maugeri et al. 2015) and the metals engineering and manufacturing sector (Lemos and Scur 2014; Sutton et al. 2015). This makes projections about the positive impacts arising from the planned projects, for example in terms of additional jobs, seem overly optimistic. At the very least, such impacts should not be taken for granted, even if economic models and multipliers make them seem real. More important is to cast a critical eye on the supply-side conditions that will be necessary for such impacts to become real.

4. The policy environment

With no additional revenues forthcoming from the extractive resource sector in the near term, the onus lies on improving the policy environment in non-monetary ways to support the domestic private sector to pull through the dire times that the country is facing over the next decade. This means tackling the barriers that hinder entrepreneurial Mozambicans in rural areas becoming more productive and sustaining a growing number of MSMEs. This is different to giving in to the demands that existing entrepreneurial elites may be lobbying for in terms of capturing a share of the resource rent associated with the production of extractive resources.¹⁹

¹⁹ See Melia (2015) for a stylized, comparative assessment of Mozambique's political economy of extractive resources.

This section examines the policy environment for diversifying the domestic economy on the back of the extractive industries. It starts off with a brief summary of the political trajectory that has led to the fiscal bust before the boom and the challenges the incumbent government faces. Next, it reviews the country's evolving approach to industrial policy and its achievements in terms of enabling the growth of domestic MSMEs. Third, it examines the potential for 'local content' and corporate 'social investment' to support economic diversification and local economic development.

4.1 Political trajectory of the policy environment

In the post-independence civil war era from 1975 to 1992, Mozambique's first president, Samora Machel, kept with the political spirit of the time and organized the country as a one-party state. He embraced both nationalist and socialist policies, guiding a centrally planned economy based on a long-term plan for industrialization. This included the 1975 Constitution establishing that all natural resources belong to the state. Land was nationalized and still today cannot be owned by individuals or organizations; it can only be acquired on lease from the state. Private-sector organizations (e.g. schools, clinics) and commercially valuable property (e.g. rental housing) were also nationalized. State-owned enterprises increased sharply in numbers and a good number of these still exist today.²⁰

Just two years after achieving independence, the country was plunged into a brutal war, fought between the ruling liberation party FRELIMO (Front for the Liberation of Mozambique) and its opposition RENAMO (National Resistance Party of Mozambique), the latter receiving funding at the time from white-ruled Rhodesia and later also apartheid South Africa. This war lasted seventeen years and a heavy human cost was paid, leaving many injured by landmines, killing an estimated one million people, and forcing about five million Mozambicans to seek refuge in neighbouring countries. After nearly two decades, the FRELIMO president, Joaquim Chissano, and RENAMO leader, Afonso Dhlakama, agreed to the Rome General Peace Accords that brought peace in 1992.²¹

The transition to a multi-party presidential republic from 1992 to 2005 paved the way for the country to move on from the nationalist and socialist economic model of the post-independence era and towards a gradual opening up of the economy for private investment.²² A significant marker was the first investment

²⁰ The 2018 IMF report mentions loss-making state-owned enterprises as a risk to the country's financial sector.

²¹ See various chapters in Addison (2003) for more background on how the transition from conflict to peace came about.

²² Hanlon (2017) casts a critical retrospective eye on the role that donors have played during this era and the implications in relation to the country's contemporary debt crisis.

in the O&G sector, when Sasol agreed to develop the previously 'stranded' gas onshore field in the Inhambane Province. When the first multi-party elections were held in 1994, the democratic transition came about without pressure from urban protests against the incumbent regime, unlike in most other African countries (Bratton and Van de Walle 1997). The incumbent president, Joaquim Chissano, won the elections and continued to head the government until 2005. The country achieved relative political stability and was hailed for its pursuit of economic and public-sector reforms. This period also introduced the first steps towards the decentralization of political power in the spirit of the 1992 Peace Accords, albeit in a manner that has favoured FRELIMO.

This positive-looking trajectory started to take a negative turn from 2005, when President Armando Guebuza took over from Chissano. In the following decade, he spearheaded a political culture that favoured centralized political power paired with the cementing of top-heavy elite capitalism, nurturing party-political alliances (Bertlesmann Stiftung 2016; Orre and Rønning 2017). His presidency struck observers for its willingness to yield and wield political power through a system of granting the necessary public licences to a small and politically well-connected economic elite (Cruz et al. 2014). This well-connected oligarchy has been eager to capture the rents associated with economic liberalization and the increasing foreign investments into the resource-based industries. Some commentators had already pointed to this risk looming over the country, based on observing how state assets and natural capital were privatized, especially in the aftermath of the war and even before Guebuza had taken over the presidency (Addison 2003).²³ Hindsight appears to trace the origins of the present fiscal situation to the Guebuza era.

Elections held in October 2014 passed the presidency to Filipe Nyusi. He is said to be departing from the path that Guebuza and his allies had favoured and the style of political decision-making they had nurtured. The first challenge for the Nyusi government has been to get to grips with the fiscal situation and restore trust with multilateral and bilateral development partners. The second challenge has been to ease the internal political tensions that flared up under the Guebuza presidency and which Nyusi has so far been able to contain on the basis of a fragile ceasefire. In view of the local elections that took place in October 2018 and the general elections taking place in 2019, Nyusi is banking on progressing with the decentralization of power to resolve this political subject, pending since the 1990s.²⁴ In early February 2018, the government proposed constitutional changes

²³ It was Guebuza who, in 1975, as interior minister had been responsible for the '24-20' order which forced 200,000 Portuguese residents to decide between adopting Mozambican nationality or leaving the country within 24 hours with a maximum of 20 kg of luggage.

²⁴ In October 2013 RENAMO called off the Paris General Peace Accords, in relation to which a fundamental point of contention has been for the decentralization of political power negotiated in 1992. The Guebuza government had taken a strong position against RENAMO's demands, whereas the

redistributing political power to the level of the country's provinces. The National Assembly approved these changes in May 2018 (*Further Africa* 2018c). The third challenge is to figure out how, in spite of the dire fiscal situation and the constrained budget over the medium term, the country can take advantage of the positive outlook for its extractive resources sector and build human and other forms of domestic capital that the country so desperately needs.

4.2 Industrial policy and MSME development

Examining the approach the country has taken to industrial policy to date can provide clues on how the country can take advantage of the positive outlook for its extractive resources sector.

Over the years, several policies, strategies, and plans have been put in place with the aim of achieving industrial development and strengthening MSMEs. To name a few, these policies, strategies, and plans have included the visionary Agenda 2025, which stresses governance, human capital, and economic development and underscores the need for investments to achieve productivity increases in the agriculture and fisheries sectors. Then, there is the Five-Year Plan (2015–2019), intended to serve as the key medium-term programming instrument to implement Agenda 2025. A raft of additional strategies have included the National Development Strategy (2015–35), the Strategy to Improve the Business Environment (known as EMAN II), the Export Strategy (2012–17), the Strategy for Employment and Vocational Training (2006–15), the Strategy for the Development of the Private Sector (2013–22), and the Strategic Plan for the Development of the Agricultural Sector. A District Development Fund has also been set up for the purpose of delivering loans and other financial services to enterprises in rural areas.

Alongside this, the country has entertained a forward-rolling Industrial Policy and Strategy (IPS) as the overarching framework for growing and diversifying the economy since the mid-1990s. The first IPS (1997–2006) was introduced in the context of the Structural Adjustment Programme that guided the country in adopting a liberal approach to re-establishing a market economy. It stressed that the government and its state apparatus are responsible for promoting a friendly environment that offers attractive and transparent incentives to private (foreign) investors. Arguably, this approach set the country on a new path and enabled the

Nyusi government has taken a more conciliatory stance. More recently, it has become less clear to what extent RENAMO continues to pose a threat to FRELIMO. During the time in which this chapter was being written, RENAMO leader Afonso Dhlakama died, on 3 May 2018, in his mountain hideout in central Mozambique (*Further Africa* 2018b). In contrast to FRELIMO's tensions with RENAMO, there is also the view that different factions within FRELIMO pose a greater threat to the incumbent presidency.

first large-scale investments in the extractives sector, including bringing to market the previously 'stranded' natural gas of the Mozambique Basin.

The second IPS (2007–15) introduced several additional measures to provide more active support to industrialization. These have included establishing the Institute for the Promotion of Micro, Small and Medium Enterprises (IPEME), tasking it with the responsibility to promote and support MSMEs. The second IPS also promoted several industrial development zones, including the Nacala Rapid Development Zone, the Maluana Technology Park, and the Beluluane Export Processing Zone. The latter is located next to the Maputo Development Corridor, which hosts the Mozal smelter and associated suppliers, as well as several other anchor projects.²⁵ The Mozal smelter imports raw material from Australia and elsewhere through the deep-water port in Maputo and uses hydroelectricity from Cahora Bassa dam to produce aluminium.

Observers have been especially critical of the achievements of these two IPSs as these have left the economy and its manufacturing sector in a mixed state of affairs (Cruz et al. 2014, 2016). While foreign investments in mega-projects have given the country international visibility and export earnings, they have not (yet) contributed more substantially to public finances. For example, Sasol only became a top corporate tax payer in 2015, after its ten-year cost-recovery period ended in 2014. At the same time, it is hard to imagine that the tax base has broadened beyond the extractive industries, when MSMEs are reported to be in decline and the labour market has not changed as much as could have been expected, given the economic growth recorded. In addition, prestige developments, such as the various resource corridors and special development zones, have at best delivered mixed results (Mtegha et al. 2012).

The current government introduced the third and most recent IPS (2015–24). Although it continues to underline the need for MSME development, it recognizes that the two preceding IPSs fell short of their expected outcomes. Under the third IPS, the Ministry of Industry and Commerce (MIC) has introduced a new strategy for MSME development, tasking the IPEME and its Provincial Directorates of Industry and Commerce with its implementation. This includes extending the IPEME's territorial reach to provide MSMEs with more localized services by means of eight business development centres (CORs) and business incubators maintained in the provinces of Maputo, Tete, Manica, and Cabo Delgado, and the districts of Catandica, Chiuta, Caia, and Mocuba. The MSME strategy itself comprises five priorities: (1) improve the business environment; (2) increase the capacity of MSMEs; (3) improve access to financial services; (4) improve market access; and (5) strengthen monitoring and coordination

²⁵ Initially a joint venture project led by BHP Billiton, Mozal Aluminium is now operated by South32 (47.1 per cent), the miner that was demerged from BHP Billiton in 2015. See <http://www.south32.net/what-we-do/places-we-work/mozal-aluminium> (accessed 29 March 2018).

mechanisms. A key aspiration is that MSMEs will be able to take advantage of demand arising from, as well as around, extractive industry projects for locally produced goods and services.

In addition to the MIC's new MSME strategy, the current government also launched a new National Programme for Sustainable Development (2015–2030). It is referred to as the 'Estrela Project' and it is led by the Ministry of Land, Environment and Rural Development. The aim is to improve rural electricity, banking, water, infrastructure, and technology.

The aspirations set out in the MIC's MSME strategy has prompted the World Bank-funded Mining and Gas Technical Assistance Programme (MAGTAP)²⁶ to conduct several studies to support its implementation. These set off from the question: which sector niches could potentially provide opportunities for local MSMEs in the mining, oil, and gas sector, and where and to what extent do these overlap with the sector priorities set by the IPS III?²⁷ The hypothesis behind this question has been that it makes sense to support local production of goods and services for which there is also demand beyond that arising from the extractive resources sector.

The first MAGTAP study split potential opportunities into two sets of goods and services: (1) those that overlap with the five priority industries targeted by the MSME strategy; and (2) those that comprise so-called *transversal services*, defined as bearing relevance not only across the five priority industries but also beyond. Such transversal services include, for example, HVAC (heating, ventilation, air-conditioning), cargo transportation and logistics, rental services, accounting and financial services, supply of office consumables, and waste management. This study has suggested that, at least in theory, there could well be opportunities for MSMEs to link up with the extractive and related industries.²⁸

The second study asked: to what extent do the constraints raised by existing studies on MSMEs apply to the identified niche areas?²⁹ A survey by FinScope (2012) and a study by USAID (2013) served as the benchmark. Both studies highlight which factors undermine MSME development:

- Lack of finance, deficits in human resources, inadequate infrastructure, and corruption and inefficient public processes and public–private relationships are among the most mentioned factors that make for an unfavourable business environment and poor public goods and services provision.³⁰

²⁶ See World Bank (2018). MAGTAP's overall objective is to strengthen the capacity and governance systems of key institutions, managing different aspects of the extractive resources sector.

²⁷ See Community Insights Group and EnergyWorks (2017a).

²⁸ See Appendices in Dietschke and Esteves (2018) for a fuller coverage of the results of the MAGTAP studies.

²⁹ See Community Insights Group & EnergyWorks (2017b).

³⁰ The UNU-WIDER-supported MSME survey conducted in 2017 also mentions these factors (UNU-WIDER 2018).

- Internal factors, such as weak organizational capacity and poor business management practices, undermine MSMEs' abilities to meet quality standards, achieve certification, and upgrade their applied technologies.

By conducting interviews with around 100 MSMEs, this study drilled deeper into the identified niche areas. On this basis, it concluded that across the two sets of goods and services focused on by the first study, there are two groups of MSMEs that face somewhat different constraints:

- The first group comprises MSMEs offering services that require a higher level of management sophistication. These services include (a) specialist geological, laboratory, and waste management services; and (b) logistics and transport maintenance services. Mozambican companies offering these services tend to be somewhat larger and more often meet the definition of medium-sized companies.
 - For this group, the good news is that while their management capabilities are not yet what they ought to be in order to qualify as *certified suppliers* to the extractive industries, they are nevertheless close enough to warrant targeted interventions that would get them to this point.
- The second group comprises MSMEs that offer a diverse set of goods and services, including goods and complementing services such as construction materials, camp-site equipment, chemicals, and HVAC equipment, as well as more generally the *transversal services* mentioned above. Mozambican companies offering these goods and services tend to be smaller and less sophisticated, including micro-enterprises offering anything from catering services to office consumables, to accounting and financial services, to specialized consulting services.
 - This group would primarily benefit from basic and general enterprise development support, as opposed to seeking to qualify these companies as *certified suppliers*.

In conclusion, the conundrum is that in order for these two groups to build linkages with the extractive industries, enterprises would require different sets of policy interventions: enterprises offering the services comprising the first group would need very targeted supply-side support to reach the milestone of *certified supplier* status. On the demand-side, local content stipulations could possibly complement this support. Meanwhile, the enterprises offering the goods and services that marked the second group are much further from being able to supply *directly* to lead operators and their lead contractors. Enabling these types of enterprises to benefit from possible *induced* linkages would best be achieved by supporting MSMEs more generally and across all sectors. However, the policies, strategies, and plans with which previous governments have tried to support

MSME development have not been particularly effective, especially with regard to that part of the economy that matters most for the majority of Mozambicans. The efforts tried to date do not appear to have tackled more fundamental constraints that undermine rural-based economic and social development.³¹ This raises the question of whether more recent efforts, set in the context of the impending resources boom, could make a difference.

4.3 Local content and social investment in local economic development

Local content stipulations tend to target the demand-side of bringing local enterprises into the supply chain of foreign-funded investment projects. In parallel, corporate local content development programmes may also support supply-side interventions to qualify local enterprises as *certified suppliers*.

On the demand-side, the announcement was made in late 2014 that the government was embarking upon drafting a *sector-specific* local content bill to provide a legal and regulatory framework for the participation of Mozambican businesses and citizens in extractive industry projects. In response, several companies that were already invested in the sector commissioned studies that confirmed that Mozambique already has a diverse range of general and sector-specific policies, strategies, laws, and regulations in place setting out local content objectives and stipulations.³² Box 10.1 highlights some of these (without claiming comprehensiveness).

Notably, it could be seen as a positive sign that the present government has not rushed into finalizing the bill, which to date remains pending and continues to be discussed among key stakeholders. Other countries in the region have pursued a different approach and have put out sector-specific local content laws mandating ambitious quantitative procurement targets. In practice, however, such legislation has delivered rather mixed outcomes (Östensson 2017).

The proposed Local Content Bill of 2014 triggered a debate that demonstrated the different positions that domestic stakeholders hold and that needed to be reconciled. One position has promoted a principle-led approach that seeks to focus local content on ‘value added in the country’. This position emphasizes the ‘use of local factors of production’ and the ‘development of local value chains’ to diversify the economy. It also appears to go along with a reflective-realist understanding of the existing capabilities of the private sector, with a view to identifying and focusing on niche areas where the extractives sector could most likely source

³¹ See Dietsche (2014) for a broader discussion on this subject.

³² See also OECD (2017). USAID/DAI (2015) compiled a detailed but unpublished stocktake of national content provisions in existing legislation.

competitive factors of production from within the country. It is said that stakeholders in the Ministry of Economy and Finance (MEF), as well as the majority of stakeholders in the Ministry of Mineral Resources and Energy (MIREME), have been in favour of this position.

The other position maintains that local content stipulations should oblige locally registered foreign suppliers of goods and services to ensure they meet mandatory targets on Mozambican co-ownership. A respective target of 15 per cent has been quoted, with the Mozambican private sector said to have been lobbying for this position. Supposedly, the technical argument put forth to underpin this position is that such ownership participation would support technology transfer and deliver dividend income to nationals who would re-invest in the country. At the same time, there are some doubts about whether those lobbying for this position are genuinely interested in entrepreneurship.

Box 10.1 Local content objectives and stipulations

The Policy and Strategy for Mineral Resources (Resolution No 89/2013 of 31 December) and the associated Implementation Plan (2017) contain several local content references, including (1) to promote local entrepreneurship and the creation of partnerships through the entire value chain of the natural resources industry sector; (2) to give priority to increasing benefits to national operators/companies and promote the establishment of SME cooperatives and associations; (3) to give priority to the exploitation of natural resources benefiting the development of local communities; (4) to train professionals (e.g. geologists, geochemists, mining engineers, and petroleum engineers, as well as legal and taxation experts, contract negotiators, and auditors); and (5) to encourage the participation of women.

The Mining Law (Law No. 20/2014 of 18 August) requires that foreign legal entities providing services to mining operations associate with Mozambican legal entities, and that mining operators give preference to local products and services, and ensure the employment and professional training of Mozambican workers. The law also demands that mining contracts stipulate minimum standards for local procurement and employment and training of Mozambicans. The Mining Regulations (Decree No. 31/2015 of 31 December 2015) guide the procurement of goods and services.

The Oil & Gas Law similarly stipulates that foreign companies providing services to the petroleum operations associate with Mozambican individuals or companies, and that rights holders of petroleum operations must give preference to local products and services when these are comparable in quality, quantity, and availability and do not cost more than 10 per cent more than

imported goods and services, including taxes. The law also stipulates that production-sharing contracts contain stipulations on local procurement and employment and training of Mozambicans.

The Regulation on the Resettlement Process Resulting from Economic Activities (Decree 31/2012 of 8 August 2012) requires that affected communities are given opportunities to benefit directly from investment projects.

The Regulation for the Contracting of Foreign Citizens in the Petroleum and Mining Sectors (Decree No. 63/2011 of 7 December 2011) applies to foreign and domestic employers and to all foreign employees, imposing a quota regime stipulating that the share of foreign employees as a percentage of the company's workforce can only be 5 per cent for employers with more than 100 employees; 8 per cent for companies with 10–100 employees; and 10 per cent for employers with up to 10 employees. In addition, there is a Strategy for Training Human Resources for the Mineral Resources Sector (2010–20). Furthermore, the Investment Law (2004) requires that applicable investment projects create a minimum of twenty-five work places for directly employed Mozambicans starting in the second year of operation, and that the Mozambican workforce is provided with opportunities to acquire professional qualifications.

The Natural Gas Master Plan expresses the expectation that the O&G sector will support industrial development delivered by MSMEs developing around the country's mega-projects. It anticipates that specific measures will be put in place to promote the growth of MSMEs in and around the value chain of O&G projects. It also suggests that increased tax revenues will be put towards stimulating MSME development. A set of indicators has been spelled out to guide project approvals. These seek to evaluate investors' commitments towards using Mozambican suppliers and they suggest that investors develop and propose detailed action plans.

Source: Authors, based on the discussed laws and regulations.

If it was agreed that some form of ownership participation was to be required, there are also different opinions on whether such participation should be delivered via carry arrangements benefiting selected individuals, or whether beneficiaries should bring their own resources to the table—that is, at least sharing the risks in exchange for the rewards that equity participation should deliver. In terms of implementation, it is understood that the MEF is taking the lead in advancing the pending Local Content Bill, while subsequent local content regulations would be drafted by MIREME. The MEF is also planning to establish a small unit that would undertake relevant sector analyses to inform as well as monitor the implementation of the eventual Local Content Act.

Less clear is what role the MIC and its IPEME will play. The MAGTAP studies have stressed that the IPEME is ill prepared to support the enterprises of Group A, as it does not have the knowledge and experience required to guide supplier development for the specialist areas of expertise within which these enterprises operate. Direct participation in extractive industry supply chains requires meeting high international standards, not least because the sector entertains a very low level of tolerance for late and below-standard delivery.

Other supply-side interventions include the experiences gained with local content programmes delivered in the past. Often quoted is the Mozal-related Mozlink programme, which originated in the early days of the Mozal smelter and was led by the International Finance Corporation (IFC). At one stage it included the participation of several foreign companies invested in Mozambique. The results of this programme appear to have been mixed and the programme no longer exists.³³ All primary references to the programme ceased following the programme's evaluation conducted around 2009/10. One conjecture has been that not all of the suppliers developed under the programme have been of the type adding value in-country. No other third party has stepped up to take on the role that the IFC had sought to play.

In summary, recent efforts suggest an inconclusive picture regarding whether 'local content' can really contribute towards building the domestic capital that is required to diversify and structurally transform the country's economy for the benefit of its rural-based population. Some experimental efforts appear to be underway that could positively contribute to some local companies achieving *certified supplier* status (Lemos 2016; Lemos and Scur 2014).³⁴ However, the litany of challenges that MSME surveys and studies have flagged as constraints to private-sector development suggests that claims portraying the country's extractive resources sector as the silver bullet to build up the country's industrial capacity could be grossly overpromising, at least over the next two decades.

Another recent effort that could hold some potential in support of rural-based economic development is the Policy for Corporate Social Responsibility for the Mineral Resources Extractives Industry,³⁵ which the president approved in May 2015 and which the (then) minister of mineral resources and energy followed up

³³ The authors are aware that individual companies have continued with their own supplier development programmes.

³⁴ This includes providing selected small and medium-sized companies in manufacturing and in the construction and building materials industry with management training and consulting services aimed at improving productivity and firm performance. For additional assessment of the construction sector, see also Cruz et al. (2018), Mageri et al. (2015), and Cardno (2015).

³⁵ Presidential Decree No. 11/2015 of 16 May 2015.

with a regulatory Implementation Guide³⁶ that was approved in December 2016. These documents speak to the objective of ensuring that the sector contributes to local economic development by oil, gas, and mining companies developing and implementing comprehensive social investment plans and, in some cases, negotiating local development agreements (*Boletim da República* 2017: 100, authors' translations). Corporate efforts to deliver benefits beyond their core business are expected to prioritize human capital development, local business links, and productive employment creation, and help local companies develop economic activities around oil, gas, and mining projects.

Although the language of the corporate social responsibility (CSR) Implementation Guide overlaps with that more commonly featuring in local content debates, the target beneficiaries are quite different. The focus is on the local level, where sub-national public authorities struggle to deliver public goods and services critical to building rural-based domestic capital. Here, the guide leaves it open to what extent social investment efforts are negotiated to focus more narrowly on supplier development, or whether they may want to target broader enterprise development to meet the expectations and needs of impacted rural communities and their respective district and provincial authorities.

From this bottom-up perspective, the expectations are typically to support income generation and (self-)employment opportunities through investments in local capabilities and helping local MSMEs innovate and adopt new technologies, with a view to tapping into potential demand for locally produced goods and services. Corporate efforts to support this type of enterprise development in collaboration with sub-national authorities, communities, and delivery-oriented development partners could hold some potential to bring to the fore and jointly tackle some of the barriers that hinder entrepreneurial Mozambicans in rural areas from becoming more productive and accessing markets. However, to date it has remained unclear if the incumbent government still supports the uptake of the CSR Policy and Implementation Guide and if and how companies will actually be able to implement these.

Perhaps there lies an opportunity in the country's predicament of unlikely substantial additional resource revenues over the medium term, despite a booming natural resources sector, *if* this encourages collaborative efforts supporting private sector development from the bottom up. This chapter does not have space to delve into the qualitative details of the institutional arrangements that have so far undermined the development of MSMEs. It concludes on the note that it would seem wise to scrutinize these aspects more closely and bring them into the national debate about extractives and development. There is the risk of

³⁶ Ministerial Order No. 8/2017. The original goes by the Portuguese title of 'Guião Implementação de Política de Responsabilidade de Social Empresarial para a Indústria Extractivo dos Recursos Minerais' (Government of Mozambique 2017).

overpromising on the delivery capacity of local content in a country context in which the gap is particularly wide between most of the inputs that the sector procures and hires, and those which the local economy produces.

5. Summary

This chapter has set off from the positive long-term outlook of Mozambique's extractive resources sector and the expectation that it will contribute to economic diversification and social development, not least by means of procuring locally produced goods and services and hiring Mozambicans. The chapter has argued, however, that even so, the prospects are challenging for this sector to link up with the local economy and to contribute to its diversification. Beyond foreign-funded and export-oriented mega-projects, the country's formal economy is very small, rural-based, and dominated by entrepreneurs operating at the lowest level of the MSME spectrum.

The current fiscal situation, in combination with the delays experienced in developing the offshore natural gas sector, undermines the assumption that additional revenues from the sector could be used to finance visionary strategies and plans aimed at achieving economic diversification and transformation through the spending of these revenues. Thus, the chapter has asked the question: what other options are there for the government to ensure its citizens benefit from the extractive resources sector? It has cautioned against optimistic projections overpromising positive impacts and has argued that the onus lies on improving the policy environment for broader and rural-focused private-sector development, not least to balance the growing dependence on extracting and processing mineral resources. A stock-take of the policy environment has evolved over time and highlighted that the incumbent government faces the challenge of building much-needed human and other forms of domestic capital in ways that do not rely solely on spending additional revenues.

While there are some signs of departing from the unfortunate path the preceding government has followed, the jury is out on whether more recent efforts to support MSME development will deliver such domestic capital building. In the context of potential opportunities offered by the demand arising from the extractives sector, the results of a series of MAGTAP studies has suggested that there are two mutually non-exclusive choices: to focus more narrowly on supplier development, possibly benefiting a few companies achieving 'certified supplier' status as the pre-condition for participating *directly* in the sector's value chain; or to support enterprise development more broadly, recognizing that Mozambique's non-extractive economy is distinctly rural-based. The chapter's discussion of recent efforts made to encourage local content and social investment in local economic development has delivered an inconclusive picture regarding the former and cautiously pointed to the opportunities associated with the latter, because it offers

at least the potential to innovate around supporting the ‘industries without smokestacks’ that some observers have highlighted as the key to the country’s development.

For the foreign companies already invested in Mozambique, it seems clear that they will have to ‘up their game’ in terms of the qualitative efforts they have to put into linking up their investment projects with the domestic economy—whether at the level of the national economy, or at the level of the particular provinces, districts, and communities where their operations are located.

References

- Addison, T. (ed.) (2003). *From Conflict to Recovery in Africa*. Oxford: Oxford University Press.
- AfDB, OECD, and UNDP (2016). ‘Mozambique 2016’. In *African Economic Outlook*. Paris: AfDB, OECD, and UNDP. Available at: www.africaneconomicoutlook.org.
- Andrews, M. (2013). *The Limits of Institutional Reform in Development: Changing Rules for Realistic Solutions*. Cambridge: Cambridge University Press.
- Bertelsmann Stiftung (2016). *Mozambique Country Report: Bertelsmann Transformation Index*. Gütersloh: Bertelsmann Stiftung.
- Boletim da República* (2017). *Boletim da República: Publicação Oficial da República de Moçambique*. 16 January 2017. (In Portuguese.)
- Bratton, M., and N. Van de Walle (1997). *Democratic Experiments in Africa: Regime Transition in Comparative Perspective*. Cambridge: Cambridge University Press.
- Cardno (2015). *Market Systems Analysis of the Building Construction Sector in Cabo Delgado Province*. Final report, prepared for the International Labour Organization (ILO). Maputo: Cardno.
- Community Insights Group & EnergyWorks (2017a). ‘Study of Priority Niches for Value Chain Analysis with the Aim of Enhancing the Competitiveness of MSMEs Working with Large Mining, Oil & Gas Projects in Mozambique’. Study for the Mozambican Ministry of Industry and Commerce for the World Bank Mining and Gas Technical Assistance Project (MAGTAP). Singapore: Community Insights Group & EnergyWorks.
- Community Insights Group & EnergyWorks (2017b). ‘Study on Enhancing the Competitiveness of National MSMEs to Participate within the Supply Chains of Large Mining, Oil & Gas Projects in Mozambique’. Study for the Mozambican Ministry of Industry and Commerce for the World Bank Mining and Gas Technical Assistance Project (MAGTAP). Singapore: Community Insights Group & EnergyWorks.
- Cooperação Alemã (2018). *Resource Sector Mozambique: New Market—New Opportunities*. Hannover: BGR, GIZ, and AHK.
- Cruz, S. A., F. Fernandes, F. J. Mafambissa, and F. Pereira (2018). ‘Construction Sector in Mozambique: An Overview’. WIDER Working Paper 2018/117. Helsinki: UNU-WIDER.

- Cruz, S. A., D. Guambe, C. P. Marrenguela, and A. F. Ubisse (2014). 'Mozambique's Industrialization'. WIDER Working Paper 2014/059. Helsinki: UNU-WIDER.
- Cruz, S. A., D. Guambe, C. P. Marrenguela, and A. F. Ubisse (2016). 'Mozambique's Industrial Policy'. In C. Newman, J. Page, J. Rand, Abe. be Shimeles, M. Söderbom, and F. Tarp (eds), *Manufacturing Transformation: Comparative Studies of Industrial Development in Africa and Emerging Asia*. Oxford: Oxford University Press.
- Cruz, S. A., and F. J. Mafambissa (2016). 'Industries without Smokestacks: Mozambique Country Study'. WIDER Working Paper 2016/158. Helsinki: UNU-WIDER.
- Dietsche, E. (2014). 'Diversifying Mineral Economies: Conceptualising the Debate on Building Linkages'. *Mineral Economics*, 27: 89–201.
- Dietsche, E. (2017). 'New Industrial Policy and Extractive Industries'. WIDER Working Paper 2017/161. Helsinki: UNU-WIDER.
- Dietsche, E. and A. M. Esteves (2018). 'What Are the Prospects for Mozambique to Diversify its Economy on the Back of "Local Content"?' WIDER Working Paper 2018/113. Helsinki: UNU WIDER.
- FinScope (2012). 'FinScope MSME Survey Mozambique 2012'. Available at: www.finmark.org.za/wp-content/uploads/2016/01/Rep_FS_Mozambique_MSME_20121.pdf (accessed 29 March 2018).
- Further Africa* (2018a). 'Mozambique Has Funds to Pay 17% of its Debts to the Private Sector', 15 March. Available at: <https://furtherafrica.com/2018/03/15/mozambique-has-funds-to-pay-17-of-its-debts-to-the-private-sector> (accessed 22 March 2018).
- Further Africa* (2018b). 'Afonso Dhlakama, Mozambique's Opposition Leader, Dies at 65', 4 May. Available at: <https://furtherafrica.com/2018/05/04/afonso-dhlakama-mozambiques-opposition-leader-dies-at-65> (accessed 8 May 2018).
- Further Africa* (2018c). 'Mozambique Proposes Constitutional Changes to Secure Peace Agreement', 8 February. Available at: <https://furtherafrica.com/2018/02/08/mozambique-proposes-constitutional-changes-to-secure-peace-agreement> (accessed 22 March 2018).
- Government of Mozambique (2017). 'Corporate Social Responsibility Policy Implementation Guide for the Mineral Resources Mining Industry'. Ministerial Order No. 8/2017 of 16 January.
- Hanlon, J. (2017). 'Following the Donor-Designed Path to Mozambique's US\$2.2 Billion Secret Debt Deal'. *Third World Quarterly*, 38(3): 753–70.
- ILPI (2013). *Political Economic Analysis of the Petroleum Sector in Mozambique*. Oslo: International Law and Policy Institute.
- IMF (2018). *Republic of Mozambique: Staff Report for the 2017 Article IV Consultation*. Washington, DC: International Monetary Fund.
- Lachler, U., and I. Walker (2018). *Jobs Diagnostic Mozambique: Let's Work*. Washington, DC: World Bank Group.
- Lemos, R. (2016). 'Does Management Training and Consulting Services Improve Working Conditions, Worker Skills and Productivity, and Firm Performance in SMEs? Evidence from the Construction Industry in Mozambique'. London: International Growth Centre.

- Lemos, R., and D. Scur (2014). 'Management Practices in Manufacturing in Mozambique'. London: International Growth Centre.
- Maugeri, N., V. Nhabinde, R. Quintella (2015). 'Background Study for a Strategy and Policy Framework to Support the Development of the Construction and Building Materials Industry in Mozambique'. London: International Growth Centre.
- Melia, E. (2015). 'The Political Economy of Extractive Resources'. Working Paper. Frankfurt: Gesellschaft für Internationale Zusammenarbeit.
- Mtegha, H., P. Leeuw, S. Naicker, and M. Molepo (2012). *Resource Corridors: Experiences, Economics and Engagement: A Typology of Sub-Saharan African Corridors*. Johannesburg: EI Sourcebook/University of Witwatersrand.
- OECD (2017). 'The Case of Mozambique'. In *Local Content Policies in Minerals Exporting Countries: Case Studies*. Paris: OECD.
- Orre, A., and H. Rønning (2017). 'Mozambique: A Political Economic Analysis'. Report commissioned by the Norwegian Ministry of Foreign Affairs. Oslo: Norwegian Institute of International Affairs and Christian Michelsen Institute.
- Östensson, O. (2017). 'Local Content, Supply Chains, and Shared Infrastructure'. WIDER Working Paper 2017/96. Helsinki: UNU-WIDER.
- Roe, A. (2018a). 'Extractive Industries and Development: Lessons from International Experience for Mozambique'. WIDER Working Paper 2018/56. Helsinki: UNU-WIDER.
- Roe, A. (2018b). 'Extractive Industries and Development: Mozambique—Bust before Boom: Reflections on Investment Surges and New Gas'. WIDER Working Paper, 2018/140. Helsinki: UNU-WIDER.
- Sutton, J. with A. J. Pimpão, F. Simione, Q. Zhang, and S. Zita (2015). 'An Enterprise Map of Mozambique'. London: International Growth Centre.
- UNDP (2016). 'Mozambique'. Briefing note for countries on the 2016 Human Development Index. New York: United Nations Development Programme.
- UNU-WIDER (2018). 'Survey of Mozambican Manufacturing Firms 2017'. Descriptive Report. Copenhagen, Helsinki, and Maputo: University of Copenhagen, UNU-WIDER, CEEG, and the Mozambican Ministry of the Economy and Finance.
- USAID (2013). 'Assessing Policy Options for Strengthening Local Content in Mozambique'. Unpublished report for USAID's Mozambique Support Program for Economic and Enterprise Development (SPEED).
- USAID/DAI (2015). 'Analysis of National Content Provisions in Existing Legislation in Mozambique'. Unpublished report for USAID's Mozambique Support Program for Economic and Enterprise Development (SPEED).
- World Bank (2018). 'Mozambique Mining and Gas Technical Assistance Project—Procurement Plan (English)'. Report. Washington DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/225411517300695137/Mozambique-AFRICA-P129847-Mozambique-Mining-and-Gas-Technical-Assistance-Project-Procurement-Plan> (accessed 21 March 2018).

Gas in Tanzania

Adapting to New Realities

Mark Henstridge

1. Introduction

Large volumes of natural gas have been discovered offshore Tanzania. Current official estimates suggest proven reserves of 57 trillion cubic feet (tcf) of gas,¹ which is a lot of gas.² To put it into context, the price for liquefied natural gas (LNG) in Asia for most of 2018 was around US\$10 per million British thermal units (mmbtu), which values 57 tcf at US\$55 billion: equivalent to about ten times the 2018 Tanzanian GDP, and about US\$10,000 per person. The investment in the projects that would be needed to produce such gas is also large—it would be the biggest set of investments in Tanzania ever, with a total cost estimated at almost the same order of magnitude of GDP: potentially around US\$44 billion (Baunsgaard 2016).

With such big numbers associated with the offshore natural gas, it is not hard to imagine the fantastic prospects of increased wealth and accelerated development that are tantalizingly almost within the government's grasp. The reality is that these numbers are indeed fantasy: the perceived scale of any revenue based on the numbers would be wildly overestimated. What matters is not the stock of reserves, but the value of any flow of production.

Any expectation that there will be a boom any time soon will be sorely disappointed. Not only does the commercial viability of the array of investments by private companies needed to produce, liquefy, and ship LNG need a minimum price higher than that achieved in the recent past, but project viability also needs reduced risk. Such investments face an array of risks, including technical, market, and policy risks. In the end, as well as prices, costs, and risks, a key determinant

¹ Ministry of Energy and Minerals quarterly reports (MEM, various years), though estimates of the amounts of gas that could potentially be produced are lower.

² The units used to calibrate stocks and flows of gas and liquified natural gas (LNG) are potentially confusing. As well as industry-specific units for pricing, a mix of imperial and metric units is used for both stocks of reserves and flows of production. There is a conversion table included in each annual publication of the BP Statistical Review of World Energy (www.bp.com/statisticalreview).

of the scale of any potential resource revenue is the time it will take to bring reserves to production: the longer it takes, the smaller any revenue will be relative to a growing GDP or population.

There have been a number of careful estimates of the likely scale and timing of the prospective boom which show a consistent picture of modestly material, but not transformative, revenue to government. They are reported here after a discussion of key assumptions in making such projections, and the risks that surround Tanzanian offshore gas.

I then look to embed the projections in a brief discussion of two topics relating to the role of natural resources in growth, structural change, and industrialization: first, the interactions between public policy and the risks faced by large-scale investment in natural resources; second, the way in which an array of public policies condition the impact of actual and prospective natural resource projects on wider matters of economic growth, structural change, and industrial development.

2. The magnitude and timing of a prospective resource boom

The official estimate of gas reserves in Tanzania is 57 tcf, but the estimates of actually ‘recoverable’ gas reported by the companies which have done the exploration are lower, perhaps below 30 tcf (Baunsgaard 2016; see also Scurfield and Mihalyi 2017). In any case, this is a significant quantity of gas, but it is deep under the sea far offshore. Any resource boom will be determined by flow of production and any associated revenue flows to government—which, in turn, are a function of the costs of capital investment and the cost of production; the recovery of those costs as part of earning a return on investment; and the structure of the fiscal terms which shape the shares of government and investor of the dollar net present value (NPV) of the project.

In this section, the factors which shape production volumes and costs, LNG prices, and the nature of the fiscal terms are set out. A key determinant of a boom—if in the end there is one—is time: the longer it takes to bring gas reserves to production, the smaller the boom relative to GDP or on a per-person basis.

Projections of gas production are in part determined by geological, engineering, and commercial risks and constraints. There is a minimum feasible flow of gas production needed to make the facilities for production, transport, and liquefaction of gas work efficiently. For offshore gas in Tanzania, that minimum ‘anchor volume’ of production is large, representing so much gas that it outstrips the capacity of Tanzania to absorb it, so almost all would be exported as LNG—hence the need to have a liquefaction plant.

To put the scale into context, it is useful to look first at the volumes of reserves and production onshore. As well as the large-scale offshore discoveries, Tanzania also has onshore or shallow water fields at Mnazi Bay and Songo Songo, shown in Figure 11.1. They are much smaller than the offshore discoveries: Mnazi Bay has technically recoverable gas estimated at just 0.3 tcf, while Songo Songo holds 0.7 tcf, compared with recoverable gas reserves estimated at a total of 29–37 tcf between the two main offshore consortia.³ However, the smaller quantities of shallow water or onshore gas can be brought into production more quickly and more easily, and so at a significantly lower cost. Songo Songo has produced since 1974. Production from Mnazi Bay by the companies Maurel et Prom and Wentworth Resources started in 2015, with the gas being delivered to Dar es Salaam via pipeline for power generation.

In April 2018, construction on the Kinyerezi II gas-fired power station was completed and the facility was opened by President Magafuli, with the project expected to be commissioned at full capacity of 240 megawatts (MW) in October 2018 (*The East African* 2018). The use of onshore and shallow water gas in power generation has supported a significant addition to Tanzania's generating capacity, and gas production had increased from 78 million standard cubic feet per day (mscuf/d) in 2012 to 132 mscuf/d in 2016, with scope for further increases in line with the ambition for more investment in gas-fired power generation, to around 200 mscuf/d.⁴

To put this into context, the ambition of production of 200 mscuf/d of gas for power generation is equivalent to 2.1 billion cubic metres (bcm) or 1.5 million tonnes of LNG: below, we discuss the prospect of volumes of LNG from Tanzania of the order of 15–20 million tonnes. Taking just 10 per cent of 15 million tonnes of LNG for domestic use would mean 1.5 million tonnes of LNG: the equivalent of around 200 mscuf/d, or a doubling of gas hoped to be going into power generation. This point illustrates the scale of potential LNG exports relative to expectations of gas consumption in Tanzania.

The offshore gas is 80–100 kilometres offshore Tanzania, in water depths of up to 2,000 m and a further 4,000 m below the seabed. The reserves have been discovered by two separate consortia of international oil and gas companies across several 'blocks'. One consortium is led by Statoil as the operator, and includes ExxonMobil (Block 2). The other is led by Shell, following their takeover of BG Group, and also includes Ophir (Blocks 1, 3, and 4). The location of Blocks 1, 2, 3, and 4 is illustrated in Figure 11.1.

³ On Songo Songo reserves, see Orca Exploration Group (2017); on Mnazi Bay reserves, Wentworth Resources (2018); on the offshore blocks, Baunsgaard (2016) and Scurfield and Mihalyi (2017).

⁴ See World Bank (2017) for production data; expectations for onshore and shallow water production going into power generation are drawn from a 2013 private briefing by BG Group for Oxford Policy Management.

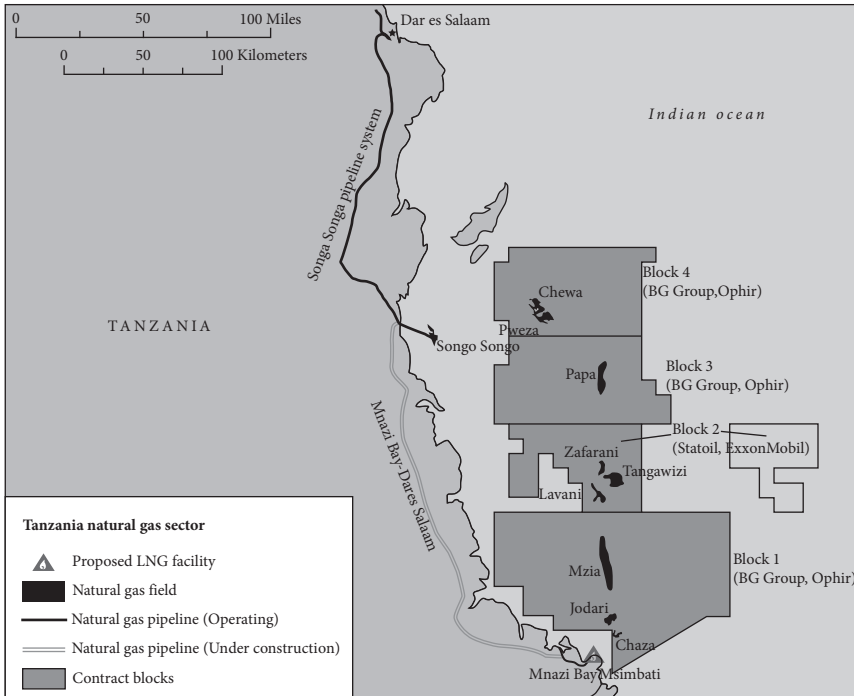


Figure II.1 Natural gas offshore Tanzania

Note: Representation of international boundaries and names not authoritative.

Source: Reproduced from EIA (2013).

2.1 Risks

There is an interaction between solving the geological and engineering challenges and the commercial constraints and risks. The higher the capital costs required, and the longer the time it takes to build and install facilities, the more secure an investor will need to be in the expected return on investment, and the risks that surround it. There are, broadly, two sets of risks apart from the technical geological and engineering risks. These are the market or commercial risks, and the policy risks: the extent to which there is stability in the set of legal and regulatory measures, and the commercial agreements, which amount to a coherent 'authorizing environment' for a major natural resource project.

2.1.1 Geological and engineering challenges

There is a combination of geological and engineering challenges to producing and transporting gas from the bottom of the sea over a long distance. The gas from each of these different fields comes from different depths, and comes to the level

of the seabed at different temperatures and pressures. Differential pressures mean that different gas fields cannot simply be plugged in to each other without careful management of relative reservoir and pipeline system pressures. The gas from different fields may also have a different mix of the butane and propane which makes up natural gas. These have to be blended, either at the wellhead on the seabed or onshore, and the longer hydrocarbons—natural gas liquids (NGLs)—have to be stripped out from the production flow of propane and butane. In addition, one feature of the seabed between several of the gas fields and the shore is a canyon, on the scale of the Grand Canyon, across which a pipeline will have to run to transport the gas from the sub-sea wellhead installations to the shore.

Such challenges can be overcome: but they need to be carefully evaluated, and engineering design work will need to be completed to meet them. The cost of engineering solutions will not be clear until such work is done—during a succession of engineering design projects starting with the preparatory ‘pre-Front End Engineering Design’ (pre-FEED) work—and it all takes time. The operator of a consortium of investors will typically incur the costs of pre-FEED work when the main parameters of a project are clear, even if they still face ongoing market and commercial risks.

2.1.2 Market and commercial risks

A key market risk relates to the price that can be secured for exports of LNG. The current expectation is that East African gas will go to Asia. During 2017, prices for LNG imports to Japan were significantly lower than the average for the previous decade: an average of US\$8.61/mmbtu for the year, compared with an average of US\$12.15/mmbtu for the ten years 2007–16. The extended period of higher prices reflected a mix of circumstances. LNG prices had been strong in Tokyo while Japan was importing gas to generate power after Japanese nuclear plants failed safety standards in 2002, were damaged by the tsunami of 2004, and suffered the Fukushima disaster of 2011. In addition, LNG had been priced using a formula that related gas prices to the oil price, and oil prices had been above US\$50 per barrel for most of the period 2005–15. Figure 2 shows crude oil and natural gas prices from 2014 to late 2018.

The average price of LNG imports to Japan during the first ten months of 2018 rose to US\$10.40/mmbtu—a 21 per cent increase over the average for 2017. Figure 2.5 in chapter 2 in this volume illustrates the extent to which Asian LNG prices continue to move in a similar way to crude oil prices, and the volatility of hydrocarbon prices. According to Scurfield and Mihalyi (2017) (of which more later), the level of prices in 2017 and 2018 is still below the long-run price of US\$14/mmbtu that would make investment in Tanzanian LNG viable on the basis of the rate of return international companies usually require on capital investment, but not far off the US\$11 that they argue could make investment possible.

‘Henry Hub’ in Louisiana, the part of the US gas pipeline network that serves as a reference point for market pricing of gas across the US. The average price at Henry Hub for the first ten months of 2018 was unchanged over the average for 2017, at a shade under US\$3/mmbtu.

What matters for assessing the market risks for large investments in LNG is the prospects for the price in the future. The recent past, together with some expectations about the changes in global gas markets, provides some guidance for thinking about the future. There are at least three factors to bear in mind: (i) the sustainability of the LNG pricing link to crude oil and the scope for integration of global gas markets; (ii) expectations for demand for LNG in Asia; and (iii) expectations for supply of LNG.

The link between LNG prices and the oil price is eroding. This is related, in part, to an increasing integration in global gas markets through LNG. The volume of gas traded as LNG more than doubled between 2000 and 2010 to nearly 300 bcm, and increased further to 393 bcm in 2017.⁵ The growth in LNG now includes a link between the increase in supply of gas in the United States, where new ‘tight’ and shale gas supplies have recently turned the United States into an exporter of LNG. This supply shock helps explain why the US gas prices at Henry Hub, shown in Figure 11.2, are lower than LNG prices in Asia. In economics, the market price under competition is set by the intersection of supply and demand curves at the margin. As US exports grow, they add to the marginal supply of LNG across the Pacific and so put downward pressure on prices in Asia.

The link between oil prices and LNG prices is also eroding because there is dissonance between what LNG buyers want, which is short-term price flexibility, and what LNG suppliers need, which is long-term price stability. There has been a steady increase in the share of LNG traded on the basis of spot prices. Between 2010 and 2017, the number of cargoes of LNG traded on a spot basis more than doubled from 500 to over 1,000. The proportion of LNG trade accounted for by spot pricing increased from 12 per cent in 2010 to 25 per cent in 2017 (Shell 2018).

Although the price for LNG import to Japan did increase to over US\$10/mmbtu in 2018 to close in on the recent decade-long average price, it cannot be assumed that this is now a stable price level. The erosion of the link with oil prices and lower-cost marginal supplies of LNG from the United States simply sustained downward pressure on prices. However, there are forecasts of increased demand for gas, and hence LNG, in Asia, and there is some analysis of expected supply of LNG based on recent patterns of investment in liquefaction plants, which may shift the price outlook for the medium term.

⁵ Data from the BP Statistical Review of World Energy, available at <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html> (accessed 23 December 2018), and from BP (2018).

The biggest changes in gas markets in Asia are in China. Gas demand in China has more than doubled from just over 100 bcm in 2010 to nearly 250 bcm in 2017. Over that period, China's imports of LNG have gone up from around 10 bcm in 2010 to around 40 bcm (Shell 2018). Both China's total gas demand and imports of LNG exceeded industry consensus forecasts in 2017.

Increased demand for LNG, in particular in Asia, is a key feature of the forward-looking outlook exercises conducted by both Shell and BP: Shell projects a 55 per cent increase in LNG trade, or an additional 200 bcm, by 2035; BP projections show a significantly higher increase—an 85 per cent increase in LNG, or an additional 335 bcm, over the same period.

Increases in supply of LNG can be expected over the two years to 2020 because there remains some major investment in LNG supply, much of it from Australia for the Asian market, coming on-stream in the next two years: an estimated additional 40 bcm in additional supply capacity is expected in both 2018 and 2019, but not much more after that. The Shell LNG outlook argues that there is a risk of a lack of supply investment around the middle of the next decade. This is possibly relevant to Tanzania given that the 'Final Investment Decision' (FID) for the offshore gas has been postponed a number of times, and is now not expected before 2022. A key party to investment in offshore gas in Tanzania will be Shell. At the same time, there are alternative new sources of supply, not least Mozambique, which has more than twice the recoverable reserves of Tanzania and is a few steps further along the path towards first production.⁶

2.1.3 Policy risks: the 'authorising environment'

Progress on the development of a project of scale and complexity requires work to solve geological and engineering challenges. But that work will not start until there is some degree of confidence in the policy environment for the project. For example, as touched on above, a consortium of investors will typically only incur the costs of pre-FEED work when the main policy and commercial parameters of a project are clear. Pre-FEED work is an essential input to an FID. And the more detailed and intense engineering work—FEED—usually starts when there is a clear Host Government Agreement (HGA) in place which defines the project, the associated fiscal terms, and their implications for the commercial case for an investor, given the market and commercial risks they face.

The policy risks come in two broad groups. One is the legal and regulatory requirements which cover fiscal terms and other formal obligations on a project. The other is the extent to which there is sufficient clarity in the roles and

⁶ Reserves in Mozambique are estimated at 100–80 tcf, compared with the official reserves for Tanzania reported at 57 tcf. It was reported in August 2018 that Anadarko was targeting the first half of 2019 for FID in Mozambique (see *Offshore Energy Today* 2018), with plans to export 12.88 million tonnes a year, which is equivalent to 17.5 bcm a year.

responsibilities across government for working with the consortia investing in a large and complex project. The administrative processes that confront the investor will be part of the assessment of the risks associated with any given set of policies—which combine in an assessment of how straightforward it is to do business. Section 3 below lays out these two broad categories of risk in more detail.

2.2 Projections: production and prices

The geological, engineering, and market risks surrounding offshore gas in Tanzania suggest that there might be no production any time soon—especially when the policy risks set out below are also taken into account. However, in looking at what *could* be feasible given the scale of reserves, a number of scenarios have been used as the basis for estimates of potential public revenue. There are at least three published exercises in projecting expected volumes of production, and their timing. Henstridge and Rweyemamu (2017) updated the model used in an earlier study that was published by the Africa Development Bank and the Bill & Melinda Gates Foundation.⁷ Scurfield and Mihalyi (2017) is part of a series of briefs on natural gas in Tanzania published by the Natural Resources Governance Institute (NRGI). Baunsgaard (2016) is an IMF ‘Selected Issues Paper’ which accompanied the 2016 IMF Article IV Consultation on Tanzania, and which updated earlier work reported more extensively in a 2014 Selected Issues Paper (Baunsgaard 2014).

Because the scale of reserves and of production are such that the only feasible use for almost all the gas will be LNG exports, the assumptions on production become a function of the capacity of each ‘train’ for liquefying gas.⁸ The minimum production of gas will be the minimum needed to make one train work. Most modern trains process around 5 to 6 million tonnes of LNG a year—equivalent to between just under 7 bcm and almost 9 bcm a year. Each study has broadly comparable assumptions on production, which include a steady state of 15–20 million tonnes of LNG each year, with the liquefaction plant building up to three or four trains.

There are a range of price assumptions in each study, reflecting the drop in prices in 2016. Baunsgaard (2016) and Scurfield and Mihalyi (2017) share the observation that prices need to be at least US\$11/mmbtu before investment

⁷ The AfDB/BMGF (2015) publication is ‘Background Paper 2’ on the timing and magnitude of new resource revenues, which was a background paper to a report, *Delivering on the Promise*, on the possibilities for increased investment in human development that could arise from new resource-revenue opportunities in six countries in sub-Saharan Africa.

⁸ The term ‘train’ refers to the linked set of cooling plants that turn natural gas into a liquid at a temperature of -161°C .

becomes feasible, even if their estimates on rates of return to the investor are lower than most usually accept.

The assumptions on the capital investment costs are broadly similar as well: a total of around US\$44 billion—comparable in order of magnitude to the US dollar value of Tanzanian GDP. The consistency across all the assumptions used in all three studies is not wholly unsurprising. The scale and complexity of producing LNG with offshore gas can be reasonably inferred, though the details of fiscal terms are not all in the public domain.

2.3 Projections: fiscal terms and cost recovery

To make projections of potential revenue, the fiscal terms have to be modelled, including the ‘cost recovery’ provisions for investors to have a relatively early recovery of the costs of capital investment, which shapes both the expected return on investment and the shares of the NPV of the project between the government and the investor. The larger the provision for early cost recovery, the higher the return on investment—which could mean that the government can take a larger share of the total NPV of the project over its lifetime—but the smaller the immediately available revenue to government.

The fiscal terms on a large hydrocarbon investment, sometimes referred to as a ‘petroleum operation’ to distinguish it from the taxation of a normal corporate entity, uses a mix of instruments. To model revenue to government, the assumptions for capital investment costs, operating costs, volumes of production, and prices for a petroleum operation are combined to construct a sequence of cash flows. The applicable fiscal terms are then applied to give estimates of the profitability of the project for the investor, and the revenue going to government.

There are at least two broad trade-offs which any set of fiscal terms will resolve. One is between the share of the ‘rent’ from the project which goes to the government and the share which goes to the investor. This is usually calculated on an NPV basis, where future cash flows are discounted by how far into the future they are—meaning a dollar to be received in ten years’ time is discounted relative to a dollar received today. The share going to government on that basis might go down if the fiscal terms deliver more revenue earlier on: this could be through a tight ceiling on cost recovery which increases the ‘profit gas’ available for sharing, or through changes in the terms on the carry-forward of investment allowances. When the government gets earlier revenue, the investor will need to have relatively more of the rest of the NPV to offset risks associated with the length of time it takes to go net cash flow positive.

The other trade-off for the government is that the more ‘progressive’ the implicit tax schedule, the higher the share of volatility in the public finances. What this means is that the more the government gets of any ‘up-side’ in rent

when the price goes up, the more volatile will be the revenue stream as it amplifies any volatility in sales prices. When sales are made through long-term contracts, this effect is somewhat limited. But if there are sales on the growing spot market for LNG cargoes, there will be a bigger challenge of volatility in the management of the public finances.

The fiscal terms for Tanzania are assumed to be those reflected in the current Production Sharing Agreements (PSAs). They are not in the public domain, and are therefore approximate. There is a more detailed discussion of the modelling challenges and options in Scurfield and Mihalyi (2017).

The results for revenue to government from Henstridge and Rweyemamu (2017) are presented in Figure 11.2. The left-hand panel shows an estimate of the amounts that go to government from each of the main instruments in the fiscal terms as at 2014, expressed in terms of constant-price 2012 US dollars. The take from a fixed-percentage royalty shows as flat during the plateau of constant production, with a constant-price assumption. The step increase in receipts from profit share shows after eleven years of production, which is the time when capital cost recovery is complete and profit gas increases, and at the same time receipts from corporate income tax (CIT) kick in and there would be some dividends from the share in the consortium held by the state through a national company.

The right-hand panel of Figure 11.2 shows three variants of price assumption, the high scenario being 25 per cent above the central case, and the low price scenario being 25 per cent below it. The revenue projections are expressed as a share of GDP, which is assumed to be growing in line with UN population projections of workforce growth and with an assumption on trend growth in labour productivity that had led to an assumption of real GDP growth of the order of 7 per cent. Also arguably optimistic is the start date of 2021, which was not wholly realistic at the time of the modelling exercise on which the chart is based.

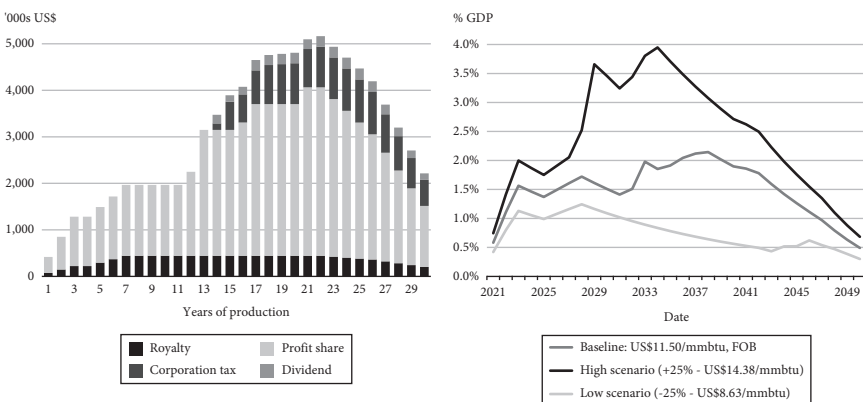


Figure 11.2 Revenue projections in Tanzania

Source: Author's construction based on Henstridge and Rweyemamu (2017).

The right-hand panel provides an illustration of volatility: even with constant plateau production and a constant-price assumption, the profile of revenue is different at different price levels. This is partly a result of the pattern of receipts under the fiscal terms illustrated in the left-hand panel, and partly because a higher price means that cost recovery is completed sooner rather than later: that feature of the fiscal terms means that when prices do move around from year to year, revenue to government can be more volatile than spot prices for LNG.

The start date for production is dependent on the date of the FID. It is a decision based on analysis of considerable preparatory work, such as the pre-FID work referred to above, as well as appraisals of the full panoply of risks, opportunities, and alternatives. The FID for the upstream gas developments under both consortia, and the construction of the liquefaction plant that both would use, was once thought to be feasible in 2016. At the time of writing, at the end of 2018, it is not expected until 2022 at the earliest. The time between FID and the first production of gas is a minimum of five years—hence the modelling of a 2021 start date based on a risk-free assumption on construction and a 2016 FID date (as referred to above)—but delays are likely, and gas production might not start until eight to ten years after FID. Such a delay means that any projection of revenues based on constant US dollars leads to a shrinkage of revenues relative to GDP or when expressed as dollars per person.

The costs of delay for any given configuration of costs, production, prices, and fiscal terms are illustrated in Figure 11.3. Compared with production starting in 2021, a ten-year delay reduces the average revenue over the life of the project by about half when expressed as a percentage of non-resource GDP, from 1.7 per cent to 0.9 per cent—given the assumption that GDP continues to grow—and by a quarter when expressed as dollars per person, from US\$33 to US\$25 per year. This is because both the economy and the population are growing, and any given scale for a project diminishes over time in relative terms. The point that Figure 11.3 underscores is that delays are costly to all concerned.

In sections 3 and 4 I set out two areas of public policy which matter for making the most of this sort of natural resource: (i) the policy which changes the risks and opportunities for the project (section 3); and (ii) some elements of public policy more broadly which shape whether there is scope for a contribution to growth, structural change, and industrialization (section 4).

3. Public policy and risk

There are, broadly, two aspects of public policy which shape the risks faced by a complex large-scale natural resource project. One is the legal and regulatory requirements which cover fiscal terms and other formal obligations on a project; the other is the extent to which there is sufficient clarity in the roles and

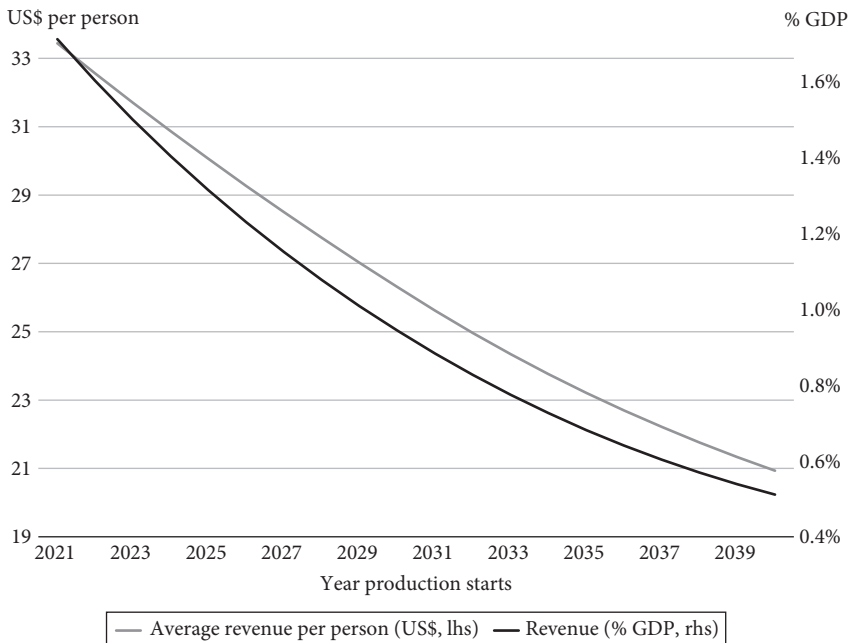


Figure 11.3 The costs of delay

Source: Author's construction based on Henstridge and Rweyemamu (2017).

responsibilities across government for working with the consortia investing in a large and complex project.

3.1 Legal and regulatory requirements

As discussed earlier, for a contractor to commit to the initial pre-FEED phase of planning, and then to FID, there needs to be a reasonable degree of certainty over the laws, regulations, and commercial agreements that will govern the project. This is not yet the case in Tanzania.

In 2015 an incomplete legal and regulatory environment was strengthened when the Petroleum Bill received presidential assent: the Act is a major piece of legislation which: (i) expands the provisions regulating upstream petroleum operations that were previously governed by the Petroleum (Exploration and Production) Act, Cap. 328 (PEPA); (ii) includes mid- and downstream petroleum product supply operations (previously regulated by the Petroleum Act, Cap. 392); and (iii) provides regulation of the mid- and downstream natural gas activities.

While the 2015 Act is the cornerstone for activities of the oil and gas sector in Tanzania, there were several areas where greater clarity in the broader legal framework was needed. For example, the consortia partners investing in separate

projects for upstream production of gas are also evaluating the joint LNG plant. There is a question of the extent to which the projects are treated as being integrated, both from a regulatory point of view and in terms of whether they constitute an integrated taxable entity. The operations of upstream gas production and an export LNG plant are distinct from traditional downstream activities, such as the transport, distribution, and sale of gas for the domestic market. It is preferable for large integrated gas projects which span upstream and midstream to have a single regulator to ensure consistent regulation and effective project execution and operation of the gas/LNG value chain. However, in the Act the construction and operation of export liquefaction facilities (and other related activities such as gas processing, storage, and jetties/marine facilities) are considered part of the midstream and downstream regulated activities alongside domestic transportation and distribution and the sale of gas to the market in Tanzania.

In addition, the Act provides exclusive rights over the natural gas midstream and downstream value chain to the NOC, the Tanzania Petroleum Development Corporation (TPDC). This provision might not be beneficial for efficient development of gas resources, particularly in areas where the NOC has no experience, for example in large-scale gas liquefaction. In an integrated gas/LNG value chain, the upstream contractors are looking to establish their interest in the liquefaction plant in line with their upstream participation interests so as to secure common incentives between owners and users of the LNG plant. This is important to ensure cost-effective execution and operations. It also provides lower risk for the investors in upstream production.

As well as the broad legal framework provided by the Petroleum Act 2015, there are some specific laws, regulations, and contracts needed for even the preparatory work on a large-scale LNG project to start. A key step is an HGA for the LNG plant. The discussions on the HGA were reported to have started in 2017 with the aim of completion by late 2018, although press reports suggest differences remained at October 2018 (see, for example, Ng'wanakilala 2017, 2018). The HGA will need to settle the question of how much the upstream gas production is integrated with the liquefaction of gas for export, which will affect the commercial viability of each investment and the associated risks. A key variable is the tolling fee if one is charged for liquefaction, or the price of upstream gas if the ownership of the gas is to pass to the operators of the LNG plant before export. This is because the tax liabilities of each part of the gas value chain could change, depending on whether integration creates one taxable entity, or whether the fiscal terms and other obligations in the PSAs that were negotiated between 2005 and 2007 would simply apply to upstream production.

However, at the same time, there are some commercial risks associated with the viability of those PSAs. Since they were agreed, a new model PSA was published in 2013. The analysis done by Scurfield and Mihalyi (2017) for NREGI suggests that a straight application of the terms of the model PSA to the gas projects in Tanzania

would increase the minimum sales price needed to clear the threshold for investment from US\$14/mmbtu to US\$21/mmbtu.

Under normal circumstances, there would be little risk of a fundamental renegotiation of PSA fiscal terms. However, Tanzania now has a mix of laws that raise precisely such a risk. They are: (i) the Written Laws (Miscellaneous Amendments) Act 2017 ('Amendments Act'); (ii) the Natural Wealth and Resources (Permanent Sovereignty) Act 2017 ('Sovereignty Act'); and (iii) the Natural Wealth and Resources (Review and Re-Negotiation of Unconscionable Terms) Act 2017 ('Contract Review Act'). These laws appear quite targeted at mining. But they significantly elevate risks in any evaluation of the commercial opportunities and risks that an international investor in gas would undertake. For example:⁹

- The Sovereignty Act appears to require approval of any mining or petroleum agreements by the National Assembly, which has the authority to require renegotiation of any existing or future arrangements. Review includes scrutiny for 'unconscionable' terms under the Contract Review Act; in addition, any clause that subjects the contract to the jurisdiction of an international arbitration body might be deemed unconscionable—the Sovereignty Act stipulates that disputes relating to resource extraction be adjudicated in Tanzania. This appears to rule out industry-standard arbitration clauses, and would need to be reconciled with the obligations of Tanzania's bilateral investment treaties.
- There are a number of changes to income tax and other laws which appear to change the fiscal terms, for example: (i) the expiry of depreciation allowances for natural-resource prospecting, exploration, and development after ten years of production—which may imply that companies would not be able to recover the full cost of a phased expansion in a project; (ii) the exclusion of cost oil/gas from gross income, which changes the calculations of taxable income for petroleum operations and deductions for depreciable assets whose costs are recouped through cost oil/gas; and (iii) royalties are no longer deducted from taxable income, which broadens the tax base.

The cost of elevated risks of this sort comes in the time it will take to work through the mitigations that any international investor would look to make when assessing the case for committing significant investment capital to a complex project in Tanzania. These considerations are not limited to extractives. The Dangote Group has invested US\$650m in a cement plant in Tanzania. Aliko Dangote is

⁹ Woodroffe et al. (2017) provide a thorough and considered guide to these laws, on which the observations of the next two paragraphs are based, which draws on the published versions as submitted to Parliament.

reported later in 2017 as saying that, ‘They’ve scared quite a lot of investors and scaring investors is not a good thing to do’ (*Financial Times* 2017). In this environment, perhaps there is little surprise that the negotiations on the HGA appear to have taken longer than hoped (see, for example, Lewis 2018).

In addition to the HGA, or as part of it, there will need to be agreement on the site lease for the LNG plant, and an LNG Marine Rights Agreement; a Project Development Agreement on co-operation for FEED and beyond will need to be established between TPDC, as the national oil and gas company, and the international investors; and ‘Upstream Implementation Arrangements’ by block will also be needed—which will include the operationalization of ‘Domestic Market Obligations’ (DMO) terms and conditions, for which the price of gas delivered for domestic use in Tanzania will be key to further shaping the commercial case for the international investors: the more gas is required for delivery domestically at a price below parity with international prices, the less favourable the commercial case for investment.

The cost of elevated risks and additional complexity comes in the additional time it takes to finalize the basis for moving forward with the project: recall that the HGA is a necessary step before embarking on the engineering work in the FEED necessary to find solutions to the engineering challenges that have not yet gone away, and that delay progressively reduces the value of the natural asset relative to GDP or to the population of Tanzania.

3.2 Policy co-ordination and the authorizing environment

Too often the transformation of resource wealth into prosperity fails not because of a lack of the correct policies, but because of a weak underlying system of governance. Implementation of policies and strategies in the oil and gas sector will require co-ordination and an authorizing environment across a range of different government institutions.

The Ministry of Energy and Minerals (MEM) is the lead policy and administrative institution and plays a co-ordinating role with other institutions in the sector, many of which are its affiliates. Working alongside MEM, the nationally owned petroleum company TPDC is the national partner in all petroleum ventures. The potential conflict of interest given that TPDC still holds policy and regulatory roles in addition to its commercial role is being addressed through the restructuring of the company to take on a purely commercial role, and the portioning off of its upstream regulator role to a new independent regulatory body, the PURA. The Energy and Water Utility Regulatory Authority (EWURA) role is confined to midstream and downstream regulation.

Looking towards taxation and revenue collection, the Ministry of Finance (MOF) is the lead policy institution, but MEM and TPDC also play an important

role in setting royalty and profit-sharing terms at the project level. The Attorney General is also involved in negotiation and devising contracts. In terms of revenue collection, several institutions have roles to play in relation to different components. Among the institutions involved, the Tanzania Revenue Authority (TRA) collects income taxes from gas companies, while MEM collects the large share of non-tax revenues from petroleum activities via TPDC, including royalties, licence fees, application fees, annual rent, and profits from oil and gas. The MOF collects revenues from equity holdings, and local authorities collect a local service levy from mining companies. Tax audits are carried out by the TRA. These institutions play similar roles in relation to all other economic agents in the economy.

Co-ordination on environmental and community issues is also complex. The Vice President's Office (VPO) is the lead policy institution in this domain, and has to co-ordinate with MEM and the national agencies on policy issues. Compliance and enforcement of law is implemented by the National Environment Management Council (NEMC), in co-ordination with local authorities. Meanwhile the Ministry of Labour and Employment leads on the formulation of labour, labour market, social security, and employment policies, while the Ministry of Lands, Housing and Human Settlements Development has to approve land allocations for extractives use.

Two key challenges pervade when it comes to co-ordination on the full range of issues required to harness natural gas for development. First, the fact that many of these institutions lack the authority to convene high-level decision-makers from partner institutions on a regular basis means that they tend to operate in an environment of inadequate information. Second, without high-level oversight to direct activities, there has been no one to oversee organizational roles and responsibilities, opening possibilities of 'mission creep' where institutions work beyond their mandate, sometimes leading to potential conflicts of interest, while lack of engagement or inaction has meant that other institutions are not doing the work that they should be.

4. Public policy and the contribution of natural resources to growth, structural change, and industrialization

Public policy will influence the impact of natural resources on economic development in, broadly, four phases, aligned with the phases through which a natural resource project goes as it is developed and as it operates. Policy will condition: (i) construction jobs and skills training; (ii) the environment for private business investment—which can increase ahead of the development of the natural resource, and which includes 'local content' that seeks to support firms who can

be part of an international supply chain and other externalities, such as the effect on the standards of operations and management if managers can provide a transition of international business and management practices from multinational companies involved in the oil and gas investments and value chain into other business activities; (iii) appropriate fiscal policy management in the face of possibly large and volatile macroeconomic flows as the revenue arrives; and (iv) the efficiency and focus of public investment, including in infrastructure and other forms of public capital. In this section I focus on the first two, and only briefly touch on the last two.

4.1 Jobs and construction

The construction phase of an LNG investment entails building or assembling a sophisticated facility to condense natural gas to a liquid by cooling it to -161°C (-260°F), and the associated infrastructure so that the gas can be exported by ship. There is likely to be a material impact on the labour market for a range of semi-skilled and skilled workers, such as construction workers, bricklayers, metal workers, carpenters, plumbers, and electricians. It has been estimated that some 4,000–5,000 jobs would be created directly during construction of LNG facilities in Tanzania. This compares with a number of jobs on other LNG construction projects ranging from around 2,000 in Australia to 8,000 in Angola (OPM 2013).

Training will be essential for secure project delivery, and it may well need a specific initiative: there are not the skilled people to meet this demand, even if the requirements number just a few thousand in a labour force numbering in the millions. An assessment of vocational and educational training needs concluded, among other findings, that: (i) those graduating from ‘vocational education and training’ are not directly employable; (ii) the trades which will be needed are not being taught; (iii) in any case, the training is low quality (VSO 2013, 2014). However, most of the areas in which training would be needed to fill the jobs created as part of the investment in hydrocarbons were not sector-specific: the VSO assessment showed that a significant number of the skills needed are transferable. These include the skills needed in metal work, building works, civil engineering and infrastructure, mechanical work, and electrical work.

As argued in the framing chapter (chapter 2 this volume), more and better construction skills are important for strengthening the contribution of a boom when ‘Dutch disease’ leads to an appreciation of the real exchange rate. That appreciation raises the returns to non-tradables, including non-traded capital, which is mainly buildings. If the construction sector is weak, the supply of structures is inelastic and the real estate boom is more in prices than buildings. If, however, there are growing numbers of people with transferable construction skills, the supply of structures is more elastic and the boom is then more in the supply of

buildings, and relatively less a real estate price boom. Therefore a widespread programme of vocational training to a standard good enough to permit trainees to work on the construction phase of a natural resource project means a stronger and more elastic supply of people with the skills which will be in demand as the boom kicks in.

4.2 Externalities and private investment

One of the ways to show that an apparently large investment in oil or gas production is at the same time very small is to point out that when it is in operation, it creates very few jobs directly. Although it takes several thousand people to build an LNG plant, only a few hundred are needed to operate it. This then points to the scope for linkages with the domestic economy, in particular in a local supply chain, as a key source of impact on growth, structural change, and industrialization.

Perhaps the best summary of this opportunity was given by John Sutton at the launch of the ‘Enterprise Map of Tanzania’, his review of industrial capabilities: ‘If oil industry supply chains can be fully integrated with Tanzania’s domestic industrial sector, then the payoff to medium-term growth will be huge... No single issue in Enterprise policy is more important right now’ (Sutton and Olomi 2012). The emphasis in Sutton’s analysis of the opportunity is on the development of firm capabilities—meaning, essentially, the organizational ability to get things done, including through absorbing and innovating by using new ideas or ways of doing things. Sutton gauges capabilities in terms of quality and productivity. As he put it in his Gilman Rutihinda Memorial Lecture: ‘Crude measures such as an “x per cent local content rule” are ineffective: rules of this kind are too easily circumvented, and may generate an unfortunate bias in the supplier base towards those activities that contribute little to the development of the host country’s industrial capabilities’ (Sutton 2014).

