

Breaking out of Enclaves

*Leveraging Opportunities from Regional Integration
in Africa to Promote Resource-Driven Diversification*



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Promote Resource-Driven Diversification*

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Abbreviations and Acronyms

AECF	Africa Enterprise Challenge Fund
AfDB	African Development Bank
AGOA	Africa Growth and Opportunity Act
AMDC	African Minerals Development Centre
AMV	African Mining Vision
ANC	African National Congress
APEI	Accelerated Program for Economic Integration
ASP-B	Port Services Administration-Bolivia
AU	African Union
AUC	African Union Commission
BCA	Border-Crossing Agreement
BOT	Build-Operate-Transfer
BSGR	Benny Steinmetz Group Resources
CAPEX	Capital Expenditure
CDN	Corredor de Desenvolvimento do Norte
CEAR	Central East African Railways
CFM	Portos e Caminhos de Ferro de Moçambique
CFTA	Continental Free Trade Area
Chinalco	Aluminum Corporation of China
CLIN	Corredor Logístico Integrado do Norte
COE	Specific Operational Contract
COMESA	Common Market for Eastern and Southern Africa
CQCEN	Central Queensland Coal Network
CRISIL	Credit Rating Information Services of India Limited
CSN	Companhia Siderúrgica Nacional
CVRD	Companhia Vale Rio Doce
DC	Development Corridor
DFI	Development Finance institution
DRC	Democratic Republic of Congo
DTIS	Diagnostic Trade Integration Study
EAC	East African Community
EBA	Everything but Arms
ECA	Economic Commission for Africa
ECOWAS	Economic Community of West African States
EITI	Extractive Industries Transparency Initiative
EPZ	Export processing zones

EU	European Union
FCA	Empresa Ferroviaria Andina S.A.
FCAB	Ferrocarril de Antofagasta a Bolivia
FCEV	Fuel cell electric vehicle
FDI	Foreign direct investment
GASBOL	The Bolivia-Brazil Pipeline
GDP	Gross domestic product
GMS	Greater Mekong sub-region
GTB	Gas Transboliviano S.A.
GVA	Gross value addition
GVC	Global value chain
HCCPG	Hunter Valley Coal Chain Planning Group
HVCCC	Hunter Valley Coal Chain Coordinator
HVCCLT	Hunter Valley Coal Chain Logistics Team
ICT	Information and communications technology
IFC	International Finance Corporation
INATTER	National Surface Transport Regulator
ITS	Integrated Transportation System
JICA	Japan International Cooperation Agency
ktpa	Thousands of tonnes per annum
LCDA	Lapsset Corridor Development Authority
LKAB	Luossavaara-Kiirunavaara Aktiebolag
LOHC	Liquid Organic Hydrogen Carrier
MBR	Minerações Brasileiras Reunidas
MCC	Maputo Corridor Company
MCLI	Maputo Corridor Logistics Initiative
MCT	Ministry of Transport and Communications
MDC	Maputo Development Corridor
MIDP	Motor Industry Development Programme
MoPEA	Liberian Ministry of Planning and Economic Affairs
MRS	MRS Logistica S.A.
MRU	Mano River Union
Mtpa	million tons per annum
NAFTA	North American Free Trade Area
NCTTCA	Northern Corridor Transit Transport Coordination Authority
NEPAD	New Partnership for African Development
NOK	Norwegian Krone
NTB	Non-tariff barrier
OEM	Original equipment manufacturer
OPEX	Operating Expenditure
OSJD	Organization for Cooperation of Railways

PAIDF	Pan-African Infrastructure Development Fund
PIC	Public Investment Corporation
PIDA	Program for Infrastructure Development in Africa
PPP	Public Private Partnership
PWCS	Port Watarah Coal Services
R&D	Research and development
REC	Regional Economic Community
RFFSA	Rede Ferroviaria Federal S.A.
RRT	Resource rent tax
RSDIP	Regional Spatial Development Initiative Programme
RVR	Rift Valley Railways Consortium
SADC	Southern African Development Community
SDCN	Sociedade para o Desenvolvimento do Corredor de Nacala
SDI	Spatial Development Initiative
SEK	Swedish Krona
SIE	Small isolated economies
SMME	Small, medium, and micro enterprises
SOE	State Owned Enterprise
SPV	Special Purpose Vehicle
SSA	Sub Saharan Africa
SSATP	Sub-Sahara Africa Transport Policy Program
SWF	Sovereign wealth fund
TBG	Transportadora Brasileira Gasoduto Bolívia-Brasil S.A.
TFTA	Tripartite Free Trade Area
TNC	Transnational corporation
TRL	Tanzania Railways Limited
UEMOA	l'Union Economique et Monétaire Ouest Africaine
WAEMU	West African Economic and Monetary Union
UMA	Arab Maghreb Union
UNDP	United Nations Development Program
USA	United States of America
WTO	World Trade Organization

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Executive Summary

This report explores the relationships between extractive resources, regional integration, and economic diversification. It looks at how regional approaches can increase the local employment and production effects of extractive resources projects. It discusses the regulatory, institutional, and political economy barriers facing African policymakers in achieving regional cooperation. The analysis makes frequent reference to three case studies of efforts to create trans-boundary transport corridors, including the Nacala corridor in southern Africa, proposals for the exploitation of iron ore in Guinea and Liberia, and the LAPSET corridor in East Africa to ship oil and gas from South Sudan to ports on the Indian Ocean. This section provides a summary of the main findings and messages from the report.

Effectively linking the extraction of resources and regional integration in Africa would bring stronger and more inclusive economic benefits

The issues of exploiting natural resources and regional integration are inextricably linked but poorly addressed by policy makers. An abundance of extractive resources tends to impede economic diversification, by reducing the relative profitability of other tradable sectors and by reinforcing investments in mine-to-coast transport infrastructure. Investments in transport infrastructure to bring extractive resources to the coast can distort both the commodity structure of trade, especially if access to that infrastructure by other economic agents is prohibited, and limit the scope for value to be added to those resources through further processing at the regional level. Conversely, the large number of landlocked resource-rich countries often require the transshipment of resources across borders before reaching the coast. Thus, regional cooperation frequently is necessary to develop extractive resources, and the quality of regional agreements helps determine whether these resources are developed in a manner that generates real increases in welfare rather than elite enrichment and capital flight.

Increased access to extractive resources-related infrastructure would go some way to overcoming the infrastructure gap that afflicts the continent and limits economic diversification. Natural resource exploitation in Africa has generally been conducted with weak linkages to the wider economy, with very little value added. Natural resource concessionaires have traditionally adopted an enclave approach to infrastructure development, in which they provide their own power and transportation infrastructure and services to ensure reliable input to their operations. Investments in physical infrastructure, in particular, are not always aligned with national infrastructure development plans.

African countries have missed out on opportunities to promote shared use of infrastructure and take advantage of potential synergies to strengthen linkages between resources and the broader economy. Strengthening linkages between natural resource projects and local production is critical to the development impact of those projects. Non-mining businesses can potentially take advantage of transport infrastructure constructed to serve mines. Designing and building such shared infrastructure often has implications for regional integration. For example, if a mine is located far from a suitable port or the resource is in a landlocked country, this will involve development of trans-boundary physical infrastructure which requires strong cooperation and coordination between all countries involved in the extraction and transport of resources.

Defining and implementing policies at the country level to ensure that extraction of resources has strong development impacts has proven to be a major challenge

The key policy issues relate to the routing, ownership arrangements, and regulatory regime governing the construction and use of transport infrastructure. These are critical to the development impact of extractive resources projects. If the transport infrastructure serves local markets as well as mines, if there is open access to the infrastructure for firms engaged in local economic activities, and if efficient local firms contribute to construction and maintenance then the developmental impact of resource related projects will be enhanced.

Providing for local firms to access the resources-related transport infrastructure has proven to be difficult for governments with weak capacity. Governments often must address an important tradeoff between an integrated user concession, where one firm is responsible for extraction and transport to market, and requiring separate ownership of the mines and of the transport infrastructure. The firm with an integrated user concession has an incentive to avoid open access, as the coordination issues involved can increase costs, while transport capacity is often geared to mining output, so there may be little room for additional traffic. Particularly in light of the weak capacity of regulatory institutions in Sub-Saharan Africa, the concession owner may be able to shut out other users, even in the face of open access requirements, by citing limited capacity or technical problems. By contrast, a firm that owns only the transport infrastructure may have an incentive to pursue open access in order to run trains at maximum capacity, while an integrated user approach avoids coordination issues between separately owned railroad and port operators that can disrupt operations. An integrated user model also is likely to be more attractive to investors than a separated ownership approach, and in some cases may be the only feasible means of exploiting the resources. The experience with the Nacala Corridor, which includes Malawi, Zambia, and Mozambique, shows how complex cross-border projects can be implemented with an integrated user concession. By contrast, the undeveloped allocation of institutional and regulatory responsibilities in the complex LAPSETT Corridor (which potentially may involve several projects in Ethiopia, Kenya, South Sudan, Tanzania, and Uganda) has contributed to uncertainty concerning the ultimate shape of the project.

Appropriate contractual provisions and strong regulation are typically necessary to achieve open access. Defining objective criteria for granting open access can be difficult, given the uncertainties surrounding capacity, technical coordination issues, and appropriate pricing. Nevertheless, some objective standard is needed, given the success of mining companies in resisting open access under vaguely worded requirements. A well-functioning and independent regulator is necessary to monitor and enforce the tariffs, and also to adjudicate access and pricing disputes. For example, vague open access requirements and the lack of effective regulation have delayed achievement of open access in the exploitation of minerals in Liberia.

Appropriate policies can allow firms in other sectors to benefit from extractive projects. Policies and practices should ensure equal access to contracts and procurement procedures. More ambitious efforts have required that local firms participate in production; for example, the Nigerian procedure where the awarding of bids to foreign firms is based, in part, on their submission of a plan for involving local contractors. Since lack of expertise, production inefficiencies, and inadequate connections to production networks are important reasons for the failure of local firms to benefit from mining activities, governments (and donors) can increase local content by providing technical assistance to firms. Partnering with firms in other African countries may improve local firms' capacity, while also encouraging regional development. The design of local content requirements requires careful review. For example, defining local content in terms of ownership is more open to circumvention (by residents fronting for foreign firms) than a definition based on value added.

Domestic political economy issues have been key to the undermining of the developmental benefits of extractive resources. These also affect regional projects. The approach of elections can boost pressures for the completion of projects, so that incumbents can claim responsibility for the jobs and economic benefits. Dominance of some countries' economies by foreign firms can mean that there is no effective domestic proponent of the reforms required for the efficient exploitation of extractive resources. A lack of political consensus and diffuse distribution of power can make it difficult for governments to come to agreement on their own positions and increase external uncertainty over the ultimate terms of agreements. A lack of sufficient technical specialists can increase reliance on donors (or even extractive resource firms) in the definition of contractual provisions, potentially undermining the ability of the government to achieve its own goals. Africa's complex ethnic mosaic, and the fact that both ethnic groups and extractive resources tend to be geographically concentrated, can intensify disputes over mineral wealth, which, at the extreme, can lead to civil conflict.

Ensuring that extractive resources projects make a substantial contribution to development requires transparency and accountability. Ensuring transparency can highlight instances of corruption and point out inefficient approaches to developing extractive resources. International initiatives, including the African Peer Review Mechanism, Extractive Industry Transparency Initiative, Kimberly Process, Revenue Watch, OECD guidance, and requirements by industrial countries that their mining and oil companies disclose the terms of contracts, can play an important role in supporting transparency in African countries. However, these initiatives have had only a limited impact on extractive resources projects in Sub-Saharan Africa, where the terms of contracts tend to be either unavailable or published only as a the result of leaks. Accountability requires effective

checks and balances within government, so that strong parliaments and courts can contain the tendency for executives flush with oil and mineral revenues to dominate the political scene while democratic elections and a vibrant civil society can ensure that the developmental interests are reflected in government policies.

Non-governmental stakeholders can be critical to the success of regional extractive resources projects. Donors, the private sector, and regional institutions have played important roles in regional extractive resources projects in Sub-Saharan Africa. Donors have provided critical finance, technical assistance, and support for the involvement of the private sector, although better coordination of their efforts is needed to avoid overwhelming governments. Large multinational extractive resource firms have been essential for the exploitation of minerals, and have also served as important facilitators for projects. For example, mining companies have assisted in negotiations between Liberia and Guinea over the export of Guinean ore. Regional economic communities (REC) secretariats have encouraged trade and transport reforms in their member countries, which can contribute to the efficiency of extractive resource projects. However, lack of funds has limited the contribution of RECs to planning and negotiating projects. Moreover, overlapping memberships have eroded the effectiveness of RECs as fora for negotiations between members and burdened the technical capacity of governments that participate in multiple RECs. RECs also tend to be dominated by their largest country members, which has impaired their ability to serve as independent arbiters of regional issues.

Inter-governmental cooperation can provide the framework for the successful exploitation of extractive resources

Cooperation between the countries involved in extractive resource projects is critical to their success. Such cooperation can increase the credibility of the continued commitment to contract terms by having another state act as possible enforcer, prevent local monopolies of road/rail sections from charging excessive prices, help capture economies of scale, and facilitate border crossings which often are a source of administrative bottlenecks. Critical technical issues include ensuring compatibility between railway/pipeline systems (for example using the same railroad gauge) and their suitability for multi-purpose cargo. RECs can play an important role through encouraging the lowering of trade barriers and the harmonization of standards that can facilitate trade, assisting with the planning of infrastructure projects (although their contributions in this area has been limited), and helping to resolve intra-regional disputes.

Inter-governmental agreement on efficient extractive resources projects, however, can be difficult to achieve. Recent proposals for projects in Sub-Saharan Africa have highlighted how differences in state interests can affect design. For example, the closest port to the Simandou iron ore mines in Guinea is in Liberia, but the government of Guinea is determined to maximize its gains by shipping ore to a port near Conakry, about twice the distance. Complex discussions over the design of the LAPSET project have been affected by the strategic interests of the countries involved, including South Sudan's need to reduce its dependence on Sudan for oil shipment; Kenya's desire

to bolster its trade relations with Uganda, South Sudan, and Ethiopia, and achieve economies of scale in the shipment of its own oil; Uganda's difficult choice between intensifying its trade links with either Kenya or Tanzania; and Tanzania's interest in ensuring greater local benefits from the project through the construction of gas-fired power plants before shipping gas to Kenya. Competition between Kenya and Tanzania also threatens to create excessive port capacity in East Africa, which would threaten the viability of the new ports envisioned in both countries.

Innovative regional arrangements could improve the effectiveness of collaboration. Steering committees, with representation from each member state and an advisory body with representatives from stakeholders involved in the corridor, could be responsible for regional planning and could provide policy guidance on multiple areas, including financing, the corridor route, coordination with other RECs affected by the corridor, inputs to continental programs, and capacity building. Each steering committee would have corridor-specific committees that would play a more active role in development, including reviewing the impact of legal frameworks on the corridor, evaluating technical specifications, measuring demand by (and means to serve) other potential users of the infrastructure, facilitating customs clearance and other logistical challenges, monitoring the effectiveness of national regulators, and collecting information to determine stakeholders that would participate in corridor activities.

Photograph by Michael Fuller

Introduction

Despite the recent slump, the last decade witnessed an unprecedented increase in worldwide commodity prices driven by demand from emerging economies like China and India. This “super cycle” of soaring global demand has led to a wave of foreign investment in Africa’s renewable and non-renewable natural-resource sectors. The exploitation of, and wealth generated by, these resources have presented a new set of challenges and opportunities for resource-rich¹ African countries, which house 55 percent of the region’s total population. Natural-resource-driven growth in Africa has most commonly been viewed through the lens of “the resource curse,” in which poorly managed resource wealth, by increasing the real value of the local currency, can crowd out other tradable sectors of the economy, resulting in a lack of diversification, resource dependency, and exposure to global price shocks.

Natural-resource exploitation in Africa has generally been conducted with weak linkages to the wider economy with very little value added. Natural-resource concessionaires have traditionally adopted an “enclave” approach to infrastructure development, in which they provide their own power and transportation infrastructure and services to ensure reliable input to their own operations. Such investments in physical infrastructure in particular are not always aligned with national infrastructure-development plans: African countries can thus miss out on opportunities to promote the shared use of infrastructure and to take advantage of potential synergies to strengthen linkages between extractive resources and the broader economy.

The resource curse and weak governance are issues that continue to pose serious impediments to sound resource management. The debate has recently been shifting, moreover, to whether resources can make a meaningful contribution to growth through infrastructure investments and linkages to the national and regional economies. Those economies provide a window of opportunity for employment and development to mostly remote areas where very little economic opportunity previously existed.

For instance, through shared infrastructure, non-mining businesses can potentially take advantage of linkages beyond the mining value chain by adding lateral linkages, in particular, in sparsely populated remote areas where mining can unlock the potential of agriculture and regional trade of food staples. Designing and building such shared infrastructure often has implications for regional integration. For example, a mine located far from a suitable port, or a resource in a landlocked country will involve the development of trans-boundary physical infrastructure that requires strong cooperation and coordination among all countries involved in the extraction and transport of resources.

Regional integration is often seen as less relevant for resource-rich countries. Demand for natural resources as commodities typically comes from the global market rather than from regional

¹ Based on the IMF definition, “Resource-rich countries” refer to those where non-renewable natural resources (oil, gas, coal, metals and minerals) comprised at least 20 percent of total exports or natural resource rents were equivalent to 20 percent of GDP (both criteria based on a 2007-11 average). These countries are Chad, DRC, Equatorial Guinea, Guinea, Mozambique, Niger, Sierra Leone, Angola, Botswana, Cameroon, Congo, Cote d’Ivoire, Gabon, Mauritania, Nigeria, South Africa, Sudan, and Zambia. With the recent wave of new offshore oil and gas production coming to market, countries like Ghana and Tanzania will soon be added to this list of resource rich countries, therefore, these countries will be included in the study. South Sudan is also included as a resource-rich country.

markets. While general observations in the literature based on this model do not necessarily favor regional integration for resource-rich countries, there are more complexities in real cases, especially given asymmetric gains from trade between resource-rich and resource-poor neighbors, some of which are coastal, while others are landlocked.