The economic structural change in Tanzania since 2000 has been driven by a shift of workers out of agriculture. Only agriculture and mining achieved within-sector labour productivity gains from 2000 to 2010: it was the between-sector shifts of workers out of agriculture which led to all gains in average productivity in the economy.¹⁰ At the same time, of all jobs created outside agriculture, 83 per cent were in the informal sector, mainly in micro-enterprises or self-employment. Tanzania’s enterprise survey data suggest that even in the formal sector, firm-level labour productivity fell in almost all non-agricultural industries. Overall, there are very few individual industries in which innovation and technology absorption seem to

¹⁰ The analysis underpinning these conclusions is reported in a detailed background paper on Tanzania for the ‘Pathways Commission’ (Salam et al. 2018) looking at the opportunities and challenges of new technology for economic development.

be working to raise productivity. In other words, there should be great scope to use the opportunities of a prospective international supply chain for gas to strengthen firm capabilities—and scope for improvements in productivity that could come from foreign direct investment (FDI) into Tanzania associated with strengthening firm capabilities—of both nationally owned and foreign-owned firms. In looking to be practical, Sutton argued for a small and effective local content unit rather than such rules. A local content department was established in 2015 in the National Economic Empowerment Council (NEEC) in the Prime Minister’s Office, with responsibility for local content strategy. However, MEM has taken the lead in the development of the gas sector’s local content policy and legislation.

The policy framework for local content in Tanzania has emerged in the last few years.¹¹ In November 2017, the local content regulations for the 2015 Petroleum Act, published by MEM, came into effect. They reflect the 2015 Energy Policy. The policy and legal framework prioritizes local participation in the gas value chain, rather than developing linkages. ‘Participation’ seems to mean ‘a progressive and comprehensive integration of Tanzanian citizens into all aspects of the petroleum industry to ensure maximization of benefits’ in the National Energy Policy.

The regulations set out minimum local content levels for both employment of nationals and the use of goods and services across the value chain, with significant penalties for non-compliance. However, the policy is somewhat inconsistent: the definition of ‘local’ varies, but allows an 85 per cent foreign-controlled joint venture to qualify as a ‘local’ company. The implicit definition of local goods or services includes those which are ‘locally available’, which could include goods imported into Tanzania by a foreign-owned company. However, at the same time, the Non-Citizens Act 2014 limits foreign participation in economic activities in Tanzania.

The policy approach in Tanzania therefore takes a literal sense of ‘local’ content, combined with uncertainty on what it means in practice. It is not a policy approach which is mindful of the development of firm capabilities for improved productivity in Tanzanian firms more broadly.

4.3 Fiscal policy management and public investment

The third and fourth channels for impact on growth and structural change are through the public finances. The offshore gas finds have yielded revenue through receipts from sales taxes and personal income taxes that have been bolstered by the activity surrounding exploration. But there has of course been no direct

¹¹ The policy and legal context is thoroughly analysed in Scurfield et al. (2017).

revenue, and none can reasonably be expected until the late 2020s. Accordingly I only touch on these two issues here—they have been widely discussed in a range of writings elsewhere—in light of the establishment of a fiscal framework for oil and gas in 2015.¹²

Parliament approved a fiscal framework for the management of oil and gas revenue in 2015, which is integrated into the overall fiscal and budget framework, reinforcing rather than fragmenting it. It codifies a fiscal rule with a threshold at 3 per cent of GDP. If revenues are below that threshold—as expected in the projections discussed above—then they can go to finance a non-gas budget deficit. Above 3 per cent of GDP, they are saved. The stock of savings can be drawn down at a limit of 3 per cent of GDP. At the same time, there is a ceiling on recurrent expenditure—which is that it is limited to increase by nominal GDP—and a ceiling of total expenditure of 40 per cent of GDP. A summary and brief analysis by Baunsgaard (2016) highlights some threshold effects around 3 per cent of GDP, and contrasts the application of these rules with those that would follow constructs such as the permanent income hypothesis (PIH).

However, neither this fiscal rule nor PIH use a broader economic consideration, which is that in transforming gas from a sub-soil asset into a flow of expenditure it should, in principle, be treated as a capital financing item: as an asset transformation this is a rearrangement of the public-sector balance sheet. The further transformation from the dollar receipts as the government share of the rent, through public investment into public infrastructure or other public assets, should in principle be evaluated against the relative costs and benefits of the alternative investments. The accumulation of human capital through better health status, or through improvements in literacy, numeracy, and the other learning outcomes which contribute to a productive labour force, are to be included in such an evaluation of the costs and benefits of alternatives.

In reality, however, there are considerable limitations on the public sector's ability to manage such flows of investment efficiently. And in practice, there will be some investments (such as roads) that are relatively more straightforward to administer than others (such as materially improved learning outcomes) even as Tanzania falls woefully short on both.

5. Conclusion

This review of the prospects for a boom from natural resources in Tanzania points to the conclusion that there probably won't be one.

¹² See, for example, work by the Collaborative Africa Budget Reform Initiative on revenue management in the extractive sector (CABRI 2016).

First, the costs of extracting large quantities of gas from deep under the sea far offshore are high compared with immediate market price prospects; second, the array of risks facing the billions of dollars of investment needed to produce offshore gas are high. Those risks are partly technical—there are engineering problems to solve—and partly related to the markets for LNG, and there are also significant policy risks.

The government has reinforced the policy risks: the trio of laws passed in 2017—the Amendments Act, the Sovereignty Act, and the Contract Review Act—has postponed the prospects of the preparation for an FID, as evidenced by ongoing negotiations on the HGA for the LNG plant. Had there been an FID in 2016, as was once thought possible, and production starting in 2021, the average revenue during the project would have been 1.7 per cent of GDP. If the FID does not take place until after 2022, as currently expected, and there are further delays as technical, market, and policy risks are navigated, and production starts ten years later in 2031, then the average lifetime revenue will nearly halve. Some of that forgone revenue is a result of market risks materializing; much is simply the cost of delay. The progress of broadly similar investments in Mozambique provides a hint of what might have been for Tanzania. In addition, the prospect of large-scale offshore gas supporting economic transformation is dimmed by the approach to local content being focused on ‘participation’ rather than meeting the broader challenge of raising productivity through strengthened firm capabilities. This approach looks unlikely to support growth, structural change, or industrialization.

After early hopes of a boost to growth and industrialization that pulled in advice from many sources on how to manage revenues, and the exploration of the lessons to be learned from other countries which took place back when gas prices were still high in Asia, it is disappointing that the prospects of production and the potential contribution to growth have faded.

Acknowledgements

I am grateful to Dennis Rweyemamu for earlier work together (listed in the References) on these subjects; the usual disclaimer applies.

References

- AfDB/BMGF (2015). ‘Flagship Report Paper Series. Paper 2: Timing and Magnitude of New Natural Resource Revenues in Africa’. Dar es Salaam: Africa Development Bank Group/Seattle: Bill & Melinda Gates Foundation. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Timing_and_magnitude_of_new_natural_resource_revenues_in_Africa.pdf (accessed 23 December 2018).

- Baunsgaard, T. (2014). 'Tanzania: Fiscal Implication of Offshore Natural Gas'. Selected Issues Paper, IMF Country Report 14/121. Washington, DC: IMF.
- Baunsgaard, T. (2016). 'Offshore Gas Development: Exploring Price Sensitivity and Some Revenue Management Considerations'. Selected Issues Paper, IMF Country Report 16/254. Washington, DC: IMF.
- BP (2018). 'Energy Outlook'. BP (online). Available at: <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html> (accessed 23 December 2018).
- CABRI (2016). 'Revenue Management in the Extractives Sector: Keynote Paper 2'. Centurion, South Africa: Collaborative Africa Budget Reform Initiative. Available at: https://www.cabri-sbo.org/uploads/files/Documents/keynote_paper_2016_revenue_management_cabri_revenue_management_in_the_extractives_sector_in_africa_english.pdf (accessed 23 December 2018).
- The East African* (2018). 'New Plant to Add 240MW to Tanzania Grid'. *The East African*, 2 October. Available at: <https://www.theeastafrican.co.ke/business/New-plant-to-add-240MW-to-Tanzania-grid/2560-4787762-2absaoz/index.html> (accessed 23 December 2018).
- EIA (2013). 'Overview: Emerging Oil and Gas Developments in East Africa'. US Energy Information Administration (online). Available at: <https://www.eia.gov/beta/international/regions-topics.php?RegionTopicID=EAE> (accessed 23 December 2018).
- Financial Times* (2017). 'Dangote Accuses "Bulldozer" Tanzanian President of Scaring away Investors'. *Financial Times*, 9 October. Available at: <https://www.ft.com/content/c3349c6b-00e3-368e-b128-28031983055e> (accessed 23 December 2018).
- Henstridge, M., and D. Rweyemamu (2017). 'Managing Hydrocarbon Resources'. In C. Adam, P. Collier, and B. Ndulu (eds), *Tanzania: Path to Prosperity*. Oxford: Oxford University Press.
- Lewis, I. (2018). 'Tanzania Playing Catch up on LNG Project: The NOC Wants to Get a Stalled LNG Project Moving, but Doubts Remain over the Operating Environment'. *Petroleum Economist* (online), 10 May. Available at: <http://www.petroleum-economist.com/articles/politics-economics/africa/2018/tanzania-playing-catch-up-on-lng-project> (accessed 23 December 2018).
- MEM (Ministry of Energy and Minerals) (various years). *Quarterly Report*. Dodoma: Government of Tanzania.
- Ng'wanakilala, F. (2017). 'Tanzania Hopes for LNG Plant Agreement with Oil Majors by 2018'. Reuters (online), 24 January. Available at: <https://www.reuters.com/article/us-tanzania-gas/tanzania-hopes-for-lng-plant-agreement-with-oil-majors-by-2018-idUSKBN1581F4> (accessed 23 December 2018).
- Ng'wanakilala, F. (2018). 'Shell and Equinor Certain That Natural Gas Project in Tanzania Will Go ahead'. Reuters (online), 24 January. Available at: <https://www.reuters.com/article/us-tanzania-gas/tanzania-hopes-for-lng-plant-agreement-with-oil-majors-by-2018-idUSKBN1581F4> (accessed 23 December 2018).
- Offshore Energy Today* (2018). 'Anadarko Targets First Half of 2019 for Mozambique LNG FID'. *Offshore Energy Today* (online), 1 August. Available at: <https://www.offshoreenergytoday.com>

- offshoreenergytoday.com/anadarko-targets-first-half-of-2019-for-mozambique-lng-fid/ (accessed 23 December 2018).
- OPM (2013). 'Tanzania: An Assessment of the Macro-Level Socio-economic Impacts of a Potential LNG Project'. Unpublished report. Dar es Salaam: Oxford Policy Management.
- Orca Exploration Group (2017). '2017 Annual Report'. Dar es Salaam: Orca Exploration Group Inc. Available at: http://www.orcaexploration.com/pdfs/2017_Orca-Q4_full.pdf (accessed 23 December 2018).
- Salam, U., S. Lee, V. Fullerton, Y. Yusuf, S. Krantz, and M. Henstridge (2018). 'Tanzania Case Study: Rapid Technological Change—Challenges and Opportunities'. Background Paper Series 7. Oxford: Pathways for Prosperity Commission. Available at: <https://pathwayscommission.bsg.ox.ac.uk/Tanzania-case-study> (accessed 23 December 2018).
- Scurfield, T., and D. Mihalyi (2017). 'Uncertain Potential: Managing Tanzania's Gas Revenues'. Dar es Salaam: Natural Resource Governance Institute. Available at: <https://resourcegovernance.org/sites/default/files/documents/uncertain-potential-managing-tanzania-gas-revenues.pdf> (accessed 23 December 2018).
- Scurfield, T., N. Woodroffe, and S. Olan'g (2017). 'Localizing Tanzania's Gas Sector: Determining Optimal Policies for an Emerging Producer'. Dar es Salaam: Natural Resource Governance Institute. Available at: <https://resourcegovernance.org/sites/default/files/documents/localizing-tanzania-gas-sector-determining-optimal-policies.pdf> (accessed 23 December 2018).
- Shell (2018). 'Shell LNG Outlook 2018'. Royal Dutch Shell plc (online). Available at: An updated edition for 2019 is available at: <https://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook-2019.html> (accessed 24 September 2019).
- Sutton, J. (2014). 'Gains from the Natural Gas: Local Content and Tanzania's Industrial Development'. Seventh Gilman Rutihinda Memorial Lecture, Bank of Tanzania, 10 June. Available at: <https://www.theigc.org/wp-content/uploads/2014/08/Sutton-2014-Gilman-Rutihinda-Memorial-Lecture-Speech.pdf> (accessed 23 December 2018).
- Sutton, J., and D. Olomi (2012). 'An Enterprise Map of Tanzania'. London: International Growth Centre.
- VSO (2013). 'Vocational Skills Gaps in the Tanzanian Oil & Gas Sector'. Stakeholders workshop presentation, Dar es Salaam, 4 November. Available at: http://www.tzdp.gov.tz/fileadmin/_migrated/content_uploads/Skills_gaps_workshop_-_Presentation.pdf (accessed 23 December 2018).
- VSO (2014). 'Producing Progress: Matching Skills to Jobs around Tanzania's Gas Industry'. Dar es Salaam: VSO.
- Wentworth Resources (2018). 'Tanzania: Operations'. Wentworth Resources plc (online). Available at: <https://wentplc.com/operations/tanzania/> (accessed 23 December 2018).

Woodroffe, N., M. Genasci, and T. Scurfield (2017). 'Tanzania's New Natural Resources Legislation: What Will Change?' Dar es Salaam: Natural Resource Governance Institute. Available at: <https://resourcegovernance.org/sites/default/files/documents/tanzania-new-natural-legislation-what-will-change.pdf> (accessed 23 December 2018).

World Bank (2017). 'Implementation Completion and Results Report (IDA-52150 and IDA-53970)'. Report ICR00004220. Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/415911514407501553/ICRR-TZ-First-Power-and-Gas-Sector-DPO-P143645-Final-12212017.docx> (accessed 23 December 2018).

The Construction Sector in Tanzania

Geraldine J. Kikwasi and Cecilia Escalante

1. Introduction

From simple tools and temporary shelters to the need for more permanent structures that would complete the transition from a nomadic lifestyle to settlements, we can say that construction is as old as humans. Industrialization made materials available on a great scale and improved the manufacturing techniques that made it possible to cope with urbanization. By transforming the environment through, for example, housing, roads, bridges, water, health, and power infrastructure, the construction sector is a key enabler for social and economic development worldwide.

In the last decade, Tanzania has experienced relatively high economic growth, averaging 6–7 per cent a year (World Bank 2018b). The construction sector has played a key role in this growth. Figure 12.1 shows the gross domestic product (GDP) in percentage growth rates and the annual growth of the industry and construction sector. Despite the deceleration of the economy in 2013, the industry has since seen growth rates above of those of the general economy.

While the industry and construction sector has generally performed well over the years, within this sector it is the mining and quarrying and the construction activities that are leading the growth. Figure 12.2 presents the annual growth rates of these two activities as well as the manufacturing sector. As can be seen, while the three activities have experienced positive growth rates, the mining and quarrying and construction activities feature greater levels of growth. In fact, since around 2010, Tanzania has witnessed further natural gas exploration, which may explain the steeper line of growth rates for mining and quarrying activities in recent years.

Tanzania is on the path from being a low-income to a middle-income country (MIC). Investment in fixed assets has grown strongly and has boosted economic growth. Between 2005–16, the country experienced gross fixed capital formation (GFCF) rates in the range of 25–34 per cent of GDP. While all the activities that form the GFCF have experienced a sustained increase in value, construction is the sector that contributes the largest share (see Figure 12.3).

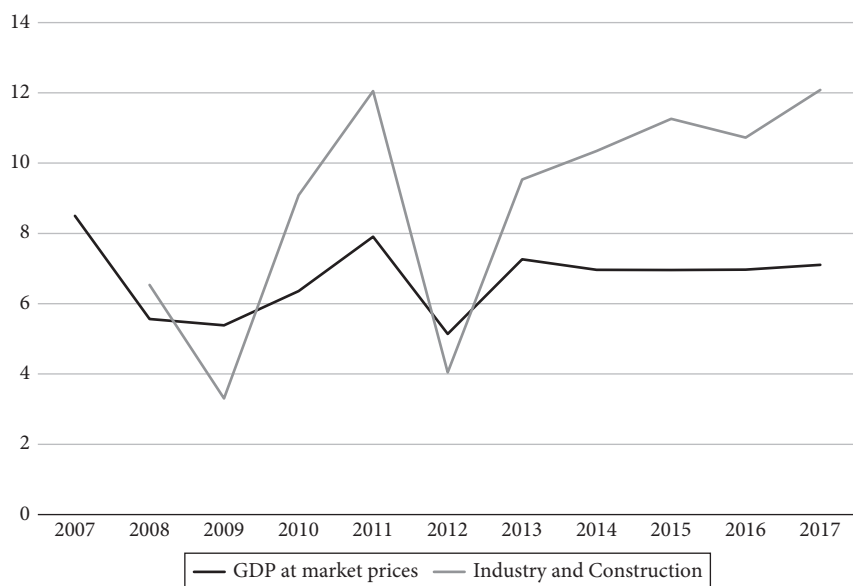


Figure 12.1 Gross domestic product by kind of economic activity: percentage growth rates, 2007–17

Source: Authors' calculations based on data from NBS (2018).

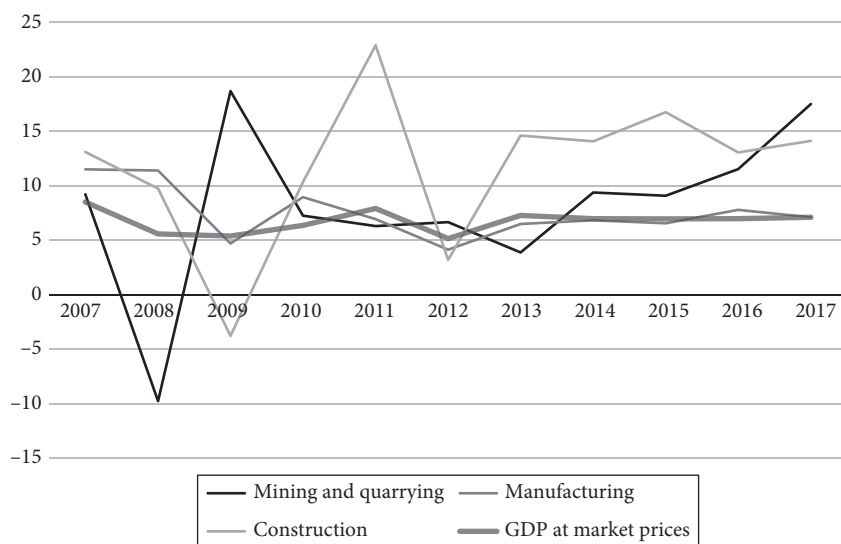


Figure 12.2 Within industry and construction: percentage growth rates, 2007–17

Note: Constant 2007 prices.

Source: Authors' calculations based on data from NBS (2018).

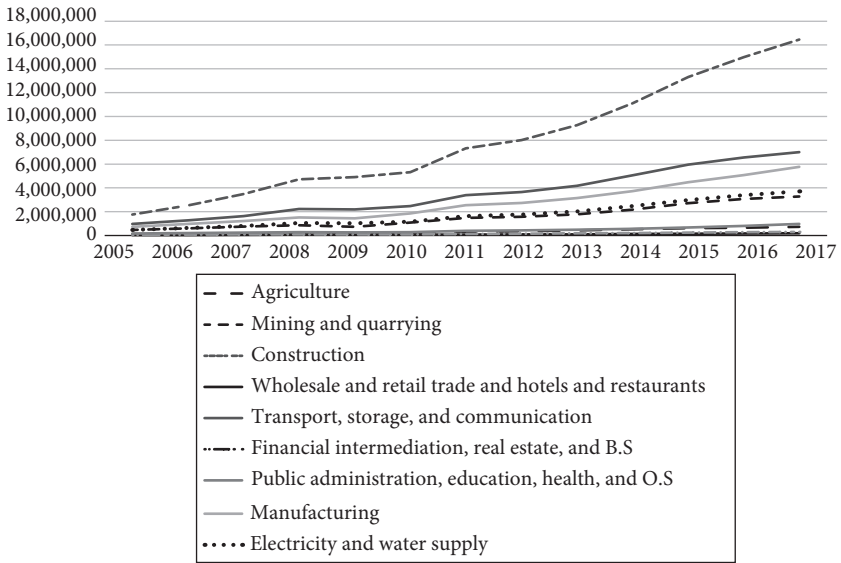


Figure 12.3 Gross fixed capital formation by kind of economic activity at current prices, 2005–17

Source: Authors' calculations based on data from NBS (2018).

NBS (2018) attributes the country's growth in the construction sector to an increase in construction activities, mainly the construction of commercial and residential buildings and ongoing infrastructure projects. These include the Standard Gauge Railway (SGR), expansion of Mwanza airport, construction of bridges at TAZARA and the Ubungu intersection in Dar es Salaam, construction of the Manyoni to Tabora road, the Songosongo natural gas project, which involved the construction of a 512-kilometre pipeline from Mtwara to Dar es Salaam, the Madimba Processing Centre, and the infrastructure for Phase 1 of the Dar es Salaam Rapid Transit Bus.

Despite promising growth, a number of constraints have hindered the performance of the sector. NBS (2013) and Clyde & Co (2013), among others, identify the following challenges:

- inadequate capacity of local contractors and consultants
- inadequate and erratic work opportunities
- inefficient procurement systems
- occasional financial mismanagement in public/private sectors
- poor working environments
- low-technological equipment
- lack of skills

- inadequate capital
- unfavourable donor conditions
- application of inappropriate delivery practices.

Leeds (2016) sets out the four main challenges facing the construction sector. These are: poor productivity and productivity which is a result of easy entry and stiff competition; poor project performance; a skilled labour shortage; and sustainability concerns. These, along with the concerns that have traditionally impacted the sector on the continent, such as constantly rising project costs, corruption issues, lack of skilled labour, on-site safety, and capital supply constraints (Bonface 2015), hinder the successful development of the sector.

We will explain the structure of the construction sector and analyse its main actors and the key drivers of development. The information presented was collected through interviews with relevant stakeholders, desk review, and publicly available information mainly from the Tanzania National Bureau of Statistics (NBS).

2. Structure of the construction sector

The Tanzanian construction sector is made up of the Ministry of Works, Transport, and Communication and its agencies, consultative body, regulatory boards and clients, suppliers of construction materials and equipment, consulting firms, construction enterprises, private firms, and professional associations.

2.1 Ministry of Works, Transport and Communication (MoWTC)

The ministry is responsible for policy formulation, planning, overseeing, and overall coordination of the transport and communications infrastructure. The institutions under the MoWTC that deal directly with the construction sector include:

- a) Agencies:
 - i) The Tanzania Building Agency (TBA), responsible for the maintenance and development of government buildings.
 - ii) The Tanzania National Roads Agency (TANROADS) and the Tanzania Rural and Urban Roads Agency (TARURA). These agencies are responsible for the maintenance and development of the road network. TANROADS manages the trunk and regional network. Since July 2017, TARURA is dealing with the district urban and rural road network previously managed by the local government authorities (LGAs).

- iii) The Tanzania Electrical, Mechanical, and Service Agency (TEMESA). TEMESA is responsible for providing efficient and effective electrical, mechanical, and electronic services, reliable and safe ferry transport services, and the hiring of equipment to government institutions and the public at large.
- b) Boards and Councils:
- i) The Roads Fund Board (RFB), established by The Road Tolls (Amendment No.2) Act 1998¹ (RFB 2018) started operations in 2000 with the mandate of advising the roads minister on new sources for road and fuel tolls, the adjustment of the rates of existing roads and fuel tolls, and on regulations for the collection of road and fuel tolls for the purpose of ensuring an adequate and stable flow of funds to road operations. The RFB is also the main source of funding for the maintenance of the road network in Tanzania.
 - ii) The National Construction Council (NCC) is a consultative body responsible for promoting and providing strategic leadership for growth, development, and expansion of the construction sector, with an emphasis on the development of local capacity.
 - iii) There are three bodies that are separately responsible for regulating the activities of the actors in the construction sector. The Contractors' Registration Board (CRB) registers, regulates, and develops the capacity of contractors, while the Engineers' Registration Board (ERB) and the Architects' and Quantity Surveyors' Registration Board (AQRB), in addition to their administrative activities, also oversee the conduct of their members and the consulting firms in the sector.
- c) The Public Procurement Regulatory Authority (PPRA) ensures that the procuring entities and LGAs adhere to the provisions of the Public Procurement Act 2011 and its 2013 Regulations 2013.

There are also a number of associations that represent consultants and contractors. These include: the Tanzania Institute of Quantity Surveyors (TIQS), Architects' Association of Tanzania (AAT), Institute of Engineers Tanzania (IET), Association of Civil Engineering Consultants of Tanzania (ACET), the Tanzania Civil Engineering Contractors' Association (TACECA), the Contractors' Association of Tanzania (CATA), and the Association of Citizen Contractors of Tanzania (ACCT). These associations collectively protect the interests of their members and promote their activities.

¹ The Act was revised in 2006 and is now referred as the Road and Fuel Tolls Act, CAP 220 (Revised 2006).

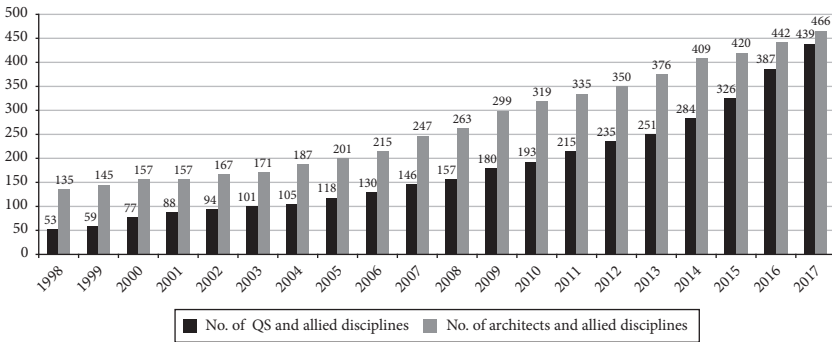


Figure 12.4 Trend of registration of architects, quantity surveyors, and allied disciplines, 2000–17

Source: Authors' calculations based on data collected at the offices of the AQRB (2018).

2.1.1 Architects and Quantity Surveyors Registration Board (AQRB)

The AQRB, established by the Architects and Quantity Surveyors (Registration) Act No.16 of 1997,² is responsible for registering and regulating the activities of architects, quantity surveyors, allied disciplines, and consulting firms. As at December 2017, the AQRB had 466 architects and allied disciplines on its register. Almost 90 per cent of those registered were local architects, 6.8 per cent were foreign architects, and the rest were landscape architects, interior designers, and architectural technologists. Similarly, during 2017, the Board registered a total of 439 quantity surveyors and allied disciplines: 402 local and two foreign quantity surveyors, fifteen building surveyors, and twenty construction managers. The AQRB currently has 236 architectural firms, 124 quantity surveying firms, one building surveying firm, and one interior design firm on its register.

While both disciplines have increased their numbers since 2000, quantity surveying has done so at a faster rate. In 2000, the number of registered quantity surveyors was half the number of registered architects. These figures have been similar in recent years but do not take account of the graduate register, which has 198 graduate architects and 247 graduate of quantity surveyors and allied disciplines (Figure 12.4).

2.1.2 Engineers Registration Board (ERB)

The ERB is a statutory body established under the Engineers Registration Act No.15 of 1997 as amended in 2007.³ The Board is responsible for the registration and regulation of engineering activities and the conduct of engineers and

² Repealed and replaced by Act No. 4 of 2010.

³ The *Engineers Registration (Amendment) Act 2007*.

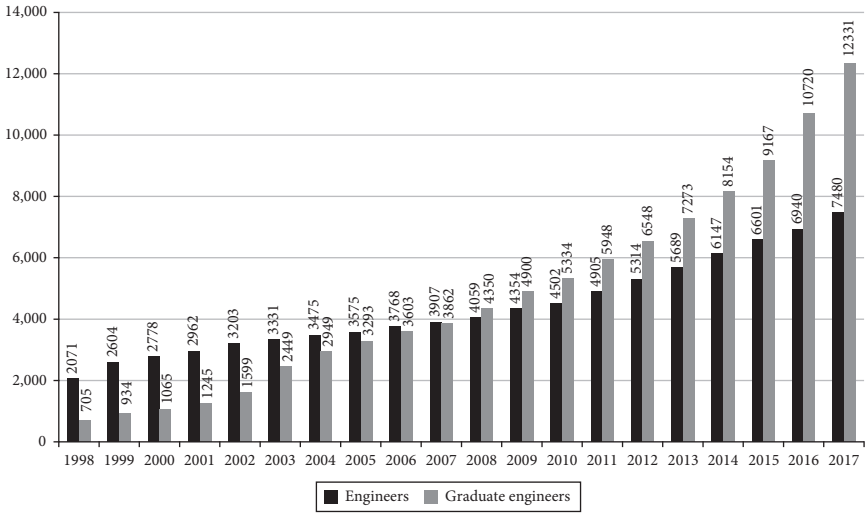


Figure 12.5 Trend of engineers’ registration, 2000–17
 Source: Authors’ calculations based on data collected at the offices of the ERB (2018).

engineering consulting firms. At the end of December 2017, the Board had on its register 20,135 engineers in the categories of graduate engineers, graduate incorporated engineers, incorporated engineers, professional engineers, temporary professional engineers, and consulting engineers. The majority of registered engineers were graduates, who represented over 63 per cent of all registered engineers. There has been a rising trend of registration of engineers for the past ten years (Figure 12.5).

During the same period, the ERB had on its register 314 engineering consulting firms, the majority of which (71 per cent) were local and 29 per cent were foreign. Statistics from the ERB reveal that between 2013 and 2015, foreign consulting firms executed 165 projects against 3,217 projects undertaken by local firms. While local firms had more projects, the figures also reveal that foreign firms got high-value projects. Foreign contractors were awarded less than 5 per cent of the total number of projects in those three years at a total value of TZS8,285.5 billion (US\$3.6 million), while local contractors’ projects had a value of TZS5,781.05 billion (US\$2.5 million).

2.1.3 The Contractors Registration Board (CRB)

The CRB was established under CRB Act No.16 of 1997 as amended in 2008.⁴ Similar to the above-mentioned boards, it is responsible for the registration, regulation, and development of contractors. The Board registers five types of

⁴ The *Contractors Registration (Amendment) Act No. 15 2008*.

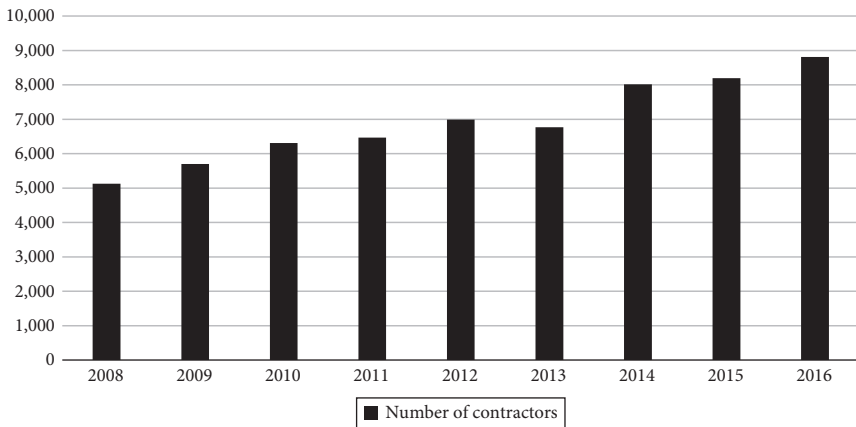


Figure 12.6 Trend of registration of contractors, 2008–16

Source: Authors' calculations based on the data collected from the offices of the CRB (2018).

contractors: building, civil works, mechanical, electrical, and specialist contractors. These contractors are further categorized into local and foreign contractors, a classification that depends only on the nationalities of the shareholders of the company. Collectively, these are classified into seven classes (with I being the highest class), which cater for building, civil works, and electrical and mechanical contractors. Specialist contractors are restricted to classes I–III. Foreign contractors are restricted to classes I and II for all types of works except specialist works where foreign contractors can be in classes I–III. Over the past nine years, the number of registered contractors has increased from 5,125 to 8,669 (Figure 12.6), an increase of 69 per cent.

In Table 12.1 we observe the distribution of registered contractors by category and class. The general distribution of contractors by size reveals that the great majority of registered contractors are concentrated in classes IV–VII (small contractors), accounting for 84 per cent of the total, with Class VII alone accounting for 34 per cent of the total. The rest are divided between class I (large contractors), accounting for 5.3 per cent, and Classes II–III (medium contractors), accounting for 10.6 per cent. This supports the work of the Tanzania NBS (NBS 2013), which shows that the Tanzanian construction sector takes the form of a pyramid structure. In this structure most of the weight is closer to the ground, with a few large firms at the top and many small and medium firms at the bottom. Building and civil contractors represent about four-fifths of the total number of contractors, accounting for 42 and 37.9 per cent, respectively.

The class in which a contractor is registered is important for determining the maximum value of any single contract that this firm can access. Foreign contractors account for only 2.4 per cent of the total number of contractors but represent almost half of the contractors in class I (46 per cent). Local contractors are

Table 12.1 Distribution of contractors by categories and class as of December 2016

Type	Class I			Class II	Class III	Class IV	Class V	Class VII	Class VII	Total
	Foreign	Local	Total							
Building	52	70	122	53	57	251	756	760	1,643	3,642
Civil	33	34	67	18	56	230	636	1,175	1,106	3,288
Electrical	24	23	47	9	11	59	77	108	333	644
Mechanical	12	7	19	1	4	14	36	45	57	176
Specialist										
Building	6	9	15	8	9					32
Civil	25	12	37	38	185					260
Electrical	26	41	67	95	156					318
Mechanical	34	52	86	66	157					309
Total	212	248	460	288	635	554	1,505	2,088	3,139	8,669

Source: Authors' calculations based on CRB (2017).

Table 12.2 Class limit for any single contract (in million TZS)

Type	Class	Class limit (mil. TZS)	Type	Class	Class limit (mil. TZS)
Civil	One	Unlimited	Specialist building	One	Unlimited
	Two	8,000		Two	800
	Three	4,000		Three	300
	Four	2,000	Specialist civil	One	Unlimited
	Five	1,100		Two	800
	Six	500		Three	300
	Seven	200			
Building	One	Unlimited	Specialist mechanical	One	Unlimited
	Two	5,000		Two	800
	Three	3,000		Three	300
	Four	1,800			
	Five	900			
	Six	400			
	Seven	200			
Mechanical	One	Unlimited	Specialist electrical	One	Unlimited
	Two	3,000		Two	800
	Three	1,500		Three	300
	Four	900			
	Five	450			
	Six	250			
	Seven	150			
Electrical	One	Unlimited			
	Two	3,000			
	Three	1,500			
	Four	900			
	Five	450			
	Six	250			
	Seven	150			

Source: Reproduced from the Contractors Registration (Amendments) By-Laws, 2017 (United Republic of Tanzania 2017).

concentrated in class VII, which accounts for 36.2 per cent of the total number registered. Table 12.2 presents the values of work allowed for each class of contractor. Class I contractors are allowed to undertake works of unlimited value, while the rest are restricted to certain thresholds per contract. The involvement of local contractors in work opportunities has been low as they execute many projects of low value, leaving the large share to foreign contractors. Similar to the case with the foreign consulting firms, statistics from the CRB reveal that, in terms of the number of projects and value, between 2011 and 2017 foreign contractors executed 1,019 projects with a value of TZS17,085.29 billion (US\$7.43 million) and local contractors executed 17,344 projects with a value of TZS8,239.03 billion (US\$3.58 million). Assuming these figures represent the total of all projects, it

seems that foreign contractors carry out about 5.5 per cent of the contracts but get 67 per cent of the available funds.

To reverse this trend, the Public Procurement Act 2011, its 2013 Regulations, and 2016 amendments made provisions for preferring, and exclusively preferring local individual contractors or firms registered as local contractors. Sections 54 and 55 of the Public Procurement Act provide for national preferences and exclusive preference for local persons or firms.⁵ A procuring entity can therefore grant a margin of preference of up to 10 per cent to local firms or associations between local and foreign firms where the contracts for works, consultancy, or non-consultancy services are to be awarded on the basis of international tendering or selection, or national competitive tendering or selection in which foreign firms participate. Similarly, an exclusive preference scheme for local persons or firms applies to procurement not exceeding a value of TZS 10,000 million (US\$4,348) for works, and TZS 2,000 million (US\$870) for goods, consultancy, or non-consultancy services where financial resources are exclusively provided by a Tanzanian public body.

The number of contractors in Tanzania has been increasing in recent years (Figure 12.3). This has led to stiff competition and many other challenges as firms compete for fewer available resources. These challenges have been extensively studied (Materu 2001; Baitani and Mullungu 2007; Khoza 2007; Musingi 2007) and include a lack of finance and financial support, shortage of construction equipment, shortage of skilled labour, inadequate management skills, unfavourable regulatory environment, and high cost of doing business. Moreover, Muhegi and Malongo (2004) add that stiff competition, high equipment hire rates, and a lack of qualified staff are problems that the contractors have been facing for quite some time in Tanzania. According to the recent study by Mwombeki (2017), firms mention that delayed payment; lack of capital to finance the project; lack of business and financial management skills; inadequate equipment and plant in the construction sector; and corruption during procurement and project execution are the main challenges contractors currently face. Interviews with contractors, clients, and consultants confirm the challenges found by the previous studies. Table 12.3 summarizes the most-cited challenges.

2.2 Clients

Clients in the construction sector always come and go, particularly those from the private sector. Clients in the public sector are agencies, ministries, LGAs, and

⁵ Regulations 30 to 43 of the Public Procurement Regulations prescribe how to realize these two and other preference schemes.

Table 12.3 Contractors' challenges

S/N	Challenge	Remarks
1	Inadequate management skills	<i>Most local contractors cannot adequately manage projects, but, foreign firms engage them as subcontractors and their performance is acceptable.</i>
2	High equipment hire rates	<i>Many companies hire equipment and/or plant but rates are very high for local contractors to afford.</i>
3	Stiff competition	<i>There are more than 8,000 registered contractors in Tanzania who struggle for few work opportunities.</i>
4	Low financial base	<i>Local contractors cannot afford to tender for projects that require high levels of bid security and annual turnover because of their financial base.</i>
5	Lack of capital	<i>Local contractors lack the capital to acquire the necessary equipment and facilities for the project.</i>
6	Late payment	<i>Some clients do not honour interim payment certificate as per contract.</i>

Source: Authors' compilation from interviews with contractors, clients, and consultants carried out in 2018.

parastatal organizations such as the ministries of education, health, water, works, transport and communication, also municipal and district councils.

Every client who intends to erect a structure for use by the public must ensure there are adequate resources to accomplish the project in terms of finance and technical personnel. However, that has not always been the case particularly with LGA clients. Kikwasi (2011a) identifies the main challenges with LGA contract works as being a lack of sufficient funds to complete the project and inadequate capacity to manage the contracts. As well as identifying these challenges, Musingi (2007) finds additional challenges, namely inefficient utilization of resources due to an inadequate number of contractors in their locality and low-quality works. Similarly, NBS (2013) states that the inadequate capacity in the public sector is due to a lack of appropriate technical and managerial skills, understaffing, inadequate working facilities, poor remuneration, and bureaucracy. In a more recent study, Malongo (2015) finds that the contractors' problems perceived by clients are contractors not using qualified staff, poor knowledge of tendering procedures, lack of financial and project management skills, and lack of equipment. These challenges and many others contribute to the poor performance of projects and the sector at large.

3. Behaviour of construction prices

According to the Centre for Affordable Housing Finance in Africa (CAHF 2017), building a generic 55m² house in Dar es Salaam, Tanzania is cheaper than in

14 main African cities. At US\$26,750 dollars, the cost of such a house in the urbanized Dar es Salaam is about half of what a person in Kampala, Uganda has to pay and 2.36 times cheaper than building the same house in Nairobi, Kenya. However, it is estimated that the country has a deficit of 3 million housing units and that demand increases by about 200,000 units annually (CAHF 2017). According to CAHF (2015, 2016, 2017), the cost of building the cheapest house in Tanzania fell from US\$20,992 in 2015 to US\$17,874 in 2017. Some of this reduction in cost can be attributed to the increased supply and lower price of cement associated with recent investments in cement factories, in particular, the Tanga Cement Company Ltd and Dangote Cement Plc. According to data from the National Construction Council (NCC 2016) price index for cement has been relatively stable since 2005. However, the index price for labour has increased steadily since 2005. In fact, the labour price index increased from 6,879.40 in January 2010 to 22,358.06 units in January 2016.

Studying the NCC (2016) data, we observe that other important materials for the construction sector, such as iron sheets and steel pipes, have seen relative stability in the past decade. However, important components, such as fuel and diesel, have fluctuated or, as in the case of hardwood in 2013 and later in 2016, have experienced big jumps.

3.1 Investment shocks in the construction sector

The majority of construction contracts have been affected by the fall of the Tanzania shilling against the US dollar. Implementation of some of these contracts depends on the importation of materials and equipment, which drain the stock of the foreign currency in the country. As the exchange rate escalates, this increases government and private investors' expenditure on projects. The instability of the local currency has led to most large projects being awarded wholly or partly in foreign currency. Contracts with durations of two years and more attract the use of a price adjustment formula which uses indices to compensate contractors for changes in the price of labour, materials, and equipment. If there is a drastic increase in the indices, the cost of construction increases, leading to suspension or delay of the project. The current practice has been to state a limit of variation of price in the contract. Investors in public-private projects are likely to withdraw or bargain for a longer term of investments upon increases in construction costs.

Currently, the Tanzanian government is implementing large infrastructure projects such as the Standard Gauge Railway (SGR), construction of bridges at TAZARA and the Ubungu intersection in Dar es Salaam, and the deepening of ports at Dar es Salaam and Mtwara regions. These projects expend a large part of the country's foreign currency reserves and thus put the local currency at risk of depreciating. Similarly, most of these projects have clauses that allow the use of a

price adjustment formula, which uses both local and foreign indices to compensate contractors in the event of price changes.

4. Key bottlenecks to supply response

In section 2, we mentioned some of the challenges that contractors and consultants face in the sector. In this section, we will address in depth the most important constraints to sector supply response: access to land, construction permits, skills, and availability of materials and equipment.

4.1 Land issues in Tanzania

Tanzania has embarked on an industrial economy course that puts pressure on land governance. The Land Act 1999 provides for three categories of land: general, village, and reserved:

- *General land*: public land that is not reserved land or village land and includes unoccupied or unused village land.
- *Village land*: as defined in the Village Land Act, 1999, is an area declared to be village land under and in accordance with Section 7 of the Act and includes any transfer or land transferred to a village.
- *Reserved land*: land reserved, designated, or set aside under the provisions of listed laws (Land Act 1999: Section.6); these include: environmental protection areas, such as national parks, forest reserves, and wildlife reserves, including marine parks, and areas intended and set aside for spatial planning and future infrastructure.

General land is the category that is expected to be utilized by the construction sector for development. Land acquisition and registration is still a major problem in Tanzania. Kironde (2009) assessed land governance in the country and concluded that there were major challenges in registering land and improving land information systems, urban land management, and the management of public land, expropriation, and dispute resolution. Similarly, Mugabi (2013) highlights the challenges in land ownership in rural areas, which include: conflicts over land especially between farmers and livestock keepers; persistent land disputes resulting from the rapid expansion of towns encroaching on surrounding farming areas; tenure conflicts between customary and granted land rights; alienation of the people through accumulation of land by big national and multinational companies, leaving small-scale producers landless; absence of adequate and coordinated land information; and land insecurity among small landholder farmers, especially women.

An interview with an official from the Ministry of Lands, Housing and Human Settlement Developments reveals the following challenges associated with planning:

- lack of master plans for LGAs. Out of 133 LGAs, only ten have prepared master plans and eighteen have plans in progress
- inadequate staff in the land sector—only 35 per cent of LGAs are staffed in this area
- informal settlement accounting for 60 per cent of housing
- regularization
- slow registering of villages—only 10 per cent of the 12,500 villages are registered.

Tanzania's performance on issues related to land is not promising. A recent study by the World Bank (2018a) ranked Tanzania 142 out of 190 in the registering property category, which examines the steps, time, and cost involved in registering property, based on a standardized case of an entrepreneur who wants to purchase land and a building that is already registered and free of title dispute.

4.2 Issuance of construction permits in Tanzania

The World Bank's (2018a) Doing Business (DB) collects information on the procedures an entrepreneur needs to follow and the time and cost to complete those, in order to operate a business. The DB report considers 'dealing with construction permits' as one of the criteria for doing business. Obtaining a construction permit involves a number of steps including land location, land rent clearance, applying and obtaining building permits, and construction inspections and certification. The DB Tanzania report (World Bank 2018a) details twenty-four procedures for getting construction permits, including obtaining location plans, registration with regulatory boards, and inspection by LGA officers. According to the World Bank, Tanzania has fallen in its ranking for processing and issuing construction permits—from 126 in 2015 and 136 in 2016 to a low of 156 in 2017, out of 190 countries. The Tanzania Private Sector Foundation (TPSF 2014) states that in Mwanza, the municipality issuing a construction permit takes up to 131 days to do so. Ninety of these days are spent at the approval meeting, which requires councillors and officials to approve each application to provide a building permit. This is similar to the figures reported by the World Bank (2018a), which showed that it took 184 days to obtain a permit, out of which ninety days were taken up with approvals by councillors. The TPSF (2014) has identified the following challenges in issuing construction permits in Tanzania:

- the wide distances (physical separation) between the key departments and offices responsible for scrutinizing and processing building/construction permits
- inadequate collaboration between the Tanzania Investment Centre (TIC) and LGAs
- a one-size-fits-all approach to processing and issuing construction permits. The processing and requirements of construction permits are the same regardless of the type or size of project
- lack of awareness among applicants about procedures and requirements, including methods for charging fees for scrutinizing and issuing construction permits
- unclear rules of the environmental management officers in scrutinizing and processing construction permits
- a lack of by-laws to support and/or facilitate processing/issuing construction permits for specific projects.

Aiming to alleviate these challenges, the TPSF (2014) has recommended the following short-term and long-term measures to improve processing of construction permits:

- The processing and issuing of construction permits should be left to the technical staff of LGAs.
- Councils need to engage private-sector professional firms to do the inspection instead of waiting for council officers to visit sites at every stage of construction.
- Differentiate size of investment projects in processing and issuing permits.
- Each council should prepare a simple one-page leaflet freely available to the public, outlining key steps, issues scrutinized/checked, average costs, and number of days or time required to accomplish a procedure.
- Create a one-stop centre in each LGA for the processing and issuing of construction permits.
- LGAs to be supported in using ICT in the processing and issuing of construction permits.
- Review legislation, regulations, and preparation of by-laws to enhance processing and issuing of permits.

An interview with an official from the permit-issuing section of one of five municipalities in Dar es Salaam revealed that the process for obtaining a permit has recently been shortened. He added that the Government of Tanzania has directed municipalities to ensure that the planning and construction committees make decisions on issuing permits within one month. This has reduced the duration of processing permits from ninety to thirty days. The official also disclosed

that most of the challenges related to issuing construction permits have since been addressed, but challenges remain on the users' side as some applicants are not aware of urban regulations, and some clients construct structures that are different to approved designs/plans, which brings problems in later stages of the process.

4.3 Skilled labour

WEF (2017) has identified the technical and management skills of the labour force as one of the challenges for Tanzania to address if it is to reach middle-income country (MIC) status by 2025. Despite the government's efforts in expanding access to education, by 2014 only 15.79 per cent of the population aged fifteen or more had some level of secondary education and 1.3 per cent had university education (NBS 2014). In fact, 72 per cent of the population of Tanzania had only seven years of education in 2014. Tanzania ranks 106 out of 130 countries in the Global Human Capital Index, which measures how well countries are developing their human capital according to four categories: capacity, deployment, development, and know-how (WEF 2017). Breaking down the index, Tanzania ranks second-to-last (129th) when measuring the share of people employed in occupations that require tertiary education out of the total employed (CLFG 2017).

The Five-Year Development Plan II (FYDP II) (2016/17–2020/21) (URT 2016) recognizes the challenges of skills in Tanzania. One of the key actions of the plan is to target higher levels of foreign direct investment (FDI) and other private-sector financial flows to improve skill levels in the labour force through better internship programmes. The skill challenges the country faces also affect the construction sector. A recent report by Lema (2017) finds a shortage of skills in the construction sector. Lema further explains that the internationally recommended ratio is 1:5:25 for engineers, technicians, and artisans respectively. However, the current ratio in Tanzania is 1:0.2:2.6, reflecting the country's 10,000 construction professionals, 2,000 technicians, and 26,000 artisans, which is far from the expected figures of 10,000, 50,000, and 250,000 respectively. The shortage of architects and quantity surveyors was also noted by Mcha (2010), who established that only 10 per cent of LGAs had architects and quantity surveyor professionals as part of their staff. Kikwasi (2011b) evaluated construction skills at management level and found that telecommunication, materials, and water resource engineers were available only by special arrangement.

Interviews with contractors, clients, and consultants reveal skill shortages in various areas (Table 12.4). The most cited are: inadequate exposure of graduates to professional skills; lack of technicians; and lack of formal training for artisans. The two regulatory boards, ERB and AQRB, have internship programmes for graduates in engineering, architecture, and quantity surveying and allied disciplines. The ERB supervises the Structured Engineers' Apprenticeship

Table 12.4 Construction skills shortages

S/N	Skills challenges	Remarks
1	Inadequate exposure	<i>There are many graduates with certificates but who have no skills and lack exposure to perform duties related to their professions.</i>
2	Technicians	<i>There is a lack of technicians in engineering and architecture as most of the technical colleges that used to train technicians have been upgraded to universities.</i>
3	Materials engineers	<i>It is difficult to get engineers who specialize in materials engineering or have the necessary skills in construction materials.</i>
4	Railway lines, mining, oil and gas, airport and dam construction	<i>Tanzania is spending most of its development funds in the construction of standard gauge railway line, oil and gas and mining, which demand specialist skills. There are no skills at all at middle management level and no technicians, particularly in the mining and oil and gas sectors.</i>
5	Project managers	<i>There are very few professionals with the necessary skills and experience to take up the role of project manager.</i>
6	Engineers	<i>Some contractors fail to register companies because they cannot find engineers to employ.</i>
7	Foreign experts	<i>Some contractors are allowed to engage foreign experts because there are no such skills in Tanzania.</i>
8	Artisans	<i>Most artisans lack formal training, as well as knowledge in construction theories and drawings.</i>

Source: Authors' compilation from interviews with contractors, clients, and consultants carried out in 2018.

Programme (SEAP) which is funded by the Government of Tanzania for three years, and the AQRB supervises the Enhanced Articled Pupillage Programme (EAPP) for two years, which is jointly funded by the Government of Tanzania and the AQRB. Due to limited financial resources, the two programmes only admit a small share of graduates.

The manpower in the construction sector is far below that expected. An extract from regulatory bodies (Table 12.5) indicates that the number of registered professionals and technicians is still low compared to potential employers. For instance, there are only 6,657 engineers and 439 quantity surveyors who are expected to serve all potential employers. On the other hand, there are only 727 technicians available for consulting firms and contractors. This supports the findings of Lema (2017) that there is a significant gap in the skill demand–supply in Tanzania. Interviews with regulatory officials reveal the following efforts to address the challenge of an inadequate number of technicians in the sector:

- Tanzania's government has extended study loans to students in technical colleges instead of to university students only.

Table 12.5 Comparison of registered professionals, technicians, and potential employers

S/N	Potential employees		Potential employers	
	Specialization	Number	Organization	Number
1	Consulting engineer	531	Contractors	8,814
2	Professional engineer	6,657	LGAs	133
3	Q/Surveyors	439	Consulting firms	674
4	Architects	466	Agencies and ministries	29
5	Technicians	727	Private employers	various

Source: Authors' calculations based on data collected from the offices of the AQRB, CRB, and ERB, and from CLGF (2017).

- The government has been advised to revive old technical schools to impart technical skills to students in secondary school.
- The government has been advised to encourage the Vocational Education Training Authority (VETA) to take on the role of training technicians.
- The government is to restrict upgrading of technical colleges to universities.

4.4 Construction materials and equipment

The manufacturing and supply of local construction materials, such as cement, reinforcement steel, paints, ready-mixed concrete, and roofing materials, have been on the rise in Tanzania. The country has five big cement factories: Twiga Cement Factory, Tanga Cement Company Ltd, Tanzania Portland Cement Company Ltd, Mbeya Cement Company Ltd, and Dangote Cement Plc. The fairly recent increase in the number of big cement players in the local market seems to be responsible for the country's stable cement prices. In 2017, a 50kg bag of cement was sold at US\$4.5 in Tanzania, which is almost half the price in neighbouring Kenya and Uganda where it is US\$8 and US\$8.5, respectively (CAHF 2017).

While there are big companies supplying other construction materials locally, the country is a net importer of construction materials and machinery (Deloitte 2016), mainly from China, which accounts for more than a third of the total imports (34 per cent), followed by India and South Africa with 14 and 5 per cent, respectively. The challenge of locally available and imported building materials in Tanzania is that of quality. Most of the construction materials on the market, both manufactured and imported, are expected to be of substandard quality.

Companies that hire equipment and/or plant machinery in Tanzania include: EFFCO Solutions (T) Limited, Kays Logistics Company Ltd, Torya Machinery Ltd, Armani Investment Limited, and CMTL Logistics. In addition, Mantrac Tanzania Ltd is the sole authorized dealer of CAT construction equipment in

Table 12.6 Challenges associated with construction materials and equipment

S/N	Challenge	Remarks
1	Local materials	<i>Locally produced materials such as aggregates, sand, and gravel are not readily available in regions other than Dar es Salaam.</i>
2	Imported materials	<i>Most materials are imported and there are few well-established suppliers in Tanzania, which makes construction materials expensive.</i>
3	Quality of materials	<i>The advancement of technology has brought about a variety of materials with no guarantee of quality.</i>
4	Unavailability of construction materials	<i>Imported materials for specific projects such as railway line construction, mining, oil and gas are not readily available.</i>
5	Equipment and/or plant hire rates	<i>Most plant hire companies are based in Dar es Salaam, they are not readily available in the regions and hire rates are higher than in Dar es Salaam by almost 40 per cent.</i>
6	Equipment owning	<i>Most firms lack the capital to purchase the basic equipment needed for construction.</i>
7	Unavailability of equipment	<i>Construction equipment is not readily available.</i>

Source: Authors' compilation from interviews with contractors, clients, and consultants carried out in 2018.

Tanzania. It is evident that the availability of construction equipment has been improving, with more companies investing in the hiring and supply of new and used construction equipment. However, contractors are constrained by inadequate capital to acquire such equipment and/or plant. Muhegi and Malongo (2004) point out that contractors face several challenges related to equipment and machinery when budgeting for and delivering projects. For example, there is a limited/small capital base and, usually, not readily available equipment or high hire rates.

Interviews with contractors, clients, and consultants undertaken in 2018 reveal challenges associated with construction materials and equipment (Table 12.6). The challenges related to construction materials are high cost and low quality of imported materials and unavailability of locally produced materials. Similarly, challenges associated with equipment and/or plant are a lack of capital for acquisition, quality, and high cost of hiring.

5. Conclusion and policy recommendations

The construction sector is responsible for creating the necessary infrastructure to support most of Tanzania's development and economic activities. The key bottlenecks for the development of the construction sector emanate from land

acquisition, construction permits, skills, and quality/availability of materials and equipment. Obtaining land for development is still a major challenge, as most of the challenges listed in the works of Kironde (2009) and Mugabi (2013) still exist. Most of the land is unplanned, attracting informal settlements and necessitating regularization. Construction permits still take a long time to issue, but the government has directed LGAs to reduce the time for processing these by shortening the approval period from ninety to thirty days. In addition, the government has set up a task force to prepare building codes. Construction skills in Tanzania, as in many other countries, are still in short supply. The findings of Lema (2017) and Kikwasi (2011b) still hold true. There are insufficient engineers, architects, and quantity surveyors and related disciplines to meet demand. Likewise, the sector has an acute shortage of technicians and qualified artisans. The availability and quality of construction materials is also an area of concern. The sector depends on imported materials, which are expensive but with no guarantee of quality. Construction equipment/plant have also emerged as a challenge, as owning them requires capital and hire rates are high for local contractors to afford. Contractors, who constitute a major part of the construction sector, and the sector at large, have been persistently facing challenges. The challenges of inadequate management skills, stiff competition, and the high cost of hiring equipment, identified in this study have also been identified by Materu (2001), Khoza (2007), Muhegi and Malongo (2004), and Mwombeki (2017).

From the above evidence, the proposed institutional and policy reforms necessary for the development of the sector relate to skills shortages, raw materials, contractors' challenges, construction permits, and access to land.

5.1 Raw materials and construction equipment/plant

Tanzania's dependence on imports of building materials and equipment poses a threat, as big investments are currently ongoing and others are planned to achieve the objective of making Tanzania a middle-income country. The fifth-term government has embarked on implementation of the FYDP II's first objective of industrialization, with the broad aims of: becoming a semi-industrialized nation by 2025; developing sustainable productive and export capacities; becoming a regional production, trade, and logistics hub; and promoting industrial skills. One of the priority sectors is building and construction. Institutions charged with the implementation of the plan should prioritize investments in construction materials. The poor quality of local and imported materials has been noted. The Tanzania Bureau of Standards (TBS) is mandated to undertake quality control measures for products of all descriptions and to promote standardization in the sector and in commerce. The TBS is to devise a mechanism,

such as the Confederation of Tanzanian Industries (CTI) recommendation of creating an anti-counterfeit task force and a public–private advisory committee on counterfeits, to ensure that locally produced and imported materials are of acceptable quality.

There are various equipment plant hire companies in Tanzania. The main challenge has been less that of availability and more that of unregulated hire charges. The government should form or identify an agency that will register and regulate the activities of plant hire companies.

5.2 Skills shortage

The available statistics reveal a shortage of skills, and the construction sector is among those affected by lack of exposure to graduates and inadequate technicians. One of the targets of the FYDP II is to improve skill levels in the labour force through better internship programmes. The ERB and AQRB regulatory boards have internship programmes that expose graduates to various features of construction projects. These programmes are constrained by financial resources. The government should allocate financial resources to such programmes as part of implementing the plan. To increase the number of technicians and enhance the skills of artisans, the government should facilitate and promote technical schools and technical colleges to offer technical education, restrict upgrading of technical colleges to universities, and recognize and regulate the skills of artisans.

In addition, it will be important to direct resources to more science- and mathematics-oriented subjects. According to a study conducted by the Government of Tanzania, in 2014 up to 80 per cent of the firms interviewed (which includes all sectors) stated that the occupations that were and are expected to continue to be in demand are based on science and mathematics subjects. However, in 2013 about 24 to 30 per cent of the government funding through the Higher Education Student's Loan Board (HESLB) was directed to science-related programmes, which is not surprising as the admission of students to higher education institutions in engineering, medical, natural sciences, and ICT accounted for only 20.5 per cent of the admissions (TRC 2014). Funding for science-oriented institutions, student loan schemes, and awareness campaigns about the skills needed in the next decade, among others, should be areas of focus for the government if it is to close the skills gap and move to a middle-income, semi-industrialized country. A further priority should be to support the development of a highly skilled labour force outside Dar es Salaam in intermediate cities that already offer some infrastructure and levels of development that will contribute to early gains. Some LGAs far from the coastal region in Tanzania have expressed a problem in recruiting locally qualified staff.

5.3 Access to land and construction permits

The fifth-term government embraces an e-government system. The constraints that are currently experienced in land governance and permit processing could be minimized by using ICT. The ministry responsible and LGAs should subscribe to e-government systems and ICT in the processing of permits and land governance. Similarly, the ministries responsible should expedite the preparation of a Building Act and its regulations that will guide all building construction activities in the country.

5.4 Contractors' challenges

The CRB organizes and conducts annual consultative meetings that identify challenges and make recommendations. The government and sector stakeholders are aware of these challenges. As contractors form a major part of the construction sector, stakeholders and the government should endeavour to address these challenges as follows:

- Inadequate business and management skills: CRB should conduct skills needs assessments and engage experts in the area to train contractors on a yearly basis.
- Delayed payment to contractors: Contractors should make proper use of clauses in the conditions of contracts and/or provisions of the Public Procurement Act 2011 and its regulations to deal with clients who delay their payments.
- The Public Procurement Regulatory Authority should ensure all procuring entities abide by sections 54 and 55 of the Act and related regulations when engaging in procurement of works. This in turn will develop the capacity of local contractors and address issues of management skills, capital, and equipment where joint ventures, associations, or partnering apply.

Acknowledgements

We are indebted to UNU-WIDER for its support and to the whole team for the constructive comments and other logistics, in particular Finn Tarp, John Page, and Janis Vehmaan-Kreula. We also recognize the generosity of officials from the Tanzania Architects and Quantity Surveyors Registration Board, Engineers Registration Board and Contractors Registration Boards who gave us access to data, the interpretation of which forms a substantial part of this chapter. Lastly, we appreciate the contribution of individual professionals (architects, engineers, and quantity surveying professionals)

who participated in the interviews. However, we remain responsible for any error in facts and/or interpretations in the chapter.

References

- Baitani, M., and B. M. Mullungu (2007). 'Challenges Facing the Contracting Industry'. In the Proceeding of Contractors Annual Consultative Meeting: 10 Years of CRB: Empowering Contractors to Meet the Challenges Ahead, Dar es Salaam.
- Bonface, D. (2015). 'Top 5 Challenges Facing Africa's Construction Sector'. Available at: <https://constructionreviewonline.com/2015/07/top-5-challenges-facing-africas-construction-industry/> (accessed 15 March 2018).
- CAHF (Center for Affordable Housing Finance in Africa) (2015). *2015 Yearbook. Housing Finance in Africa: A Review of Some of Africa's Housing Finance Markets*. Johannesburg: CAHF. Available at: <http://housingfinanceafrica.org/documents/2015-housing-finance-in-africa-yearbook/> (accessed 15 March 2018).
- CAHF (Center for Affordable Housing Finance in Africa) (2016). *2016 Yearbook. Housing Finance in Africa: A Review of Some of Africa's Housing Finance Markets*. Johannesburg: CAHF. Available at: <http://housingfinanceafrica.org/documents/2016-housing-finance-in-africa-yearbook/> (accessed 15 March 2018).
- CAHF (Center for Affordable Housing Finance in Africa) (2017). *2017 Yearbook. Housing Finance in Africa: A Review of Some of Africa's Housing Finance Markets*. Johannesburg: CAHF. Available at: <http://housingfinanceafrica.org/documents/2017-housing-finance-in-africa-yearbook/> (accessed 15 March 2018).
- CLFG (Commonwealth Local Government Forum) (2017). *The Local Government System in Tanzania: Country Profile 2017–2018*. Available at: http://www.clgf.org.uk/default/assets/File/Country_profiles/Tanzania.pdf. (accessed in September 2018)
- Clyde & Co (2013) *Structure of the Construction Industry in Tanzania*. Available at: <http://www.inhousecommunity.com/upload/pdf/e03348b1933c78bb6127f679678fe45e.pdf> (accessed 15 March 2018).
- CRB (Contractors Registration Board) (2017). *Proceedings of CRB Annual Consultative Meeting 2017: 20 Years of CRB; Contractors' Good Conduct and Compliance as a Strategy to Win Clients' Trust*. Dar es Salaam 4–5 May.
- Deloitte (2016). 'Tanzania: A Leader among Africa's Emerging Markets'. Available at: <https://www2.deloitte.com/za/en/pages/deloitte-africa/articles/tanzania.html> (accessed July 2018).
- Khoza, R. (2007). 'Regulation and Development of the Contracting Sector'. In the *Proceedings of Contractors Annual Consultative Meeting: 10 Years of CRB: Empowering Contractors to Meet the Challenges Ahead*, Dar es Salaam.
- Kikwasi, G. J. (2011a). 'Assessment of LGAs' Programmes for Improving Construction Contract Performance: Case Study of Kagera District Councils'. *Journal of Construction*, 4(1): 24–7.

- Kikwasi, G. J. (2011b). 'An Evaluation of Construction Skills in Tanzania.' *Journal of Construction and Architectural Management*, 18(2): 127–39.
- Kironde, L. (2009). 'Improving Land Sector Governance in Africa: The Case of Tanzania.' Paper for workshop on Land Governance in Support of the MDGs. Washington, DC, 9–10 March. Available at: http://www.tzdpd.or.tz/fileadmin/_migrated/content_uploads/land_governance_in_Tanzania_paper_by_Kironde.pdf (accessed 29 January 2018).
- Leeds, R. (2016). 'Top 4 Challenges Facing the Construction Sector.' *Digitalist Magazine*. Available at: <http://www.digitalistmag.com/future-of-work/2016/08/15/top-4-challenges-facing-construction-sector-04388065> (accessed 15 March 2018).
- Lema, N. M. (2017). 'Human Resource Needs and Skills Development of the Construction Sector in Tanzania.' LTPP Report—Planning Commission. Unpublished report.
- Malongo, J. K. (2015). 'Board Performance for Year 2014 and Feedback from ACM 2014 Recommendations.' Proceedings of CRB Annual Consultative Meeting 2015 *Challenges and Future Perspectives of the Construction Sector towards Attainment of Vision 2025*. Dar es Salaam, 14–15 May, 1–30.
- Materu, S. N. (2001). 'Promotion of Local Contracting Capacity.' In the Proceedings of Construction Sector Forum, Dar es Salaam.
- Mcha, A. (2010). 'Participation of Architects and Quantity Surveyor in Development of Local Government Authorities.' In the proceedings of Continuing Professional Development Seminar, *The Impact of Building Sector in Global Climatic Changes*, Dodoma.
- Mugabi, C. (2013). 'Challenges Facing Land Ownership in Rural Tanzania.' ESFR Policy Brief 4/2013. Dar es Salaam: Economic and Social Research Foundation.
- Muhegi, B., and J. Malongo (2004). 'Globalization: A Challenge to the Tanzanian Construction Industry.' International Symposium on Globalisation and Construction. AIT Conference Centre, Bangkok, 17–19 November.
- Musingi, R. (2007). 'Challenges Facing the Contracting Sector.' In the Proceedings of Contractors Annual Consultative meeting *10 Years of CRB: Empowering Contractors to Meet the Challenges Ahead*, Dar es Salaam.
- Mwombeki, F. K. (2017). 'An Overview of Contractors' Conduct and Compliance.' Proceedings of CRB Annual Consultative Meeting 2017, *20 Years of CRB; Contractors Good Conduct and Compliance as a Strategy to Win Clients' Trust*. Dodoma, 4–5 May.
- NBS (Tanzania National Bureau of Statistics) (2013). 'Integrated Business Survey, 2010 Construction Sector Analytical Report'. Available at: www.nbs.go.tz (accessed 29 July 2014).
- NBS (Tanzania National Bureau of Statistics) (2014). 'Tanzania Integrated Labour Force Survey 2014'. Dar es Salaam. Available at: www.nbs.go.tz (accessed 20 July 2018).
- NBS (Tanzania National Bureau of Statistics) (2018). 'Gross Domestic Product 2017'. Available at: www.nbs.go.tz (accessed 20 July 2018).

- NCC (National Construction Council) (2016). 'Labour/Material Indices'. Tables available for purchase at NCC Tanzania Offices. Dar es Salaam: NCC.
- RFB (Roads Fund Board) (2018). *History of the Board*. Available at: www.roadfund.go.tz/history (accessed 20 August 2018).
- TPSF (Tanzania Private Sector Foundation) (2014). 'Study on the Delivery of Construction Permits in Tanzania: Roadblocks, Implications and Way Forward'. Dar es Salaam: TPSF.
- TRC (Transport Resource Center) (2014). 'The Study on National Skills Development to Facilitate Tanzania Become a Strong and Competitive Economy by 2025'. Final Report. Dar es Salaam: TRC.
- United Republic of Tanzania (2017). 'Contractors Registration (Amendments) By-Laws, 2017'. *Gazette of the United Republic of Tanzania*, 49(98).
- URT (United Republic of Tanzania) (2016). *National Five-Year Development Plan 2016/17–2020/21*. Available at: http://www.mof.go.tz/mofdocs/msemaji/Five%202016_17_2020_21.pdf (accessed 26 July 2018).
- WEF (World Economic Forum) (2017). *Global Human Capital Report 2017: Preparing People for the Future of Work*. Available at: http://www3.weforum.org/docs/WEF_Global_Human_Capital_Report_2017.pdf (accessed 4 March 2018).
- World Bank (2018a). *Doing Business Tanzania 2017*. 14th edition. Available at: www.doingbusiness.org (accessed 29 January 2018).
- World Bank (2018b). *The World Bank in Tanzania*. Available at: <http://www.worldbank.org/en/country/tanzania/overview> (accessed 6 August 2018).

Local Content

Are There Benefits for Tanzania?

Mia Ellis and Margaret McMillan

1. Introduction

Tanzania has an abundance of natural resources, and in recent years there has been debate about how best to manage these resources. The focus is on understanding how extractive industries of mining and natural gas can be harnessed to benefit Tanzania's development. Extractive industries are typically capital-intensive, thus directly creating few jobs. Yet, a number of countries have managed to exploit natural resources for industrialization and widespread wealth accumulation (Van der Ploeg 2011). Aware of this, African governments are seeking ways to better integrate natural resource extraction with local economies. In Tanzania and elsewhere, a key initiative for achieving this integration is local content legislation.

Because of the role that multinational corporations (MNCs) play in the extractive industries of developing countries, benefits of natural resources are not always felt by local communities. Traditionally, the policy focus has therefore been on how to accrue benefits from resources through taxation, royalties, and licences (Hansen et al. 2015). Though this management of natural resource revenues is an important topic, it is beyond the scope of this chapter (Tordo et al. 2013). Instead of this traditional policy focus, in recent years there have been efforts to generate broader growth benefits from natural resources through local content provisions that increase local participation in the extractives value chain (Tordo et al. 2013).

A general definition of local content is the incidence of domestic inputs—including capital, labour, and intermediate products—into the value chain (Hansen et al. 2015; Kolstad and Kinyondo 2017). This encompasses most other definitions of local content, which include specifications for local labour involvement, purchases of local inputs and services, and local ownership of firms (Hansen et al. 2015; Kinyondo and Villanger 2017). In general, local content policies represent an attempt by the government to ensure that the benefits of a national resource are going to the country. Approximately 90 per cent of resource-rich countries have some form of local content requirement (Lange and Kinyondo

2016). Some critics of local content assert that it reduces overall welfare by distorting allocative efficiency (Lange and Kinyondo 2016). Others argue that when designed correctly, local content can support the development of the domestic economy in a way that offsets its costs (Altenburg 2011; Chang 2002).

The first goal of this chapter is to assess local content policy in Tanzania. We begin with a description of the legislation and institutions surrounding local content policy in Tanzania. While we provide historical context, our main focus is on legislation enacted over the past ten years. We then evaluate these policies using both qualitative and quantitative evidence. The qualitative evidence relies primarily on a review of a series of studies in which participants in the industry were interviewed and results synthesized. Our first quantitative exercise uses panel data from the Annual Survey of Industrial Production (ASIP) to examine trends in employment and worker training by mining firms pre- and post-2010 local content legislation. Our second quantitative exercise uses the 2013 Census of Industrial Production (CIP) to estimate multinational corporations' (MNCs) potential to contribute to the local economy by computing employment (local and foreign and skilled and unskilled), worker training and total expenditures on raw materials (locally procured and imported).

The second goal of this chapter is to summarize other developing countries' experiences with local content policy, especially those in Africa. Lessons from other countries suggest that the effectiveness of local content policy has varied significantly across countries. While most countries have seen increases in local employment in extractives, there have not been consistent increases in procurement of local goods and services. Furthermore, there is limited evidence of growth in linkages between extractives and non-resource sectors, especially linkages with sideways industries such as finance.

We find that Tanzania has enacted significant legislation surrounding local content over the past ten years; 2016–18 have been especially active as new legislation has attempted to strengthen local content requirements. This legislation ranges across provisions mandating employment generation and training, local procurement, the use of local financial services, and promotion of technology transfer and inter-sectoral linkages. Using operating data from Tanzanian mining companies, we also find evidence of increases in local content MNCs in terms of employment and training post 2010-legislation, as well as significant value in local content in 2013, especially in terms of procurement of goods and services. This suggests that there may be further indirect benefits of local content, through benefits accrued to the non-resource sector firms providing goods and services.

The remainder of this chapter is organized as follows. Section 2 introduces the state of extractive industries in Tanzania and describes the legislation regulating these industries and local content in Tanzania. Section 3 describes the institutions established to regulate local content legislation and monitor its effectiveness. In

section 4, we evaluate the impact of local content policy in Tanzania. Section 5 evaluates the magnitude and potential of local content to impact the local economy. Section 6 describes other developing countries experiences with local content legislation, and section 7 concludes.

2. Local content legislation in Tanzanian extractive industries

The last decade or so has seen a significant increase in Tanzanian legislation surrounding local content, including acts with provisions for local procurement of goods and services, local employment, and local firm ownership, as well as provisions intended to increase transparency and accountability in extractive industries. Overall, recent legislation has reduced the favourability of natural resource agreements for MNCs, increased government power in extractive industries, and imposed new local content regulations on foreign firms. This section will discuss new provisions in natural resource legislation that affect local content in extractives overall, as well as sector-specific regulations.

2.1 General legislation

In 2014, the Non-Citizens Act was signed into law, which regulates employment of foreign employees. It requires that companies employing foreign workers develop a succession plan for the replacement of a foreign worker with a local worker, before expiration of the maximum total permitted stay in the country (normally five–ten years) (Kinyondo and Villanger 2017). The succession plan must also detail a proposal for knowledge and expertise transfers from the foreign to the local worker during the employment period, in such a way that the citizen can successfully take over the work (Kinyondo and Villanger 2017).

The government joined the international Extractive Industries Transparency Initiative (EITI) in 2009, and in 2015 passed the Tanzania Extractive Industries Transparency and Accountability Act (TEITA). The act establishes the Extractive Industries Transparency and Accountability Committee (EITA) as an independent government entity intended to serve as an oversight body for extractive industries, promote citizen participation in and awareness of said industries, and ensure that the benefits of said industries are verified, accounted for, and utilized for the betterment of Tanzanians (NRGI 2016). TEITA also requires both government agencies and extractive industries companies to provide accurate and timely information to the Tanzanian EITI (TEITI) (Lange and Kinyondo 2016). This was intended to both regulate the use of government revenues from the petroleum sector and to increase transparency (Lee and Dupuy 2018).

Three new acts were passed in 2017 amending past laws and establishing new requirements. These acts have sector-specific requirements, which are discussed in the following sections, but also have significant provisions affecting extractive industries as a whole. The first act passed in 2017 was the Natural Wealth and Resources (Permanent Sovereignty) Act, also known as the Permanent Sovereignty Act. The act states that the people of Tanzania have permanent sovereignty over all natural wealth and resources and that ownership and control of said resources will be exercised by the government on the people's behalf (Woodroffe et al. 2017). It also requires that in the interest of ensuring permanent sovereignty over natural resources, any disputes related to extractive industries must be handled by judicial bodies or other entities established in Tanzania (Woodroffe et al. 2017).

Also passed that year was the 2017 Natural Wealth and Resources Contracts (Review and Re-negotiation of Unconscionable Terms) Act, also known as the Unconscionable Terms Act. The act requires that any mineral or petroleum agreements be submitted to the National Assembly, which now has the authority to review and renegotiate all existing and future agreements (Woodroffe et al. 2017). If involved parties fail to reach an agreement on renegotiation of 'unconscionable' terms, the terms will be treated as expunged; it is not clear how this will affect the rest of the agreement (Woodroffe et al. 2017).

The third act passed in 2017 was the Written Laws (Miscellaneous Amendments) Act, also known as the Miscellaneous Amendments Act. While it primarily governs the mining sector, it does include a few specific provisions that apply to extractive industries in general, such as reducing allowances given to MNCs and also prohibiting certain stabilization agreements. These measures are intended to reduce favourable allowances for foreign firms, and to increase government control over agreement terms.

2.2 Mining sector

Mining regulation in Tanzania has historically lacked specific quotas, monitoring mechanisms, or incentives and sanctions. Past experiences with mining are a major driver of the current sentiment towards petroleum in Tanzania (Lange and Kinyondo 2016). However, the three acts passed in 2017 represent a recent and significant attempt to reclaim Tanzania's mineral resources. This section presents background information on the mining sector and its local content policies, and discusses the current legislation governing the sector.

2.2.1 Background

Tanzania is a host to many mineral resources, including gold, tanzanite, diamonds, uranium, coal, and nickel (Hansen et al. 2015). The first policy surrounding mining and local content was the 1979 Mining Act. This required

licence applications to include a plan for local procurement of goods and services (Makene et al. 2012). How well this law was actually enforced remains unclear, as there were few foreign firms engaged in the sector (Lange and Kinyondo 2016).

Following the increased liberalization of Tanzania's economy in the 1980s, the World Bank released a 1992 report criticizing local content, recommending that foreign investors be treated the same as domestic firms, and discouraging the use of the mining sector as a tool for employment generation (Lange and Kinyondo 2016). The subsequent Mining Act of 1998 did not include any mention of local content; however, it did offer generous value-added tax (VAT) exemptions to foreign investors (Lange and Kinyondo 2016). In the 1990s, there was a rapid increase in foreign direct investment (FDI) in mining, primarily in gold. Partially due to favourable concessions, revenues were significantly less than expected (Lange and Kinyondo 2016). For example, among the five mines established between 1999 and 2005, two did not pay the required 30 per cent corporation tax, and the other three only began paying the tax seven, nine, and eleven years into operations (Lange and Kinyondo 2016). By 2008, Tanzania had become the third largest producer of gold in Africa, but its annual revenues were less than US\$30 million (TMAA 2015).

2.2.2 Current local content

This experience led to public criticism of the government's handling of foreign investment, and in 2010 a new mining act was passed (Lange and Kinyondo 2016). This 2010 Mining Act is the primary legislation governing the mining sector and its associated local content provisions. With regard to local content, it includes provisions to promote forward and backward linkages, requires MNCs seeking prospecting and mining licences to draw up a list of goods and services that could be bought locally, and attempts to promote training and skills transfers.

The 2017 Miscellaneous Amendments Act amended the Mining Act of 2010, instituting new rules for governance of the sector, as well as provisions affecting contract and local content requirements (Woodroffe et al. 2017). For example, it established the Mining Commission to regulate the sector, increased royalties on a number of minerals, and increased local and government involvement in the holding and sale of minerals. For example, earnings from mineral sales must now be kept in local financial institutions, except when distributed as profits. It also prohibits the export of raw minerals for beneficiation outside of the country. If the capacity for beneficiation exists in the country and the law is properly enforced, then this will be instrumental in allowing Tanzania to participate in a greater share of the value chain.

Regarding specific references to local content, this act states that applications for new licences must include a local content plan. This local content plan is not specifically defined, but likely refers to the plans also required by the act regarding local procurement, training and employment, and technology transfer

(Woodroffe et al. 2017). For example, the act specifically requires that mineral right-holders give preference to goods produced or available in Tanzania, and to services provided by Tanzanian citizens or local companies. They must produce a procurement plan detailing a strategy for use of local goods and services covering at least five years. If such goods and services are not available, they must be procured from companies that are engaged in joint ventures with a local company, with the local company holding at least 25 per cent of the venture. A local company is defined as one that is either 100 per cent owned by a Tanzanian citizen or a joint venture at least 50 per cent owned by Tanzanian citizens (Woodroffe et al. 2017).

The act also includes requirements for training and employing Tanzanians. In addition to annual reports on achievements in utilizing Tanzanian goods and services and a local supplier development programme, rights holders must submit an annual report on their programme for training and recruiting Tanzanians. This report should include information on a clearly defined training programme for the company's Tanzanian employees as well as a commitment to knowledge transfer. The act specifies that technology transfer is the shared responsibility of government and mineral right-holders, though it does not provide details on the implementation of such technology transfers (Woodroffe et al. 2017).

The 2017 Permanent Sovereignty Act also included significant amendments to the 2010 Mining Act and expanded local content requirements. The act makes illegal any agreement that does not fully secure the interests of Tanzanian citizens and the state. It requires that any natural resource contract provide for both state and citizen participation and expands existing requirements for Tanzanian participation from special mining licence-holders to all mineral right-holders. It stipulates that the government will have no less than 16 per cent free carried interest in the capital of mining companies (Woodroffe et al. 2017). It also prohibits the exportation of raw minerals for beneficiation outside of the country, and requires that agreements include a commitment to establish beneficiation facilities within Tanzania, though exemptions to this rule may be granted under some circumstances (Woodroffe et al. 2017). In general, this act moves to reclaim control of natural resources, giving the government greater authority as well as imposing requirements to keep mineral resources inside Tanzania.

Most recently, in January 2018, the Tanzanian government adopted the Mining Regulations on Local Content Policy (Kasanda and Liu 2018). This stipulates that Tanzanian companies are given first preference when competing for mining licences, and that at least 5 per cent of the participating interest in any company competing for a licence must be Tanzanian-owned (Woodroffe et al. 2017). In this policy, a Tanzanian company is defined as being at least 51 per cent owned by Tanzanian citizens, where Tanzanian citizens hold at least 80 per cent of senior executive and management positions and 100 per cent of non-managerial and other positions (Woodroffe et al. 2017). Furthermore, any company providing

services to a mining company must incorporate a joint venture in which Tanzanians have at least 25 per cent equity in the venture (Woodroffe et al. 2017).

The policy also stipulates that firms must give priority to Tanzanians for employment opportunities as well as make reasonable efforts to provide training, and certain types of positions (for example, all junior and mid-level positions) must be entirely filled by Tanzanians (Woodroffe et al. 2017). The policy also includes provisions requiring that the foreign firm implement technology transfer programmes, that they make use of Tanzanian legal and financial services, and that they transact business using a bank account at a Tanzanian bank (Woodroffe et al. 2017).

The policy requires that mining firms submit an annual local content plan as well as an annual performance report (Woodroffe et al. 2017). This new policy sets up a Local Content Committee (LCC) to oversee and implement the regulations. Among other powers, the LCC may launch investigations into mining firms that it believes may be operating through a ‘front’ (an evasive practice in which a company is presented as a Tanzanian company simply to fulfil local content requirements) or engaging in bid rigging (Woodroffe et al. 2017). Finally, the policy sets up a Common Qualification System, which will be used to verify contractors’ capacities and capabilities, evaluate the application of local content, track and monitor performance and feedback provision, and rank and categorize mining service companies (Woodroffe et al. 2017).

2.3 Oil and natural gas

In many ways, hydrocarbon resources are seen as a second chance to take advantage of Tanzania’s natural resources to benefit the local population. Following the national sentiment that Tanzania did not benefit from the surge in minerals extractive FDI in the 1990s, local content policies surrounding petroleum have been somewhat stricter than those historically attached to the mining industry (Hansen et al. 2015). Given that the natural gas sector is just beginning to develop in the country and it will take many years for production to actually commence, Tanzania has a window of time in which to optimize its extractive industries’ regulations to ensure that local communities get the maximum benefits possible.

2.3.1 Background

Though the term petroleum normally refers to oil, in the Tanzanian context it is used to refer to both the oil and natural gas sectors. Exploration activities for petroleum resources began as much as sixty years ago, but so far no oil reserves have been found in the country (TEITI 2017). As such, the discussion of the oil and natural gas sector is limited to a discussion of natural gas. Natural gas resources were discovered as early as the 1970s, but commercial production did not begin until 2004 (Lange and Kinyondo 2016; Lee and Dupuy 2018). Increased

exploration in the 2000s led to the development of new policies, including the Petroleum Act of 2008 (since replaced) and the Natural Gas Policy of 2012. In 2007 the government opted for production sharing agreements for petroleum resources, which give the government the right to audit investors' accounting records. This decision was likely informed by the experience with the mining sector, in which companies were suspected of over-reporting expenses and under-reporting earnings to reduce taxable income (Lange and Kinyondo 2016).

In 2010, there were major discoveries of offshore natural gas reserves. The found reserves are estimated to total around 57 trillion cubic feet (Lee and Dupuy 2018; NREGI 2016). The International Monetary Fund estimated that this discovery could generate US\$3–6 billion in annual revenues once fields begin production (Kolstad and Kinyondo 2017). Companies are in negotiations with the government for many projects related to these resources, including plans for a liquid natural gas plant (Lange and Kinyondo 2016; Lee and Dupuy 2018). There are expectations that Tanzania will become one of the world's biggest exporters of natural gas in the coming decades (Lange and Kinyondo 2016). Sixty-six per cent of the Tanzanian population supports exporting natural gas, and the discoveries of these new resources could eventually enable Tanzania to become energy independent (Lee and Dupuy 2018). As a result, it is clear that this industry offers huge potential that must be carefully managed. These recent discoveries have spurred the Tanzanian government to develop new local content policies intended to increase job and business opportunities for Tanzanians (Kinyondo and Villanger 2017).

2.3.2 Current local content

In 2014, Tanzania published the Draft One Local Content Policy. This policy suggested requirements for local content in petroleum extractives, stating that at least 10 per cent of goods and services used by MNCs must be sourced locally (Kolstad and Kinyondo 2017). The policy envisions an attempt to develop baseline information on current capacity and capabilities for Tanzanian-owned companies to become suppliers (NREGI 2016). The policy did not address how the government would deal with improving local capacities, and it also lacked detail on specific regulations for midstream activities, such as the transport of extracted petroleum and gas prior to refinement (Kinyondo and Villanger 2017; Lee and Dupuy 2018).

This draft policy informed much of the 2015 Petroleum Act, which is the primary legislation governing the petroleum sector in Tanzania (Kinyondo and Villanger 2017; NREGI 2016). It covers upstream, midstream, and downstream petroleum activities and contains several clauses related to the use of local labour and procurement restrictions (Kinyondo and Villanger 2017; Lee and Dupuy 2018). The act set up new roles for governance of the petroleum industry and establishes a local content in the National Economic Empowerment Council (NEEC) (Lee and Dupuy 2018; Scurfield et al. 2017).

Regarding more specific local content terms, the act includes requirements that licence-holders, contractors, and subcontractors give preference to goods produced or available in Tanzania, and to services provided by Tanzanian citizens or local companies (NRGI 2016). It defines a local firm as one 100 per cent owned by a Tanzanian citizen or a company that is in a joint venture with Tanzanians whose participating share is at least 15 per cent (NRGI 2016). If a firm cannot source locally available goods and services, they must be purchased from a firm in a joint venture with a Tanzanian company, in which the Tanzanian company has at least a 25 per cent share. To enforce these requirements, the act stipulates that MNCs provide a detailed local supplier development programme (Calignano and Vaaland 2018). The act also states that the government can revoke a firm's licence if it consistently fails to comply with approved local content plans (Lange and Kinyondo 2016). The act also includes provisions promoting the training and recruitment of Tanzanian citizens (NRGI 2016).

Most recently, the government passed the 2017 Petroleum (Local Content) Regulations, under the 2015 Petroleum Act (Scurfield et al. 2017). Some of these regulations formalized local content requirements provided for in the 2015 act. For example, it requires preference to be given to Tanzanians in all employment levels, and states that both unskilled and semi-skilled positions may only be given to Tanzanians (Scurfield et al. 2017). It also establishes minimum levels of local employment in more skilled positions. The regulations allow for more flexibility than the 2015 Petroleum Act. For example, it permits other business arrangements to be formed in the case where joint ventures are not possible (Scurfield et al. 2017). Also, the government is allowed to give several exemptions; for example, they may exempt a company from the semi-skilled requirement, or from the joint venture/business arrangement requirement. These regulations also allow for fiscal incentives to be given to encourage gas companies to develop local capacity and supplier training programmes.

Finally, the most recent acts passed in 2017 have some important implications for the oil and gas sector. The Miscellaneous Amendments Act requires petroleum agreements to ensure equitable distribution of benefits, and to favour national interest, participation, transparency, and accountability (Woodroffe et al. 2017). The Permanent Sovereignty Act reinforces this, making it illegal for any agreement to not fully secure the interests of the Tanzanian people and requiring that they further Tanzania's permanent sovereignty over natural wealth and resources (Woodroffe et al. 2017).

3. Management of local content policies in Tanzania

According to Ovadia (2017), there are at least nine government agencies and groups with direct authority over petroleum and mining. The primary

regulator is the Ministry of Energy and Minerals (MEM). In the mining sector, the mining commissioner has primary regulatory authority. In the gas and oil sector, the commissioner of the MEM has had less authority since the 2015 Petroleum Act, which established and transferred regulatory authority to Petroleum Upstream Regulatory Agency (PURA). The state oil company Tanzania Petroleum Development (TPDC), also plays a role in drafting and implementing oil and gas policy. Finally, the Energy and Water Utilities Regulatory (EWURA) conducts regulation of midstream and downstream oil and gas activities (Ovadia 2017).

There are numerous ministries and agencies within the Tanzanian government that hold responsibility for local content policies and extractive industries. How authority is spread among these agencies has not always been clear (Ovadia 2017). It is crucial that this responsibility is clarified, as the government can fulfil several important roles in promoting local content. It can increase local firm participation by ensuring that all stakeholders are aware of the local content mandates and that MNCs have information about the quality and skills of local suppliers, and by providing local firms with information about the needs of MNCs (Calignano and Vaaland 2018; Hansen et al. 2015). One effort towards this goal has been the establishment of a Common Qualification System in the 2017 Petroleum Local Content Regulations, which is a database containing details of local suppliers approved by the government (Woodroffe et al. 2017).

Further efforts by the government should work to ensure that both MNCs and local firms are aware of one another's capabilities and demands and are able to take advantage of all possible collaborations. Sutton (2014) specifically recommends the establishment of a local content unit (LCU) to achieve these goals. Such a unit would oversee and regulate local content policies and help to develop linkages between MNCs and local firms. The LCU, as proposed by Sutton (2014), is an administrative body with two primary roles: negotiating with MNCs and developing local capabilities through enterprise development programmes. It is important to understand what MNCs are looking for in their suppliers, and to understand how prepared domestic firms are to meet those needs. Training programmes can then be implemented to increase local capacity, based on the specific capacities identified.

Following this advice, in 2015 Tanzania created the Local Content Department in the NEEC, within the Planning Unit of the Office of the Prime Minister, and instructed this department to take the lead on local content issues. The Local Content Department is mandated to coordinate the government's local content policy and work with the different agencies and ministries that hold authority over local content. However, its overall impact as of yet is unclear as the unit is largely in the planning phase (Sen and Logan 2016). Future research is needed to understand the effectiveness of this unit and to determine whether it is truly assisting in the creation of local content.

4. Evaluating Tanzania's local content policies

4.1 Qualitative research

There is a significant body of work focused on the design and effectiveness of local content policies in both the mining and oil and natural gas sectors in Tanzania. However, most of these studies make use of qualitative research methods or present quantitative summaries of the state of local content (ACET 2017; Lange and Kinyondo 2016; Ovadia 2014). This represents a significant gap in the literature on extractive industries and local content, and future efforts should be taken to conduct more rigorous empirical analysis of the relationship between local content policies and local content creation.

Furthermore, all analysis of the actual effectiveness of local content policies in Tanzania is limited to the mining sector, as natural gas operations have not yet commenced. One example of the sort of qualitative and descriptive analysis present in the mining sector is a study by Lange and Kinyondo (2016), who make use of interviews and statistics from the TMAA to argue that local content in the mining sector has failed to increase the share of domestic employment in foreign firms or to increase local procurement of goods and services relative to foreign procurement.

In addition to understanding the direct value of local content, it is useful to understand whether indirect benefits of extractive industries have been created through linkages with non-resource sectors. A study by Hansen (2013) found that horizontal linkages with the mining sector are rare, and that when they exist, vertical linkages are weak. By reviewing the existing literature on these linkages, Hansen finds that the vertical linkages with local firms that do exist tend to be in transport, cleaning, catering, and security. However, in some cases even this procurement is not truly local, as the supplier firms are simply importing and reselling goods with little value-added, or in other cases are not actually Tanzanian-owned.

However, there are some examples of successful local provision of services. For example, up to 2007, all mining firms used foreign catering services. However, in recent years a Tanzanian catering firm, AKO catering, has managed to become the primary supplier of catering services to large-scale mines (Lange and Kinyondo 2016). AKO was able to gain a significant market share by providing high-quality services at a much lower price than those charged by foreign firms (Lange and Kinyondo 2016). This is an example of local content being created without the need for a legal mandate, and suggests that MNCs will be interested in engaging with local firms if the local service is competitive.

A major weakness to the analysis in this chapter and other studies is the use of data from several years ago, which limits any understanding of how more recent policies may have taken effect or of how effects may have changed over time.

Furthermore, the data are not rich enough for a more rigorous econometric analysis of the performance of local content in Tanzania, which would allow for the identification of any causal relationship between policy and outcome. In future research, it would be especially beneficial to develop an understanding of how specific components of local content policy impact its effectiveness. Finally, there is no existing analysis of the broader spillover benefits of local content within the Tanzania economy. As a result, there is still a lot that we do not know about the effectiveness of local content legislation in Tanzania.

4.2 Testing for the impact of local content policy using the ASIP

A simple way to test for the impact of local content policy in Tanzania is to look at local content metrics before and after the implementation of policy. Though local content policies have been enacted in the oil and natural gas sectors, these sectors are largely non-operational today. Therefore, this section attempts to identify any change in the value of local content in the mining sector before and after the enactment of the 2010 Mining Act, using data from the ASIP for the years 2008 through 2012. All tables and figures discussed in this section can be found in the online working paper version of Ellis and McMillan (2018). The survey is a complete census of all industrial firms operating in Tanzania that have ten or more employees. In 2008 there were just twelve such mining firms; in 2012 there were eighteen. This section attempts to understand whether the act affected local content in any of the following ways: increased employment of Tanzanians; increased employment of Tanzanians in higher-skilled positions; and increased spending on worker training.

Ellis and McMillan (2018: Figure 1) show the average firm employment of both Tanzanian and foreign employees, separated by firm ownership type. The mean number of foreign employees in all firms has remained relatively stable from 2008 to 2012. Pre-2010, the mean employment of Tanzanians in foreign-owned firms was relatively stable; however, following 2010 the mean number has increased consistently. This suggests that following 2010, foreign firms did indeed increase their local content in terms of local employees. This trend is different from the trends in jointly and domestically owned firms, which are both less consistent, and provides some evidence for a unique response among foreign mining firms from the year 2010, which could be attributed to the act.

Ellis and McMillan (2018: Figure 2) also show the percentage of workers in a firm who are skilled Tanzanians, separated by firm ownership type. A skilled position in this case is defined as managerial and professional staff or skilled operatives. From 2008 to 2012, the share of employees who were Tanzanians in skilled positions in foreign-owned firms increased slightly, with the increase

occurring between 2009 and 2011. The share of employees who were Tanzanians in skilled positions in domestically owned firms decreased up until 2010 and then increased consistently, though the net change over the period was a decrease. The trend in jointly owned firms was inconsistent. This once again provides some evidence that local content in foreign firms has followed a trend distinct from jointly and domestically owned firms, and that they may be reacting to the imposition of local content laws.

Finally, Ellis and McMillan (2018: Figure 3) show the mean spending on worker training in mining firms, broken up by firm ownership type. The spending on worker training in domestically owned firms has been stable and low over the period, whereas the spending in jointly owned firms was trending upwards pre-2010 and has decreased since 2010. On the other hand, the trend in spending in foreign-owned firms was varied pre-2010 but has increased consistently since 2010. The level of spending is also significantly higher in foreign-owned firms than jointly or domestically owned firms. Once again, this provides some evidence for a change in local content in mining MNCs following the year 2010.

From these data, it appears that there is some evidence of increased local content in foreign-owned firms following the year 2010. The trends of local content in these firms are distinct from the trends in jointly and domestically owned firms, which suggests that it is not simply attributable to market conditions. It would be valuable to examine changes in procurement of local goods and services over this same period to see if that type of local content followed a similar trend; however, these data are missing for mining firms in the ASIP. A further limitation of this analysis is that these data only allow for examination of the 2010 Mining Act. More recent acts have had much more explicit requirements for local content, and it is possible that they have had a greater effect. Therefore, getting recent data on mining firms and also collecting current data from natural gas firms will be crucial in enabling analysis of the impact of more recent local content provisions.

5. Quantifying the value of local content using the 2013 Industrial Census

Given the extensive focus on local content in Tanzania, it is useful to try to estimate the actual value of this local content. This section attempts to do so for the mining sector, using the most recent data available from the 2013 CIP in Tanzania. All tables discussed in this section can be found in the online working paper version of Ellis and McMillan (2018). The CIP data are post-implementation of the first local content legislation in Tanzania (2010 Mining Act), but pre-implementation of the more recent amendments to the legislation. As such, they may capture effects of the 2010 legislation but will not tell us anything about the more recent legislative changes. Regardless, the estimates give an idea of the potential direct

value of local content. It measures the potential contribution of local content in terms of employment generation and training, and then in terms of the value of goods and services sourced locally. The decision to focus exclusively on mining comes from the fact that natural gas is not yet operational and oil resources have not yet been discovered, so we do not have relevant data for the petroleum sector.

The census includes 390 mining firms, 378 (97 per cent) of which are domestically owned (see Ellis and McMillan 2018: Table 1). The number of firms jumps dramatically from 2012 because the 2013 data include firms with less than ten employees. There are only ten foreign-owned mining firms in the census, and two jointly owned firms. Ellis and McMillan (2018: Table 2) show that these foreign and jointly owned firms are much larger than the domestically owned firms. For example, while almost 50 per cent of domestic mining firms have fewer than ten employees, there are no such foreign or jointly owned firms. This suggests that while there are very few foreign and jointly owned mining firms, they may still play a major role in mining sector employment. Indeed, the census data report that foreign-owned firms employ 8,785 individuals in total, and jointly owned firms employ 1,187. Meanwhile, domestically owned firms employ 8,706 workers. This tells us that non-domestic mining firms account for just over half of all employment in the sector, and that local content policies requiring the employment of Tanzanians therefore have the potential to create a significant amount of employment.

Though these foreign and jointly owned firms play a large role in mining sector employment, this is only relevant to local content if they are employing Tanzanians. Ellis and McMillan (2018: Table 3) show the breakdown of employment in mining firms by worker type, including citizenship and whether they are skilled. In this case, a skilled worker is defined as someone either in a managerial position or a skilled technical position. On average, only 0.34 per cent of workers in mining firms are foreign; however, this jumps to 9.27 per cent for foreign-owned firms. The share is much lower (1.14 per cent) in jointly owned firms, which could indicate that joint-ownership models result in hiring more Tanzanians.

Ellis and McMillan (2018: Table 3) also shows that the share of foreign workers employed in mining firms is the same as the share of foreign and skilled workers—this indicates that mining firms do not hire any foreigners for unskilled positions. Local content suggests that firms should hire Tanzanians for all positions for which they are qualified, which likely tend to be unskilled positions. Therefore, the fact that all firms are not choosing to hire foreign workers for unskilled positions is a hopeful sign for their adherence to local content. Ellis and McMillan (2018: Table 3) also shows us that foreign-owned firms employ significantly more skilled Tanzanians than domestically owned firms. This indicates that foreign-owned firms require a much greater share of skilled employees than domestically owned firms, and it also suggests that there are Tanzanians with the capacity to fill

these skilled roles. This is a positive sign, and is in contrast to the argument that locals do not have the skills needed by MNCs.

Lastly, Ellis and McMillan (2018: Table 4) show the average and total spending of mining firms on employee training. These training expenditures are only reported by firms with ten or more employees; therefore, these numbers do not fully represent the mining sector. It tells us that foreign-owned firms spend US\$916,283 on training on average. Meanwhile, domestically owned firms spend just US\$2,214 on average. This suggests that foreign-owned firms are spending a considerable amount of money on worker training, in line with the stipulations of local content policies.

This evidence suggests that there is significant potential of MNCs to generate employment for Tanzanians. Not only do foreign and jointly owned mining firms employ more workers overall than domestically owned firms, they clearly employ a significant number of Tanzanians, do not limit them to unskilled positions, and offer more training opportunities than domestic firms. However, it is important to look at the contribution of these mining firms in the greater Tanzanian context. Overall, the mining sector only employs 18,678 individuals. In a country with a population of 50 million, this employment contribution is minimal. This draws attention to the broader question of the scope of local content's potential, and might indicate that efforts to create linkages between the mining sector and other sectors with more employment potential would have greater benefits for the country.

The other side of the local content issue is the value of locally sourced inputs. Ellis and McMillan (2018: Table 5) shows the mean spending on raw materials and services, in 2013 US dollars. Once again, Ellis and McMillan (2018: Table 5) report these values for firms with ten or more employees, as only these firms report a breakdown of expenditures on imported versus locally purchased raw materials. The data show that foreign and jointly owned firms spend significantly more on imported raw materials than locally sourced raw materials. This may suggest that the raw materials needed are not available locally, or that local content policies are not being followed. Regardless, it is clear that the money spent by MNCs on raw materials is primarily leaving the country. Ellis and McMillan (2018: Table 5) also show that average spending on services is much greater than average spending on raw materials. While it is possible that some of these services are sourced internationally, this may suggest that there is more potential for benefits to local firms through the provision of services, rather than direct inputs.

This analysis leads to a few points. First, regular collection of this sort of data will be critical to evaluating the progress of local content policies. It would be helpful to have annual surveys of mining firms to collect information on employment, training, and local procurement of goods and services. Once operations commence in the gas sector, this data collection should be done there as well. This will be especially helpful in understanding how recent policy changes to local

content have impacted the sectors. Furthermore, it would be helpful to add a separate module to the ASIP to collect information about both direct and indirect linkages between foreign and domestic firms. Finally, it would be useful to include a module to collect information about vertical linkages between firms. This would allow us to see how the impacts of local content may extend to firms providing goods and services for extractive firms, as well as to downstream industries.

6. Lessons for Tanzania from country experiences with local content legislation

Because we do not have a deep understanding of the effectiveness of local content in Tanzania's mining sector, and the natural gas sector is too young for there to be any measurable benefits, it is useful to look at the experiences of similar countries. It is especially useful to look at the experience of other countries with local content in natural gas, as Tanzania still has time to carefully construct an optimal local content strategy. Finally, the analysis of other countries' experience offers some insights into possible mechanisms through which local content's effectiveness in Tanzania could be analysed.

6.1 Quantitative analyses

As is the case in Tanzania, most research into local content policies does not offer a rigorous empirical analysis of local content's success (ACET 2017; Tordo et al. 2013). Due to the lack of empirical analysis, it is difficult to attribute local content creation to actual policies. However, there are two studies, both in Nigeria, that attempt to empirically test the benefits of local content policies. It is helpful to look at Nigeria's experience, because its industry is centred around oil and natural gas, and can provide important insights for Tanzania's upcoming natural gas activities.

The first was done by Adewuyi and Oyejide (2012), who used a logit regression to study the factors determining backward linkages in Nigeria's oil and gas industry. They conducted a survey of fifteen foreign- and locally owned oil-producing firms and 115 oil and gas industry suppliers. The supplying firms were limited to those in the two oil cities of Port Harcourt and Warri, which were chosen due to their status as centres of oil prospecting, exploration, production, and refining. A random sampling method was then used to choose the supplying firms. They then administered questionnaires to the top executives at each firm, with twelve oil companies and eighty-six suppliers responding. They then regress different measures of backward linkages—such as the value spent on locally sourced inputs, the extent of information sharing, and labour training—on a number of

explanatory variables that include a dummy variable for whether the company has used the provisions of the local content policy. The research finds significant evidence for the existence of local content in Nigeria, with many firms surveyed reporting linkages between foreign and local firms. Furthermore, the logit analysis shows that local content policies are consistently positively correlated with increases in many types of linkages, including the share of inputs sourced locally, negotiations of payments and delivery with oil firms, and labour training from oil firms. Therefore, the authors argue that this provides evidence that local content policies did indeed create linkages in the oil and gas value chain in Nigeria.

A more recent study, also in Nigeria, was conducted by Adedeji et al. (2016). First, these authors make use of surveys conducted by other researchers and extract information to construct observed variables that represent latent variables such as local content policy. For example, they make use of the survey administered by Adewuyi and Oyejide (2012) to construct variables measuring local content policy and backward linkages. They then survey 209 local oil and gas firms in the Niger Delta, requesting the firms to indicate the implications of seven local content policy and five infrastructure items. The surveys also asked about the impact of these items on the firms' activities in the industry, about cooperation with local subcontractors and suppliers, and about local labour demand. The researchers then used structural equation modelling to examine the relationships between these variables. They find that local content policy is significantly positively related to promoting local participation of local firms and in creating backward linkages in the oil industry. They also find that local content policy has an indirect effect on demand for local labour, through its effects on participation and linkages.

These studies present empirical evidence that local content policies for oil and natural gas do have a significant impact on creating employment, firm participation, and sectoral linkages in the Nigerian economy. They highlight the importance of having detailed survey data on local content to conduct similar empirical studies in Tanzania. As discussed in section 5, including modules in existing surveys or conducting new surveys with firms in the mining and oil and natural gas sectors to collect information on employment, local procurement, and firm linkages will be instrumental in allowing for empirical analysis of not only the general effects of local content policy but also the effects of different types of local content policy and of local content management.

6.2 Qualitative evidence

In addition to empirical analysis, there is a significant body of work analysing the effectiveness of local content policies through qualitative and descriptive research methods. Examining how different aspects of local content policy may be

effective, or not, is useful in determining the best design of these policies. For example, other countries' experiences can tell us something about how employment requirements perform compared to procurement requirements, or what aspects of local content policy design are more effective in creating linkages with the broader economy.

A comparative study of local content policies in the mineral and oil and gas sectors in eight African countries provides several important insights for developing effective local content policies (ACET 2017). Looking at Burkina Faso, Ethiopia, Ghana, Namibia, Nigeria, Mozambique, South Africa, and Zambia, this study finds that a lack of available data significantly hinders the ability to quantitatively assess the effectiveness of local content (ACET 2017). The research does not distinguish between local content policies that are more effective for minerals versus oil and natural gas; however, it does highlight the fact that any local content policies should be carefully tailored to the specific country context (ACET 2017).

Using the data that are available, the study finds that these countries have been most successful in promoting local employment and skills development (ACET 2017). Furthermore, these gains have been greater in low- and medium-skill positions, which is relevant in the Tanzanian context, as much of the workforce is low skilled (ACET 2017). However, as the use of technology in extractives increases, the potential of direct employment effects declines (ACET 2017). As a result, the impact of employment requirements in local content may be lessened in the future. This becomes even more true for fledgling industries, where local workers are even less likely to have the necessary skills. This suggests that more focus of Tanzania's natural gas local content policy should be on developing linkages that can create indirect employment opportunities through sectors providing goods and services as inputs as well as in sectors with sideways linkages (such as finance). The other conclusion of this finding is that in the future, as extractives become more automated, any hope of creating direct employment will require that local content policies include strategies for skills development, through both MNC and publicly provided training programmes. These policies should be developed through coordination with the private sector to ensure they take into account both the current and future skill needs of extractive firms.

The evidence on the success of provisions for local procurement of goods and services is less clear. Country data suggest that spending on procurement represents the largest portion of MNC expenditures, indicating that there is significant potential for local content creation (ACET 2017). Furthermore, engaging local businesses in this way can extend benefits to non-resource sectors of the economy, create jobs, and promote technology transfers. Ghana, South Africa, and Nigeria have all seen increases in local procurement since the implementation of local content policies (ACET 2017). However, in other countries, such as Zambia, Namibia, Ethiopia, and Burkina Faso, there is minimal evidence of increases in local procurement (ACET 2017). The study also finds that there is a need for

increased value addition by local suppliers, and that government supplier development programmes can be instrumental in helping local suppliers to become competitive (ACET 2017). For example, Tullow Oil Ghana partnered with the government to establish an Enterprise Development Center and the Jubilee Technical Training Center, which worked to build the capacity of local businesses and to develop human capital in technical and vocational skills (ACET 2017). The establishment of these centres was a direct response to the 2013 enactment of local content policies in Ghana and is an excellent example of public–private coordination that helps to get locals engaged in the extractives value chain (ACET 2017).

There are still other ways through which local content policies attempt to create benefits for the wider economy. One important route is through requirements to use local financial services. As most extractive industries are capital intensive, financing is an important part of these projects. Requirements for the use of financial services in local content policies are somewhat rare, but they were recently implemented in Tanzania. Another way through which local content can assist with local capacity is by requiring certain processes to be completed locally. For example, one of the major issues with extractives is that often the raw product is exported internationally, and the benefits of all the subsequent activities in the value chain are missed by the local economy. Laws that require or incentivize the local completion of those processes could be instrumental in generating a wider range of benefits from the extractives industry. A similar law was passed in Botswana in 2005 for diamonds, which has been critical in capturing downstream revenues as well as developing new, high-skill services (Koitsiwe and Adachi 2017).

6.3 Summarizing the evidence

The information presented in sections 4 and 5 shows that there is local content in the Tanzanian mining sector and that the trend in local content in foreign firms changed post-2010. It is not clear from this information that the creation of this local content was caused by the implementation of local content policies, but the empirical evidence from Nigeria suggests that it is a possibility. Future research is needed to understand the causal relationship between local content policies and local content creation, and once the natural gas sector becomes operational, it will be important to conduct empirical research on that sector as well. Regardless, the preceding information offers several insights into the effectiveness of different types of local content policies, and implications for their management.

Evidence from other countries' experiences suggests that local content policies have been most successful in promoting employment generation and skills development. This is supported by the data in Tanzania, as Ellis and McMillan (2018: Tables 3–4) show that foreign mining firms employ a significant percentage of

Tanzanian workers and spend much more on training than do domestic firms. If Tanzania wants to further promote direct employment generation and skills development in extractives, it will be useful to have some evaluation of the specific skills that are lacking. For example, there has been no significant, quantitative study of Tanzanians' existing or potential capacity to engage in the natural gas sector (Scurfield et al. 2017). For individual skill development, it would be beneficial to establishment partnerships between local training institutions and leading international universities, through which new courses can be developed and degree programmes can be strengthened (Sutton 2014).

Though there is evidence that local content policies focusing on employment and skills can be effective, it is not clear how sustainable or broad these outcomes are. For example, though foreign firms spend a significant amount on worker training, it is not clear what skills are developed by this training. Furthermore, given that extractive industries are not labour intensive and are becoming increasingly automated, it is not clear that direct employment generation will continue to be a viable aspect of local content policy in the future (ACET 2017). As a result, it is important to look beyond direct employment opportunities and to focus on developing linkages between extractive MNCs and local firms in a way that will allow for indirect employment generation.

The evidence from other countries' experiences and the data on the Tanzanian manufacturing sector shows less clear progress on procurement of local goods and services. Though local content legislation consistently mandates local procurement, this is often hindered by the unavailability of quality goods and services. The ACET report demonstrates that many countries have failed to see any increase in local procurement since imposing local content requirements, and Ellis and McMillan (2018: Table 5) show that foreign firms purchase very few local inputs. There is more evidence for the purchase of local services, but the majority of spending is still on foreign services. As a result, local content policies could be made more effective if actions were taken to improve the capacity of local firms to act as suppliers.

7. Conclusion

In recent years there has been a renewed focus on local content in Tanzania. Though this has largely been driven by developments in the natural gas sector, it has led to policy changes for the mining, natural gas, and oil sectors. The recent changes to local content legislation have been clear attempts to reclaim domestic control of natural resources and ensure that their benefits accrue to the Tanzanian population. However, there are still many issues that must be addressed to ensure that local content strategies are most effective. There is limited empirical analysis of the effectiveness of local content policies, which is a major gap in the literature.

Evidence from other countries' experiences and the data from Tanzania mining firms suggest that different aspects of local content policies have varying effectiveness. Some success has been identified in employment generation and worker training, but the level of employment in extractives is generally low and it is not clear that this type of local content will be viable in the future. The progress on increasing local procurement is not evident, and more effective government management of the connection between MNCs and local firms is needed. These insights indicate that it is especially important to focus on creating linkages that will lead to benefits for sectors beyond extractives. However, there is minimal evidence of the creation of linkages between extractive industries and other sectors.

Given that the natural gas sector is still in its infancy, it is the ideal time to work to develop both local capacity and linkages to other sectors. This will ensure that the benefits of Tanzania's natural resource endowments are creating sustainable development for Tanzania's industry.

References

- ACET (2017). 'Comparative Study on Local Content in Mineral, Oil and Gas Sectors: Policies, Legal and Institutional Frameworks—Trends and Responses in Selected African Countries: Synthesis Report 2017'. Report. Accra: African Center for Economic Transformation.
- Adedeji, A., S. Fahmi, A. Rahman, and S. Law (2016). 'The Role of Local Content Policy in Local Value Creation in Nigeria's Oil Industry: A Structural Equation Modeling (SEM) Approach'. *Resources Policy*, 49: 61–73.
- Adewuyi, A., and T. A. Oyejide (2012). 'Determinants of Backward Linkages of Oil and Gas Industry in the Nigerian Economy'. *Resources Policy*, 37(4): 452–60.
- Altenburg, T. (2011). 'Industrial Policy in Developing Countries: Overview and Lessons from Seven Country Cases'. Discussion Paper 4/2011. Bonn: DIE.
- Calignano, G., and T. I. Vaaland (2018). 'Local Content in Tanzania: Are Local Suppliers Motivated to Improve?' *The Extractive Industries and Society*, 5(1): 104–13.
- Chang, H. (2002). *Kicking away the Ladder: Development Strategy in Historical Perspective*. London: Anthem Press.
- Hansen, M. W. (2013). 'Reaping the Reward of Foreign Direct Investments: Linkages between Extractive MNCs and Local Firms in Tanzania'. DIIS Working Paper 2013:22. Copenhagen: Danish Institute for International Studies.
- Hansen, M. W., L. Buur, A. M. Kjær, and O. Therkildsen (2015). 'The Economics and Politics of Local Content in African Extractives: Lessons from Tanzania, Uganda and Mozambique'. *Forum for Development Studies*, 43(3): 1–28.
- Kasanda, P., and A. Liu (2018). 'Local Content Regulations Following Amendments to the Tanzanian Mining Act, 2010'. Briefing Note. London: Clyde & Co.

- Kinyondo, A., and E. Villanger (2017). 'Local Content Requirements in the Petroleum Sector in Tanzania: A Thorny Road from Inception to Implementation?' *The Extractive Industries and Society*, 4(2): 371–84.
- Koitsiwe, K., and T. Adachi (2017). 'Linkages between Mining and Non-Mining Sectors in Botswana.' *Mineral Economics*, 30(2): 95–105.
- Kolstad, I., and A. Kinyondo (2017). 'Alternatives to Local Content Requirements in Resource-Rich Countries.' *Oxford Development Studies*, 45(4): 409–23.
- Lange, S., and A. Kinyondo (2016). 'Resource Nationalism and Local Content in Tanzania: Experiences from Mining and Consequences for the Petroleum Sector.' *The Extractive Industries and Society*, 3(4): 1095–104.
- Lee, B., and K. Dupuy (2018). 'Understanding the Lie of the Land: An Institutional Analysis of Petro-Governance in Tanzania.' *Journal of Energy & Natural Resources Law*, 36(1): 85–101.
- Makene, M., J. Emel, and J. Murphy (2012). 'Calling for Justice in the Goldfields of Tanzania.' *Resources*, 1(1): 3–22.
- NRGI (2016). 'Tanzania's 2015 Extractive Sector Legislation: Recommendations for Effective Implementation.' Briefing. New York: National Resources Governance Institute.
- Ovadia, J. S. (2014). 'Local Content and Natural Resource Governance: The Cases of Angola and Nigeria.' *The Extractive Industries and Society*, 1(2): 137–46.
- Ovadia, J. S. (2017). 'Local Content in Tanzania's Gas and Minerals Sectors: Who Regulates?' Briefing. Bergen: Chr. Michelsen Institute.
- Scurfield, T., N. Woodroffe, and S. Olan'g (2017). 'Localizing Tanzania's Gas Sector: Determining Optimal Policies for an Emerging Producer.' Briefing. New York: National Resources Governance Institute.
- Sen, R., and S. Logan (2016). 'Maximising the Impact of FDI on Domestic Industrial Capabilities and Job Creation.' Policy note. Oxford: International Growth Centre.
- Sutton, J. (2014). 'Gains from the Natural Gas: Local Content and Tanzania's Industrial Development.' Seventh Gilman Ruthinda Memorial Lecture. Dar es Salaam: Bank of Tanzania.
- TEITI (2017). *Tanzania Extractive Industries Transparency Initiative Final Report 2015–16*. Dar es Salaam: Tanzanian Extractive Industries Transparency Initiative.
- TMAA (2015). 'Annual Report 2014'. Report. Dar es Salaam: Tanzania Minerals Audit Agency, Ministry of Energy and Minerals.
- Tordo, S., M. Warner, O. E. Manzano, and Y. Anouti (2013). *Local Content in the Oil and Gas Sector: World Bank Study*. Washington, DC: World Bank.
- Van der Ploeg, F. (2011). 'Natural Resources: Curse or Blessing?' *Journal of Economic Literature*, 49(2): 366–420.
- Woodroffe, N., M. Genasci, and T. Scurfield (2017). 'Tanzania's New Natural Resources Legislation: What Will Change?' Briefing. New York: National Resources Governance Institute.

Uganda's Oil

How Much, When, and How Will It Be Governed?

Sebastian Wolf and Vishal Aditya Potluri

1. Introduction

In 2006, discoveries of commercially viable oil reserves in Uganda raised hopes of a timely boost to economic growth in the country. Twelve years later, despite pressing development needs, Uganda has not yet moved to the production stage and is yet to derive significant revenues from the resource. There are good reasons to tread slowly. Economists routinely warn of the pitfalls of windfall revenue from natural resources, and negative experiences of young petrostates provide cautionary examples. In this chapter we attempt to provide a primer on the Ugandan journey to becoming a petroleum producer and study the path the country is taking to navigate the potential perils of the 'resource curse'.

We complement previous work with a renewed modelling effort to gauge the size and timing of revenue flows. Our estimates are based on updated cost estimates, leaked details of production sharing agreements, and the state of development of the infrastructure required for production. We assume that the first oil will flow in 2023 at the earliest, and estimate that revenues will average about US\$2,115 million over thirty-three years in constant 2018 US\$ terms. The expected revenue will not allow Ugandans to stop working and live off the oil; we estimate that it will average US\$38 per capita per year over the same thirty-three-year span, compared with a GDP per capita of US\$797 in 2018.

The Ugandan government's stated intent is to use oil revenues to boost growth and structural transformation through investment in infrastructure at a controlled pace. To this end the Government of Uganda (GoU) has introduced a new policy and institutional framework that will govern the management of oil revenues. Adapted from the Norwegian model, the established framework mandates that revenues first enter a Petroleum Fund, and then be used either to invest in a sovereign wealth fund, or to finance a maximum fiscal deficit of 3 per cent of non-oil GDP. The sovereign wealth fund is meant to park revenues abroad in times when domestic investment absorption is at capacity and/or signs of Dutch disease emerge. We identify a number of potential shortcomings of the framework put in

place. We point to gaps in the management of volatility, lack of isolation from the political cycle, lack of clarity regarding the distribution of revenues to local governments, and a persistent lack of transparency. Weaknesses in public investment planning and management raise further doubts as to whether the planned investments will realize the expected transformational impact.

Our analysis draws on a growing body of work on Uganda's oil boom that discusses options to manage the revenue inflows, and that evaluates whether certain best-practice oil governance models should be adopted in Uganda (African Development Bank 2015; Bategeka and Mawejje 2013; Collier 2011; Henstridge and Page 2012; Polus and Tycholiz 2017; Shepherd 2013; World Bank 2015). Other work that we build on focuses on the politics behind oil governance in Uganda, and argues that power relations in the country, rather than technical considerations, are the most important predictor of the eventual developmental outcomes from the oil revenues. We also look at the relatively long process of commercializing oil. This has been a subject of debate in the literature we refer to, as to whether this delay represents deliberate government choice or is an early manifestation of inadequate capacity and elite capture (Patey 2015; Polus and Tycholiz 2016).

Our chapter complements two further chapters of this book which study the role of the construction sector (Colonelli and Ntungire, chapter 15) and local content policy (Sen, chapter 16) in Uganda to understand how the oil boom to come can play a role in the structural transformation of the Ugandan economy.

In section 2, we lay out the timeline of oil exploration in Uganda, and then move on to describe the expectations and assumptions regarding the size of the boom to come. We then provide our projections. In section 3, we discuss the institutional framework that has been put in place to manage oil revenues, and comment on its advantages and disadvantages. Section 4 concludes.

2. Timing and sequencing of the oil boom

2.1 Uganda's oil timeline thus far

2.1.1 Exploration during colonial times

Oil in Uganda has a history that goes back to the late nineteenth century, when local communities discovered oil seepages in the Albertine region. Such finds were documented by Emin Pasha in 1877 and by British colonial administrator and explorer F. Lugard in 1890, the latter being quick to declare ownership of them.

In the twentieth century, exploration was erratic and hindered by geopolitical events. In 1925, the British colonial administration conducted a geological survey to map possible oil deposits. This survey provided the first official confirmation

of the presence of hydrocarbons in the Albertine Graben and generated international interest in commercializing oil reserves in Uganda (Kiiza et al. 2011). In 1938, a Johannesburg-based investment company drilled exploration wells and made discoveries. More exploration wells were drilled, but these initial attempts were soon halted by the Second World War, disrupting the oil market. Some exploration activity resumed in 1952, but this was again halted after a change in colonial policy that clustered East Africa into an agriculture zone. Up to independence, no reserves of commercial viability were discovered.

2.1.2 Exploration after independence

The political turmoil and insecurity that followed Ugandan independence put a brake on exploration activity until the early 1980s, when President Obote resumed power. The new government restarted exploration and was assisted by the World Bank to fund aeromagnetic surveys over the Albertine region. It also advanced the legislative and administrative framework by passing The Petroleum (Exploration and Production) Act in 1985 and establishing a dedicated Petroleum Unit in the Geological Survey and Mines Department. This Act, along with the Petroleum (Exploration and Production) (Conduct of Exploration Operations) Regulations of 1993, regulated upstream activities in the oil sector. Political instability in the mid 1980s, however, delayed progress. Soon after the National Resistance Movement (NRM) took power in 1986, President Museveni suspended negotiations with oil companies. With the aim of endowing Ugandan professionals with stronger bargaining power so that they might negotiate favourable contract terms, staff were sent for training to Norway, the United States, and India (Rwakakamba and Lukwago 2013).

A few years later, the government signed the first production sharing agreements (PSAs). The first three were signed with Petrofina, a Belgian oil company, in 1991, and with Uganda Works and General Engineering Company, in 1995. These were, however, cancelled after the alleged failure of the oil companies to deliver on the agreed terms. The next agreement was signed in 1997 with Heritage Oil and Gas for the exploration rights of Exploration Area (EA) 3A in the Semliki basin.¹ Under this contract, Heritage conducted the first seismic surveys, which considerably increased confidence that significant oil deposits were present in the area.

The 2000s were marked by more substantial exploration activity and the emergence of Irish company Tullow Oil as a dominant player in the Ugandan oil sector. On the back of increases in the oil price and a decade of stability in the country, investments in the region increased significantly and more companies showed an interest in drilling exploration wells. The government signed a number

¹ EA3A covered the southernmost part of Lake Albert and its shores, an area stretching from Kanywataba to Buhuka (see Wolf and Potluri (2018) for a map).

of PSAs, and three companies—Tullow Oil, Hardman Resources, and Heritage Oil—fielded discoveries. As a result, the commercial threshold of reserves for oil extraction was reached in 2006 for EA2², in 2007 for EA3A, and in 2009 for EA1³. Through several acquisitions, Tullow Oil managed to consolidate rights for all Exploration Areas with significant discoveries (EA1, EA2, and EA3A), and attracted oil giants Total and CNOOC into a joint venture at equal shares in 2011.

2.1.3 Slowdown of exploration activity and development of current legal framework

The five-year period after 2011 was characterized by a substantial slowdown of activity in the sector. Four factors contributed to the deceleration. First, the government saw a need to develop a more robust policy and legal framework before moving into the production stage. To this effect, the Ministry of Energy and Mineral Development (MEMD) approved a National Oil and Gas Policy in 2008, and in 2011 parliament imposed a moratorium on the signature of new contracts until the requisite legal framework was put in place. Second, the government did not want to proceed to the production stage without agreement on a large refinery. The president pronounced that he did not want oil to be sold without adding value in-country. He wanted a refinery large enough to refine all of Uganda's oil, saturate the domestic fuel market, and export surplus fuel to the regional market. Oil companies, on the other hand, had concerns regarding the commercial viability of a large refinery and feared ending up in a monopsony. Third, several tax disputes arose, leading to litigation between the government and the oil companies. Last but not least, a downward trend in the oil price beginning in 2014 lowered the oil companies' incentive to push ahead with investments.

With regard to the first of these factors, parliament passed the Petroleum (Exploration, Development and Production) Act and the Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act in 2013. These Acts established the Petroleum Authority of Uganda (PAU) as the regulatory body and designated the Uganda National Oil Company (UNOC) to manage the government's commercial interest in the sector. Formulated with Norwegian support, the two Acts formed the legal basis for the development of upstream and midstream capacity. In the same year, the Ministry of Finance approved an Oil and Gas Revenue Management Policy. This provided an important signal that the government intended to put in place a prudent governance framework to manage the expected revenue. Consequently, in 2015, the government passed the Public Finance Management Act. This was a landmark legislation that included

² EA2 covered most of Lake Albert and its shores, excluding the southern and northern ends.

³ EA1 covered the northern end of Lake Albert, and the confluence area of the Nile called the Pakwach Basin.

provisions on the management of oil resources and gave birth to the Charter for Fiscal Responsibility, the Petroleum Revenue Fund, and the Petroleum Revenue Investment Reserve. The development of the legal policy and regulatory framework saw extensive support by development partners, most prominently the Norwegian government.⁴

The second and third factors which were slowing down exploration and operational progress were overcome through concessions gained from both the government and international oil companies. In 2013, the government accepted the oil companies' compromise on the refinery and agreed to a smaller facility to serve only the domestic fuel market, and to a pipeline to export crude oil (see sections 2.1.5 and 2.1.6 below). Regarding the tax disputes, the government stood its ground and Tullow Oil eventually agreed to pay the taxes demanded in order to avoid risking the non-renewal of its exploration licences. External factors also improved when in 2016 the international oil price began to recover.

2.1.4 Development of infrastructure required for production

Construction of the required infrastructure for production has been slow. The only major oil-related projects completed thus far are the Hoima–Kaiso–Tonya road (finished in 2014, this was an entirely GoU-funded project and forms an important network to connect oil wells) and an oil waste treatment plant in Nyamasoga (finished in 2015). Virtually no progress has been made in the three crucial large infrastructure projects, namely the crude oil refinery, the oil pipeline, and the Hoima airport.

2.1.5 Critical infrastructure project 1: oil refinery

From the time of its proposal, the crude oil refinery has been a contentious project. President Museveni initially insisted on refining all crude oil in-country to increase local value addition and end dependency on fuel imports. The president's views were bolstered by Foster Wheeler's feasibility study conducted in 2010–11, which claimed that a 150,000 bbl/day refinery would generate US\$1 billion in profits annually through import substitution and export earnings. These figures were disputed by the oil companies, which expected local demand to be insufficient to render the refinery profitable. The oil companies cited a similar situation in Kenya, where the refinery in Mombasa shut down due to lower efficiency than the large competitors in the Middle East and India, and other failed refinery projects across Africa (Patey 2015). After lengthy negotiations, the government changed its view and agreed to a smaller refinery of 30,000 bbl/day (scalable to 60,000 bbl/day) to serve the domestic market. The Russian company

⁴ The Norwegian government pledged in its third phase of support US\$6.5 million for the period 2015–18. The first and second phases ran from 2006–9 and from 2009–14 at budgets of US\$2.58 million and US\$18.3 million, respectively.

RT Global Resources was selected as lead investor for the refinery in early 2015. However, the deal fell through due to disagreement on the terms, and this led to another round of bidding. In early 2018 the GoU signed a new deal on the refinery with investors consisting of the Albertine Graben Refinery Consortium (led by US-based General Electric). A final investment decision is yet to be taken, making the completion date an open question.

The refinery is estimated to have a cost of US\$3–4 billion and is to be financed to 40 per cent by the GoU. The government's stake in the project is held by the Uganda Refinery Holding Company (which is a subsidiary of UNOC). The refinery, as well as the planned airport, will be hosted in the Hoima Oil and Gas Industrial Park (New Vision 2018a).⁵ A major bone of contention at the moment is the resettlement of more than 20,000 people in the area that has been earmarked for the refinery, complicated by the lack of formal land ownership titles among Ugandan residents.

2.1.6 Critical infrastructure project 2: oil pipeline

For the oil companies, the construction of a crude oil export pipeline was non-negotiable; it was viewed as the only commercially viable and reliable path to bringing Ugandan oil to the international market. In late 2013, the government accepted the oil companies' demands for a pipeline, but the choice of route quickly became a geostrategic issue. A deal between Uganda and Tanzania for the East African Crude Oil Pipeline (EACOP) was reached in 2016, after an informal agreement with the Kenyan government was voided. The 1,445 km pipeline will be the longest heated pipeline in the world. In addition to the route being more cost effective thanks to numerous concessions by the Tanzanian government, issues of land acquisition, resettlement, and security played a role in swaying the GoU to decide against Kenya. President Museveni was also said to have been wary of the Kenyan route due to Uganda's experience with price surges of fuel transiting through Kenya during the 2008 election period (Patey 2015). The governments of Tanzania and Uganda are planning to finance 70 per cent of the project through international lenders, and 30 per cent through equity from the joint venture partners. At an expected cost of US\$3.5 billion, it will transport a maximum of 216,000 barrels a day, at an expected price of US\$12.2 per barrel. As of mid-2018, the Tanzanian and Ugandan governments are yet to complete the deal through the signature of a host government agreement that assures the investing parties' contractual rights for the Tanzanian section of the pipeline. This is a major outstanding issue before a final investment decision can be made. In light of this, it is unlikely that the pipeline will start operation before 2022. Consequently, oil companies will be unable to begin large-scale production until then.

⁵ The Industrial Park is also planned to include petrochemical industries and a free zone for export production.

2.1.7 Critical infrastructure project 3: Hoima airport

The international airport in Hoima, which will be Uganda's second international airport, has been deemed necessary to bring in equipment for production that is too large to enter the country by road. It is planned to be completed by May 2020, i.e. thirty-six months after the start of construction. In 2018, parliament approved borrowing of US\$318 million for the project. The majority of this sum is to be borrowed from UK Export Finance. The construction project has been awarded to the Israeli firm SBC Uganda.

2.2 Forecast of size and timing of revenue stream

In planning for oil revenues, an accurate forecast of the potential size and timing of the revenue stream provides an important input for fiscal policy decisions, and helps determine the choice of institutional framework. Will the revenues be larger or smaller than current tax collections, and how will they stack up against aid inflows? Will there be more revenues than can initially be absorbed in efficient domestic investments? Ever since 2006, when it was proven that oil in Uganda was commercially viable, the government, civil society, and researchers have built estimates and expectations of the size of the prospective oil boom.

Some of these expectations have already been solidified in infrastructure investments, or built into investment plans. The government has run an average budget deficit of 4.3 per cent of GDP over the last ten years, mainly to fund large infrastructure investments. In part, the investments made or planned provide the infrastructure necessary to enable oil production in the Albertine Graben, such as roads connecting the different fields, the export pipeline, the refinery, and an industrial park including the airport to allow importation of heavy equipment. But the scope of public investment extends far beyond the oil-producing regions, with three large hydropower dams on the Nile, airport extensions, new railway lines, and extensions of the road network to bolster trade (see Table 14.1 for an overview of large ongoing or planned public infrastructure projects in Uganda).

Investments funded through debt have seen the stock of public debt increase from 26.1 per cent in FY 2012/13 to 37 per cent or US\$9.4 bn in FY 2016/17. The government plans to further increase its debt stock to 47.8 per cent by FY 2021/22. While these debts have not been collateralized against future oil revenues, the GoU expects future oil revenues to play an important role in managing its accumulated debt in the medium term, and expects the debt stock to begin declining as oil revenues come on stream (Ministry of Finance 2017a).

Yet, forecasts of oil revenue have varied significantly depending on the information available at the time they were produced and the assumptions made. To illustrate this, we compare assumptions made in forecasts by the World Bank (2010),

Table 14.1 Large (>US\$100m) ongoing or planned public infrastructure projects in Uganda

Name of project (ordered by start of construction)	Estimated cost (US\$m), rounded**	External funding*	Start of construction (actual or expected)	End of construction (actual or expected)
Kampala–Entebbe expressway	480	86% Chinese loan	2012	2018
Karuma dam	2,200	85% Chinese loan	2013	2018
Isimba dam	590	82% Chinese loan	2013	2018
Bridge over the Nile	180	83% Japanese loan	2014	2018
Entebbe airport expansion	500	100% Chinese loan	2016	2021
Re-establishment of Uganda Air	400	82.5% commercial loan	2018	2018
Hoima airport	320	100% British loan	2018	2020
Oil pipeline	3,550	30% equity, 70% debt	2019	2022
Refinery	3,500	60% equity, 40% debt	2019	2022
Ayago dam	1,900	unknown	2020	2025
Kampala–Jinja expressway	1,000	60% PPP investment	2020	2025
Standard gauge railway (Malaba–Kampala section)	2,300	unknown	unknown	unknown
Standard gauge railway (remaining network)	Up to 10,500	unknown	unknown	unknown

Notes: *Remainder is expected to be funded by GoU. **Excluding operation and maintenance costs.

Source: Authors' compilation from project documentation, the National Development Plan II, the Public Investment Plan 2017/18–19/20, and newspaper articles.

Bategeka and Matovu (2011) of the Economic Policy and Research Centre, Henstridge and Page (2012), Lassourd and Bauer (2014) of the Revenue Watch Institute, a joint report by the National Planning Authority, AfDB, and World Bank (World Bank 2015), and KAPSARC (2016). All authors point to three major sensitivities:

- international crude oil prices
- the estimated size of recoverable reserves, and
- delays in the execution of projects.

2.2.1 Critical forecast sensitivity 1: oil price

As the price of oil is notoriously volatile and hard to predict, most authors provide several low- and high-price scenarios to illustrate the sensitivity of their revenue models to changes in its price. Among the projections we reviewed, assumptions regarding the oil price at the start of production range from US\$30 to US\$120. By coincidence or not, this is about the same range of fluctuation as the actual oil price over the period these projections were produced. The earlier studies were conducted in a high-price environment and thus were more optimistic over oil price assumptions, often assuming a minimum price above US\$60. Once the price fell to about US\$50 in 2015 and then US\$30 in 2016, more pessimistic assumptions were used. The price of Brent has since risen to above US\$70 again. To provide conservative estimates in the light of the price fluctuations over the last decade, we model a lower-bound price scenario with a constant price of US\$40 (the actual oil price dipped below this level for only ninety-seven days over the period 2008–18), a reference-case scenario starting with the current price of US\$77 and a 2 per cent growth rate, and a higher-bound price scenario starting with the current price of US\$77 and a 5 per cent growth rate.

2.2.2 Critical forecast sensitivity 2: recoverable reserves

Uncertainty regarding recoverable reserves also has a large impact on the accuracy of projections. Between 2011 and 2016 the signature of new contracts for exploration was halted by a parliamentary moratorium, and exploration thus continued at a relatively low pace under existing contracts. Despite this, in 2014, the level of proven reserves was revised upwards from 3.5bn to 6.5bn barrels. This increased the estimated range of recoverable oil reserves, from 200m barrels to between 1.2bn and 1.7bn barrels.⁶ At this stage, 40 per cent of the total area with potential for petroleum reserves had been explored. In late 2017, Australia's Armour Energy and Nigeria's Oranto Petroleum signed new PSAs with the government for exploration in the Kanyawataba EA in Ntoroko district and the Ngassa EA in Hoima district, respectively. They plan to drill over 400 new wells in the next 2–3 years (the last fifteen years saw 121 wells drilled). The probability of additional discoveries is therefore reasonably high, especially given the high drilling success rate of 87 per cent up to 2017. However, the Ngassa EA and further currently unlicensed EAs that make up the majority of unexplored territory are located mostly off the shores of Lake Albert. These fields would need to contain significant reserves to be commercially viable because exploration and production in a body of water is more expensive than on land. It also bears higher environmental risk.

Adding to the uncertainty over reserves is the potential downward revision of already established estimates of recoverable reserves if recovery proves more difficult than expected—which is the reason 'proven recoverable reserves' are

⁶ Source: Petroleum Authority of Uganda (<http://petroleum.go.ug/uploads/resources/FrequentlyAskedQuestion.pdf> [sic]).

quoted in a relatively large range of 1.3–1.7 bn by the MEMD. The recovery factor eventually realized will depend on the development of production cost prices and geological conditions on the cost side, and the oil price on the revenue side.

We base our projections on estimates of 1,054 m barrels recoverable reserves quoted by KAPSARC (2016), who provide a detailed model of upstream development and operational costs for the production fields in EA1, EA2, and EA3A based on information from the MEMD. In addition, we assume recoverable reserves of 400m barrels for the production fields in EA1A,⁷ an area for which no official estimates have been made public. As a result, our lower-bound and reference scenarios assume recoverable reserves of 1,454 m barrels, right in the middle of the 1.2–1.7 bn barrel range quoted by the MEMD. Our higher-bound scenario assumes additional discoveries in the remaining 60 per cent of terrain at 50 per cent of the success rate of exploration thus far, i.e. 2,181m barrels of total recoverable reserves by 2027.

2.2.3 Critical forecast sensitivity 3: delays

The timing of the onset of production would seem to be the easiest factor to predict, given that it is largely under the control of the GoU and the contracted oil companies. Generally, the projections we have reviewed assume that, in line with government plans, production would start within 2–3 years of the publication of the relevant studies. *Ex post*, we know that none of the expectations embodied in previous projections regarding the onset of production have been met thus far, and that the government has continuously pushed back its schedule to reach first oil (Parliament of Uganda 2016). As of 2019 the key infrastructure projects have been ready for final investment decisions for two years, but were delayed over a tax dispute between the Ugandan government and the joint venture partners, and ongoing negotiations between the Ugandan and Tanzanian government regarding the oil pipeline. If final investment decisions are finally made in 2020 and construction begins the same year, oil production could start in 2023 at the earliest.

2.2.4 Revenue projections

We base our revenue projections on the production and cost profiles in an upstream cost model by KAPSARC (2016) and exploration cost accounts from Tullow (2012). Our assumptions on profit sharing are based on leaked production sharing agreements. All our assumptions are detailed in Wolf and Potluri (2018) for a detailed description of assumptions.

In our reference-case scenario of a US\$77 pb oil price in 2018 with a 2 per cent growth rate and a balancing 2 per cent inflation rate we project that oil revenues will peak at US\$4,536 m and average US\$2,116m over thirty-three years in constant 2018 US\$ terms (see Figure 14.1).

⁷ EA1A was created in 2012 after EA1 exploration rights expired. It was made up of the area of EA1 for which no production licence application had been submitted.

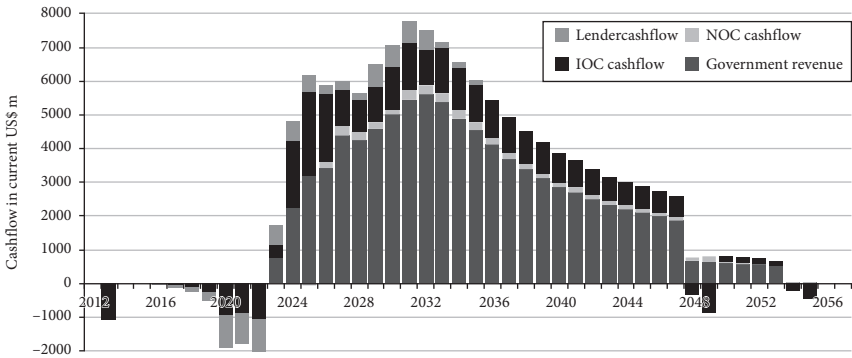


Figure 14.1 Projected cashflows for lender, international oil companies, national oil company, and GoU revenues

Source: Authors' illustration based on authors' model.

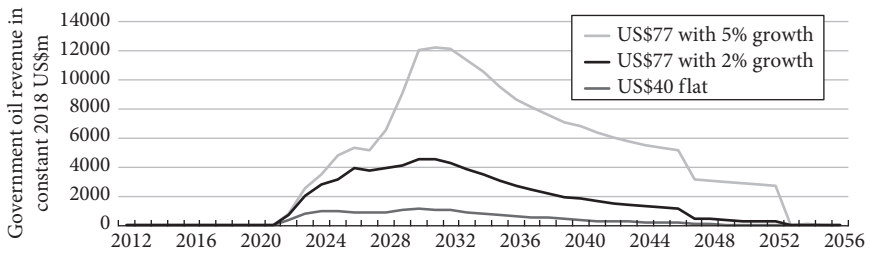


Figure 14.2 Government oil revenue sensitivity to oil price assumptions

Source: Authors' illustration based on authors' model.

In per capita terms, we project revenues of up to US\$83 at peak oil and US\$38 if averaged over thirty-three years. As a percentage of non-oil GDP the oil revenue would be 13 per cent at peak oil and 6 per cent on average, and as a percentage of non-oil tax revenue 73 per cent at peak oil and 32 per cent if averaged over thirty-three years. The non-discounted revenues are composed of 57 per cent of profit oil, 19 per cent of daily production royalty, 15 per cent of income tax, 5 per cent of UNOC participation, 3 per cent of withholding tax, and 3 per cent of cumulative production royalty.

The above projections are very sensitive to the assumed oil price. In the event of a US\$40 flat oil price throughout the production period, but 2 per cent inflation of other prices, the government oil revenue peaks at US\$1,177m in constant 2018 US\$—only 26 per cent of the reference case scenario. In the event of a US\$77 oil price—with a 5 per cent rather than a 2 per cent growth rate, and additional discoveries of 50 per cent of the current total discoveries, assumed to follow EA1A contract terms, production, and cost profiles—government oil revenue would peak at nearly US\$12bn. Figure 14.2 compares the reference case to

these different scenarios, which should be considered lower and upper bounds rather than likely scenarios.

3. Is Uganda ready for oil to flow?

Experiences of failure to derive sustainable development outcomes from natural resource assets are so common that a vast literature exists on the ‘resource curse’. In its introduction, the Natural Resource Governance Charter, an authoritative collection of best-practice measures that provides a benchmarking tool for countries such as Uganda that are in the process of increasing their resource extraction, states: ‘Countries with non-renewable resource wealth face both an opportunity and a challenge. When used well, these resources can create greater prosperity for current and future generations; used poorly, or squandered, they can cause economic instability, social conflict, and lasting environmental damage’ (NRGI 2014: 4). Grounded in this Charter, the Natural Resource Governance Institute (NRGI) also produces an index that aims to assess the quality of natural resource governance. The index published in 2017 classified Uganda’s resource governance as ‘poor’, but improving towards ‘weak’ (NRGI 2017), ranking the country fifty-first out of the eighty-nine countries assessed. In this section we aim to provide an overview of the governance framework put in place thus far and complement previous assessments in identifying areas of weakness and room for further improvement.

We first lay out the expectations the government has built for the sector, then provide an overview of the governance framework established to achieve the goals. We uncover ambiguities regarding the definition of the fiscal anchor and the use of the sovereign wealth fund and briefly discuss the vulnerability of the fiscal anchor to price and political shocks. Given the relatively small revenues there is only a low risk of Dutch disease effects, which should easily be contained if a fiscal rule is adhered to. We contrast the fiscal rule the government has chosen with other options, and end the discussion of the governance framework with the crucial issue of public investment management, which is arguably one of the biggest weaknesses in the current governance framework.

3.1 Expectations for the oil sector

‘Vision 2040’, which was adopted in 2007, is the primary policy document that establishes the government’s objectives for the coming decades. The headline policy goal of this document is to attain upper-middle-income status for Uganda by 2032. The objectives are delineated into workable strategy plans via six five-year National Development Plans (NDPs), which guide the medium-term public

expenditure priorities (The Republic of Uganda 2007). The NDP-I (2010–15) was published in 2010 and aimed for Uganda to attain middle-income status by 2017 (The Republic of Uganda 2010). The NDP-II (2015–20) was published in 2015 and revised the target year for attainment of middle-income status to 2020 (Republic of Uganda 2015a). Recent GDP growth has, however, been slower than anticipated, averaging 4.47 per cent over 2012–16 compared with 7.7 per cent for 2007–11.⁸ This makes it highly unlikely that Uganda will achieve middle-income status by 2020. Regardless of whether their goals are realistic or not, the first two NDPs provide valuable insights into the direction of the strategic medium- and long-term policy.

The NDPs identified infrastructure development and employment generation as the key outcomes expected from development of the oil and gas sector. Within this, the oil pipeline and refinery were prioritized as the large-scale investment projects to drive growth. Additionally, Hoima city is to be developed as a strategic city for supporting further development of oil infrastructure. The delays are evident: Vision 2040 sequenced the oil refinery for completion under NDP-I and the oil pipeline under NDP-II (with initial investments as early as the third year of NDP-I), but as of 2018, neither project has reached the final investment decision stage.

During their construction and future operational stages, these projects are expected to create a multiplier effect generating further investments in secondary industries such as petrochemicals, plastics, and fertilizers, as well as tertiary industries such as manufacturing, transportation, construction, and communication (New Vision 2018b). As negotiations and contractual agreements for infrastructure projects are still being finalized, there is reason to believe that the local economy is not in a position to maximize gains from the anticipated investment inflow. Although government policy has placed significant importance on local content development, progress to develop labour skills and infrastructure has been slow.⁹

3.2 The current governance framework and its shortcomings

The delays in Uganda's progress towards oil production have given time to put in place a governance framework for the management of oil revenue. The governance framework for oil revenue is currently defined through:

⁸ Source: World Development Indicators, World Bank Data (<https://data.worldbank.org/country/uganda>).

⁹ This has been reiterated over numerous reports (Report of the Auditor General (2015), and National Strategy for Private Sector Development (2017/18–2021/22) (Ministry of Finance 2017d)). With regard to the labour force, Uganda is part of the East African Community's Common Market Protocol, which establishes free movement of labour amongst EAC member nations. While this can alleviate the shortage of skilled labour in the country, Ugandan workers need to develop skills at a fast rate to take advantage of the opportunities in the oil and gas sector.

- the Public Financial Management Act (2015)
- the Charter of Fiscal Responsibility (2015), to be updated after every general election
- the Petroleum Revenue Management Policy (2012).

The Petroleum Fund is set up and defined in the Public Financial Management (PFM) Act (The Republic of Uganda 2015b). Withdrawals from this fund are to be made either to support the annual budget (via transfers into the consolidated fund) or to invest into the Petroleum Revenue Investment Reserve (PRIR) (which is designed to be a sovereign wealth fund invested abroad). The expected annual withdrawals from the Fund are required to be outlined in the Medium-Term Budget Framework (MTBF).¹⁰ The Petroleum Fund has so far received revenue only from taxation. The government withdrew money (Sh.125.3 billion) for the first time for the 2017/18 annual budget.

3.2.1 Ambiguity regarding the fiscal anchor and sovereign wealth fund

As per the Petroleum Revenue Management Policy, the government is adopting the non-oil, non-grant deficit as a fiscal anchor, eventually to be combined with an overall expenditure growth limit. This anchor is to be operationalized through the Charter of Fiscal Responsibility, which determines the deficit limit. Section 3.1 (iii) of the Charter states that the fiscal balance, when calculated without petroleum revenues, should be ‘maintained at a sustainable level over the medium term’. However, clarification is required on whether the sustainable fiscal balance limit is the same as mandated by the East African Monetary Union protocols (at 3 per cent of GDP), which must be adhered to by FY 2020/21 according to the Charter (Ministry of Finance 2016a). The exact definition of the fiscal anchor for the use of oil revenues has been postponed and the Charter is supposed to be updated to ‘establish specific operational objectives for petroleum revenue management once there is certainty of the flow of petroleum revenues’.

The working of the PRIR, which will be held by the Bank of Uganda at the Federal Reserve Bank of New York, is also ambiguous at the moment. Appropriations to the PRIR are required to be based on the recommendations of an Investment Advisory Committee¹¹ to the minister of finance. However, these recommendations are not binding, and it is unclear to what extent they must be followed. Ambiguity also surrounds the use of the funds saved in the PRIR, as the

¹⁰ At this stage, the MTBF projects Sh.125.28 billion for oil infrastructure development for 2017/18. The MTBF 2018/19–2022/23 does not indicate any fiscal expenses from the oil fund (Ministry of Finance 2017c).

¹¹ The Investment Advisory Committee is to comprise four non-public officials (including the chairperson) and three government representatives (one each from the Ministry of Finance, Ministry of Energy and Mineral Development, and National Planning Authority). The committee has not yet been established.

PFM Act does not regulate withdrawals. It is unclear whether the government can only tap into the expected permanent income derived from the reserve, or whether withdrawals of the principal are also allowed. By end of December 2017, the Petroleum Fund held Sh.422 billion (equivalent to US\$114.21 million),¹² with the PRIR having a zero balance.

3.2.2 Vulnerability to price and political shocks

Another issue that is not addressed in the PFM Act is how the government plans to shield itself from the volatility of oil revenues in the event that it uses them to finance its deficit. While the fiscal anchor is a good tool to shield the economy from large year-on-year changes in government spending, it only works well if revenues are consistently above the levels required to finance the non-oil non-grant deficit targeted by the fiscal anchor. In our lower-bound scenario, oil revenues would not be enough to fund a 3 per cent budget deficit except around the peak oil years. Therefore, especially in a situation of already high debt burdens, it would be advisable to maintain a medium-term credit line either through paying off debt to leave more room for short-term financing or by keeping a balance in the Petroleum Fund to help smooth revenue volatility, avoid disruptions to public spending and investments, and prevent premature withdrawals from the PRIR.

A further issue of contention with the definition of the fiscal rule (embedded in the Charter of Fiscal Responsibility) is that it must be approved by every new parliament. This affords the government flexibility to react to unforeseen circumstances. However, the downside is that it ties the fiscal rule to the political business cycle and leaves fiscal sustainability at the mercy of the powers that be, which can lead to irresponsible spending.

3.2.3 Narrow focus on development spending

The use of petroleum revenue is restricted through the PFM Act. Section 58 of the Act states that money from the Petroleum Fund can be used either for the national budget or for investing in the PRIR; and Section 59 (3) of the PFM Act further states: 'For avoidance of doubt, petroleum revenue shall be used for the financing of infrastructure and development projects of government and not the recurrent expenditure of government'. Although it appears to be a well-worded maxim, it is debatable what does and does not constitute infrastructure and development projects—for example, does expenditure on security, which is a component of the NDP, count as infrastructure building? Furthermore, since the consolidated fund does not earmark its sources for specific allocations and money is fungible, this restriction appears void. Another concern is that the current definition in the PFM Act omits mention of the necessity to plan for operational and maintenance

¹² At US\$1 = Sh.3695.

expenditure at the time development projects are financed, and in fact prohibits paying for these from petroleum revenue. Insufficient provision of operational and maintenance funds is already a cause for fast depreciation and low return from public investments (World Bank 2016). Another issue is that 6 per cent of revenues from royalties are to be appropriated as transfers to local governments for development purposes, but it is unclear whether this is to be done as they are collected, or whether the transfers can be shifted to other fiscal years.

3.2.4 Mitigating the risk of Dutch disease

Dutch disease has hampered growth in numerous resource-rich African countries (its insidious effects on Nigeria's economy and particularly on its agriculture sector during the 1970s form the archetype of natural resources precluding developmental gains). Studies attempting to estimate Uganda's exposure to Dutch disease suggest that its negative effects are likely to be modest given the expected size of the boom (Lassourd and Bauer 2014). One way to mitigate any potential impact of the above scenario is to spend at a sustainable level defined by the fiscal rules discussed above. Uganda's fiscal planning in the past has demonstrated commitment to adopt sound and predictable planning methods. For instance, the Ministry of Finance was one of the early adopters of the Medium-Term Expenditure Framework (MTEF). The government should take a similarly progressive stance on commitment mechanisms for the Petroleum Fund, and possibly enshrine a fiscal rule in the PFM Act. Another mechanism to shield the economy from Dutch disease is to sterilize the effect of changes in exchange rates through investment abroad, as planned with the PRIR. Withholding oil revenue from the domestic economy can preclude and tame the effects of exchange rate appreciation. As the government's investment absorption capacity is in doubt, this method can halt large cash inflows and the subsequent currency appreciation.

3.2.5 How much to spend: the choice of fiscal rule

Wolf and Potluri (2018) illustrate the effect different fiscal rule choices would have on the government spending path and conclude that the option chosen by government (assuming the non-oil deficit is set at the EAC deficit norm of 3 per cent) is a relatively conservative spending scenario, particularly in the earlier years, and especially when compared with hand-to-mouth spending. Hand-to-mouth spending not only leaves the government at the mercy of oil price volatility, but also front-loads investment, with serious operations and maintenance implications as well as adverse macroeconomic effects (Adam et al. 2014). The different rules considered yield results similar enough to conclude that any rule would be better than no rule.