Recently, however, regional organizations in Africa have stepped up commitments to increasing cooperation in managing the continent's natural resources. For instance, the governments of the Great Lakes region recently affirmed their commitment to work together, with the support of the international community, to address common security and economic challenges, including *“strengthening regional cooperation including deepening economic integration with special consideration for [the] exploitation of natural resources.”*² Along the same line, the African Union put forward the African Mining Vision, which suggests that a regionally coordinated approach may help improve the development impact of mineral resources. *“For the mining sector to improve its contribution to broad based development, it must be better integrated into the national and regional economic fabric through linkages. To harness linkage opportunities, challenges such as those relating to deficiencies in human capital formation, particularly in knowledge intensive areas, as well as infrastructure inadequacies must be addressed.”*³

Regional trade in Africa can play a vital role in diversifying economies away from dependence on the export of a few mineral products, in delivering food and energy security, in generating jobs for the increasing numbers of young people, and in alleviating poverty and delivering shared prosperity. The deeper integration of regional markets can reduce trade and operating costs and can ease the constraints faced by many firms in accessing not only demand for their products but also the essential services and skills that are needed as their inputs to boost productivity and diversify into higher value-added areas. Goods traded across borders in Africa will tend to be more employment-intensive than minerals, and the facilitation of such trade is likely to have a more direct impact on poverty in terms of the poor who both produce and trade the basic foodstuffs that dominate such trade.

A large number of diversification studies have been carried out in resource-rich countries in recent years. These studies have mostly lacked a regional focus in their analysis, and have been limited in their impact on reducing reliance on natural resources and diversifying economies towards more value-added activities. This publication moves beyond traditional diversification studies by providing a regional perspective that views resource-rich countries' cross-border and regional trade as a means to diversify into employment-generating agriculture and related services.

Deepening regional integration among African economies provides both opportunities and challenges to the sound management of extractive resources, and translating wealth from these resources in to diversified economies and equitable growth. This report explores how African countries can grow sustainably through exploiting their mineral and hydrocarbon resources by designing infrastructure, policy, and regulatory frameworks in mutually supportive ways, in order to support increasing trade and economic diversification through the movement of goods, services, and people.

² *Peace, Security, and Cooperation Framework for the DRC and the Region*, signed on February 24, 2013

³ Africa Mining Vision Action Plan <http://www.africaminingvision.org>

While various aspects of multi-user and multi-purpose infrastructure of resource-related infrastructure have already been studied, little research has been done on how such infrastructure could be used as a catalyst for regional integration and diversification, taking the political economy of cross-border arrangements into account. This report focuses on three envisioned cross-border resource corridors in Africa, namely the Nacala, Simandou-Nimba-Liberia, and Lapsset Corridors. These case studies encompass three different sub-regions that vary in their level of regional integration and that are assessed through a framework that organizes the most important policy questions and leads to a number of concrete recommendations for national and regional policy-makers, as well as donors and development institutions.

Each of the three case studies within this report seeks to illustrate a number of common features of cross-border resource corridors, namely to:

- Map out the context and highlight the rationale for regionally integrated multi-user and multi-purpose infrastructure;
- Understand the regulatory and legal issues related to regional multi-user and multi-purpose infrastructure;
- Understand the operational aspects of regional multi-user and multi-purpose infrastructure; assess the impact that the construction of an extractive-industry project and associated infrastructure will have on existing infrastructure; and
- Understand the political-economy aspects of regional multi-user infrastructure.

This report sets out to contribute to the discussion on how to maximize synergies between sound management of extractive resources and regional integration by informing dialogue among policymakers and development partners, and by stimulating public-private discussion. Contributing to this critical policy agenda item demonstrates that regional integration is still relevant for Africa's resource-rich countries. The authors attempt to shed light on the regulatory, institutional, and political-economy barriers facing African policymakers in creating a policy environment in which natural resources increasingly have value added and stronger employment effects, and in which synergies in infrastructure development are maximized for the benefit of the broader national and regional economy.



Making the Most of Africa's Extractive Resource Wealth through Regional Value Chains and Linkages to the Wider Economy

Photograph by John Kirk

Extractive resources wealth has been associated with a decline in tradable sectors in many African economies, as well as limited intra-regional trade. When properly managed, the exploitation of natural resources is not necessarily inimical to local tradables production and trade with neighboring countries. Indeed, the extractives sector can transform economies, leading to diversification and better jobs in the formal economy (Paradis 2014). However, achieving some diversification of production while exploiting oil and mineral wealth poses significant challenges.

Establishing an appropriate policy framework for building on Africa’s mineral wealth is increasingly important, as more and more mineral and oil deposits are discovered. The last decade (2000–2010) has been viewed as the decade of discovery in Africa (ICMM 2014). In addition, much of Africa’s mineral wealth lies relatively untapped, as large areas remain under-explored due to their remote locality or inhospitable environment (such as jungle or Kalahari sands). Based on current knowledge, Africa has the world’s greatest reserves of alumina-silicates, chromium, cobalt, diamonds, gold, platinum group metals, phosphates, and vermiculite. It also has significant resources of bauxite, fluor spar, manganese, natural gas, nickel, oil, titanium, uranium, vanadium, and zirconium.

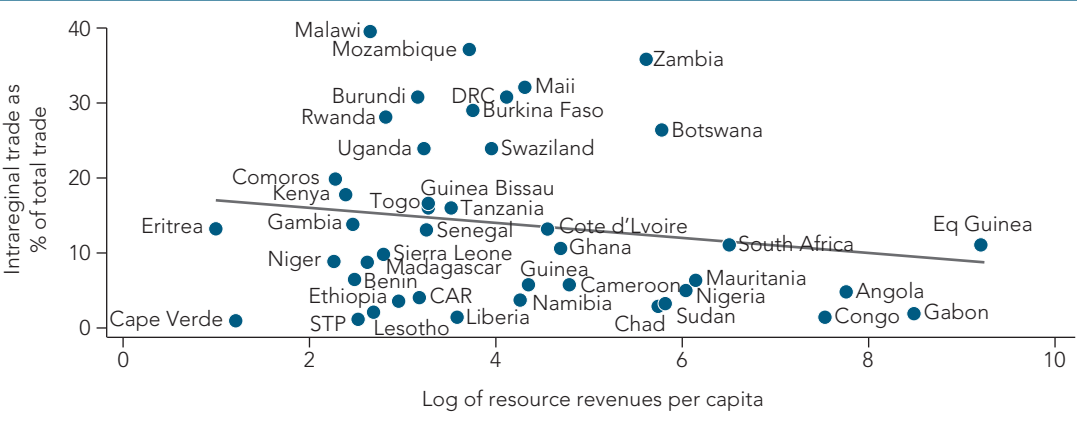
This chapter first discusses how extractive resources can contribute to regional value chains and the impact of natural resources wealth on FDI for local production and trade. It then turns to the effectiveness of local content regulations for encouraging participation by domestic firms in extractive resources projects.

1.1 An overview of extractive resources in Africa from a regional integration perspective

Despite enormous efforts at regional integration over the past few decades, trade flows between African countries remain small—even more so for resource-rich countries. Africa’s share of total global trade stood at only around 2.4 percent in 2014, and intra-regional trade accounted for only about 10 percent of its total global trade. Intra-regional trade in Africa remains well below that in industrialized blocks like the European Union (68 percent) and NAFTA (57 percent).⁴ Resource-rich countries tend to trade differently compared to resource-poor African countries. Countries that generate larger revenues from resources trade less with the rest of Africa (Figure 1). The dominance of extra-regional trade is not necessarily inimical to development. For example, trade between neighbors may be limited because they produce similar goods, and opportunities to trade with more developed countries can generate technology transfers and help achieve economies of scale through reaching large markets. However, dependence on extra-African markets is also a symptom of high dependence on primary commodities, as these are traded in international markets dominated by the more developed countries.

⁴ COMTRADE (wits.worldbank.org)

Figure 1: Extractive resource revenues and intraregional trade (2007–2011 average)



Source: Author's calculations based on COMTRADE and WDI data.

Increasing intra-regional trade in Africa can play an important role in reducing many countries' dependence on the export of a limited number of primary commodities. The opportunity to move into the export of more processed goods has been an important spur to development in many rapidly growing economies. In Africa, these industries may only be able to take off by serving domestic and regional markets (Collier and Venables 2010). In fact, intra-regional trade is far more industrialized than Africa's trade with the rest of the world (ECA 2014): intra-regional trade is concentrated largely in services (49 percent) and manufacturing (48 percent) with only 3 percent in the primary sector. Deeper integration of regional markets can lower trade and operating costs, increase demand for the production of more processed goods, and improve access to important services and skills. Intra-regional trade also is likely to have a more direct impact on poverty than trade in minerals, as intra-regional exports tend to be more employment intensive and are often produced and traded by the poor (Brenton and Isik 2012).

While the record in Africa is not very positive, properly managed extractive industries can contribute to growth through linkages to the broader economy. Some degree of industrial development usually occurs through backward and forward linkages with resource extraction activities (Morris and others 2012). Bishop and others (2013) show that business services (for example, engineering, legal and accounting services) account for a larger share of resource-related activity than do the more obvious connections of transport and construction. Services play a major role in extractive industries, amounting to some 22 percent of value added in mining and nearly 34 percent in some related industries (AfDB 2014). Many of the services are similar across industries (for example, logistics services, repair services, finance and business services) and therefore can be easily outsourced to specialists, which in some cases do not need to be local. Knowledge intensive services in particular can easily be provided on a cross-border basis.

A host of services are important for extractive industries in Africa. These include banking, insurance, education, remote sensing, environmental, geo-survey, mapping, drilling and piling, sampling, laboratory, metallurgical, civil, electrical, mechanical and mining engineering, geological

and geophysical, mining, refrigeration, logistics, human resources, legal and accounting, administrative, information technology, security, management and health services. Pilot plant facilities are in particular an excellent service to provide, since they enhance African knowledge while advancing the ability to process mineral commodities. Opportunities for the construction sector related to mining are significant in Africa, both directly in the construction of the mine and the mine area, as well as in the construction of related infrastructure (e.g. roads, railroads, harbors, airports, and housing for miners). The provision of services to mineral companies extends to what is usually considered public goods. Hospitals, clinics, schools, and even possibly technical colleges and universities may be built by the mining sector or developed to serve them, and may eventually be available to the wider community. Morris and others (2012) indicate that, in time, mining companies will evolve towards outsourcing all but their core competencies.

There has been a recent turn to regionalized mechanisms aimed at improving the developmental impact of extractive resources wealth. In part, these initiatives are in reaction to the failures of the last four decades, the harmonization of policies in the natural resource sector, and the sharing of capacity and best practices that could help foster greater local production, intra-regional trade, and diversification through the exploitation of oil and minerals. Examples of regional initiatives include the African Mining Vision (Box 1) and several programs begun by the continent's RECs.

The idea of resource-based regional growth corridors, driven by infrastructure development, also has gained traction. The New Partnership for African Development's Spatial Development Initiative (NEPAD-SDI) program is a tool for configuring, prioritizing, and promoting interrelated, large-scale investments and transport infrastructure to promote trade, optimize the use of infrastructure, encourage value added processing, and enhance competitiveness (Jourdan 2007). The SDI, and the more recent Development Corridor approach, identify "anchor" projects and connecting corridors based on a review of the availability of mineral commodities, agriculture, forestry, fisheries, and tourism projects. Investments are configured along the corridor to catalyze revenue streams from sustainable sectors and to provide enough cargo volumes to ensure that transport infrastructure along the corridor is fully used. The early commitment of cross-border political champions at the highest level, and the identification of financiers are essential to success. Twelve possible corridors have been identified that will anchor natural-resource-focused infrastructure projects, with the aim of integrating the resource sector with the wider economy.

Spatial development planning has been applied to transport corridors. Efforts to promote regional value chains are reflected in the policy frameworks of a number of national governments, as well as intergovernmental bodies, through spatial development planning along cross-border corridors. The goal of the spatial development corridor approach (particularly through the Spatial Development Initiative adopted by the South African government and NEPAD) is to leverage the anchor projects for more integrated growth along cross-border transport and service corridors, and to ensure that investments in extractive resources translate into widespread development. The idea is that the mining projects generate sufficient cash flows and cargo volumes to finance the backbone infrastructure needed to create a development corridor, which then further involves other activities with high development impact, such as agriculture. The success of an SDI strategy

Box 1: The African mining vision

The African Mining Vision (AMV) was adopted by the first African Union Conference (AUC) of African Ministers responsible for mineral resources development, held in Addis Ababa in October 2008 (AUC 2011). The AMV recognizes that the extractives sector will probably play a catalytic role in the development of many African countries.

The AMV suggests that a regionally coordinated approach may help improve the development impact of mineral resources. The vision consists of seven areas of focus, through four broad phases (see box figure), which do not necessarily occur sequentially. African states are seen as moving from an initial phase of dependence on resource exploitation, provision of unskilled labor and the import of inputs and technologies, to a final phase characterized by industrialization (including the processing of minerals), a dense and diversified structure of production, a skilled workforce, and technological development, supported by a diverse tax base, good policies, and strong regulation. The AMV emphasizes the need for mining to be integrated with the economy as a whole, through upstream, downstream and sidestream linkages.

Four phases of resource-based industrialization



Agreement was reached on an action plan for implementing the AMV in December 2011. On 16 December 2013, the African Development Bank (AfDB), the AUC, Economic Commission for Africa (ECA), and the United Nations Development Program (UNDP) launched the African Minerals Development Centre (AMDC) in Maputo, Mozambique to assist in the implementation of the Africa Mining Vision. The Eighth African Development Forum, focusing on "Governing and Harnessing Natural Resources for Africa's Development" was held in October 2012. To create the skills for African countries to take advantage of mineral development and growth opportunities, an African Mineral Skills Initiative was launched at the Forum, in collaboration with AngloGold Ashanti.

Source: AU, 2009.

requires the coordination of infrastructure investment (e.g. in power, roads, rail, ports, and information and communication technology) across countries, the construction of supplemental feeder infrastructure to connect with non-resource activities, and the identification of upstream and downstream linkages with local small- and medium-sized enterprises.⁵

⁵ Sachs, Toledano and Maples 2011.

1.2 Mineral commodities offer opportunities for building regional value chains

Global value chains (GVCs), where different stages of the production process are divided across various countries, integrate low-income, middle-income and industrialized countries and provide opportunities for equitable growth. In a global economy where production, investment and trade are shifting more and more towards GVCs, African countries are struggling to add value to their products on the continent and participate in these GVCs. Participation in GVCs require a host of conditions that need to be met including physical infrastructure, high quality logistics services, a well-functioning business environment, and a sound legal and institutional framework – conditions that most African countries are yet unable to meet.

Regional value chains (RVC) can help African countries add more value, diversify their economies, and overcome these constraints which hinder ability to join GVCs. RVCs are different from GVCs: in RVCs, the production process takes place across different countries within a region where the finished product is exported, either globally or regionally, by a country from that region. By connecting to RVCs, countries can make use of the region to increase their competitiveness and move up the value chains by producing higher value goods (Banga et al., 2015). In this regard, RVCs can be considered as a springboard for African countries to connect to and move up GVCs by allowing them to achieve economies of scale.

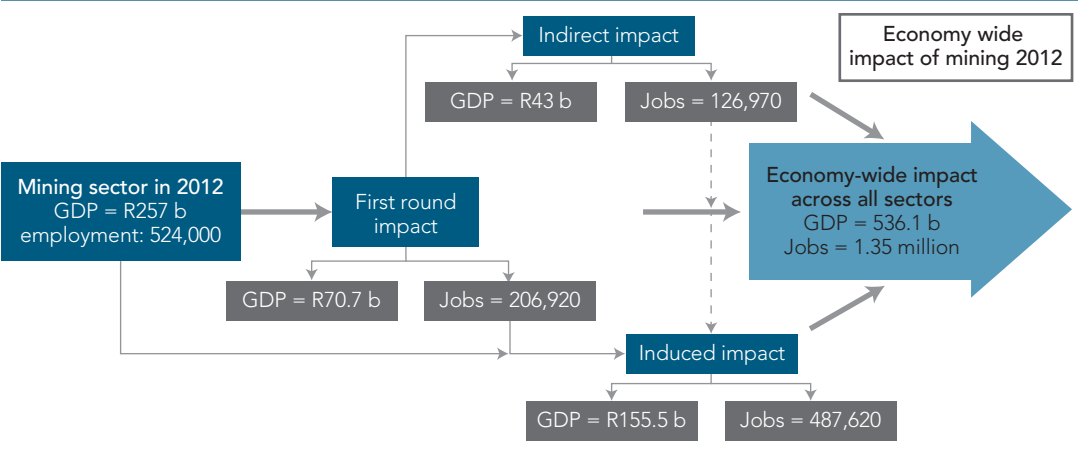
In order to build and successfully connect to RVCs, a considerable level of regional integration is necessary. In an environment of pervasive barriers to regional trade and the absence of well-established and functioning regional markets, RVCs cannot flourish and provide a platform for boosting competitiveness and equitable growth.

The development of mineral-based RVCs can be important for growth and employment in resource-rich countries. Mining tends to be a capital-intensive activity. For example, ECA (2005) indicates that manufacturing FDI in Africa is 17.5 times more labor intensive than mining FDI. Nevertheless, mining activities typically generate a lot more employment than that represented by the number of people working in the sector. For example, the South African mining sector employed 524 thousand people in 2012. However, after accounting for the demand by mining sector firms for products and services from other sectors, the total number of jobs dependent on the sector was 1.35 million (Figure 2).

Mineral commodity value chains tend to be rather complex in nature, involving throughout the value chain multiple opportunities for upstream, sidestream and downstream linkages. In general all of these linkages are heavily reliant on input and output quality as well as on-time delivery. This requires eliminating a broad range of impediments, ranging from shortage of skills and infrastructure gaps to non-tariff trade barriers, if value chains are to be broadened and deepened within the various sub-regions of Africa.