This section has so far focused on the management of oil revenues, and certain restrictions on it. However, equally important is the governance of expenditures that will be financed from the oil revenues. As Uganda gets closer to oil extraction,

the lack of a fiscal strategy to delineate a long-term development expenditure plan raises concerns. Governance measures defined in the PFM Act will only be put to the test after significant revenue from oil exports begins to flow into the Petroleum Fund. Up to now, only relatively small amounts of money have been collected in the Petroleum Fund through taxes, signature bonuses, or tax settlements with oil companies, so the government's commitment to prudent management of these resources has not yet been tested.

3.2.6 Poor quality of public investment management

The government plans to convert oil reserves into assets through public investments. Its public investment programme has already expanded significantly (guided by the NDPs that have placed infrastructure, energy, and transport as priority sectors) over the last five years. As more development projects get funded through the national budget rather than by donors and development partners, the government's oversight and competency in managing these investments becomes more decisive.¹³ However, relatively poor Public Investment Management Assessment (PIMA) scores raise doubts regarding current government capacity to significantly expand its public investment portfolio without further reducing its already low rate of return. The Ministry of Finance (2017b) estimates that Uganda currently loses over 60 per cent of resources invested in public projects due to inefficient management.

Recent diagnostic studies by the Ministry of Finance, World Bank, and IMF have identified numerous issues in the existing project management system that require reassessment and reform. *Ex ante* analysis carried out during project inception and appraisal stages has been weak and limited. Preparation for projects often starts after they are included in the budget, thereby precluding the possibility of any appraisal or feasibility study to guide investment decision-making (IMF 2018; Ministry of Finance 2016b; World Bank 2016). An internal diagnostic study by the Ministry of Finance suggests that the Development Committee (which is the approval body for projects at the Ministry of Finance) is 'not comprehensive and faces challenges to standing up to political directives on including projects' (Ministry of Finance 2016b). Furthermore, project evaluations rarely consider the external costs of investments such as environmental degradation or pollution, which can have negative affects on sectors such as tourism and agriculture. This may thus inflate the profitability of some investments at the expense of growth in other sectors.

Under-execution of projects has also been a challenge. In 2017/18, forty-seven of sixty-nine projects that were due for completion, as indicated in the Public Investment Plan (PIP), needed extensions. Although the energy sector, which

¹³ The Public Investment Plan for 2017/18 consisted of 440 projects, of which 317 are funded by the GoU.

features the largest investments, has seen an improvement in its absorption rate (from 19 per cent in 2015/16 to 25 per cent in 2016/17), it is still low enough to be a cause for concern (Ministry of Finance 2018). Some of these delays are due to institutional factors. The IMF suggests that the PIP is over-committed in the medium term, which is affecting budget releases. Although the MTEF includes projects mentioned in the PIP, the link between the Public Investment Management System and the MTEF still requires stronger feedback mechanisms to better capture progress and thereafter direct funding into areas with higher absorption. Additionally, for monitoring purposes, improvements in stocktake mechanisms within the Ministry of Finance can allow a more systematic identification of medium-term commitments (IMF 2017). As government-funded and externally funded projects are not coordinated in the same data systems, an 'Integrated Bank of Projects' is being implemented at the Ministry of Finance, which is expected to ameliorate this problem.

At the concluding stages, project plans often do not include an asset management strategy. They also have weak monitoring and evaluation systems to assess the quality of service, which results in an under-provision of maintenance and support during operational stages. A generally poor maintenance culture in the management of assets exacerbates this problem. Though the government over the years has increased budget allocations for operations and maintenance (from 3.4 per cent (2004/5–2008/9) to 8.4 per cent (2012/13–2016/17)), they are still far below the global best-practice mark of 20 per cent of total budget (World Bank 2016). To improve this, there is a need to develop better feasibility studies and a stronger monitoring and project evaluation mechanism.

4. Conclusion

For the first time since its formation in 1998, the Uganda Bureau of Statistics, in its 2016/17 household survey, measured an uptick of poverty. Growth in real per capita terms has stagnated, averaging about 1 per cent over the years 2012–16, and the government has improved its tax take only marginally to just above 13 per cent of GDP. Debt levels have risen quickly. Infrastructure has been prioritized over service delivery in the use of the little fiscal space available, and the quality of service delivery has stalled or worsened. Development partners currently fund large parts of the service delivery system, which the government has increasingly less appetite for. In the light of these developments, windfall revenues from the exploitation of natural resources could provide a welcome fiscal relief to Uganda.

This chapter complements previous work with a renewed modelling effort to estimate the size and timing of revenue flows, taking into account recent information regarding the size of reserves, costs of extraction, and progress with the required infrastructure. We expect that first oil will flow in 2023 at the earliest,

and estimate that revenues will average about US\$2,116m over thirty-three years in constant 2018 US\$ terms. The amount of revenue to expect will not allow Ugandans to stop working and live off the oil; as per our estimate, revenues would average US\$38 per capita per year over the same thirty-three-year span, compared with GDP per capita of US\$797 in 2018.

In an attempt to transform the natural resource assets into productive assets, the government has established a new policy and institutional framework with the goal of boosting growth and structural transformation through investment in infrastructure at a controlled pace. Adapted from the Norwegian model, the established framework mandates that revenues shall first enter the Petroleum Fund, and then be used either to finance a maximum deficit of 3 per cent of non-oil GDP, or to invest in the sovereign wealth fund. The sovereign wealth fund is meant to park revenues abroad in times when domestic investment absorption is at capacity and/or signs of Dutch disease emerge.

Despite pressing needs, the development of the oil sector has proceeded slowly—much more slowly than people outside and within the government expected. Whether intentionally or not, it seems that so far the Ugandan government has done a good job in the sequencing of policy, legislation, and institutional and commercial development. Particularly when compared with other African oil producers, such as Ghana, which raced from discovery to production in only two years, Uganda is taking its time to prepare for the onset of revenues. That being said, we identified a number of shortcomings in the framework put in place that could become problematic if unaddressed. These include lack of clarity in the management of volatility, a lack of isolation of revenue management from the political cycle, uncertainty regarding the distribution of revenues to local governments and a persistent lack of transparency. Weaknesses in public investment management raise further doubts about the transformational impact of the planned investments.

It is important to note that these are not purely technical challenges, and that the political will to improve governance will be the overall deciding factor regarding the benefits that the resource boom will bring for the economy. In economies like Uganda's, the government plays the biggest part in capturing benefits from a natural resource boom owing to the small size of the private sector. Whereas this chapter has focused mainly on the size, timing, and governance of oil revenues, the two other chapters on the oil boom in Uganda that form part of the book (Colonelli and Ntungire, chapter 15; Sen, chapter 16) explore in more detail the role the government can play to use the oil sector as an engine of structural transformation and diversification.

Acknowledgements

We thank UNU-WIDER for its support in the preparation of this study, and we are grateful to Finn Tarp, John Page, Richard Newfarmer, and Anthony Okello for reviews

of earlier drafts, and to participants in the UNU-WIDER workshop on Natural Resources, Structural Change, and Industrial Development in May 2018 for their comments. Any errors of fact and interpretation are our own.

References

Government documents

- Ministry of Finance, Planning and Economic Development (2016a). 'Charter for Fiscal Responsibility FY2016/17–FY2020/21'. Kampala.
- Ministry of Finance, Planning and Economic Development (2016b). 'Public Investment Diagnostic Study'. Kampala.
- Ministry of Finance, Planning and Economic Development (2017a). 'Infrastructure and Public Investment (Presentation for the High-level Growth Forum)'. Kampala.
- Ministry of Finance, Planning and Economic Development (2017b). 'National Budget Framework Paper FY2018/19–FY2022/23'. Kampala.
- Ministry of Finance, Planning and Economic Development (2017c). 'National Strategy for Private Sector Development 2017/18–2021/22'. Kampala.
- Ministry of Finance, Planning and Economic Development (2018). 'Background to the Budget Fiscal Year 2018/19'. Kampala.
- Parliament of Uganda (2016). 'Oil Production to Start in 2020'. Press release. 9 December.
- The Republic of Uganda (2007). 'Vision 2040'. Entebbe.
- The Republic of Uganda (2010). 'First National Development Plan 2010/11–2014/15'. Entebbe.
- The Republic of Uganda (2015a). 'Second National Development Plan (NDPII) 2015/16–2019/20'. Entebbe.
- The Republic of Uganda (2015b). 'The Public Finance Management Act, 2015, 2/ CVIII'. Entebbe.

News reports

- New Vision (2018a). 'Hoima Industrial Park Plan Laid Out'. *Oil and Gas Journal* (Tuesday 16 January): 21–8.
- New Vision (2018b). 'Prepare Now for Oil Opportunities'. *Oil and Gas Journal* (Tuesday 23 January): 19–22; 59–62.

Reference papers

- Adam, C., D. Bevan, and T. Ohlenburg (2014). 'Public Investment and Growth in Uganda'. Working Paper S-43203-UGA-1. International Growth Centre.

- African Development Bank (2015). 'Flagship Report Series, Paper 2: Timing and Magnitude of New Natural Resource Revenues in Africa'.
- Bategeka, L., and J. M. Matovu (2011). 'Oil Wealth and Potential Dutch Disease Effects in Uganda'. Research Series No 81. Kampala: Makerere University Economic Policy Research Centre (EPRC).
- Bategeka, L., and J. Mawejje (2013). 'Accelerating Growth and Maintaining Intergenerational Equity Using Oil Resources in Uganda'. Research Series No 111. Kampala: Makerere University Economic Policy Research Centre (EPRC).
- Collier, P. (2011). 'Managing Uganda's Oil Discovery'. Centre for the Study of African Economies, Department of Economics. Oxford University.
- Henstridge, M., and J. Page (2012). 'Managing a Modest Boom: Oil Revenues in Uganda'. Research Paper 90. Oxford University.
- IMF (2017). 'Enhancing the Performance of Public Investment Management'. Country Report 17/269. Washington, DC: International Monetary Fund.
- IMF (2018). 'Initiating the Stock-taking of the Public Investment Program'. Country Report 18/180. Washington, DC: International Monetary Fund.
- KAPSARC (2016). 'Evaluating Uganda's Oil Sector: Estimation of Upstream Projects'. KS-1659-DP53A. King Abdullah Petroleum Studies and Research Center (KAPSARC).
- Kiiza, J., L. Bategeka, and S. Ssewanyana (2011). 'Righting Resource-Curse Wrongs in Uganda: The Case of Oil Discovery and the Management of Popular Expectations'. Research Series 78. Kampala: Makerere University Economic Policy Research Centre (EPRC).
- Lassourd, T., and A. Bauer (2014). 'Fiscal Rule Options for Petroleum Revenue Management in Uganda'. Policy Paper. Revenue Watch Institute.
- Natural Resource Governance Institute (NRGI) (2014). 'Natural Resource Charter Second Edition'. New York.
- Natural Resource Governance Institute (NRGI) (2017). '2017 Resource Governance Index'. New York.
- Patey, L. (2015). 'Oil in Uganda: Hard Bargaining and Complex Politics in East Africa'. OIES Paper WPM 60. Oxford Institute for Energy Studies, Oxford University.
- Polus, A., and W. Tycholiz (2016). 'Why Is It Taking So Long? Solving the Oil Extraction Equation in Uganda'. *African and Asian Studies*, 15(1): 77–97.
- Polus, A., and W. Tycholiz (2017). 'The Norwegian Model of Oil Extraction and Revenues Management in Uganda'. *African Studies Review*, 60(3): 1–21.
- Rwakakamba, M., and D. Lukwago (2013). 'Farmers in Uganda's Oil Economy: Deal or no Deal?'. Kampala: Agency for Transformation.
- Shepherd, B. (2013). *Oil in Uganda, International Lessons for Success*. London: Chatham House, The Royal Institute of International Affairs.
- Wolf, S., and V. A. Potluri (2018). 'Uganda's Oil: How Much, When, and How Will It Be Governed?' WIDER Working Paper 2018/179. Helsinki: UNU-WIDER.

World Bank (2010). 'Country Assistance Strategy for the Republic of Uganda for the Period FY 2011–2015'. Annex 6. Report 54187-UG. Washington, DC: World Bank.

World Bank (2015). 'Uganda Country Economic Memorandum, Economic Diversification and Growth in the Era of Oil and Volatility'. Report 97146-UG. Washington, DC: World Bank.

World Bank (2016). 'From Smart Budgets to Smart Returns: Unleashing the Power of Public Investment Management'. Uganda Economic Update Seventh Edition. Washington, DC: World Bank.

Construction and Public Procurement in Uganda

Emanuele Colonnelli and Nicole Ntungire

1. Introduction

The construction sector represents the backbone of most developing economies, as it provides the foundation for infrastructure development, and it is therefore thought to act as a multiplier for all other economic sectors that rely on such infrastructure. Uganda is no exception, with conservative estimates from the Uganda Bureau of Statistics (UBOS 2018) suggesting the construction sector directly contributes to approximately 7 per cent of gross domestic product (GDP). The construction sector has been growing rapidly over the past decade, in contrast to the declining trend observed in some key traditional sectors such as manufacturing (see Colonnelli and Ntungire 2018). This growth in the construction sector is largely attributed to an accelerated rate of execution of public investment in energy and infrastructure. The upward trend in public investment is consistent with the country's strategy, as outlined in the National Vision 2040 and the second National Development Plan, to focus on building its capital stock, as a way to address Uganda's infrastructure deficits and to build production facilities to prepare for exploitation of the country's oil resource.

With respect to the growth of the natural resource sector, the importance of the construction sector is self-evident, more so with the recent discovery of an estimated 3.5 billion barrel oil reservoir in Uganda's western and north-western Albertine Graben which has attracted considerable investor attention and signals strong potential for Uganda's previously nascent extractive industry to transform livelihoods and raise the productivity of its largely agrarian-based economy. Estimates from the Petroleum Authority of Uganda (2018) put the value of total investments that will be made over the next three to five years, as Uganda transitions to an oil-producing country, at over US\$20 billion. Expectedly, a key portion of these planned investments will involve the construction sector, including the construction of an oil refinery (US\$4.5 billion), the construction of a 1,445-km East African crude oil export pipeline to the port of Tonga in Tanzania (US\$3.55 billion), the construction of a new international airport in Kabaale,

Hoima District, and the construction of regional road networks (US\$1 billion). Despite the promising prospects, the construction sector faces several bottlenecks, and the risks of failing to successfully convert investment opportunities into new job creation and national productivity growth are high. These new opportunities and challenges raise several questions: how much of the increased economic activity will be passed to the domestic private sector? Will these opportunities motivate efficiency—and transparency—enhancing regulatory changes? Will the influx of foreign capital increase or limit competition in the sector? Would corruption and inefficiency in public procurement still play a major role as a barrier to industry development?

These questions are especially important in light of the many challenges that have limited sectoral growth among construction firms and other stakeholders in their supply chains. These challenges range from difficulties in accessing finance to the endemic corruption and limited competition in public procurement, from the challenges of local firm capacity development to the information asymmetries about market prices and subcontractors' quality, and the list goes on. We aim to shed light on these issues in various ways, acknowledging that these challenges are difficult to tackle from a policy perspective, but that several incremental steps could be taken, and that Uganda is on an upward and promising trend.

We approach this study starting from the assumption that data are key to enlighten the policy debate. Unfortunately, the construction sector is notoriously opaque, and data on construction projects for most sub-Saharan countries tend to be limited only to a subset of the very largest ones from international donors. Nevertheless, we are able to provide novel quantitative evidence from a unique database on the universe of public procurement contracts, which allows us to study the market structure and several issues that are specific to the construction sector. The emphasis in this chapter is therefore on the interaction between construction firms and government spending. We further complement the analysis with an original survey of more than 600 construction firms, and with a number of focus groups and structured interviews conducted with several public- and private-sector organizations and officials.¹

The chapter is organized as follows. First, we provide an overview of the construction sector, and we illustrate its market structure using the micro-data on procurement contracts and firm-level surveys. Second, we discuss the basics of the regulatory framework, with a focus on public procurement and the primary stakeholders. Third, we argue about the importance of specific challenges to the growth of the sector and their relationships with policy. We then conclude.

¹ Unless otherwise specified, all statistics in this chapter refer to authors' calculations based on the original administrative from the Procurement and Disposal of Public Assets Authority and survey data collected.

2. Overview and market structure of the construction sector

The UBOS defines the construction sector as covering activities that include ‘construction of buildings, civil engineering and specialized construction activities’, with examples of the latter being ‘plumbing, heat and air conditioning installations, plastering and glazing, activities related to clearing of building sites, demolition of wreckage of buildings and repair of buildings’ (UBOS 2010–11).

According to data from the latest Census of Business Establishments, collected in 2010–11 by UBOS, there are 458,106 businesses in the country, of which only 653 (0.14 per cent) are in construction (see UBOS 2010–11). However, this number may vastly underestimate the importance of construction. First, when looking at the employment share, construction accounts for 1.3 per cent of all employment. Second, construction tends to be characterized by firms that mostly operate in specific but constantly changing construction sites, rather than their headquarters, which makes them less likely to be identified and to respond to census-like surveys. A better estimate is the contribution of the construction sector to national GDP, which saw the sector account for between 7 per cent (Colonnelli and Ntungire 2018) and 13 per cent of GDP according to UBOS (2018), where the latter considers a broader definition of the construction supply chain. Furthermore, government contracts involving construction account for 57 per cent of the total value of public procurement, or a staggering total of 8,451 billion Ugandan shilling (UGX), during the period 2010–15.

Lack of micro-data on both the demand and the supply side of the construction sector makes it difficult to provide a comprehensive picture of this market, especially from a time-series perspective.² Additionally, both demand and supply sides of the construction sector are extremely complex, with several key stakeholders involved.

Fortunately, Uganda’s primary public procurement regulatory agency, namely the Public Procurement and Disposal of Public Assets Authority (PPDA), collects rich administrative data on all government contracts. The data are directly obtained from all central and local government agencies through a compulsory mix of paper document submissions and the completion of online data systems, which are regularly checked for accuracy by PPDA officials.³ We partner with PPDA to fully digitize and harmonize these datasets, which gives us the possibility to analyse, to the best of our knowledge, the most comprehensive dataset to date on public procurement for an African country. In sub-section 2.1 we focus

² The last two full Censuses of Business Establishments took place in 2001–2 and 2010–11, with a partial update of the dataset in 2006–7.

³ Until 2015, the online system was named Procurement Performance Measurement System. Starting in 2015, the system was vastly changed and streamlined, and is currently named Government Procurement Portal.

on such new data to provide a deeper overview of the demand side for construction sector services.

Additionally, in 2016, we conducted an original survey of 664 construction sector firms, by means of face-to-face ninety-minute surveys of local owners and managers. These firms were identified as a stratified sample of firms that have ever done business with government agencies in 2014–15.⁴ The surveys include sections on basic business and owner/manager details, management practices, employment composition, supply chain linkages, expectations, and the importance of various challenges to doing business in the sector. In sub-section 2.2 we focus on these novel surveys to shed more light on the supply side of the construction sector.

Naturally, all datasets have a specific focus, and ours is biased towards the relationships between construction and public procurement. This caveat should be kept in mind, because we cannot go into details of specific sub-sectors that are less dependent on government spending, such as residential construction, where households and other private-sector firms play the major role as clients. Similarly, we are limited in our analysis of subcontracting among firms, as usually these data are subject to less strict disclosure and reporting requirements. Nevertheless, what is unquestionable is that the government plays a central role in the Uganda construction sector, as the largest projects are fully or partially run by government agencies, with local firms reporting that government contracts regularly account for more than 70 per cent of their total volume of business. Importantly, public procurement plays the leading role in construction sector activities not only in Uganda, but in all other East African countries as well.

2.1 Demand side: the role of government contracts

A total of 221 public bodies, or procurement and disposal entities (PDEs), have engaged in public procurement activity in the period 2010–15.⁵ Of these, 143 PDEs (65 per cent) have contracted at least one construction sector firm, which is the focus of the analysis sample used in the text. A further listing of the top twenty-five PDEs by number of construction contracts, shows see the dominant role played by the Uganda National Roads Authority (UNRA) and the National Water & Sewerage Corporation (NWSC);⁶ however, local governments also clearly play an important role for the dispersion of economic activity across geographical regions.

⁴ For more information on the sampling frame and other survey details, please contact the authors.

⁵ All our analysis in this sub-section refers to the period 2010–15, and all numbers are expressed in 2015 Ugandan shilling, unless we specify otherwise.

⁶ See Colonnelli and Ntungire (2018).

We further disaggregate the importance of these demand-side agents in (Colonnelli and Ntungire 2018), where we report the splits of PDEs into central versus local governments, by region, and by type of government agency.⁷ Not surprisingly, we find that while there are more local (eighty-eight) than central (fifty-five) PDEs, the latter account for 47 per cent of all contracts, and for 94.5 per cent in terms of the total value of contracts. This is informative of the highly skewed distribution of public buyers in the market, which is value-wise dominated by a few large government agencies engaging in extremely high-value contracts with construction firms. In terms of regional dispersion, we see that the majority of PDEs (eighty-four) are located in the central region, which is also the area with the dominant PDEs (such as UNRA), thus accounting for the majority of contracts (57.6 per cent) and almost the entirety of contract value (94.3 per cent). On the other hand, the PDEs in the northern, eastern, and western regions account for 16.4, 17.1, and 8.9 per cent of the contracts, and 2.4, 2.0, and 1.3 per cent of contract values, respectively. Finally, when looking at the classification by PDE type, we find that statutory bodies (such as UNRA, Uganda Revenue Authority, National Agricultural Research Organization, among others) play a crucial role, as they account for 21.5 per cent of the contracts and 76.4 per cent of contract values. Most small and medium contracts are instead contracted to firms by the local districts, which cover 46.3 per cent of all contracts but only 6.2 per cent of the total value.

Moving to the time-series dimension of the data, we can observe the evolution of public procurement activity over time (see Figure 3, Colonnelli and Ntungire 2018). We observe that while the number of active PDEs playing the role of buyers of construction firms' services has been increasing since 2010, reaching a peak of 121 PDEs engaging in at least one public procurement contract in 2015, the total number and value of contracts show a more nuanced pattern. This is true both when looking at the total number of contracts and total contract values.

To conclude the depiction of the demand side for public procurement, we report various summary statistics on construction contracts (see Colonnelli and Ntungire 2018). First of all, most construction contracts are labelled as 'macro' (a total of 11,791, or 83.6 per cent); that is, contracts that broadly require higher levels of documentation, stricter regulatory requirements, and minimum contract sizes. In comparison, only 28.2 per cent of non-construction contracts are classified as 'macro' across the other sectors, a clear indication of the importance of government contracts for firms in the construction industry. The largest construction procurement contract in the data is a contract of UGX315 billion, while the median macro contract is of UGX300 million; we also observe a high level of dispersion in contract value, indicative of the dominant role played by large

⁷ See Colonnelli and Ntungire (2018).

outliers for aggregate economic dynamics. In terms of sources of financing for construction contracts, we find that the vast majority of contracts (10,118 out of 14,110, or 72 per cent) are funded by the central government, while a smaller set is funded by the specific PDE (1,805), and only 560 contracts have been funded by international donors. However, the donor-funded contracts are the largest, with a median of UGX61 million and a mean of UGX2.1 billion, compared with a mean of UGX32.7 million and a median of UGX0.7 billion for central-government-funded contracts, and UGX18.5 million and UGX0.2 billion for self-funded contracts. We finally observe the distribution of contracts by allocation method: only 32.1 per cent of contracts are based on fully competitive procurement allocation methods (such as open domestic or international bidding), while 23.5 per cent require a request for quotations, 6.5 per cent follow a direct procurement method, and 37.9 per cent are allocated through various 'restricted' methods, with a number of them requiring pre-selection by the Evaluation Committee from a small set of firms, as discussed later. While the primary determinant of the contract allocation method is the size of a contract, as we can see from the summary statistics, these data also indicate that there is considerable discretion involved in public procurement, an important topic we return to in later sections.

2.2 Supply side: firm-level evidence

A primary challenge in studying the construction sector in developing countries is the paucity of comprehensive data sources on the firms operating in this sector. We conduct a novel survey of 664 firms operating in the construction sector in Uganda, interviewing firm owners with the goal of collecting information on their firm balance sheet, management and personnel structure, experience in doing business with the government, and self-reported challenges in operating their business.

The firms entering the sample are geographically dispersed, with 37 per cent firms located in the central region of the country, 31 per cent located in the eastern region, 22 per cent in the northern region, and 10 per cent in the western region (see Figure 4, Colonnelli and Ntungire 2018). The firms are relatively young, with 65 per cent of them having started operations after 2004 and only 10 per cent of firms founded before 2000.

Almost all firms (94 per cent) are male-owned and all but six owners were born in Uganda. The average age of the firm owner is forty-one years, with about 10 per cent of firms having an owner younger than thirty years. Interestingly, the majority of owners (62 per cent) also own or run an additional business.

Looking at the labour force characteristics of firms we see that the average firm has about ten full-time and fifteen part-time employees, while the median is five employees (for both variables)—a result of the fact that the distribution of these

variables is highly right-skewed, with a right tail of very large firms (see Table 3, Colonnelli and Ntungire 2018). The surveyed firms are highly reliant on the employment of casual employees, with the median firm employing sixteen casual workers over the month before the survey was conducted, with an average of twenty-six workers. On average, firms have about two people as managers. The median firm does not employ any foreign workers, although a small number of firms are heavily reliant on foreign workforce.

We also analyse key balance sheet variables (see Colonnelli and Ntungire 2018: Table 4) and find sizeable variation in profits for the past twelve months as well as in the number of contracts that the firms currently have. The median firm had about US\$2,300 of profits in the last year, while the overall average profit was about US\$13,000. The breakdown of business costs highlight that firms' greatest expenses are on labour costs, costs to buy stock and inputs in production, and the costs of renting or buying equipment.

The typical firm currently has only one contract. Importantly, as is evident from the data (see Colonnelli and Ntungire 2018: Figure 5), there is large variation in the share of business revenue that typically comes from procurement: we see a bimodal distribution, with about 28 per cent of firms that usually have close to zero reliance on government contracts, and about 42 per cent of firms that are completely reliant on procurement as a source of business. Similarly, about 64 per cent of firms in the sample have more than half of the value of their contracts coming from the public sector.

The data⁸ also confirms the importance of the public sector as a major source of business for construction firms in Uganda, with the average firm having less than one private buyer and 2.7 different public-sector bodies, with which they do business. The sector also seems highly concentrated, as the self-reported average number of competitors of a firm is three. Similarly, a firm does not typically obtain inputs and supplies from a large number of suppliers. Interestingly, the data further reveals that on average, a large share of these firms' production is outsourced or subcontracted (close to 20 per cent). This is relevant in the context of procurement, as the government may find it more difficult to monitor execution and quality of work in the presence of complex supply chains.

When it comes to the perceived challenges in doing business, firms believe that a large number of competitors engage in unfair business practices, like avoiding or underreporting taxes, selling below market prices, avoiding labour regulations and health and safety regulations, and engaging in collusion. Importantly, the average firm owner believes that 71 per cent of competitors engage in corrupt or unfair practices to win contracts (see Colonnelli and Ntungire 2018: Table 7). Even among the local firms with which the owners report doing business, 40 per cent on

⁸ See Colonnelli and Ntungire (2018: Table 5).

average are believed to be corrupt, while the share is much lower for international firms. A good reputation is thought to be an important determinant of the likelihood of doing business with a firm for all owners, and 70 per cent of firms state they have some internal control mechanisms to monitor corruption cases inside their firm. Finally, while firm owners seem to be very concerned about corruption cases in their sector, only 40 per cent of them believe that court enforcement works well in Uganda, and the share decreases to 22 per cent when it comes explicitly to corruption cases.

3. Regulatory framework and main stakeholders

In this section, we discuss the regulatory framework of the construction sector and the role of public procurement in Uganda, with a focus on the main stakeholders in both the public and private sector. The information in this section is mostly based on the regulations and guidelines contained in the Public Procurement and Disposal of Public Assets Act 2003 and the subsequent 2014 regulations, as well as on various other guidelines published online by the regulatory agencies discussed in the following sections. We refer the readers to the original text for more details and specific exceptions.

3.1 Public procurement and the central role of PPDA

Part II, Section 5 of the Public Procurement and Disposal of Public Assets Act 2003 (henceforth the 'Act') established an autonomous regulatory body called the Public Procurement and Disposal of Public Assets Authority (henceforth, the 'Authority' or PPDA) (see Public Procurement and Disposal of Public Assets Authority 2003). It can be argued that the Authority represents the key player in the construction sector in Uganda, as public procurement plays such a central role as discussed in section 2. The Authority is also seen as the main anti-corruption and transparency agency in the country. The objectives of the Authority can be summarized as follows:

- set the standards and practices for public procurement and disposal systems
- monitor and ensure compliance to these standards and practices
- advise the government and public entities involved in procurement on procurement and disposal policies
- build procurement and disposal capacity in Uganda (Part II, Section 6 of the Act).

Part II, Section 7 of the Act outlines the functions of the Authority. Besides policy functions (such as, for example, advising government and public entities on best practices and capacity building) and regulatory ones (which include, among others, issuing guidelines and regulations, investigating breaches of the law, and carrying out performance audits of government contracts and public bodies' performance), PPDA also collects data on management functions and the allocation of government contracts. Some of the rich data that PPDA manages were illustrated in section 2; additionally, it oversees the maintenance of databases of providers and of online systems for publishing notices of procurement opportunities and awards.

As for the organizational structure, the Authority is governed by a board of directors appointed by the minister of finance, which consists of between six and eight members, including the executive director of the Authority, who is an *ex officio* member and who does not vote, and the secretary to the Treasury or a person nominated by him or her (Part II, Section 11 of the Act). The board appoints the executive director, who is responsible for the management and operations of the Authority, as well as for the management of its funds and property, and is in charge of the officers and staff of the Authority (Part II, Section 17 of the Act). Finally, officers and staff operate in six different departments: Executive Director and Corporate Office, Procurement Audit and Investigations, Finance and Administration, Internal Audit, Legal and Advisory Services, and Compliance and Training and Capacity Building.

3.2 Doing business with the government

The Public Procurement and Disposal of Public Assets Act of 2003 provides rules governing all public procurement (defined as any procurement that is funded by public funds and by funds generated by a PDE) and public disposal activities (defined as the disposal of government assets). Furthermore, eleven regulations, which were drafted by the Authority in 2014, provide a comprehensive set of rules governing all procurement and disposal activities. In this sub-section, we illustrate the main components of these regulations.

3.2.1 Choice of procurement method

The first step in the process for the award of a procurement contract is the selection of the procurement method. Smaller contracts qualify for micro procurement, which is subject to specific (simplified) regulations. Specifically, for the case of construction projects, this method can only be used for contracts with a value lower than UGX10 million. The micro procurement requires no written disclosure or bid; the only requirement is that the PDE evaluates a minimum of three quotations from different providers.

Additionally, as briefly seen in section 2, there are various other procurement methods, each subject to different regulations:

- open bidding (domestic and international)
- restrictive bidding (domestic and international)
- request for quotations and proposals
- direct procurement.

The choice of which method to use depends on guidelines set forth in PPDA Regulation 6 and, for each contract, PDEs must detail the reasons that justify the use of a specific method. In the following paragraphs, we describe the details of each method. Importantly, while simplified compared with the specific details in the law, it is evident that a considerable degree of discretion is left in the hands of public officials, as will be discussed in more details in section 4.

Open bidding (domestic and international): This is the most transparent and preferred method, since it involves maximum competition. The PDE must publish a bid notice offering the opportunity to participate in the auction to all interested bidders. However, a request can be made to the Contracts Committee (discussed later in this section) to use a pre-qualification screening to obtain a shortlist of potential bidders. This is allowed if the project is highly complex, if the detailed nature of the evaluation implies that evaluating several complex bids would require a significant amount of time, or when the costs of preparing a detailed bid would strongly discourage competition. This method should be used when the contract value for the construction project exceeds UGX500 million. The minimum bidding period is thirty days for international bidding (open also to foreign providers) and twenty days for domestic bidding (open only to providers from Uganda).

Restricted bidding (domestic and international): This method is similar to open bidding, except that there is no publication of a bid notice. Instead, the invitation to bid is restricted to a limited number of potential providers included in a shortlist. Shortlisted firms can come from the Register of Providers (a database maintained by PPDA with information on firms interested in doing business with the government), officials' market knowledge, previous experience of providers, or a previous pre-qualification.

For construction contracts, this method can be used when the value of the contract lies between UGX200 million and UGX500 million. Alternatively, the method can be used if there is a limited number of potential providers, or in cases of emergency when there is insufficient time for an open bidding procedure.

A minimum of three bidders must be invited to bid or, in case the justification for using a restricted bidding method is the limited number of potential providers, all available potential providers. The minimum bidding period is twenty days for international bidding (open also to foreign providers) and twelve for domestic bidding (open only to local providers).

Request for quotations and proposals: This is a simplified method compared with open and restricted bidding, as it requires quicker and simpler procedures and documentation. Similar to restricted bidding, the invitation to bid is restricted to a limited number of shortlisted bidders, which can come from the Register of Providers, officials' market knowledge, or previous experience of providers.

This method can be used when the construction project's value lies between UGX10 million and UGX200 million. Alternatively, the method can be used in cases of emergency when there is insufficient time to use other, more competitive methods. A minimum of three bids must be obtained from potential providers.

Direct procurement: This method can only be used in an emergency situation, when there is insufficient time to use any other procedure, or when the construction project can only be carried out by one single provider or, in some instances specified by the regulations, when an original contract needs to be extended. This method can be used for any contract value, provided that the PDE justifies its use in light of the above conditions.

3.2.2 Evaluation phase

The evaluation criteria must be clearly specified in the solicitation documents, together with a statement of requirements, which clearly defines the quantities and specifications of what is to be purchased. Evaluations must be conducted by a team of at least three staff, who are approved by the Contracts Committee. All evaluations must be based on criteria pre-specified in the solicitation documents. There are three stages of evaluation:

1. *Preliminary examination:* At this stage, unsuitable bidders and incorrect bids are eliminated. Unsuitable bidders are companies that are not registered or that are not compliant with the legal requirements listed in the Public Procurement and Disposal of Public Assets Act. Incorrect bids are mostly those that are not accompanied by a bid security and those where not all submission requirements are correctly followed.
2. *Detailed evaluation:* At this stage, the technical quality of the bids is assessed. Depending on which of the five evaluation methodologies (described in stage 3) is used, this is done either by comparing the documentation provided in the bid with the specifications in the solicitation documents or by awarding merit points to each bid.
3. *Financial comparison:* At this stage, the best evaluated bidder is determined, following one of five evaluation methodologies, which must be specified *ex ante* in the tender or solicitation documents, and which are reviewed by the Contracts Committee to verify they are well suited for each given contract:
 - a) *Quality- and cost-based selection:* This evaluation methodology considers both the technical quality of the bid and its cost. This is done in two steps. First, the technical quality of bids is evaluated, assigning merit

points to each bid and eliminating bids below a certain predetermined score. Then, the remaining bids are awarded points based on cost. The best evaluated bid is the one with the highest weighted technical and cost scores (with weights predetermined in advance).

- b) Quality-based selection: This evaluation methodology considers only the technical quality of the bid, by assigning merit points that determine the best evaluated bidder.
- c) Fixed-budget selection: This evaluation methodology considers the technical quality of the bid, but ensures that the cost of the bid is within a pre-specified budget. For bids within this budget, merit points are awarded to determine the best evaluated bidder.
- d) Least-cost selection: This evaluation methodology considers the cost of the bids, provided that the technical quality of the bids meets the minimum technical standard required. In order to determine which bids meet the standard, merit points are assigned to the technical quality of each bid, and bids below the minimum standard are eliminated. For bids that meet this standard, the best evaluated bidder is the least costly one.
- e) Technical compliance selection: A methodology similar to the least-cost selection one, except that in the first step there is a simpler pass/fail decision to determine whether a bid meets the technical standards, instead of the assignment of merit points.

3.3 Stakeholders in the construction sector

3.3.1 Main stakeholders in public procurement

The process of procuring government contracts involves several agencies, units within agencies, and a number of specific public officials. In this section, we list the main such stakeholders, their functions, and how they are organized.

PDEs: All procurement and disposal activities are carried out by procurement and disposal entities, or PDEs, as also extensively discussed in Section 2. A PDE refers to a ministry or department of the government, a local government, or any other body established by the government or intended to carry out public functions (such as a public university or a public hospital).

Entities must plan their procurements at the beginning of each fiscal year, with the goal of aggregating requirements into larger contracts, gaining economies of scale, and avoiding emergency procurement whenever possible.

Each PDE is composed of an accounting officer, a contracts committee, a procurement and disposal unit (PDU), a user department, and an evaluation committee, which must act independently and not interfere unduly in the operations of others. Next, we discuss these other stakeholders.

Accounting officer: The accounting officer is the person with the overall responsibility for procurement and disposal within the PDE, although s/he is not

involved in detailed procurement or disposal work or in making official contract allocation decisions. S/he appoints members of the contracts committee and staff in the PDU.

Before the procurement process starts, the accounting officer commits funds to specific contracts; s/he undertakes assessments of market prices and the unit costs for each construction project and s/he advertises bid opportunities. Additionally, s/he authorizes payments to providers, signs contracts, communicates decisions to successful bidders, and ensures that contracts are implemented in accordance with the award. In emergency situations, the accounting officer can sign contracts without the approval of the contracts committee. S/he is also in charge of investigating complaints from bidders and of submitting the procurement plans to the secretary of the Treasury and to PPDA at the beginning of each fiscal year. In sum, accounting officers hold a considerable share of power in the procurement process.

Contracts committee: The contracts committee consists of up to five members: a chairperson, a secretary, and a maximum of three other members (including a lawyer). Neither the accounting officer nor a member of the PDU may be members of the contracts committee. Its main responsibility is to ensure that procurement and disposal activities are conducted in compliance with the Act and additional regulations. This is done by approving or rejecting recommendations from the PDU. Specifically, the contracts committee has the power to authorize the choice of procurement and disposal procedures, evaluate the contract documentation through various evaluation reports, and make amendment to awarded contracts. Finally, and importantly, it approves the evaluation committee.

Procurement and disposal unit (PDU): The PDU manages all procurement and disposal activities of the PDE (except adjudication of awards), working in conjunction with the user department and seeking approval of the contracts committee where appropriate.

In particular, the PDU plans the procurement and disposal activities of the PDE, recommends the procedures to follow, prepares statements of requirements, prepares and issues the bid documents and the contract documents, and maintains a list of providers in archive records.

In addition, it recommends the members of the Evaluation Committee.

Its size and structure and the number and grades of staff are determined by the procurement workload of the PDE.

User department: The user department works under the PDU. Its responsibilities include the preparation of the annual procurement plan, providing technical inputs to the procurement process, and managing contracts once placed.

Evaluation committee: Members of the evaluation committee conduct all evaluations. The members are recommended by the PDU and approved by the contracts committee. The committee has a minimum of three members, and must

include at least one person representing the user department and a member of the PDU. Some members may be external, if the required level of skills and seniority are not available within the PDE.

3.3.2 Additional stakeholders

Several other private- and public-sector stakeholders play an important role for the functioning of the construction sector. The following is a list of the main such stakeholders:

- *Uganda National Association of Building and Civil Engineering Contractors (UNABCEC)*: This is a professional association that gathers local civil work firms. It advocates and lobbies for policy change, with a special interest in improving the landscape for domestic construction firms engaging in public procurement contracts. UNABCEC has more than 300 members, who benefit through access to data, newsletters, and other activities such as networking events among firms and public officials.
- *Inspectorate of Government (IGG)*: This is a government agency that plays a fundamental role in the enforcement of regulations and in ensuring transparency in the interaction between the private and the public sector. It works in close collaboration with PPDA, and its role in ensuring efficient public procurement is clearly summarized in its mission to ‘promote good governance, accountability and the rule of law in public office’ (see Inspectorate of Government 2018). Together with PPDA, the IGG is among the primary anti-corruption agents in the country.
- *PPDA Appeals Tribunal*: It reviews PPDA decisions when a public procurement bidder is aggrieved by a decision made by the PPDA, when a bidder alleges that PPDA has a conflict of interest, or when a PDE or any person’s rights are adversely affected by a decision made by the PPDA.
- *Africa Freedom of Information Centre (AFIC)*: This is a non-governmental agency with a primary goal of improving transparency in public procurement, so as to increase value for money in government spending. It plays an important role in anti-corruption monitoring and is at the forefront of the open contracting advocacy, operating across multiple regions in sub-Saharan Africa.
- *Uganda Revenue Authority (URA)*: This is a government agency responsible for tax collection and compliance among both firms and individuals. It plays an important role for construction firms, as the reliance on government contracts for firms in this sector makes them especially relevant targets of tax audits.
- *Uganda National Bureau of Standards (UNBS)*: While not its primary function, it stipulates standards for materials and techniques used in construction, therefore playing a crucial role for construction sector firms.

- *Uganda Bureau of Statistics (UBOS)*: This is the government agency responsible for the Census of Business Establishments, which aims to provide a comprehensive picture of private-sector activity across all Uganda regions and sectors.
- *Architect Registration Board*: It controls the registration and certification of architects.
- *Uganda Institute of Quantity Surveyors*: It regulates the professional practices and registrations of quantity surveyors in Uganda.
- *Uganda Institute of Professional Engineers*: It regulates the certification and practices of professional engineers as well as all matters concerning civil engineering. Set up by the parliament, it has the goal of streamlining qualifications of engineers and practices in the country.
- *Engineers Registration Board*: This is a statutory body with a mission to regulate and control engineers and their profession.

4. Challenges to sector development and efficiency

As for every other emerging economy in the world, there are several frictions to the functioning of private-sector activities in Uganda. The construction sector is an especially challenging one in this regard, as it possesses several backward and forward linkages with other sectors and is strongly interconnected with the rest of the economy. For example, high levels of policy uncertainty and unplanned government expenditure limit growth of the sector, especially given the fact that it faces significant sunk costs and large, often irreversible, firm investment in fixed capital. Similarly, macro-economic fluctuations and currency devaluations can be a drag on construction firms who are typically dependent on bank financing. While these are all first-order important issues, they are also extremely hard to tackle from a policy perspective. Therefore, in this section we focus on specific key issues we think act as barriers to firm and industry development in the Ugandan construction sector, and where incremental policy improvements may be easier to achieve. Furthermore, our emphasis is on local small and medium firms, which are in a weaker bargaining position and hence stand the most to gain from efficiency-enhancing reforms.

4.1 Corruption and inefficiency in public procurement

Corruption is often seen as the leading friction to doing business (Mauro 1995), with costs being highest for government-dependent firms in developing countries. Recent evidence further shows that the negative link between corruption and economic growth is arguably causal (Colonnelli and Prem 2018). The reasons

why sectors like construction are so prone to corruption are several. Obviously, as is evident from our previous discussion, construction is the economic sector most dependent on public procurement. This, coupled with typically sizeable average contracts, gives public officials and politicians many lucrative opportunities to illegally extract rent from the private sector. These concerns are magnified when we consider that the government plays not only the role of client but also that of regulator. Another reason is that, by its very nature, construction costs are difficult to measure, as construction involves complex non-standard processes with high degrees of asymmetric information between buyers and sellers (Kenny 2007). Relatedly, output quality is even harder to observe. For example, the quality of a billion-dollar road may only be accurately assessed years after the contract has been paid out, when potholes and other damages due to sub-par quality construction materials and processes become apparent to the public. Finally, construction also involves an intricate supply chain, multiple inter-sector linkages, and a number of different private-sector agents, which lead to difficulties for regulators to track illegal activity and take proper enforcement actions.

Anecdotal evidence on corruption cases in construction abound. As a large-scale example, a few years ago a special government commission was set up to study the misuse of funds by the UNRA, after several scandals in the construction of roads by international firms were uncovered. The commission estimated that over a period of approximately seven years, an astonishing UGX4 trillion had likely been misappropriated. Furthermore, in a recent report, the IGG uncovered (through investigations and complaints) the presence of 1,399 cases of abuse of public office, which mostly involved corruption and embezzlement in the public procurement process (see Kahungu 2018).

We also report new data we digitized from all PPDA anti-corruption and performance audits they performed during the period 2010–16 (see Colonnelli and Ntungire 2018: Figure 6). As the data shows, only 37 per cent (less than half) of the audited procurement contracts were found to be fully satisfactory in their allocation and execution, with a significant chunk of them (26 per cent) qualified as ‘high risk’, namely subject to severe violations including fraud and corruption, among other irregularities. An additional piece of evidence comes from the suspension (or blacklisting) of 156 providers from participating in public procurement due to corruption violations verified after prosecutorial actions. Administrative data from PPDA also shows that about 20 per cent of blacklisted firms are still selected for government contracts during the suspension period.

Of course, corruption per se is not the sole problem in public procurement, as more benign forms of inefficiency are also widespread. Moreover, it is often difficult to distinguish between corruption and inefficiency, as many cases fall into the grey areas in between. For example, the administrative data from PPDA shows that a significant share of construction projects exceeds the original proposed costs or is completed with significant delays compared with expectations, or both.

While corruption may be a reason behind such efficiency-reducing renegotiations of contract terms, other explanations have simply to do with limited capacity on the government's or provider's side, who may have each been unable to accurately predict the project's difficulty. An additional example relates to the interpretation of discretionary procedures, where officials may simply lack the necessary skills to make the most efficient decisions. There is also a host of other cases of seemingly pure inefficiencies and red tape, such as the widely cited issue firms face in waiting for government payments for already executed contracts, which disrupts their cash flows and adversely impacts their credit repayment ability as well as relationships with finance providers.

When it comes to policy implications, it is crucial to aim for big picture changes aimed at addressing both corruption and inefficiency in the interactions between firms and government agencies. Anti-corruption and performance audits of the types performed by PPDA and mentioned earlier, for example, are a well-suited policy tool. However, due to budget limitations, these audits only cover a subset of the PDEs and a few thousand government contracts are audited every year. While there is not enough data to evaluate how successful they are in the Uganda context yet, such audits, especially if randomized, have been shown to be quite effective in other contexts (e.g. see Avis et al. 2017); providing more resources for such activities that combine capacity building with monitoring is likely a productive way forward.

Transparency is also of paramount importance for the construction sector. Indeed, one of the primary challenges firms face is that of obtaining timely and relevant information on available tenders. Such opacity in the disclosure of tender opportunities is therefore seen as a major limitation to competition, as only the largest and well-connected firms may end up bidding for a contract. While private and non-governmental agencies like UNABCEC and AFIC play an important role in trying to increase transparency and awareness among local firms, more efforts from the government are needed. The creation of the Government Procurement Portal in 2015, which provides timely, online information on all government procurement activities with the goal of achieving a full-fledged e-procurement system, is the right approach. However, many firms and stakeholders complain about the limited effectiveness of the current system, due to implementation shortcomings. Hence, newspapers and local associations still remain the prevalent source of information about tenders for small local firms, and competition remains limited. One of the reasons why implementing e-procurement has been challenging is that several public agencies lack the technology or the skills to do so. This indicates the need for the central government to increase efforts towards capacity building of the most remote and less-skilled agencies, which to date remain too sporadic. Transparency is also an issue on the government side, as our interviews show that officials are often unaware of sources of data they can use in the phase of bidders' screening for example. A

practical next step in this direction is that of improving the communication and information flows across public-sector agencies (like the URA and PPDA); such a policy offers great potential and likely relatively low costs, but is currently hindered by large amounts of red tape.

The issue of transparency is directly linked to regulation. As described in Section 3, procurement regulations leave an excessive amount of discretion in the hands of public officials, which can often find easy justifications for the use of non-competitive methods to allocate procurement contracts. We find evidence for this both in the data, where open bidding systems remain the exception rather than the rule, and through a number of qualitative field interviews. This is not surprising considering, for instance, the presence of vague statements in the key metrics of selection for pre-screened firms, such as the reliance on ‘officials’ market knowledge’ or the weight on a provider’s ‘previous experience’, without further details or directions. There are countless examples like this. The language of these regulations must then be tightened, and officials must be subject to more severe monitoring (and potentially more severe follow-up penalties) in cases in which they abuse such vague regulations for private gains. Regulation is often also discussed in relation to local capacity building, with a first-order example being that of schemes to help local firms compete with international ones. The two main such schemes are the preference scheme and the reservation scheme, which in sum attempt to subsidize local firms’ bids in open bidding auctions, and to prioritize specific local sectors and groups of small local firms.⁹ While these schemes are in place, the widespread view of the local construction sector is that enforcement of such schemes is currently largely lacking, due in part to the vague or non-existent regulations on follow-up activity in case of schemes’ violations. Regulation alone per se is, however, likely not sufficient to improve local firms’ abilities to compete, and there is uncertainty over the effectiveness of such local schemes (which some argue may even ultimately reduce competition and efficiency by disincentivizing large productive firms to participate in the sector). Other initiatives, such as enterprise development schemes and skills-matched internships, though long-term oriented, should also allow local firms to develop the necessary skills and to be able to attract the talent needed to compete with their international counterparts.

Finally, Uganda’s construction sector lacks the necessary regulatory framework to enforce compliance to standards and quality, which has led to a consistent low quality of skill and labour inputs and therefore low productivity of the sector.

⁹ For the sake of brevity, we refer the reader to the following guidelines and regulations for more information on such schemes: PPDA Act 2003, Sections 50(1), 50(2) (see Directorate of the First Parliamentary Counsel 2003); Local Governments (PPDA) Regulations 2006, Regulation 53 (see Public Procurement and Disposal of Public Assets Authority 2006); PPDA Guidelines on Reservation Schemes 2018 (see Public Procurement and Disposal of Public Assets Authority 2017); ‘Buy Uganda Build Uganda Policy 2014’ (see Ministry of Trade, Industry and Cooperatives 2014).

Currently, the mandate for quality assurance of the construction sector falls under the Construction Standards and Quality Assurance Department, Ministry of Works and Transport; however, for a more coordinated and comprehensive approach the government of Uganda should consider a national body or programme that would work closely with the existing private-sector structures (e.g. UNABCEC and the Uganda Institution of Professional Engineers) to enforce and reward quality.

4.2 Access to finance

The construction industry is a high-risk sector for financiers, especially in relation to the extractive sector, as it often requires significantly high fixed capital investments and incurs huge sunk costs. The lack of access to finance is especially acute for local construction firms whose ability to borrow is limited by rigidities in the domestic financial market and a lack of adequate collateral. A survey of local and foreign construction firms executing work on donor-financed road projects in Uganda found that the typical amount of credit obtained by a foreign construction firm was twenty times larger than that obtained by a local construction firm (Balimwezo 2009). This sharp contrast in access to financing for the domestic construction industry puts local firms at a disadvantage, restricting their ability to undertake new projects, recruit skilled labour, or even manage current projects. These issues are more and more salient to firms, as the influx of international firms, primarily from China, using considerable cheap credit from their original countries strongly limits national firms' competitiveness for the same contracts.

Currently, the lion's share of financing to the domestic construction sector in Uganda has been undertaken by commercial banks; but banks have mostly short-term liabilities and are therefore not well placed to hold long-term assets on their balance sheets, which further hinders borrowing especially for long-term construction projects. In addition, nominal and real interest rates are high (nominal interest rates have remained over 20 per cent for the past ten years), making it very costly for firms to borrow from the domestic market. Interviews with several construction sector firms reveal that most small and medium local firms therefore rely on money lenders (who charge a premium over the average market interest rates), as the flexibility they provide is essential for firms, and partly justifies the exorbitant associated costs. Other alternative sources of funding often include family and friends, while development finance institutions seem to have very limited traction in Uganda due to perceived excessive bureaucracy. All these challenges become particularly relevant for local firms tendering for public work contracts. To finance equipment and large contract tenders, and in the absence of access to credit, such companies often resort to their own

savings or hire used equipment from the local market, further undermining their competitiveness and quality of work produced.

A further hindrance to financing for small- and medium-sized construction firms is the bid security requirements to deal with government contracts, which are often too demanding for these firms. Firms argue that even if they are able to obtain the bid security from a bank, typical delays in dealing with government agencies make it too costly for them. On the one hand, while the bid security must be submitted before the evaluation phase, firms pay significant interest fees, which are magnified if the government delays the contract evaluation (which firms argue is typically the case, with delays taking up to several weeks or months). On the other hand, similar extra interest costs are incurred if the government delays the actual payments for work performed (which again firms argue is typically the case and consider these delayed payments to be the primary challenge in public procurement). All firms interviewed emphasized how strong a barrier to directly participating in public procurement and sector development the issue of bid security and delayed payments is.

Finding possible solutions for these access-to-finance challenges is no easy task, in Uganda or other emerging economies in the region. Here, we focus on one possible solution that can help bridge the financing gap for domestic contractors and that has had success in similar contexts, namely 'lease financing'. Financial leasing is a contractual arrangement that allows one party (the lessee) to use an asset owned by the leasing company (the lessor) in exchange for specified periodic payments (lease rentals). During the lease period, legal ownership of the asset is retained by the lessor. An advantage of this mode of financing is that the lessee need not provide collateral, provided s/he has sufficient cash flow from core operations to cover the lease rentals. While financial leasing was only introduced to the Ugandan financial market in 1994, the market has witnessed significant growth over the past decade with potential for rising demand. To date, eleven companies offer financial leasing as a product, of these only three are independent while the remaining eight are ring-fenced divisions of commercial banks. A key constraint to further growth of the sector, however, is a less-than-enabling policy environment: Uganda has no legislation that regulates the business and practice of leasing; while a bill has been submitted to the minister of finance, planning and economic development it is yet to be signed and there is no indication of the bill being signed soon. Moreover, the construction sector remains a less-favoured sector for this mode of financing compared with other economic sectors such as agriculture and transport, owing to several risks, foremost of which is the fact that, as already mentioned, construction contracts are usually dependent on untimely government disbursements that make regular lease payments difficult. Not surprisingly, the firms we interviewed were not optimistic about the current framework on lease financing, which remains as of now a largely unexplored financing avenue.

4.3 Marginal costs of construction

Addressing the bottlenecks to supply in the construction sector before the onset of investments associated with the transition to commercial oil production will be critical, as any constraints to supply may likely translate to higher marginal costs and prices, thereby reducing the physical output for a given amount of nominal investment.

There is some evidence that marginal costs of construction (particularly for public investments) are already rising in Uganda. Construction costs, particularly for civil works and non-residential buildings, have outpaced overall inflation significantly and appear to be accelerating (see Colonnelli and Ntungire 2018: Figure 8). More specifically, whereas prices for the construction sector as a whole fell by 0.4 per cent between December 2016 and December 2017, the prices for civil works rose by 3.1 per cent (reflecting a surge in public investment). To ensure that demand matches supply, the government needs a better understanding of local supplier capacity (e.g. through enterprise surveys) as well as a steady and reliable flow of information to suppliers on its upcoming investment plans.

5. Conclusion

In this work, we rely on administrative micro-data and new survey evidence, combined with structured interviews of local firms and both private- and public-sector organizations, to describe the role of the construction sector in Uganda. Construction is by many considered to be the central sector to focus on for countries like Uganda that aim to make efficient use of the recent wave of natural resource discoveries.

The emphasis of this analysis is on the interaction between government agencies and local firms, as public procurement plays the crucial role of main driver of industry growth. The data point to a market structure that is rather concentrated. On the one hand, a few government agencies are responsible for the vast majority of government procurement and the largest contracts. On the other, the supply side of the market sees the presence of a right tail of large firms accounting for most of the economic activity. Unsurprisingly, the largest firms tend to be the foreign ones. We then illustrate the regulatory framework for public procurement in Uganda, with a focus on the organizational structure of the supervisor agency, namely the PPDA. We also expand on various other players, in both the private and the public sector, that can be instrumental in the efficient development of the construction sector.

In section 4, we provide an in-depth analysis of some of the main challenges local construction firms face in Uganda. In particular, we discuss the role of corruption and inefficiency in public procurement as the leading issue to address.

Higher levels of transparency and more streamlined regulations are the way forward, and Uganda is on a positive trend, but there is a long road ahead. A second key channel is the frictions in accessing finance that local firms face, which we argue can be alleviated by regulatory changes more favourable to lease financing and related tools. We conclude by briefly discussing the importance of tracking construction costs and prices at such a time of increasing demand.

Acknowledgements

We thank Francesco Loiacono, Edwin Muhumuza, Richard Newfarmer, John Page, Edoardo Teso, and Yan Wen for comments and assistance in the data collection and analysis. We also thank the International Growth Centre, Uganda, and the Centre for Economic Policy Research, London, for its Private Enterprise Development in Low-Income Countries Initiative, the Stanford Center for International Development, Cambridge, Massachusetts, and the Abdul Latif Jameel Poverty Action Lab for financial support.

References

- Avis, E., C. Ferraz, and F. Finan (2017). 'Do Government Audits Reduce Corruption?' *Journal of Political Economy*, 126(5): 1912–64.
- Balimwezo, R. (2009). 'A Comparative Study of Local and Foreign Construction Firms' Participation in Donor Funded Road Construction Projects. A Case Study of Uganda.' Dissertation, Makerere University, Uganda. Available at: <http://makir.mak.ac.ug/handle/10570/3427> (accessed November 2018).
- Colonnelli, E., and M. Prem (2018). 'Corruption and Firms: Evidence from Randomized Audits in Brazil'. 14 November. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2931602 (accessed November 2018).
- Colonnelli, E., and N. Ntungire (2018). 'Construction and Public Procurement in Uganda.' WIDER Working Paper 2018/180. Helsinki: UNU-WIDER. Available at: <https://www.wider.unu.edu/publication/construction-and-public-procurement-uganda> (accessed May 2019).
- Directorate of the First Parliamentary Counsel (2003). Public Procurement and Disposal of Public Assets Act No. 1, 2003. Available at: https://www.ppda.go.ug/download/ppda_act/ppda_act/PPDA_ACT-2003.pdf (accessed December 2018).
- Inspectorate of Government (2018). 'Mission.' Available at: <https://www.igg.go.ug/about/mandate/> (accessed December 2018).
- Kahungu, M. T. (2018). 'Theft of Government Money, Assets Top IGG Report.' *Daily Monitor*, 11 October. Available at: <https://www.monitor.co.ug/News/National/Theft-government-money--assets-top-IGG-report---/688334-4800596-oqk952/index.html> (accessed December 2018).

- Kenny, C. (2007). 'Construction, Corruption and Developing Countries.' Policy Research Working Paper WPS 4271. Washington, DC: World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/7451> (accessed November 2018).
- Mauro, P. (1995). 'Corruption and Growth.' *The Quarterly Journal of Economics*, 110(3): 681–712.
- Ministry of Trade, Industry and Cooperatives (2014). 'Buy Uganda Build Uganda Policy.' Kampala, Republic of Uganda: Ministry of Trade, Industry and Cooperatives. Available at: <http://www.mtic.go.ug/images/policies/bubu.pdf> (accessed December 2018).
- Petroleum Authority of Uganda (2018). 'Oil and Gas Development in the Albertine Graben.' Republic of Uganda: Petroleum Authority of Uganda. Available at: <http://www.natureuganda.org/downloads/PublicTalks/PAU.pdf> (accessed December 2018).
- Public Procurement and Disposal of Public Assets Authority (2003). 'Public Procurement and Disposal of Public Assets Act.' Republic of Uganda: Government of Uganda.
- Public Procurement and Disposal of Public Assets Authority (2006). The Local Governments (Public Procurement and Disposal of Public Assets) Regulations, 2006. Statutory Instruments Supplement, 4 August 2006, No. 39. Available at: https://www.ppda.go.ug/download/regulations/regulations/local_government_regulations/Local-Government-Regulations-of-2006.pdf (accessed December 2018).
- Public Procurement and Disposal of Public Assets Authority (2017). 'Public Procurement and Disposal of Public Assets Guideline.' Republic of Uganda: Government of Uganda. Available at: https://www.ppda.go.ug/download/guidelines/guidelines/central_government_guidelines/GUIDELINE-ON-RESERVATION-SCHEMES-TO-PROMOTE-LOCAL-CONTENT-MARCH-2018.pdf (accessed December 2018).
- UBOS (2010–11). 'Statistical Abstract'. Kampala: Uganda Bureau of Statistics (UBOS).
- UBOS (2018). 'Uganda Bureau of Statistics: Data and Statistics'. *Knoema*. Available at: <https://knoema.com/atlas/sources/UBOS> (accessed November 2018).

Enhancing Local Content in Uganda

Ritwika Sen

1. Introduction

The recent confirmation and ongoing development of commercial oil and gas resources in Uganda has given rise to two complementary effects. The first refers to the active engagement and accompanying investment decisions of international oil companies (IOCs), global service providers, and other experienced international oil industry actors. The second effect consists of an urgent national interest to participate in, and maximize the benefits from, anticipated capital investments in the burgeoning industry. In preparation, the government of Uganda has developed an extensive policy and regulatory framework with the aim to extend the growth benefits of the petroleum sector beyond its direct (and exhaustible) contribution to the economy. An important component of these policy efforts is 'local content policies' (LCPs), specifically targeted at enhancing national participation through opportunities for employment and productive linkages. LCPs comprise varied measures ranging from mandating, negotiating, or incentivizing the use of national labour and industry.

Natural resource discoveries offer countries a unique learning opportunity to develop the institutional capabilities required to promote local content. Sutton (2017) argues that a local content management programme is more likely to succeed if it starts with a narrow area of operation, such as extractive industries, and expands horizontally to a wider range of sectors. Features specific to the oil and gas industry also favour the implementation of LCPs, such as: the greater bargaining power of host governments relative to multinational corporations; a clear sequencing of work plans and engagement opportunities; and largely formal operations which entail the upkeep of regular procurement and tax records. However, international experience also cautions against a set of 'pitfalls' that often contribute to missed opportunities in this area. These include inflated government expectations regarding domestic workforce and industrial capabilities; over-reliance on regulatory mandates for local content use (or 'x per cent' local content requirements); delays in the timing of policy interventions relative to industrial activities; and, attempting to 'do everything at once' (Steenbergen and Sutton 2017).

This chapter analyses policy options to promote local content in Uganda as it transitions into an oil-producing country.¹ As new entrants into a global industry, prospective domestic suppliers have limited (if any) competencies to provide exploration and production-related services or specialized ‘core’ industry operations in the short term. However, they can deploy (and upgrade) existing capabilities to competitively supply a range of ‘non-core’ or ancillary services to the oil industry, such as construction, food and beverages, accounting and legal services. Although LCPs typically seek to foster employment linkages, in addition to backward and forward productive linkages at the firm level, this chapter focuses solely on domestic supplier development aspirations. The analysis comprises an evaluation of existing LCPs in Uganda, a mapping of the natural resource value chain, and an assessment of domestic firm capabilities to supply the anticipated demand for goods and services from oil and gas exporters. This exercise is informed by industry interviews, secondary sources, and administrative data, including transaction-level value-added tax data from the Uganda Revenue Authority. The concluding section proposes policy initiatives to promote a feasible pattern of domestic supplier integration in Uganda’s resource value chain.

2. Prospects for local supplier development

Oil and gas exploration in Uganda was initiated by the British colonial administration in the 1920s. However, consistent efforts to investigate the country’s petroleum potential only began in earnest after the restoration of stability in an independent Republic of Uganda. The existence of commercializable oil resources was confirmed as recently as January 2006. At present, Uganda’s oil resources are estimated at 6.5 billion barrels of oil equivalent, of which around 1.4 billion barrels are recoverable.² In addition, Uganda’s gas resources comprise 170 billion cubic feet (bcf) of associated gas (found within the oil) and 500 bcf of non-associated or independent natural gas (MEMD 2017).³ To date, commercial oil production has not taken place in Uganda, although it is anticipated that joint venture partners Total E&P, CNOOC, and Tullow Oil (who are leading the development of oilfields already discovered) will commence production by 2020–1.

Prospects for the development of a competitive local supplier base for the oil industry in Uganda depend on various factors, not least of which is the magnitude of the resource discovery itself. To put the scale of Uganda’s newfound oil resources into perspective, Sen (2018: Table 1) compares the recoverable oil reserves

¹ It is anticipated that commercial oil production will commence in the year 2020–1.

² These estimates are measured in terms of *stock tank original oil in place*, which refers to the volume of oil estimated at reservoir temperature and pressure conditions.

³ Wolf and Potluri (2018) provide a detailed account of the timeline of past oil exploration and anticipated development and production activities in Uganda.

of selected oil-producing countries across the world. For example, Nigeria is reported to have 37.1 billion barrels of commercially recoverable oil reserves remaining, which is projected to last for over forty-nine years at the observed daily production rate of 2,053 thousand barrels of oil per day (BoPD). Albeit Nigeria's recoverable reserves were approximately twenty-seven times that of Uganda's proven oil resources as of end-2016.

The Ugandan government anticipates that the country's proven oil and gas resources (to date) will last for twenty to thirty years. As additional exploration and appraisal activities planned may lead to further resource discoveries, the estimated production period may in fact be prolonged. The area currently explored in the Albertine Graben, where Uganda's exploration activities are concentrated, represents less than 40 per cent of the total area with the potential for production (MEMD 2017). Put together, Uganda's current resource scale and the potential for further discoveries suggest the following:

- The development of supplier capabilities in non-core or ancillary operations to service the oil and gas industry needs to be prioritized in the short term. This encompasses several less skill and capital-intensive goods and service industries that are *not specific* to the oil industry (e.g. catering, construction, transport, and logistics). However, prospective suppliers are required to meet demanding industry-specific standards to qualify as approved vendors. This will require broad-based public, donor, or corporate initiatives to provide business and technical training to local suppliers.
- Specialization in technologically sophisticated 'core' exploration and production operations may be useful in the medium to long term. For this purpose, targeted training programmes (e.g. shadowing schemes) led by international industry actors will be needed to build requisite expertise among local firms and the workforce.

Uganda's oil industry has received cumulative foreign direct investment (FDI) inflows worth US\$3.4 billion between 2001–16 (Namubiru 2018). Going forward, it is anticipated that additional investments of over *six times* this magnitude (i.e. US\$20 billion) will be made over the next three to five years (Ssekatawa 2017). Although this represents a critical opportunity for local businesses, their integration in the supply chains of multinational corporations (MNCs) is unlikely to be automatic. An Industrial Baseline Survey commissioned jointly by IOCs in Uganda noted that only two sectors (security services and cement manufacturing) met the quantity *and* quality requirements of the oil industry as of 2013 (SBC 2013). Furthermore, opportunities for supply linkages vary over the life cycle of petroleum projects—typically peaking at the engineering, procurement, and construction phase, and plateauing thereafter through production, operations, and maintenance. It is anticipated that opportunities in construction activities will

commence in late 2019 once the joint-venture partners reach Final Investment Decision. This implies that *urgent* policy action is needed to bolster domestic supplier preparedness. Otherwise, the possibility of missed opportunities in Uganda (as in many countries before) looms large.

3. The local content management framework

Legal structures governing resource extraction can aid the transformation of resource wealth into development. In the context of LCPs, the legal and regulatory framework serves to establish the formal ‘rules of the game’ by clarifying policy intent and scope, and (in some countries) by establishing targets, metrics, and institutional responsibilities for its assessment. Cross-country comparisons of local content outcomes in seven Latin American oil- and gas-producing countries by Herrera et al. (2016) suggest that a higher level of specificity in legal provisions may be associated with better local content outcomes. However, the authors observe that this is not a sufficient condition to guarantee desired policy outcomes, as countries (namely Ecuador and Colombia) with similar legal ‘specificity scores’ were reported to have vastly different performance.⁴ With that caveat in mind, this section describes and evaluates existing legal and regulatory requirements for local content faced by companies operating in Uganda’s oil and gas industry. The principles used for the assessment are threefold: (1) clarity of scope, including provisions for measurement; (2) presence of monitoring mechanisms; and (3) feasibility of implementation. Evidence for the third criterion has been compiled on the basis of industry interviews and a comprehensive audit of the implementation of national content in Uganda’s oil and gas sector by OAG (2015).⁵

3.1 Overview of local content requirements in Uganda’s oil industry

The oil and gas sector in Uganda is guided by the National Oil and Gas Policy of 2008, whose goal is ‘to use the country’s oil and gas resources to contribute to early achievement of poverty eradication and create lasting value to society’. In particular, the policy emphasizes the deliberate implementation of national participation in oil and gas activities through its objectives (vii) and (viii). These relate to optimum state and industrial participation in sectoral activities, the expansion of employment opportunities for citizens, and support for the development of competencies for national entrepreneurs and the workforce to competitively supply goods and services to the sector. In addition, a National Local Content Policy

⁴ The authors attribute these findings to differences in the business climate between the two countries.

⁵ The first two criteria conform to the benchmarks used in the comprehensive catalogue of LCP frameworks compiled by the ELLA project (Herrera et al. 2016).

for the Oil & Gas Sector was ratified by the cabinet on 25 June 2018.⁶ The general principles laid out in the policy are further elaborated through the following laws and regulations:

- Petroleum Exploration, Development and Production Act, 2013 (henceforth PEDP Act).
- Petroleum Refining, Conversion, Transmission and Midstream Storage Act, 2013 (henceforth PRCTMS Act).
- Petroleum Exploration, Development and Production Regulations, 2016.
- Petroleum Exploration, Development and Production National Content Regulations 2016 (referred to as PEDP NC Reg. in Table 16.1).
- Petroleum Refining, Conversion, Transmission and Midstream Storage Regulations 2016.
- Petroleum Refining, Conversion, Transmission and Midstream Storage National Content Regulations, 2016 (referred to as PRCTMS NC Reg. in Table 16.1).

These regulations are augmented through binding provisions incorporated within production sharing agreements (PSAs) with licensed operators. These contractual clauses provide for the training and employment of *suitably qualified* Ugandans, in addition to the payment of annual training fees to the government ActionAid (2017). However, as all PSAs with industry operators have not been made available publicly, these have not been included as part of the review of local content requirements.

The PEDP Act (2013) and PRCTMS Act (2013) guide the current institutional and regulatory framework for the governance of Uganda's oil and gas sector: the Directorate of Petroleum under the Ministry of Energy and Mineral Development (MEMD) is responsible for policy formulation and the licensing of petroleum activities. The Petroleum Authority of Uganda (PAU), established in 2013, is the regulatory body responsible for monitoring compliance in the petroleum sector. Finally, the Uganda National Oil Company was set up (also in 2013) to manage the state's commercial interests in the petroleum sector. Both the MEMD Directorate and PAU consist of National Content Units, with the former leading on aspects related to policy formulation, training, and enterprise development, whereas the latter primarily focuses on monitoring compliance. However, industry interviews indicate that in practice the two institutions encounter some overlap in their functions related to the enhancement of national participation (as PAU also undertakes initiatives for national content promotion from time to time). For the purposes of coordination and effective implementation, it may be advisable to clarify institutional responsibilities for local content promotion.

⁶ Albeit this document is not yet available in the public domain (Ampurire 2018).

Table 16.1 Overview of legal requirements for local sourcing and supplier development

Relevant act or regulation [1]	Instrument [2]	Detailed requirements [3]
Part II Sec. 8 PEDP NC Reg. Part II Sec. 8 PRCTMS NC Reg.	Preparation of National Content Plans (Qualitative specifications)	Licensees are required to submit plans detailing the prioritization of: Goods produced or available in Uganda, subject to quality standards and timeline requirements Services offered by Ugandan companies, registered entities, and citizens during the evaluation of bids.
Part VIII Sec. 125 PEDP Act Part II Sec. 9(1) PEDP NC Reg. Part VII Sec. 53 PRCTMS Act Part II Sec. 10(1) PRCTMS NC Reg.	Preferential treatment (Qualitative specifications)	First consideration required for: (a) Goods and services produced <i>and</i> available in Uganda (b) Services rendered by Ugandan citizens and companies.
Part II Sec. 9(2–4) PEDP NC Reg. Part II Sec. 10(2–3) PRCTMS NC Reg.	Joint venture provision (Quantitative restriction)	(a) Where goods and services required are not available, procurement permitted from a company involved in a joint venture with a Ugandan Company Ugandan company must have 48 per cent participating interest (upstream reg.) Ugandan company must be approved by the PAU, based on technical and financial competence, experience, active participation, etc.
Part II Sec. 9(6–7) PEDP NC Reg. Part II Sec. 10(4) PRCTMS NC Reg.	Express authorization requirement	Where Ugandan citizens and firms do not meet required quality/competence: Licensee may use another company with permission from the PAU This must be within a period specified by the PAU Licensee <i>may</i> develop a supplier development programme (upstream reg.).
Part II Sec. 11(1–4) PEDP NC Reg. Part II Sec. 10(4) PRCTMS NC Reg.	Reserved schedule of goods and services (Import restrictions)	(a) Specified list of goods and services to be exclusively provided by Ugandan companies, registered entities, and citizens Recommendation for unbundling of contracts to reduce the size, complexity, and scope of works for domestic producers Where required quality of reserved goods and services is not available, licensee may procure from another company (with permission from PAU).

Part II Sec. 12–13 PEDP NC Reg., Part II Sec. 12–13 PRCTMS NC Reg.	Procurement principles (Quantitative restrictions)	Mandatory inclusion of national content in bid evaluation criteria Must account for at least 10 per cent of total evaluation score based on: <ul style="list-style-type: none"> • employment and training of Ugandan citizens • utilization of local goods and services • proposals for technology transfer When bids are within 5 per cent of each other based on financial evaluation the bid with highest national content will be chosen. Contracts with a value in excess of US\$1,000,000 must contain a labour clause mandating the use of Ugandan labour in specific categories.
Part II Sec. 12–13 PEDP NC Reg., Part IV Sec. 30 PRCTMS NC Reg.	Enhancing supplier–buyer linkages (National Suppliers Database)	The PAU shall develop a National Suppliers Database All oil and gas industry suppliers are required to register PAU (along with licensees) shall develop qualification criteria PAU shall undertake qualification of suppliers on an annual basis and invite applications through national and international advertisements PAU is required to publish the list of qualified suppliers on 31 December.
Part II Sec. 23 PEDP NC Reg., Part II Sec. 23 PRCTMS NC Reg.	Technology transfer and training Requirements (Qualitative)	Licensees must submit annual plans detailing initiatives for transfer of technology, know-how, and skills They must also submit annual reports of accomplishments Licensees shall support technology transfer by encouraging joint ventures Further, licensees are required to organize in-country events to connect international companies, Ugandan companies, citizens, and registered entities
Part III Sec. 25 PEDP NC Reg., Part III Sec. 25 PRCTMS NC Reg.	Reporting requirements	(a) Licensees must submit quarterly and annual NC performance reports (b) A national content performance report must specify: <ul style="list-style-type: none"> • national content expenditure levels • employment of Ugandan citizens and foreign workers in hours or days worked • training and employment of Ugandan citizens (name, job, level) • procurement of locally manufactured materials versus imports • details of Ugandan companies, citizens, and registered entities contracted • technology transfer, R&D, and training programmes undertaken.

Source: Author's summary based on acts and regulations cited in column 1.

Table 16.1 provides an overview of regulations to enhance local content through requirements for local sourcing and supplier development activities.⁷ Laws and regulations (column 1) have been categorized according to instruments employed (in column 2) and their main provisions, which are outlined in column 3. These have broadly been classified based on instruments employed, such as preferential treatment for Ugandan goods and service providers or joint-venture provisions. The upstream and midstream regulations (PEDP NC Reg. and PRCTMS NC Reg.) define ‘national content’ as:

- ‘The level of use of Ugandan local expertise, goods and services, Ugandan companies, Ugandan citizens, registered entities, businesses and financing in petroleum activities’
- ‘The substantial combined value added or created in the Ugandan economy through the utilisation of Ugandan human and material resources for the provision of goods and services to the petroleum industry in Uganda.’

The above definitions clarify two aspects of policy intent: (1) the scope of *local* content pertains to value created in the *national* economy because of petroleum activities; and (2) the contribution to value creation within the national economy is conditioned on the nationality of individuals, and the ownership of companies concerned (in spirit). Notably, the regulations define ‘Ugandan companies’ as those that are incorporated under the Companies Act (2012), provide value addition to Uganda, use available local raw materials, employ at least 70 per cent Ugandans, and are approved by the PAU.⁸

3.2 Evaluation of local content requirements

Table 16.1 highlights the use of mandatory local content requirements implemented through preferential treatment for local suppliers, minimum participating interests in joint ventures, import restrictions, and procurement provisions. Additional procurement principles (not listed in the above summary) related to the unbundling of contracts, establishment of tender information offices, and requirements to provide feedback to unsuccessful bidders are targeted towards improving the likelihood of successful bids by local suppliers. The compilation of a National Suppliers Database (NSD) by the PAU is also intended for this purpose. International experience suggests that an assertive (rather than

⁷ This is not a comprehensive overview of local content requirements as provisions related to direct employment and the training of Ugandan citizens have been omitted.