Strong policies that eliminate trade barriers and regional infrastructure investments are essential to develop regional value chains. Improvements in the business climate, and in human capital, in Sub-Saharan Africa are generally important to increase the profitability of economic activities, and are no less essential for value chain production. Public sector efforts to encourage

Figure 2: Economy wide impact of the South African mining sector in 2012



Source: Callaghan, 2013

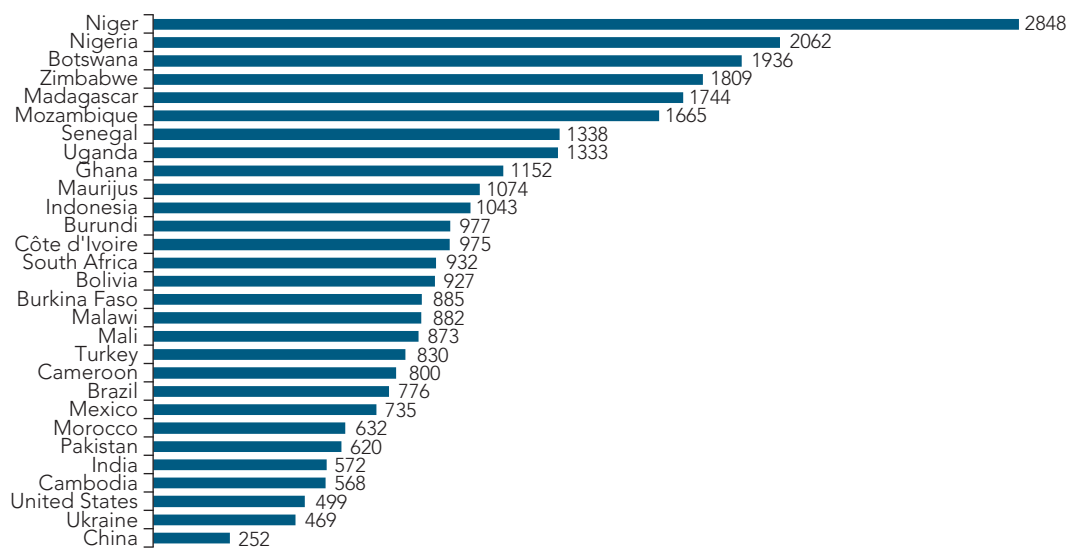
the development of regional value chains should particularly focus on establishing the logistics capabilities that facilitate coordination of production along the value chain (OECD 2013). Efficient logistics require a well-run transportation network with adequate coverage of major areas of production and markets, customs and port facilities that speed the processing and transport of cargo, and the development of services that support trade, for example communications, finance, and insurance. Policies to strengthen the provision of services include defining standards for quality and reducing unnecessary barriers to entry (including by foreign firms) to increase competition. Other areas where the public sector could play a key role in establishing efficient regional value chains include targeted research on processing technologies, support for higher education and for training in the skills needed in promising industries and in supportive infrastructure, trade policies that allow for low-cost imports of necessary inputs and that improve access to export markets, and the dissemination of information and cooperative activities that could facilitate the coordination of production in new areas.

There are several value chains, based on mineral commodities extracted in Africa, which offer particular opportunities for RVC development. Four interacting value chains have been singled out here as those most likely to take hold. These mineral value chains require considerable interaction within the region to be able to meet their potential, but if they do so the intra-regional trade stimulated will put resource-rich African countries securely on route to a structural transformation required to move towards fully diversified economies.

1.2.1 Phosphates based fertilizer industry

Over the last 50 years, cereal productivity in Africa as leveled off at around 1 t/ha, compared to over 4 t/ha in other developing countries. Total agricultural output in Africa has kept pace with population growth mainly due to the expansion of cultivated areas. Although climate will have an influence, the low production per hectare is largely due to the limited use of mineral fertilizers, with

Figure 3: Imported fertilizer prices in 2012 (USD per ton of nitrogenous fertilizers)



Source: Authors' calculations based on FAO and COMTRADE data.

average fertilizer use in Africa at 8 kg/ha compared to the global average of 107 kg/ha. As a result, Africa's soils have become nutrient depleted (Wanzala and Groot 2013).

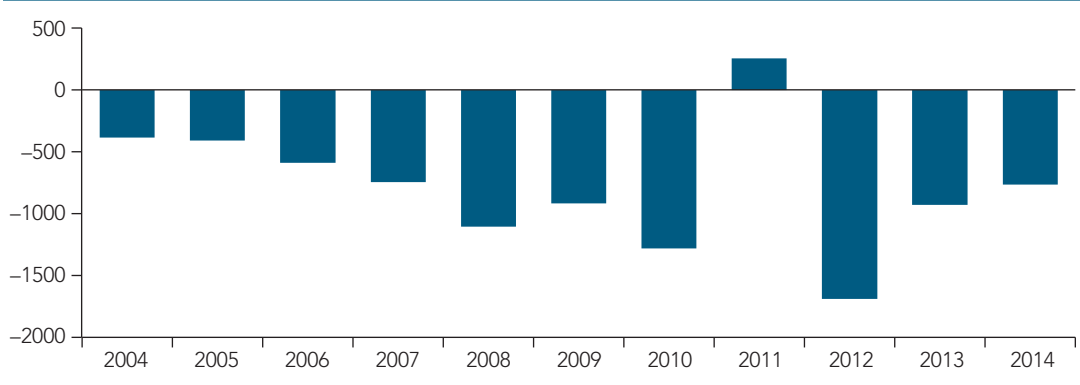
Despite having all of the building blocks for the manufacture of complete fertilizers, Africa is a net importer of fertilizers with African countries paying the highest for its imports of fertilizers compared to other developing and industrialized countries around the world. Figure 3 shows that countries with large agricultural sectors like Nigeria and Zimbabwe can pay up to four times more for imported fertilizers in comparison to other developing countries such as China and India.

Markets in many African countries are too small to exploit scale economies associated with fertilizer production, therefore, regional markets in fertilizers have not emerged (Bumb et al. 2011). Hence, fertilizers cannot move freely from country to country. Consequently, most countries have to import directly from the global market, and face high prices since they are small buyers and unable to obtain the same price as larger buyers. In addition, shipping companies charge more for smaller deliveries which also drives up the price, especially for landlocked countries (World Bank, 2013)

Phosphate rock deposits occur in a large number of African countries, however, Africa is a net importer of phosphate-based fertilizers (Figures 4 and 5). Despite phosphate rock mines being developed or expanded in Angola, Congo (Brazzaville), Ethiopia, Guinea-Bissau, Namibia, Mali, Mauritania, Mozambique, Senegal, South Africa, Togo, Tunisia, Uganda, and Zambia, not enough value is being added. Similarly there are widespread deposits of oil, gas and coal, which can be used to produce nitrogenous fertilizers.

Although concentrated potassium deposits are not common in Africa, they do occur, and excellent deposits exist near the coast in the Congo as well as in Ethiopia and Niger. A complete fertilizer also has other requirements such as sulphur, of which Africa has good supply in the form

Figure 4: Sub-Saharan Africa’s net exports of chemical fertilizers (USD, millions)



Source: Authors’ calculations based on COMTRADE data.

of sulphides. Other useful materials are calcium and magnesium carbonates (for acid soils), gypsum, which can be used as a soil amendment, and vermiculite—all of which are in plentiful supply.

Each of the major components for complete fertilizers can be produced separately and then exported before being combined to produce various types and grades of fertilizer that might be required or specified within a country or region, making the value chain of fertilizers a promising vehicle for boosting intra-regional trade.

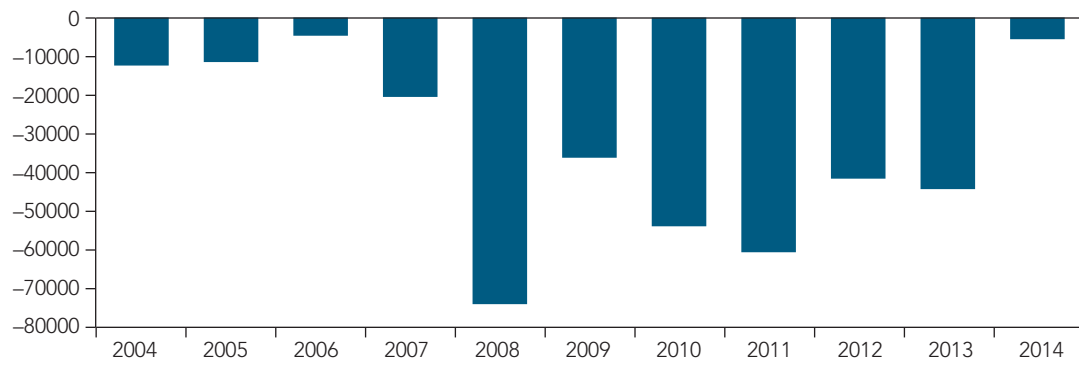
In addition to the opportunities for intra-regional trade of raw materials, fertilizer components, and ready-to-apply fertilizer products, the correct use of fertilizers in Africa is likely to significantly increase food production, which has the potential in itself to lead to significant intra-regional trade and to greater food export out of Africa. In fact intra-regional trade may be a requirement for the

Figure 5: Phosphate deposits around the world



Source: World Bank, IBRD 41646 (May 2015) based on Zapata (2004).

Figure 6: Sub-Saharan Africa's net exports of phosphate based fertilizers (USD, thousands)



Source: Authors' calculations based on COMTRADE data.

Box 2: Emerging phosphate-based fertilizer value chains across the region

Although Kenyan phosphate deposits are relatively poor, a fertilizer plant at Mombasa is being considered, utilizing Kenyan and Tanzanian raw materials (Callaghan 2013a). South Africa and Zimbabwe have several producers of fertilizers.

Growth poles in which fertilizer production may be considered include Tete, Rovuma/Mtwara, Lephalale /Southern Botswana, Zimbabwe, Songo-Songo and Cabinda/Bas Congo which is primarily a fertilizer growth pole (Callaghan 2013). Currently Tanzania and South Africa export fertilizers or fertilizer components. There is rapid development of fertilizer possibilities in Ethiopia, which has good potash deposits (rare in Africa). A value chain showing possible fertilizer development in Africa and the locality of the most important inputs is given in the Annex section.

In the case of Tanzania (as in Africa as a whole) some 90 percent of the requirement for fertilizer is met by imports, and these imports also make up the fertilizer exported to neighboring (land-locked) countries. Imports are from the U.S., Russia, Ukraine, Finland, Norway, Australia, Morocco, Egypt, and various countries in the Middle East, mostly through the port of Dar es Salaam. About 10 percent of fertilizer used in Tanzania is produced at Minjingu Mines and Fertilizers Limited, which beneficiates phosphate ore mechanically to a P₂O₅ content of 28–30 percent. A new product is composed of 20 percent calcium, 20 percent phosphate, 10 percent nitrogen, 5 percent sulphur, 0.5 percent boron and 0.3 percent zinc. Manure is also widely used as a fertilizer especially for cotton and maize production. There are 16 import/export companies in the fertilizer chain in Tanzania. Although Tanzania has no import duty on fertilizers there are several other taxes and costs of importing which contribute to the high prices of fertilizer in the country, as does the long road-transport distances to the point of sale to the farmer. High prices, poor access to credit, and lack of knowledge leads to only some 9 percent of farmers regularly using fertilizers (Kamhabwa 2014).

production of fertilizers and the establishment of blending plants simply because fertilizer use tends to be so low that there may not be enough demand for specific products if trade is not taking place.

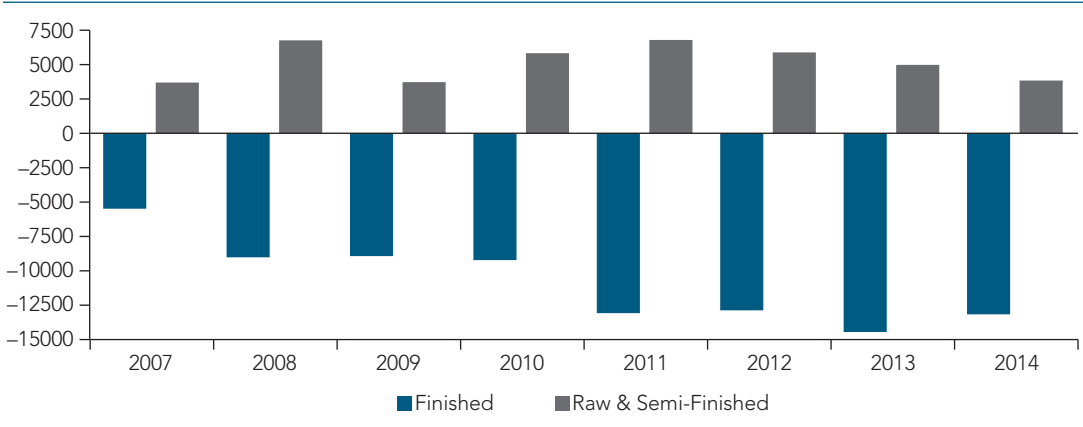
It is important that policies that reduce transaction costs and increase competition in the provision of services that affect the production and distribution of fertilizers and food crops are put in place. If trade barriers are removed the price of fertilizers in many countries in Africa may decrease substantially, especially if they are being produced locally. In order for a RVC in fertilizers to flourish, barriers to regional trade in fertilizers must be eliminated to reduce transaction costs. One key constraint that needs to be addressed is installing a consistent and stable policy environment for regional trade in fertilizers. In addition, African countries need to invest in institutions that reduce the transaction costs of coordination failures. Many countries have enacted new fertilizer laws in recent years, however, more needs to be done to strengthen the standards and testing capacity (World Bank, 2013)

1.2.2 The African steel industry

Since steel is such a major input for all forms of physical infrastructural and industrial development, a well-managed steel industry selling its products at export parity prices is vital in Africa. While the production of steel is not always a highly profitable industry in itself, it provides many jobs, has a very high multiplier effect, and opens the door to a vast array of associated upstream, sidestream, and especially downstream linkages.

Africa has more than sufficient iron ore and all of the other requirements to produce all of its steel requirements as well as a great deal for export. Currently, African countries are net exporters of iron ore and net importers of steel and steel products (Figure 7). Since steel is one of the basic building blocks of economies and steel making processes are well known, this represents an opportunity to develop sufficient steel mills in Africa to provide for all of its needs. These needs are also likely to grow rapidly as Africa catches up with the rest of the world in steel intensity per capita. This will require a considerable increase in trade within the continent in raw materials and

Figure 7: Sub-Saharan Africa’s net exports of iron and steel products (USD, millions)



Source: Author’s calculation based on COMTRADE data.

Box 3: The regional steel value chain: examples from across Africa

There is a modest Intra-regional steel value chain already in place and as the economies of African countries grow this can be used as a stepping stone for a vibrant value chain extending throughout Africa. Africa's largest steel roofing provider, the Safal Group, already has 36 operations in 11 countries (Ethiopia, Kenya, Uganda, Rwanda, Burundi, Tanzania, Malawi, Mozambique, Angola, Zambia, and South Africa). South African steel products are currently exported to Kenya, Mozambique, Nigeria, Tanzania, and Zambia. Currently some 60 percent of South Africa's exported steel products (1.36 Mt in 2013) is exported to other African countries.

Most of the iron and steel imported by Kenya is from South Africa, Japan, India, and China. Kenya's largest steel producer, Devki Steel Mills, had crude steel output capacity of 250 ktpa in 2012. The output included billet, rebar, wire, rod, plate, and structural sections. In that year Kenya's annual steel demand was estimated at 480–500 ktpa, while steel products were Kenya's largest manufactured goods export within COMESA and EAC. Mabati Rolling Mills (Safal Group) has a capacity to produce up to 200 ktpa of cold rolled sheet and some 20 percent of its finished steel production is exported to neighboring landlocked countries. Corrugated Sheets, a company established in Kenya in 1958 has a capacity for 100 ktpa. Downstream from the mills is an important distribution network, and Tuffsteel delivers some 300 tpd sourced from local mills to customers (Steelfirst 2013).

When Zambia allowed zero-rated rolled steel imports in 2000, 20 firms emerged to produce corrugated steel roofing sheets from imported hot rolled sheet, and Zambia experienced a shift from importing roofing sheets toward manufacturing for local sale and export to neighboring countries (Dinh et al. 2012).

In Tanzania, 2012 production of corrugated iron sheet, rolled steel, steel sheet, and billet reached 261,346 tons (Steelfirst 2013). Annual demand for steel in Tanzania is about 800 kt (Majaliwa, 2014). Alaf (Safal Group) focuses on the construction and roofing market. It produces cold rolled steel coil and sheet as well as aluminum and zinc-coated coil, from its 70 ktpa coating line. Some 25 percent of its finished steel production is exported to neighboring landlocked countries. Kamal Steel had a capacity in 2013 to produce 80 ktpa using scrap in an electric furnace operation. It produces rebar for the domestic construction industry (Steelfirst 2013). According to Tanzanian officials, the recent expansion of the Kamal steel plant was a result of a ban of exports of scrap metals that was designed to stimulate local production by enabling the availability of local raw materials. Tanzania had 5 steel plants in 2005, but now has 15.

Steel capacity in the wings includes the on/off deal between Essar Africa and the Zimbabwe government; it appears that the current plan is to build a 500 kt steel plant by 2016 and later increase the capacity to 1 Mt (Dzirutwe 2014). The Liganga steel plant in Tanzania may come into operation by 2018. The Chinese Hebei Iron and Steel Group will partner with the State-owned Industrial Development Corporation of South Africa in setting up a steel plant in South Africa's Limpopo Province. The project is planned to produce 5 Mtpa of steel by 2019 (Creamer 2014a).

finished products; and because of the relatively large tonnages the industry will be supportive of international trade infrastructure.