⁸ ‘Registered Entities’ are further defined as businesses owned by Ugandan citizens registered under the Business Names Registration Act or Partnership Act 2010.

aspirational) goal-setting approach to local content regulation is more likely to succeed only where there is pre-existing capacity among local firms and individuals to supply the industry (Tordo et al. 2013). In Uganda's case, a focus on implementable outcomes, combined with supplier development initiatives, is more likely to yield positive results. This section assesses the various LCPs based on these criteria.

3.2.1 Clarity of scope and provisions for measurement

The upstream and midstream national content regulations make explicit provisions to foster national industrial participation in the oil and gas sector. While there are no mandatory minimum levels specified in relation to this objective, provisions related to minimum joint-venture participating interests (48 per cent), the reserved schedule of goods and services, and bid evaluation criteria regarding national content (10 per cent of the total evaluation score, and a 5 per cent cost margin) establish a lower bound. However, there are points of ambiguity in the regulations that stem from the definition of 'Ugandan companies' and local goods.

As stated earlier, a Ugandan company is defined as one that is incorporated under the Companies Act (2012), provides value addition to Uganda, uses available local raw materials, employs at least 70 per cent Ugandans, and is approved by the PAU. This stringent definition encompasses only a subset of companies registered in Uganda, regardless of ownership or control. In other words, a foreign-owned company or a subsidiary of a foreign firm that is registered in Uganda and satisfies the remaining conditions can lawfully be regarded as a Ugandan company. At the same time, a Ugandan-owned company which employs only Ugandan nationals and specializes in the assembly of imported parts may or may not be considered 'Ugandan', depending on the availability of locally produced input substitutes. In relation to the primary intent of LCPs—that is, value creation that is retained within the national economy, employment generation, and the deepening of domestic industrial capabilities—both companies should ideally qualify as 'local'. The definition further complicates the reporting and measurement of local content through the procurement records of licensees, contractors, and subcontractors. While it may be feasible for the procurement departments of IOCs to report on purchases from domestically registered companies or even domestically owned companies, the administrative costs of discerning whether each supplier is indeed 'Ugandan' as per the law (in the case of reporting companies and the evaluating authority) may be unreasonably high.

The second point of ambiguity, as also noted by OAG (2015), stems from the lack of clarity regarding what constitutes a local good or service. For instance, part II section 9 of the upstream national content regulations requires that licensees accord first preference to the procurement of goods produced and readily available in Uganda, and services rendered by Ugandan citizens and companies. However, the more quantitative (and specific) bid evaluation criteria under section 13(b) of

the same regulations provides for the evaluation of national content (accounting for no less than 10 per cent of the evaluation score) based on utilization of 'local goods and services', among other criteria. Without clarity on what constitutes 'local' in this regard, there is no guarantee that even Ugandan companies will provide goods that are produced in-country. The OAG (2015) report consequently recommends that procurement reports reflect whether goods purchased (regardless of company classification) are indeed imported or domestically produced. This recommendation has since been incorporated under reporting requirements for licensees under section 25 of both the upstream and midstream regulations. However, the definitions continue to remain unclear.

3.2.2 Presence of monitoring mechanisms

Monitoring processes related to the implementation of national content regulations are well established. Licensees are required to submit quarterly and annual reports detailing their performance in this regard (see Table 16.1 for further details). These reports are evaluated by the PAU in relation to national content programmes prepared and submitted by licensees within twelve months after the granting of a license. As a result, even though there are no established 'annual targets' related to the participation of national industry, performance can be evaluated against company-specific plans that are ratified by the PAU.⁹ However, neither the company-specific plans for the use of national content, nor the reports of their achievements in this respect are made available to the public. The public release of documents detailing planned and achieved procurement of locally produced goods and services by IOCs (and their subcontractors) could enhance transparency, while providing an information resource for aspiring suppliers.

3.2.3 Feasibility of implementation

The ability to implement the regulations outlined above ultimately hinges on the preparedness of domestic firms to supply goods and services of the quality and scale required by the oil industry. Anecdotal evidence from industry interviews and national supplier information workshops suggests that international companies are committed to finding solutions that involve local content. This could involve the unbundling of supply contracts and process innovation in project design to facilitate local sourcing. However, IOCs and their contractors are also very clear about their expectations from suppliers. This consists of requirements for health, safety, and environmental standards, business conduct and ethics, and financial

⁹ However, there are annual targets laid out by the regulations related to the direct employment and training of Ugandan citizens. For instance, at least 30 per cent of management staff should consist of Ugandans at the start of petroleum activities. This should increase to at least 70 per cent within five years after the start of activities (part II, section 17 PEDP NC Reg.).

and operational controls, among other provisions.¹⁰ These expectations, currently beyond the reach of several domestic suppliers, are considered necessary for firms to pre-qualify for competitive tendering processes. Ugandan oil and gas suppliers interviewed by SBC (2013) indicate that key obstacles to development encountered by them include: visibility over demand, required infrastructure improvements, high borrowing costs, workforce skills deficit, demanding quality standards, and the capacity of suppliers. Although concerted policy efforts to address the first two issues have been made (or are planned), there are limited capability development interventions and supplier credit-facilitation initiatives in place. In this regard, it is critical for the government to expedite its plans for an Industry Enhancement Centre to provide training, matching, and financial advisory services to domestic suppliers. Sen (2018: Box 1) discusses an ongoing donor-funded initiative in Uganda (the E4D/SOGA programme) that provides health, safety, and environment and bid management training to local suppliers.

4. Assessing domestic supplier capabilities in Uganda

The overview and assessment of local content requirements in Uganda's oil and gas sector underscores the importance of 'bridging the gap' between existing supplier capabilities and the requirements of the industry. Estimates from a baseline survey (SBC 2013) suggest that the natural resource sector in Uganda can generate up to 150,000 indirect and induced jobs (at its peak) if domestic supplier integration in natural resource value chains is realized. This section aims to collate evidence on existing domestic supply linkages to the natural resource sector, and the capabilities of prospective oil and gas suppliers to inform the policy process. In particular, the analysis is structured to answer two key questions: (1) How are local firms integrated into the natural resource value chain in Uganda? (2) What capabilities do domestic firms have to enter the resource value chain?¹¹

4.1 How are local firms integrated into the natural resource value chain?

To ascertain the extent and nature of domestic supplies to the natural resource sector, I examine transaction-level value-added tax (VAT) declarations in Uganda. These returns include all reported purchase transactions by the natural resource

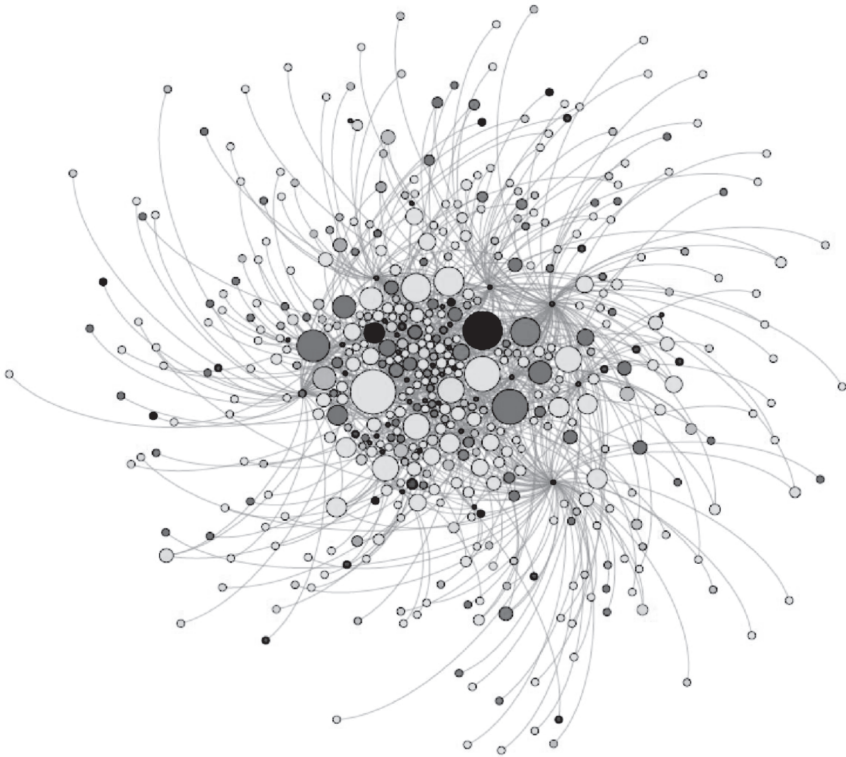
¹⁰ For example, Fluor (2018) outlines business conduct and ethics expectations for suppliers by Fluor Corporation, which is a prospective EPC contractor for the Tilenga project.

¹¹ The latter is with a specific focus on the oil and gas sector.

sector (i.e. oil, gas, and mining), which are listed along with the (anonymized) tax identification numbers of sellers. This feature of the dataset allows me to identify the sectors which firms that sell to the natural resource sector correspond to. VAT in Uganda is payable by individuals, businesses, and corporate entities with business sales over 150,000,000 Ugandan shillings (UGX; approximately US\$40,000) per annum. Notably, this threshold was raised from UGX 50,000,000 (US\$13,000) by the VAT Amendment Act (2015) that came into force in the fiscal year 2015/16. The dataset utilized for the purposes of this study corresponds to the period 2010–14/15 (as more recent periods were not available due to data access limitations). Consequently, the analysis pertains to the universe of reported purchase transactions by the natural resource sector, from tax-paying domestic firms with annual turnover above US\$13,000. While this would typically constitute an important limitation for the analysis of nationally representative firm capabilities in Uganda, our focus is limited to the subset of firms with the potential to supply an international industry. Therefore, tax compliance and earnings above minimum-income thresholds (for taxation purposes) amount to prerequisites for the identification of these firms. The largely formal nature of procurement within the natural resource sector (especially oil and gas operators) also lends itself to this analysis.

Figure 16.1 presents a mapping of input supply relationships in Uganda's natural resource sector corresponding to the fiscal year 2014/15. Each node (or circle) represents a firm, and each connecting edge represents the presence of a supply relationship between two firms in the fiscal year 2014/15. Nodes have been coloured according to their sector of operation, where medium-grey nodes (or red nodes in the four-colour version of this figure in Sen 2018) (categorized under 'mining and quarrying') represent purchasing firms from the natural resource sector. These also include firms from the oil and gas sector. Due to the limited number of oil and gas operators in the economy, the analysis has been conducted at the aggregate natural resource sector level in order to prevent the identification of any one firm. The layout of the network has been adjusted to concentrate more-connected firms (ones with a higher number of supply relationships observed) at the centre, and isolate less-connected firms at the periphery.¹² The size of nodes has further been scaled in proportion with the number of firms that a given firm has a supply relationship with (note that this is distinguished from buyer relationships, as a result of which natural resource firms are typically smaller in size unless they also sell to other natural resource firms). The fan-like structures emanating from natural resource firms in this graph is a result of representing

¹² The Force Atlas2 layout was used for purposes of spatialization using Gephi network visualization software. This is a force-directed layout wherein nodes repulse each other like charged particles, and edges counteract this by attracting their nodes like springs. The position of nodes in the resulting layout is dependent on the position of other nodes and the connections between them. See Jacomy et al. (2014) for further details.



Legend:

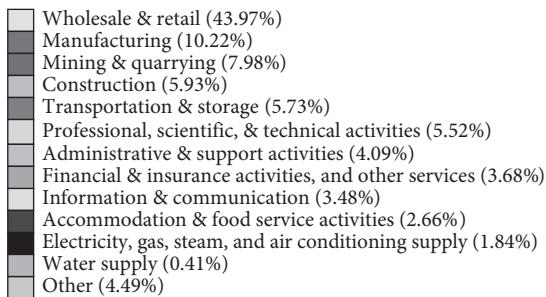


Figure 16.1 Domestic suppliers in Uganda's natural resource value chain, FY 2014/15

Source: Author's illustration based on data from the Uganda Revenue Authority

only direct-purchase relationships. In other words, Figure 16.1 does *not* depict the suppliers of suppliers, and so on.

The mapping of domestic suppliers in Uganda's natural resource value chain illustrates that there is indeed a population of local goods and service providers that sell to the sector. However, these supply transactions are dominated by trades with the retail and wholesale sector, which account for almost half of the supply

connections in the graph. This includes the purchase of largely imported products such as motor vehicle parts and accessories, motor vehicles, machinery, and equipment, among others. The manufacturing sector ranks second among suppliers in terms of connections in the network (estimated at 10 per cent of the whole). A handful of manufacturing firms (shown in dark medium grey here, or blue in Sen 2018) dominate the supplier network, trading with most natural resource firms. These include manufacturers of plastic products, fabricated metal products, batteries and accumulators, and cement, plaster, and lime, to name a few. A small population of manufacturers is also observed at the periphery of the network. These firms only trade with a subset of natural resource sector buyers and include manufacturers from a variety of sub-sectors such as manufacturers of basic iron and steel, soft drinks, pulp, paper, and paperboard. The construction sector (in light grey or neon green in Sen 2018), which accounts for 6 per cent of connections in the network, appears to be well spread out across the core and the periphery, with no evidence of any one dominant supplier. The transportation and storage sector (in moderate grey or pink in Sen 2018) supplies a variety of services to the natural resource sector, including cargo handling, warehousing and storage, freight, and land transport. Of these, the cargo-handling sub-sector is observed to be the most ‘connected’ and consists of a few key suppliers that most buyers are dependent on. Other less-connected sectors that demonstrate the presence of ‘lead firms’ in the supplier network include information and communications (lighter grey, or light pink in Sen 2018), water supply (medium lighter grey, or purple in Sen 2018), and electricity, gas, steam, and air-conditioning supply (black, or navy blue in Sen 2018).

The limited purchase of domestically manufactured goods and services by the natural resource sector (as a whole) depicted in Figure 16.1 calls into question the growth policy relevance of fostering supply linkages to the (more narrowly defined) oil and gas industry. In fact, Tordo et al. (2013: 7) find that direct purchase linkages from the oil and gas industry, across forty-eight countries, is lower than that of other sectors. The authors note that few, if any, industries display a lower level of direct backward linkages. Utilizing actual input purchase transactions recorded in Uganda’s VAT dataset (rather than estimates based on input–output tables), I confirm that this may also be the case for the current country context.

Figure 16.2 depicts input–supply relationships across industries in the entire (formal) Ugandan economy in FY 2014/15. Each node now represents an industry (defined at the ISIC Rev. four-digit level). Edges represent the presence of supply relationships across industries. Supply relationships (or edges) have only been depicted for industries if the number of transactions between a given buyer–supplier industry pair exceeds 5 per cent of the buyer’s total purchase transactions over the period. Other aspects of the graph’s layout correspond to that of Figure 16.1—that is, more connected industries are positioned at the core, and nodes have been scaled up based on supplier ‘connectedness.’ However, the colour scheme has now been used to highlight *direct* backward linkages from the oil and

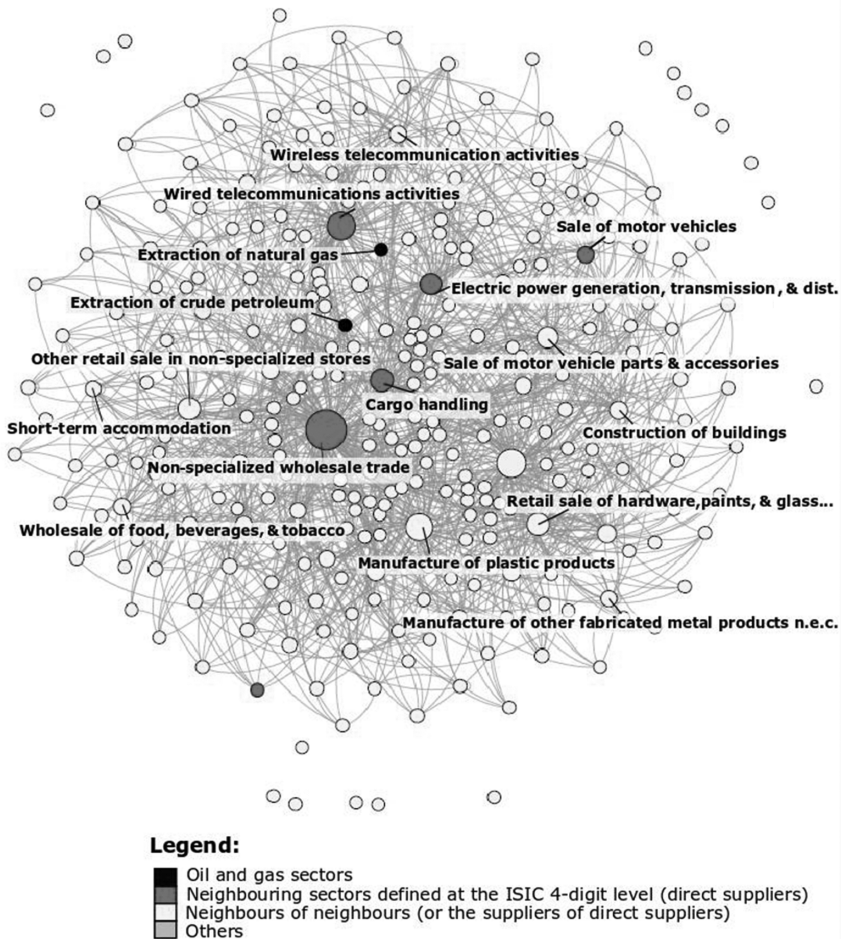


Figure 16.2 Direct and indirect backward linkages from the oil and gas sector, FY 2014–15

Source: Author's illustration based on data from the Uganda Revenue Authority

gas industry (coloured in black) to other supplier industries (dark grey here, or coloured in red in Sen 2018). Corresponding to the purchases observed at the firm level from the natural resource value chain, I find that the oil and gas industry (while still in its exploration and appraisal phase) purchased goods and services directly from the wholesale and retail trade, transport and storage, electric power generation, transmission and distribution, and information and communications sectors. However, the number of light grey and white nodes here (grey and yellow nodes in Sen 2018) underscores the numerous domestic industries that oil and gas companies were *not* making significant direct purchases from.

Figure 16.2 further extends the notion of productive linkages to encompass not only direct suppliers to the oil and gas industry, but also *indirect* linkages through

the industries which (in turn) sell inputs to supplying industries. This broader definition of backward linkages conforms to the approach first proposed by Chenery and Watanabe (1958) using input–output tables as discussed by Tordo et al. (2013: 164–5). Using actual purchase transactions recorded between the oil and gas industry (depicted in black), its direct suppliers (in dark grey, or red in Sen 2018), and the suppliers of suppliers (white nodes, or yellow nodes in Sen 2018), the economic reach and potential impact of the industry becomes much more apparent. Indirect suppliers that will be affected by the anticipated increase in demand from oil and gas companies include industries as diverse as short-term accommodation providers, plastic product manufacturers, and manufacturers of fabricated metal products. Notably, as the oil industry establishes further direct supply linkages the commencement of the engineering, procurement, and construction phase (followed by production and operations and maintenance), the network of indirect suppliers reached will grow exponentially.

The analysis of linkages through purchase transactions has important implications for the study of local content, and interventions required to support domestic preparedness for the upcoming increase in supply opportunities. Direct suppliers to oil and gas companies will need to ensure that their own supply chains (including domestically produced and imported input suppliers) are equipped to service the increase in production required to meet contractual obligations. To this end, the government of Uganda has access to an invaluable resource through its VAT transaction records (filed on a monthly basis) and ASYCUDA customs data (recorded at the transaction level). The analysis of these records, in conjunction with industry consultations, can help to create an evidence base to inform the design of targeted supplier development and support initiatives. This can be attained at little incremental cost to the government.

4.2 What capabilities do domestic firms have to enter the resource value chain?

Despite heightened public interest (and an elaborate regulatory framework) to enhance national participation in the oil sector, there is still limited evidence on supplier capabilities to service the industry. Available information sources include a slightly dated Industrial Baseline Survey commissioned by IOCs (SBC 2013), and a NSD maintained by the PAU. The NSD is a useful tool to provide basic information on registered suppliers, as sectoral regulations require all prospective suppliers (whether domestic or foreign) to be registered on the database.¹³ This includes data on company names, business type, sector of operation, business category, country of registration, physical address, and additional information (if

¹³ Requirements for inclusion in the database include: evidence of business registration, social security provisions for employees, tax compliance, and possession of a bank account.

Table 16.2 Oil and gas suppliers in Uganda: by sector and selected variables

Sector	Registered suppliers		Domestic firms in top 5 per cent
	in Uganda	abroad	above 95th percentile/ total assessed
[1]	[2]	[3]	[4]
Accommodation and food service	36	2	0/1059
Administrative and support activities	35	6	1/977
Agriculture, forestry, and fishing	5	0	9/369
Arts, entertainment, and recreation	1	0	0/172
Construction	158	42	7/3119
Education	10	1	0/78
Electricity, gas, and air-conditioning supply	23	6	12/203
Financial and insurance activities	37	1	8/265
Human health and social work activities	27	3	1/155
Information and communication	59	12	9/841
Manufacturing	52	79	44/1673
Mining and quarrying	26	32	3/123
Other service activities	138	26	0/1005
Professional, scientific, and technical activities	173	69	2/1208
Public administration and defence	1	0	1/799
Real estate activities	12	0	7/654
Transportation and storage	99	20	7/1015
Water supply, sewerage, waste management	16	10	0/85
Wholesale and retail trade	53	7	202/8058

Source: Author's calculations based on data from the PAU and the Uganda Revenue Authority.

any). As of 28 February 2018, 1,277 suppliers were registered on the National Suppliers Database, of which 75 per cent were companies incorporated in Uganda. However, the NSD does not convey *any* information on supplier capabilities in its current form.¹⁴ This subsection consequently draws on novel administrative data sources (e.g. VAT and PAYE datasets maintained by the revenue authority) to augment the publicly available information on domestic supplier capabilities.

Table 16.2 examines the composition of the NSD at the broad sector level. The table presents the number of domestic and foreign suppliers, classified on the

¹⁴ Future phases of the National Suppliers Database may include a joint qualification system, and an e-market for the procurement of goods and services.

basis of country of registration, in columns 2 and 3 respectively. Rows corresponding to sectors (listed in column 1) which feature in the schedule of goods and services reserved for domestic supply are highlighted in grey. The darker shade of grey implies that the whole sector has been reserved for domestic suppliers, whereas the lighter shade indicates that only specific sub-sectors have been reserved. For example, the transportation and clearing and forwarding sub-sectors have been reserved for purposes of domestic supply. However, this does not include all the sub-sectors that feature under 'transport and storage', such as warehousing and storage. Column 4 displays a representative measure of the capabilities of domestic firms under each sector. This indicator measures the number of domestic firms from each sector that feature in the top 5 per cent (i.e. above the 95th percentile) of most 'productive' firms in Uganda. The measure of productivity utilized here corresponds to sales or revenue earned per worker and has been constructed by combining firm-level sales information from monthly VAT returns with employment information from monthly PAYE tax returns.

A few limitations of the data in Table 16.2 should be noted. The measure of revenue per worker was constructed using yearly averages for firms corresponding to each sector over the period 2010–14/15. However, the number of suppliers registered on the NSD corresponds to a single point in time (suppliers registered in Uganda as of 28 February 2018). There is also no reason to suppose that the sample of domestic firms listed in the NSD corresponds (wholly) to the sample of firms which filed PAYE and VAT returns between 2010–14/15, although these are all tax-paying firms. Despite these limitations, the summary indicator in column 4 conveys useful information for two reasons:

- For any given sector the presence of non-zero firms among the most productive firms in the economy is indicative that it is indeed a competitive sector with high growth potential. This suggests the sector's importance from an economic policy perspective, and should feature in the prioritization of any supplier development initiatives rolled out by the government.
- Information on the number of firms in a sector that are above the productivity threshold relative to the total number of firms assessed is indicative of the presence (and probability) of a small or mid-sized population of highly productive domestic firms in a particular sector. This can help the government and IOCs to identify sectors in which supplier integration may be feasible and targeted in the short term.¹⁵

Overall, the data presented in Table 16.2 highlight several notable features. Columns 2 and 3 indicate that foreign suppliers outnumber domestic suppliers in

¹⁵ Ideally this analysis should be conducted at the sub-sector level to guide policy action.

the manufacturing and mining sectors. A closer look at the data reveals that foreign manufacturers typically dominate more technologically complex sub-sectors such as the manufacture of other electrical equipment, special-purpose machinery, and chemical products. This pattern conforms to expectations, as these industries are currently beyond the reach of Uganda's domestic industrial capabilities and have limited potential for local content development.

Column 4 further confirms the results of Spray and Wolf (2017) that high-productivity sectors in Uganda primarily consist of services (including information and communications, construction, transport and storage, wholesale and retail trade) and manufacturing sectors. Narrowly defined industries within these aggregate high-productivity categories (e.g. cargo handling, wireless telecommunication activities) that have the potential to supply the oil and gas industry along with a wider range of economic sectors may be relevant candidates for targeted supplier development initiatives. Fostering these 'connected' and high productivity industries can result in broad-based and sustainable economic gains. Notably, Spray and Wolf (2017) also find that the growth of productivity and output in these industries is a strong indicator of overall economic growth. However, it is worth emphasizing that even in the case of more productive and connected manufacturing and service industries (where a stronger economic case for local content can be argued), it is imperative to consider the costs and benefits of various policy options. Mandating local content requirements in these sectors can risk exacerbating supply bottlenecks (while raising input costs), not only in the oil industry, but all other industries that are connected through backward linkages.

The row-colour scheme identifying reserved goods and services, coupled with the productivity measure (column 4) highlight concerns that the accommodation and food service sector and water supply, sewerage, and waste management sector may be under-prepared to service the industry. Detailed assessments by the oil industry in SBC (2013) observed that the catering of camp facilities, food supply, and hazardous waste management industries were below required standards in 2012. Indeed, due to the lack of internationally recognized standard certification in occupational health and safety (ISO 45001) and quality management systems (ISO 9001:2008), no domestic catering firms were awarded contracts during the oil exploration phase in Uganda (Atuhairwe 2018). A more optimistic picture has emerged in the treatment of hazardous wastes sector, where the country has evolved from having non-existent capabilities (in 2013) to state-of-the-art facilities, such as a US\$20 million oil waste treatment plant in Nyamasoga.¹⁶

Figure 16.3 further presents the distribution of average labour productivity in (selected) sectors discussed above. These are presented in a logarithmic scale to facilitate cross-sector comparison. This implies that the histograms, although apparently normally distributed, are significantly skewed to the right in absolute

¹⁶ See Sen (2018: Box 2) for further details.

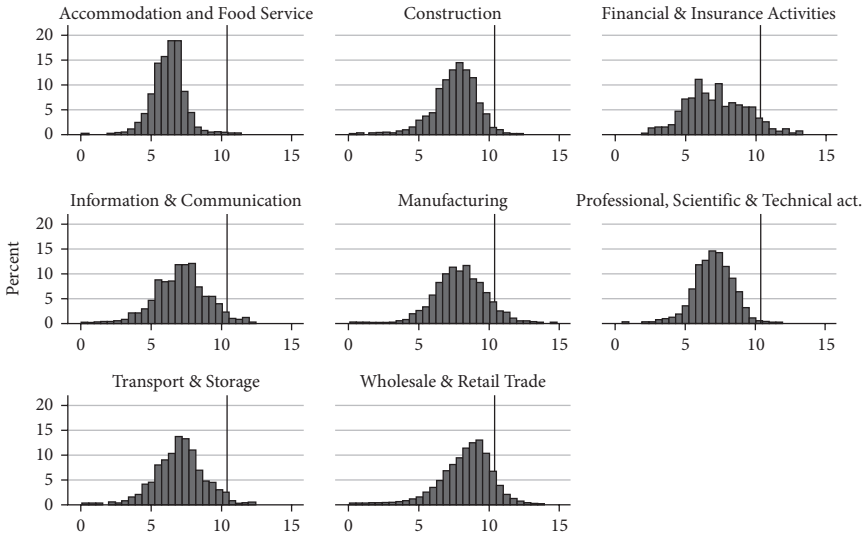


Figure 16.3 Distribution of revenue/workers across select supply industries, logarithmic scale

Source: Author’s illustration based on data from the Uganda Revenue Authority

terms. In other words, there is a consistent pattern across sectors where a large number of low-productivity firms are observed, and only a few high-productivity firms feature in the right tail of the distribution.¹⁷ The significant heterogeneity in firm productivity observed *within* sectors highlights another important consideration for the design of potential supplier development interventions: within a target sector, should interventions focus on the right tail of the productivity distribution to include only high-capability firms, or encompass the whole distribution of firms? This is an especially relevant consideration given the tight time frame for industrial supply opportunities in Uganda.

To approach the question posed above, it is useful to consider the capabilities of the median firm (in targeted sectors) relative to the requirements of the oil industry. Table 16.3 summarizes performance indicators of median firms from (a few) priority industries for local content development identified by SBC (2013). The study identifies twenty-five industries based on potential benefits to the economy (in terms of job creation potential and skill development) and feasibility—that is, investment intensity and time required for quality upgrading to industry standards.¹⁸ Columns 2, 3, and 4 present information on the number of employees hired, monthly revenue earned per worker, and monthly value added per worker

¹⁷ The vertical grey line in the diagram corresponds to the 95th percentile of the economy-wide labour productivity distribution. It is used to identify the number of firms in the top 5 per cent, as described in Table 16.3.

¹⁸ For succinct presentation, only selected manufacturing and service industries from the list of twenty-five industries have been included.

Table 16.3 Median firm by supply category and indicator, in 2015 US\$

Prospective suppliers	Employees	Revenue/ worker	Value-added/ worker	Industry standard
[1]	[2]	[3]	[4]	[5]
Manufacture of structural metal products	7	4,022	1,621	Below
Manufacture of furniture	7	3,599	708	Far below
Treatment and disposal of non-hazardous waste	9	253	142	Meets standard
Construction of roads and railways	19	702	0	Below
Construction of other civil engineering projects	19	1,336	1,028	Far below
Urban and suburban passenger land transport	9	282	65	Far below
Freight transport by road	10	1,801	976	Far below
Cargo handling	7	719	454	Far below
Restaurants and mobile food service activities	13	600	167	Far below

Note: Revenue/worker and value-added/worker are reported on a monthly basis in 2015 US\$.

Source: Author's calculations based on data from the Uganda Revenue Authority and SBC (2013).

(in 2015 US dollars) observed for the median firm in each supplier industry. These data correspond to the period 2010–14/15. For instance, the median cargo-handling firm has seven employees, earns US\$719 in revenues per worker, and adds value worth US\$454 per worker in a given month. Column 5 further provides information on the quality of goods and service provision in each of these industries, relative to the oil and gas industry's standards, as per SBC (2013).¹⁹ We observe that only one industry—the treatment and disposal of non-hazardous waste—conformed to the industry quality standard (in this list). As of 2013, oil and gas operators also perceived that five industries among the reserved schedule (corresponding to transport of goods and people, catering, and civil works) were *far* below industry standards.

An example from the transport industry may help to illustrate what it means to be 'far below' the industry standard in practice. SBC (2013) interviewed thirty-three companies in the transportation sector and found that a total fleet of 2,500 trucks operated in 2012. Of these, only companies supplying 200 trucks met required oil and gas producers' land transportation safety recommended practices and ISO 9001 quality management standards. Relative to the estimated increment in demand for trucks during oilfield development and production, the study estimated a supply gap of 700 per cent. Recent reports suggest that the transport and logistics industry

¹⁹ These assessments correspond to the year 2013, and may consequently be a little dated.

may still be under-prepared to service the demands from the oil industry, although a handful of indigenous firms (such as Bemuga Holdings and Globe Trotters Ltd) have acquired international standards certification (Rwothungeyo 2018).

5. Conclusion

Extant empirical evidence indicates that supply linkages to the external sector (whether direct or indirect) is an important driver of productivity improvements at the firm level (Atkin et al. 2017; Spray 2017; Spray and Wolf 2017). This chapter consequently focuses on LCPs as a means to leverage the anticipated demand pull from oil and gas exporters to foster supplier capabilities in a wide range of ‘connected’ goods and service sectors. The summary of extensive (and fairly ‘specific’) local content requirements in Uganda’s oil industry, however, suggests that the government has thus far leaned principally on legal and regulatory instruments to force productive linkages to national industry. Instead, market-enabling policies that support domestic firms to overcome the sizeable barriers to entry into these global value chains are more likely to yield an implementable and durable pattern of supplier integration. The importance of a collaborative approach to local content (as opposed to a ‘command and control’ approach) is already becoming apparent on large infrastructure development projects in Uganda, where local firms are losing out due to their inability to meet standards, in spite of legal directives to source locally (Kasemire 2018). Indeed, the key contention of this chapter is that the combination of limited supplier capabilities and insufficient capability-development interventions requires urgent remedial policy action.

A wide range of policy options are available to the government of Uganda to pursue a collaborative approach to local content management. This may include the establishment of an independent local content unit to foster buyer–supplier linkages through information provision, matchmaking, and networking (Steenbergen and Sutton 2017). A review of the existing institutional framework to promote local content in Uganda’s oil and gas sub-sector suggests that it may be important to distinguish responsibilities for this function from the sector regulator and the line ministry in charge of energy and mineral development. Instead, this chapter recommends the adoption of a long-term view in which institutions are developed to foster buyer–supplier linkages in the oil and gas sector, which can gradually be expanded horizontally to other sectors. This follows from the view that sub-sector-level LCPs are ultimately linked to national industrial development and employment-generation objectives.

The chapter further assesses oil and gas supplier capabilities by examining input-sourcing patterns from the natural resource value chain, and indicators of firm performance from tax administration datasets. The analysis underscores the need for capability-raising innovations or policies to support aspiring

domestic suppliers. However, the design of appropriate supplier development interventions, including their scope (targeted or broad-based), funding modalities, and effectiveness within a limited time frame require further investigation. The current analysis offers an approach towards the identification of programme scope—that is, (1) the prioritization of high-potential productive and ‘connected’ sectors; and (2) consideration of the within-sector distribution of firm capabilities (compared to industry standards) to assess whether a programme should only target high-capability firms or the sector more broadly.

I conclude with policy recommendations to ultimately refocus the government’s approach to local content promotion to much-needed supplier development initiatives. These are as follows:

- Establishment of the Industry Enhancement Centre (IEC) jointly planned by the government and IOCs to impart business and technical training to domestic firms, as a priority.
- Scaling up of existing business development training programmes (in the interim, prior to the establishment of the IEC) for domestic suppliers. This could include, for example, the E4D/SOGA programmes related to bid management and HSE compliance (see Box 1), which have demonstrated their effectiveness at a small scale.
- Design of policy interventions targeted at alleviating supply-side constraints (e.g. access to finance, standards certification) faced by priority supply industries.
- Extension of the NSD using updated information on supplier capabilities (e.g. firm performance, markets served, transaction history). This could help to guide prospective buyers, while enhancing the visibility of domestic suppliers.

References

- ActionAid (2015b). ‘Oil Waste Managers Face Lean Days, Criticism over Standards’. *Oil in Uganda*, 8 December. Available at: www.oilinuganda.org/features/environment/oil-waste-managers-face-lean-days-criticism-over-standards.html (accessed 31 July 2018).
- ActionAid (2017). ‘Australian Oil Firm Armour Energy Joins Uganda’s Upstream Oil Sector’. *Oil in Uganda*, 20 October. Available at: www.oilinuganda.org/features/infrastructure/australian-oil-firm-armour-energy-joins-ugandas-upstream-oil-sector.html (accessed 2 May 2018).
- Ampurire, P. (2018). ‘Cabinet Approves Local Content Policy for Oil and Gas’. *Softpower News*. Available at: www.softpower.ug/cabinet-approves-local-content-policy-for-oil-and-gas (accessed 31 July 2018).
- Atkin, D., A. K. Khandelwal, and A. Osman (2017). ‘Exporting and Firm Performance: Evidence from a Randomized Experiment’. *The Quarterly Journal of Economics*, 132(2): 551–615.

- Atuhairwe, R. (2018). 'Govt Asked to Help Indigenous Companies Get ISO Certification.' *The New Vision: Oil and Gas Journal*, 27 March.
- Chenery, H., and T. Watanabe (1958). 'International Comparisons of the Structure of Production.' *Econometrica*, 46: 73–84.
- Fluor (2018). *Fluor's Business Conduct and Ethics Expectations for Suppliers and Contractors*. Available at: <https://www.fluor.com/SiteCollectionDocuments/BRHQ056009-Supplier-Expectations.pdf> (accessed 3 May 2018).
- Herrera, J. J., S. Jarrín, and M. Morales (2016). 'Local Content Frameworks in Latin American Oil and Gas Sector: Lessons from Ecuador and Colombia.' Regional Evidence Paper. Lima: Evidence and Lessons from Latin America.
- Jacomy, M., T. Venturini, S. Heymann, and M. Bastian (2014). 'ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software.' *PLoS ONE*, 9(6): e98679.
- Kasemire, C. (2018). 'Ugandan Firms Could Lose out on SGR Opportunities.' *The Monitor*, 14 May. Available at: <https://allafrica.com/stories/201805140067.html> (accessed 11 September 2018).
- MEMD (2017). 'The Oil and Gas Sector in Uganda: Frequently Asked Questions.' Kampala: Ministry of Energy and Minerals Development. Available at: <http://pau.go.ug/about-us/resources/faqs/> (accessed 2 May 2018).
- Namubiru, B. (2018). 'Status of Oil and Gas Projects and the Skilling and Local Content Opportunities.' Presentation to the Skilling and Local Content Forum. Kampala: Petroleum Authority of Uganda.
- OAG (2015). *Annual Report of the Auditor General for the Financial Year Ended 30th June 2014*. Kampala: Office of the Auditor General, Government of Uganda.
- Rwothungeyo, B. (2018). 'Oil Logistics: How Ready is Uganda?'. *The New Vision: Oil and Gas Journal*, 3 April.
- SBC (2013). *Industrial Baseline Survey Report: Prepared for Total E&P, Tullow Oil and CNOOC*. Kampala: Schlumberger Business Consulting.
- Sen, R. (2018). 'Enhancing Local Content in Uganda's Oil and Gas Industry'. Working Paper 2018/110. Helsinki: UNU-WIDER.
- Spray, J. (2017). 'Reorganize, Replace or Expand? The Role of the Supply-Chain Learning by Exporting'. Working Paper. Cambridge: University of Cambridge.
- Spray, J., and S. Wolf (2017). 'Industries without Smokestacks in Uganda and Rwanda'. Working Paper 12/2017. Helsinki: UNU-WIDER.
- Ssekatawa, A. (2017). 'National Suppliers Database Will Foster Local Content in Uganda's Oil and Gas Sector'. *The Daily Monitor*, 22 September. Available at: <https://www.monitor.co.ug/OpEd/Commentary/National-suppliers-database-foster-local-content-oil-sector/689364-4106768-ep88w2/index.html> (accessed 2 May 2018).
- Steenbergen, V., and J. Sutton (2017). 'Establishing a Local Content Unit for Rwanda'. Policy Note. London: International Growth Centre, London School of Economics.

- Sutton, J. (2017). 'Towards a Common Policy Regime for Local Content in the East African Community: A Report to the Committee of Finance Ministers of the EAC'. London: International Growth Centre, London School of Economics.
- Tordo, S., M. Warner, O. E. Manzano, and Y. Anouti (2013). *Local Content Policies in the Oil and Gas Sector*. Washington, DC: World Bank.
- Wolf, S., and V. Aditya Potluri (2018). 'Uganda's Oil: How Much, When, and How Will It Be Governed?' WIDER Working Paper 2018/179. Helsinki: UNU-WIDER.

The Boom–Bust Cycle of Global Copper Prices, Structural Change, and Industrial Development in Zambia

Robert Liebenthal and Caesar Cheelo

1. Introduction

Since becoming independent in October 1964, Zambia has experienced a number of resource-based boom-and-bust cycles. Its main industry, copper mining, accounted for more than 90 per cent of exports in the late 1960s (Nash 1997). In 2017, that share was still 73.6 per cent (MOF 2018), indicating little diversification—although, as we discuss later, there has been variation over that period. Mineral exports other than copper exist, notably cobalt, gold, coal, manganese, and semi-precious stones, and in recent years cobalt, which is mined along with copper in several mines, has become increasingly important as global prices have strengthened due to the use of the commodity in electronics.¹ Despite this, mineral exports continue to be dominated by copper. Zambia remains around the world's seventh-largest copper producer and the second-largest in Africa, having ceded first place to the Democratic Republic of Congo in 2015. Thus, understanding the boom, or rather the cycle of booms and busts, over Zambia's economic history is almost entirely about understanding the fortunes and misfortunes of the copper mining industry, its impact on the rest of the economy, and how the industry and the broader economy have been managed during booms.

Much has been written about Zambia's experience in managing its mining industry and in trying to ensure that this industry benefits the economy of Zambia and its people. Successive development plans, most notably the Fifth, Sixth, Revised Sixth, and Seventh National Development Plans (2006–10, 2011–15, 2013–16, and 2017–21, respectively) have struggled with the issue. In particular, Adam et al. (2014) is a good starting point, offering perhaps the most exhaustive

¹ However, cobalt, at 1.3 per cent of exports in 2017, and gold, at 2.2 per cent, remain relatively small.

recent analysis of the topic; among their key conclusions was that, ‘Zambia is a country endowed with abundant natural resources that can be harnessed to put the country on a sustainable development path. Foreign ownership of mining companies and attractive tax incentives have limited the amount of resources that the economy can absorb from increased mining revenues’, and also that, ‘democracies find the conversion of natural resource wealth into sustained prosperity particularly difficult to manage’ (Adam et al. 2014: 14).

This chapter sets out to assess the prospects for Zambia’s natural resources, notably its mining industry, and the implications for its revenues, especially for the public sector, focusing particularly on the available evidence on the size of the revenues and the timing of their availability. Then, based on the country’s long and challenging experience of managing the fluctuating fortunes of the industry, it attempts to draw lessons for policy and institutional changes.

2. Zambia’s economic and political context

Zambia’s economic performance can be broken down into three main phases, drawing on the insights and observations of various authors (Adam et al. 2014; Bigsten and Kayizzi-Mugerwa 2000; Chan and Clancy 2000; IMF 2017; Kaunda 2002; Nash 1997; Ndulo and Mudenda 2004).

From independence in 1964 to 1973, the economy grew on average by 6 per cent per annum as mining output and copper prices rose (Nash 1997; Ndulo and Mudenda 2004). In 1970, the mining industry was partially nationalized, as the state took majority ownership of the mines, followed in 1973 by full nationalization and the abrogation of management agreements with the former owners. Eventually, ownership of the mines was vested in Zambia Consolidated Copper Mines Ltd (ZCCM), a wholly government-owned corporation. Also in 1973, Zambia became a one-party state following a socialist ideology, a situation reversed in 1991 when a multiparty dispensation was reintroduced (Chan and Clancy 2000).

The Movement for Multi-Party Democracy (MMD), which was elected in that year, espoused a liberal, free-market agenda and started a process of economic liberalization and privatization, culminating in privatization of the mining industry in 2000 (Bigsten and Kayizzi-Mugerwa 2000; Chan and Clancy 2000; Ndulo and Mudenda, 2004). From 1973 to 2000, the economy stagnated and per capita incomes actually fell, due to low copper prices and adverse terms of trade (oil prices having increased dramatically in the 1970s) as well as economic mismanagement. Copper output, which reached 750,000 tons in 1970, fell steadily to only 250,000 tons in 2000. From 2000 onwards, economic growth recovered,

averaging more than 6 per cent until 2009, when the international financial crisis hit and copper prices again dipped significantly. By 2009, copper output had again reached over 700,000 tons, following major investment in the sector by the new owners (Adam et al. 2014; IMF 2017) (see Liebenthal and Cheelo 2018: Figure 1).

3. Extent of the mineral resource

There are limited data on Zambia's mineral resource. A United States Geological Survey of undiscovered copper resources in Africa estimated that 8.4 million tons of undiscovered copper lies in the Roan arenite tract, which roughly covers Zambia's Copperbelt and Central Provinces (Zientek et al. 2014). However, this does not include the North-Western Province, which in 2017 accounted for 70 per cent of Zambia's production of 797,000 tons, with three of the largest mines, Kansanshi, Lumwana, and Kalumbila. Nor does it include Northern Province, where at least one investor is seeking to start a major mine. Although mineral reserve quantification studies and reports are hard to come by, the *Zambia Business Times* of 26 March 2016 quotes an 'economic report on Africa' as recording that Zambia had a copper reserve of some 35 million tons in 2016, equivalent to US\$228 billion at a copper price of US\$6,500 per ton (*Zambia Business Times* 2016).

The World Bank (2016) concluded that rules for licence allocations and geological data collection—that is, the *de jure* situation—are the highest-scoring aspects of Zambia's mining regime. In other words, the basic legal framework for Zambia's mining industry is reasonably sound. However, the World Bank also found issues relating to the awarding and retention of exploration and mining licences, which it said lacked transparency and consistency. It found weaknesses in three areas:

- interview responses on allocating and managing licences raised concerns about the use of discretionary power, whether procedures are followed in practice, the application of procedural timeframes, the application of sanctions on non-performing companies, and poor resourcing of the unit managing licence monitoring
- keeping the mining cadastre up to date
- the state of mapping and geological exploration, which falls short due to a low proportion of licensed ground being serviced by active mapping and due to limited recent geologic mapping, and because the development of geological information, including geological mapping and databases, is not strong.

The same report stated that geological mapping of the country is only 60 per cent complete and that there is no large-scale reconnaissance licence in place. Thus,

the full extent of Zambia's mineral resources is yet to be discovered, fully quantified through exploration, and exploited.

The Fraser Institute, which conducts annual surveys of investment perceptions among mining companies globally, ranked Zambia sixth out of fourteen African countries in 2017 for investment attractiveness, and seventy-first out of 104 globally—compared with forty-third in 2016 (Stedman and Green 2017). Respondents to that survey voiced increased concern over the taxation regime, the geological database, and political instability.

Zambia scored 50 out of 100 points in the Natural Resource Governance Institute's resource governance index for 2017 (NRGI 2017), with an above-average score for value realization (58/100) and the enabling environment, but below average for revenue management (35/100). The index was especially positive about ZCCM-IH,² which it rated the second-best-governed state-owned enterprise in sub-Saharan Africa. However, the pipeline of new investment in mining is limited. Recent investments have included the Kalumbila mine, output from which is already scaling up significantly, the Synclinorium investment by Mopani mine in Kitwe, and the new smelter at Kansanshi in Solwezi. Given the gestation period for new investment, it is possible that mining output could reach a plateau in the next few years. In addition, mining output and new investment have been constrained in the recent past by power shortages. Mining consumes about 55 per cent of Zambia's power generation.

Zambia has taken steps recently to address its power deficit, most notably by eliminating power subsidies and thus making power investment more attractive. This was despite resistance from the mining industry, which was the major beneficiary from the power subsidies. The current investment pipeline includes a 700 MW investment at Kafue Lower, some 600 MW of solar installations, and 350 MW from the Maamba coal-fired facility. Finance is being sought, by both public and private operators, through public-private partnerships (PPPs), for major investments at Batoka and on the Luapula River. There is reason, therefore, to be cautiously optimistic about the country's ability to meet its power requirements. The Commonwealth Development Corporation (CDC) is also taking a controlling interest in the country's largest independent power producer, the Copperbelt Energy Corporation, with a view to expanding its access to private finance.

As a result, the Seventh National Development Plan (7NDP) is cautious about projecting Zambia's future copper output, with a target of 1 million tons by the end of the plan period, compared with 797,266 tons in 2017 (Republic of Zambia 2017) based on current investment plans. At the same time, the 7NDP sets

² Zambia Consolidated Copper Mines-Investment Holdings (ZCCM-IH) was established in 2001 as the holding company for the minority shareholding that the Zambian government retained after privatization. Its shareholding ranges from 10 per cent to 50 per cent in ten mining companies.

out strategies to address these issues, notably through better geological information generation and provision; improved mineral processing; development of market linkages; and promotion of mineral exploration. Petroleum exploration is being promoted, and a number of oil blocks are being explored, but it is too early to estimate any yield from these efforts. At the time of writing, a new mining policy is reported to be under preparation, but no details are currently available.

Current price projections by the World Bank (2015a), the Fraser Institute (Stedman and Green 2017), and others indicate that prices for copper are likely to remain in the US\$6,000–7,000 range and that cobalt prices are also likely to remain high. Such projections are of course subject to great uncertainty, depending on an expanding world economy, especially with the growth of China, strong investment and construction demand, and the growth of the electric car industry. Recent actions on world trade by the US government could well lead to lower growth in world trade and the global economy. But even without such considerations, the track record of commodity price forecasts has been mixed—inevitably so.

4. How large are the resource revenues likely to be?

From 2013 to 2025, one estimate is that 5 per cent to 7 per cent of GDP can be raised from mining companies (Simpasa et al. 2013). This compares with 5 per cent of GDP (28 per cent of government revenue) in 2014. This estimate includes not only mineral royalty and company income tax, but VAT on imports, income tax (PAYE) on wages and salaries paid by the mining companies, and other payments. The key assumptions behind the lower figure are that the mining tax regime remains unchanged from 2013 and that unit costs for the industry increase at the same rate as they did from 2008 to 2012. Output and exports are assumed to remain at 2012 levels. This could therefore be considered a conservative estimate, given that both output and prices are now higher than at that time, and that output is likely to increase based on projects that have started since then or are in the pipeline. In US dollar terms, public revenues would remain at slightly over US\$1 billion per annum. Similarly, a World Bank projection in 2015—based on the mining tax regime in place then (subsequently revised)—projected public revenues at US\$1.5 billion by 2020, tapering off to US\$1.2 billion by 2013 (World Bank 2015b). However, a much more optimistic scenario from the same United Nations Development Programme (UNDP) source has revenues reaching US\$4 billion per annum, based on the expiration of capital allowances, significantly higher levels of production and exports, and higher prices. The conclusion is that the range of possible public revenue outcomes is large and uncertain. Notably, the lower range of possible revenue projections does not show a significant increase in public revenues from mining, indicating that there may, in fact, be no boom.

5. When are the revenues likely to come on line?

The future trajectory of mining revenues will depend on the extent of the resource (discussed above) and new investment. New investment in turn will depend in part on a range of government policies in the mining sector, notably support for exploration, licensing, and taxation.

As noted earlier, mining already accounts for a significant share of exports (75 per cent in 2015), government revenue (26 per cent), and GDP (10 per cent) (ZEITI 2015). In addition, mining investment over the period 2004–16 totalled US\$12.3 billion, about 70 per cent of the total foreign direct investment (FDI) stock in Zambia (BOZ 2017). It accounts for about 21 per cent of formal sector employment (World Bank 2015b).

As noted above, copper output had fallen from a peak of 700,000 tons in 1970 to 250,000 tons in 2000, partly because of low copper prices but also because of limited investment and high operating costs, leading to the mines losing some US\$20 million per month by the late 1990s. Under pressure from international donors, but also recognizing concerns about the performance of the mines, the mines were privatized, with the government holding a residual golden share of about 10 per cent on average in the privatized companies through ZCCM-IH.

The privatization process has been criticized and remains controversial. In particular, the Development Agreements (DAs) between the government and the new owners (which have never been officially published, but have been leaked) locked in taxation and other provisions for 15 to 20 years (depending on the particular DA³) in a way that prevented the Zambian government from benefiting from any price or profit windfall (Lombe and Mwakacheya 2017; Manley 2017). Specifically, mineral royalty was set at 0.6 per cent of gross sales value, less the cost of transporting, insuring, and processing/refining the products; company income tax (CIT) was set at 25 per cent of gross profits, less depreciation, price participation payments to ZCCM-IH, capital expenditure incurred during the year (100 per cent depreciation), and accumulated losses carried forward (Lombe and Mwakacheya 2017; Manley 2017). The DAs also included provisions for subsidized electricity—a significant distortion as the mines came to consume more than 50 per cent of Zambia's power output. As noted earlier, privatization contributed to a substantial increase in mining investment and consequently output, though the increase in copper prices during that period means that attribution is not straightforward. In general, for many commentators, the mines' privatization was seen as 'selling the family silver' (Kaunda 2002). Certainly, the sale of the mines coincided with the low point in the copper price cycle, with the probable

³ It should be noted that the DAs were not standard, and that different provisions applied to each mining company.

result that the mines were sold for less than they would have been, had it been possible to wait for better conditions.

Despite the Agreements, in 2008 the government introduced both a windfall and a variable profits tax, which—after protests from the mining companies—were eventually withdrawn (Adam et al. 2014). At the same time, the DAs were abrogated. In addition, the depreciation allowance was reduced from 100 to 25 per cent; the loss carry-forward was reduced to a maximum of ten years; hedging operations were to be taxed separately; and the mineral royalty was raised to 3 per cent and applied to gross sales (Manley 2017). An IMF assessment suggested that the result of these changes was to increase the average effective rate on mining in Zambia from around 31 per cent to 47 per cent (Adam et al. 2014), taking Zambia from being one of the lowest to one of the highest tax regimes among developing countries.

Following criticism from the mining companies, the tax regime was again changed in 2009. The windfall tax was withdrawn and the 100 per cent capital allowance was restored, but the royalty was increased to 6 per cent in the 2012 budget, sufficient—according to IMF estimates—to generate an additional 1.5 per cent of GDP (Adam et al. 2014). However, in the 2015 budget the mineral royalty rate was changed to 20 per cent for open-pit mines and 8 per cent for underground mines, while corporate income and profits taxes were set at zero. After only a few months, in July 2015, corporate income and profits taxes were reintroduced and set at 30 per cent, while the mineral royalty was set at 9 per cent for all mines.

In 2016, the mining tax regime was changed again, partly in response to pressure from the mining companies. The main change was the removal of the 9 per cent royalty and its replacement with a price-based royalty, similar to the windfall tax but at lower rates: 4 per cent when the LME price is below US\$4,500 per ton, 5 per cent when it is between US\$4,500 and US\$6,000, and 6 per cent when the royalty is above US\$6,000. With prices currently in the US\$6,000–7,000 range, this is significantly lower than the previous regime. In addition, the variable profits tax was removed (Manley 2017).

Manley also estimates that the effect of the new tax regime will be to reduce the effective tax rate for low-cost mines from about 58 per cent to about 43 per cent, and for high-cost mines from about 90 per cent to about 68 per cent. Most mines in Zambia, especially the underground mines, are relatively high-cost, (See Liebenthal and Cheelo 2018 figure 2). However, an increasing share of mining output is coming from lower-cost mines, mainly open-pit, in the North-Western Province.

Related to this, Manley argues that the new tax regime is less progressive with respect to price, and therefore less able to capture the rents generated by the mines. Since the royalty is applied to output, not profits, it does not capture rents directly. But it is a reasonable assumption that profits rise as prices rise, so that relating the royalty to price increases is an approximation to rent increases,

though probably not to total rents. Manley goes on to argue that the Zambian government will face pressure to increase taxes again if prices remain high. At the same time, if prices are lower in the future, a less progressive regime risks the closure of high-cost mines, with consequent impact on employment, especially in the politically sensitive Copperbelt.

Ideally, the tax regime would capture rents through profit taxes, which take account of costs. But mining costs are notoriously hard for the tax authorities to verify, and are widely suspected of being inflated specifically to avoid taxation. While there are challenges in verifying output and sales too, these are somewhat less difficult than those on the cost side and may be easier for the tax authorities to overcome. In general, lack of quality data on mining companies in Zambia has fuelled perceptions of large-scale tax evasion (World Bank 2016). Efforts to improve data quality and availability are proceeding. The Zambia Extractives Industries Transparency Initiative (ZEITI) has produced authoritative data up to 2015, but nothing more recent (ZEITI 2015).

In addition, the government is, with support from co-operating partners, implementing two projects aimed at addressing the data issue. The Mineral Value Chain Monitoring Project (MVCMP, www.mvc.org.zm), which is based at the Zambia Revenue Authority (ZRA), monitors the mineral value chain from exploration to export, one of its aims being to improve tax collection. In addition, it is establishing the Mineral Output Statistical Evaluation System (MOSES), which will produce comprehensive audited data on mining production and exports. Secondly, the Mineral Production Monitoring Support Project (MPMSP), based at the Ministry of Mines and Mineral Development (MMMD), also aims to support tax collection through effective regulation and monitoring of mineral production, particularly through capacity development at the MMMD. It aims to improve the issuance of mineral export permits and the analysis of mineral content through spot tests. Since early 2016, new monthly reporting systems for mineral production are being used to compare mines' production reports with their export permits and royalty reporting.

For obvious reasons, the extent of tax evasion and avoidance is hard to estimate and is the subject of controversy. The report of the High Level Panel on Illicit Financial Flows (IFFs) from Africa—also called the Mbeki Report—stated that Zambia loses around 9 per cent of its GDP to IFFs (AU/ECA Conference of Ministers 2014: 55). The UNCTAD (2016) study *Trade Misinvoicing in Primary Commodities in Developing Countries* found that over the period 1995–2014, 67.7 per cent of Zambia's copper exports went to China and Switzerland, both countries with high levels of export misinvoicing. In the case of Switzerland, no such exports are recorded by the recipient country, probably because the exports are effectively in transit to another destination (Readhead 2016). UNCTAD (2016: 16) found copper under-invoicing of US\$5.6 billion, equal to 10 per cent of Zambia's copper exports over the period. Global Financial Integrity, the Washington-based think tank, at one

point stated that Zambia lost US\$8.8 billion in IFFs between 2001–10 (Kar and Freitas 2012) and that the country was losing US\$2–3 billion per year to the mining industry, but then modified the claim, maintaining that the problem clearly exists but withdrawing the specific estimate (Forstater 2017a, b). Against this, the World Bank (2016) found that Zambia scored relatively well on tax policies and instruments, including rules for auditing, base erosion, and profit shifting.

The existence and extent of tax evasion and avoidance and IFFs related to the mining sector are inevitably the subject of political debate and pressure. For example, in March 2018 the ZRA announced that it had uncovered tax irregularities by a prominent mining company of ZMK76.5 billion (about US\$7.6 billion) resulting from the misclassification of consumables and spare parts at importation for the previous five years; the company subsequently identified itself as Kalumbila mine, owned by First Quantum Minerals, Zambia's largest mining company and largest tax-payer. Similarly, a dispute is ongoing between ZCCM-IH and First Quantum over the application of profits from Zambian mines to development expenditures at a South American mine. Such disputes are almost inevitable and no judgement as to their validity can be made here. However, they can increase the perceived risks of new investment if they are not handled within a rules-based framework which reflects consultation.

Lombe and Mwakacheya (2017) conducted interviews with mining companies and other stakeholders (unions, community sector organisations) to establish perceptions about the way government has handled the industry. In addition to concerns about policy consistency, they record a lack of consultation; a preference by government for operating through statutory instruments rather than legislation; a lack of appropriate analysis and impact assessments; the politicization of decision-making; and insufficient attention to revenue-sharing among central government, local government, and communities. While such agencies as the World Bank and the IMF, not to speak of the mining industry itself, argue for a stable and predictable tax regime, the relatively short-term time horizon for politicians in Zambia means that that regime—and indeed other aspects of mining policy—are at constant risk of change due to new developments, as well as new analysis. As Manley states:

The government faces two trade-offs when designing the tax regime. One is the desire for a progressive regime that captures rent and increases the overall stability of tax policy against the disinclination to expose the treasury to the risk of low mining revenue if prices fall. The other is the desire for a progressive tax regime on the one hand, and a regime that is simple enough to collect revenues and combat tax avoidance on the other. (Manley 2017: 17)

The political trade-offs around the tax regime are complicated further by the impact the mining industry has on employment, social development, and the

environment. Despite employing some 90,000 workers directly (about 8 per cent of formal employment; World Bank 2016), the numbers in indirect employment, especially in mining areas, are much larger. Likewise, despite the small share (approximately US\$2 billion annually: some 10 per cent) of goods and services consumed by the industry that are produced locally, many contractors to the mines use local labour and are subject to the fortunes of the mining industry. As noted earlier, this poses a particular challenge for the higher-cost operations in the Copperbelt, where some of the older mines are approaching the end of their lives. Recent experience in the absorption of job losses in the Copperbelt suggests, however, that these challenges can be managed through a combination of co-operation with the trades unions, retraining, and small business support.

Before privatization, ZCCM, as the state-owned mining company, provided a wide range of social services, (hospitals, schools, local infrastructure) in most if not all mining areas. With privatization, these responsibilities went to local authorities, which were ill equipped, both financially and organizationally, to carry them out to the standard to which they had been delivered under ZCCM. As stated in the MinGov report, 'a key shortcoming is the absence of a legislated requirement for sharing resource revenue between central and local governments' (World Bank 2016). The ICMM (2014) found that 'in 2012, the four mining companies (Mopani, KCM, Lumwana and First Quantum) spent just under US\$70 million on social investments', equivalent to 0.3 per cent of Zambia's GDP. In the Copperbelt, the companies have continued to run hospitals, health clinics, and some schools—in addition to training facilities aimed specifically at the development of mine-related skills. In the 'New Copperbelt', North-Western Province, where community expectations of services were lower, much attention has been paid to basic infrastructure and community services. At Kalumbila, a new township has been developed by the mining company. ICMM (2014) concluded that consultation and engagement around the services being provided by the mining companies was to be recommended; that a holistic approach to providing community services had been quite successful; and that alignment and partnership with local government and non-governmental organizations (NGOs) had been quite effective.

The long history of mining in Zambia has left a legacy of environmental damage in mining towns (World Bank 2016). At privatization, the responsibility for addressing this legacy was left with the government and with local authorities, which were and are ill equipped to handle it, both financially and technically. Kabwe, for example, still has levels of lead pollution as high as or higher than those of any other municipality in the world. Tailings dumps accumulated over decades of mining have not been cleaned up, since their owners (and many informal miners) believe that increased copper prices will at some point make recovery profitable. Meanwhile, the dumps are causing environmental health liabilities in local communities. In addition, copper smelters in several Copperbelt

municipalities have been responsible for sulphur dioxide (SO₂) emissions, potentially causing acid rain, soil erosion, crop damage, and air and water pollution. The Kafue River has been affected, which has given rise to some international activism by environmental NGOs. In addition, new (post-privatization) environmental liabilities are often inseparably mixed with the old ones, so that the responsibility for clean-up is unclear. In addition, some mining companies are not complying with existing regulations, specifically the requirements of the Environmental Protection Fund (EPF). In particular, the prospect that some of the old tailings could be processed at some point in the future (and the fact that some of them are being processed now by illegal small-scale miners who have some political influence) means that there is resistance to remediation. These liabilities may eventually become the responsibility of the state.

The government has attempted to address some of the environmental health risks. It succeeded in directly addressing some of the major risks, notably several tailings dumps, with some demonstrated impact on local exposure levels; and in achieving some policy and legislative progress, notably the Environmental Management Act of 2011 and operationalization of the EPF. However, as noted above, much of the legacy of pollution remains; the responsibility for addressing new environmental issues is ambiguous; and the institutional mechanisms for addressing these issues still require strengthening.

6. Fiscal policy and managing copper booms

In Adam et al. (2014), Paul Collier argues that three rules need to be instituted to govern depleting (or exhaustible) resources, apart from managing volatility. These are: a *savings rule*, which governs the share of resource revenues that should be set aside to offset the depletion of the resource; a process for *managing investment of the savings*; and a *debt strategy* which governs recourse to borrowing.

The savings rule can refer to both domestic private and public saving, i.e. assuming private saving is retained in the country and therefore available for local investment. While there is reinvestment of profits (savings) by the mining companies—in addition to new inflows from outside Zambia—there is to date no private Zambian-owned company in copper mining (though there are several small mines and some presence in the gemstone sector). Thus, savings in Zambia from the mining sector mainly take the form of public saving, which is essentially about taxation, and any dividend that might accrue to the government as result of its holdings in the mines through ZCCM-IH. On the public sector side, Zambia has not created a specific sovereign wealth fund for managing the natural resource revenues from copper mining. This long-term fiscal policy management stance is markedly different from that of, say, Zambia's neighbour to the south-west, Botswana. Like Zambia, Botswana is landlocked, and like Zambia, it is mineral-resource-rich, though mainly in diamonds. In 1994, the Pula Fund was established

under the Bank of Botswana Act, as a sovereign wealth fund to hold a long-term investment and form part of the country's foreign exchange reserves. The Pula Fund's goal is to preserve a portion of the income from diamond exports for future generations. Dixon (2016) reports that the Pula Fund is Africa's oldest and third-largest fund, and that it stood at US\$5.4 billion in 2016. Collier (Adam et al. 2014) notes that a savings rule such as the establishment and operationalization of a sovereign fund should take account of the time that complete depletion of the resource is expected to take: the closer it is to depletion, the higher the savings rate should be.

To date, Zambia has no mineral savings rule in place. Moreover, there is not—and never has been—any mechanism in place to address price volatility, for example through a stabilization fund. Without any savings rules, there is no systematic process for managing investment of the savings. Even successive development plans and annual budgets, while making implicit and, generally, conservative assumptions about likely mineral price trends, have not explicitly set out different possible revenue scenarios against which to plan different expenditure scenarios. While there is widespread recognition among policymakers that revenues can be, and generally are, volatile, the general sense is that little if anything can be done about the volatility itself. The main policy response is to emphasize economic diversification away from mining, a theme which appears in all plans and policy statements and is nominally given high priority. However, diversification has had limited success in practice.

Collier also advises using debt strategies as a fiscal policy anchor for managing resource revenues (Adam et al. 2014). Zambia published its first Medium-Term Debt Strategy (MTDS) in mid-2017 through the efforts of the country's Ministry of Finance (MOF 2017b). Between 2005/06, when the country secured debt forgiveness under the Heavily Indebted Poor Countries (HIPC) initiative and the Multilateral Debt Relief Initiative (MDRI), and around 2012, when renewed rapid debt accumulation began, Zambia had no need of a debt strategy. But with the mounting debt, which reached 58 per cent of GDP by 2016 (as we show in Section 7), Zambia needed a debt management strategy; hence the MTDS. However, the MTDS does not make any association between domestic resource mobilization strategies and copper mineral resource revenues or even global copper prices. If the strategy takes into account these important factors, it only does so covertly or implicitly. Thus, Zambia does not have an explicit resource revenue management strategy from a fiscal policy perspective.

7. How much spending? Fiscal projections

As noted earlier, the 7NDP sets a target for domestic revenue (including mining) at 18 per cent of GDP, which is in turn targeted to reach a growth rate of 5.5 per cent per annum by 2021. It also aims at keeping the fiscal deficit at 3 per cent of GDP,

so that public spending does not exceed 21 per cent of GDP (Republic of Zambia 2017). However, the fiscal deficit in 2017 was 7.8 per cent of GDP, against a target of 7.0 per cent, suggesting that significantly more fiscal adjustment will be needed to come into line with the plan. In addition, GDP growth was 4.1 per cent in 2017, and is projected by the World Bank at 4.3 per cent in 2018 and 4.7 per cent in 2019—below the 7NDP targets for those years (4.6 per cent and 5.2 per cent, respectively) (World Bank 2017). The composition of public spending also gives rise to scepticism that there will be any unencumbered windfall from the mineral resource in the near term. Personal emoluments absorbed some 42.5 per cent of current expenditure in 2017, while interest payments absorbed another 24.5 per cent (MOF 2018).

As one would expect, the fiscal projections on anticipated mineral revenue contributions to the overall fiscal position are hard to pin down. The 7NDP sets out targets, as reported earlier, but does not disaggregate mineral revenue. Over the medium term (2018–20), the Medium-Term Expenditure Framework (MTEF) projects that total domestic revenue will increase from ZMK47.9 billion in 2018 to ZMK65.9 billion in 2020 (MOF 2017a). The total mineral sector contribution (mining corporate income tax plus mineral royalties, excluding PAYE and import VAT) will increase from ZMK5.3 billion in 2018 to ZMK6.4 billion in 2020, while its share in total domestic revenue is projected to decline from 11.1 per cent of total revenue in 2018 to 9.7 per cent in 2020 (see Figure 17.1). The declining share reflects an intention by the authorities to slightly reduce fiscal dependency on the mines over time in the medium term. However, these projections predate the large increase in debt and debt servicing since 2017 (see later), which might be expected to increase pressure to tax the mines more heavily.

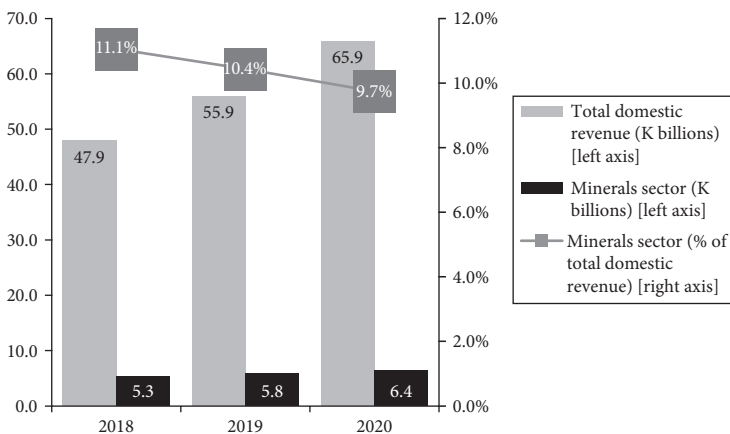


Figure 17.1 Revenue forecasts in the MTEF

Source: Authors' construction based on MOF (2017a).

8. Revenue-sharing arrangements

As argued earlier, Zambia's current mineral tax regime is broadly in line with good international practice and is capturing in the region of 40–70 per cent of pre-tax profits, depending on the cost structure of the mines. In addition, since ZCCM-IH holds between 10–20 per cent of the shares in the operating mines, except Lumwana, it can be claimed that there is additional benefit to the Zambian state, although this has typically taken the form of increases in asset values, since dividends have to date rarely been declared. However, these calculations do not take account of possible profit shifting, transfer pricing, etc., which are denied by the mining companies.

Leaving possible tax avoidance aside for the time being, the main issue with the current tax regime is its possible lack of progressivity if mineral prices increase. The presence of ZCCM-IH offers the potential for the Zambian state to influence the operating and investment policies of individual mines, though there are limits arising from ZCCM-IH's minority shareholder status. As noted in the MinGov report, co-ordination among the various government agencies involved in the mining sector, (the Ministries of Mines and Mining Development, Finance, and National Development Planning, and ZRA) could be improved (World Bank 2016).

It is generally argued that the tax regime should be stable and predictable. Certainly, investors will be sensitive to the 'prisoner's dilemma' whereby—once they have committed resources for investment and are locked in—they are vulnerable to various perceived assaults on their capacity to earn returns. However, it may be difficult for Zambia to maintain the present tax and royalty regime, especially if copper prices remain high, since there could then be a strong case for raising the royalty rate. In addition, as noted above, Zambia's debt situation and the need to raise resources for debt servicing will increase the pressure to recover more resources from the mining industry.

As noted earlier, Zambia is taking some steps to address tax avoidance through the MVCMP and the MPMSP, but these initiatives are in their early stages and focus mainly on the revenue side. Possible trade misinvoicing and transfer pricing aimed at under-reporting profits—while receiving some attention, as Readhead (2016) notes—may still require more.

9. Reducing sovereign debt

Zambia's public debt declined rapidly after the country qualified for debt relief under the Enhanced Initiative of the HIPC and MDRI, falling from 261 per cent of GDP in 2000 to 25 per cent only six years later in 2006 (Figure 17.2). Fiscal and current account balances jumped to one-off highs in 2006 before normalizing. Current account balances saw a short-lived episode of positive annual outcomes

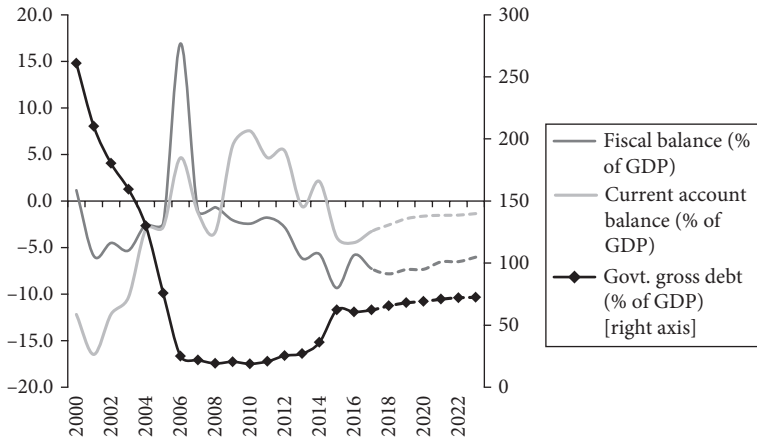


Figure 17.2 Fiscal and external balances and public debt

Source: Authors' construction based on IMF (2018).

from 2009 to 2012. Fiscal balances remained in deficit throughout, becoming deeper from 2014 onward. This reflected a rapid accumulation of debt, as the public debt stock rose from 36 per cent of GDP in 2014 to 62 per cent in 2015. The IMF (2017) estimated Zambia's debt stock at 56 per cent of GDP in 2017, very close to the 58 per cent of GDP debt stock estimate announced by the Ministry of Finance at an Economics Association of Zambia (EAZ) event about ten months later in August 2018. The IMF's prediction was that the debt will reach about 72 per cent of GDP by 2023 (IMF 2018), accompanied by twin (fiscal and current account) deficits. The IMF maintained its assessment of Zambia as being at high risk of debt distress, sustaining the opinion of a joint IMF-World Bank Debt Sustainability Analysis (IMF 2017).

However, with a reducing revenue percentage contribution from mining, no big bonanzas can be expected from the sector in terms of large revenue inflows for debt amortization, even in scenarios where global commodity (mineral) prices rebound further. Mining proceeds are more likely to be pooled with other revenues towards honouring constitutional obligations (the inflated public wage bill) and statutory obligations (interest payments on debt and arrears payments).

10. Exchange rate

Zambia's dependence on traditional (mainly copper) exports and therefore on global mineral commodity prices, particularly copper prices, places the country at risk of 'Dutch disease'—negative impacts on the economy through possible sharp rises in inflows of foreign currency associated with copper which make the country's other products less price-competitive on the export market—when global prices improve. For instance, global copper prices rebounded, increasing

by 21.3 per cent and 20.6 per cent per annum respectively, in 2016 and 2017, after a dramatic 29.9 per cent fall in 2015 (See Liebenthal and Cheelo 2018: Figure 5).

The dependence of Zambia's traditional export earnings on global mineral commodity price movements—copper prices in particular—is quite evident in the statistics. For instance, the annual percentage changes in traditional exports were directly correlated with annual changes in global copper prices over the period 2003–17 (See Liebenthal and Cheelo 2018: Figure 6 Panel (a)). However, the relationship between traditional export changes and the real effective exchange rate is less obvious (BOZ 2018).

One way of testing the competitiveness of non-traditional exports is to check whether the local currency is overvalued. The IMF (2017) conducted a real exchange rate assessment for Zambia. The assessment suggests that a large depreciation brought the real effective exchange rate closer to equilibrium in 2016. The results are based on the External Balance Assessment (EBA-lite) methodology,⁴ which included three approaches, namely: (i) the current account model (CA); (ii) the real exchange rate model (REER); and (iii) the external sustainability (ES) approach.

Table 17.1 in Liebenthal and Cheelo 2018 presents the three sets of results. In summary, the IMF finds the following:

- The CA approach suggests that the real effective exchange rate is about 5.6 per cent overvalued.
- The REER approach suggests that the real effective exchange rate is in line with fundamentals.
- The ES method indicates an overvaluation of between 4.2 per cent and 10 per cent.

These results show that the local currency was somewhat overvalued although they are inconclusive about the magnitude of the overvaluation. This means the improvement in global copper prices and the resultant increase in copper fortunes has had a small negative effect on the competitiveness of Zambia's non-traditional exports—*prima facie* evidence for mild Dutch disease.

11. Fiscal rules

Fiscal rules are long-lasting, legally-binding, quantitative limits or restrictions on budgetary aggregates. They are numerical bounds on budget aggregates like revenues, expenditures, public debt, and the budget balance. They restrain both the

⁴ The EBA-Lite methodology is an IMF innovation for comprehensively assessing an economy's external sector position, going beyond the conventional exchange rate and (balance of payments) current account components to include the assessment of external balance sheets, capital flows, and reserve adequacy.

executive and the legislature from amassing excessive powers and discretion in budget-setting and execution (Lienert and Fainboim 2010; Schaechter et al. 2012). Fiscal rules are generally established through legislation, or, in some cases, as constitutional provisions, thus lasting beyond a single fiscal year. They often last beyond the term of office of a single government (Schaechter et al. 2012). This promotes continuity and consistency in policymaking and execution. Proponents of fiscal rules favour them because they offer an avenue for recourse to legal sanctions in cases where political commitment and institutional capacities are weak.

However, opponents of fiscal rules argue that, at best, such rules could be taken as but one component of a wide fiscal framework or budget system laws (clear rules for formulating, executing, and reporting on the annual budget, as well as a clear statement of medium-term fiscal policy objectives). Many observers argue that the ultimate success of a fiscal framework will depend on the political commitment to implement it. Baunsgaard et al. (2012), for instance, emphasize that the issue of political commitment is not trivial, citing an extensive literature on the political economy of resource-rich countries which demonstrates its importance. And fiscal rules might actually compromise the prospects of success of the fiscal framework, particularly if policymakers realize that they can get away with flouting the rules without any sanctions.

The question we are therefore left with is: are economies that are prone to fiscal slippages better off or worse off with fiscal rules? Again, this issue requires a more systematic literature review and further study in order to determine the usefulness and reliability of fiscal rules for a country like Zambia.

12. Public investment

Rajaram et al. (2014) and the Public Expenditure and Financial Accountability Report (PEFA) (GRZ 2017) set out three broad areas for assessing public investment management:

- planning (including preliminary screening of projects for consistency with national strategies and objectives)
- allocation (including detailed project appraisal, project selection, and budgeting; i.e. linkage to the budget cycle)
- implementation (including protection of investment, funding availability, project management, and evaluation).

The most recent assessment of public investment management in Zambia is contained in the PEFA 2017 report, which paints a dismal picture. It reports that there is currently no public investment management system in place (GRZ 2017: 36). A Public Investment Planning Department has been established in

the Ministry of National Development and Planning, but without supporting legislation⁵ it is handicapped and lacks capacity. However, it is in the process of developing a comprehensive planning and budgeting framework (GRZ 2017: 37); and the 2018 budget proposal contained a commitment to strengthening the public investment management (PIM) system. Economic analyses of project proposals and major investments are not conducted or reviewed other than by the sponsoring entity (i.e. a ministry or parastatal agency), or as required by an outside financing entity such as a donor agency. No formal system is in place for project identification, screening, or appraisal. While provision for investment projects is made in the current-year budget, multi-year provision and protection of funding is not taken seriously. No standard procedures are in place for project monitoring, though progress reports are available selectively. As indicated earlier, mining revenues are not separated out from other public revenue sources, so there is no separate budget for such investments. In general, maintenance of public assets is underfunded, despite some efforts, for example through the Road Fund, to earmark funds for road maintenance. As reported in the PEFA, the maintenance budget is not adequate to maintain the quality of infrastructure.

As a result, comprehensive information is not available on how borrowed funds have been spent and whether such spending meets appropriate economic and social criteria. For the first two Eurobonds (US\$750 million issued in 2012 and US\$1,000 million issued in 2014), a detailed plan for their expenditure was issued (See World Bank 2017: 32), with most of the resources targeting infrastructure, mainly roads. The World Bank (2017: 32) notes that where resources have not been linked to specified investment, they have been largely used to finance public consumption.

Road investments are undoubtedly a priority in Zambia, though it can be argued that maintenance of the existing network deserves a higher priority than much new construction. Comprehensive road investment programmes are under implementation (the Link Zambia 8000 for US\$5.4 billion, the Pave Zambia 200 Project, plus urban road programmes for Lusaka and the Copperbelt). However, in addition to questionable priorities (notably major trunk road investments in areas of low population density and little-travelled areas), the costs of road construction in Zambia appear to be significantly higher than in other African countries (World Bank 2017: 33). In addition, serious questions have been raised about various recent investments, notably the procurement of 42 fire trucks in 2017 at US\$1 million each and a US\$280 million investment in a digital migration platform for public broadcasting.

⁵ Planning and budget legislation has been promised for some time, but has not been presented as at the time of writing.

Table 17.1 Expenditure releases on selected recurrent budget items

	2015		2016		2017	
	ZMK billion	% of DFE	ZMK billion	% of DFE	ZMK billion	% of DFE
Personal emoluments (PEs)	16.1	35	18.8	40	20.0	37
Interest payments	5.2	11	7.4	16	9.8	18
Strategic reserves (FRA)	1.9	4	0.9	2	1.0	2
Government goods and services	5.1	11	4.8	10	4.9	9
Farmer Input Support Programme (FISP)	2.1	5	1.9	4	2.8	5
Domestic finance expenditure (DFE)	46.2	100	46.7	100	53.8	100

Source: Authors' construction based on Ministry of Finance Annual Economic Reports (various), available at: www.mof.gov.zm/?page_id=5246 (accessed February–August 2018).

Finally, the strong spending appetite for recurrent (consumption) spending, particularly wages (personal emoluments), at the expense of investment expenditures has been a source of concern. Actual wage bill expenditure (releases by the Ministry of Finance) averaged 37.4 per cent of total domestically financed expenditure during 2015–17, marking personal emoluments as holding the largest share of recurrent expenditure in the country (Table 17.1). Because public sector wages and salaries are constitutionally protected from underfunding, the wage bill burden can be expected to remain a significant feature in Zambia's fiscal landscape over the medium term.

13. Conclusions

This chapter extends and amplifies the observations of others and also provides some new perspectives towards understanding the boom over Zambia's economic history, recounting the fortunes and misfortunes of the economy in the wake of swings in the copper mining industry. In many ways the chapter corroborates the views and assertions of others. For instance, Adam et al. (2014: 19) judge the period until 2002 in Zambia to have been a failure from the point of view of copper extraction and use:

Successive governments did not use the revenues from copper to accumulate productive assets. Instead, they were used to finance consumption subsidies for the population and production inefficiencies in the state-owned copper company. In reality, the policy was even worse: not only were revenues from copper used for these recurrent purposes rather than for investment, they were also used as the implicit collateral for international sovereign borrowing... Hence, far from accumulating assets, the country accumulated debts.

Adam et al. go on to argue that Zambia was saved from these errors by the rise in the world price of copper and by the debt forgiveness (HIPC and MDRI) that largely cancelled Zambia's debt by 2006. Some twelve years on, the risks and challenges described by Adam et al. remain all too evident.

Compared with 2002, Zambia in 2018 finds itself with a similarly bullish price outlook for copper and other commodities (most notably cobalt); with an industry that, through privatization, has begun to operate more efficiently and is contributing much more than it did in earlier periods to the public revenue; attracting significant foreign investment; but with an even more catastrophic accumulation of sovereign debt and virtually no prospect of official debt relief. As noted earlier, there is no mineral boom in prospect for Zambia given current price and output projections; rather, there is a reasonable chance of avoiding debt distress if strong fiscal management is put in place.

The current mining fiscal regime appears generally well placed to ensure a reasonable sharing of mineral revenues between the private sector and the state, with the possible defect that it is insufficiently progressive and will come under renewed pressure if copper prices are sustained at the present levels. If and when changes in the regime are contemplated, it will be important to base them on good analysis and, to the extent possible, on wide consultation.

Probably the main lacunae in the mining fiscal system are the weakness in data and, particularly, the vulnerability to mispricing, profit shifting, and other IFFs. It should be emphasized that there is little hard evidence on the amounts being lost through these means, but there can be no doubting the need for more transparency around all mining transactions, or the challenges involved in making this happen. A good start has been made with the MVCMP and MPMSP projects, but more will be needed. Related to this, strengthening capacity and co-operation among the key government agencies involved in the mining industry should remain a high priority. The widespread mistrust of the mining industry among stakeholders requires greater transparency, at a minimum, together with a stronger effort to improve the dialogue.

The recent accumulation of debt, and the great challenges to fiscal management, including but not limited to public investment mismanagement, should set in motion a process of learning the lessons and ensuring they are widely understood—in addition to the obvious need to achieve better fiscal results and manage the debt stock going forward. Zambia's institutions dealing with economic management have been weakened in the recent past, for reasons that need more investigation and analysis but which start with an apparently dysfunctional political system. The ability of Zambia to ringfence and prudently use the mineral revenues from copper mining in building productive capacities through asset accumulation remains elusive, as recurrent consumption expenditure demands dominate the fiscal landscape and the agenda of the fiscal authorities.

References

- Adam, C. S., P. Collier, and M. Gondwe (eds) (2014). *Zambia: Building Prosperity from Resource Wealth*. Oxford: Oxford University Press.
- AU/ECA Conference of Ministers (2014). *Report of the High-Level Panel on Illicit Financial Flows from Africa*. Addis Ababa: AU/Economic Commission for Africa.
- Baunsgaard, T., M. Villafuerte, M. Poplawski-Ribeiro, and C. Richmond (2012). 'Fiscal Frameworks for Resource-Rich Developing Countries'. Washington, DC: IMF.
- Bigsten, A., and S. Kayizzi-Mugerwa (2000). 'The Political Economy of Policy Failure in Zambia'. Working Papers in Economics 23. Gothenburg: School of Economics and Commercial Law, Gothenburg University.
- BOZ (Bank of Zambia) (2017). 'Foreign Private Investment and Investor Perceptions in Zambia 2017'. Lusaka: Zambia.
- BOZ (2018). 'Balance of Payments Statistics'. Available at: <http://www.boz.zm/balance-of-payments-statistics.htm> (accessed March–June 2018).
- Chan, S., and C. Clancy (2000). *Zambia and the Decline of Kaunda 1984–1998*. New York: Edwin Mellen Press.
- Dixon, A. D. (2016). 'The Rise, Politics, and Governance of African Sovereign Wealth Funds'. The Brown Capital Management Africa Forum Paper 3. Washington, DC: Wilson Center.
- Forstater, M. (2017a). 'Is the Idea of Counting Dollars of Illicit Financial Flows Undermining Action Where It Counts?' Washington, DC: Center for Global Development.
- Forstater, M. (2017b). 'Stop Spreading the Myth: Zambia Is Not Losing \$3 Billion to Tax Avoidance'. Washington, DC: Center for Global Development.
- GRZ (Government of the Republic of Zambia) (2017). 'Government of the Republic of Zambia Public Financial Management Reform Program: Report on the Evaluation of the Public Financial Management System of Zambia, November 2017 (PEFA 2017)'. Lusaka: GRZ.
- ICMM (2014). *Enhancing Mining's Contribution to the Zambian Economy and Society*. London: International Council on Mining and Minerals.
- IMF (2017). 'Zambia: 2017 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for Zambia'. IMF eCountry Report 17/327, October 2017. Washington, DC: IMF.
- IMF (2018). 'World Economic Outlook Databases: April 2018'. Available at: <https://www.imf.org/en/Publications/SPROLLS/world-economic-outlook-databases> (accessed April 2018).
- Kar, D., and S. Freitas (2012). *Illicit Financial Flows from Developing Countries: 2001–2010*. Washington, DC: Global Financial Integrity.
- Kaunda, F. (2002). *Selling the Family Silver: The Zambian Copper Mines Story*. Lusaka: F. Kaunda.

- Liebenthal, R., and Cheelo, C. (2018). 'Understanding the Implications of the Boom-Bust Cycle of Global Copper Prices for Natural Resources, Structural Change, and Industrial Development in Zambia.' WIDER Working Paper 2018/166. Helsinki: UNU-WIDER.
- Lienert, I., and I. Fainboim (2010). 'Reforming Budget System Laws.' Washington, DC: IMF.
- Lombe, W., and B. Mwakacheya (2017). *Experience of Mining Fiscal Reform and Renegotiation of Mining Contracts: The Case of Zambia*. Accra: Third World Network—Africa.
- Manley, D. (2017). 'Ninth Time Lucky: Is Zambia's Mining Tax the Best Approach to an Uncertain Future?' NRGi Briefing October 2017. New York: National Centre for Development Studies.
- MOF (2017a). *The 2018–2020 Medium-Term Expenditure Framework & The 2018 Budget*. Lusaka: Ministry of Finance.
- MOF (2017b). *Medium-Term Debt Strategy 2017–2019*. Lusaka: Ministry of Finance.
- MOF (2018). *Annual Economic Report 2017*. Lusaka: Ministry of Finance.
- Nash, J. (1997). 'Zambia.' In J. Nash and F. Foroutan (eds), *Trade Policy and Exchange Rate Reform in Sub-Saharan Africa*. Canberra: National Centre for Development Studies.
- Ndulo, M., and D. Mudenda (2004). 'Trade Policy Reform and Adjustment in Zambia.' Paper prepared for United Nations Conference on Trade and Development (UNCTAD). Geneva: UNCTAD.
- NRGI (2017). *2017 Resource Governance Index*. New York: Natural Resource Governance Institute.
- Rajaram, A., T. M. Le, K. Kaiser, J.-H. Kim, and J. Frank (2014). *The Power of Public Investment Management: Transforming Resources into Assets for Growth*. Washington, DC: World Bank.
- Readhead, A. (2016). 'Case Study March 2016: Transfer Pricing in the Mining Sector in Zambia.' New York: Natural Resource Governance Institute.
- Republic of Zambia (2017). *Seventh National Development Plan 2017–2021*. Lusaka: Ministry of National Development Planning.
- Schaechter, A., T. Kinda, N. Budina, and A. Weber (2012). 'Fiscal Rules in Response to the Crisis—Toward the "Next-Generation" Rules. A New Dataset.' IMF Working Paper 12/187. Washington, DC: IMF.
- Simpasa, A., D. Hailu, S. Levine, and R. Tibana (2013). 'Discussion Paper: Capturing Mineral Revenues in Zambia: Past Trends and Future Prospects.' New York: UNDP.
- Stedman, A., and K.,P. Green (2017). 'Annual Survey of Mining Companies 2017'. Vancouver: Fraser Institute.
- UNCTAD (2016). *Trade Misinvoicing in Primary Commodities in Developing Countries: The Cases of Chile, Côte d'Ivoire, Nigeria, South Africa and Zambia*. New York and Geneva: UNCTAD.

- UNCTAD STAT (2018). 'Data Centre'. Available at <http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx> (accessed May 2018).
- World Bank (2015a). 'Commodities Price Forecast (Nominal US Dollars)'. Washington, DC: World Bank.
- World Bank (2015b). 'Zambia Economic Brief June 2015: Making Mining Work for Zambia'. Washington, DC: World Bank.
- World Bank (2016). *Mining and Investment Governance Review: Final Report April 2016*. MinGov Report. Washington, DC: World Bank.
- World Bank (2017). 'Zambia Economic Brief December 2017: How Zambia Can Borrow without Sorrow'. Washington, DC: World Bank.
- Zambia Business Times* (2016). 'Zambia's Copper Reserves Estimated at \$228 billion'. 26 March.
- ZEITI (Zambia Extractive Industry Transparency Initiative) (2015). 'A Short Guide for Our Stakeholders on Revenue from Mining in Zambia for the Year 2015'. Lusaka: ZEITI.
- Zientek, M. L., J. D. Bliss, D. W. Broughton, M. Christie, P. D. Denning, T. S. Hayes, M. W. Hitzman, J. D. Horton, S. Frost-Killian, D. J. Jack, S. Master, H. L. Parks, C. D. Taylor, A. B. Wilson, N. E. Wintzer, and J. Woodhead (2014). *Sediment-Hosted Stratabound Copper Assessment of the Neoproterozoic Roan Group, Central African Copperbelt, Katanga Basin, Democratic Republic of the Congo and Zambia*. US Geological Survey Scientific Investigations Report 20105090T. Reston, VI: US Geological Survey.

The Construction Sector in Zambia

Caesar Cheelo and Robert Liebenthal

1. Introduction

The importance of good-quality infrastructure in determining the course of industrialization, structural transformation, and economic development in any economy is generally well established in the literature (ECA 2017; Page 2018). Economic infrastructure includes a range of basic services—physical structures, systems, institutions, services, and facilities—that are the foundational tool for developing the economy of a country, region, or city. The stock of physical infrastructure or physical assets is one of the bedrocks of industrial activity. It broadly determines the efficiency with which producers and consumers operate and interact in clearing markets, significantly shaping the fortunes of an economy.

A range of constructed or capital installations exist which qualify as (physical) infrastructure. These include: (i) *transportation systems* such as roads, bridges, walkways, rail, airports, and ports; (ii) *electric energy production and distribution systems* such as electric grids; (iii) *water and sanitation systems* that provide a supply of clean water, allow for water resource management, and support sanitation through waste disposal subsystems; (iv) *housing infrastructure*, including accommodation or buildings for residential and commercial purposes, office buildings, and extractive industry and manufacturing infrastructure or factories, which are specialized types of housing infrastructure; and (v) *telecommunication installations* like phone, television, or internet network installations, satellites, etc.

Because of the *public good* nature of most physical infrastructure, most efforts to install or build physical assets, particularly in developing countries like Zambia, tend to be public-sector-driven and state-funded. Granted, contemporary infrastructure projects in Africa are generally financed through loan and grant term-financing from cooperating partners or through public–private partnerships, albeit mainly limited to energy projects. However, even these foreign-financed projects must eventually be paid for by the host countries through loan or grant repayments. Thus, for a number of African countries the ultimate direct financing of infrastructure projects out of domestic taxpayer resources has been inevitable and its scale sizeable.

However, the *private good* nature of some physical infrastructure, particularly residential and commercial accommodation buildings in the private domain, must not be forgotten. In Zambia, both the private residential housing and the commercial office and retail outlet (shopping mall) subsectors have seen tremendous growth in the past eighteen years (2000–18), especially in urban areas. These dynamics are worth keeping in mind given the way they have changed the human settlement and retail aspects of the Zambian economy.

The construction sector is a critical determinant of how successful an economy will be at converting its public and private resources or investment efforts into physical assets. For instance, emerging evidence from a large sample of countries suggests that restricted sectoral competition results in relatively higher construction costs, which are in turn correlated with relatively poorer-quality infrastructure installations. Similarly, the success of building social infrastructure such as schools, health facilities, water and sanitation systems, and so on critically depends on the competitiveness of construction services. If construction services face bottlenecks or constraints in production and are unable to increase supply, any surge in demand, other things being equal, will force costs and prices to rise, reducing the output of physical asset for a given nominal investment outlay.

To deliver infrastructure, construction services require a range of critical factor inputs, including raw material inputs, (skilled and unskilled) labour, land, technology, finance, organization, and so on. Each can significantly enhance or constrain the expansion of physical assets. This study has a twofold objective, namely: (i) to identify the key bottlenecks and constraints in the construction sector in Zambia; and (ii) to identify policy options to enhance the sector's ability to respond to surges in demand for construction services. We consider these issues over the past decades in Zambia, with a bias towards the last eight years (2010–17). Broadly, in this study, we employ industrial organization and political economy tools as the main conceptual and analytical lenses, and we draw on secondary data as the main basis of empirical observation and inferencing. The methodology we utilize is simple and straightforward, and is self-evident as part of the presentation of the main observations and insights.

The rest of the chapter is structured as follows: section 2 presents a basic description of the industrial organization of the construction sector in Zambia; section 3 assesses the key bottlenecks, constraints, and challenges in the construction sector; and section 4 concludes the chapter with a summary of plausible policy options for dealing with key bottlenecks in construction.

2. Organization and change in Zambia's construction industry

The demand for construction services, which are responsible for expanding the stock of physical assets of infrastructure in Zambia, stems from the evolving

demographic, political, and economic circumstances of the economy. These aspects are highlighted in turn in the subsections that follow.

2.1 Demographic, political and economic changes, and construction in Zambia

Zambia's population was projected at 16.4 million inhabitants in 2017 (CSO 2013). The country covers a land area of 752,618 km² (World Bank 2018b), meaning a fairly low population density of 22 persons per km² compared with an average density of 44 persons per km² in sub-Saharan Africa. The urban population is estimated at 42 per cent of the total population, with the rest (58 per cent) residing in rural areas. Outside the national parks, game reserves, Game Management Areas (GMA), and forest reserves, most rural and urban spaces in the country are occupied by human inhabitants, although some districts are very sparsely populated, with extremely low densities—e.g. Mulobezi in Western Province, with 3.0 persons per km², Luano in Central Province (3.6), Mufumbwe, North-Western (3.8), Ngabwe, Central (4.0), Kasempa, North-Western (4.1), and Sesheke, Western (4.3) (Brinkhoff 2018). These human settlement patterns in rural areas add to considerable pressure on the authorities to expand Zambia's public-sector infrastructure development agenda to cater for the rural areas. This is because even the most sparsely populated areas are entitled to physical infrastructure (roads, electricity, infrastructure, schools, health facilities, water and sanitation, etc.).

Conversely, the high population densities in urban areas have raised demand for commercial and residential real estate, thus pushing up demand for building construction services in these areas. Lusaka District, where the capital city is located, has by far the highest population density at 5,808 persons per km² compared with, say, 856 persons per km² in the second most densely populated district, Kitwe (Brinkhoff 2018). Lusaka has therefore established itself as the most preferred destination for private investments in residential housing, as well as in commercial private buildings for office accommodation and retail space (shopping malls and supermarkets). The demand for related building construction services is therefore much greater in Lusaka than in other parts of the country. Added to these human settlement pressures, the current political dispensation is anchored on an economic philosophy of state-led development, to be achieved primarily through public goods infrastructure expansion. The *2011–2016 Manifesto* of the ruling political party in Zambia, the Patriotic Front (PF), asserts that:

Under the MMD government, investment in infrastructure development has been limited and the pace of development slow. Part of this is due to an obsession with

maintaining ‘tight money’ through fiscal and monetary policies. This has resulted in many parts of Zambia resembling ghost towns despite more than five years of record mineral prices and a production boom. (Patriotic Front 2011: 29)

In 2011, when the PF came to power, its manifesto locked the country into an ambitious infrastructure development path that persists today. The public infrastructure development ambitions are also seen in the *Seventh National Development Plan 2017–2021* (7NDP; Republic of Zambia 2017). The 7NDP has ten Strategic Development Outcomes, including one on ‘Improved Transport Systems and Infrastructure’, which focuses on construction and rehabilitation of railways; development of aviation infrastructure and operations; construction and rehabilitation of the road network; and construction and rehabilitation of maritime and inland waterways. Beyond this, the Development Outcomes in agriculture, tourism, water and sanitation, information and communication technology (ICT), etc. all incorporate components of related infrastructure development.

Ultimately, the underpinning philosophy of a sustained expansionary fiscal path committed Zambia to, initially, two major infrastructure development undertakings, namely:

- the Link Zambia 8000 road project—also known as Accelerated National Roads Construction Programme (ANRCP)—which was initiated in 2012, aiming to transform Zambia into a land-linked country through extension of the surfaced core road network by 8,000 km in three phases
- the creation of new districts and revitalization of old ones, which saw an expansion of the total number of districts from 72 in 2011 to at least 108 in 2017 (Brinkhoff 2018), with all the new districts requiring administrative infrastructure (offices and personnel housing, schools, health facilities, road network, etc.).

To date, Zambia’s political commitment to development through infrastructure expansion has remained consistently strong, particularly during the period 2013–17. The country’s nominal expenditure on non-financial assets (NFAs) (or capital spending on physical assets) grew from ZMK2.5 billion in 2010 to a peak of ZMK12.8 billion in 2015 before slowing down somewhat to ZMK8.3 billion in 2017 (Figure 18.1, Panel (a)). Concurrently, the share of NFA expenditure increased from 17 per cent of total budget expenditure in 2010 to a high of 25 per cent in 2015 (the year before the general elections of 2016), but declined to a period low of 14 per cent in 2017 (a year after the elections).

The government roads programme was the most dominant planned non-financial capital expenditure item in the National Budget during 2010–17 (Figure 18.1, Panel (b)), accounting for an annual average allocation of 42 per cent of NFAs over the period. The other major capital expenditures, such as rural electrification, power rehabilitation, railway line rehabilitation, and water and

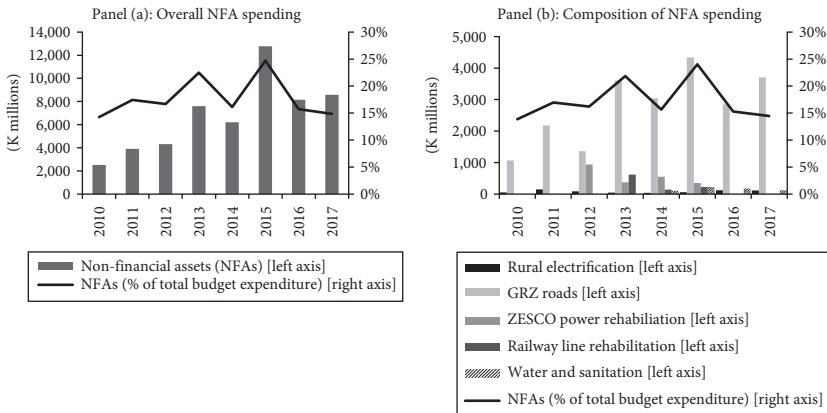


Figure 18.1 Public expenditure on physical assets

Notes: GRZ = Government of the Republic of Zambia; ZESCO = Zambia Electrical Supply Company.

Source: Authors' construction from Ministry of Finance Annual Economic Reports (available at: www.mof.gov.zm/?page_id=5246, accessed Fe–Aug 2018) and Fiscal Tables (provided privately).

sanitation were relatively small and intermittent to varying degrees during the period. Surprisingly, significant electric power rehabilitation expenditures were made during 2012–15, with part of the financing (about US\$255 million, or 34 per cent) meant to come from borrowed proceeds (US\$750 million) from the 2012 Eurobond (World Bank 2017). However, the notable expenditure seen in Figure 18.1, Panel (b), failed to protect Zambia from the power shortage that would ensue as a result of a partial drought in 2015.

Overall, it can be expected from the foregoing that the demand for construction services in Zambia will continue to be significantly influenced by the public sector's demand for and expenditure on major infrastructure development projects and programmes. In turn, these decisions will continue to be significantly determined by the political dispensation, particularly the appetite for infrastructure development as a key avenue towards economic growth and development.

As the political economy factors driving construction and infrastructure development in Zambia continue, policymakers and decision-makers would do well to pay attention to the efficiency of the country's investments. Although somewhat cursory, one popular and quick way of gauging the efficiency or productivity of investment is to calculate and assess the incremental capital–output ratio (ICOR). The ICOR is computed as the investment-to-GDP ratio (investment as a percentage of GDP) divided by the GDP growth rate (per cent). It measures the marginal amount of investment capital necessary for an economy to generate an extra unit of production output (or GDP). Overall, the higher the ICOR value, the lower the productivity of capital (or the higher the inefficiency of production).

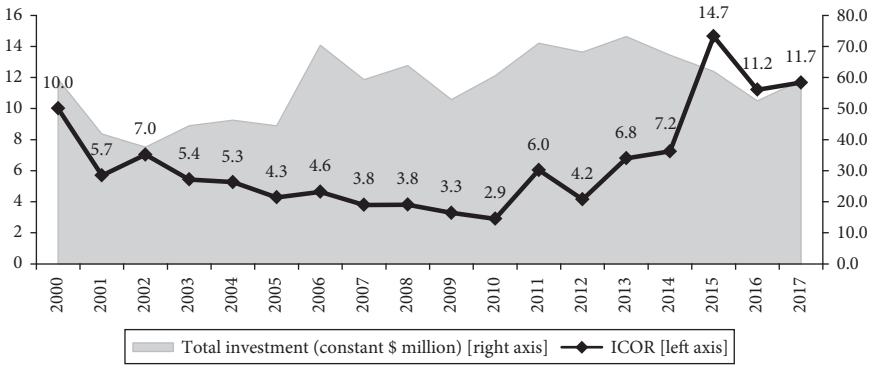


Figure 18.2 Real total investment and capital productivity

Source: Authors' construction based on IMF (2018).

Over the period 2000–17, Zambia's ICOR first declined steadily between 2000 and 2010, reflecting gains in production efficiency during the period (Figure 18.2). On average, over 2000–10, the country's annual ICOR value was 5, implying that US\$5 of capital investment was necessary to generate US\$1 of extra GDP. Then, from 2011 onwards, except in 2012, the ICOR value increased markedly and sustained high value until the close of the period. The annual average ICOR value over the latter period was 9, implying that to generate US\$1 of extra GDP now required not US\$5 but US\$9 of capital investment—suggesting that Zambia became less efficient in its use of capital. The country's capital stock has become increasingly less growth-enhancing, thus raising questions about, among other things, the quality of investment spending and in particular the quality of the construction services that are responsible for the capital formation (or installation of infrastructure).

From the perspective of sectoral economic activity, the growth of the construction sector has been impressive over a sustained period. This performance has been significantly underpinned by Zambia's aforementioned high propensity to spend on infrastructure development. Save for two short episodes (2007–9 and 2012–13), the real growth rate in construction value added has always been higher than the overall real GDP growth rate since the turn of the twenty-first century (Figure 18.3). However, construction sector growth has also seen a higher degree of volatility than the overall real GDP growth trajectory.

Underpinned by robust growth, the contribution of construction services to the economy has increased markedly. The share of construction in economic activity increased rapidly from 3.6 per cent of GDP in 1995 (three years after the liberalization reforms of 1992) to a sectoral peak of 10.9 per cent in 2000, and then declined marginally to 10.3 per cent in 2017 (CSO 2018).

In terms of employment, out of the total of 5.9 million employed persons in 2014 (CSO 2015), construction accounted for 182,806 workers (or 3.1 per cent of

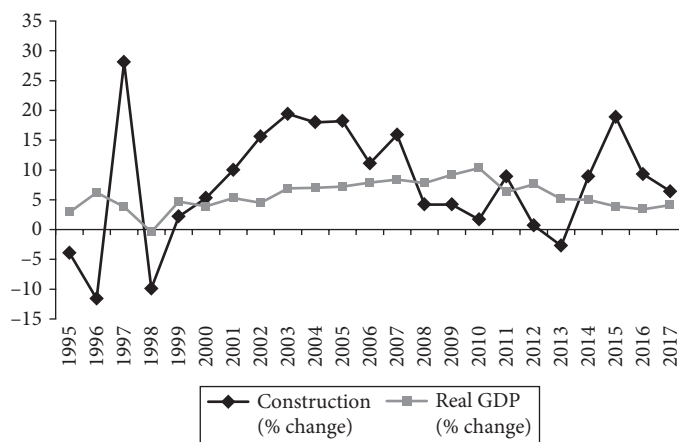


Figure 18.3 Percentage changes in GDP, by type of economic activity (constant prices)
Source: Authors' construction based on CSO National Accounts data (provided privately).

the total). Of these, 59,085 (32 per cent) were employed in the formal sector while 123,721 (68 per cent) were in the informal sector.

The average earnings for paid employees in construction in 2014 was ZMK1,834 per worker (ZMK1,851 for men and ZMK1,401 for women) compared with relatively higher earnings overall across all industries combined (ZMK2,344 both genders, ZMK2,427 men, and ZMK2,129 women). On the other hand, the average work time for employed persons (15 years or older) in 2014 was 44.7 hours per week (44.8 hours for men and 42.3 hours for women) compared with 40.7 hours per week on average overall across all industries (43.4 hours for men and 37.2 hours for women). This indicates that, on average, workers in construction typically worked for longer than their counterparts in other industries but earned relatively less. And this is despite the impressive real growth in construction sector value added and shares of GDP at the macroeconomic level.

2.2 Construction industry organization: cost and pricing implications

The construction industry can be viewed in terms of the supply of and demand for construction services. The industry is therefore organized in terms of the number of suppliers and consumers, the pricing mechanisms, the ease of entry and exit, the level of information flow (or asymmetries), and so on (industrial organization lens).

On the supply side, the National Council for Construction and Zambia Institute for Policy Analysis and Research (NCC and ZIPAR 2017) report that the NCC

recorded 3,081 registered firms in 2016. This increased to 3,791 as of 30 September 2017 according to the NCC list of registered contractors (NCC 2018). In terms of ownership, NCC and ZIPAR (2017) estimated that most of the firms (91.4 per cent) in the construction industry were Zambian-owned, with foreign-owned firms only accounting for 4.4 per cent and jointly owned firms for 4.2 per cent. Although foreign-owned firms constituted less than 5 per cent, they generally dominate the industry in terms of the value of contracts awarded. For instance, in 2014, 90 per cent of foreign-owned construction firms which submitted public tender bids successfully secured the tenders, compared with the 3.8 per cent of Zambian-owned firms which were successful in the same year.

In the Zambian context, it is important to note that construction firms are graded based on each firm's capacity to deliver, which is determined as a mix of the firm's previous contracts, access to credit, numbers of professional and technical staff (human resource competence), financial position (including operating capital endowment), and state of technology. The grading system is numeric, with 1 the highest grade attainable and 6 the lowest. The higher the grade, the higher the annual registration fees a firm is required to pay. In 2014, the registration fee was ZMK7,750 for Grade 3 firms and only ZMK625 for Grade 6 firms.

The NCC and ZIPAR (2017) survey shows that the majority of the firms in construction (87.9 per cent) in Zambia in 2017 were registered in the lower grades (4–6), while firms in higher grades (1–3) account for about 12.1 per cent (Figure 18.4). This is corroborated by the registration pattern revealed in NCC (2018) (Figure 18.5). With firms in lower grades having limited values on the contracts that they execute, this market composition entails that higher-grade firms—i.e. firms that can generally afford higher registration fees—are inherently able to capture significantly larger market shares.

Thus, while the construction sector, on the supply side, allows for a fairly high degree of openness, making room for firms to freely enter into and exit from

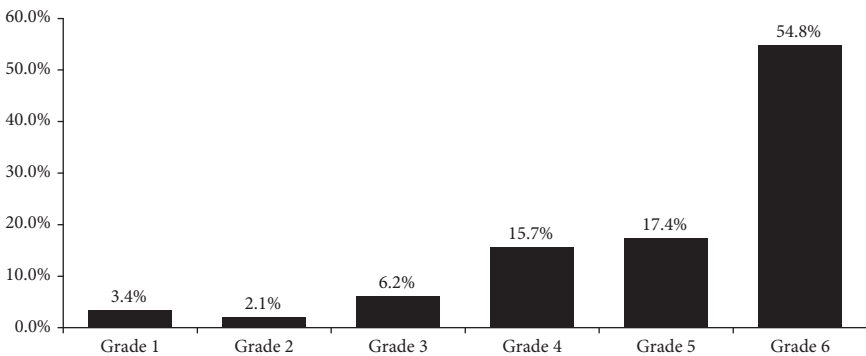


Figure 18.4 Grading of construction firms in Zambia, by overall proportion (%)

Source: Authors' construction based on NCC (2018).

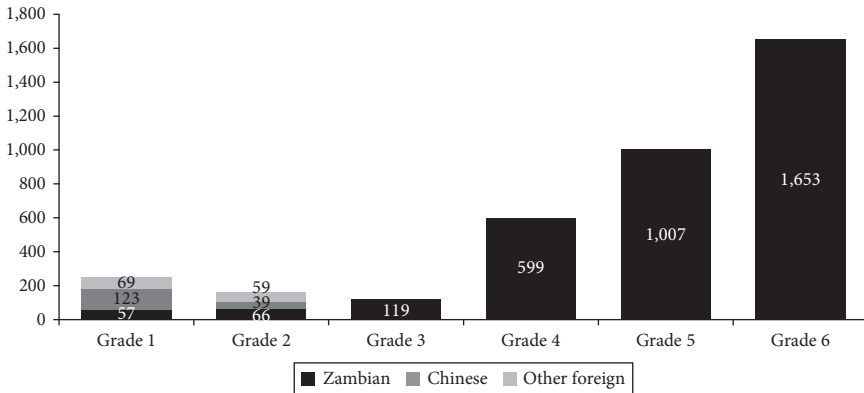


Figure 18.5 Grading of construction firms, by number and ownership

Source: Authors' construction based on NCC (2018).

the market, the registration fee, operating capital endowments, human resource competence, and state of technology all allow firms to significantly differentiate the construction services they are able to offer, thus posing a constraint on lateral firm movement to higher grades within the sector. It is on the basis of observations like these that the Ministry of Commerce Trade and Industry (MCTI 2018) has argued that, while the number of infrastructure projects in the construction sector in Zambia has been on the increase, there has been limited participation of local firms and inputs; MCTI has therefore argued for a local content strategy.

At face value one might expect the construction industry in Zambia to be characterized by monopolistic competition—a type of imperfect competition where market entry and exit are highly feasible and, more importantly, where many price-taking producers (firms) sell goods or services that are differentiated from one another and hence are not perfect substitutes (Gans et al. 2003). But, as we show later in this section, the industry is actually characteristic of an oligopoly, with very few dominant firms within each of the six construction sector service areas, namely: (i) Category B—general building and housing; (ii) Category C—general civil engineering works; (iii) Category E—general electrical and telecommunications; (iv) Category M—mining services: construction works within mining areas; (v) Category Me—mechanical engineering works; and (vi) Category R—general roads and earthworks.

It is partially in light of this industrial structure and the limitation that it imposes on local participation that Phiri (2016) analyses the 20 per cent subcontracting policy in the Zambian construction sector, assessing its efficacy in developing the capacity of local contractors, and finds that:

- It would be difficult to grow the capacity of local contractors using the policy because of a limited and weak implementation framework.

- The policy statement only covered the road subsector and was silent on the other salient subsectors such as building and energy installation construction.
- The policy did not have any measures or implementation framework for how its objectives would be achieved.; and
- Foreign contractors were not willing to build the capacity of local contractors as there was no incentive for them to do so.

Saasa also finds that:

The 20 percent subcontracting initiative is neither policy nor law. NAMSSC has been pushing the Government to work on a legislation which would lead to increased compliance. The initiative has not been working as earlier envisioned... The transfer of technology or skills development is not working because RDA nominates political cadres with no qualifications and knowledge in construction but may produce NCC registration certificate. These politically inclined beneficiaries normally trade-off the 20 percent with Chinese contractors. Those that manage to participate face delayed payments of up to two years.

(Saasa 2018: 26)

Clearly, issues of efficiently, effectively, equitably, and justly promoting local content in construction should be a high priority on the Zambian agenda for construction sector development if the sector is to deliver the structural change and industrial development it is meant to bring to the country. *The demand side* of the construction industry can be compartmentalized into three broad sub-groups of consumers of construction services, namely households, private firms, and the government.

Households' direct demand for construction services is mainly exerted through demand for housing accommodation. According to the Living Conditions and Monitoring Survey (LCMS) of 2015 (CSO 2016), the distribution of households by the type of housing they occupy and by tenancy status (Table 18.1) reveals current (2015) housing service consumption patterns across the country. About 81.3 per cent of urban households are resident in detached houses, flats/apartments, or semi-detached houses, compared with only 16.6 per cent of households in rural areas.

Moreover, the largest proportion of urban households (49 per cent) occupied rented private accommodation, followed by households in owner-occupied residences (41.4 per cent); in rural areas the vast majority (90.8 per cent) are resident in owner-occupied houses. Notwithstanding these patterns, the draft national housing policy (MLGH 2016) estimates that Zambia's housing deficit was at 1,539,000 units in 2016, of which 40 per cent were urban area deficits and 60 per cent were rural. The situation analysis in the draft policy suggests that Zambia has continued to experience rapid urbanization (and great demand for urban

Table 18.1 Percentage distribution of households, by type of housing and tenancy

Type of housing unit								
	Traditional hut	Improved traditional hut	Detached house	Flat/apartment	Semi-detached house	Servants' quarters	Other	Total no. of households
Zambia	32	21.5	28.5	10.4	5.5	1.3	0.8	3,014,965
Rural	52.9	29.9	14.2	1.3	1.1	0.1	0.4	1,718,060
Urban	4.3	10.2	47.4	22.5	11.4	2.8	1.4	1,296,905
Tenancy								
	Owner- occupied	Rent from institution	Rent from private owner	Free Housing	Other	Not stated		Total no. of households
Zambia	70	1.8	22.2	5.9	0.5	0.0		3,014,965
Rural	90.8	1.1	2.0	5.8	0.3	0.0		1,718,060
Urban	41.4	2.8	49.0	6.1	0.8	0.0		1,296,905

Source: Authors' construction based on CSO (2016).

housing) due to, among other things, the limited economic opportunities and poor access to economic and social infrastructure, including social amenities and services, in rural areas.

Regarding firms' demand for construction services or infrastructure, surprisingly little information and data exist to offer deep insights. In principle, it is argued that demand mainly comes indirectly, in terms of business needs for logistical support infrastructure (storage, office accommodation, transportation, energy, telecommunications, etc.). According to the last *Zambia Business Survey* (Clarke et al. 2010), such logistics infrastructure services, particularly transport and land access, were relatively serious obstacles for micro, small, and medium-scale enterprises (MSMEs) in Zambia in 2008, whereas they were relatively lesser constraints for large firms, except in the case of electricity, which was the most significant obstacle (Table 18.2). The main take-home point here is that the presence of obstacles implies that at least a latent demand for construction services will exist as firms seek options to address the supply shortfalls behind the constraints.

To the extent possible, firms and households transfer their demands for construction services to the government by demanding physical infrastructure as a public good. In turn, the government's demand for construction services as the state yields to public pressure is typically seen in its infrastructure spending habits (seen in section 2.1).

Table 18.2 Most serious obstacles to firms' operations (2008)

Large firms		MSMEs	
Potential obstacle	Rank	Potential obstacle	Rank
Electricity*	1	Access to finance	1
Macroeconomic instability	2	Transport*	2
Cost of finance	3	Cost of finance	3
Tax rates	4	Access to land*	4
Access to finance	5	Corruption	5
Corruption	6	Crime	6
Crime	7	Macroeconomic instability	7
Tax administration	8	Electricity*	8
Trade regulation	9	Political environment	9
Transport*	10	Business licensing/registration	10
Access to land*	11	Telecommunication*	11
Worker education/skills	12	Tax rates	12
Political environment	13	Trade regulation	13
Telecommunication*	14	Worker education/skills	14
Business licensing/registration	15	Labour regulation	15
Labour regulation	16	Tax administration	16

Notes: Rank ranges from 1 (most serious) to 16 (least serious), based on firm perceptions; * related to construction services demand and logistics infrastructure.

Source: Authors' construction based on Clarke et al. (2010).

Based on the interaction of supply and demand within the industrial organization context of construction, price determination is highly opaque, given a fairly high degree of information and supplier participation asymmetries. NCC and ZIPAR (2017) attempt a decomposition analysis of the firm types or categories in the construction sector. The market structure analysis finds that the sector is generally reflective of an oligopolistic market across the firm categories (Table 18.3), implying a strong possibility of collusion in price fixing and market-share capture.

2.3 Construction regulations and public institutions

Regulations and public institutions are often erected to rectify key market failures such as some of those encountered in the foregoing narrative. The legal and public-sector institutional environments surrounding any given sector are therefore key determinants of how well the sector will perform. This subsection briefly highlights some of the key regulations and public institutions in construction.

2.3.1 Important procurement laws and regulations in construction in Zambia

UNZA and COLMAK (2010) highlight seven pieces of legislation and broad agreements that are important in guiding and regulating the construction sector in Zambia. The seven legislative and regulatory procurement arrangements make up the legal framework to which public procurement—including construction procurement—is anchored.

2.3.2 Important governance and regulatory institutions and other stakeholders

The overarching governance body for infrastructure development and therefore construction services is the Ministry of Housing and Infrastructure Development (MHID). The ministry was created in September 2016 to superintend the designing, procuring, and construction of all public infrastructure. It is responsible for various functions, including the following: architecture; aviation infrastructure; building and construction industry policy; education infrastructure; health infrastructure; maritime infrastructure; national housing policy; and land-transport-related infrastructure. Six key statutory bodies are under the governance and direction of the ministry, namely: the Association of Consulting Engineers of Zambia (ACEZ)/Engineering Institution of Zambia (EIZ); the National Council for Construction (NCC); the National Housing Authority (NHA); the Quantity Surveyors Registration Board (QSRB); the Road Development Agency (RDA); and the Zambia Institute of Architects (ZIA).

The apex regulatory public institution in the construction industry in Zambia is the NCC. It is a statutory body set up under the National Council for

Table 18.3 Market structure, by construction firm category

Firm category	No. of firms	Product	Entry barriers	Price control	Concentration ratio (C5), %	Hirschman-Herfindahl Index (HHI)	Market structure
Building and housing	1,269	Differentiated	None	Some	65	1,935	Oligopoly
Road and earthworks	138	Identical or differentiated	Moderate	Considerable	86	2,529	Oligopoly
Civil engineering works	224	Differentiated	Moderate	Considerable	94	5,818	Oligopoly
Mining services	151	Differentiated	Moderate	Considerable	96	2,403	Oligopoly
Electricity and telecom works	1,093	Differentiated	None	Some	78	1,979	Oligopoly
Industry outlook	2,875	Identical or differentiated	None to moderate	Some to considerable	63	670	Oligopoly

Notes: Concentration ratio (C5) is a common measure of the market share of the five largest firms in the industry; ranging from 0–100 per cent, it shows the extent of market control of the largest firms in the industry, illustrating the degree to which an industry is oligopolistic. Typically, a C5 value of 0 per cent depicts perfect competition; 1–40 per cent means close-to-perfect competition to oligopoly; 40–70 per cent means most likely an oligopolistic industry; and 70–100 per cent means ranging from an oligopoly to monopoly. The HHI is an alternative measure which gauges level of market competition in an industry. It ranges from 0 to 10,000 ‘points’, with higher points denoting higher levels of market concentration or monopoly power among few firms. That is, a higher HHI score depicts lower levels of competition in the industry.

Source: Adopted from NCC and ZIPAR (2017).

Construction Act No. 13 of 2003 and is responsible for the promotion, development, training, and regulation of the construction industry in the country. The NCC is a cornerstone institution in regulating and assuring the quality of construction services given its role as registrar of contractors in Zambia.

Another important institution for construction in Zambia is ACEZ, a representative body for consulting engineers in the country. ACEZ exists to promote professional interests, rights, powers, and advancement of the profession of consulting engineers; promote training of engineers; establish a code of conduct of consulting engineers; and serve the public in matters connected with engineering. Under the Engineering Institution of Zambia (EIZ) Act No. 17 of 2010, Section 19(2)(c), consulting engineers are required to be members of ACEZ and to also register with the Engineering Registration Board in the college of consulting engineers. By law, this means that membership of ACEZ is mandatory for any organization or person providing or intending to provide engineering consultancy services, and only those consulting firms/companies that meet the above requirement should be engaged to provide engineering services on a consultancy basis.

As of June 2018, ACEZ had seventy registered members, including fifty-four Lusaka-based engineering consulting firms, four Copperbelt-based firms, two firms with dual (Lusaka and Copperbelt) physical presence, eight (Lusaka-based) sole-practitioners, and two (Lusaka-based) associate members. The ratio of ACEZ-registered consulting engineers to NCC-registered construction contractors was 1:54 in 2018. The skewed spatial distribution of consulting engineers implies that their services outside the capital, Lusaka, should be at higher cost, taking into account accommodation, transportation, and other incidental costs on out-of-Lusaka services.

Architects and quantity surveyors are also key service providers in the construction sector. Practising architects are registered with ZIA, which is founded on the Zambia Institute of Architects Act Cap 442 of 1995. On the other hand, practitioner quantity surveyors are registered with and regulated by QSRB, under the Quantity Surveyors Act (Cap 438) No. 37 of 1995. In relation to ZIA and QSRB, this study did not find systematic and reliable information on the numbers of practitioners registered with the respective statutory bodies. However, the legal provisions or legislation governing the practices are clear and available in the public domain.

Public procurement and therefore procuring public sector entities are an important source of demand for construction services in Zambia. An overview by UNZA and COLMAK (2010) reveals that, as of 2010, Zambia's procuring entities are well documented. A total of 174 procuring entities across ten categories were captured in the baseline report, with the largest two categories being ministries and government departments, accounting for 21 per cent of the total, and statutory bodies (20 per cent), while the smallest two categories were banking and lending institutions and media institutions, each accounting for 2 per cent.

Typically, once physical assets are installed in Zambia they are managed and operated either by the procuring entity or by a specially established body corporate or statutory body. The governance structure that oversees the manager and operator of the infrastructure will then depend on the overall governance structures superintending the procuring entity, body corporate, or statutory body. Typically, a separate regulatory authority will also have been established to independently and impartially regulate the sector that the procuring entity, body corporate, or statutory body operates in. For instance, for public roads the RDA is the procurer, manager, and operator of the infrastructure while MHID is the overall governance authority that among, other things, appoints the RDA board of directors. Interestingly, the regulation of the RDA (a statutory body established through the Public Roads Act No. 12 of 2002) is split between NCC and the Road Transport Safety Agency (RTSA), a statutory body under the Ministry of Transport and Communication (MTC).

Recent research suggests that more reliable and effective principal-agent arrangements between MHID and RDA should be sought in order to improve the independence and professionalism that RDA is meant to have. Saasa (2018) argues that MHID commands an overbearing influence over the ultimate decisions regarding which road investments are pursued. The study noted a lack of independence of the RDA in the implementation of road projects and public infrastructure works due to political interference from its parent ministry.

In addition to the above, the construction sector draws the attention of cross-cutting oversight and watchdog institutions including the parliament (oversight) and the Auditor General's Office, and non-governmental organizations (e.g. Transparency International—Zambia, Zambia Land Alliance, etc.). These use various approaches to foster the accountability, transparency, and overall good governance of the industry.

3. Bottlenecks in the construction sector

What are the key bottlenecks to supply responses? These can be categorized into three broad fields, namely: firm-level, firm-specific factors; industry-wide factors; and national or macroeconomic bottlenecks. We consider each of these in turn.

3.1 Firm-level bottlenecks

NCC and ZIPAR (2017) isolate a number of firm-specific challenges and bottlenecks that affect the competitive pricing of construction services. For instance, when viewed by NCC grade, construction firms have vastly different characteristics in terms of operational investment decisions and levels of exposure to external

constraints and challenges. The lower-grade firms (Grades 4–6) generally invest far less in modern methods of construction, construction technology, and basic ICT than their higher-grade (Grades 1–3) counterparts. Moreover, more low-grade firms face challenges with access to finance and high labour turnover than do their counterparts in the high-grade groups. Implicitly, the state of technology, in particular construction methods used, is low, adversely affecting the price and quality of physical infrastructure that the industry is able to supply. Similarly, the issue of disparate levels of access to information and resulting information asymmetries—for instance, in knowledge about government tenders and tender procedures—have already been discussed. Suffice to say that this too results in suboptimal pricing and can also negatively affect the quality of infrastructure that construction services can deliver.

The firm-level diversity also promotes an oligopolistic market structure in which the largest, most dominant firms possibly collude in setting prices and deciding on the supply of construction services, thus pseudo-affecting supply responses. Granted, Zambia has competition regulations and laws and a Competition and Consumer Protection Commission, but behaviours such as collusion are hard to detect and even harder to prove. And even when evidence is provided, enforcement in terms of prosecution may be problematic as it is often the responsibility of other agencies that can be somewhat far removed from the industrial significance of these cases.

Ultimately, construction services are highly differentiated by firm grade, firm category, and a host of other firm-specific characteristics, thus preventing competitive pricing from emerging in the industry. Firms are able to significantly influence the final price on contracts because their product is quite differentiated from what other firms might offer. In turn this acts to distort or even delay supply responses to rising demand for construction services.

3.2 Industry-wide bottlenecks

The industry-wide bottlenecks include a variety of structural challenges, systemic inertias ('red tape'), and constraints which affect sectoral firms indiscriminately, but which larger, more sophisticated firms can better contend with given their larger operating capital outlays, among other things. For instance, other things being equal, the earlier-mentioned cost of registration with NCC—e.g. a fee of ZMK7,750 per year for Grade 3 firms compared with ZMK625 per year for Grade 6 firms—forces smaller firms with financial constraints to stay small.

The industry also faces significant constraints to doing business, particularly in relation to acquiring a construction permit. Table 18.4 shows, for instance, that dealing with construction permits still takes in excess of six months (189 days) and the number of procedures (ten) is still relatively high compared with other

Table 18.4 Selected doing-business indicators

DB year	Dealing with construction permits			Registering property			Starting a business	
	Procedures (number)	Time (days)	Cost (% of Warehouse value)	Procedures (number)	Time (days)	Cost (% of property value)	Procedures (number)	Time (days)
2006	11	230	10.4	6	73	9.6	7	36
2008	11	207	10.7	6	73	9.6	7	34
2010	11	207	7.3	6	42	6.6	7	19
2012	10	208	6.5	5	45	8.3	7	19
2014	10	189	3.9	5	45	8.6	7	8.5
2016	10	189	2.6	6	45	15.0	7	8.5
2018	10	189	3.1	6	45	9.9	7	8.5

Note: 'DB year' = 'Doing Business year', the twelve-month period adopted by the World Bank for the Ease of Doing Business Survey.

Source: Authors' construction based on World Bank (2018a).

doing-business indicators like registering property and starting a business. This naturally constrains the supply responses of contractors trying to set up shop and do business in Zambia.

Weak institutional support and commitment in the industry is also a challenge which can serve as a significant constraint to construction services supply. Weak institutional commitment is clearly demonstrated in that, in March 2017, the (International) Board of Construction Sector Transparency (CoST) initiative informed Zambia's Ministry of Housing and Infrastructure of its decision to revoke the membership of CoST Zambia, an international country-centred (public and private sectors and civil society) multi-stakeholder initiative designed to promote transparency and accountability in construction. This was because over an extended period CoST Zambia had not demonstrated progress towards implementing CoST standards. Thus, although the country was among the eight where CoST was successfully piloted between 2008 and 2011, by 2015 it had been declared 'inactive', having failed to make meaningful progress for an extended period. CoST Zambia was given a further six months to get itself 'reactivated' through appropriate policy reform and compliance measures. With no high-level commitment or movement from the responsible institutions, the timeline and all subsequent timelines lapsed, forcing the board to take its March 2017 decision. The risk is high that weaknesses in transparency, accountability, and good governance will continue to obtain, making room for vices like corruption and rent-seeking.

In some instances, the room for corruption is created by the over-design and over-specification of construction projects at inception. Anecdotal evidence on road construction costs in Zambia compared to Kenya is a first-line indication of the possibility of over-design and over-specification related to corruption and rent-seeking. On average, road construction costs in Zambia were around US\$1.6 million per km, which, on the face of it, was not very different from the average in Kenya (\$1.5 million per km). However, once it is observed that the road projects selected in the Kenyan case were all relatively more complex urban road engagements with an average road length of 20 km, we readily notice than the Zambian case, with a fairly large number of long truck road projects (of 120 km length on average), has some seemingly overpriced roads. In particular, many experts and observers have aired suspicions that the Lusaka–Ndola dual carriageway construction project (commissioned in late 2017) and the Chikwa road construction project (of 2018), worth an estimated US\$3.3 million and US\$3.1 million per km respectively, were grossly over-specified and thus overpriced. Saasa (2018) provides evidence lending support to these suspicions.

Transparency International Zambia (TIZ) is on record as having recently cited 'cadreism' as a major source of corruption in the construction sector in Zambia (Lifuka 2018). TIZ's opinion is that the common problems faced by the construction industry include the non-disclosure of beneficial owners of bidding construction companies and rigging of tenders, among others.

While cadreism and ‘cadre-preneurial contract trading’ (the specialization by politically connected cadres in the illicit capture of public tenders and their sale on illegal secondary tender markets) might be a new phenomenon, evidence of strongly suspected corruption in the construction sector is now well documented. The Auditor General’s report for the year ended 2016 (OAG 2017) records over twenty major construction-related counts of financial irregularity and/or misconduct on the part of procuring entities (ministries, provinces, and spending agencies) and/or contractors. Construction- or infrastructure-related anomalies, irregularities, misconduct, and so on amounting to a total of ZMK213.3 million (equivalent to US\$22.5 million) were observed in the 2016 financial year.

An FIC (2018) report provides further evidence of possible corruption and malpractice in the construction sector:

Construction: During the year [2017], it was observed that some businesses in the construction sector made large cash deposits. This is unusual considering that payment for services provided in this sector are made either by cheque or other safer electronic means instead of cash. It was noted that a total of USD 9,668,421.14 and ZMW 14,150,918.70 cash deposits were made by construction businesses. In 2017, a total of USD 3,430,852.81 and ZMW 391,553,520.20 cash withdrawals were reported to the Centre. It was further observed that a number of construction companies awarded contracts by some quasi-government institutions had no capacity to execute the works, while others were not tax compliant.

(FIC 2018: 10)

Essentially, a staggering US\$55.96 million of suspicious and questionable cash transactions were made between procuring entities and contractors in 2017. Moreover, the underlying weaknesses in the legal framework—which CoST Zambia should have helped to address—have been prevalent for over a decade. UNZA and COLMAK (2010) report that the legal requirement for the release of material project information (MPI) established by the Public Procurement Act No. 12 of 2008 was (and still is) focused on the disclosure of the best-evaluated bidder only. The disclosure of the winning contractor and consultant’s name and the contract value are the only details required to be disclosed. The other MPIs that should be required to be released include: the scope of the projects; the tender procedure; a list of tenderers; the contract programme; and details of any re-award of main contract. Of the pre-tender MPIs, only the Environmental Impact Assessment is permitted by law to be released.

Unfair advantages among foreign-owned firms also cause supply response distortions, particularly insofar as the equitable distribution of public tenders and construction contracts is concerned. Anecdotal evidence abounds of China’s influence in the construction sector landscape in Zambia. Many practitioners and even officials in the Ministry of Finance argue that large-scale infrastructure

projects that are bankrolled using Chinese loans always come with ‘fine print’ in loan contracts, whereby the transactional benefits are all captured by Chinese entities. Thus, financial handling takes place through Chinese financial intermediaries and the awarding of project contracts is mainly (80 per cent plus) to Chinese firms, most of whom are Chinese state-owned or state-affiliated entities that are subsidized by the Chinese government to do business in Africa.

3.3 Macroeconomic factors serving as construction bottlenecks

The main macroeconomic bottlenecks relate to variables with a direct impact on the cost of construction services. These include the adverse business shocks and uncertainty associated with a local currency collapse, coupled with heightened inflation such as occurred in Zambia from mid-2015 through most of 2016 (Figure 18.6, Panel (a)). They also include factors like high credit or borrowing costs (high interest rates) and fuel price hikes due to policy reforms (Figure 18.6, Panel (b)).

Another major risk, which is perhaps not yet a bottleneck, is the high level of public debt. According to the IMF (2018), Zambia’s public debt stock rose from 19 per cent of GDP in 2010 to 62 per cent in 2017 and is projected to increase further to 72 per cent of GDP by 2023. This first-line indication is therefore that the country’s debt stock is very close to unsustainable levels or may have already breached the sustainability threshold. Considering that the debt was accumulated mainly to cover three large public expenditure items—the wage bill, debt service interest payments (both consumption expenditure items), and large infrastructure projects, particularly the GRZ roads programme (section 2.1)—the anticipated forced slowdown in public spending and borrowing is likely to dampen demand

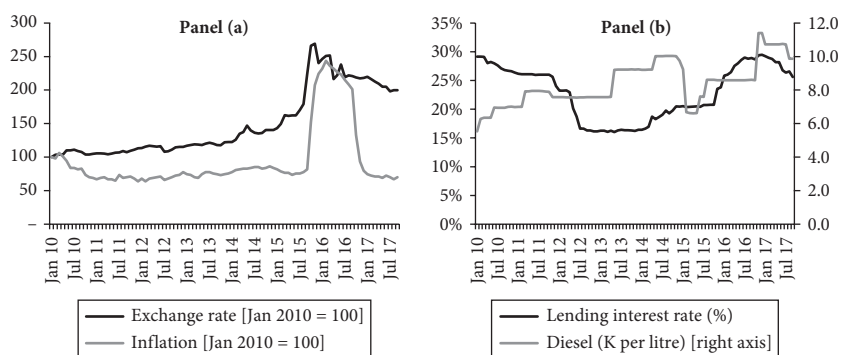


Figure 18.6 Selected macroeconomic stability indicators

Source: Authors’ construction based on BOZ fortnightly statistics (available at: <http://www.boz.zm/monetary-and-financial-statistics-New.htm>, accessed February 2018) and CSO monthly bulletins (available at: <http://www.zamstats.gov.zm/index.php/publications/category/1-monthly-bulletin>, accessed April 2018).

for infrastructure and therefore construction services. Given that the supply of construction services has been significantly stimulated by the government's infrastructure expenditure, the anticipated reversal of fortunes underpinned by the debt overhand is likely to have a significant adverse effect on the industry.

4. Summary of options for dealing with key bottlenecks

From the foregoing, what institutional, governance, and policy reforms are desirable for the construction sector in Zambia? We recommend the following:

4.1 Institutional, governance, and regulatory reforms

- Key institutions charged with the governance of the construction sector should be reformed through the establishment of 'carrot-and-stick' mechanisms like Cabinet Office-administered performance-based contracts throughout these organizations.
- The law should be strengthened in terms of the provisions for procuring entities in construction (as well as in other sectors) to proactively release necessary or material project information into the public domain; and for the much talked-about international price benchmarking.
- The construction authorities (MHID and NCC) should work towards strengthening, streamlining, and simplifying the procurement and contracting rules and systems, particularly assessing processes that have in the past resulted in information and participation asymmetries; loss of RDA independence; and risks of rent-seeking, cost escalation, financial irregularity, corruption, misconduct, and malpractice.
- The authorities should establish a contract unbundling policy and law, particularly for large contractors, so that no single large-scale contractor is awarded contracts to execute, say, more than 60 per cent of the works as a monopoly services supplier. The unbundling of contracts will create room for smaller contractors to participate in some aspects of the unbundled infrastructure development projects.

4.2 Industry-support policies and reforms

- The authorities should consider establishing training and capacity-building programmes that improve the sharing and use of information and knowledge and enhance know-how or competency, thus reducing information asymmetries—particularly to the benefit of local service providers.
- The private sector is already substantively supporting training and local skills development through contributions to the statutorily determined Skill

Development Levy (SDL), a 0.5 per cent levy on gross remunerations (payroll) payable by employers with effect from 1 January 2017, under the SDL Act No. 46 of 2016. However, due to reported juridical disagreements between the Ministry of Higher Education (MOHE) and the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) over who is charged with administering the SDL funds, the operational framework has to date not been formulated. Stakeholder authorities like the construction authority should readily intervene to ensure that slippages that impede the training and skills development of practitioners under their charge are fully and swiftly resolved. Specifically, they should ensure that the rightful proportion of the proceeds of the SDL starts to flow to the construction private sector towards skills development.

- The authorities should review and update the local content strategy of MCTI and the partial policies such as the 20 per cent subcontracting policy towards establishing a robust and comprehensive local content policy and implementation framework for construction services.
- Within the overall local content policy and strategy, the authorities should establish viable options for increasing access to finance for local contractors. An important financing option will be negotiated with tied aid and tied development finance from bilateral partners like China who have a significant contractor presence in Zambia. For instance, access to Chinese government development assistance to Zambia by Chinese contracts should be conditional on the contractors demonstrating a willingness and ability to build the capacities of local contractors through skills, technology, and operating-capital transfer partnerships.
- The authorities should consider establishing publicly supported and financed/ resourced skills development and research and development programmes towards improving upon the currently low standard of methodology and technologies used by the majority of local contractors in construction; contractors, particularly local contractors, should be given sufficient knowledge and comparative advantage of the quality and safety standards for construction in Zambia.
- The authorities should explore other options for the mobilization and ring-fencing of affordable finance, including trade credit to frontrunner or winning sectors like construction.

References

- BOZ Brinkhoff, T. (2018). 'Zambia: Administrative Division. Provinces and Districts.' City Population. Available at: <https://www.citypopulation.de/php/zambia-admin.php> (accessed September 2018).
- Clarke, G. C., M. K. Shah, and R. V. Pearson (2010). *Zambia Business Survey: The Business Landscape for MSMEs and Large Enterprises in Zambia*. Lusaka: FinMark Trust, Zambia Business Forum, Republic of Zambia, Private Sector Development Programme, and World Bank.

- CSO (2013). *2010 Census of Population and Housing—Population and Demographic Projections 2011–2035*. Lusaka: Republic of Zambia Central Statistical Office.
- CSO (2015). *2014 Labour Force Survey Report*. Lusaka: Republic of Zambia Central Statistical Office.
- CSO (2016). *2015 Living Conditions Monitoring Survey (LCMS) Report*. Lusaka: Republic of Zambia Central Statistical Office.
- CSO (2018). *The Statistician*, Volume 7. Lusaka: Republic of Zambia Central Statistical Office.
- ECA (2017). 'Comprehensive Report on Developments in Africa's Regional Integration in the Context of Trade, Investment, Infrastructure, Industrialization, Land Management, Food Security and Agriculture, with a View to Influencing Policy'. Economic Commission for Africa, Committee on Regional Cooperation and Integration, E/ECA/CRCI/10/2. Addis Ababa: UN Economic and Social Council.
- FIC (2018). 'Money Laundering/Terrorist Financing Trends Report 2017'. Kabulonga: Financial Intelligence Centre.
- Gans, J., S. King, R. Stonecash, and G. N. Mankiw (2003). *Principles of Economics*. South Melbourne: Thomson Learning.
- IMF (2018). 'World Economic Outlook Database: April 2018 Edition'. Available at: <https://www.imf.org/en/Publications/SPROLLS/world-economic-outlook-databases> (accessed June and August 2018).
- Lifuka, R. (2018). Presentation to Construction Sector Anti-Corruption Forum, Intercontinental Hotel, Lusaka, Zambia, 7 February.
- MCTI (2018). 'Strategy Paper on the Promotion of Local Content'. Lusaka: Ministry of Commerce Trade and Industry.
- MLGH (2016). 'National Housing Sector Policy for Zambia: First Draft'. Lusaka: Ministry of Local Government and Housing.
- NCC (2018). 'Register Contractors: Registrations as at 30th September 2017'. Lusaka: National Council for Construction.
- NCC and ZIPAR (2017). 'Baseline Survey of the Zambian Construction Industry: Final Report'. Lusaka: National Council for Construction and Zambia Institute for Policy Analysis and Research.
- OAG (2017). 'Report of the Auditor General on the Accounts of the Republic for the Financial Year Ended 31st December 2016'. Lusaka: Office of the Auditor General.
- Page, J. (2018). 'The Road Not Taken: Structural Change in Africa Reconsidered'. In B. S. Coulibaly (ed.), *Foresight Africa: Top Priorities for Africa in 2018*. Washington, DC: The Brookings Institution.
- Patriotic Front (2011). *2011–2016 Manifesto*. Lusaka: Patriotic Front.
- Phiri, F. (2016). 'An Analysis of the Twenty Percent Subcontracting Policy in the Zambian Construction Sector: Its Efficacy in Developing Capacities of Local Contractors'. Master's dissertation. Lusaka: University of Zambia.
- Republic of Zambia (2017). *Seventh National Development Plan 2017–2021*. Lusaka: Ministry of National Development Planning.

- Saasa, O. (with C. Musonda) (2018). 'Pro-Growth Road Infrastructure Development in Zambia: Challenges, Opportunities and Policy Options.' Lusaka: Premier Consult Ltd Economic Social & Business Consultants.
- UNZA and COLMAK (2010). *Zambia CoST Baseline Study Report*. Lusaka: University of Zambia (UNZA) and COLMAK.
- World Bank (2017). *How Zambia Can Borrow without Sorrow*. Zambia Economic Brief (December). Washington, DC: World Bank.
- World Bank (2018a). 'Doing Business'. Available at: <https://datacatalog.worldbank.org/dataset/doing-business> (accessed August 2018).
- World Bank (2018b). 'Data: Zambia'. Available at: <http://data.worldbank.org/country/zambia?view=chart> (accessed April 2018).

Local Content in Zambia—a Faltering Experience?

Wilfred C. Lombe

1. Introduction

At independence in 1964, Zambia inherited an economy driven by copper mining. This has not changed despite post-independence policies to industrialize and diversify the economy. Copper mining continues to dominate the economy, accounting for over 70 per cent of the country's foreign exchange earnings. Between 2006–15, the total contribution of mining to the gross domestic product (GDP) averaged 12.9 per cent, with a high of 14.6 per cent in 2014. Its contribution to GDP is second only to that of services, the fastest-growing sector in the economy over the same period. The mining sector is also a significant employer, providing direct employment to 82,725 people in 2014 (GRZ 2017).

To counter the dominance and vicissitudes of commodity dependence, Zambia began to build its industrial sector shortly after independence. Both the initial and subsequent development plans prioritized agriculture and manufacturing as growth poles for industrialization and economic diversification. In 1965, manufacturing value added (MVA) contributed about 7 per cent to GDP. Over 2011–15, the MVA contribution to GDP averaged 7.5 per cent, indicating stagnation in real manufacturing output over time. In contrast, between 2004–13 the Zambian economy grew at an average of 7.7 per cent, spurred by high levels of investment in the mining industry. These occurred on the back of high copper prices that persisted during the period. Yet according to the *2016 Human Development Report*, the incidence and depth of multidimensional poverty increased between 2006–10 (UNDP 2016: xviii). It hence appears that the conversion rate from high economic growth rates to welfare gains to the poor has not been sufficient.

The dominance of copper mining in the economy makes it a good choice to drive industrialization and local content (LC) growth. Estimates of input goods and services are reported to be as high as US\$5 billion annually (Fessehaie et al. 2015: 55). The share of domestic firms in the mining market is less than 4 per cent, while that of indigenous firms is about 1 per cent (Fessehaie et al. 2015; UNDP 2016). It is clear that localizing a significant portion of the supply chain, through

manufacturing linkages, would not only contribute to industrialization and economic diversification; it would support greater welfare gains through increased employment and wealth redistribution.

2. LC and industrialization: a brief review

2.1 What constitutes LC?

The term ‘local content’ commonly refers to domestic purchases of goods and services, and/or the employment of nationals in an extractive operation. However, LC is often extended to local workforce or supplier development or the provision of infrastructure and services to communities around a mining operation. Thus ‘local’ can refer to the spatial spread of benefits in the vicinity of a project, in a district or national economy, or even in a regional economy. When applied to the supply of goods and services, ‘local’ can also have ownership connotations. The benefits to the national economy depend on the ownership of the ‘local’ firm. This is illustrated in Figure 19.1, which posits that the highest economic value added is created when the supplier firm is a locally owned and operated manufacturer, sourcing its inputs locally. Conversely, the lowest value added arises from a foreign-owned importer and distributor.

For the above reasons, some countries consider that LC is fully met when goods or services are provided by firms that are owned or controlled by domestic capital (OECD 2017). These broad definitions of LC extend its scope to linkages with other economic sectors (AfDB 2017: 4; OECD 2017: 7; Tordo et al. 2013: 1).

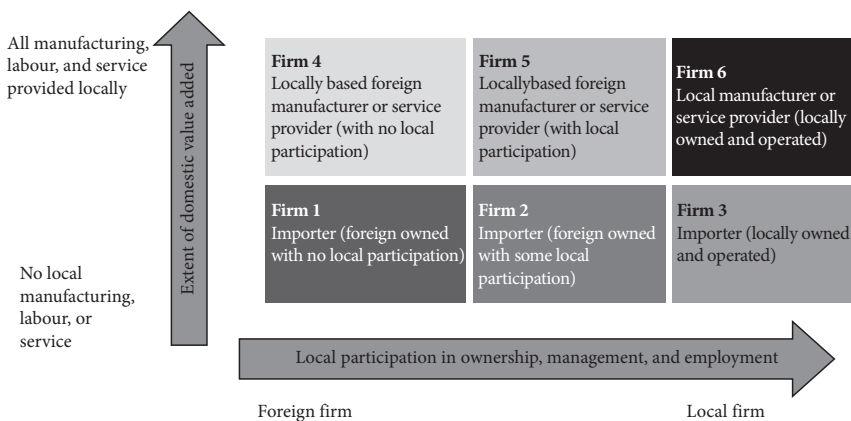


Figure 19.1 Classification of local supplier firms of goods and services

Source: Author’s illustration, adapted from AfDB and BMGF (2014: 11).

They are particularly favoured by developing countries, keen to extract the greatest economic and social benefits from exhaustible resources. Typically, extractive projects create few domestic linkages in these countries (UNCTAD 2007: 140).

How well LC supports industrialization and economic transformation depends on the policy space. For this reason, LC tends to also be defined in terms of its long-term policy objectives. These commonly include technology transfer; research and development (R&D) to improve innovation and national competitiveness; and downstream value addition to deepen the natural resources value chain (AfDB and BMGF 2014; OECD 2017; Tordo et al. 2013).

2.2 LC, economic linkages, industrialization, and structural change

The extent to which an extractive operation generates linkages with other economic sectors is a fundamental aspect of LC. The principal commercial linkages are the upstream (backward) links, which connect the extractive operation to its suppliers of goods and services, and the downstream (forward) links, which process the operation's output into intermediate manufactures and final products. These linkages are commonly termed production or industrial linkages. They involve flows of information and/or materials between two or more industrial sectors or firms, and are based on the notion of value added to raw materials or intermediate semi-manufactures (Braunerhjelm 2010; Kragelund 2017; OECD, UNCTAD, and WTO 2013).

Morris et al. (2011: 8) make an important distinction between the breadth and depth of linkages. The upstream breadth refers to the share of inputs that is acquired locally, while on the downstream side breadth represents the proportion of production processed by local firms. The depth, on the other hand, is the extent of domestic value added to locally acquired inputs upstream or locally processed outputs downstream. By and large, the breadth and depth of linkages determine the strength of capital-formation structures, and the degree of industrial development and economic diversification. LC is therefore a key driver of industrialization and, through inter-firm production linkages, enables product specialization and a division of labour. This boosts productivity and competitiveness due to efficiencies in factor allocation.

The literature abounds with empirical evidence linking aggregate factor productivity to economic growth. Bartelme and Gorodnichenko (2015) use an input-output approach to quantitatively analyse the empirical relationship between linkages and their aggregate productivity. Their results show that the strength of linkages, measured as the average output multiplier across industries and/or sectors, strongly determines total factor productivity. Their work confirms the importance of specialization and factor allocation efficiency in economic growth and development.

Production linkages are in effect manufacturing associations. Manufacturing is hence a key driver of aggregate growth and industrialization (Hernesniemi et al. 1996; Karmiloff 1989) and an increase in its share directly raises growth. Tyler (1980) provides empirical evidence that the competitive manufacture of goods for domestic consumption, but more so for export, correlates with economic growth and industrialization. For a sample of fifty-five middle-income countries,¹ he found a strong correlation between GDP and growth in manufacturing output and exports. Manufacturing takes place at firm level. Newman et al. (2017) explore the empirical relationship between export performance and productivity at firm level using panel data from Vietnam. They find strong evidence that productive firms self-select into export markets and that export performance is associated with increased firm-level productivity. These effects are cumulative over time, with productivity gains arising from years of exporting experience. They conclude that firms actually learn by exporting, and that the extent of learning is related to their capacity to adapt and change in order to benefit from export possibilities in liberalized markets.

2.3 The importance of technological change and entrepreneurship

While classical economics emphasizes the importance of investment and capital accumulation in economic growth, neoclassical economists postulate that innovation and entrepreneurship are more critical to transforming factors into increased economic output. This has led to the so-called new growth theory, whose central argument is that technological advances and innovation are more critical to boosting productivity than improvements in capital stock (Colander 2017; Hernesniemi et al. 1996; Porter 1990). Technological change is further postulated to create significant spillover effects, thus providing other economic sectors with new ways of improving productivity. These spillovers are important to structural transformation and industrialization.

There exists a strong body of empirical evidence linking technological innovation to manufacturing and industrialization. Examples include several studies undertaken under the Learning to Compete (L2C) project which confirm the importance of investing in R&D and innovation to boost within-firm productivity and improved manufacturing export competitiveness (Mattoussi and Ayadi 2017; Newman et al. 2017). Demonstrative evidence indicates that the quality of R&D in sciences and engineering provides the greatest source of innovation. Similarly, empirical evidence from OECD countries indicates that increased entrepreneurship, as measured by business ownership rates, is associated with higher rates of

¹ Defined as having a GDP per capita of US\$300 or less in 1977 dollars.

employment growth (Braunerhjelm 2010). These insights suggest that while technological innovation creates new knowledge, innovative entrepreneurship is the main link between knowledge, commercialization, and output growth. They are highly relevant to African countries, such as Zambia, where R&D, innovation, and endogenous entrepreneurship are seriously constrained.

2.4 Global and regional value chains and LC

Global value chains (GVCs) are production networks typically coordinated by multinational enterprises (MNEs). GVCs have become a key feature of production, accounting for about 84 per cent of international production networks and over a quarter of global GDP (UNCTAD 2017). Some 90,000 MNEs have a combined total of US\$27 trillion in foreign direct investment (FDI) stock in nearly 1 million foreign affiliates worldwide. Fundamentally, GVCs exploit differences in factor productivity across countries, creating manufacturing value added to raw materials or intermediate feedstock. The competitiveness of the final product is dependent on aggregate productivity across the production networks and the value added at each stage of production.