Traditionally steel was produced in large-scale integrated mills, but as more steel scrap has become available mini-mills have become common. An integrated steel mill is used to produce iron in a blast furnace from iron ore using coke and limestone as fundamental inputs. The molten iron is combined with scrap in a basic oxygen furnace to produce steel. A mini-mill produces steel directly from scrap using an electric arc furnace. Mini-mill producers are able to adapt production to meet demand quickly, and thus have lower costs and shorter lead times than integrated producers. Mini-mills are dependent on scrap and in many markets scrap (and especially good quality scrap) has become constrained. In 2012 just under one-third of all the steel produced in Africa was produced in traditional steel and two-thirds produced in electric furnaces (Callaghan 2013b).

In order to open the door to considerable downstream development and job creation, African countries need to build modern efficient steelmaking capacity to cater for future demand and at the same time ensure that steel will be sold locally at export parity prices. The cost of importing steel to inland localities in Africa is high both due to the cost of transport as well as import tariffs. Furthermore inland producers tend to charge import parity prices, which then make downstream light industry uncompetitive. Dinh and others (2012) give the example of the cost of steel in Ethiopia as being 30 percent higher than it is in China.

In areas like Tete in Mozambique, there is already an active steel value chain based largely on intra-regional trade among 11 of the Tripartite countries (Figure 8), and with this start, strong government support and policy development to grow the industry will ensure the continued existence of the large integrated mills already in existence as well as support new mills. Furthermore, the network of secondary steel forming companies and steel distributors can easily be expanded to ensure that the overall steel industry can cope with the rapid growth expected in Africa. A simplified value chain of the steel industry in Africa (not including stainless steels) is given in the Annex.

Although iron ore is the major input by mass into an integrated steel mill furnace, there are other important components, and in the case of the production of stainless steels and other specialty steels, other components may have a higher value. As a result, the production of steel—especially if stainless steels and special steels are produced—is likely to lead to considerable trade within Africa in order to collect all of the required components such as coking coal, limestone, dolomite, manganese, chromium, molybdenum, and tungsten.

Over the last decade, high demand from China and the expectation of increased global demand has led to a huge increase in capacity of mining iron ore around the world. This glut has resulted in rapidly falling prices in 2014 as Chinese demand has declined (Figure 9). This situation poses a serious threat for mines that are small and especially those with higher production costs. Steel mills may also currently be under threat due to the reduction in demand from the East. In order to become resilient and adapt to changing market conditions brought on by plunging global prices, it is likely that iron miners will have to consider making changes to ensure that in the short term to medium term they can extract ore profitably at current low market prices.

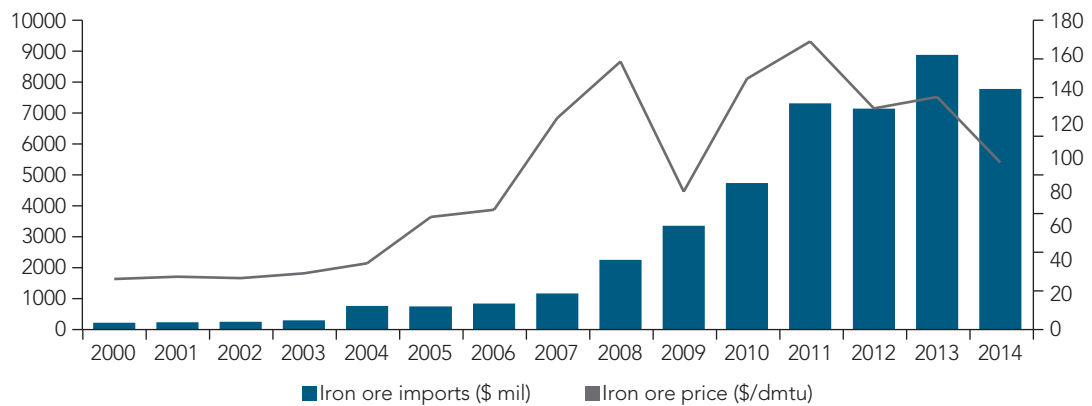
Although the growth of China's demand is now slowing, it is still expected to grow its consumption of steel per capita to reach a demand of about 600–700 kg per capita in 2020 (Ernst & Young

Figure 8: Estimated future mining production in East and Southern Africa



Source: World Bank, IBRD 41622 (May 2015).

Figure 9: China's imports of iron ore from sub-Saharan Africa



Source: Author's calculations based on COMTRADE and World Bank.

2013). India still has a long route to travel along the steel intensity curve and Africa hardly features at all; therefore, despite the current glut, it is likely that global demand will once again pick up.

1.2.3 *Hydrogen fuel cells & platinum: Africa's RVC of the future?*

South Africa holds 75 percent of the world's supply of platinum. Hydrogen fuel cells using a platinum catalyst have the potential to generate a new industrial sector and provide the opportunity for South Africa to become a major player in the global green economy. Fuel cell technology, if harnessed correctly, could simultaneously help address South Africa's existing energy challenges and provide rural areas with energy.

Hydrogen based energy solutions are important because they allow virtually any form of input energy to be converted into non-polluting chemical energy. Recent breakthroughs in the Liquid Organic Hydrogen Carriers (LOHCs) mean that Africa may have the opportunity to move quickly into the use of fuel cells for the provision of power to rural communities and even for use in fuel

Box 4: Nickel production and regional refining possibilities

Nickel is used in the production of high quality austenitic stainless steels and in corrosion resistant alloy steels. Nickel in stainless steel makes up about two-thirds of the total metal usage. The Burundi/Tanzania nickel deposits contain more than 10 percent of the world's known nickel and are as yet unexploited.

The Kabanga Nickel Project is an active mine exploration project 130 km south west of Lake Victoria in Ngara district, Kagera Region, Tanzania. The Kabanga prospect has been delayed; it appears that this is due to "logistical problems" and to delays in the issuing of the mining license and the Mining Development Agreement. The Kabanga nickel prospect together with the Burundian Musungati nickel/copper project received a high ranking in the TMSA growth poles report (Callaghan 2013).

Pyrometallurgical and hydrometallurgical alternatives are available for the processing of laterites and sulphide deposits. Laterites will ideally need to be processed locally since the ore cannot be appreciably upgraded. They could be processed pyrometallurgically to produce ferronickel, or hydrometallurgically to produce a variety of nickeliferous end products. In the case of the sulphide ores (Kabanga) it is likely that a nickel-copper matte will be produced and exported to an overseas refinery.

Development of the nickel projects are likely to result in the opening up of significant trading opportunities between Burundi and Tanzania as well as possibly between Burundi and Zambia, the DRC, and Zimbabwe. If one considers the quantity of nickel in the Tanzanian and Burundian deposits then it makes sense that a refinery be considered. Negotiation with major players should take place to ensure that a smelter is planned for the region as well as a refinery to produce LME grade nickel in the longer term.

cell driven vehicles. The major advantage of LOHCs over other forms of hydrogen storage is that the proposed LOHC compounds have physical and chemical similarities to diesel. This will allow the LOHCs to make use of the existing energy infrastructure (e.g. carrier ships, storage tanks, or fuel stations) and therefore enable a slow and stepwise replacement of existing hydrocarbon fuels by alternative LOHC fuels. Dependent on the final usage, different LOHCs may be best for the application and several are already developed

Anglo American Platinum has already developed fuel cell powered locomotive and dozer prototypes for use in its mining operations, and, together with Ballard and Eskom is currently field testing a methanol-fueled platinum-based fuel cell home generator system in an off-grid residential application in South Africa (Ballard 2014). It appears that LOHCs may be the ideal solution to a green fuel for future fuel cells. A simplified value chain is provided in the Annex.

While many remain skeptical about the use of fuel cells in everyday motor vehicles, their use for rural electrification and for special vehicle usage (such as for forklifts, inner city buses, space vehicles, and a recently announced submarine to be built jointly by Japan and the U.S.) is more realistic. The South African Science and Technology Minister announced last year that an MOU had been signed between the University of the Western Cape, Coventry University, and Microcab Industries (a hydrogen fuel cell vehicle producer) in the United Kingdom, which related to Microcab using Hydrogen South Africa (HySA) technologies, with the prospect of HySA becoming a major supplier to Microcab (Bizcommunity 2013).

While there is no definitive answer to the practicality of this sector taking off, the U.S., UK, Japan, Canada, and Germany are currently devoting extensive research into the development of a hydrogen economy. Newly developed platinum nickel alloys may dramatically decrease the price and increase the availability of catalysts to the industry. Furthermore, platinum nickel alloys would give further incentive to the development of a regional value chain comprising the platinum rich south and nickel rich east of the region. However, there have been several recent negative reports about the possible use of fuel cells that discuss the fact that a great deal of platinum will be required and that there is a high risk of interruption of the supply of platinum since the reserves are largely in Africa and Russia.

1.3 Extractive resource wealth can limit regional trade and FDI for non-resource sectors

Despite the potential for extractive industries to promote investment in non-resource sectors, the record is rather bleak. One issue is that increases in rents from the export of oil, natural gas, and coal can significantly reduce FDI devoted to non-resource sectors. For example, host countries with positive resource rents attract less non-resource FDI from the United States and the Netherlands (Poelhekke and van der Ploeg 2013).⁶ The mechanism behind this empirical finding is similar

⁶ Rents are defined as production times the world price net of extraction costs and represent a pure profit. This result controls for market size, education of the work force, the price level, the tax burden, previous FDI levels, and proximity to other countries with significant FDI and to the home country of the multinational.

to a standard ‘Dutch disease’ small open economy model such as in Cor- den and Neary (1982).⁷ An increase in minerals prices (or the discovery of new deposits) increases the return to capital in the resource sector, which attracts capital and labor from the non-resource traded sector by bidding up their prices (even if the resource sector is capital intensive and relies on foreign labor, it still will rely on some domestic labor, in part to supply basic services). The non-resource traded sector cannot compensate for these higher production costs by raising prices, because these are determined on world markets. As a result, the sector loses competitiveness and shrinks, while

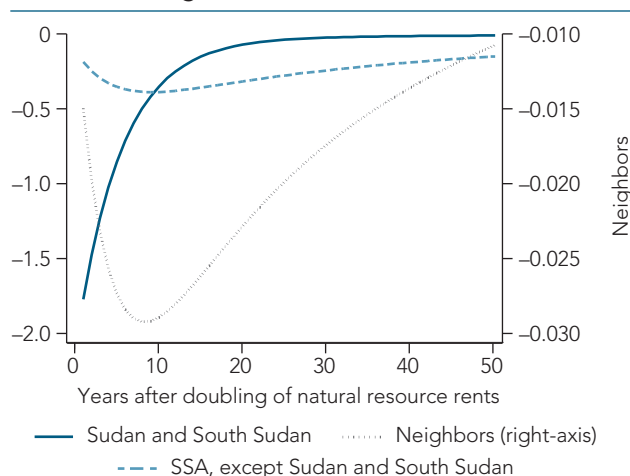
attracting less non-resource FDI. This effect is larger if the non-traded sector represents a large share of consumption (and therefore less of the additional income from the rise in resource rents is spent on domestically produced traded goods), as is typically the case in sub-Saharan Africa.

Sudan and South Sudan provide one example of the impact of extractive resources on FDI flows. Resource rents for the two countries combined (separate data on South Sudan are not available) averaged over \$25 million during 1984–2003, and then ballooned to \$15 billion by 2009 after a 50 percent increase in the world price of oil between 2007 and 2008. Dutch companies reported positive non-resource FDI for 2002, but none after 2004.⁸ While the civil war was a major reason for this decline, total FDI inflows (mostly to the oil sector) actually increased after 2004, to \$2.6 billion in 2008.

Modeling results show that, on average across countries, a rise in natural resource rents reduces FDI flows to non-resource sectors. Figure 10 illustrates the size of this effect for Sudan and South Sudan. The solid line tracks the immediate effect of a doubling of hydrocarbon rents on the stock of non-resource FDI: non-resource FDI decreases by close to 2 percent in the first year. This seems like a small number, but the effect is persistent and takes more than 25 years to dissipate. In addition, the decline in non-resource FDI to one country reduces the attractiveness of neighboring countries to foreign investors, because the resource-rich country is less likely to be suitable as a link in the regional production chain.

Specialization in natural resource production also can reduce intra-regional trade relative to trade with global markets. Natural resource wealth tends to bias infrastructure investment towards mine- or plantation-to-coast infrastructure, often accentuating a bias inherited from colonial

Figure 10: Conditional effect of a doubling of hydrocarbon rents on non-resource FDI in Sudan and South Sudan, its neighbors, and sub-Saharan Africa



Source: Authors' calculations based on Poelhekke and van der Ploeg (2013).

⁷ Poelhekke and van der Ploeg 2013, See online appendix for details.

⁸ The actual amounts used in the analysis are confidential.

Box 5: The importance of transport infrastructure for trade patterns

Transportation infrastructure has the power to directly affect the patterns of trade and economic activity. For example, Duranton, Morrow, and Turner (forthcoming) find evidence of agglomeration of economic activity driven by a decrease of a country's internal trade costs through increased transportation investment. They find that the U.S. highway system favored the relocation of sectors producing heavy goods to well-connected cities. Similarly, Faber (forthcoming) finds that the construction of highways in China favored the concentration of industrial activity in larger locations, to the detriment of smaller ones.

Transportation infrastructure affects the location of economic activity to the extent that factors of production are mobile. There is, however, less evidence that it also affects economic growth positively. Two recent papers have looked at the long-run impact of transportation infrastructure on economic growth. Banerjee et al. (2012) find that Chinese areas that were connected by railway in the late 19th century were only somewhat richer in 1986, and did not grow faster than less connected counties after 1986. By contrast, Jedwab and Moradi (2012) find that areas that were more connected by colonial railways in Ghana are more developed today.

There is more evidence that infrastructure fosters market integration. For example, Donaldson (forthcoming) finds that colonial railroads in India had a major positive impact on trade integration between Indian regions and with the rest of the world, implying a positive welfare effect. Keller and Shiue (2008) find that railways had a stronger market integration effect on 19th century Europe than customs liberalizations and monetary unions. The main findings of these papers suggest that internal infrastructure investment leads to an agglomeration of economic activity if factors of production are mobile, but not necessarily to economic growth directly. However, more indirectly, increased regional integration as a result of infrastructure investment and the resulting positive effects of trade can yield welfare gains. Especially for relatively small countries, trade openness is an essential ingredient for economic growth (Alesina et al. 2005).

times.⁹ General purpose, cross-border infrastructure that supports trade with neighboring countries suffers as a result. And since transport infrastructure investments have an important impact on the structure of production (Box 5), this bias has important implications for intra-regional trade.

Cheaper mine-to-coast infrastructure reduces transport costs involved in trade with the rest of the world relative to the transport costs in trading with neighboring countries. T-shirts produced in neighboring Mali may conceivably be more costly to import in Guinea than T-shirts made in Bangladesh, because Guinea, as a result of mining activity, has better infrastructure connecting its interior to its ports and on to world markets than with neighboring Mali.¹⁰ The profitability of simple

⁹ Colonial policies distorted trade in favor of trade with the colonizers by shaping infrastructure to serve the export of natural resources, rather than connecting towns (let alone towns in neighboring countries), thus placing colonies on an adverse path of specialization (Dos Santos 1970; Amin 1972)

¹⁰ Mali exported \$372 million worth of cotton, and only \$14,639.00 worth of articles of apparel, including T-shirts, in 2012. Of total exports by Mali in 2012 (worth \$2.6 billion) only 0.5% (\$13.7 million) went to Guinea (COMTRADE HS7, 2014).

manufacturing industries, which have been the starting point for diversification and rapid growth in many countries, may be impaired by a combination of low import costs for competing goods from world markets and high trade costs for its own exports to the region. Thus, this allocation of infrastructure perpetuates the relative decline of non-resource sectors that could benefit from trade links. While infrastructure investment geared to extractive resources can have relatively high short-run returns, general purpose, cross-border infrastructure may have higher returns in the long run.

Empirical analysis supports the view that the allocation of infrastructure in countries dependent on natural resources biases trade towards global, rather than regional, markets. Bonfatti and Poelhekke (2014) find that globally, countries that are more dependent on natural resources tend to import less from their neighboring countries than expected from standard determinants of trade (e.g. proximity, shared language). Limao and Venables (2001) assert that intra-regional trade is “too small” compared to what a standard model of trade predicts, and that much of this difference can be attributed to the poor quality of transport infrastructure. They also find that the negative effect of distance on bilateral trade flows is larger for countries in Sub-Saharan Africa than for other regions.¹¹ Sachs et al. (2004, p.182) explicitly blame this on interior-to-coast transport infrastructure. For Sub-Saharan Africa, Bonfatti and Poelhekke (2014) find that countries without mines tend to import 60 percent more from their neighbors than from more remote countries, but this effect is much smaller for countries with mines (the methodology and regression results are presented in the annex). And countries with 6 or more mines do not import more from their neighbors than from remote countries.¹²

Not all mining infrastructure is likely to reduce the cost of trading with global markets compared to the cost of trading with neighbors. For example, the remote Boké-Kamsar railway is purpose-built for mining, and it is far away from the most important location of Guinea's internal market, which is the capital city Conakry. Few imports into Guinea will thus make use of this railway or its port. However, the Kindia-Conakry railway is more likely to be able to serve both the mines and substantial local demand, and thus will decrease trade costs more significantly. Bonfatti and Poelhekke (2014) construct a simplified index that tries to capture this distinction for each mine.¹³ They find that globally and for Sub-Saharan Africa (although the coefficient is less significant in the latter), the negative impact of mines on trade with neighbors is only important when the mines are close to transport corridors that are also close to population centers.

The negative impact of mines on trade with neighbors does not apply to landlocked countries. Roads and railways to transport minerals from landlocked countries must transit another country to reach global markets, so will reduce the costs of trading with at least one neighbor. Bonfatti and Poelhekke (2014) find that landlocked countries without mines import 150 percent more from neighbors than from remote countries. With mines, a landlocked country imports even more from one of its neighbors. For each additional mine, the effect is 69 percent more imports from neighbors.

¹¹ See also UNECA 2010.

¹² This effect is somewhat reduced, but not eliminated, when controlling for the possibility that mining revenue may be spent on higher quality goods which may be produced disproportionately by non-neighboring countries and bought on world markets.

¹³ Individual mine indices were averaged with city population weights to yield one index per country.

The construction of oil pipelines also may not reduce trade with neighbors. Unlike railroads and roads, pipelines cannot be used to transport other goods. However, clearing the right of way for an oil pipeline may reduce the cost of building a railroad. For example, the proposed oil pipeline from South Sudan to Lamu in Kenya (the LAPSET project) would have little impact on regional integration, unless a road or a railway is built along the pipeline. Then the costs of importing goods into South Sudan would decrease, improving trade integration between landlocked South Sudan and neighboring countries. In this case, it is advisable to make sure that the route of the infrastructure also connects to major cities in the region (such as Nairobi and Kampala) where regional markets are concentrated.

1.3.1 *The impact of extractive resource infrastructure on trade: The Case of the Guinea—Liberia Iron Ore Corridor*

Guinea's exports are heavily dependent on extractive resources. Of the country's \$1.5 billion in goods exports in 2006,¹⁴ 15.5 percent were fuels and 65.6 percent ores and metals. Only about 4 percent of exports went to other countries in Sub-Saharan Africa, and less than that to neighboring countries. On the other hand, about 80 percent of Guinea's imports came from outside Sub-Saharan Africa, and some 62 percent of imports were manufactures.

As discussed above, the impact of extractive resources infrastructure on regional trade depends, in part, on whether mines are located close to population centers. Guinea's seven mines are, on average, located at some distance from cities and ports. The value of a *mine impact index*—which varies between 0 (mines are remote and may have dedicated ports) and 1 (mines are close to city/port infrastructure)—for Guinea is 0.47, or somewhat below the average for Sub-Saharan Africa of 0.65.

Table 1: Bilateral trade by Guinea in 2006

Exports to	Total (USD)	Fuels (%)	Ores and metals (%)	Foods (%)	Agricultural raw materials (%)	Other (%)
World	1,440,000,000	15.5%	65.6%	8.7%	2.6%	7.6%
SSA	61,600,000	39.8%	7.0%	25.8%	3.4%	23.9%
Neighbors	29,400,000	5.5%	0.0%	49.4%	0.5%	44.7%
Imports from	Total (USD)	Fuels (%)	Ores and metals (%)	Food (%)	Agricultural raw materials (%)	Other (%)
World	1,140,000,000	9.0%	0.5%	27.2%	0.9%	62.4%
SSA	226,000,000	12.0%	0.1%	19.2%	0.0%	68.5%
Neighbors	183,000,000	7.6%	0.1%	16.8%	0.0%	75.4%

Note: SSA is sub-Saharan Africa. Neighbors are Cote d'Ivoire, Guinea Bissau, Liberia, Mali, Senegal, and Sierra Leone. Trade based on UNCTAD's COMTRADE data base, SITC Rev.2. Fuels are SITC 3; Ores and metals are SITC 27 + 28 + 68; Foods are SITC 0 + 1 + 22 + 4; Agricultural raw materials are SITC 2 less 22, 27 and 28.

¹⁴ This year was chosen for the analysis because at the time of writing (September 2014) it had the highest coverage of bilateral country pairs in the COMTRADE data base.

The likely impact of the Simandou mine on trade costs depends on the route chosen for the railroad transporting ore to the coast (Box 5 provides basic information on the Simandou corridor). Choosing the shortest route (to Buchanan in Liberia, which is 486 km from Simandou along existing roads) would not lower the cost to residents of Conakry, or to most of Guinea, of importing goods from world markets (the Simandou mines are far from large Guinean population centers). Thus shipping Simandou's ore through Liberia would not tend to impair the competitive position of Guinean production vis-à-vis imports, or bias Guinean demand against trade with neighbors.

The cost of trading with world markets could fall with the alternative route to Conakry. The alternative of building a railway from Simandou to relatively far away Conakry (at 816 km distance along existing roads), and following a route that connects to regional towns such as Faranah and Mamou (see Figure 11), would decrease the cost of trade with world markets. This infrastructure could lead to further agglomeration of sophisticated manufacturing in Conakry from which the

Box 5: Guinea – Liberia iron ore corridor

The choice of route for shipping iron ore from the Simandou mountain range in southeast Guinea to the coast will have a significant impact on the return from the project and on the prospects for regional trade. The Simandou mountain range is home to some of the most substantial premier grade, untapped iron ore reserves in the world. First discovered in 1997, the infrastructure challenges associated with extracting and exporting the ore have left the deposits undeveloped. The shortest export route for these deposits goes through Liberia (350km to the nearest port), rather than the approximately 650km to a port near Guinea's capital, Conakry. However, at present, it seems highly unlikely that any iron ore from the four Simandou iron ore blocks will be exported via the shorter route.

In May 2014, Rio Tinto—which holds the development license for blocks 3 and 4 of the Simandou iron ore deposits—entered into an Investment Framework with the Government of Guinea, the Aluminum Corporation of China (Chinalco), and the International Finance Corporation (IFC) to develop these Simandou deposits and to finance, construct and operate a 650km multi-user, multi-purpose trans-Guinean railway line from Simandou to a greenfield deep water port south of Conakry. A bankability study is currently being undertaken to assess the infrastructure investment costs, and Rio Tinto seems open to sharing these costs with other mining companies.

The rights to develop blocks 1 and 2 of the Simandou iron ore deposits are currently under dispute. Until recently, they were held by Benny Steinmetz Group Resources (BSGR) and Vale, which the Government of Guinea had authorized to transport the iron ore through Liberia in exchange for a \$1 billion investment in rehabilitating the existing railway line from Conakry to Kankan, which is currently not operational. However, now that BSGR and Vale have been stripped of their development licenses, it remains to be seen who will acquire the rights to blocks 1 and 2, and whether the Government of Guinea will allow the iron ore to be exported through Liberia, or will also require a Guinean-only transport solution.

(continued on next page)

Box 5: Guinea – Liberia iron ore corridor *(continued)*

At present, the only functioning rail infrastructure in the Simandou-Nimba-Liberia Corridor is a 250km single track railway line operated by ArcelorMittal from Yekepa in Liberia to the port of Buchanan, 272km south-east of Liberia's capital, Monrovia (see Figure 11). The Yekepa-Buchanan railway line currently only serves ArcelorMittal's iron ore deposits in Liberia, but the company is contractually required to allow other users on the line at the request of the Government of Liberia, provided the railway line has sufficient capacity and additional users will not affect ArcelorMittal's operational efficiency. The company is currently upgrading its mine, rail, and port infrastructure, after which it is anticipated that the railway line will have a capacity of 30–50mtpa, whereas ArcelorMittal is only expected to be exporting 15mtpa by 2015. Hence the upgrade would provide sufficient capacity to accommodate exports of smaller mineral deposits.

Earlier in 2014, ArcelorMittal agreed to allow Sable Mining Africa Limited (whose 80 percent-owned Guinea subsidiary, West Africa Exploration SA, holds a development license for an iron ore deposit in the Nimba mountain range) to export its iron ore on its existing rail and port infrastructure. Sable Mining hopes to commence production in 2016, with 1.5mt of exports in the first year and 3mt in the second year, so its production amounts should be relatively easy to accommodate on the existing railway line. It is envisaged that Sable Mining will construct a spur to connect with the Yekepa-Buchanan railway line.

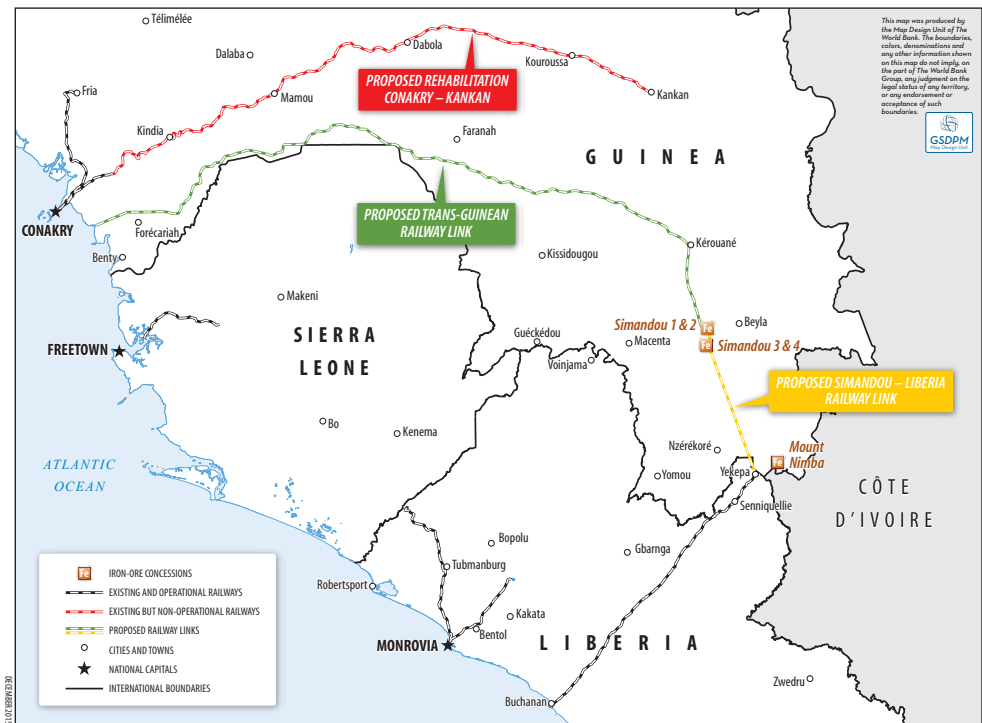
ArcelorMittal has also recently announced that it is acquiring BHP Billiton's 56.5 percent stake in Euronimba Ltd., a company that holds a 95 percent stake in another Mount Nimba concession. The deposits are situated just 40km from the point where ArcelorMittal's current railway line ends. Assuming ArcelorMittal receives authorization from the Government of Guinea to export iron ore through Liberia, a cross-border spur would be required to link the deposits to the existing railway line.

In summary, it is unclear whether Guinea will allow the shipment of ore from Simandou, or from other deposits in area, to the sea through Liberia, or require a more expensive route to a port near Conakry, as in its agreement with Rio Tinto. Figure 11 shows the existing Yekepa-Buchanan railway line operated by ArcelorMittal, the proposed Simandou-Liberia link to this railway line, and the proposed trans-Guinean railway line from Simandou to a port south of Conakry. Note that the railway line from Conakry to Kankan is currently not operational.

hinterland can be served through internal trade, while basic manufacturing and agriculture may thrive in specialized regional centers.¹⁵ Also, the Simandou-Conakry route would make it easier for the non-resource export sector to export to world markets. However, the downside for the non-resource export sector is that trade costs with the rest of the world would decrease, intensifying

¹⁵ This line of thinking is based on the theory of “systems of cities” and functional specialization between cities; see for example Duranton 2013. In addition, Rosenthal and Strange (2004) report that a doubling of city size is associated with a productivity gain of 3–8 percent.

Figure 11: Proposed corridors from Simandou deposits



Source: World Bank, IBRD 41621 (May 2015).

competition from more sophisticated countries. In the short run, the welfare effects are more positive than the Liberia route because imports will become cheaper, but in the long run, the non-resource export sector may be hurt.

Building infrastructure to connect with corridors could increase intra-regional trade. One way to reap the benefits of the proposed railroad from Simandou to Conakry while avoiding the undesirable impact on some non-resource activities would be to build additional infrastructure, on top of what is needed for the Simandou mine. This could include connecting the Liberia route to Kankan and upgrading the Conakry-Kankan railway, so that goods produced in the interior of Guinea could be traded more easily with Liberia. Another approach would be to adjust the Rio Tinto route so that it connects Faranah and Mamou as well, and upgrade and extend infrastructure to Kankan and neighboring Bamako in Mali. Investing in infrastructure to facilitate trade with Mali (whose primary transit country is Senegal, because Bamako is connected to the port of Dakar by rail)¹⁶ may be worthwhile. Of course, these proposals would have to be developed together with the neighboring country in question to ensure optimal investment on both sides of the border.

Finally, the intended railway corridor from Simandou to a dedicated port near Conakry would have little impact on intra-regional trade. This corridor, which could follow the Sierra

¹⁶ According to major container shipping routes. See Maersk Line: http://my.maerskline.com/appmanager/maerskline/public?_nfpb=true&_nfls=false&_pageLabel=page_schedules_location

Leone-Guinea border, will not affect trade costs for non-resource goods from either world markets or neighboring countries. The dedicated port will not compete with Conakry's port because it would not connect to internal markets.

1.4 Creating an enabling environment for local firms to participate in extractive resources projects requires careful planning

Facilitating participation by local providers of services and manufactures can increase the developmental benefits of extractive resources investments. The foreign oil and mining companies that are primarily responsible for extractive resource projects in Sub-Saharan Africa have a natural tendency to rely on their traditional suppliers, who have a track record of having met quality and performance standards. In addition, most concessions tend to benefit from extensive VAT and tariff exemptions that make it easy for foreign companies to import most of their inputs. While international, low-cost reliable suppliers initially tend to capture the bulk of such contracts, a demand for proximate suppliers that are efficient and can reduce response and inventory risk could emerge in the longer term. However, there is nothing automatic about this process. Even when attempts are made to encourage local content, the bar is typically set very high, with the requirement that “products and services [be] equivalent to imported products in terms of cost, quality, health and safety, warranty, and delivery timings.”¹⁷

Minimum efforts to counter this bias involve policies and practices that ensure equal access to contracts and procurement procedures by local firms. It is instructive that in an industry survey, Ugandan firms cited “visibility over demand” of the needs of the oil sector as their biggest concern (followed by access to finance and improved infrastructure). Trade shows could be organized in order to make local firms more visible to the mining community.

More ambitious efforts have required that local firms participate in production at a minimum level. A focus on indigenization has led to only weak backward linkages in Angola, Tanzania, and Zambia, yet Nigeria has been more successful (AfDB 2013). Nigeria's Oil and Gas Content Development Act (2010) requires oil and gas operators to provide a Nigerian content plan. The Act creates a local content monitoring board, gives precedence to bids with a high Nigerian content, and requires all projects to have an employment and training plan. Licenses are then awarded on the basis of price and the Nigerian content, if the price does not exceed the lowest bid by more than 10 percent. (AfDB 2013). Such requirements must balance short-term economic goals, for example in terms of the cost of inputs and meeting quality and time schedules, with longer-term development.

The limited capacity of local firms and quality standards have been identified as the top reasons for the low level of inclusion of domestic suppliers in the extractive industries in Africa (AfDB 2013). It would be a mistake, however, to assume that local firms in many regions in Africa have little part to play in mining activities. For example, an industry-led analysis of Ugandan firms

¹⁷ World Bank 2012.

shows that local firms in many sectors can meet quality requirements and could produce at sufficient scale for the Albert Basin project. These firms include mostly those in cement and steel manufacturing, food supply, and security services. Firms operating in transport and logistics service sectors, however, will need help between now and when development of the Albert Basin begins. The current slow pace of project development (industry observers predict an earliest date for oil production of 2019) might provide sufficient time for improvements in capacity.¹⁸

Local content requirements can be supported by efforts to increase the productivity of local firms. In Ghana, for example, Newmont Ghana Gold Limited partnered with the Chamber of Mines and the IFC, and set aside funds for a dedicated training unit to promote SME capacity. The resulting Ahafo Linkages Program grew from \$1.7 million in 2006 to \$14 million in 2010, and over the period secured contracts for over 370 local businesses. The IFC (in collaboration with Rio Tinto and the Guinea Alumina Corporation, GAC) has a program for local SME capacity development in Guinea. The project has generated a database of about 700 SMEs and has identified a few dozen of them as local hubs for training other SMEs (through the IFC Business Edge in Guinea initiative). Rio Tinto has initiated the Guinea Buy Local Program (GBLP) to boost local SMEs. Similar MSME enterprise development efforts exist in Liberia (most notably through IFC's CASA Initiative).¹⁹ But despite such efforts, large gaps still exist between local companies and international contractors and sub-contractors.

One promising approach is to partner African companies with mining companies in other African states. For example, South Africa, Ghana, and Nigeria could be sources of such partnerships with firms in Guinea and Liberia. In the case of Guinea, the IFC has identified 50 such companies that will help in the process of skills transfer to local firms. The example of BCM Group from Ghana, specialists in surface mining and civil earthworks services, is also a good model. Although founded in Australia in the 1950s, the company has since relocated its global headquarters to Accra and now has operations in Mali, Tanzania, Niger, and Central Asia. The group's extensive African experience can be of use in mentorship arrangements with fledgling companies in other parts of the region.

Local content rules require a definition of the beneficiaries. When participation requirements are framed in terms of local ownership, it creates an incentive for foreign businesses to partner with local businesses to gain access. While such partnerships can facilitate the transfer of skills, at the extreme they can also vitiate local content rules altogether (for example when locally connected businessmen simply serve as fronts for foreign companies). An alternative approach is to base local content rules on the share of value added performed locally, although care would have to be taken to ensure that such requirements do not impose barriers to participation on small firms that may encounter difficulties in fulfilling accounting requirements.

There is an issue as to the consistency of local content rules with WTO agreements. The agreement on Trade-Related Investment Measures (TRIMS) prohibits the mandatory local procurement of

¹⁸ Hamman 2014

¹⁹ The IFC's Conflict Affected States in Africa (CASA) Initiative, launched in 2008, is helping design and implement integrated strategies targeted to support economic recovery and growth.

parts and components relating to foreign investment. While TRIMS provisions have been enforced in some cases, complaints are rarely made when these requirements are combined with investment incentives (Cimino, Haufbauer, and Schott 2014).²⁰ No doubt the unwillingness to challenge local content requirements through the WTO dispute settlement system is considerable when a major firm from the affected country is involved in a delicate partnership with the presumed violator to develop extractive resources. Moreover, the TRIMS agreement does not apply to services, and some countries may be unwilling to bring cases that might generate publicity about their own use of local content rules (many countries enforce requirements that might be viewed as questionable under the TRIMS agreement). In practice, it does not appear that the TRIMS agreement has been a major obstacle to the use of local content requirements in the context of extractive resources projects.