GVC growth has been rapid, facilitated by technological advances in transport and information and communication technologies which have reduced trade costs. Whereas in many G20 countries the domestic content in gross exports decreased between 1995–2009, the income derived from exports of value added by GVCs increased by 106 per cent during the same period (OECD, UNCTAD, and WTO 2013: 12). This increase was more pronounced in emerging economies, particularly the BRIC economies (Brazil, Russia, India, and China). Domestic value added derived from foreign final demand increased in China by 600 per cent, in India by 500 per cent, and in Brazil by nearly 300 per cent. To the contrary, Africa's share in GVCs has remained limited.

Although GVCs are coordinated by MNEs, empirical evidence suggests a substantial contribution to aggregate innovation and production by small entrepreneurial firms (Braunerhjelm 2010; UNCTAD 2010). In Sweden, once a natural-resources-driven country but now a major mining equipment and machinery manufacturer, one-third of patented applications in manufacturing emanate from small businesses of less than twenty-five employees. Significantly, a substantial proportion of patenting small firms have links to a Swedish MNE (Braunerhjelm 2010). This underscores the significant role innovative small and medium-sized enterprises (SMEs) play in GVCs, and highlights the need for Least Developed Country (LDC) government and firm strategies that embrace GVCs as a means of upgrading production.

The regional milieu offers GVCs opportunities for spatial agglomeration. These include enterprise clustering and developing manufacturing linkages; sharing of

business development services; and access to knowledge and skills (Braunerhjelm 2010; Pietrobelli and Rabellotti 2010; UNCTAD 2010). Several studies undertaken by the United Nations Economic Commission for Africa (UNECA) argue that South Africa's superior knowledge-creation institutions, and research institutes in mining, represent a growth opportunity for southern Africa, which is essentially a mining economy (UNECA 1997). It is hence unsurprising that South Africa has several GVCs operating in the Zambian mining industry.

3. The evolution of LC in Zambia

3.1 LC, manufacturing, and industrialization in Zambia: a historical perspective

3.1.1 LC and import-substitution industrialization, 1964–91

At independence in 1964, Zambia inherited a mono-economy dominated by copper mining. This accounted for about 50 per cent of GDP and 95 per cent of export revenues. Manufacturing value added contributed only 6.9 per cent to GDP (UNDP 2016). It is therefore unsurprising that diversifying the economy dominated the country's initial development plans.² The cornerstone of these plans was an import-substitution industrialization strategy (ISI) targeting the manufacture of intermediate and consumer goods; the development of linkages in the economy; and the production of a surplus for exports (Karmiloff 1989; UNDP 2016). Broadly viewed, ISI was in effect an LC development strategy.

ISI swiftly gained traction during the first decade (1964–74), aided by the nationalization of productive assets and buoyant commodity prices. Nationalization included the acquisition of majority (51 per cent) shares in Roan Copper Mines and Nchanga Consolidated Copper Mines, the two main mining assets, and their merger in 1983 to form Zambia Consolidated Copper Mines (ZCCM). The chief reason for nationalization was to assert control over a private-sector-driven economy in which capital accumulation was foreign-controlled, profit repatriation deemed excessive, human resources development limited, and investment in production selective (Kaunga 1993).

Manufacturing value added grew rapidly at 13 per cent per year in constant 1970 prices (Karmiloff 1989) and by 1980, state participation in manufacturing GDP and employment had risen to 56 per cent and 54 per cent respectively (Kaunga 1993: 4–5). The bulk of import substitution, and state participation, occurred in the consumer goods subsectors of food, beverages, textiles, and tobacco, which by 1970 accounted for 60 per cent of total manufacturing output.

² These were the Transition Development Plan (1964–6) and the First National Development Plan (1966–71).

These are generally the soft subsectors of manufacturing, with low technological barriers (Morris et al. 2012). The larger rates of growth, however, occurred in chemicals, plastics and rubber, and metal products—subsectors of direct relevance to LC. Together these subsectors accounted for about 40 per cent of total manufacturing output and had the larger share of private sector firms, particularly in basic metal and metal fabrication (Karmiloff 1989: 6).

The high growth rates in the subsectors of rubber products, chemicals, non-metallic minerals and metals, and machinery was a boon for LC growth in the mining industry. Zambia swiftly established comprehensive manufacturing facilities for mining inputs in these subsectors. Rubber products included rubber linings, seals and couplings, tyres, and V-belts. Metallic products included wear-resistant crusher parts, mill balls, valve components, wire ropes, roof bolts, rock drills, rock drill steels, conveyor idlers and pulleys, pumps, and valves; while the chemical side included explosives, fuses, and detonators.

Downstream of the copper value chain, manufactured products included copper rod, electric cables, and transformers. From a side-stream viewpoint, engineering facilities for the manufacture of components mushroomed. They included foundry, machine, and fabrication workshops. However, the facilities were typically low-end and suffered from a lack of in-house engineering expertise. This, coupled with limited imports of specialty steels, led to poor operating practice and invariably uncompetitive poor-quality products.

From a skills viewpoint, a comprehensive study by UNECA found that Zambia had well-established education and training facilities at degree, technician, and artisan levels (UNECA 1996). However, there were skill deficits especially in specialized areas such as engineering, mine and mineral process design, project engineering, ore estimation, and operations research. Regulatory-level skills, including in policy design, mine safety, and environmental management, were also qualitatively and quantitatively deficient. These weaknesses were partly attributed to a lack of industry participation in skills development and knowledge generation, and to poor funding of universities and technical and vocational training facilities by government (UNECA 1996).

ISI had a number of structural deficiencies (described in section 5) and by the mid-1970s, the strategy struggled as industrial production declined. A rapid fall in world copper prices led to a dramatic decline in Zambia's economic fortunes, and ISI was abandoned altogether in 1991 with the change in government. Nevertheless, the period is generally described in the literature as the most successful of Zambia's attempts at LC growth and industrialization (AfDB 2017; Karmiloff 1989; UNDP 2016).

3.1.2 LC, market liberalization, and privatization, 1991–present

The new government refocused policy on macroeconomic stabilization and economic liberalization as the main catalysts for reflation industrial growth. The

main aim of the measures was to remove any structural distortions and inefficiencies created by the ISI policy and improve competitiveness in the manufacturing sector. Restrictions on imports and exports were eliminated, tariffs decreased, and most foreign exchange controls removed. However, exports, rather than increasing, declined on the back of weak commodity prices and a depreciation in the exchange rate. The import-intensive heavy manufacturing industries that supported LC further weakened and, by 2000, total manufacturing value added had fallen to about 10 per cent of GDP from about 25 per cent in 1991. The unintended consequence of liberalization was a collapse of manufacturing (UNDP 2016).

This led to a shift in policy in 2001 towards export-oriented industrialization and improving beneficiation in the copper value chain. This policy has been accompanied by the introduction of Multi-Facility Economic Zones (MFEZ). These aim to support the emergence of clusters of firms that benefit from spatial proximity to grow various industrial processes, from primary to tertiary processing. There are several MFEZs at present. The Chambishi MFEZ reportedly focuses mainly on the copper supply chain, and houses both heavy and light industries, including copper smelting; manufacture of copper wire and cables; household appliances such as stoves; motor parts; and agro-processing (UNDP 2016: 22). However these products probably require verification: an assessment done for this chapter suggests that the list might be exaggerated. The new Kafue Iron and Steel MFEZ is being designed around the Integrated Kafue Iron and Steel plant and is expected to focus on engineering, machinery, and equipment manufacture for economic sectors including mining, agriculture, manufacturing, construction, chemical, and infrastructure development.

3.1.3 Privatization stymied LC development and the manufacturing sector

Privatization of the mining industry from the early 2000s hastened the collapse of a struggling manufacturing sector. At the time, Zambia was in a very weak bargaining position given its heavy indebtedness to the Bretton Woods institutions, and it inadvertently made over-generous concessions through the Development Agreements (DAs) signed with individual mining companies (Simpasa et al. 2013). These included imports of capital equipment free of customs and excise duty; capital write-off of any expenditure on imports of plant and machinery and a reduction in corporate tax through such imports; and carry-forward losses that limited tax payments until profitability was regained.

These provisions are commonly cited as a major source of tax leakages (Tordo et al. 2013). They provide cost-accounting opportunities to legally circumvent tax payments through aggressive capital recovery, and asset creation to redeem costs that might constitute normal business losses. Generally, cost- and production-reporting continue to raise concerns in the industry (ICMM 2014); according to PricewaterhouseCoopers, 'cost reporting requires increased consistency and transparency across the industry' (PwC 2013: 42). Other than being a potential

source of tax leakages, these provisions have had the effect of rewarding mine owners for importing their inputs rather than sourcing goods from domestic manufacturers. The legal provisions do not oblige mine owners to purchase inputs locally and there are no preferences for Zambian suppliers. These factors have led to reversals in LC growth from the ISI era.

Despite the above weaknesses, forward linkages persist within the copper value chain. Copper is mostly exported in smelted and refined forms, representing a number of value-added stages beyond mining. Traditionally, downstream processing of refined copper into rods and wire was exclusively undertaken by one company. However, with the large Chinese investment in the Chambishi MFEZ, forward linkages are reported to have deepened with expansion in exports of semi-fabricates (Morris et al. 2011; UNDP 2016). Available information is, however, patchy, suggesting the need for a more thorough survey to establish the current state of linkages.

3.2 Current LC initiatives

Current LC initiatives in Zambia include a collaborative public–private initiative, the Zambia Mining Local Content Initiative (ZMLCI), funded by the World Bank and the International Finance Corporation. This operates under the joint leadership of the Chamber of Mines (CoM) and the Zambia Association of Manufacturers (ZAM). It seeks to enhance local content and use of locally manufactured inputs in the Zambian mining industry. The (UK) Department for International Development-funded Private Enterprise Programme (PEP-Zambia) seeks to create sustainable business partnerships between Zambian SMEs and large corporations and offers business development services for small businesses. This programme also runs business plan competitions to promote endogenous entrepreneurship (AfDB 2017). These programmes are ongoing and it is probably premature to gauge their success.

Individual mining firms maintain their own LC initiatives in addition to providing employment estimated at 82,725 people in 2014 (GRZ 2017). While these numbers are large, they represent less than 2 per cent of the labour force for a sector that contributed 12.9 per cent to GDP in 2015 (UNDP 2016). This underscores the capital intensity of the industry. Non-employment-industry LC initiatives include running supplier development programmes, providing support to trades training institutes, and investing in infrastructure and community development programmes. KCM, for example, has a Local Economic Development Strategy which includes a vendor development programme in which it has identified a range of products for possible local sourcing. The company also runs the Kitwe Trades Training Institute. Mopani provides training for SMEs through workshops and employs dedicated staff to help SMEs with tender procedures.

Mopani also provides support to the Kitwe Trades Training Institute. FQM has a supplier development programme providing training in tendering and cost estimations. It also provides financial and teaching support to the Solwezi Trade Training Institute. Due to the remoteness of its operations, FQM has also invested heavily in extensions to the electricity grid, construction of the airport at Solwezi, and road maintenance in North Western Province (AfDB 2017).

While industry itself views as considerable its contribution to LC growth and Zambia's industrial development (ICMM 2014), various reports and field surveys suggest that stakeholders, including government, view these efforts as ad hoc and insufficient (AfDB 2017). There is widespread scepticism about the value of industry supplier development programmes, with stakeholders suggesting regular audits of their effectiveness and sustainability, as well as their alignment to public policy on industrialization. Judged by the low value of local suppliers participating in the mining supply chain (see section 3.3), these sentiments appear justified.

3.3 LC, supply chains, and domestic supplier firms

Figures vary for the supply of goods and services to the Zambian mining industry. A study prepared for the ZMLCI in 2012 estimated local sourcing at approximately US\$2.5 billion per year, while later ZMLCI stakeholder consultations in 2014 raised this estimate to about US\$5 billion (Fessehaie et al. 2015). The ZMLCI study categorized expenditure into *core mining services* (drilling services, underground development, instrumentation services, contract mining, etc.); *core input goods* (explosives, mill balls and rods, chemicals, plant spares, etc.), *non-core services* (security, catering, customs handling, cleaning, transportation, etc.); and *non-core goods* (safety and office equipment, stationary, nuts and bolts, light fittings, etc.). That study, and others (ILO 2014; Morris et al. 2011), generally distinguish three types of suppliers of goods and services. Category 1 comprises international suppliers, mainly subsidiaries of original equipment manufacturers (OEMs), large distributors, and representatives of GVCs that have a local presence. They have no manufacturing facilities and hence create little domestic value added. Category 2 comprises international suppliers with no local presence, while Category 3 consists mostly of indigenous traders, commonly referred to as 'briefcase businessmen' (Morris et al. 2011: 54), and a number of small manufacturing firms producing a range of mining inputs. The inputs include metallurgical plastics and rubber products, engineering products, and paints. This group also includes the domestic manufacture of packaged explosives and explosive accessories; timber for underground support systems; and agricultural lime and quicklime. Figure 19.2 summarizes the distribution of expenditure among the three categories of suppliers in the four expenditure classes, based on the lower amount of US\$2.5 billion per year.

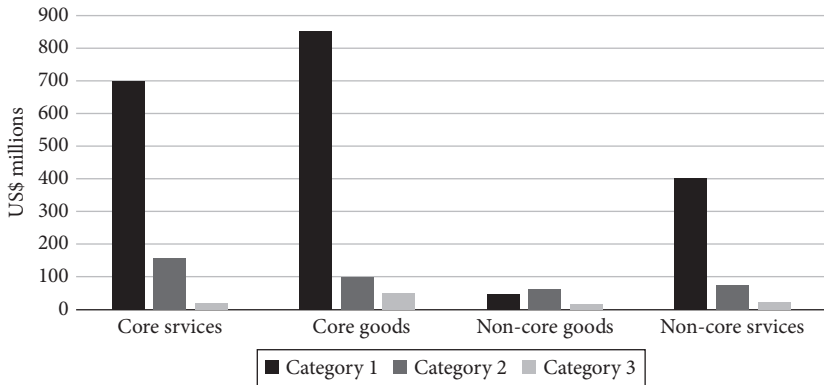


Figure 19.2 Market share of goods and services by supplier origin (US\$ millions)

Source: Illustration based on ZMLCI data (Fessehaie et al. 2015: 53).

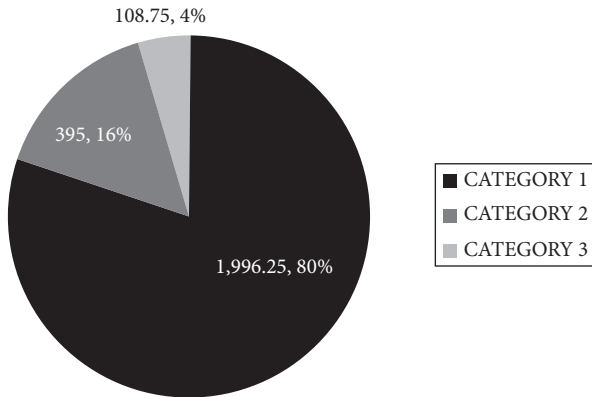


Figure 19.3 Estimated composition of Zambia's mining procurement expenditure, 2012 (US\$ millions and %)

Source: Illustration based on ZMLCI data (Fessehaie et al. 2015: 53).

The figure indicates that foreign suppliers, with or without a presence in Zambia (i.e. Categories 1 and 2), dominate all classes of goods and services supplied to the mines. Percentage-wise, they account for 98 per cent of core services, 95 per cent of core goods, 87 per cent of non-core goods, and 95 per cent of all non-core services provided. Aggregately, Figure 19.3 shows that the foreign suppliers account for 96 per cent of goods and services procured by the mines, while domestic manufacturers and traders share 4 per cent. The 4 per cent includes resident multinational manufacturing companies (e.g. in explosives, cement, drill steels), and resident haulage companies. Indigenous Zambian suppliers of goods and services are estimated at about 1 per cent and are mostly found in simple non-core services, such as catering, security service, and office maintenance.

The conclusion is hence manifest that the industry supplier development programmes at firm level have not succeeded in upgrading Zambian indigenous suppliers to provide core goods and services.

Yet the small domestic input manufacturers hold the greatest potential for generating domestic MVA and growing LC. However, their capabilities are limited by a range of weaknesses. These include a lack of access to long-term capital; inability to access engineering design expertise and production technologies; high costs of production inputs; and low-level facilities that lack full quality control of production.

The above weaknesses result in poor-quality goods that do not meet industry standards. Structured support is required to grow the capabilities of this group for a predetermined set of low-entry core goods and services. This could include margins of preference; incentives for imports of raw materials and equipment; technical mentorship; and access to technology and structured finance. Mentorships have proved particularly useful in South Africa and are part of global best practice (see Genesis Analytics 2014: 15–20).

4. The policy and legislative space for LC

Zambia's long-term development context is guided by Vision 2030. Adopted in 2006, the Vision foresees the country attaining the status of a '*prosperous middle-income nation by 2030*' (GRZ 2006). By that date, Zambia's economy is envisaged to be well diversified with a strong industrial sector, a modern agricultural sector, and an efficient services sector. It is further envisaged to be technologically proficient, fully able to adapt, innovate, and invest using its human and natural resources. From an LC viewpoint, the economy is envisioned to have strong cohesive industrial linkages in the primary, secondary, and tertiary sectors, supported by sound and well-maintained socio-economic infrastructure (GRZ 2006). These attributes are a good basis for LC growth.

The Vision is broken down into a series of sectoral sub-visions and targets for development. Some of the key sectors that impact on LC development are shown in Table 19.1. Vision 2030 is implemented through five-year national development plans (NDPs). The current plan, the Seventh National Development Plan (7NDP), seeks greater responsiveness and alignment to Vision 2030 (GRZ 2017). It sees the sources of accelerated economic growth and industrialization as: a full exploitation of Zambia's comparative resource endowments; a strong export-oriented manufacturing and industrial base with solid backward and forward linkages; improved productivity through greater human capital development and technological innovation; and graduating micro and small to medium-scale enterprises.

The Plan sees mining as a source of value-added intermediate inputs for manufacturing and other economic sectors, increased productivity, and export

Table 19.1 Visions and goals of certain economic and social sectors relevant to LC development

Sector	Vision	Targets/goal
Mining	Private-sector-led mineral resource exploration and exploitation that contributes to sustainable socio-economic development by 2030.	Increase in share of mineral output used in industrial production to 30 per cent by 2030.
Manufacturing	Technology-based and export-focused manufacturing sector that adds value to abundant natural resources by 2030.	Increase in share of general manufacturing contribution to GDP to 36 per cent by 2030; increase in manufactures exports as a share of merchandise exports to 71 per cent by 2030.
Infrastructure	A well-developed and maintained socio-economic infrastructure by 2030.	Develop and implement public–private partnerships; achieve affordable and efficient connectivity.
Energy	Universal access to clean, reliable, and affordable energy at the lowest total economic, financial, social, and environmental cost by 2030.	Abundant and reliable supply of affordable energy; export-led energy industry.
Science and technology	A nation in which science, technology, and innovation are the driving forces in national development, and which competes globally by 2030.	Build and sustain human resource capacities and capabilities by 2030; strengthen linkages between productive sectors and research institutions in the economy by 2030.
Employment and labour	Sustained full employment by 2030.	Have an efficient and effective labour market information system in place.
Education and skills development	Innovative and productive lifelong education and training for all by 2030.	Comprehensive and diversified curricula responsive to social and economic needs; increase university and skills training output by 2 per cent per annum.

Source: Author's illustration based on AfDB (2017: 24).

competitiveness. It forms a good base for industrialization and LC growth. However, visions and development plans are actualized through policies and legislative and other regulatory provisions. An excellent review of how well the policy and legislative environment supports industrialization and LC growth has recently been undertaken by the African Development Bank (AfDB 2017). The main findings of the review are that a number of sectoral policies are supportive

of Vision 2030. However, subordinate pieces of legislation are generally aligned neither to the Vision nor to the policies they claim to implement.

A good example of misalignment is that which exists between the 2013 Mineral Resources Development Policy and the 2015 Mines and Minerals Development Act, both under current implementation. The Policy emphasizes improved downstream processing to create export goods; forming linkages with other economic sectors; enhancing the acquisition of relevant skills; and raising levels of R&D and innovation. These principles are absent in the Act, which serves more as a licensing than an industrialization tool. Metrics for increasing LC are inadequate, while the use of incentives, taxes, and tariffs—all common tools for deepening linkages in the mineral value chain—has been counterproductive to LC development, as earlier outlined.

Similarly, the Employment and Labour Market Policy seeks to develop ‘an efficient and effective labour market in order to enhance productivity in the economy’ and to ‘resort to foreign labour only in those fields still lacking adequate qualified human resources’ (GRZ 2004: 6). The Policy further aims to create relevant skills for the labour market, especially in generating value added. However, there are no triggers for these elements in the Employment Act, which contains no provisions preferencing the employment and training of nationals, or limiting the employment of expatriate staff (AfDB 2017).

The Industrial Policy, adopted by Cabinet in 2018, envisions ‘an industrialised and competitive nation with a diversified, innovative and globally competitive industrial base, which contributes to sustainable growth and employment creation by 2027’ (GRZ 2018: 14). The Policy aims to address weaknesses of low productivity; lack of export competitiveness; unclear incentive packages for LC growth; limited beneficiation; and restricted access to affordable long-term investment finance.

Two of the main pieces of legislation subordinate to the Industrial Policy are the Zambia Development Agency (ZDA) Act and the Citizens Economic Empowerment (CEE) Act. These Acts are aligned to Vision 2030 and are consistent with LC growth and the 7NDP. The ZDA Act, for example, targets SME growth; increased R&D and innovation; and improved industrial productivity and export competitiveness. Similarly, the CEE Act requires all companies and state institutions to ensure the broad representation of qualified citizens in all occupational categories; and companies to prepare and implement employment equity plans with numerical targets. The Act empowers the Commission to determine thresholds to be prescribed for the participation of targeted citizens, citizen-empowered companies, and citizen-influenced companies in tenders for the procurement of goods and services. Both the ZDA Act and the CEE Act are, however, poorly implemented on account of persistent budget deficits.

Kragelund (2017) refers to the influence of other policies and legislation as contextual factors whose cohesion is necessary for successful LC initiatives. The

above examples and field survey findings (AfDB 2017) suggest fragmentation and incoherence across policies and acts in relation to industrialization and LC growth. These contextual factors need to be fixed for LC and industrialization to succeed.

5. LC and industrialization: the structural impediments

Earlier analysis shows that industrialization, the growth of LC, and structural transformation are principally determined by the quality of production linkages, whose drivers are:

- a. efficiency of factor allocation, and the productivity of firms participating in LC linkages
- b. investment and capital accumulation, especially in infrastructure
- c. quality of skills and endogenous entrepreneurship
- d. technological change, the rate of innovation, and spillover effects
- e. a supportive policy and institutional environment.

These elements provide context for the analysis of the structural impediments to LC development and industrialization that follows.

Morris et al. (2012) frame the story of industrialization in most sub-Saharan African (SSA) countries as dirigiste import-substitution policies (which initially built domestic industrial capabilities, albeit of low productivity and internationally uncompetitive), followed by structural adjustment policies (which generally eroded many of the industrial capabilities of the preceding era), and, more recently, the promise that SSA economies can emulate the export-oriented success of some East Asian economies (Morris et al. 2012: v). This certainly appears to be the case for Zambia.

5.1 ISI: a defective industrialization and LC agenda?

To recap, ISI aimed to develop manufacturing linkages for intermediate and consumer goods and to grow exports. While the policy initially succeeded in creating a burgeoning manufacturing sector, there were structural distortions in the production linkages that emerged. Firstly, there were inefficiencies in factor allocation. ISI was more successful in the consumer goods subsectors of food, beverages, textiles, and tobacco. These subsectors increased domestic backward linkages, as evidenced by the decline in the share of manufactured imports in total consumption from 66 per cent in 1965 to 46 per cent in 1972 (Karmiloff 1989: 12). However, from the viewpoint of substituting for imported mining input goods, these

subsectors were inconsequential. The subsectors of rubber products, chemicals, non-metallic minerals and metals, and machinery were of greater consequence to substituting imported mining input goods. These capital-intensive subsectors absorbed over 70 per cent of investment during 1964–74, and no less than 45 per cent of all new investment during 1975–85. Yet they had poor backward linkages into intermediate goods and a high import dependence. There was no investment made in the manufacture of domestic intermediate goods to offset the high import dependency.

ISI was also characterized by distortions in factor productivity. Driven by the large initial investments in chemicals, rubber, and plastics, assets per worker in these subsectors rose dramatically by about 75 per cent in the first decade. However, despite initial upward blips, total factor productivity (TFP)³ and MVA both declined dramatically over 1965–80. The largest decline occurred in base metals, reflecting the low capital productivity of the mining industry, starved of capital reinvestment. More generally, there were large deteriorations in output-to-capital ratios in industrial chemicals and plastics, as firms directly dependent on the mining industry struggled to cope with shortages of the capital required to keep plants operational (Karmiloff 1989: 19).

The productivity distortions of ISI should be understood in the context of the economic challenges of the time. A global recession and a slump in copper prices in the 1970s sent the copper industry into a spiral of falling export revenues and diminishing production volumes. Zambia's economic growth as a whole floundered (UNDP 2016). Table 19.2 indicates that by 1985 GDP growth had declined to –0.3 per cent, largely due to ballooning consumption and to shrinking copper exports and gross domestic investment (Karmiloff 1989: 5). ISI growth in manufacturing hence took place in the context of stagnating aggregate output, crippled by low capacity utilization in the mining industry itself and in the import-intensive subsectors that supported it.

The manufacture of mining inputs requires a range of skills and technological capabilities (Morris et al. 2012). There was a lack of technological skills and expertise especially in engineering subsectors including high-end foundry, fabrication, and machining facilities (AfDB 2017). The absence of an iron and steel industry during the ISI era is cited as the single most constraining factor due to limitations in imports of various steels for the engineering subsector. The decline in TFP, in the face of expansion in capital assets, has been largely attributed to these weaknesses (AfDB 2017) and the difficulty in endogenous assimilation of technologies embodied in new capital equipment (Karmiloff 1989). Under these conditions, ISI led to a proliferation of poor and uncompetitive products, with exports of manufactures at less than 2 per cent of total exports per annum.

³ Combining capital and labour inputs.

Table 19.2 Growth and structure of GDP, 1960–85

Average real growth of GDP, %	1960–70	1970–80	1980–85
	8.3	1.0	–0.3
<i>Sources of GDP</i>			
	1970	1980	1985
Government consumption	16	26	23
Private consumption	39	55	62
Gross domestic investment	28	23	14
Exports less imports	17	–4	–3
<i>Sectoral contribution</i>			
Agriculture	11	14	15
Manufacturing	10	19	21
Mining, quarrying, public utilities	37	33	15
Wholesale and retail trade	10	12	13
Transport and communications	4	6	5
Other services including government	20	27	28

Source: Author's illustration based on Karmiloff (1989: 5).

5.2 Post-1991 reforms: an elusive industrialization and LC agenda?

Market liberalization had the aim of improving factor allocation and productivity in order to stimulate the export competitiveness of the manufacturing sector. It also aimed to improve beneficiation in the copper value chain (UNDP 2016). ISI had similar objectives, hence these were not new goals. Table 19.3 shows growth in the real GDP and economic sectors over the period 1991–2015. GDP growth was high, particularly during 2006–10, on the back of significant FDI in the mining sector. From 2005–14, FDI inflows averaged US\$1.2 billion annually, facilitated by exceptionally high copper prices during the period. These inflows made investment funds in commodities liberally available and greatly increased copper output to about 800,000 tons in 2017.

FDI inflows have unfortunately been disproportionately concentrated in the mining sector, with the five largest mining companies accounting for nearly 100 per cent of the inflows. This has crowded out investment in the manufacturing and agriculture sectors, perceived to be the main sources of diversification and industrialization (UNDP 2016). Table 19.3 shows that despite the post-2000 policy aim to build a strong manufacturing sector, the share of manufacturing in real GDP continually declined from an average of 25.3 per cent during 1991–95 to 7.5 per cent during 2010–15.

Of consequence in Table 19.3 is the dramatic rise in the share of services, which accounted for more than 56 per cent of GDP over 2011–15. This represents the meteoric rise in the wholesale and retail trade, mostly among South African chain stores, as well as the high transportation costs of a highly import-dependent

Table 19.3 Real GDP and sectoral growth over the period 1991–2015

Average % growth	1991–95	1996–2000	2001–05	2006–10	2011–15
Real GDP	–3.0	2.8	4.8	8.7	5.2
<i>Sectoral growth</i>					
Agriculture	4.9	–2.4	–1.4	7.4	9.1
Industry (mining, manufacturing, construction, and utilities)	4.1	0.6	12.1	12.3	2.9
Manufacturing	1.0	2.3	5.7	3.8	6.7
Services (wholesale and retail trade, transport, other)	–2.4	7.0	5.8	9.3	7.2
<i>Sectoral contribution, % of GDP</i>					
Agriculture	21.8	20.0	17.2	12.5	8.3
Industry	43.5	29.9	27.7	33.7	35.1
Manufacturing	25.3	12.5	10.9	9.3	7.5
Services	34.7	40.2	45.1	53.7	56.6

Source: Author's illustration, based on data calculated from Africa Information Highway (2018).

economy. With the notable exception of the growth in services, there has been little structural diversification in Zambia's capital formation.

The technological formation of manufacturing continues to be narrow. A review in 2010 revealed that resource-based manufactures (mainly in the food, beverages, and tobacco subsectors) and low-tech manufactures (fabricated metal products) accounted for 87 per cent of manufacturing GDP (GRZ 2014; UNDP 2016). Only 13 per cent of total manufacturing output was medium- to high-tech manufactures, comprising mainly the chemical and machinery subsectors. The observed ISI structural weaknesses in areas crucial to industrialization and LC growth have hence persisted. Labour productivity has reportedly been declining partly due to weak physical capital, lack of access to technologies of production, and low levels of productive skills (GRZ 2014: 63). The unavailability of skilled labour has been more acute in the areas of chemicals, rubber, plastic, electrical machinery and equipment, and repair and installation of machinery—all vital areas for industrialization.

Endogenous entrepreneurship, important for growing domestic capabilities, has also continued to be weak. The prima facie view demonstrated by Figure 19.1 is that locally owned firms are more deeply embedded in the local economy and, crucially, are more committed to LC development than fleet-footed foreign-owned firms. In their seminal work, Morris et al. (2012) explore the impact of ownership of lead-commodity firms and their suppliers on the direction and pace of domestic linkage development in natural-resource-exporting African countries, including Zambia. They demonstrate that ownership origins matter in jurisdictions

like Zambia where there is no local ownership in the lead-commodity firms and their suppliers. The Western owners, including South African mining firms, have typically adopted the ‘global-sourcing-follower-supply’ model of supply chain management. This requires first-tier suppliers to co-locate with the commodity producer. Hence, GVCs such as Caterpillar, Atlas Copco, and others have followed the mining firms into Zambia but have very limited links with the domestic supply chains. This explains their complete dominance in the supply chains demonstrated earlier.

On the other hand, the ‘going-out policy’⁴ has shaped the behaviour of Chinese mining firms. Backed by the strategic intent to command access to resources, Chinese investment in mining in Zambia has grown rapidly from the original acquisition of Chambishi Copper Mine by the China Non-Ferrous Metals Company. This investment has now expanded into an industrial park, the Zambia China Economic and Trade Cooperation Zone, hosting about thirty-nine manufacturing enterprises that extend the Chinese mining value chain in Zambia. Chinese mining firms have focused less on outsourcing and have tended to internalize supplies. The locally based suppliers are increasingly Chinese-owned, not just with respect to technology-intensive inputs but also in relation to the provision of relatively simple inputs which can characteristically be supplied by domestic suppliers (Morris et al. 2012).

These issues underline the importance of distinguishing between localization, which is deepening domestic value added, and indigenization, which is increasing the share of national ownership in the linkages (Morris et al. 2012). While there has been some localization, albeit at a relatively minor level, there has been very little indigenous participation in LC development in Zambia in either the pre- or the post-privatization eras. Industrialization without growing endogenous entrepreneurship and domestic technological capabilities cannot be sustainable. There are no demonstrative precedents for this approach.

The policy and institutional environment for LC growth and natural-resources-led industrialization has continued to be weak. Zambia did not have an industrialization policy until 2018, and an LC policy is under development, presumably with an LC Act to follow. This should improve policy cohesion and alignment to the industrialization goals of Vision 2030. Institutionally, industrialization and LC development fall under the Ministry of Trade Commerce and Industry. However, responsibility for industrialization activities spans several ministries, as seen earlier. Coordination has proved to be a challenge. Other institutional factors that impede industrialization include the inadequate levels of quality infrastructure, particularly rail and energy (UNDP 2016), and the limited availability of long-term finance, which constrains the growth of SMEs. Also, business procedures remain cumbersome, while enterprises with market power commonly practice

⁴ This provides China with access to natural resources through the provision of preferential loans for infrastructure and social development in exchange for natural resources companies.

price discrimination. This applies, for example, to electricity, fuels, copper metal, cement, and water. Aggregately, these factors raise the costs of manufacturing inputs, thereby making production uncompetitive for domestic and export markets (GRZ 2014).

6. Back to basics: mending the role of LC in industrialization

6.1 Improve the competitiveness and productivity of the manufacturing sector

Structural fault-lines in productive linkages have hobbled LC and industrialization. The subsectors of consequence to LC growth and industrialization continue to have high import dependence on account of poor backward linkages into intermediate goods. This, combined with poor skills and access to technological innovation, has been responsible for the poor capital and labour productivity levels in subsectors relevant to LC, and those of manufacturing in general. To improve the competitiveness of manufacturing, and exports, Zambia needs to do several things:

6.1.1 Develop a domestic raw material base

This is necessary to provide intermediate goods to key subsectors of manufacturing. Of importance is the new integrated iron and steel industrial cluster. This has been included in the 7NDP to stimulate industrialization and LC growth particularly in the areas of chemicals, rubber, plastic, and machinery and equipment manufacture for the economic sectors, including mining, agriculture, manufacturing, construction, and infrastructure development.

It will be necessary to identify and develop target goods for which manufacturing capabilities either are available or can competitively be built up in a reasonable time. These are goods that present low-technology entry points and are already being, or have previously been, manufactured locally. Examples have been provided in the text. For these ‘low-hanging fruits,’ it will be necessary to evaluate the domestic market potential, technologies of production, and sources; local raw material sources; and the business partnerships required for their manufacture.

6.1.2 Improve workforce skills

Labour productivity depends on workforce skills and capabilities. The chapter notes Zambia’s poor stock of skills across the key sectors critical to industrialization, particularly in various engineering fields. This is exacerbated by the weak participation of industry in education and training (E & T), and the detachment of company career paths from institutions of learning.

There will be a need, as part of incentives and legislative provisions, to explore how industry participation in E & T can be improved. The AfDB (2017) report

recommends that an industry skills survey be undertaken, which should serve as a basis for a workforce development model; a skills forecasting model; and integrating industry competency-based schemes with E & T learning. Industrialization and structural transformation will also require the state to develop, as matter of urgency, a medium- to long-term human resource development plan to align secondary and tertiary education, and skills training to meet the strategic needs of industrialization.

6.1.3 Improve R&D and innovation

The depth of technological innovation determines capital productivity and the capability to produce exportable manufactures. R&D and a national system of innovation are the most important sources of technological upgrading. Zambia has to develop a national system of innovation to drive the pace and direction of technological innovation for manufacturing. Targeted policy interventions are required that adapt imported technologies through indigenous R&D and innovation. Industry participation in R&D and innovation will need to be scaled up through the use of appropriate incentives to reward companies investing in R&D or in areas that are key to industrialization and LC development.

6.2 Strengthen the policy and legislative base for LC growth and industrialization

While the planning and policy frameworks are supportive of developing productive linkages and of industrialization, the subordinate legislation generally is not. Weak alignment and poor implementational coordination are impediments to industrialization, structural transformation, and LC growth. Several actions will be required to reinforce the legislative provisions.

6.2.1 Strengthening mineral legislation

The 2015 Mines and Minerals Development Act is inadequate in its current form. There will be a need to deepen LC and industrialization provisions by:

- a. aligning the Act to its policy objectives and those of Vision 2030
- b. providing incentives that reward mining and other companies engaging in high-level skills-building and domestic R&D to develop products and processes that extend the mineral value chain
- c. introducing targets preferencing the employment of nationals and their integration into company career paths, especially at higher technical and managerial levels
- d. providing targets preferencing local suppliers, supported by monitorable firm-level LC plans for supplier development.

6.2.2 Rationalizing the use of incentives

The current incentives structure, inherited from the Development Agreements, rewards mining firms for importing goods rather than encouraging their domestic manufacture. At the same time, there are no incentives, such as import tariffs, to protect nascent manufacturing industries for goods that can be manufactured locally. Nor are there any export tariffs on unbeneficiated mineral products to encourage local processing. The entire area of incentives needs to be evaluated to determine their impact on domestic manufacturing and industrialization; innovation, productivity, and export competitiveness; and mineral tax revenues. This should lead to improved targeting of incentives towards broad industrialization goals. Targeted incentives could also encourage some GVCs to relocate part of their production to Zambia.

6.2.3 Harmonizing legislation across sectors

Examples have been provided of incoherence in several pieces of sectoral legislation in respect of industrialization and LC objectives. There will be a need for a detailed review of the coherence of the legislative provisions across the different policies and acts, to harmonize their support for industrialization and LC growth. This probably requires the development of a stand-alone LC policy and act in order to accommodate key provisions relating to industrialization and LC development.

6.3 Build the capabilities of endogenous SME manufacturing firms and suppliers

The literature reviewed confirms the role of endogenous entrepreneurship in business start-ups and employment creation, as well as in providing innovative inputs into GVCs. In Zambia, a dearth of endogenous entrepreneurship has limited SME growth to the supply of simple non-core services to the mining industry. There is need for long-term programmes to remove the intractable lack of skills and technological accumulation among SMEs, coupled with improving their access to structured long-term finance. It would be useful to review how nationals can best be supported to acquire lower-end manufacturing technologies and expertise through mentorships and foreign partnership arrangements. Mentorships are particularly useful in graduating SMEs into providing core mining input goods and services.

6.4 Strengthen the macroeconomic environment

LC development and industrialization require a stable macroeconomic environment, efficient infrastructure, and supportive institutions. Inflation and monetary

policy will need to aim at reducing the cost of capital through a stable financial sector that facilitates long-term project borrowing.

Road, rail, and energy infrastructure will need further improvements to support industrialization efforts. Rail infrastructure continues to be in poor shape to support bulk movement of cargo. Zambia has been in an energy deficit, with frequent outages since 2009, and by 2020 demand is projected to be twice the current generation capacity. Zambia needs to double generation capacity by that date. Physical infrastructure for skills-building and R&D to support innovation are dysfunctional. Industrialized countries that succeeded in developing out of commodities had major programmes to support skills acquisition and R&D to assimilate and improve technologies. An improvement in national institutions will be required to enhance technological innovation in manufacturing firms relevant to industrialization and LC growth.

On the soft infrastructure side, it will be necessary to widen the scope of the Zambia Bureau of Standards to accommodate standards for broader engineering goods. Government functions too will need to be reorganized to better support LC growth and industrialization. It may be necessary to create an apex ministry of industrialization to improve the coordination of LC development and industrialization efforts.

References

- AfDB (African Development Bank) (2017). *Development of a Framework for Local Content Policy for the Mining Sector in Zambia*. African Natural Resources Centre (ANRC). Abidjan: AfDB.
- AfDB and BMGF (Bill & Melinda Gates Foundation) (2014). 'Creating Local Content for Human Development in Africa's New Natural Resource-Rich Countries'. Flagship Report Paper Series, Working Paper 6. Abidjan: AfDB.
- Africa Information Highway (2018). 'AfDB Socio-Economic Database, 1960–2019'. Available at: <http://dataportal.opendataforafrica.org/bbkawjf/afdb-socio-economic-database-1960-2019> (accessed 26 January 2018).
- Bartelme D., and Y. Gorodnichenko (2015). 'Linkages and Economic Development'. Berkeley, CA: University of California.
- Braunerhjelm P. (2010). 'Entrepreneurship, Innovation and Economic Growth'. Working Paper 224. Centre of Excellence for Science and Innovation Studies (CESIS). Stockholm: Royal Institute of Technology.
- Colander D. C. (2017). *Economics*, 10th edition. New York: McGraw-Hill Education.
- Fessehaie J., R. das Nair, P. Ncube, and S. Roberts (2015). 'Growth Promotion through Industrial Strategies—a Study of Zambia'. Working Paper 6/2015. Johannesburg: Centre for Competition, Regulation and Economic Development (CCRED).

- Genesis Analytics (2014). 'Design of a Zambia Mining Local Content Programme'. Report prepared for the World Bank. Johannesburg: Genesis Analytics.
- GRZ (Government of the Republic of Zambia) (2004). *National Employment and Labor Market Policy*. Lusaka: Ministry of Labor and Social Security.
- GRZ (2006). *Vision 2030: A Prosperous Middle-Income Nation by 2030*. Lusaka: Ministry of Finance and National Planning.
- GRZ (2014). *2011–2012 Manufacturing Sector Study Report*. Lusaka: Ministry of Commerce, Trade and Industry and Central Statistics Office.
- GRZ (2017). *7th National Development Plan 2017–2021: Accelerating Development Efforts towards Vision 2030 without Leaving Anyone behind*. Lusaka: Ministry of National Planning.
- GRZ (2018). *National Industrial Policy*. Lusaka: Ministry of Trade, Commerce and Industry.
- Hernesniemi H., M. Lammi, and P. Ylä-Anttila; P. Rouvinen (ed.) (1996). 'Advantage Finland: The Future of Finnish Industries'. Research Institute of the Finnish Economy (ETLA) and Finnish National Fund for Research and Development (SITRA). Helsinki: Taloustieto Oy.
- ICMM (International Council on Mining and Metals) (2014). *Enhancing Mining's Contribution to the Zambian Economy and Society*. London: ICMM.
- ILO (International Labour Organization) (2014). *More and Better Jobs in Zambian Mining Communities*. Lusaka: ILO.
- Karmiloff, I. (1989). 'Industrialization in Sub-Saharan Africa: Case Study for Zambia'. Working Paper 26. London: Overseas Development Institute (ODI).
- Kaunga, E. C. (1993). 'Privatization: The Zambian Experience'. Available at: <http://unpan1.un.org/intradoc/groups/public/documents/aapam/unpan028227.pdf> (accessed 26 January 2018).
- Kragelund, P. (2017). 'The Making of Local Content Policies in Zambia's Copper Sector'. *Resource Policy*, 51: 57–66.
- Mattoussi, W., and M. Ayadi (2017). 'The Dynamics of Exporting and Innovation'. *Journal of African Economies*, 26(1): 52–66.
- Morris, M., R. Kaplinsky, and D. Kaplan (2011). 'Commodities and Linkages'. MMCP Discussion Paper 13, Making the Most of Commodities Programme. Cape Town: University of Cape Town and Open University.
- Morris, M., R. Kaplinsky, and D. Kaplan (2012). 'One Thing Leads to Another'. Cape Town: University of Cape Town and Open University.
- Newman, C., J. Rand, F. Tarp, and N. Thi Tue Anh (2017). 'Exporting and Productivity'. *Journal of African Economies*, 26(1): 67–92.
- OECD (2017). *Local Content Policies in Mineral-Exporting Countries, Part 1*. Working Party of the Trade Committee, Trade and Agriculture Directorate. Paris: OECD.

- OECD, UNCTAD (United Nations Conference on Trade and Development), and WTO (World Trade Organization) (2013). 'Implications of Global Value Chains for Trade, Investment, Development, and Jobs'. Paper prepared for G20 St Petersburg Summit. Geneva: UNCTAD.
- Pietrobelli, C., and R. Rabellotti (2010). 'Global Value Chains Meet Innovation Systems'. IDB Working Paper IDB-WP232. Washington, DC: International Development Bank (IDB).
- Porter, M. (1990). *The Competitive Advantage of Nations*. New York: The Free Press.
- PwC (PricewaterhouseCoopers) (2013). *Mine—A Confidence Crisis*. Beijing: PwC.
- Simpasa, A., D. Hailu, S. Levine, and R. J. Tibana (2013). *Capturing Mineral Revenues in Zambia*. UNDP and EU Global Partnership on Land, Natural Resources and Conflict. New York: UNDP.
- Tordo, S., M. Warner, O. E. Manzano, and Y. Anouti (2013). 'Local Content Policies in the Oil and Gas Sector'. World Bank Study 78994. Washington, DC: World Bank.
- Tyler, W. G. (1980). 'Growth and Export Expansion in Developing Countries'. Discussion Paper 20. Rio De Janeiro: Instituto De Planejamento Economic E Social (IPEA).
- UNCTAD (United Nations Conference on Trade and Development) (2007). *World Investment Report 2007—Transnational Corporations, Extractive Industries and Development*. Geneva: UNCTAD.
- UNCTAD (2010). *Integrating Developing Countries' SMEs into Global Value Chains*. New York and Geneva: UNCTAD. Available at: http://unctad.org/en/Docs/diaeed20095_en.pdf (accessed 13 January 2018).
- UNCTAD (2017). 'Integrating SMEs into Value Chains Can Boost Development'. Available at: <http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1550> (accessed 5 January 2018).
- UNDP (United Nations Development Programme) (2016). *Human Development Report 2016—Industrialization and Human Development*. Lusaka: UNDP.
- UNECA (United Nations Economic Commission for Africa) (1996). *Assessment of Skill Deficiencies in the Mining Industries of Eastern and Southern Africa*. Multinational Programming and Operational Centre for Eastern and Southern Africa (ECA/MULPOC/LUS/ICE/IV/7 & 8). Lusaka: UNECA.
- UNECA (1997). *Integration of South Africa into Southern Africa: A Mining Perspective*. Multinational Programming and Operational Centre for Eastern and Southern Africa (ECA/MULPOC/LUS/ICE/IV/21). Lusaka: UNECA.

PART III
POLICY IMPLICATIONS

Implications for Public Policy

John Page and Finn Tarp

1. Introduction

Although natural resources make diversification and structural change more challenging, public policy matters. Tradable goods production will expand or contract according to whether it is internationally competitive. This depends both on relative prices and on the policy and institutional changes and investments that governments make to enhance competitiveness. This chapter draws together some lessons for the design of policies to promote structural change in the growing number of African resource exporters. We begin by addressing the three key themes that guided our research—managing the boom, the construction sector, and linking industry to the resource.

We then propose some ideas for widening the options for structural change. These include policy and institutional reforms to deal with Dutch disease, expanding the concept of structural change from a focus on industrialization to ‘industries without smokestacks’, and investing in knowledge. We argue that governments in resource-abundant economies can use institutional and policy reforms and public investments to mitigate the impact of Dutch disease. They can also broaden their options for diversification by promoting the growth of tradable services and agri-business, including horticulture. Creating and using knowledge—either specific to the resource or in areas where the economy may have localized competitive advantages—has been an important element in the diversification of several resource-rich economies, and African governments can learn from these successes. Finally, natural resources open new opportunities for spatial policies, such as resource-based Special Economic Zones (SEZs) and growth corridors that can catalyse resource-based infrastructure for national development.

2. Managing a modest boom

There is a common thread among the African resource exporters we have studied. In all these countries—except perhaps Mozambique—the impact of the resource on the economy will probably not be large enough to be transformative. None of

them is likely to become another Kuwait. At the same time, resource revenues could well be large enough to be potentially disruptive. Gas in Mozambique might bring a much larger windfall, though its timing and magnitude are uncertain. In short, most of the resource exporters we have studied face the challenge of managing a modest boom.

The fact that the revenue stream associated with the resource discovery may be more modest—and more volatile—than politicians and the public believe and that the extent of the resource may be limited raises important issues for public financial management. As Mark Henstridge reminds us in chapter 2, the production of a mineral is actually a sequence of asset transformations. While the labels ‘production’ and ‘revenue’ imply a flow of output or income, those transactions are mainly steps in the transformation of an asset from one form to another. Sustainable development depends on converting the rents from extracting resource assets into assets yielding other sources of income. One way to diversify income is by accumulating financial assets abroad. Prudent fiscal management, therefore, depends on identifying investments that have a high likelihood of yielding benefits to the domestic economy that exceed the opportunity cost of holding foreign assets.

In poorer economies, the needs of today’s poor should outweigh the needs of future—presumably richer—generations, and in principle, the returns to domestic investment should exceed those offered by foreign assets. The country studies, however, suggest that while using public expenditure to support current consumption or new investment makes sense in principle, it is challenging in practice. In Ghana, Mozambique, and Zambia pressures to spend without the institutions governing public expenditure in place have proved difficult to resist. Managing even a modest boom puts substantial pressure on public financial management in three areas: managing expectations, controlling the volume of public expenditure, and improving the quality of public investment.

2.1 Managing expectations

Ghana, Mozambique, Uganda and Tanzania share a common problem: both legislators and the public believed that the revenues from new resource discoveries would be larger and would come on stream sooner than they have done. In addition, despite a long history of copper revenue management, Zambia has ended up in debt distress, largely from relaxing fiscal discipline in the face of rising copper prices. Managing the expectations arising from any new resource discovery is essential to establishing the basis for prudent public financial management.

In Ghana, early oil revenue projections were bullish, and with the impending 2008 national elections in sight, the incumbent government did little to manage public expectations with respect to the volume and timing of revenues. As a

result, the petroleum discovery gave a false impression that there was more fiscal space than existed. This fiscal buoyancy also made it difficult to develop a political consensus for critical improvements in institutions such as fiscal rules and the independence of the central bank. In Mozambique, the EMATUM bond issue of 2013 had an obvious problem at the time of contracting the loan. The bond issue had a maturity date of 2020. Therefore, even if the very optimistic revenue projections had proven to be correct, the timing was clearly off. Full repayment of the loan had to happen *before* one dollar of gas revenues became available.

Despite projections that imply that production of gas is at least a decade away in Tanzania, expectations have been high, including in Mtwara—the onshore supply base for offshore exploration—where unrest resulted in several fatalities. Ironically, today the prospects of the energy companies reaching a final investment decision appear to be growing increasingly remote.¹ Since Uganda reached the commercial threshold of oil in 2008, the government, civil society, and the public have speculated regarding the size of the oil boom to come, and some of these expectations have already resulted in infrastructure investments. To date, none of the previous projections of the onset of production proved realistic.

Two vulnerabilities appear to have led to fiscal exuberance in the five case-study countries. First, early projections of revenues tended to use optimistic estimates of price trends, and of the extent of the resource. Second, the resource extraction agreements between the multinational companies and the government were not publicly available. Lack of public disclosure of the agreements forced analysts to use the limited published information available—together with some relatively standard features of production-sharing agreements—to make rough estimates of the level of resource revenues and extraction costs.

To address the first problem, governments need to make the public (and their political representatives) aware of the great uncertainty attached to estimating commodity prices and the extent of commercially extractable resources. In the case of Tanzania, for example, Henstridge notes that the initial optimism surrounding the extent of the undersea gas reserves has come up against the reality of declining natural gas prices, calling the commercial viability of liquefied natural gas (LNG) exports into question. There has been little public communication on the uncertainty surrounding when and how the projects may go ahead. This is an area where the international financial institutions could be helpful. Both the IMF and the World Bank have specialized staff dedicated to monitoring commodity price trends and making projections. In economies with new resource discoveries, governments should publicize these organizations' price projections and estimates of price variability.

In the case of resource extraction agreements, disclosure on the part of government and the extractive companies can reduce the uncertainty associated with

¹ See chapter 11.

the timing and scale of revenues. Most resource-extraction contracts around the world are confidential. Yet, Cameroon, Colombia, Ecuador, Kazakhstan, Kurdistan, Liberia, Morocco, and Timor Leste have all published their production-sharing agreements. Among the countries in our case studies, Ghana stands out for the extent to which it has made the content of its production-sharing agreements available to the public. Public access to the production-sharing agreements may also strengthen the incentives for the extractive companies to make accurate information available regarding the extent of commercially viable reserves.

2.2 How much spending?

Pressures to increase public spending are an unavoidable companion to resource discoveries. This raises the question of how to assess how much spending is too much. Regardless of whether spending is in the form of consumption or public investment, there is an absorption constraint. Getting feedback from the economy when the public investment programme moves forward will show whether the limits of absorptive capacity become binding. The most direct signals are inflation and the exchange rate. Some appreciation of the exchange rate is inevitable when spending out of resource revenue increases, but when inflation accelerates and the exchange rate is appreciating beyond manageable limits, the pace of spending needs scaling back.

The country studies underscore this point. In Ghana, there has been an upward trend in inflation since 2012, reaching 17.5 per cent in 2016. Fiscal slippages and aggressive capital investments, along with some overvaluation contributed to widening current account deficits through 2013. Although the cedi depreciated by 31 per cent against the dollar in 2014, IMF estimates suggest a real effective exchange rate overvaluation of around 8 per cent. In Mozambique, the inflation rate accelerated from 2 per cent in 2014–15 to an average of 17.3 per cent in 2016–17 and the exchange rate has appreciated in nominal terms by 24 per cent since October 2016. In Zambia, inflation responded to the recent spending surge by accelerating from 7.4 per cent in 2013/14 to 14 per cent in 2015/16. Following a doubling of the Kwacha value of the US dollar in November 2015, the currency has appreciated by about 70 per cent. Clearly, public expenditure exceeded the absorptive capacity of those economies. Tanzania and Uganda in contrast, have kept inflation in check in the five per cent range and sustained relatively stable exchange rates.

2.3 Improving the quality of public spending

The quality of public spending should determine the quantity of public spending. The key decision rule for a resource-abundant economy should be never to

finance an investment project where the return broadly and carefully assessed is less than that obtained from holding foreign assets. Applying this rule, however, is more complex than it appears at first sight. While it is possible to estimate the returns to investments in discrete domestic investment projects with some precision, it is considerably more difficult to appraise the benefits of efforts aimed at improving the competitiveness of the economy as a whole. Nonetheless, problems with addressing externalities should not be an excuse for failure to evaluate the great majority of investment projects. Once the overall volume of spending consistent with prudent public investment is set, governments should park any remaining revenue in investments overseas.

One of the critical failures of public expenditure management found in the country studies is the lack of effective systems to prioritize and select investment projects. Even Ghana, which attempted to introduce global best practices into the management of resource revenues, has had greater success in promoting transparency in accounting for revenues than in identifying priorities for public expenditure. Similar, although more extreme, issues have affected project selection in Mozambique, Tanzania, and Zambia. In all cases, accurate estimates of the returns to the projects financed out of resource revenues are not available.

Addressing this problem requires improving the quality of project appraisal. A major contributor to Botswana's success in translating diamond revenues into economic development was the requirement for appraisal of every public investment project. Chile, another resource-rich economy, followed similar rules. It is revealing that none of the countries among those we studied has systematic requirements for project appraisal. To improve project selection, governments need to build a cadre of economists with training in project appraisal and make them responsible for project preparation in each spending ministry. The finance or economics ministry—as the case may be—should have a prioritized list of projects meeting the agreed threshold rate of return. To succeed in changing the organizational culture, a prerequisite is that writing sound project appraisals become a required skill for officials to advance their careers, together with the capacity to identify and reject inadequate appraisals.

The country studies show that frequently public investments proceed without adequate provision in the budget for recurrent costs of maintenance. This is especially dangerous in the case of spending out of resource revenues. Lack of maintenance can seriously degrade project returns. Adam and Bevan (2014) show that the returns to operations and maintenance of existing, poorly maintained public infrastructure are higher, in terms of their contribution to growth, than building new infrastructure. Maintenance costs, themselves, also increase when routine maintenance is deferred (Burningham and Stankevich 2005).

Adopting a medium-term expenditure framework (MTEF) that incorporates multi-year maintenance plans can help make budget preparation more forward-looking. However, forward planning is only effective where inputs from line

departments are sound. Proper budgeting for maintenance needs good data on the condition of infrastructure assets and the scope and cost of work to be completed. This requires greater communication between sector managers in line ministries and budget decision-makers. Governments should also ensure that user fees are adequate to cover routine maintenance, as well as the operation of the infrastructure and its replacement.

Where reforms to institutionalize maintenance expenditures are difficult to implement, governments should consider earmarking resource revenue for the management of assets. Botswana, for example, used a rule of thumb that 18 per cent of the capital cost of any public asset—whether a school, medical facility, road, or bridge—needed to be budgeted for recurrent costs of maintenance. When they checked later, planners found that the ratio required was a bit higher and cut back the investment programme.

The rapid accumulation of debt in several countries introduces another public expenditure option—paying down the debt. Van der Ploeg and Venables (2011) argue that when a country faces debt-elastic foreign interest rates, it may be desirable to use a portion of the resource windfall to repay foreign debt. The positive empirical relationship between the stock of foreign debt and the credit spread means that where governments face external credit constraints, reducing foreign debt can boost domestic investment and growth. However, debt reduction will not be optimal in all cases. There should be persuasive evidence that the economy is credit constrained.² In any case, governments should avoid the temptation to relax prudent debt management practices in the face of pressure from domestic constituencies to front-load spending.

3. Construction and ‘investing to invest’

As the country studies demonstrate, high costs in the construction sector can act as a brake on the ability of the economy to transform investment effort into investment outcomes and limit the opportunities for the domestic firms to participate in the construction phase of natural resource projects. Paul Collier has emphasized the need for policies to reduce the marginal cost of construction: he terms this ‘investing to invest’ (Collier 2011). Because the speed with which construction can expand without driving up prices should determine the pace of public investment, the government needs a rapid flow of information from the construction sector to design the public investment programme.

² When van der Ploeg, Stefanski, and Wills (2012) analysed the potential uses of petroleum revenue in Ghana using the same model, they concluded that the government should give priority to reducing the stock of foreign debt. Similar conclusions are likely to hold for Mozambique.

This is not a trivial task—the history of public–private engagement in Africa has shown more failures than successes (Page and Tarp 2017)—but it is essential. Ghana, Uganda, and Zambia highlight the close links between macroeconomic management and price shocks to construction costs. The vicious circle of too much fiscal expenditure spurring rising construction costs in all three countries reinforces the argument that feedback from the construction sector is crucial for effective management of the public expenditure programme.

One reason why construction prices tend to rise in response to increases in demand is that construction requires organization, land, material inputs, skills, and finance. Each can potentially constrain the expansion of output. The case studies identify limited capabilities in domestic contracting firms, opaque or time-consuming regulations, lack of skilled labour, problems with the price and quality of material inputs and lack of access to finance as factors that increase costs and limit the supply response in the construction sector. Public policies can address many of these constraints.

3.1 Increasing the capabilities of local contractors

The great majority of firms engaged in construction in the country studies are micro, small, and medium enterprises (MSMEs). Business training is one of the most common forms of support to MSMEs around the world. While training programmes have traditionally targeted services and manufacturing firms, governments in economies with new resource discoveries may wish to focus first on the construction sector. Cheelo and Liebenthal, for example, conclude that there are potentially high pay-offs to establishing capacity-building programmes for construction firms in Zambia.³

Unfortunately, the results of most MSME training programmes have been disappointing (McKenzie and Woodruff 2012). Few studies find any significant impacts of training on firm performance. Paradoxically, the impact assessments find that the firms that most benefit from training are those with superior prior performance. Rather than training an untargeted range of micro and small firms, the government might consider running a business plan competition in which winners receive a substantial prize and access to training (McKenzie 2015). If the construction sector appears to be non-competitive overall, as in Zambia, policy changes to promote greater competition are also essential.

An alternative to training would be to assist business organizations in the construction sector to acquire good management practices and make them available to their members. In India, for example, the private sector almost wholly funds

³ See chapter 18.

the Confederation of Indian Industries, which provides services of this kind at fees that are within the reach of India's smaller manufacturing companies. These types of initiatives have lower fiscal costs and make the private beneficiaries bear a greater cost share than training. They also face a market test; if they do not deliver value, firms will abandon them.

3.2 Relaxing supply constraints

As Kirchbirger notes in chapter 3, frequently, the public sector, itself, is responsible for policy-induced constraints to construction. Sometimes, as in the cases of Ghana, Tanzania, and Uganda, urban land rights are confused, and this can delay projects. Similarly, planning permissions might be slow. In Zambia, dealing with construction permits takes more than six months.⁴ In Tanzania there are about twenty-four steps to obtain construction permits, including obtaining a location plan, registration with regulatory boards, and inspection by local government authority officers. In total, these procedures may take up to 184 days.⁵

Institutional and policy reforms can prevent these stages from becoming constraints. The Ghana Housing Policy, launched in 2017, for example, aims to establish a land register to provide information on land ownership and to establish a programme of land ownership confirmation and guarantee arrangements. In Tanzania, the government has directed municipalities to ensure that the planning and construction committee makes decisions on issuing permits within one month. This has reduced the statutory time to process permits from ninety to thirty days, although realizing this reduction will require improving the performance of local government authorities.

In each of the countries studied, contractors and clients pointed to problems with the cost and quality of material inputs. Poorly designed policy restrictions on imports, poorly performing institutions such as customs, or the poor performance of the port may become a bottleneck that requires policy action. In Tanzania, for example, the Port of Dar es Salaam is the most acute problem. The main symptoms of the port's inefficiency are long delays at anchorage and in the series of operations needed to remove merchandise from the port. McMillan et al. (2017) estimate the total cost of delays to be equivalent to a tariff of 22 per cent on every container of imports. A combination of economizing on their use and stimulating local production may be one way to relieve the constraints imposed by lack of non-tradable inputs, although as the cases of Ghana and Mozambique illustrate, stimulating local production of inputs requires developing the local construction value chain.

⁴ See chapter 18.

⁵ See chapter 12.

Because such skilled trades as bricklayers, welders, electricians, and plumbers are complementary to unskilled labour and capital, it is not surprising that all the country studies identified skills constraints as a major impediment to the expansion of construction. With planning, construction skills can be locally developed, and the government should allocate resources to training well before the construction phase of a resource boom. A significant number of the skills needed by the resource sector are transferable. These include metal works, building, civil engineering and infrastructure, and mechanical and electrical work. Therefore, a programme of vocational training to a standard good enough to permit trainees to work on the construction phase of a natural resource project will generate a more elastic supply of people with the skills that can also relieve constraints facing the public investment programme. Immigration policies that facilitate the temporary location of service providers can also reduce the cost of importing skilled labour. For East Africa's emerging resource exporters—Kenya, Tanzania, and Uganda—this could be done within the context of deeper regional integration in the East African Community (EAC).

When contracts are awarded on price only, local contractors are often unable to win bids due to lack of access to financing. Reforms to the financial sector may help to ease the constraints to smaller firms imposed by the inability to rent or lease equipment. Cheelo and Liebenthal, for example, suggest that in Zambia, the government explore options to mobilize affordable credit for the construction sector. Governments need to exercise care, however, in the design of targeted finance programmes. The assumption that breaking financing constraints will allow micro and small business owners to scale up their operations appears to be true only when business owners have the skill and resources to profit from the investment (Banerjee et al. 2010; Bauchet et al. 2011). For this reason, as Colonnelli and Ntungire suggest in chapter 15, improvements in leasing and factoring markets may offer greater pay-offs than credit interventions targeted at construction firms.

Some governments exacerbate the financing constraints faced by local firms by failing to make timely payments for work done. In Ghana and Uganda, for example, delays in payment for government construction projects often limit the participation of local firms and lead to delays in project completion.⁶ In Ghana, a new administration may not finish projects started by an outgoing government, and funding delays are common.⁷ These payment issues tend to favour larger, foreign firms since they are more likely to have the financing needed to remain in business in the event of delayed payments. One solution to this problem would be to enact a Delayed Payment Law (DPL), like those found in the United Kingdom, Singapore, and Malaysia, making it mandatory for government to pay interest on all delayed construction payments.

⁶ See chapters 6 and 15.

⁷ See chapter 6.

3.3 Dealing with corruption and collusion

Corruption and collusive behaviour are difficult areas to deal with. We have no more than an imperfect understanding of the mechanisms by which corruption flows through into higher costs. One obvious channel is ‘leakage’ of funds. Construction is the economic sector most dependent on public procurement. This, coupled with typically sizable average contracts, gives public officials and politicians opportunities to extract rent from the private sector. The use of inferior materials and failure to meet specifications are other likely mechanisms. These problems magnify when the government plays both the role of the client and that of the regulator.

A widely held view in Tanzania is that corruption during procurement and project execution is widespread. In Ghana, the large volume of funds earmarked for construction projects frequently obscures money included for bribery and kickbacks. In Uganda, only 37 per cent of audited procurement contracts were fully satisfactory in their allocation and execution. The same audit rated a significant number (26 per cent) as ‘high risk’—subject to severe violations including fraud and corruption. However, only 22 per cent of construction firm owners in Uganda believe that court enforcement works well in corruption cases.⁸

Collusive behaviour raises costs. By one estimate, overcharges due to cartels in developing countries lead to about 40 per cent higher construction prices on average. Common problems faced by the construction industry in the countries we studied included non-disclosure of the beneficial owners of construction companies bidding on contracts and rigging of tenders. In Zambia, in addition to oligopolistic pricing in the sector, politically connected groups specialize in the illicit capture and sale on illegal secondary markets of public tenders.

Some suggested mechanisms for dealing with corruption include strengthening the role and integrity of the project engineer and checking the wealth of key procurement agency officials. Countries could also experiment with different incentive contracts for engineers to encourage reporting of corruption and fraud. Collusion is difficult to detect. Building up and publicizing databases of unit costs of comparable construction activities can assist governments in ensuring that they are not overpaying (World Bank 2011). Transparency, however, comes with a risk. The same data may facilitate collusion among firms.

4. Linking industry to the resource

Natural resources change the balance of power between governments and foreign firms. In countries that are not resource-abundant, governments are engaged in a

⁸ See chapters 6, 12, 15.

global beauty contest to attract FDI. In resource-rich countries, the foreign investors are the contestants. This provides an opportunity for governments to broaden domestic industrial capabilities by integrating local companies into the supply chains of the multinational resource extraction firms (MNCs). In all the countries studied, governments have introduced local content and value addition initiatives along the natural resources value chain with the intention of diversifying by expanding the range of domestic firms participating in the resource sector.

John Sutton's *Enterprise Maps* of Ghana, Mozambique, Tanzania, and Zambia offer some insight into the state of current capabilities in the countries we studied.⁹ Such industries as food and beverages, cement, and building materials are fairly highly developed in each country. Metal and mechanical industries, engineering and assembly, and plastics are not. The crucial difference between these types of industries is that food, cement, and building materials all serve the local market and are subject to substantial 'natural protection' due to weight, perishability, or bulk. They are also products sold to consumers directly. Metals, engineering and assembly, and plastics are different. While all four countries studied by Sutton have some activity in each industry, it is generally limited to the least demanding segments of the market in terms of both quality and productivity. That is because these are intermediate goods for which the international quality standards are high and the demand on African capabilities is too great (Sutton 2012).

Metals, engineering and assembly, and plastics are also the sectors in which supplier linkages to the natural resource value chain offer the greatest prospects for capability building. Two of the key mechanisms through which higher capabilities build up in firms are through demanding buyers and repeated relationships. The first refers to exchanges of information between suppliers and buyers with a reputation for demanding high quality adding to the capabilities of supplying firms. The second is a close and continuing contractual relationship between buyer and supplier, which often involves a two-way movement of technical and engineering personnel. Demanding buyers and repeated relationships are characteristic of the resource MNC value chain. This implies that the objective of the Africa Mining Vision of improving the capabilities of domestic firms by linking them to the natural resources value chain remains valid. The question is how to do so.

4.1 Local content

Progress in increasing local content and value addition varies. Most of the countries we studied have succeeded in introducing and enforcing requirements for the employment and gradual skills upgrading of nationals. Local procurement

⁹ See for example Sutton and Landmead (2013), Sutton and Keptney (2012), or Sutton and Olomi (2012).

regulations have met with less success for several reasons, including the scarcity of enterprises capable of satisfying industry standards in the procurement of goods and services. The country studies show that in general, local companies have concentrated at the lower end of the natural resources supply chain. Firms lack the engineering expertise, production knowledge, and quality controls to move up the chain.

Poor implementation of local content development policies is also a common problem. Often, there is need for greater collaboration between different stakeholders and ministries, and in several countries, programmes aimed at the resources sector lack coherence with broader economic development policies. For example, the Vision 2030 and 2017 Seventh National Development Plan have guided Zambia's long-term development. While some policies support Vision 2030, Lombe argues that the underlying legislation lacks alignment to the Vision, particularly in mining and mineral resources. Ghana created the Petroleum Commission to improve the alignment of local content policies with broader development objectives, but there are concerns about its capacity.¹⁰

Dietsche and Esteves observe that in Mozambique, local content objectives are contained in a diverse range of policies, strategies, plans, laws, and regulations, aimed at achieving different impacts and targeting different beneficiaries. In Tanzania, many provisions for local content are unclear and not well enforced. Ellis and McMillan argue that while the National Economic Empowerment Council could provide increased coordination of local content initiatives, the continued authority of the Ministry of Energy and Minerals over the extractive industries may frustrate its efforts. In Uganda, Sen points out there is a lack of clarity regarding what constitutes a 'local' good or service, making it difficult for firms to comply with the regulatory environment.¹¹

4.2 A public–private partnership

Integrating local firms into the resource value chain depends on addressing the priorities and concerns of both the MNCs and the government. Politicians and public officials often have inflated expectations, and the MNCs that dominate resource extraction can be sceptical that any local firm has the capabilities to enter their value chain. Dietsche and Esteves argue that because international investors in mining, oil, and gas have limited experience in Mozambique, coordinated action by the public sector, the local private sector and the international investors is essential to bridge the gap between current standards and the standards demanded by the multinational companies. Ackah notes that in Ghana,

¹⁰ See chapters 7 and 19.

¹¹ See chapters 10, 13, 16.

MNCs have had difficulty in identifying and assessing the suitability of Ghanaian suppliers, most of which have relatively short track-records and lack reputation. Local SMEs also face an information gap regarding tendering opportunities. Lombe suggests that in Zambia, it would be useful to undertake an evaluation of lower-end technologies for inputs into mining and develop mechanisms to support local firms to acquire these technologies.¹²

Integrating domestic firms into the resource value chain is a more complex undertaking than legislating or regulating local content. It depends on the ability of government and industry to develop an effective public–private partnership. Most major resource extraction multinationals devote considerable resources to the management of local content development. In Uganda, anecdotal evidence from industry interviews and national supplier information workshops indicates that international companies are committed to finding ways to increase participation by local firms, including unbundling supply contracts and innovation in project design. However, the international oil companies and their lead contractors are also very clear about their high expectations from suppliers.¹³

On the public-sector side, well-designed institutions to negotiate and manage local participation are critical to success. Page advocates in chapter 4 creating a unit—located within the office of the head of state or government—to act as the broker between the multinational companies and domestic firms. Because the agency must have support at the highest political level during negotiations, he argues that the president or prime minister should take the lead. In addition, staff of the unit must understand both the requirements of the procurement divisions of the multinational companies and the range of capabilities of domestic firms to propose realistic targets for suppliers. Some staff should have industry experience, while others need a public-sector background to facilitate coordination across government agencies.

While several of the countries we analysed have created institutions to guide their local content initiatives, they have not been wholly effective. One of the concerns raised about the competence of the Ghana Petroleum Commission, for instance, is that it is relatively new and the exposure of Ghanaian technical staff to the oil and gas industry is limited. In Mozambique, the Institute for the Promotion of Micro, Small and Medium Enterprises (IPEME) has encountered similar problems because it lacks the knowledge and experience required to guide supplier development in the specialist areas of expertise demanded by the extractive industries. The Petroleum Authority of Uganda has compiled a National Suppliers Database to regulate the procurement of goods and services in the petroleum sector. Yet, the database does not convey any information on supplier capabilities.

¹² See chapters 7, 10, 19.

¹³ See chapter 16.

It is striking that none of the local content initiatives in the countries we studied, are subject to review and oversight. Programmes designed to promote selected activities—such as local content—should incorporate periodic reviews and be evaluated against observable outcomes, for example, the rate of growth of jobs. If they are failing to meet expectations, corrective actions should be undertaken. Interventions should also be subject to sunset clauses. Requiring that a programme expire unless a review recommends extension would place the burden on advocates to show why it remains relevant (Page and Tarp 2017).

4.3 Training

Training can raise the capabilities of local firms to the minimum level needed to allow them to enter the MNC value chains. To succeed, however, the government and the resource extraction companies must agree on the design of training, and on the qualification process through which a firm achieves approved vendor status. Supplying training without buy-in by both parties is unlikely to lead to success. Ghana is a case in point. Its Enterprise Development Centre (EDC) began in May 2013 as a five-year project jointly sponsored by the Jubilee Partners and the government. The EDC provides support to small and medium enterprises attempting to enter the oil and gas sector, through a range of services such as business training, capacity building, advisory services, and access to market information. It also acts as a focal point for coordination between SMEs and the oil and gas companies, their contractors and subcontractors. In August 2016, lack of funds led to the suspension of the activities of the EDC. At that time, only about twenty-two of the 400 SMEs registered with the Ghana Petroleum Commission had gained contracts after receiving training. Clearly, there was a breakdown in communications between the private- and public-sector partners in the enterprise.¹⁴ Mozambique's experience with the IPME has been broadly similar to that of Ghana.

In Tanzania, there is a lack of clarity surrounding plans for capacity development. Although the 2017 Petroleum Regulations provide fiscal incentives to encourage gas companies to develop local supplier training programmes, there has been no analysis of Tanzanian firms' capacity to engage in the natural gas sector. In Zambia, a collaborative public-private initiative, the Zambia Mining Local Content Initiative—under the joint leadership of the Chamber of Mines and the Zambia Association of Manufacturers—is attempting to increase the use of locally manufactured inputs in the mining industry. Past initiatives failed to achieve sustainable impact, largely because of the failure to address the minimum procurement standards of the mining companies.¹⁵

¹⁴ See chapter 7.

¹⁵ See chapters 13 and 19.

5. Widening the options

New discoveries of natural resources also offer opportunities. In addition to local content and value addition initiatives, governments can draw on several other options for diversification. This section explores three. The first is to deploy institutional and policy reforms and public investments to mitigate the impact of Dutch disease. The second involves broadening the options for diversification to include ‘industries without smokestacks’, such as IT-enabled services, tourism, agro-industry, and horticulture. Investments in knowledge—either specific to the resource or in areas where the economy has location-specific comparative advantage—can expand the opportunities for structural change. The third option exploits the close links between natural resources and the spatial economy. Developing resource-based SEZs and growth corridors can leverage the investments made by resource extraction firms for broader national development.

5.1 Dealing with Dutch disease

Although the relative price changes that occur in a resource-abundant economy make diversification more difficult, governments can enhance the productivity of private investments outside the natural resource sector through institutional and regulatory reforms and public investments. Well-designed regulatory reforms, reliable electrical power, lower costs of transport, and workers better able to perform their jobs make countries more competitive by raising the potential productivity of all firms. In short, governments can attempt to deal with Dutch disease by improving the ‘investment climate’.¹⁶

Regulatory reforms are an attractive place to begin. They have low fiscal costs and the potential to increase absorptive capacity. Surveys of firms in resource-abundant countries highlight a wide range of areas in which regulatory or administrative burdens raise costs and reduce competitiveness. In Mozambique, for example, business regulations—and the opportunities for corruption engendered by the regulatory regime—increase firms’ costs and reduce competitiveness (World Bank 2009).¹⁷ In Uganda, senior managers of manufacturing firms spend on average more than thirteen days a year dealing with government officials, and 40 per cent of the manufacturing firms surveyed complained that regulations were not interpreted consistently (Henstridge and Page 2012). In Tanzania, tour operators and other tourism service providers face a plethora of regulations

¹⁶ There is by now a large literature on the investment climate in Africa. See, for example, the *Africa Competitiveness Report* of the AfDB, World Economic Forum, and the World Bank (2017).

¹⁷ See also the 2017 survey of Mozambican manufacturing firms by Berkel et al. (2018).

and taxes (Ellis et al. 2016). Tour operators pay a minimum of twenty-nine taxes, levies, and fees, mostly to the central government. Hotel operators face fifty-five taxes, licenses, fees, and levies. Over 80 per cent of respondents reported that most regulatory procedures lacked transparency.

Reforms that encourage the entry and exit of firms can have a positive impact on productivity as well. The formal manufacturing sector in Africa enjoys highly concentrated product markets. In small open economies imports ought to provide contestability—and Africa's economies have become much more open to imports over the past twenty years—yet World Bank *Enterprise Surveys* often find that firms do not feel pressed by competition. About a quarter of large firms in Tanzania, for example, responded to the World Bank *Enterprise Survey* that there were no new competitors in the markets in which they operated (Yoshino et al. 2013). Changes to rules that make markets more open and contestable can reduce concentration and the likelihood of anticompetitive practices.