Other measures to support local production in the context of extractive resources project also need to take into account the costs involved. For example, the Tanzanian government is committed to ensuring the involvement of local producers in the exploitation of oil reserves. One aspect of this effort is to encourage the local development of refineries to process oil produced domestically, which would reduce the region's dependence on imported refined oil. However, operating a local refinery without substantial subsidies would be challenging, given the stiff competition as the Middle East ramps up its refining capacity. Last year, Total reported a drop in refining margins from \$51 a ton to \$10.6 a ton.²¹ A coordinated approach within African regions would at least help avoid excess local refinery capacity, and thus minimize subsidies to state-owned refineries. Fuel subsidies, besides their economic toll from inefficient resource allocation, have also been an important source of corruption and mismanagement of public funds in several oil-producing countries.

1.5 Summary of policy implications

Ensuring that the exploitation of extractive resources is consistent with domestic development, diversification, and intra-regional trade is challenging. Successful local content rules are integrated into the entire project cycle, from feasibility studies to actual project implementation. Local content requirements need to strike a difficult balance between short- and long-term benefits. Relying exclusively on foreign firms as suppliers and imposing high quality standards on participating local firms would maximize short-term revenues; at the same time encouraging greater participation by local firms (despite some quality shortfalls) would encourage development over the longer term. Government can help boost the capacity of local firms through programs that would provide general economic benefits, for example skills training and facilitating partnerships with firms, including firms in other African countries. Finally, it is important to avoid very large and potentially inefficient investments in the name of generating local benefits from extractive resources projects.

Targeted policies to support development of regional value chains include investment in transport infrastructure; promotion of transport-related services; the devotion of greater resources to

²⁰ Cimino, Haufbauer, Schott 2014.

²¹ Total website: <http://www.total.com/en/investors/institutional-investors/main-indicators>

research, education and training; trade policies that avoid high taxes on inputs and promote market access; and assistance with the coordination of production among firms.

Local content requirements should either be set out in detail, or the granting of bids to foreign firms should take into account proposals for encouraging local content. Defining local content in terms of value added rather than ownership would limit the potential for fraudulent practices, although such requirements should not unduly burden the accounting capabilities of small firms.

Complementing mine-to-coast infrastructure with general purpose, cross-border infrastructure can improve regional integration, increase regional market size, and boost the development of the non-resource export sector. This is particularly true for landlocked countries, so long as the infrastructure also connects to regional centers of economic activity and not only to dedicated ports. For example, the building of road and/or rail connections next to the LAPSSET pipeline connecting with Nairobi, Kampala, and Addis Ababa could spur regional integration, although these projects would have to be evaluated more concretely in terms of costs and benefits.



Resource-Driven Infrastructure Projects as a Catalyst for Regional Trade and Diversification: Open Access and Cross-Border Collaboration

2

Photograph by John Kirk

Under some conditions, resource-related infrastructure can be a catalyst for cross-border integration. Large-scale extractive companies can be a powerful force for cross-border infrastructure if this is the most cost-effective means of bringing resources to the global market, and can achieve competitive transport pricing and timely delivery that may reduce costs for other firms. However, the benefits to firms not involved in the exploitation of extractive resources will be limited if these firms cannot make use of the transport infrastructure constructed for extractive resource projects. And the success of extractive resources projects in Sub-Saharan Africa often requires effective inter-state collaboration.

Planning for open access and broader economic linkages between resource-related infrastructure and the rest of the economy at an early stage can be very important. The underlying resource may have a relatively short lifecycle, beyond which the legacy infrastructure remains and should ideally be integrated with national economic development priorities and opportunities. The policymaking process around expanding the economic impact and benefits of resource-related infrastructure involves the planning and development of resource corridors and collaboration with private-sector extractive companies to promote shared-use (multi-user and multi-purpose)²² infrastructure around natural resources. This approach would avoid the widely observed “enclave approach” to resource-related infrastructure development, where companies provide their own power, water, ICT, and transportation services to ensure that the basic infrastructure needed for their operations is reliably available. Such projects rarely reflect any consideration to how investments could be integrated with the broader infrastructure investment plans of the government.²³

This chapter first discusses the importance of open access arrangements for ensuring that investments in infrastructure for extractive resources also support the non-resource sector. It then turns to how effective regulation, and inter-governmental cooperation, can improve the developmental impact of extractive resource projects.

2.1 The ability to achieve open access depends mostly on the ownership structure

Open access to transport infrastructure is critical to generating broad developmental benefits from extractive resources projects. However, ensuring open access in African infrastructure projects faces many challenges, due to lack of technical capacity to design contract provisions that encourage open access, weak regulatory institutions that enforce such agreements, and the difficult tradeoffs involved between the efficiency of extractive resource projects and open access requirements. The means to be used, and the likelihood of achieving open access, differs according to the ownership framework.

In an integrated user concession, the extractive industry anchor project owns and operates the infrastructure required to transport the hydrocarbons or minerals from the point of

²² By *multi-use* the report refers to different actors using the infrastructure in question to transport the same commodity. By *multi-purpose* the report refers to different commodities (or passengers) being transported on the infrastructure in question.

²³ Toledano et al. 2014, and Singer 1975.

extraction to the point of sale. The extractive industry company may prefer this arrangement, as it can reduce uncertainty and provide for an efficient logistics chain that is controlled by the company. This ownership structure requires great attention to regulation and supervision to achieve open access. The company has monopoly power over the transport infrastructure and could simply refuse to allow third-party access, or in the absence of effective price regulation charge excessively high tariffs (Toledano 2012). Thus open access may only be achieved if the anchor project is required—either by regulation or by contract—to allow third parties to use the infrastructure, and the government is capable of enforcing this rule.

Planning for open access becomes especially important when third-party users are not identified at the construction phase, but may require access once the corridor is already in operation. As Toledano (2012) points out, the government could impose regulatory provisions that allow for the renegotiation of a concession agreement where there is future demand for third-party access during the life of the concession and certain criteria have been met. For example, the open access regimes found in Western Australia approach shared use from an anti-trust/competition perspective. These regimes often require that third-party access be allowed where there are stranded assets, where open access is necessary to promote effective competition, and where allowing for the third-party access could be achieved in an economically feasible manner without increasing health and safety risks.

Even with a comprehensive open access regime, however, access to third parties is rarely granted on railway lines owned and operated by a leading mining company.²⁴ For example, small mining companies in the iron ore-rich Pilbara region of Western Australia have been denied access to the rail and port infrastructure controlled by major mining companies, despite lengthy litigations between mining companies as well as the continued efforts by legislators and successive governments over the past two decades. In large part, this failure has been due to the vague and weakly drafted open access provisions, with numerous exceptions that have enabled mines to reject or delay requests for access from third parties.²⁵ On the other hand, the joint Swedish-Norwegian corridor in the Arctic Circle provides a useful illustration of ensuring open access with an integrated ownership model, particularly the importance of strong governmental oversight and the retention of ownership of the tracks to ensure continuation of multi-purpose traffic (Box 6).

More shared use examples can be found for pipeline infrastructure, even with weakly drafted open access provisions. This is because there is a stronger business case to be made for the companies involved to coordinate pipeline investments. The shorter timeframes for oil/gas projects than for mineral projects from discovery to production, as well as the lower risks involved in exploration²⁶ mean that companies can better align when these projects come on stream; the inefficiencies associated with a railway corridor serving various projects are not encountered in pipeline infrastructure; and the operating costs associated with railway transport are likely to be higher

²⁴ Those examples generally materialize when a company sees an economic interest in sharing the capital expenditure or the company used to be a state-owned company as in Brazil.

²⁵ Toledano 2012.

²⁶ The geology of oil deposits allows for fairly accurate estimates of a deposit's scale and value early on in the exploration cycle. Mineral deposits on the other hand are not contiguous and far less clustered, and as such, do not allow for accurate value estimated during early exploration.

Box 6: A vertically integrated, multi-purpose cross-border mining railway in the Arctic Circle

The Ofoten & Ore line is a cross-border multi-purpose railway line operated by the Swedish mining company Luossavaara-Kiirunavaara Aktiebolag (LKAB), as well as Northland Resources' mine in Kaunisvaara, that connects the mines (in Kiruna, Svappavaara and Malmberge) to the ice-free Port of Narvik in Norway. The Ofoten line runs from Narvik to the Norwegian border, whereas the Ore line runs from the Sweden border to Boden.

Until recently, different state-owned companies on each side of the border operated the two lines. The Swedish State Railway Company operated the Ore line, whereas the Norwegian State Railway Company operated the Ofoten line. However, in the late 1980's, disputes began to arise between LKAB and the two operators as to the high transport costs on the two railways lines. At the time, LKAB was paying 0.15 Swedish Krona (SEK) per ton-kilometer in Sweden and 0.30 Norwegian Krone (NOK) per ton-kilometer in Norway to transport ore along the two lines, while comparable rates abroad were between SEK 0.03-0.10 per ton-kilometer. To reduce its costs, LKAB applied to the respective authorities for the right to operate the lines. However, this was strongly resisted by the Norwegian State Railway Company, which considered the line a profitable venture and was worried that the takeover would result in the discontinuation of the passenger railway services. In response, LKAB threatened to shift the exports to the Swedish Port of Luleå if an agreement on a transfer of operations could not be reached.

In 1992, the parties signed a 5-year operating agreement, under which LKAB would continue to purchase railway services from each of the state operators, but at a considerably reduced price. In June 1997, LKAB and the Swedish and Norwegian State Railway Companies entered into a joint venture agreement to operate the Ofoten & Ore lines. While LKAB owned a majority stake of 51 percent from the start, with each state operator owning 24.5 percent, LKAB subsequently bought out the shares of the state railway operators in 1999.

While LKAB does not own the railway infrastructure, its wholly owned subsidiary, LKAB Malmtrafik, owns the iron ore trains along the entire Ofoten & Ore Line, which are operated by locally incorporated subsidiaries on each side of the border (Malmtrafik i Kiruna on the Swedish side and Malmtrafikk on the Norwegian side). This line continues to serve container freight and passenger trains, which are not operated by LKAB.

than with oil transportation as a percentage of the total cost, thereby making this part of the logistics chain less strategic.

Open access provisions can be included in concession agreements. Where there is no regulatory framework governing open access when a concession is awarded, third-party access provisions can be negotiated into the concession agreement to require the anchor extractive company to allow third-party access if certain conditions are met. Where there is little economic benefit to allowing third-party access for the extractive company, the agreement could include an access holiday provision limited in time (or sunset clause) to enable the mining company to begin operations and recoup some of its costs for a defined period.

Box 7: Shared use facilitated by a third-party operator: The coal rail network and access agreement in Australia

The Central Queensland Coal Network (CQCN), which consists of five rail systems linking mines to ports, is the largest rail network devoted to exporting coal in Australia. While originally owned by the Government of Queensland, CQCN was privatized in July 2010. CQCN transports coal, iron ore, general freight, industrial freight, and specialised bulk freight in the resources, manufacturing and primary industries sectors.

The Queensland Competition Authority Act of 1997 regulates shared use of infrastructure,^a including rail transport infrastructure, requires providers to agree to an access undertaking that must be approved by the Queensland Competition Authority, and sets out the requirements in relation to shared use that an access provider must adhere to.^b In addition to complying with requirements to provide access, providers are required to treat access seekers fairly and equitably.

The CQCN Access Undertaking, approved on 1 October 2010, sets out the framework for negotiating access with access seekers, the development of access agreements, pricing principles, the utilization of network capacity, interface considerations between the train operator and the rail network, reporting requirements, and procedures for dispute resolution.^c The application for access to CQCN is a multi-step process and comprises the application, review, negotiation and approval of access. The 2010 CQCN Access Undertaking was scheduled to expire in 2014, and the Queensland Competition Authority is currently analyzing an updated draft access undertaking, which was submitted by Aurizon Network. It is noteworthy that the Queensland Competition Authority has invited stakeholders to comment on the undertaking.^d

^a Queensland Competition Authority Act of 1997. Part 5 Access to Services, available at: <https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/Q/QldCompAuthA97.pdf>.

^b Aurizon Network Pty Ltd. "Train Operations Agreement (Coal)," available at: [http://www.qca.org.au/getattachment/db3f2e5c-a8a9-423f-b464-ffbb009a0565/QCA-TOA-\(clean\).aspx](http://www.qca.org.au/getattachment/db3f2e5c-a8a9-423f-b464-ffbb009a0565/QCA-TOA-(clean).aspx)

^c Aurizon, "QR NetworkAccess Undertaking," template agreement (June 2014), available at: <http://www.aurizon.com.au/Downloads/QR%20Network%202010%20Access%20Undertaking%20June%202014.pdf>.

^d Queensland Competition Authority. "Stakeholder Notice: Aurizon Network's 2014 DAU and update to UT4 assessment timetable, 11 August 2014," available at: <http://www.qca.org.au/getattachment/1aa7078f-50e0-48e8-9aa1-1f7d03b234b9/SN1-Timetable.aspx>.

Any provisions requiring open access should include objective criteria as to when third-party access should be allowed (see, for example, the provisions used to promote shared use in Queensland, Box 7). The Government of Liberia has included open access requirements for the Yekepa-Buchanan railway line and Buchanan port in the renegotiated ArcelorMittal agreement, but only to the extent the railway has excess capacity, ArcelorMittal is compensated a reasonable sum, and such third-party access does not "impair the efficient and economic conduct" of its operations.²⁷ ArcelorMittal has, until recently, been able to resist providing access to other users on the

²⁷ Section 3(b)(4) of the Unofficial Restated ArcelorMittal Mineral Development Agreement as Amended with Appendices between the Government of the Republic of Liberia, Mittal Steel (Liberia) Holdings Limited and Mittal Holdings AG dated December 28, 2006.

Box 8: MRS Logística in Brazil—An example of a functioning corridor that is anchored by a mining SPV

In the 1990s, the Brazilian government decided to privatize the national rail company Rede Ferroviária Federal S.A.'s (RFFSA), following decades of financial difficulties. The RFFSA was broken down into several components to be auctioned off separately. In September 1996, MRS Logística S.A. (MRS) a consortium of several domestic mining companies (primarily in iron ore and steel) was the sole bidder for the Southeastern Federal Railroad Network and was awarded a 30-year concession.

The Southeastern Railway Network connects Rio de Janeiro to Belo Horizonte and São Paulo, is a critical freight transportation link to the region's main ports (Rio, Sepetiba and Santos), and serves three of Brazil's most economically important states (Minas Gerais, São Paulo and Rio de Janeiro). The Network includes a total of 1,674 km of rail tracks.

The MRS concession proved successful almost from the beginning, as its new owners were also its main customers: by relying on several captive clients, MRS significantly reduced the revenue risk in the project. Companhia Siderúrgica Nacional (CSN) and (Minerações Brasileiras Reunidas (MBR), the two largest (and together dominant) shareholders in MRS, represented 72 percent of total tonnage transported and 63 percent of total revenue of MRS in the first quarter of 1997. The company went through multiple rounds of expansions, and by 2009 planned to invest \$1.8 billion to expand its iron ore transportation capacity from 180 mtpa to 200 mtpa.^a

^a IFC 2013.

basis of a lack of capacity and that third-party access would hamper the safe and efficient operating of its single track railway line.

As an alternative to an integrated-user concession, a government could encourage open access to resource-related infrastructure by requiring separate ownership and operations. This could be achieved by the transport or energy infrastructure being held by a special purpose vehicle (SPV) (optimally awarded by way of a tender), that then has to raise the financing to design, construct, and manage the operation of the infrastructure (see Box 8 for an example of an SPV structure and Box 9 for the use of SPV structures in Africa) A separated ownership model, whereby a third party owns and operates the infrastructure through a separate tender or a special purpose vehicle, requires less regulation and oversight to ensure open access than under an integrated user concession. The advantage of such a model is that the infrastructure owners have an incentive to design and operate the infrastructure at maximum capacity—an objective that may be more conducive to open access. On the other hand, ownership by a single company may be necessary to achieve the efficiency required to make the cross-border corridor sustainable.

Other forms of ownership using SPVs are possible. An intermediate solution between an integrated user concession and separated ownership is to have a mining-based SPV that separately owns the rail, port or pipeline infrastructure from the extractive industry project (s), but is

Box 9: Examples of the use of SPV structures in mining projects in sub-Saharan Africa

The independent infrastructure company (InfraCo) was established by the Government of Guinea and a consortium led by Rio Tinto to own and finance the development of a new trans-Guinean railway line and new deep-sea port to export ore from Simandou on an open access basis.^a The Rio Tinto-led consortium's ownership share in InfraCo has not been publicly disclosed. This arrangement is expected to facilitate access to finance, because the Rio Tinto-led consortium has been given a stake in the infrastructure for exporting the iron ore from its Simandou blocks, but without the full \$15 billion price tag that the infrastructure is estimated to cost. However, questions may still arise as to how much discretion the SPV will have in such matters as allowing Rio Tinto, as the foundation customer and first mover, to enjoy special rights (i.e. preferential tariffs, priority access, and/or expansion options), and to what extent the SPV will have discretion in the tariff levels charged to other access seekers, including farmer and forestry businesses seeking to transport their cargo, as well as passenger rail services (Aplin 2014). In the case of Simandou, as the independent regulator has not yet been established, questions also remain as to how disputes as to third-party access will be adjudicated and on what terms.