The revenues that flow from natural resources open fiscal space for governments of resource-abundant economies to address two of the fundamental constraints to competitiveness in Africa, lack of infrastructure and skills. The literature extensively documents the productivity penalty that African firms pay because of poor infrastructure.¹⁸ The quality of electricity service ranks as a major problem according to more than half of the firms in more than half of the African countries in the World Bank's *Investment Climate Assessments*. Transport ranks a close second. Global value chains in activities from manufacturing to horticulture are highly demanding of trade logistics; and resource-rich African countries rank poorly in the World Bank Trade Logistics Index (World Bank 2016). For these economies, investments in trade-related infrastructure are essential for the success of efforts to diversify exports.

Despite significant gains in average levels of schooling, lack of production-related skills remains a major constraint to African firms. A survey of country experts from forty-five countries for the *African Economic Outlook 2013* found that over half of respondents cited lack of skills as a major obstacle keeping African firms from becoming competitive (AEO 2013). Educational quality is a problem at all levels. Learning assessments in Africa show that most primary students lack basic proficiency in reading at the end of second or third grade. Employer surveys report that African tertiary graduates are weak in problem solving, business understanding, computer use, and communication skills (World Bank 2007). In an environment in which donor funding is becoming increasingly restricted, governments can use resource revenues to close the skills gap through improving educational quality and increasing access to post primary and vocational/technical education.

¹⁸ See for example Escribano, Guasch, and Pena (2010).

Investing to invest and linking industry to the resource are complementary to improving the investment climate. Investing resource revenues to expand infrastructure and education require—to some extent—the transformation of public expenditures into physical assets. Thus, construction will largely determine the success of public actions designed to boost competitiveness. In addition, construction plays an important role in mitigating a critical symptom of Dutch disease. A natural resource boom often leads to a real estate boom. The appreciation of the real exchange rate raises the returns to non-tradable activity, as well as to non-traded capital, mainly structures. If the construction sector is weak, the supply of structures is inelastic, which implies that the real estate boom will be reflected in rising prices rather than in new construction.

By increasing firm capabilities, well-designed programmes to integrate domestic firms into the resource value chain can increase the overall productivity of domestic manufacturing. Natural resources MNCs are demanding buyers and often engage in repeated relationships with their suppliers. Both contribute to the development of firm capabilities in linked domestic firms. As the number of higher capability firms expands, the potential for productivity spillovers increases.

5.2 Broadening the horizon: industries without smokestacks and investing in knowledge

Our understanding of industry is changing. Today, new technologies have spawned a growing number of services and agri-businesses—including horticulture—that share characteristics in common with manufacturing. They are tradable, have high value added per worker and can absorb large numbers of moderately skilled workers. Like manufacturing, ‘industries without smokestacks’ benefit from technological change, productivity growth, scale, and agglomeration economies.¹⁹ Where these industries have characteristics traditionally attributed to manufacturing—strong linkages, productivity growth, and innovation—they can act as an engine of structural change.²⁰ In fact, tradable services—such as ICT-enabled services and transport, and logistics—have become leading sectors in several countries (Lavopa and Szirmai 2014).

Because industries without smokestacks share firm characteristics with ‘smoke-stack’ industries, investment climate reforms apply equally to manufacturing, tradable services, agro-industry, and horticulture. In chapter 4, Page proposes that to spur structural change an ‘export push’ complements investment climate reforms. By using trade policies, public investments, regulatory reforms, and institutional change governments can support new exporters and diversify the

¹⁹ See Ghani and Kharas (2010) and Newfarmer, Page, and Tarp (2018).

²⁰ See, for example, Ghani and O’Connell (2014), Szirmai and Verspagen (2015) and Tregenna (2015).

export basket. Institutional reforms and investments to improve trade logistics are key elements of the export push. Another critical component is prudent macro-economic management of the resource windfall. While some appreciation of the real exchange rate is unavoidable, government must manage public expenditures to reduce excessive upward pressure.

In addition to investing in general skills, resource exporters can attempt to build specialist knowledge linked to the extractive industries themselves. The South African mining supplier industry has developed globally competitive capabilities based on serving the domestic mining industry. South Africa is a world leader in a wide range of mining equipment products and its mining companies have in-depth knowledge of turnkey deep-level mine design and operation. The Norwegian government invested in building specialist knowledge about deep-sea oil exploration through its universities. Now, Norway's knowledge-based oil service industry is a major source of exports. A first initiative in building specialized knowledge might be to strengthen the geology and engineering departments of national or regional universities with the intention of developing more technically qualified staff and in the longer run, a services export industry.

Chile's successful transformation into a leading global producer of salmon and wine suggests that African resource exporters can use knowledge to diversify into industries without smokestacks. Because agro-industry, tourism, and tradable services often benefit from location-specific comparative advantage—for example, climate or languages—they may prove less vulnerable to real exchange rate appreciation than task-based manufactured exports. Success in establishing or expanding them, however, depends to a large degree on the knowledge of potential markets and production held by firms. Governments can develop three-way partnerships with the private sector, universities, and specialist research institutions to support the acquisition and dissemination of knowledge.

5.3 Spatial industrial policy

Natural resources, and the foreign investors and infrastructure they often bring, open new areas for spatial industrial policies. While most first-generation SEZs in Africa have focused on manufacturing, they are relevant to resource-based industries as well. By supporting specialist supply networks, the zones can reduce overheads, shorten delivery times, and increase innovation. In Zambia, the Chambishi Multi-Facility Economic Zone (MFEZ) focuses mainly on the copper supply chain, including copper smelting, manufacture of copper wire and cables, and the manufacture of mining equipment. The new Kafue Iron and Steel MFEZ around the Integrated Kafue Iron and Steel plant will focus on engineering, machinery and equipment manufacturing. The Shama EPZ in Ghana targets the petroleum

and petrochemical sector. It contains tank farms logistics and haulage contractors and firms manufacturing chemical inputs and accessories for the petroleum industry.

The challenges surrounding the development of resource-based SEZs are like those facing other SEZs. Infrastructure, institutions, and attitudes matter (Newman and Page 2017). Unless infrastructure and institutions are world class, it may prove impossible to draw firms into the zone. SEZ managers with business experience and a business outlook are critical to success. Because knowledge spillovers allow supplier firms to improve their production processes or products, resource-based SEZs are complementary to policies designed to build the capabilities of local firms through greater integration into the resource value chain. For this reason, the design of the institutions intended to foster value-chain relationships is critical to the success of the SEZ.

Minerals exports generally require large infrastructure investments such as roads, railways, power, and ports. Regional SEZs—often called ‘growth corridors’—can play a catalytic role in attracting investors to new locations around this infrastructure. Growth corridors are attractive for three reasons. First, they can help to solve coordination problems between investments in related projects, increasing the prospect of rapid private-sector response to infrastructure improvements. Second, it is possible that in resource-centered zones the bulk of capital spending on infrastructure for both transport and power can be financed by the resource projects, themselves. Finally, they highlight the possible complementarities between investment projects in the area.

Recent experience with growth corridors has been both positive and negative. The partnership between South Africa and Mozambique in the Maputo Development Corridor is widely regarded as a success. Based on that experience, Mozambique is developing integrated minerals transport and logistics systems in the Beira, Nacala, and Zambezi Valley Development Corridors. The corridors rely on commitments by government and the private sector to collaborate in infrastructure investment. By way of contrast, Tanzania joined Rwanda in 2005, to develop a Central Development Corridor (CDC) containing Tanzania’s cluster of gold mines and connecting the Dar es Salaam port with the Great Lakes region. An objective of the initiative was to grow the agro-industrial, manufacturing, tourism, mining, and service sectors in the corridor. However, progress has been slow due to lack of funding and poor institutional capacity.

Both cases suggest that governments should approach growth corridors with some caution. While narrow cost–benefit analyses often miss the role of infrastructure in triggering private investment, it is possible to exaggerate its catalytic effect and policymakers frequently have a tendency to do so. Governments need to take care to assess the costs and benefits of proposed spatial initiatives realistically and integrate them into broader national development plans.

6. Conclusions

There is a common thread among the five African resource exporters we have studied. In these countries—except perhaps in Mozambique—the impact of the resource most probably will not be large enough to be transformative. However, it could well be large enough to be disruptive. This puts substantial pressure on the need to improve public financial management in three areas: managing expectations, controlling the volume of public expenditure, and improving the quality of public investment. In all the country cases, public expectations of the size and timing of the resource boom were overly optimistic. Efforts to make information on the extent of commercial reserves, trends and variability of prices, and the terms of resource extraction agreements widely available can help to manage future expectations.

Three of the five countries succumbed to spending pressures—financed by the accumulation of debt—before resource revenues started to flow. All three now face significant debt management issues. Setting the boundaries on the volume of public spending and adjusting them using feedback from the economy are essential elements of prudent resource revenue management. Because the quality of public expenditure should ultimately govern the quantity, governments need to adopt better methods of project selection—including broad-based use of economic and social cost–benefit analysis—and develop budget institutions to ensure that new investments are adequately maintained.

The construction sector can act as a brake on the ability of the economy to transform investment effort into investment outcomes. Our country studies found that limited capabilities in domestic contracting firms, opaque or time-consuming regulations, problems with the price and quality of material inputs, lack of technical and skilled labour, and limited access to finance are factors that increase costs and constrain supply response. These are all areas in which public action can make a difference. The great majority of firms engaged in construction in Africa are micro, small, and medium enterprises (MSMEs). While training is one of the most common forms of support to MSMEs, we need new approaches to identify the types of construction firms that can most benefit from training. Frequently, the public sector is responsible for policy-induced constraints; it should address these through reforms.

Because they control access to the resource, governments can attempt to build firm capabilities in the larger economy by integrating local suppliers into the resource value chain. The country studies suggest that success largely depends on the ability of government and industry to develop an effective public–private partnership. Well-designed public institutions to negotiate and manage local participation are critical to success. Training programmes can indeed raise the capabilities of local firms to the minimum level needed to allow

them to enter MNC value chains. At the same time, country experience cautions that these programmes must be well designed and attuned to the needs of the industry.

Although discoveries of natural resources make structural change more challenging, they also offer new opportunities. Policy reforms and public investments can mitigate the consequences of Dutch disease by improving the ‘investment climate’. Institutional and regulatory reforms and investments in infrastructure and skills can boost the productivity of firms outside of the resource sector. ‘Industries without smokestacks’ and investments in knowledge, linked either to the resource itself or to industries with country-specific sources of comparative advantage, widen the options for diversification. Resource-based SEZs and growth corridors have the potential to leverage the investments made by resource extraction firms for broader development. At the same time, proper planning and effective policy design require realistically assessing their potential impact in the context of broader national development goals.

References

- Adam, C., and D. Bevan (2014). ‘Public Investment, Public Finance, and Growth: The Impact of Distortionary Taxation, Recurrent Costs, and Incomplete Appropriability’. IMF Working Papers, WP/14/73 Washington, DC: IMF.
- AEO (2013). *Global Value Chains and Africa’s Industrialization*. African Development Bank, OECD, and UNDP. Paris: OECD.
- African Development Bank, World Economic Forum, and the World Bank (2017). *Africa Competitiveness Report 2017*. Geneva: World Economic Forum.
- Banerjee, A., E. Duflo, R. Glennerster, and C. Kinnan (2010). *The Miracle of Microfinance? Evidence from a Randomized Evaluation*. Cambridge, MA: MIT.
- Bauchet, J., C. Marshall, L. Starita, J. Thomas, and A. Yalouris (2011). ‘Latest Findings from Randomized Evaluations of Microfinance’. Consultative Group to Assist the Poor. Washington, DC: World Bank.
- Berkel, H. et al. (2018). *Survey of Mozambican Manufacturing Firms*. <http://igmozambique.wider.unu.edu/report/survey-mozambican-manufacturing-firms-2017>.
- Burningham, S., and N. Stankevich (2005). *Why Road Maintenance Is Important and How to Get It Done*. Transport Notes Series; No. TRN 4. Washington, DC: World Bank.
- Collier, P. (2011). ‘Managing Uganda’s Oil Discovery’. *Joseph Mubiru Memorial Lecture*, Kampala: Bank of Uganda.
- Ellis, M., M. McMillan, and J. Silver (2016). ‘Employment and productivity growth in Tanzania’s service sector’. WIDER Working Paper 2017/16. Helsinki: UNU-WIDER.
- Escribano, A., J. L. Guasch, and J. Pena (2010). ‘Assessing the Impact of Infrastructure Quality on Firm Productivity in Africa: Cross-Country Comparisons Based on

- Investment Climate Surveys from 1999 to 2005'. Policy Research Working Paper 5191. Washington, DC: World Bank.
- Ghani, E. and H. Kharas (2010). 'The Service Revolution in South Asia: An Overview'. In E. Ghani (ed.) *The Service Revolution in South Asia*. Oxford: Oxford University Press.
- Ghani, E., and S. D. O'Connell (2014). 'Can Service Be a Growth Escalator in Low Income Countries?' Policy Research Working Paper 6971. Washington, DC: World Bank.
- Henstridge, M., and J. Page (2012). 'Managing a Modest Boom: Oil in Uganda'. Oxcarre Research Paper 2/6. Oxford: Oxford Centre for the Study of Resource Rich Economies.
- Lavopa, A., and A. Szirmai (2014). 'Structural Modernization and Development Traps: An Empirical Approach'. UNU-MERIT Working Paper 2014/76. Maastricht: UNU-MERIT.
- McKenzie, D. (2015). 'Identifying and Spurring High-Growth Entrepreneurship: Experimental Evidence from a Business Plan Competition'. Policy Research Working Paper 7391. Washington, DC: World Bank.
- McKenzie, D., and C. Woodruff (2012). 'What Are We Learning from Business Training and Entrepreneurship Evaluations around the Developing World?' Policy Research Working Paper 6202. Washington, DC: World Bank.
- McMillan, M., J. Page and S. Wangwe (2017). 'Unlocking Tanzania's Manufacturing Potential'. In C. Adam, P. Collier, and B. Ndulu (eds) *Tanzania: The Path to Prosperity*. Oxford: Oxford University Press.
- Newfarmer, R., J. Page, and F. Tarp (2018). *Industries without Smokestacks: Rethinking Africa's Industrialization*. Oxford: Oxford University Press.
- Newman, C., and J. Page (2017). 'Industrial Clusters: The Case for Special Economic Zones in Africa'. WIDER Working Paper 2017/15. Helsinki: UNU-WIDER.
- Page, J., and F. Tarp (2017). *The Practice of Industrial Policy: Government-Business Coordination in Africa and East Asia*. Oxford: Oxford University Press.
- Szirmai, A., and B. Verspagen (2015). 'Manufacturing and Economic Growth in Developing Countries 1950-2005'. *Structural Change and Economic Dynamics*, 34: 46-59.
- Sutton, J. (2012). *Competing in Capabilities: The Globalization Process*. Clarendon Lectures in Economics. Oxford: Oxford University Press.
- Sutton, J., and B. Keptney (2012). *An Enterprise Map of Ghana*. London: International Growth Centre.
- Sutton, J., and D. Olomi (2012). *An Enterprise Map of Tanzania*. London: International Growth Centre.
- Sutton, J., and G. Langmead (2013). *An Enterprise Map of Zambia*. London: International Growth Center.
- Tregenna, F. (2015). 'Deindustrialisation, Structural Change and Sustainable Economic Growth: Inclusive and Sustainable Industrial Development'. Working Paper 02/2015. Vienna: UNIDO.

- van der Ploeg, F., R. Stefanski, and S. Wills (2012). 'Harnessing Oil Revenues in Ghana.' IGC Working Paper 12/0034. London: International Growth Centre.
- van der Ploeg, F., and A. J. Venables (2011). 'Harnessing Windfall Revenues: Optimal Policies for Resource-Rich Developing Economies.' *Economic Journal*, 121(551): 1–30.
- World Bank (2007). 'Expanding the Possible in Sub-Saharan Africa: How Tertiary Institutions Can Increase Growth and Competitiveness.' Washington, DC: World Bank.
- World Bank (2009). *Investment Climate Assessment of Mozambique*. Washington, DC: World Bank.
- World Bank (2011). *Country Economic Memorandum, Mozambique*. Washington, DC: World Bank.
- World Bank (2016). *Connecting to Compete*. Washington, DC: World Bank.
- Yoshino, Y., O. Cadot, F. Ratsimbazafy, and J. Regolo (2013). 'Uncovering Drivers for Growth and Diversification of Tanzania's Exports and Exporters.' Washington, DC: World Bank.

Index

Note: Tables, figures, and boxes are indicated by an italic '*t*', '*f*', and '*b*' following the page number. Footnote numbers are indicated by 'n.' after the page number.

- ABFA (annual budget funding amount, Ghana) 106, 111, 114
Acemoglu, D. 36, 37, 46
ACEP (Africa Centre for Energy Policy) 98, 99, 110, 147–8
ACET (Association of Civil Engineering Consultants of Tanzania) 260, 301
ACEZ (Association of Consulting Engineers of Zambia) 409, 411
Acheampong, T. 102, 103, 112
Ackah, C.G. 17, 19, 20, 139–60
Ackah, I. 7, 10, 11, 97–118, 460–1
Adam, C. 45, 374–5, 384, 392–3, 453
Adedeji, A. 298
Adewuyi, A. 297–8
AfDB (African Development Bank) 178, 239, 311, 434–5, 441–2
AFIC (Africa Freedom of Information Centre) 339, 342
Africa Centre for Energy Policy *see* ACEP
African Economic Outlook 210, 464
AGI (Association of Ghana Industries) 155
agro-industry 86, 89, 463, 465, 466
 agriculture 4, 11, 114, 249
 horticulture 80, 85, 86, 88, 449, 463, 464, 465
Alexeev, M. 36
Alexeeva, V. 198
Alfaro, A. 162
Amoako-Tuffour, J. 100
AMV (African Mining Vision) 2, 17, 74, 459
ANE (National Roads Administration, Mozambique) 193
Angola 84, 102
 1976 Petroleum Activity Law 76
 Sonangol 76, 84
Arezki, R. 41
Aryeetey, E. 7, 10, 11, 97–118
Asher, S. 15, 64
Auty, R. 33, 141
Azapagic, A. 142

Badeeb, A. 34
Bartelme D. 424
Bategeka, L. 311

Bauer, A. 311
Baungsgaard, T. 239, 251, 390
Bawumia, M. 107, 109–10
Benamghar, R. 68
Bevan, D. 45, 453
Bleaney, M. 109
boom *see* resource boom
Botswana 78, 453, 454
 diamonds 78, 82, 300, 384
 Pula Fund 384–5
Brookings Institution: Natural Resources, Structural Change and Industry in Africa 1
Buffie, E.E. 177
Burkina Faso 132, 166, 299

CAHF (Centre for Affordable Housing Finance in Africa) 267–8
CDC (Central Development Corridor, Tanzania) 467
CDC (Commonwealth Development Corporation, Zambia) 377
Charlton, L. 162
Cheelo, C. 11, 12, 14, 17, 374–96, 397–421, 455
Chenery, H. 364
Chile 86, 88–9, 453, 466
China 45, 238, 274
 construction sector and Chinese firms 14, 65, 128, 344, 416–17, 419
 mining sector 378, 440
Chitor, B. 97
CIT (corporate income tax) 241, 379
Clyde & Co. 258
Collier, P. 58, 67–8, 199, 384, 454
COLMAK 409, 411, 416
Colonnelli, E. 14, 15, 16, 17, 326–48, 457
 competition 42, 59, 342, 455, 464
 constraints to competitiveness 80
 construction sector 59, 65, 68, 398
 Ghana: construction sector 128, 133
 import competition 18, 43
 local competition 80
 Tanzania: construction sector 259, 266, 276
 Uganda: construction sector 327, 335, 342, 343
 Zambia: construction sector 405, 413

- Conrad, R. 36
- construction sector 2, 12–17, 70–1
- case studies 52, 53–4, 53*t*, 54*t*, 62–7, 63*t*, 66*t*, 67*f*
 - challenges 2, 21, 58–68, 71, 398, 456–7, 468
 - characteristics of 52–5
 - Chinese firms 14, 65, 128, 344, 416–17, 419
 - competition 59, 65, 68, 398
 - construction boom 41
 - construction costs 2, 12–14, 21, 52, 55–8, 183, 454, 455, 468
 - construction and development: conceptual approach 183–6
 - construction sector production chain 184*f*, 185–6
 - corruption 53, 59, 67–8, 69–70, 71, 340–1, 458
 - critical inputs 65–7
 - demand shift and different supply elasticities 55, 55*f*
 - developing countries 51–71
 - education and training 455, 468
 - employment 40–1, 55, 59, 70
 - financing 52, 64, 65, 71, 457, 468
 - firm capabilities 14–15, 21, 59–64, 468–9
 - foreign/regional firms 14, 51, 55, 62
 - gross fixed capital formation 53, 54*t*
 - importance of 12–13, 21, 51, 119, 256, 326, 398, 465, 468
 - institutional constraints 59, 64–5, 69
 - ‘investing to invest’ 454, 465
 - investment of resource revenues and physical assets 12, 21, 465
 - knowledge on the construction sector in Africa 51, 58, 59
 - local content 70, 71
 - local firms 55, 62, 64, 65, 70–1
 - maintenance expenditures 12, 52–3, 58
 - materials 15–17, 21, 248, 456, 468
 - natural resource-rich countries 52, 70, 71
 - natural resource sector and 13, 54, 72–1
 - policy 52, 55, 68–70, 71, 454–8, 468–9
 - politics 52, 68, 341
 - price levels of GDP and construction 66–7, 67*f*
 - sectors 62–3
 - shares of value added 53, 53*t*
 - skills 15–16, 21, 248–9, 457
 - SSA (sub-Saharan Africa) 14, 53–4, 59, 61–2, 64
 - supply constraints 456–7
 - unit costs 51, 52, 56–8, 57*t*
 - value addition 53, 53*t*
 - World Bank, contract awards 59–62, 60*t*, 63*t*
 - World Bank, International Comparison Project 65–6, 66*t*
 - see also* Ghana: construction sector; Mozambique: construction sector; procurement; Tanzania: construction sector; Uganda: construction sector; Zambia: construction sector
- Corden, W.M. 34
- corridors 88, 189, 220
- growth corridors 449, 467, 469
 - see also* SEZs
- corruption 7, 141, 458
- construction sector 53, 59, 67–8, 69–70, 71, 340–1, 458
 - Ghana: construction sector 134–5, 458
 - local content 19
 - Mozambique: construction sector 198–9
 - oil curse 103
 - policy on 458
 - rent-seeking 103
 - Uganda: construction sector 327, 332–3, 341–4, 346, 458
 - Zambia: construction sector 415–16
 - see also* transparency
- CoST (Construction Sector Transparency Initiative) 69–70, 415
- Cruz, A. S. 15, 16, 183–208, 214
- CSOs (civil society organizations) 140, 146–7
- Cust, J. 165
- Danert, K. 198
- Darkwah, A.K. 142
- Darvas, P. 132
- Deacon, R.T. 34
- Decarolis, F. 69
- debt 468
- debt distress 9, 388, 393, 450
 - debt financing 9, 21, 454
 - debt management 9, 81–2, 385, 454, 468
 - Ghana 9, 81, 107
 - Mozambique 9, 11, 163, 168, 169–70, 172, 178, 179, 187, 214, 215
 - sovereign debt 81, 393
 - Tanzania 9
 - Uganda 9, 321
 - Zambia 9, 385, 386, 387–8, 388*f*, 392–3, 417, 429, 450
- Dietsche, E. 17–18, 19, 20, 209–31, 460
- diversification 74–89, 449, 463
- Dutch disease 78–82, 89
 - export diversification 6, 74, 464
 - Ghana 111, 113, 114
 - governments 22, 79, 82, 89
 - growth and 6

- importance of 89
- industries without smokestacks 85–8, 89
- industry/resource link 82–5, 459
- infrastructure and skills 80–2, 87, 89
- investing in knowledge 85, 88–9
- local content 2, 17, 75–8, 89
- mining sector 74, 75
- Mozambique: local content 211, 214, 217, 223
- structural change 4
- sustainable development 74
- trade-related infrastructure 80–1, 464
- value addition 75, 78
- Zambia: copper mining 374, 385
- Zambia: local content 422, 439
- see also* local content
- DPL (Delayed Payment Law) 137, 457
- Dutch disease 34–6, 41
 - description 4, 78–9, 108
 - diversification 78–82, 89
 - FDI (foreign direct investment) 35, 41–2
 - Ghana 108–12, 113
 - infrastructure and skills 80–2
 - investment climate 79–82
 - policy 2, 449, 463–5, 469
 - real exchange rate 4, 35, 41, 79, 248
 - regulatory reform 79–80
 - structural change: policy and institutional reforms 2, 449
 - Uganda 315, 319, 322
 - volatility 35–6
 - Zambia 388–9
- EAC (East African Community) 316n.9, 319, 457
- education and training 16, 81, 84–5, 462
 - construction sector 455, 468
 - Ghana 84, 132, 133, 134, 136, 144, 146, 150
 - management training 85
 - MSMEs (micro, small, and medium enterprises) 85, 468
 - policy 41, 462
 - resource boom 41
 - Tanzania: construction sector 272, 274, 277
 - Tanzania: gas and LNG projects 40–1, 248–9, 462
 - Tanzania: local content 283, 286, 287, 288, 291, 294, 296, 299, 301, 302
 - Uganda: local content 351, 371
 - vocational and educational training 40–1, 82
 - Zambia 418–19, 441–2, 455
 - see also* employment; skills; technology
- economic structure
 - Africa 4, 5f
 - importance of 3, 74
 - Mozambique 174n.22, 209–10, 213–14
 - resource-rich countries 74
 - see also* structural change
- EDC (Enterprise Development Centre, Ghana) 84, 112, 140, 154, 462
- Edjekumhene, I. 99
- EIA (environmental impact assessment) 32n.4
- EITI (Extraction Industries Transparency Initiative) 104, 284
- EIZ (Engineering Institution of Zambia) 409, 411
- Elder, J. 105
- Ellis, M. 18, 282–303, 460
- employment
 - construction sector 40–1, 55, 59, 70
 - Ghana: construction sector 119, 120, 133
 - Ghana: local content 76, 103, 112, 142, 144, 156, 157
 - investment in non-tradable production 35
 - local content 17, 78, 299
 - mining sector 4, 29, 39, 40, 78
 - Mozambique: local content 17, 227
 - oil and gas 4, 13, 16, 33, 38, 39f, 40, 78, 142
 - outsourcing 142
 - resource project/jobs link 39, 39f
 - Tanzania: gas and LNG projects 16, 40, 247, 248–9
 - Tanzania: local content 283, 284, 286, 287, 288, 290, 293–4, 295, 296, 299, 300–1, 302
 - Uganda: construction sector 328, 332
 - Uganda: local content 18, 359
 - Zambia: construction sector 402–3
 - Zambia: copper mining 383, 422
 - Zambia: local content 19, 75, 423, 430, 435
 - see also* education and training; skills
- Escalante, C. 13, 16, 256–81
- Esteves, A.M. 17–18, 19, 20, 209–31, 460
- EWURA (Energy and Water Utility Regulatory Authority, Tanzania) 246, 291
- exchange rate 6, 43, 88
 - CA (current account model) 389
 - Dutch disease 4, 35, 41, 79, 248
 - ES (external sustainability approach) 389
 - exchange rate volatility 14
 - real exchange rate 4, 33–4, 35, 41, 79, 248
 - REER (real exchange rate model) 389
 - resource curse 37
 - Zambia: copper mining 374, 378, 379, 388–9
- exports 35, 46–7, 80, 425, 426, 451, 466, 467
 - export concentration 3, 4, 17
 - export diversification 6, 74, 464
 - horticultural exports 86, 87
 - Mozambique 166, 167, 168
 - service exports 86
 - Zambia, mining exports 21, 374, 379, 430

- Farzanegan, M.R. 105
- FDI (foreign direct investment) 426
- Dutch disease 35, 41–2
 - FDI boom 43, 176
 - Mozambique 42, 43, 47, 162, 163, 177, 189
 - resource boom 38, 47, 162, 163, 177, 288
 - Tanzania 250, 286, 288
 - Uganda 351
 - Zambia 379, 438
- Fernandes, F. 15, 16, 183–208
- FFH (Housing Promotion Fund, Mozambique) 196
- FID (Final Investment Decision) 13, 30–1, 33, 238, 242, 243, 252, 352
- financing
- construction sector 52, 64, 65, 71, 457, 468
 - Ghana: construction sector 16, 134, 136–7, 457
 - infrastructure 397
 - Mozambique: construction sector 16, 190–1
 - Tanzania: construction sector 16, 65, 266
 - Tanzania: local content 300
 - Uganda: construction sector 16, 17, 327, 331, 340, 344–6, 347, 457
 - Zambia: construction sector 17, 419
 - Zambia: local content 433
- FinScope 221
- Frankel, J.A. 34
- Fraser Institute 377, 378
- Gerardino, M.P. 69
- Ghana
- 1990–2016 inflation performance 107, 108*f*, 110, 452
 - debt 9, 81, 107
 - education and training 84, 132, 133, 134, 136, 144, 146
 - IMF 102, 107, 109, 133, 452
- Ghana: construction sector 119–37
- 2017 Ghana Housing Policy 123*n*.1, 131, 456
 - access to land and permits 131–2
 - challenges to the supply response of the construction sector 131–5
 - competition 128, 133
 - construction costs 122–31, 455
 - construction subsectors 119
 - corruption 134–5, 458
 - employment 119, 120, 133
 - expenditure shocks and price dynamics 14, 122, 129–31
 - financing 16, 134, 136–7, 457
 - GDP contribution 119–21, 120*f*, 121*f*
 - housing sector 16, 122–4, 123*f*, 127–8, 128*f*, 132, 137
 - inflation and subsector costs 126, 127*f*
 - institutional and policy reforms 135–7
 - local content 136
 - local firms 132, 134, 137
 - organization and capacity 134–5
 - politics 134
 - raw materials 14, 124, 133–4, 137
 - regional firms 62, 133
 - Road Fund 129
 - skilled labour 14, 16, 132–3
 - social infrastructure subsectors 124–6, 124*f*, 125*f*, 126*f*, 127, 128–9, 129*f*
 - structure of the construction industry 127–9
 - transparency 135–6
 - see also* construction sector
- Ghana: local content 17, 19, 139–57
- 2011 Petroleum Commission Act 103, 104, 146
 - 2012 Minerals and Mining Regulations 76
 - 2013 Petroleum Local Content and Local Participation Regulations 76, 103, 104, 112, 139–40, 145–6, 155–7
 - challenges 151–3, 156
 - construction sector 136
 - employment 76, 103, 112, 142, 144, 156, 157
 - foreign firms/suppliers 152
 - Ghana Petroleum Commission 19, 145, 146, 148*f*, 149, 150, 151, 152, 153–4, 156
 - goods and services supplied by Ghanaian companies 147–9, 147*t*
 - industry/resource link 20, 82
 - institutional arrangements for local content implementation 146–7
 - legislative development process 145–6
 - local content regulations 103, 112–13
 - local firms 148*f*, 149, 149*f*, 151–3, 156
 - ‘local local’ content 151
 - mining 76
 - OCTP (Offshore Cape Three Points field) 148, 151
 - oil and gas 76, 139–57
 - Onshore Gas Receiving Facility 19, 151
 - policy development process 143–5
 - policy recommendations 156–7
 - politics 19, 153
 - PPP (public–private partnership) 153–5, 156, 300
 - recruitment, training, and promotion of Ghanaian nationals for jobs 150
 - resource value chain 20, 103
 - value addition 103
 - see also* Ghana: oil sector; local content
- Ghana: oil sector 7, 97–114, 450, 452, 460–1, 466–7

- 2011/2015 PRMA (Petroleum Revenue Management Act) 10, 11, 44, 104–5, 106, 106*f*, 107, 110, 111, 112, 113
- 2016 Petroleum Exploration and Production Law 104, 145
- challenges faced by local people in oil-bearing communities 103
- Chinese loans 45
- comparing production with other African countries 101–2, 102*f*
- diversification 111, 113, 114
- Dutch disease 108–12, 113
- employment 142, 145
- fiscal management 10, 98, 100, 109–10
- Ghana Model Petroleum Agreement 100, 102
- Ghana Petroleum Commission 19, 103, 104, 112–13, 460, 461, 462
- IOCs (international oil companies) 112, 140, 145, 146–7, 148, 150, 151–2, 153, 154, 156, 157
- Jubilee field 7, 97, 100, 102, 147
- macroeconomic performance 107–13
- petroleum agreements 100, 102–3, 146
- petroleum exploration and production 97, 98–103, 113, 119, 139
- petroleum reserves of Ghana's operating fields 101*f*
- priority areas for revenue spending 11, 111, 114
- regulation 99–100, 104
- resource curse 98, 139
- revenue 105–7, 106*f*, 109, 109*f*, 110*f*, 113–14, 139
- revenue projections 7, 97–8, 450
- Saltpond offshore field 97, 99
- Sankofa field 97–8, 100, 103
- TEN field 98, 100, 103, 147
- transparency and accountability 99, 103–5, 113, 114, 453
- see also* Ghana: local content; GNPC; oil and gas
- Gilberthorpe, E. 34
- GLSS (Ghana Living Standards Survey) 120, 132
- GNPC (Ghana National Petroleum Corporation) 98, 99, 100, 102, 103, 106, 114, 145, 147, 150
- Gollin, D. 42–3
- Gorodnichenko, Y. 424
- GPFs (Ghana Petroleum Funds) 106–7, 110, 113
- GHF (Ghana Heritage Fund) 10, 105, 107, 110, 111, 113
- GSF (Ghana Stabilisation Fund) 10, 105, 107, 110, 113, 114
- GREDA (Ghana Real Estate Developers Association) 16, 122, 123
- GUSIP (Ghana Upstream Internship Program) 154
- Gutman, J. 15, 59*n*.3, 64
- GVC (global value chain) 80, 86, 370, 426–7, 431, 440, 443, 464
- Halland, H. 107, 109–10
- Hansen, M.W. 292
- Hartwick's Rule 35
- Hawkins, J. 70
- Henstridge, M. 7, 8, 13, 16, 27–50, 232–55, 311, 450, 451
- Herrera, J.J. 352
- HIPC (Heavily Indebted Poor Country) 214, 215, 385, 387, 393
- Hotelling's Rule 35
- Humphreys, M. 28
- Husain, A. 105
- hydrocarbons *see* oil and gas
- ICT/IT (information and communications technology/information technology) 86, 87
- IFC (International Finance Corporation) 226
- IGG (Inspectorate of Government, Uganda) 339, 341
- IIA (Invest in Africa) 154–5
- limi, A. 68
- ILO (International Labour Organization) 142
- IMF (International Monetary Fund) 451
- Ghana 102, 107, 109, 133, 452
- Mozambique 7, 162, 163, 166–8, 169, 170, 170*f*, 214
- Regional Economic Outlook* 163
- Uganda 320, 321
- Zambia 388, 389, 417
- India 157, 455–6
- industries without smokestacks 463, 465–6, 469
- Chile 86
- diversification 85–8, 89
- Mozambique 214, 229
- structural change and 2, 449
- industry 85
- industrialization 82, 256, 424, 425
- industrial policy 42–3, 84, 219–23
- industry/resource link 2, 20–2, 82–5, 458–62, 465
- Tanzania, industry/resource link 20, 282, 296, 302
- see also* industries without smokestacks; Zambia: local content

- infrastructure 397
 diversification and 80–1, 87, 89, 464
 financing 397
 lack of 464
 physical infrastructure 397–8, 400, 408, 412, 413, 444
 resource revenues, investment of 12, 21, 465
 SSA (sub-Saharan Africa) 80
 trade-related infrastructure 80–1, 87, 464
- institutions 46
 construction sector, institutional
 constraints 59, 64–5, 69
 extractive institution 42, 43, 46
 Ghana: construction sector institutional reforms 135–7
 Ghana: local content 146–7
 inclusive institution 47
 institutional reforms 21, 69–70, 77, 79, 80, 87, 89, 135, 418, 456, 463, 465, 469
 Mozambique: construction sector institutional features 192–3
 policy 46–7
 resource curse and 34, 36–8, 46
- International Labour Organization *see* ILO
 International Monetary Fund *see* IMF
 International Organization for Standardization *see* ISO
- investment climate 79, 463, 465, 469
 investment climate reforms 79, 86–7, 89, 465
 World Bank's *Investment Climate Assessments* 80, 464
- IOCs (international oil companies) 349
 Ghana 112, 140, 145, 146–7, 148, 150, 151–2, 153, 154, 156, 157
 Uganda 351, 357, 358, 364, 366, 371
- IPEME (Institute for the Promotion of Micro, Small and Medium Enterprises, Mozambique) 220, 226, 461, 462
- ISO (International Organization for Standardization) 152, 367, 369
- Jakobsen, M. 171
- JTTC (Jubilee Technical Training Center, Ghana) 88
 JV (joint venture) 147, 152
 Tanzania 250, 287, 288, 290
 Uganda 307, 309, 313, 350, 352, 356
- Kankam, D. 100
- KAPSARC (King Abdullah Petroleum Studies and Research Center) 311, 313
- Kenny, C. 69
- Kenya 79, 87, 198, 268, 274, 308, 309, 415, 457
- Khoza, R. 276
- Kikwasi, G.J. 13, 16, 256–81
- Kinyondo, A. 292
- Kirchberger, M. 12, 13, 14, 15, 51–73, 456
- Kironde, L. 269, 276
- Kragelund, P. 435
- Kufuor, J. 97
- Kuwait 1, 450
- L2C Project (Learning to Compete) 425
- Lachler, U. 214
- Lambon-Quayefio, M.P. 119–38
- Lane, P. 36
- Lange S. 292
- Lassourd, T. 311
- Latin America 352
- LDC (least developed country) 426
- Lee, S. 35, 43
- Leeds, R. 259
- Lema, N.M. 272, 273, 276
- Lewis-Faupel, S. 69
- liberal economy 141–2, 209, 218, 219, 375, 428
- Libya 1, 101, 141
- Liebenthal, R. 11, 12, 14, 17, 374–96, 397–421, 455
- LNG (liquefied natural gas)
 Mozambique 7–8, 162, 166–7, 167f, 212, 215
see also Tanzania: gas and LNG projects
- local content 17–21, 459–62
 challenges 2, 349, 460
 classification of local supplier firms of goods and services 423f
 construction sector 70, 71
 corruption 19
 criticism 283
 definition 75, 282, 423–4
 diversification 2, 17, 75–8, 89
 employment 17, 18, 299
 extractive sector/sub-national development link 18
 governments and 21–2
 GVCs (global value chains) 426–7
 industrialization 424
 industry/resource link 2, 20–2, 459
 LCU (local content unit) 83n.1, 250, 291, 370, 461
 local content regulations 2, 17, 47, 74, 84, 103, 112–13, 156, 250, 284, 291
 localization/indigenization distinction 440
 mining sector 74, 75
 oil and gas 142–3, 349
 policy 42, 459–62
 political economy of 18–19
 production/industrial linkages 424–5
 resource value chain 20–2

- success 2, 17, 349
 technological change and
 entrepreneurship 425–6
 technology transfer 2, 17, 74, 283, 286, 287,
 424
 value addition 423, 424
see also Ghana: local content; Mozambique:
 local content; Tanzania: local
 content; Uganda: local content; Zambia:
 local content
- Lombe, W.C. 18, 21, 382, 422–46, 460, 461
 low-income countries 4, 6, 42, 80, 87
- McMillan, M. 18, 282–303, 456, 460
 McPherson, C. 103
 MacSearraigh, S. 103
 macroeconomy
 epidemiology of the investment boom
 problem 177–8
 Ghana: oil sector 107–13
 macroeconomic management 88, 455
 macroeconomic policy 43–4, 47
 Mozambique 172
 resource curse 43
 Zambia: construction sector 14, 417–18, 417*f*
- Mafambissa, F.J. 15, 16, 183–208, 214
 MAGTAP (Mining and Gas Technical Assistance
 Programme, Mozambique) 221, 226, 228
- maintenance
 construction sector, expenditures
 12, 52–3, 58
 public investment in 11–12, 21, 45, 453–4
- Malongo, J. 266, 267, 275, 276
- Manley, D. 380–1, 382
- manufacturing 4, 52, 85–6, 89, 464, 465, 466–7
 challenges 79, 80, 463
 MVA (manufacturing value added) 422,
 433, 437
 SMEs (small and medium enterprises) 20
 Tanzania 274, 301
 Uganda 326, 362, 367, 463
 Zambia 75, 422–3, 425, 426, 427–30, 431,
 432, 433, 436, 438, 439, 441, 443, 444
- Markwardt, G. 105
 Materu, S.N. 276
 Matovu, J.M. 311
 Maugeri, N. 192
- MCTI (Ministry of Commerce, Trade, and
 Industry, Zambia) 405
- MDRI (Multilateral Debt Relief Initiative) 385,
 387, 393
- Mehlum, H. 36, 103
- MEM (Ministry of Energy and Minerals,
 Tanzania) 246–7, 250, 291
- MEMD (Ministry of Energy and Mineral
 Development, Uganda) 307, 313, 353
- MENA (Middle East and North African
 region) 156
- Mexico 36
- MFEZ (Multi-Facility Economic Zones,
 Zambia) 429, 430, 466
- MHID (Ministry of Housing and Infrastructure
 Development, Zambia) 409, 412, 418
- micro, small, and medium enterprises
 see MSMEs
- Mihalysi, D. 165, 236, 239, 241, 244–5
- mining sector 17
 capital investment 29, 31, 39
 China 378, 440
 diversification 74, 75
 employment 4, 29, 39, 40, 78
 local content 74, 75
 oil and gas extraction/mining comparison 29
 physical footprint 29
 sequence of asset transformations 29–32
 Tanzania 256, 257*f*
 value addition 74
 see also AMV; Tanzania: local content;
 Zambia: copper mining
- MMD (Movement for Multi-Party Democracy,
 Zambia) 375, 399
- MMDAs (Metropolitan, Municipal, and District
 Authorities, Ghana) 131–2
- MNCs (multinational corporations) 459,
 460, 465
 PPP (public–private partnership) 83
 resource extraction and 20
 supply chain pyramid structure 82
 Tanzania: local content 283, 284, 285, 291,
 296, 299, 302
 value chains 84, 462, 469
- MOF (Ministry of Finance, Tanzania) 246–7
- Mohammed, A.S. 17, 19, 20, 139–60
- MOPHRH (Ministry of Public Works, Housing
 and Hydric Resources, Mozambique)
 192, 194
- Morris, M. 424, 436, 439
- Mozambique 211–12
 1975 Constitution 217
 debt 187
 economic structure 174n.22, 209–10, 213–14
 evolution of the national economy since 1975
 independence 186–7, 187*f*; 210, 217–19
 FDI (foreign direct investment) 42, 43, 47,
 162, 163, 177, 189
 FRELIMO (Front for the Liberation of
 Mozambique) 186, 210, 217, 218, 219n.24
 inflation 452

- Mozambique (*cont.*)
- poverty 186, 211
 - RENAMO (National Resistance Party of Mozambique) 186, 210, 217, 218–19n.24
- Mozambique: construction sector 15, 16, 183–203, 456
- boreholes 196, 197–8
 - building materials sector 189, 194–5, 194t, 203
 - challenges 183, 200–2, 203
 - construction costs 183, 195–200, 197f
 - construction volume in state budget 190, 190f
 - corruption 198–9
 - financing 16, 190–1
 - growth of 183, 185, 187, 188t, 189, 202
 - historical background 187–90
 - household income 196, 196t, 200
 - households benefiting from housing quality facilities 196, 197t
 - housing 195, 196–8, 197f, 200, 202
 - importance of 183, 202
 - institutional features 192–3
 - Maputo 189, 192, 196–7, 197f
 - policy recommendations 201–2
 - regional suppliers 62
 - road construction 196, 198–9, 200, 202
 - structure of companies 191–2, 191f, 193t
 - SWOT analysis 200
 - value chain 195
 - see also* construction sector
- Mozambique: investment surge 161–80, 210
- 1996–2017 GDP growth rates 165f
 - 2005–16 GDP investment shares 162f
 - 2013 EMATUM bond issue 168, 169, 451
 - Cabo Delgado Province 7, 212, 214
 - debt 9, 11, 163, 168, 169–70, 172, 178, 179, 214, 215
 - disappointing economic outcomes 170–6
 - effects of investment surge 163–6
 - ENH (Empresa Nacional de Hidrocarbonetas) 175, 212
 - epidemiology of the investment boom problem 177–80
 - expectations and realities 166–70
 - extractives export dependence 166, 167
 - fiscal issues 168–72, 169f, 174, 178–9
 - IMF (International Monetary Fund) 7, 162, 163, 166–8, 170, 214
 - IMF debt sustainability assessments 169, 170f
 - investing for structural transformation 174–6
 - LNG (liquified natural gas) projects 7–8, 162, 166–7, 167f, 212, 215
 - macroeconomic choices 172
 - MSMEs (micro, small, and medium enterprises) 215–16
 - optimistic revenue projections 7, 11, 166–8, 167f, 170, 214–15, 228, 450, 451
 - policy recommendations 177–80
 - politics 177n.28
 - post-2010 investment surge 161–3
 - presource curse 168
 - project selection 161, 163
 - public investment, failures 11, 172, 174
 - resource curse 166
 - SWF (sovereign wealth fund) 172–4
 - see also* oil and gas
- Mozambique: local content 17–18, 77, 209–29, 299, 460, 461
- 2014 Local Content Bill 223
 - 2014 Mining Law and Petroleum Law 77, 224b
 - challenges 209–10, 214–16, 228
 - CSR (corporate social responsibility) 18, 226–7
 - CSR *Implementation Guide* 19, 226–7
 - diversification 211, 214, 217, 223
 - employment 17, 227
 - extractive sector/national development link 19, 222, 228
 - fiscal crisis 214–16, 228
 - foreign/regional firms 209, 210, 213–14, 224, 228, 229
 - industrial policy 219–23
 - industries without smokestacks 214, 229
 - IPS (Industrial Policy and Strategy) 219–20
 - local content objectives and stipulations 224b
 - local content and social investment in local economic development 223–9
 - MEF (Ministry of Economy and Finance) 224, 225
 - MIC (Ministry of Industry and Commerce) 220–1, 226
 - mining sector 77, 209, 213
 - MIREME (Ministry of Mineral Resources and Energy) 224, 225
 - MSMEs (micro, small, and medium enterprises) 210, 214, 216, 219–23, 225b, 227, 228
 - oil and gas 212–13, 225b
 - policy 216–28
 - Policy on Corporate Social Responsibility for the Mineral Resources and Extractive Industries* 18, 19, 226–7
 - resource value chain 20
 - rural economy 214, 216, 219, 223, 226, 227, 228
 - see also* local content
- MPI (material project information) 416, 418
- MPMSP (Mineral Production Monitoring Support Project, Zambia) 381, 387, 393

- MSMEs (micro, small, and medium enterprises) 455, 468
 definition 215n.17
 education and training 85, 468
 Mozambique 210, 214, 215–16, 219–23, 225*b*, 227, 228
- MTEF (Medium-Term Expenditure Framework) 12, 319, 386, 453
- Mugabi, C. 269, 276
- Muhegi, B. 266, 275, 276
- Multilateral Debt Relief Initiative *see* MDRI
- multinational corporations *see* MNCs
- Musingi, R. 267
- MVCMP (Mineral Value Chain Monitoring Project, Zambia) 381, 387, 393
- Mwakacheya, B. 382
- Mwombeki, F.K. 266, 276
- natural resources
 Africa 1, 21, 74
 as asset 28
 discovery of 30, 32, 37, 38, 41–2, 47
 exploration 29–30, 32, 33, 38, 40
 legal and institutional context 32–3, 32*f*
 natural resources abundance, risks of 1, 3, 4, 21, 29, 74, 89
 natural resource dependence 2
 natural resource extraction and national development 140–2
 sequence of asset transformations 29–32, 29*f*, 38, 39
 structural change and 4
 volatility 3–4, 7, 44
see also Dutch disease; resource boom; resource curse; resource-rich economies
- natural resource governance 315, 384
 Natural Resource Governance Charter 315
 Natural Resource Governance Index 114, 315, 377
- NBS (National Bureau of Statistics, Tanzania) 258, 259, 263, 267, 272
- NCC (National Construction Council, Tanzania) 260, 268
- NCC (National Council for Construction, Zambia) 403–4, 406, 409, 411, 412, 413, 418
- Ndi, G. 100
- Neary, P. 34
- NEEC (National Economic Empowerment Council, Tanzania) 250, 289, 291, 460
- NEMC (National Environment Management Council, Tanzania) 247
- Newman C. 425
- Nigeria 33–4, 36, 47, 101
 local content 75–6, 297–8, 299, 300
 National Oil Corporation 75
 oil and gas 101, 102
 recoverable reserves 351
- non-tradable sector 43, 46–7, 108, 456, 465
 non-tradable goods 4, 35, 41
 non-tradable services 30, 42, 74
- North, D. 42, 46
- Norway 88, 108, 145, 306, 322, 466
 SWF (sovereign wealth fund) 173n.21
- Novosad, P. 15, 64
- NRGI (Natural Resources Governance Institute) 147, 176, 239, 244, 315
 Natural Resource Governance Index 114, 315, 377
- Ntungire, N. 14, 15, 16, 17, 326–48, 457
- NWSC (National Water & Sewerage Corporation, Uganda) 329
- OAG (Office of the Auditor General, Uganda) 352, 357, 358
- OAG (Office of the Auditor General, Zambia) 412, 416
- Obeng-Odoom, F. 142
- oil and gas
 Africa 101–2, 102*f*
 capital investment 29, 31, 78
 construction phase of a project 13, 16, 31, 33, 38, 40, 142
 ‘conventional’ oil and gas 29n.3, 40
 employment 4, 13, 16, 33, 38, 39*f*, 40, 78, 142
 Latin America 352
 local content 142–3, 349
 oil and gas extraction/mining comparison 29
 policy 39*f*, 40, 449–54
 resource curse 133
 revenue from 31
 sequence of asset transformations 29–32, 39
 ‘unconventional’ oil and gas 29n.3
 value addition 143
see also Ghana: oil sector; Mozambique: investment surge; Tanzania: gas and LNG projects; Uganda: oil
- Olken, B.A. 67n.6, 69
- Olsen, A. 145, 157
- OPEC (Organization of the Petroleum Exporting Countries) 1
 Östensson, O. 175
- Ovadia, J.S. 290
- Owoo, N.S. 119–38
- Owusu-Ayim, J. 100
- Oyejide, T.A. 297–8

- Page, J. 1–23, 39, 74–93, 311, 449–71
- Palmer, R. 132
- Papyrakis, E. 34
- PAU (Petroleum Authority of Uganda) 307, 353, 356, 357, 358, 364, 461
- Pereira, F. 183–208
- PF (Patriotic Front, Zambia): *2011–2016 Manifesto* 399–400
- PHF (Petroleum Holding Fund, Ghana) 106
- Phiri, F. 405
- PIAC (Public Interest and Accountability Committee, Ghana) 10, 98, 104, 105–6, 110, 112, 113, 114
- PIH (permanent income hypothesis) 8, 35, 251
- PIP (Public Investment Plan, Uganda) 320–1
- Poelhekke, S. 3, 34, 35, 41
- policy 449–69
 - asset transformations 31
 - construction sector 52, 55, 68–70, 71, 454–8, 468–9
 - corruption and collusion 458
 - Dutch disease 2, 449, 463–5, 469
 - education and training 41, 462
 - fiscal and monetary policy management 43–5
 - Ghana: construction sector 135–7
 - Ghana: local content 143–5, 156–7
 - industrial policy 42–3, 84, 219–23
 - industries without smokestacks 2, 449, 463, 465–6, 469
 - industry/resource link 458–62, 465
 - institutional reforms 21, 69–70, 77, 79, 80, 87, 89, 135, 418, 456, 463, 465, 469
 - institutions and 46–7
 - investing in knowledge 2, 449, 463, 466, 469
 - local content 42, 459–62
 - managing a modest boom 449–54, 468
 - Mozambique 216–28
 - Mozambique: construction sector 201–2
 - Mozambique: investment surge 177–80
 - oil and gas 39*f*, 40, 449–54
 - politics 46
 - PPP (public–private partnership) 460–2
 - private sector 41
 - rent-seeking 80
 - resource boom 45–7
 - resource project/jobs link 39, 39*f*, 41
 - spatial industrial policy/SEZs 449, 463, 466–7, 469
 - structural change 2, 449
 - Tanzania: construction sector 275–8
 - Tanzania: gas and LNG projects 238–9, 242–51, 252
 - Uganda: local content 370–1
 - Zambia: construction sector 418–19
 - Zambia: local content 433–6, 441–4
 - see also* regulatory reform
 - politics 35–6, 37, 46, 177*n*.28
 - construction sector 52, 68, 341
 - Ghana: construction sector 134
 - Ghana: local content 19, 153
 - local content and 18–19
 - resource boom 45–6
 - Uganda: oil 305, 318, 322
- Potluri, V.A. 8, 10, 304–25
- PPP (public–private partnership) 83, 88–9, 460–2
 - Ghana: local content 153–5, 156, 300
- Presbitero, A. F. 68
- Pritchett, L. 46
- private sector
 - natural resources and 41–3
 - policy 41, 42
 - supply chain 42
 - Zambia 406, 408, 408*t*
 - see also* MNCs
- procurement 64–5, 69, 70, 71, 341, 458
 - local procurement 22, 82
 - local procurement regulations 2, 75, 76, 78, 459–60
 - Tanzania: construction sector 258, 266, 458
 - Zambia: construction sector 411–12, 418
 - see also* Uganda: construction sector
- PSAs (Production Sharing Agreements) 241, 244–5, 306–7, 312, 353
- public policy *see* policy
- PURA (Petroleum Upstream Regulatory Agency, Tanzania) 246, 291
- Qatar 1, 88
- QSRB (Quantity Surveyors Registration Board, Zambia) 409, 411
- R&D (research and development) 424, 425, 426, 435, 442, 444
 - see also* technology
- Rajaram, A. 390
- RDA (Road Development Agency, Zambia) 406, 409, 412, 418
- Readhead, A. 387
- regulatory reform 69–70, 77, 79, 80, 87, 89, 135, 418, 463–4, 465, 469
- rent-seeking 27, 36, 42–3, 46, 84, 85, 415, 418
 - corruption and 103
 - developing countries 141
 - policy 80
- resource boom 6–12, 27–47, 468
 - challenges 27
 - construction boom 41

- debt financing 9, 21, 454
 education and training 41
 FDI (foreign direct investment) 38, 47, 162, 163, 177, 288
 jobs and policy 39, 39f
 maintenance, public investment in 11–12, 21, 453–4
 managing the boom 1–2, 6
 managing expectations 450–2, 468
 managing a modest boom 449–54, 468
 policy 45–7
 politics 45–6
 public revenue management 1–2, 7–8, 21, 31, 34
 public spending 11–12, 21, 450, 452–4, 468
 saving/spending 8, 21, 31, 45
 sequence and timing 28–33, 38–9
 setting the rules 9–10
 size and timing 6, 7, 27, 38–9, 304, 310, 321, 451–2, 468
 structural change 39
 volatility 44
see also natural resources; resource curse
 resource curse 1, 27, 33–8, 41, 98n.3, 165n.9
 cross-country regressions 34, 36, 37
 Ghana 98, 139
 institutions 34, 36–8, 46
 macroeconomic policy 43
 Mozambique 166
 natural resources and institutions 34, 36–8
 oil resources 113
 ‘resource curse’ 165, 168
 volatility 3, 34, 37
see also Dutch disease; natural resources; resource boom
 resource-rich economies 1, 21, 33
 cities as ‘consumption cities’ 42–3, 46
 construction sector 52, 70, 71
see also natural resources
 Robinson, J.A. 36, 46
 Roe, A.R. 7, 9, 11, 161–82, 214, 215
 Ross, M.L. 34, 97, 103
 Rostow, W.W. 140–1
 Rweyemamu, D. 239, 241

 Saasa, O. 406, 412, 415
 Sachs, J.D. 34, 141
 Sala-i-Martin, X. 36
 SCD (Supply Chain Development programme, Ghana) 155
 Scurfield, T. 236, 239, 241, 244–5
 SDL (Skill Development Levy, Zambia) 419
 Sen, R. 18, 20, 349–73, 460
 Serletis, A. 105

 SEZs (special economic zones) 449, 463, 466–7, 469
see also corridors
 skills 81
 construction sector 15–16, 21, 248–9, 457
 diversification 80–2, 87, 89
 Ghana: construction sector 14, 16, 132–3
 lack of 464
 semi-skilled workers 16, 19, 40, 151, 248
 skilled workers 16, 18, 40, 78, 248, 295, 457, 465
 Tanzania: construction sector 16, 258, 259, 265, 267, 272–4, 273t, 274t, 276, 277
 Tanzania: local content 293–4, 295–6, 299, 301
 Uganda: construction sector 16, 344
 unskilled workers 19, 295, 457
 Zambia: local content 428, 433, 435, 441–2, 443
see also education and training; employment; technology
 SMEs (small and medium enterprises)
 Ghana 152–3, 154–5, 156
 scarcity of 22
 Zambia 430, 435, 440, 443
 South Africa
 2003 Broad-Based Black Economic Empowerment Act 77–8
 2004 Mining Charter 77
 local content 77, 299, 433
 mining sector 77, 88, 466
 Sasol 189, 209, 210, 213, 218, 220
 Spray, J. 367
 SSA (sub-Saharan Africa)
 construction sector 14, 53–4, 59, 61–2, 64
 extractive sectors 74
 industrialization 436
 infrastructure 80
 oil rents 101
 Stevens, P. 175
 structural change 1, 469
 Africa 4, 17
 diversification 4
 Dutch disease: policy and institutional reforms 2, 449
 industries without smokestacks 2, 449
 investing in knowledge 2, 449
 Mozambique 174–6
 public policy and 2, 449
 Tanzania 249
 Subramanian, A. 36
 sustainable development 8, 74, 302, 375, 450
 Sutton, J. 42, 83, 120, 209, 210n.2, 249, 250, 291, 349, 459

- Takiyawa, J.A. 99
- Tanzania
- debt 9
 - inflation 452
 - manufacturing 274, 301
 - MIC (middle-income country) 256, 272
 - mining sector 256, 257*f*
 - structural change 249
 - SWF (sovereign wealth fund) 173n.21
- Tanzania: construction sector 13, 15, 256–78, 456
- 2011 Public Procurement Act 260, 266, 278
 - access to land 269–70, 275–6, 278, 456
 - AQRB (Architects and Quantity Surveyors Registration Board) 260, 261, 261*f*, 272–3, 277
 - challenges 258–9, 266, 267, 267*t*, 269–76, 456
 - clients 266–7
 - competition 259, 266, 276
 - construction materials and equipment 16, 265, 267, 268, 274–5, 275*t*, 276–7
 - construction permits 270–2, 276, 278, 456
 - construction prices 267–9
 - contractors 263–6, 264*t*, 265*t*
 - contractors' challenges 266, 267*t*, 276, 278
 - CRB (Contractor Registration Board) 260, 262–6, 263*f*, 278
 - education and training 272, 274, 277
 - ERB (Engineers Registration Board) 260, 261–2, 262*f*, 272–3, 277
 - financing 16, 65, 266
 - foreign/regional contractors 13, 62, 263, 265–6
 - GFCF (gross fixed capital formation) 256, 258*f*
 - growth of 256, 257*f*, 258
 - importance of 256, 275
 - investment shocks 268–9
 - LGA (local government authority) 259, 266, 267, 270, 271, 272, 276, 277, 278
 - local contractors 13, 64, 258, 263, 265
 - MoWTC (Ministry of Works, Transport, and Communication) 259–66
 - policy recommendations 275–8
 - procurement 258, 266, 458
 - road maintenance 15, 64
 - skills 16, 258, 259, 265, 267, 272–4, 273*t*, 274*t*, 276, 277
 - structure of the construction sector 259–67
 - see also* construction sector
- Tanzania: gas and LNG projects 8, 232–52, 289, 451
- 2015 Petroleum Act 243–4
 - construction of 16, 40–1, 248–9
 - costs of delay 242, 243*f*, 252
 - education and training 40–1, 248–9, 462
 - employment 16, 40, 247, 248–9
 - externalities and private investment 247–8, 249–50
 - FEED (Front End Engineering Design) 236, 238, 242, 243, 246
 - firm capabilities 249–50, 252
 - fiscal policy management and public investment 250–1
 - fiscal terms and cost recovery
 - projections 240–2
 - geological and engineering challenges 235–6
 - HGA (Host Government Agreement) 238, 244, 246, 252
 - investment in 232, 233, 240, 252
 - legal and regulatory requirements 243–6, 252
 - magnitude and timing of prospective resource boom 233–42, 451
 - market and commercial risks 236–8, 252
 - NPV (net present value) 233, 240
 - onshore/offshore natural gas 234, 235*f*
 - policy co-ordination and the authorizing environment 246–7
 - policy risks: the 'authorising environment' 238–9, 252
 - production and prices projections 239–40, 252
 - PSAs (Production Sharing Agreements) 241, 244–5
 - public policy 247–51, 252
 - public policy and risk 242–7
 - resource boom 251–2
 - revenue projections 7, 39, 44, 232, 237, 241–2, 241*f*, 252, 289, 450
 - risks 232–3, 235–9
 - see also* oil and gas
- Tanzania: local content 19, 20, 77, 282–302, 460
- 2010 Mining Act 286, 287, 293, 294
 - 2014 Non-Citizens Act 250, 284
 - 2015 Energy Policy 250
 - 2015 Petroleum Act 18, 250, 289–90
 - 2015 TEITA (Tanzania Extractive Industries Transparency and Accountability Act) 284
 - 2017 Miscellaneous Amendments Act 18, 245, 252, 285, 286–7, 290
 - 2017 Permanent Sovereignty Act 245, 252, 285, 287, 290
 - 2017 Petroleum (Local Content) Regulations 77, 290
 - 2017 Unconscionable Terms Act 245, 285
 - ASIP (Annual Survey of Industrial Production) 283, 293–4, 297

- CIP (Census of Industrial Production) 20, 283, 294–7
- education and training 283, 286, 287, 288, 291, 294, 296, 299, 301, 302
- employment 283, 284, 286, 287, 288, 290, 293–4, 295, 296, 299, 300–1, 302
- financing 300
- gas sector 77, 247–8, 250, 252, 288–90
- impact of local content policies 292–7, 300–1, 302
- industry/resource link 20, 282, 296, 302
- legislation 283, 284–90
- lessons from country experiences with local content legislation 297–300
- mining 283, 292, 294, 300
- mining regulations 18, 77, 285–8
- Mining Regulations on Local Content Policy 287–8
- MNCs (multinational corporations) 283, 284, 285, 291, 296, 299, 302
- skills 293–4, 295–6, 299, 301
- technology transfer 283, 286, 287
see also local content
- Tarp, F. 1–23, 449–71
- technology 299
- Ghana 103, 145, 155, 156, 157
- mining 78
- oil industry 155
- Tanzania 283, 286, 287
- technological innovation 425–6, 441, 442, 444
- technology transfer 156, 157
- technology transfer and local content 2, 17, 74, 283, 286, 287, 424
- Zambia 17, 21
see also education and training; R&D
- Toews, G. 42, 43, 162, 178
- Tordo, S. 143, 362, 364
- Tornell, A. 36
- Torvik, R. 37
- tourism 86, 87, 88, 89, 320, 463, 466, 467
- TPDC (Tanzania Petroleum Development Company) 244, 246–7, 291
- TPSF (Tanzania Private Sector Foundation) 270–1
- TRA (Tanzania Revenue Authority) 247
- training *see* education and training
- transparency 458
- Ghana: construction sector 135–6
- Ghana: oil sector 99, 103–5, 113, 114, 453
- Uganda: construction sector 342–3, 347
see also corruption
- Transparency International 199, 412
- TIZ (Transparency International Zambia) 415
- Trinidad and Tobago 33
- Tyler, W.G. 425
- UBOS (Uganda Bureau of Statistics) 321, 326, 328, 340
- Uganda
- debt 9, 321
- IMF 320, 321
- inflation 452
- manufacturing 326, 362, 367, 463
- poverty 321
- Road Fund 12
- Uganda: construction sector 16, 326–47
- 2003 Public Procurement and Disposal of Public Assets Act 333–4
- challenges 327, 332, 340–7
- competition 327, 335, 342, 343
- construction costs 14, 346, 347, 455
- corruption 327, 332–3, 341–4, 346, 458
- employment 328, 332
- financing 16, 17, 327, 331, 340, 344–6, 347, 457
- firms 15, 331–3
- foreign/regional firms 17, 62, 344, 346
- government contracts 328, 329–31, 345
- growth of 326
- importance of 326, 346
- local firms 17, 327, 344, 346
- market structure of the construction sector 328–33, 346
- PDEs (procurement and disposal entities) 329–30, 335, 337, 342
- PDU (procurement and disposal unit) 337, 338–9
- PPDA (Public Procurement and Disposal of Public Assets Authority) 328, 333–4, 335, 338, 339, 341, 342, 346
- public procurement 327, 330, 331, 332, 333–7, 346
- public procurement, evaluation phase 336–7
- public procurement methods 334–6, 343
- regulation 333–40, 343, 347
- skilled labour 16, 344
- stakeholders 337–40
- standards and quality 343–4
- transparency 342–3, 347
see also construction sector
- Uganda: local content 18, 349–71, 460, 461
- 2008 National Oil and Gas Policy 18, 352
- 2013 PEDP Act (Petroleum Exploration, Development and Production) 353
- 2013 PRCTMS Act (Petroleum Refining, Conversion, Transmission and Midstream Storage) 353

- Uganda: local content (*cont.*)
- 2016 PEDP NC Reg (National Content Regulations) 353, 356, 358n.9
 - 2016 PRCTMS NC Reg. (National Content Regulations) 353
 - 2018 National Local Content Policy for the Oil & Gas Sector 352–3
 - domestic supplier capabilities 352, 364–70, 369*t*
 - domestic supplier/resource value chain link 20–1, 351–2, 359–64, 361*f*, 363*f*
 - education and training 351, 371
 - employment 18, 359
 - foreign firms 367
 - IEC (Industry Enhancement Centre) 371
 - IOCs (international oil companies) 351, 357, 358, 364, 366, 371
 - joint ventures 350, 352, 356
 - local content requirements 352–6, 354*t*, 370
 - local content requirements, evaluation of 356–9
 - local supplier development 350–2
 - National Oil and Gas Policy 18
 - NSD (National Suppliers Database) 356, 364–6, 371, 461
 - oil and gas suppliers 365–7, 365*t*
 - policy recommendations 370–1
 - PSAs (Production Sharing Agreements) 18, 353
 - supply industries, distribution of revenue/workers 367–8, 368*f*
 - see also* local content
- Uganda: oil 8, 10, 304–22, 451
- 2008 National Oil and Gas Policy 307
 - 2012 Petroleum Revenue Management Policy 317
 - 2013 Petroleum Acts 307
 - 2015 Charter of Fiscal Responsibility 317, 318
 - 2015 PFM Act (Public Finance Management) 10, 307–8, 317, 318–19, 320
 - Albertine Graben 306, 309, 310, 326, 351
 - delays in projects execution 311, 313
 - development spending 318–19
 - Dutch disease 315, 319, 322
 - expectations for the oil sector 315–16, 351, 451
 - exploration 305–8, 351
 - FDI (foreign direct investment) 351
 - fiscal anchor 10, 315, 317–18
 - fiscal rule choices 319–20
 - GoU (Government of Uganda) 304, 309, 313, 322
 - governance framework 315, 316–21, 322
 - Hoima airport 308, 310, 326–7
 - infrastructure required for production 308–10
 - large ongoing/planned public infrastructure projects 310, 311*t*
 - MTBF (Medium-Term Budget Framework) 10, 317
 - MTEF (Medium-Term Expenditure Framework) 12, 319
 - oil boom timing and sequencing 305–15, 322, 351
 - oil commercialization 305, 350
 - oil pipeline 308, 309–10, 313, 326
 - oil price 311, 312, 314, 314*f*, 318
 - oil refinery 308–9, 326
 - oil timeline 305–10
 - Petroleum Fund 10, 304, 317, 318, 319, 320, 322
 - politics 305, 318, 322
 - PRIR (Petroleum Revenue Investment Reserve) 10, 308, 317–18, 319
 - public investment management 315, 320–1, 322
 - recoverable reserves 311, 312–13, 350–1
 - revenue 8, 38–9, 304, 310–15, 314*f*, 318, 322, 450
 - sovereign wealth fund 304, 315, 317, 322
 - UNOC (Uganda National Oil Company) 307, 309, 314
 - see also* oil and gas
- UNABCEC (Uganda National Association of Building and Civil Engineering Contractors) 339, 342, 344
- UNBS (Uganda National Bureau of Standards) 339
- UNCTAD (United Nations Conference on Trade and Development) 381
- UNDP (United Nations Development Programme) 378
- UNECA (United Nations Economic Commission for Africa) 427, 428
- UNRA (Uganda National Roads Authority) 329, 330, 341
- UNU-WIDER (United Nations University World Institute for Development Economics Research) 1, 209, 221n.30
- UNZA (University of Zambia) 409, 411, 416
- URA (Uganda Revenue Authority) 339, 343
- Uriyo, A. 69
- USAID (United States Agency for International Development) 155, 221
- value addition 423, 424
- construction sector 53, 53*t*
 - diversification 75, 78

- Ghana: local content 103
- industry/resource link 17, 21–2, 459
- mining sector 74
- oil and gas 143
- Van der Ploeg, M. 3, 34, 35, 41, 171, 172, 173, 454
- Van Wijnbergen, S. 35
- Venables, A. 28, 34, 38, 171, 172, 173, 454
- Venezuela 1, 33, 36, 124
- Vežina, P.-L. 42, 43, 162, 178
- volatility 4, 35
 - commodity prices 3–4, 43, 44*f*
 - Dutch disease 35–6
 - exchange rate volatility 14
 - resource boom 44
 - resource curse 3, 34, 37
- VSO (Voluntary Service Overseas) 41, 248

- Walker, I. 214
- Warner, A.M. 34, 141, 164–5, 168
- Watanabe, T. 364
- WEF (World Economic Forum) 272
- Wells, J. 70
- Witter, S. 110, 171
- Wolf, S. 8, 10, 304–25, 367
- World Bank 14, 141, 198, 270, 310, 320, 451
 - contract awards 59–62, 60*t*, 63*t*
 - Doing Business report 270
 - Enterprise Surveys* 80, 464
 - International Comparison Project 65–6, 66*t*
 - Investment Climate Assessments* 80, 464
 - World Bank Logistics Performance Index 13
 - World Bank Procurement Database 51, 59, 65
 - World Bank Trade Logistics Index 81, 464
 - Zambia 376, 378, 382, 386, 388, 391
- WPM (Works Procurement Manual, Ghana) 125

- YIEDIE (Youth Inclusive Entrepreneurial Development Initiative for Employment, Ghana) 136
- Younger, S.D. 107

- Zambia
 - 7NDP (Seventh National Development Plan) 374, 377–8, 385, 386, 400, 433, 435, 441, 460
 - 1960–85 growth and structure of GDP 437, 438*t*
 - 1991–2015 real GDP and sectoral growth 438–9, 439*t*
 - 2013 Mineral Resource Development Policy 75, 435
 - 2015 Mines and Mineral Development Act 75, 435, 442
 - copper mining 8, 374, 422, 427
 - debt 9, 388, 392–3, 417, 429, 450
 - economic and political context 375–6, 422
 - education and training 418–19, 441–2, 455
 - fiscal deficit 8
 - IMF 388, 389, 417
 - industrialization 422, 433, 434
 - inflation 452
 - natural resource dependence 2, 388, 389, 422
 - poverty 422
 - Vision 2030: 433–5, 434*t*, 440, 442, 460
 - World Bank 376, 378, 382, 386, 388, 391
- Zambia: construction sector 12, 14, 15, 397–419, 455
 - challenges 405–6, 412–18
 - competition 405, 413
 - construction permits 413, 414*t*, 456
 - contribution to the economy 402, 403*f*
 - corruption 415–16
 - demographic, political and economic changes 399–403
 - employment 402–3
 - financing 17, 419
 - firm-level challenges 412–13
 - firms' grading system 15, 17, 404–5, 404*f*, 405*f*, 412–13
 - government (consumer of construction services) 406, 408
 - growth of 402
 - households (consumers of construction services) 406–8, 407*t*
- ICOR (incremental capital–output ratio) 401–2, 402*f*
- industry-wide challenges 413–17
- infrastructure 398, 400, 408, 413, 444
- infrastructure, public expenditure on 400–1, 401*f*, 402, 418
- macroeconomic challenges 14, 417–18, 417*f*
- market structure 409, 410*t*
- NFAs (non-financial assets) 400, 401*f*
- oligopoly 14, 405, 409, 410*t*, 413, 458
- organization of 403–12
- policy recommendations 418–19
- private firms (consumers of construction services) 406, 408, 408*t*
- procurement 411–12, 418
- regulations and public institutions 409–12
- see also* construction sector

Zambia: copper mining 374–93
 Copperbelt 82, 376, 381, 383–4, 391
 copper mining, boom-and-bust cycles 374, 392–3

Zambia (*cont.*)

- DAs (Development Agreements) 18, 379–80, 429, 443
- debt 386, 387–8, 388*f*, 392–3
- debt strategies 385, 393
- diversification 374, 385
- Dutch disease 388–9
- employment 383, 422
- environmental damage and health
 - issues 383–4
- exchange rate 388–9
- extent of mineral resources 376–8
- fiscal projections 385–6
- fiscal rules 389–90
- foreign ownership 375
- IFFs (illicit financial flows) 381–2, 393
- mining costs 380, 381, 383
- mining exports 21, 374, 379, 430
- mining investment 379, 422
- mining tax regime 378, 379–81, 382–3, 387, 393, 429
- MTDS (Medium-Term Debt Strategy) 385
- MTEF (Medium-Term Expenditure Framework) 386
- PEs (personal emoluments) 386, 392, 392*f*
- privatization 18, 375, 379, 383, 393, 429
- public investment management 11, 390–2, 392*f*, 393
- Public Investment Planning Department 11, 390–1
- recurrent consumption expenditure 392, 393
- revenue 378, 379, 385, 386, 386*f*
- revenue-sharing arrangements 387
- savings rule 384–5
- social investment 383
- tax evasion and avoidance 381–2, 387
- see also* mining sector
- Zambia: local content 18, 21, 75, 299, 422–3, 427–44, 461
 - 1964–91: import-substitution industrialization 427–8
 - 1991–present: market liberalization, and privatization 428–30, 438–41
- CEE Act (Citizens Economic Empowerment) 435
- challenges 433, 436–41
- construction sector 406, 419
- copper production 21, 422, 427–44
- current initiatives 430–1
- diversification 422, 439
- domestic suppliers 422, 431–3, 432*f*, 439–40
- employment 19, 75, 423, 430, 435
- export-oriented industrialization 429
- financing 433
- foreign suppliers 432, 440
- industrialization 422, 423, 428, 436, 440, 441–4
- industrialization, structural impediments 436–41
- ISI (import-substitution industrialization) 18, 427, 428, 429, 430, 436–7, 438, 439
- localization/indigenization distinction 440
- local ownership 18, 439–40
- manufacturing 75, 422–3, 425, 426, 427–30, 431, 432, 433, 436, 438, 439, 441, 443, 444
- policy and legislation 433–6
- policy recommendations 441–4
- privatization 429–30
- production/industrial linkages 21, 428, 430, 433, 436, 441
- skills 428, 433, 435, 441–2, 443
- SMEs (small and medium enterprises) 430, 435, 440, 443
- ZDA Act (Zambia Development Agency) 435
- see also* local content
- ZCCM (Zambia Consolidated Copper Mines Ltd) 75, 376, 383, 427
- ZCCM-IH (Zambia Consolidated Copper Mines-Investment Holdings) 377, 379, 382, 384, 387
- ZEITI (Zambia Extractives Industries Transparency Initiative) 381
- Zhang, C. 15, 59*n*.3, 64
- ZIA (Zambia Institute of Architects) 409, 411
- ZIPAR (Zambia Institute for Policy Analysis and Research) 403–4, 409, 412
- ZMLCI (Zambia Mining Local Content Initiative) 430, 431, 462
- ZRA (Zambia Revenue Authority) 381, 382, 387