Replacing the current concessionaires with a mining-based SPV structure could increase the efficiency of the Northern Corridor (which links Burundi, the Democratic Republic of Congo, Rwanda, and Uganda to the Kenyan port of Mombasa, and also serves Tanzania, South Sudan and Ethiopia). Performance by the East African railway system concessionaires (TAZARA, Tanzania Railways Limited, and Rift Valley Railways) has been poor and traffic volume has been low, even though the Rift Valley Railways is experiencing some notable improvements. Securing finance for a major upgrade of the rail infrastructure would require identifying an anchor project to guarantee a minimum off take. With increased regional planning and coordination between governments, rail concessionaires and mining concessionaires could perhaps connect stranded mining projects whose lack of access to infrastructure hampers their development (e.g. in the Lake Albert area which is rich in minerals and oil) to the existing or defunct lines.^b However, mining companies often prefer to control the logistics chain to ensure reliability and efficiency, and may not feel safe entrusting the upgrade of the railways to the current rail operators.

One approach would be to gather a consortium of private operators that would own and operate the rolling stock on the network and invest in the capital expenditure according to their needs in capacity allocation (Wolf 2011). Some of those operators would be directly linked to mining. The consortium could set up a SPV that would enter into long-term agreements with all these operators (a long-term take or pay off take agreement with pre-agreed tariffs that cover the cost of the financing during the term of the loan).^c If one project, such as a world-class iron ore mine, has more financial capacity than the others, this mine could be the foundation customer and first mover of the SPV and could claim founder rights.

This kind of structure would attract debt and equity investment from infrastructure funds, development banks and other capital providers that otherwise might not be interested in the corridor. It should be noted, however, that the ability of most development banks to finance large capital expenditures in developing countries on a commercial basis is constrained by the amount of

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Box 9: Examples of the use of SPV structures in mining projects in Sub-Saharan Africa
(continued)

the guarantee that the host country is able to pay in the case of an early termination. This means that in many cases, commercial lending totals are constrained to less than \$1 billion, which is only a fraction of the overall project development costs. This also means that a project's sponsor in these projects may be required to finance more than 50 percent of the investment via equity. Worldwide, only a handful of mining companies have the financial resources to do so.^d

^a Government of Guinea, Rio Tinto, Chinalco, and the IFC 2014.

^b The rail link to Tanzania, the line between Kampala and Kasese, and the northern Ugandan line from Tororo through Gulu to Pakwach on Lake Albert have been closed because of low activity and political instability. The Northern Ugandan line has however reopened early this year.

^c Ireland 2013.

^d di Borgo 2014.

anchored on one or several extractive industry project(s) that also serve as major shareholder(s). Such an SPV is advantageous from the lead mining company's perspective, as the involvement of other investors may reduce its investment cost. In addition, if structured properly, such an SPV arrangement is more likely to be bankable, given the guaranteed off take and financial buy in of the leading mining company.

There are important tradeoffs to be faced in designing infrastructure projects to ensure open access. While achieving open access is more difficult with integrated user concessions than with separated ownership, financing the infrastructure is likely to be more expensive in the latter. With separated ownership, the entire project is not backed by an extractive industry company with a strong balance sheet, and relying on additional players in take-or-pay agreements (often necessary to take up unallocated capacity) increases risk and coordination costs, especially in the case of non-mining cargo on rail infrastructure. Uncoordinated interfacing between separately owned rail and port operators may result in bottlenecks that can slow the entire logistics chain, to the detriment of all users. The Nacala case suggests that expensive and complex cross-border infrastructure solutions are more likely to go ahead under the integrated user concession model. The high capital cost of the infrastructure and the high coordination costs of a separated ownership model, combined with the logistic costs generated by poor border management systems, can render the cross border corridor not economically viable. Such coordination problems are more characteristic of the mine-railway-port- vessels logistic chain than the oil field-pipeline-processing facility chain.

2.2 Achieving open access requires strong regulation and sound contracts

Effective regulation is required to ensure open access. If each ownership model presents different risks for achieving open access, none of them can bring the expected benefits without strong

Box 10: Open access to mining-related rail infrastructure in Brazil

The 1997 privatization tender for the Carajas and Minas railway lines states that the rail concessionary shall guarantee mutual traffic or, when mutual traffic is not possible, right-of-way to other rail operators (a provision that would be further regulated by the government). The Government of Brazil also retained a golden share in each of the railway lines, which grants it certain veto rights in relation to the management and operation of the railway.

In 2001, the Brazilian Government created the National Land Transportation Agency (ANTT) to regulate the land transportation sector.^a Several regulations have been adopted to govern the implementation of shared use of rail infrastructure, and the conditions upon which access must be granted.^b Most notably, Resolution n.º 3695/2011 requires that the terms of a shared use arrangement must be set out in a specific operational contract (COE) that is entered into between the parties, and must include deadlines to request shared use, additional investments to extend the rail for shared use, and the mechanism to be used to negotiate the price for shared use. In addition, the COE must be sent to ANTT, which can require changes to the terms if it considers that any of them are not in accordance with the public interest.^c The regulation also provides that any disputes in relation to the terms of the COE must be referred to ANTT for adjudication.^d

To date, ANTT has intervened in two cases to determine the implementation of shared use of a railway line.^e One of the cases involved the right of access on the Carajas to Itaqui port spur, which is managed by the Nordeste Rail Company. ANTT granted Vale access to export minerals from the Carajas mine along this portion of a railway line that it does not operate.^f

^a See: Law 10.233 of 2001, available at: http://www.planalto.gov.br/ccivil_03/leis/leis_2001/l10233.htm.

^b ANTT Resolution n.º 3695/2011, available at: http://www.antt.gov.br/index.php/content/view/4695/Resolucao_n_3695.html

^c See: ANTT Resolution n.º 3695/2011, article 6 to 11.

^d ANTT Resolution n.º 3695/2011, article 14.

^e ANTT Resolution n.º 945/2005, available at: http://appweb2.antt.gov.br/resolucoes/00900/resolucao945_2005.htm

^f ANTT Resolution n.º 1250/2005; n.º 1733/2006; n.º 1991/2007; available at: http://appweb2.antt.gov.br/resolucoes/01000/resolucao1250_2005.htm; and http://www.antt.gov.br/index.php/content/view/2733/Resolucao_1733.html

regulatory provisions and a well-functioning and independent regulator to monitor and enforce the tariffs, and also to adjudicate access and pricing disputes (box 10 discusses the regulatory regime established in Brazil to promote open access).

Disputes are common under integrated user arrangements. These often concern discriminatory access to the infrastructure and the capacity allocation controlled by the leading extractive industries company. The main regulatory challenges under separate ownership relate to containing the profit maximization objective of the infrastructure operator. Regulation has been more successful in achieving open access under separate ownership than fully integrated ownership.

The responsibilities of the regulator should be set out in the legislation. The level of intervention can be adapted to the maturity of the regulator and the competitive nature of the transport or energy infrastructure. A mechanism is also required to adjudicate disputes between parties regarding third-party access issues. On a national level, this role could be played by an

Box 11: Australia's Hunter Valley Coal Chain Coordinator^a

Capacity constraints were encountered in the Hunter Valley coal chain beginning in the 1990s. The bottleneck has generally been the rail infrastructure, although poor operational linkages at the mine/rail and rail/port interfaces were also identified as reducing overall system capacity. The Hunter Valley Coal Chain Planning Group (HCCPG) was established in 2003 on a trial basis by the port owner, Port Watarah Coal Services (PWCS) and the rail operator, Pacific National to optimize planning and scheduling of coal train movements and shipments, as well as to coordinate maintenance. This entity evolved into the Hunter Valley Coal Chain Logistics Team (HVCCLT) in 2005. Membership expanded to include QR National as the other train operator, Australian Rail Track Corporation (ARTC) as the track owner, and Newcastle Port Corporation as the port authority. The HVCCLT had responsibility for day-to-day coordination as well as long-term system-wide capacity planning, to avoid misalignments between mines, rail, and port. Its goal was to reflect the interests of the entire coal chain in increasing transport chain efficiency through improved scheduling practices and train productivity, optimizing the rail network, and maximizing stock-piles and throughput at the export ports.

Ultimately, in 2009, the HVCCLT evolved into the Hunter Valley Coal Chain Coordinator (HVCCC), an independent entity that also included representation from the coal miners. The HVCCC has an independent CEO and Chairman. Its responsibilities now include determination of actual capacity usage and making findings as to fault if system losses occur, with financial implications.

The HVCCC model is generally seen as successful due to its broad stakeholder representation, independent leadership, and its legal powers. The model has been substantially duplicated in the Queensland coal chain through the establishment of the Integrated Logistics Centre in 2009 as a coordinating body between the port owner, port operator, rail owner, rail operators, and coal producers.

^a Toledano 2012.

independent regulator or the existing judicial system, to the extent it is viewed as impartial and competent to do so.²⁸

Providing for open access requires careful planning, particularly to ensure that the demand from mining companies does not exhaust the available freight capacity (note the mechanisms adopted in Australia to manage capacity, discussed in Box 11). For example, the Guinean railroad planned to service the Simandou project is highly dependent on PPP arrangements, and it is quite possible that market conditions—largely driven by volume constraints—could price out non-mining users. The exact modalities of the line, complete with any plans for such contingencies, will be clearer once Rio Tinto submits its business plan (scheduled for some time in mid-2015). The

²⁸ For more information on this topic, see: Toledano 2012.

business plan will signal Rio Tinto's position on projected volume growth and how it will affect the expressed goal of having a privately operated, open access multi-user railway line. Similarly, ArcelorMittal has stated that even after planned capacity increases it will face volume constraints on its dedicated line for its mine in Yekepa, Liberia.

The regulatory issues surrounding mining projects are not limited to open access. There is some discussion, for example in East Africa, about whether government-owned petroleum companies should combine the functions of regulator, prospector, and operator into a single agency, to ensure efficient coordination of these functions and economize on the use of scarce personnel. However, establishing the appropriate incentives for effective oversight requires that separate administrative units carry out these functions. For example, Uganda's Exploration, Development and Production Act separates the functions of the National Oil Company from those of the regulator Petroleum Authority. On the other hand, the Nile Petroleum Corporation dominates the sector in the South Sudan. Also, the government's share of revenues from extractive resources projects should be channeled through the normal budgetary processes, not captured by government agencies involved in exploitation.

Four types of contractual safeguards could be considered:

1. For governments to ensure the ultimate retention of ownership of the asset, they can require infrastructure concessions to be awarded on a build-operate-transfer (BOT) basis. The operation of the infrastructure is concessioned for a period long enough for the infrastructure holder to recoup the costs of the financing plus a reasonable profit margin, before ownership of the asset is transferred to the government.
2. To influence the decision-making process concerning the infrastructure and ensure that it is ultimately used in the public interest, the government can take an equity stake in the infrastructure project, or otherwise require a golden share.²⁹ Golden shares can be an efficient policy tool to influence open access decisions of port and rail infrastructure, but may impair the ability to raise financing if the golden share gives the government extensive control over management decisions. Shared use can also be promoted by greater participation by state enterprises in mining development, as was the case in Brazil (Box 12).
3. The government may contractually require the establishment or continuation of less profitable services to be operated on the railway infrastructure such as passenger service or small and medium-sized freight, as is illustrated in the Arctic Circle (see Box 6), but it may also need to subsidize such services.
4. Finally, it is important that the government at all times retains the ownership of the right of way (or servitude) for the land on which the railway infrastructure or a pipeline is located. This will allow the government to allow for other types of infrastructure, such as pipelines, transmission lines, and fiber optic cables to be laid along the railway tracks. Ensuring the shared use of such a right of way will require regulatory provisions setting out the rights

²⁹ A golden share is typically a single nominal share that grants the holder special voting or veto rights, but doesn't entitle the holder to dividends.

Box 12: State owned mining company and government interests align

The Carajas and the Vitoria-Minas railway lines, which connect the Carajas Mine to the port of Ponta da Madeira (892km) and the Itabira Mine to Belo Horizonte (905km) respectively, are operated by the Brazilian mining company Vale S.A. In addition to serving Vale's iron ore projects, the lines provide third-party cargo and passenger services. In 2013, the Carajas line transported 114mtpa, of which 3.4 percent of the cargo was for other clients, and 308,000 passengers. The Vitoria-Minas line transported 86mtpa, of which 20.1 percent was for other clients, and 890,000 passengers during the same year. Apart from iron-ore and pellets, the main commodities transported on the lines included steel, coal, pig iron, limestone, fertilizers, pulp, fuels, chemicals and soybeans.^a

While the Vitoria-Minas railway line dates back to 1904, the Carajas mine and associated infrastructure was only built in 1986, at a time where mining projects elsewhere were granted fully integrated railway concessions that did not require open access. The main reason that this railway line was conceived to be both multi-user and multi-purpose, and continues to fulfill these functions today, can be traced back to Vale having been a state owned company at the time of the construction of the project (formerly known as Companhia Vale Rio Doce - CVRD). Hence the public interest of the mining company not only consisted in maximizing the profits of the operations, which would involve an integrated railway project, but also contributing to the national wellbeing by providing transport facilities for other iron ore deposits in the region and serving non-iron ore cargo and passenger services. When CVRD was privatized in 1997 and both railway lines were passed on to Vale, the companies were required to continue to provide services to third parties.

^a Vale, "2013 Annual Report," available at: http://www.vale.com/PT/investors/Quarterly-resultsreports/20F/20FDocs/20F_2013_p.pdf.

of each of the parties, as well as a mechanism to enforce the right of way and deal with disputes. The Brazilian regulators overseeing the operation of the Bolivia-Brazil Gas Pipeline provide a good example of the role of regulation in enabling and enforcing shared use of right of ways (Box 13).

Mining investments benefit greatly from efficient, consistent, stable and understandable regulatory frameworks (Deloitte 2014). Changing the terms of taxation, royalties, social and environmental requirements, or other regulations can greatly alter the profitability of investments ex post. Thus, uncertainty over government commitment to the terms of contracts can raise firms' perceived costs of investment. To reduce the likelihood of major changes in contract terms or regulations, a business may sign a stabilization agreement with the state to ensure that measures are not implemented that adversely affect the company's commercial or financial position. At the same time, it is difficult for governments to commit to never making changes in light of revised circumstances, or even more so to constrain the choices of future governments

Box 13: The use of rights of way in Brazil along the Bolivia-Brazil gas pipeline

The Bolivia-Brazil Pipeline (GASBOL) is a cross-border pipeline to transport Bolivia's natural gas to Brazil. The pipeline is 3150km long, 557km of which is located in Bolivia and 2593km in Brazil.^a It has the capacity to transport 30 million m³/day. GASBOL started operation in February 1999, and is managed by Gas Transboliviano S.A. (GTB) on the Bolivian side and by Transportadora Brasileira Gasoduto Bolívia-Brasil S.A. (TBG) on the Brazilian side.

In Brazil, the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP) regulate natural gas and associated infrastructure. ANP has collaborated with other regulators to ensure that electricity and communications lines can be built alongside the pipeline. Most notably, in 1999 ANP issued a joint resolution for shared use infrastructure with the Brazilian Electricity Regulatory Agency (ANEEL) and the Telecommunications Agency (ANATEL), which provides for the sharing of rights of way for utility lines, pipelines, posts, and towers. More recently, ANP issued a further resolution to regulate shared use of the right of way of pipelines between the oil & gas sector and biofuel companies.^b Pursuant to this 2012 resolution, TBG is required to guarantee access to GASBOL's easement over the land on which the pipeline is located, to the extent there is excess capacity for shared use. Any party wishing to request access to the easement for the purpose of laying additional infrastructure has to put in a request to TBG, and can appeal to ANP for intervention if TBG refuses to grant the request.^c

^a TBG, "Gas Pipeline – Technical Information," available at: http://www.tbg.com.br/pt_br/ogasoduto/informacoes-tecnicas.htm.

^b ANP. Resolution 42 of 12/10/2012, available at: [http://nxt.anp.gov.br/NXT/gateway.dll/leg/resolucoes_anp/2012/dezembro/ranp%2042%20-%202012.xml?fn=document-frameset.htm\\$f=templates\\$3.0](http://nxt.anp.gov.br/NXT/gateway.dll/leg/resolucoes_anp/2012/dezembro/ranp%2042%20-%202012.xml?fn=document-frameset.htm$f=templates$3.0)

^c Art. 22 of ANP Resolution 42 of 12/10/2012, available at: [http://nxt.anp.gov.br/NXT/gateway.dll/leg/resolucoes_anp/2012/dezembro/ranp%2042%20-%202012.xml?fn=document-frameset.htm\\$f=templates\\$3.0](http://nxt.anp.gov.br/NXT/gateway.dll/leg/resolucoes_anp/2012/dezembro/ranp%2042%20-%202012.xml?fn=document-frameset.htm$f=templates$3.0)

2.2.1 *Nacala Corridor: Contractual provisions to ensure shared use in the absence of regulation*

The Nacala Corridor, which connects Malawi, Zambia and Mozambique, is a good example of the government contractually requiring the continuation of shared use on the existing and new railway network (box 14 provides basic information on the corridor).

The existing Nacala railway network, operated by the Corredor de Desenvolvimento do Norte (CDN) in Mozambique and by the Central East African Railways (CEAR) in Malawi, is open access. In 2010, approximately 270,000 metric tons of cargo and 930,000 passengers were transported along the Nacala Corridor. The outbound cargo trains to Nacala port mainly carried cotton, sugar, beans, timber, and tobacco, whereas the inbound trains carried cement, fuel, wheat, and salt. Most of the cargo was from and to Malawi (about 80 percent outbound and 70 percent inbound) with the remainder being made up of Mozambican cargo and a very small proportion of third-country cargo (from Zambia and the Democratic Republic of Congo).

Box 14: Ownership rights in the Nacala corridor

The Nacala railway line was originally built in 1912 to connect the Nacala port to the Nyasaland railway network (today Malawi), and used to be the main export route for Malawi. The infrastructure was destroyed during the 16-year civil war in Mozambique, which ended in 1992. A tripartite memorandum of understanding was signed between Mozambique, Malawi, and Zambia in 2003 to re-establish the Nacala Corridor as a key export route. To rehabilitate the infrastructure and improve the management of the corridor, the rail and port concessions were privatized in 2005. However, the concessionaires were only able to raise enough funding to make repairs that were absolutely essential to services, which resumed at very low speeds and at limited capacity. The lack of sufficient rolling stock, equipment, and sub-optimal train operations led to low traffic volumes, which in turn meant that the concessionaire was unable to reinvest in upgrading the railway network.

In 2010, the Brazilian mining company Vale purchased a majority share in the Nacala rail and port concession, with the goal of using the Nacala Corridor as the primary export route from its coal concession in Moatize, Mozambique. Vale has estimated that it will need to invest \$3.4 billion to connect Moatize to the Nacala port via Malawi, by upgrading 583km of the existing Nacala line from the current 18.5 tons per axle wagon capacity to 22.5 tons per axle capacity,^a and by building the missing link from Moatize to the Malawian railway network. The proposed railway line will have a capacity of 22mtpa and be configured as cape gauge to be compatible with the rest of the railway networks in Mozambique and the region.^b

Name	Shareholder	Total distance	Corridor distance	Construction/rehabilitation	Port
CDN	51% SDCN, 49% CFM	911.3 km	583.3 km	0/845.3 km	Existing port
CEAR	51% SDCN, 49% CFM	797 km	98.6 km	0/98.6 km	
CLN	80% vale, 20% CFM	91.8 km	91.8 km	91.8/0 km	Coal terminal
VLL	100% vale	138.5 km	138.5 km	138.5/0 km	

The table shows the route and ownership of the railway and port project. Vale has acquired 67 percent of the shares of the Sociedade para o Desenvolvimento do Corredor de Nacala (SDCN). In turn, SDCN has a 51 percent stake in the Corredor de Desenvolvimento do Norte (CDN), which is the concessionaire of the Nacala Corridor. The remaining 49 percent of CDN is owned by the Mozambican state-owned ports and railway company Portos e Caminhos de Ferro de Moçambique (CFM). SDCN is also the majority shareholder of the Central East African Railways (CEAR), which operates the Malawian rail network. Vale will upgrade CEAR's existing 98.6km rail link from Entre Lagos at the Mozambican border to the rail intersection at Nakaya.

The Corredor Logístico Integrado do Norte (CLIN) has been created to oversee the greenfield railway investments needed to complete the connection in Mozambique. It is 80 percent owned

(continued on next page)

Box 14: Ownership rights in the Nacala corridor *(continued)*

by Vale and 20 percent by CFM, and will be responsible for the construction and operation of the railway link from Moatize to Camulatsissi and the new railway spur that connects the existing Nacala line to the new coal terminal at Nacala Velha (total of 91.8km). Finally, the greenfield rail spur in Malawi will be 100 percent owned by Vale, connecting Cambulatsissi to Nakaya (136km). As part of the deal with Malawi, Vale has also committed itself to financing upgrades on the CEAR network that are unrelated to its exporting line.^c

Source: Authors' interviews

^a Interview with Vale, July 2014.

^b Fichtner Mining & Environment GmbH, "Preliminary Mozambique Coal Master Plan," Final Report (2013).

^c Interview with Vale, July 2014.

Figure 12: Nacala railway corridor development plan



Source: World Bank, IBRD 41618 (May 2015).

While the contracts are not public, in-country interviews suggest that Vale has agreed to continue the general cargo and passenger services on the Nacala railway line. Some 4mtpa apparently has been reserved for future third-party cargo throughput, and news reports³⁰ and investor

³⁰ Malawi Today 2011.

presentations³¹ support the claim that the company is contractually bound to provide these services. Furthermore, it has been reported that the railway line is designed in a way that capacity can be increased to 30mtpa in the future³² if the existing capacity becomes a constraint. It is unclear, however, how third-party access requirements will be regulated, how the access charges are going to be defined, who will subsidize the loss-making passenger services, how the customs and border regulations of each country will be aligned to minimize border delays, and how the regulatory bodies from the different countries will work together.³³ This can be traced back to the failure to enact enabling legislation and establish a railway regulator prior to concessioning the railway networks in Mozambique, Malawi and Zambia.³⁴ On the Mozambican side, the government has only recently approved the National Surface Transport Regulator (INATTER). For the railway sector, the regulator has the authority to, among other things: (i) propose railway-related legislative and regulatory measures to be approved by the Government and monitor their implementation; (ii) regulate the construction of railway infrastructure and ensure that access of operators is non-discriminatory; (iii) determine the introduction of technical improvements to increase the safety and efficiency of rail transport; and (iv) regulate access and adjudicate disputes/complaints.³⁵

INATTER is a mechanism for third parties to seek access to rail infrastructure in Mozambique. However, its control by the Ministry of Transport and Communications (MTC) raises some question as to whether the regulation and arbitration process will be neutral and based on an independent assessment. Furthermore, it remains to be seen whether INATTER has the political backing and technical capacity to impose its regulatory authority on the powerful state-owned railway company CFM, which has been in charge of setting tariffs on rail traffic in the past. The UK Department for International Development, which has supported the MTC in setting up INATTER, has recognized these challenges and views “turning INATTER into a robust and independent regulatory body as a medium to long term endeavor.”³⁶

The Railway Act of 1907, which was passed when concessions were not even a recognized concept, still governs railway operations in Malawi. Since the Act does not define the responsibilities for either the government or the concessionaire, these have been included in the concession contract. However, setting out responsibilities in a contract is not an adequate replacement for an independent regulatory body. Prior to Vale acquiring a controlling stake in the Malawian railway network, Credit Rating Information Services of India Limited recommended that thirty clauses in the original concession contract should be modified in order to improve the functionality of the network in Malawi.³⁷ It is unclear whether these recommendations have been renegotiated in the new concession agreement with Vale.

³¹ “The multiplier effect of infrastructure”, Vale presentation at Mining on Top conference, June 24, 2014

³² Interview with CFM (2014).

³³ The World Bank’s Mozambique Infrastructure Assessment in 2011 states that in the past CFM subsidized 85 percent of the passenger service costs.

³⁴ SADC 2009.

³⁵ Government of Mozambique, “Boletim da República, Decree No. 32 of 2011.. Available at: <http://www.portaldogoverno.gov.mz/Legisla/boletinRep/boletins-da-republica-2011/>

³⁶ DfID, “Mozambique Regional Gateway Programme Review,” (March 27, 2013).

³⁷ SADC 2009.

2.2.2 LAPSSET Corridor: *The lack of regulation within a country can jeopardize a cross-border corridor*

Many aspects of the development and allocation of institutional and regulatory responsibilities—both between countries and within individual countries—have not been defined for the Lamu Port-South Sudan-Ethiopia (LAPSSET) Corridor (see Box 15). While details

Box 15: The LAPSSET Corridor

The LAPSSET Corridor is a greenfield infrastructure mega-project, anchored around the development of a major deep-water port at Lamu on Kenya's north-east coast. It would include an oil and gas pipeline linking South Sudan, Ethiopia and Kenya, and, as now seems increasingly likely, Uganda, to the new Lamu port. While the port and pipeline are intrinsically linked, it is conceivable that the port would still be built (possibly on a smaller scale than currently envisaged) even if the pipeline falls through. Both the port and the pipeline can be regarded as very likely to be built over the coming decade, although it should be noted that plans to build the Lamu port first emerged in the 1970s.

The entire LAPSSET project involves a number of additional components around the port and pipeline, including an 800km road system, a single-gauge railroad, a refinery, three international airports, and related developments such as resort towns and power plants.^a While construction has commenced on elements of the project, notably the first three berths of Lamu port, the overwhelming majority of the project's components are still in planning and fund-raising phases, including the pipeline itself. Some of the more elaborate and ambitious elements of the LAPSSET project are unlikely to be developed anytime soon. Beyond this already highly ambitious vision for LAPSSET, governments have argued that the corridor could eventually be expanded to form the "Great Equatorial Land Bridge," spanning from Lamu, Kenya to Doula, Cameroon, which would include a railway line with a 3-day total transit time across the continent, through Kenya, South Sudan, the Central African Republic, and Cameroon.

Adding further infrastructure components around the pipeline could also be justified in terms of synergies arising from the need for service roads, power-generating facilities, securing land rights, right-of-way provisions, and the movement of human settlements and communities (all of which are likely to be needed for the pipeline). In this way, it could be argued that LAPSSET is an example of how cross-border resource-related infrastructure (the pipeline) can be leveraged to unlock regional trade and economic integration and the development of the physical infrastructure that goes with it.

The estimated cost for the projects, which falls heavily—but not exclusively—on Kenya, has skyrocketed from around \$16 billion at inception to current estimates of around \$26–\$30 billion (while construction and development of key components is yet to start, or is in the very earliest stages).^b The Kenyan government is clearly the driving force behind efforts to secure financing, and is casting the net very wide for international funders, both public and private.

^a Copeland and Kvelland 2013.

^b Ventures Africa 2014; and Odhiambo 2013.

Figure 13: Map of initial proposed LAPSSET Corridor



Source: World Bank, IBRD 41619 (May 2015).

are particularly lacking for South Sudan and Ethiopia, some elements of the Kenyan approach are evident. Kenya has established the LAPSSET Corridor Development Authority (LCDA), whose primary function—at this stage, at least—is in coordinating planning, implementation and fund-raising efforts across all components of the corridor.³⁸ The multi-faceted nature of LAPSSET is likely to require extensive participation from existing regulatory institutions, such as the Kenyan railways, port, highway and airports authorities, as well as the Ministries of Energy & Petroleum, and Transportation. The ability to effectively coordinate the actions of these different authorities within Kenya, and cross-border with their counterparts in South Sudan and Ethiopia (and potentially Uganda), is a major operational risk, but has received relatively little attention thus far.

³⁸ Lamu Port project website, available at: <http://www.lapsset.go.ke/profile>

2.2.3 *Guinea-Liberia Corridor: The lack of a regulatory framework for a cross-border corridor*

The Government of Liberia has included third-party access provisions in each of the five iron ore concessions awarded since the end of Liberia's civil war. However, the contractual terms that require third-party access are open to challenge and contain no details as to the technical and commercial terms on which such access is to be granted. In addition, the government has not established an institution dedicated to the regulation of railway lines that connect to mining concessions, let alone third-party access issues. As a result, there is considerable uncertainty concerning the terms on which third-party access would be granted, how tariff levels would be set, what types of special rights the leading mining company would be permitted to retain, and how (and by whom) disputes or complaints regarding open access would be adjudicated. ArcelorMittal has also only recently agreed to permit Sable Mining to export ore on its transport infrastructure, though up until early 2014 ArcelorMittal failed to agree on a shared use mining arrangement with either BSGR in relation to the Simandou reserves, or BHP Billiton in relation to its Nimba reserves (see Box [5] for a description of the corridor and a map of the location of reserves). Similarly, the government of Guinea recently announced the establishment of a regulatory body to oversee the integrated trans-Guinean rail and port infrastructure that is to be constructed in relation to Rio Tinto's Simandou concession. However, the regulations governing shared use have not been defined.

2.3 **Inter-governmental collaboration is critical to the success of cross-border extractive resources projects**

Agreements are necessary among governments participating in cross-border projects on user fees and cost/revenue sharing to finance investment and maintenance. Such agreements can also prevent sections of road or rail from being split into a series of monopolies, each charging too high a price.³⁹ It is difficult to impose road tolls in Africa because it is hard to exclude local traffic from using new roads, although a toll based on usage can work for railroads. Alternatively, cross-border infrastructure can be financed through foreign aid, even from a donor country to a neighboring recipient country. Mun and Nakagawa (2008) propose a matching grant system, in which infrastructure spending in one country is automatically matched by infrastructure spending in the other country. The funds available could be increased by involvement of a multilateral donor, which according to Rus and Socorro (2010) is best done through a "fixed-price" (lump-sum) co-financing mechanism at the supranational level. However, this leaves open the question of how maintenance will be financed.

Coordination can help capture the economies of scale that are central to infrastructure projects (Collier and Venables 2010). This is particularly important in Africa, where the populations of

³⁹ Such integration may even be done between hinterland connections and ports if they can charge usage fees such as a port access fee and a hinterland road (or rail) toll (De Borger and De Bruyne 2011).

many countries are relatively small, for example, compared to most countries in South and East Asia. In the case of a landlocked country, infrastructure spending will depend directly on the infrastructure spending of its transit neighbor. If they do not cooperate, then both countries will invest too little because they do not take into account all of the benefits from the combined, optimal amount of spending. A strong commitment to cooperative arrangements, for example, through the passage of binding legislation, is often necessary to remove the threat of hold-up—in the form of unexpected trade barriers such as steep tolls or custom duties after the infrastructure investments have been made—which otherwise could prevent cross-border investment. Effective inter-governmental collaboration also can help disseminate norms of best practice and good policies, and mitigate political risk concerns over contract enforcement if such contracts are entered upon with neighboring states that can effectively check each other.

The effective collaboration between governments involved in a corridor is particularly critical when negotiating open access. Given that open access is often not in the interest of the anchor mining or oil company because it may add the costs involved in coordinating with other users, it becomes especially important that operational inefficiencies and costs at the border are minimized. Key issues include technical coordination and management.

On the technical side, the governments and the extractive industry companies need to agree on the design of the railway or pipeline infrastructure so that it is suitable for multi-purpose cargo and aligns with compatible technical specifications. The gauge of the railway line is particularly important in this regard. While wider gauges are preferred by mining operations because trains with heavier loads can travel at faster speeds, these may not be compatible with the remaining railway network, thereby restricting the operation of non-mining cargo. Absent cross-country agreement on technical specifications, different gauge settings between two countries could lead to costly off-loading and reloading across borders, expensive retro-fitting of existing infrastructure, or the building of “Bogie exchanges” to overcome differences in the track gauges.⁴⁰

Coordination on technical specifications is also important for pipelines, where attention to cross-border harmonization of technical specification is all too often an afterthought. In the case of LAPSSET, the participation of Uganda (which remains to be decided) will significantly affect the technical requirements for the pipeline. Ugandan oil has a “waxy” quality and remains solid below 40°C (104°F). As a result, it must be heated before it can be piped, and requires additional pump stations along the pipeline—something that was not envisaged in the initial planning around LAPSSET.⁴¹ These technical requirements cannot be retrofitted, so it needs to be clear from the outset whether Uganda will participate.

The critical management issue is to facilitate border crossing. Agreement between governments on an efficient border management system, including customs procedures and the elimination of “soft-barriers” such as differing health and safety standards, is essential to the efficient transshipment of cargo. Long border delays because of checks and controls, differences in cross-border

⁴⁰ A bogie exchange refers to replacing the chassis containing the wheels and axles of the railroad car with a chassis that has differently spaced wheels.

⁴¹ Government of Kenya, Japan Port Consultants, and BAC/GKA 2011.

regulations, or requirements for crew changes increase inefficiencies and costs. Regional agreements on arrangements for transit goods can be important to facilitate trade across extractive resources corridors. In the absence of an international agreement between bordering states regarding cross-border issues, a mining or an energy company may request that the government include in the concession agreement certain obligations to facilitate cross-border access (Box 16 provides an example).

One indicator of the expected difficulties involved in inter-state coordination is that cross-border infrastructure projects often face greater problems in securing adequate financing than do projects within a single country. This may be the case even with sovereign guarantees of financing or a significant government stake in the project. Multilateral agencies can play an important role in providing finance and encouraging greater private sector participation in these projects.

RECs can facilitate inter-governmental coordination to improve the impact of extractive resource investments on regional trade. Several RECs (COMESA, ECOWAS, EAC, SADC), together with various corridor management institutions, are assisting with the harmonization, simplification, and automation of customs procedures and documentation. These efforts have contributed to the recent declines in customs delays (AU 2012). RECs can help coordinate the definition of standards and provide testing facilities on a regional basis. For example, to access the EU market it will be necessary to adopt strict ISO standards. An illustration of the importance of this issue is that the variation of standards, and the cost of trying to meet them, is a cause of the dysfunctional fertilizer markets in Africa (AfDB 2013). RECs can support centers of excellence that perform research on issues that are critical for production, where individual countries may lack sufficient

Box 16: Bolivia–Chile Agreement to ensure the unrestricted passage of transit goods

The Convention of August 16, 1937, guaranteed the full and free transit for Bolivian goods to the ports of Arica and Antofagasta in Chile. Bolivia and Chile established an Integrated Transportation System (ITS) at these ports in 1975, which enabled Bolivia to administer the transfer of goods from vessels at these ports directly to Bolivia without having to report shipping details to the Chilean authorities or having their customs agents intervening.^a

The ITS is operated exclusively for imports into Bolivia, but not for the export of Bolivian products. This system was implemented with the aim to facilitate the transportation of cargo to Bolivia in a timely manner. The Inter-American Development Bank reported in 1982 that the ITS had reduced the transportation time from vessels to trains.^b The Port Services Administration-Bolivia (ASP-B) is the Bolivian customs agent at the port of Arica, which performs the inspection and verification of cargo into Bolivia. Critics have pointed out, however, that an agreement between the Antofagasta Terminal Internacional (ATI), which is the manager of the Arica port, and ASP-B on how they interact with each other would further increase the efficiency of cargo throughput.^c

^a Uprety 2006.

^b IADB 1982.

^c Escobari 2012.

Box 17: Cross-border provisions for mining related railway corridor in Cameroon

Sundance Resources Limited, an Australian company, has proposed the development of iron-ore deposits in Mbalam (southeast Cameroon) and in Nabeba (across the border in the Republic of Congo). The project would involve construction of a 510km railway line from the Mbalam concession to a greenfield port along the coast of Cameroon, and a 70km rail spur link to the Nabeba concession across the border.

The Mbalam concession agreement, which was signed between Sundance and the Government of Cameroon on November 29, 2012, provides for multi-user access on the railway line and addresses cross-border rail movements: (i) goods shipped to the Nabeba concession and exchanged between operations on either side of the border are to pass freely, without the imposition of customs duties, excise duties, tax charges, foreign exchange restrictions, tolls, or inspections costs; and (ii) the cross-border movement of trains is to be monitored electronically, so that trains will not have to stop at the border for inspections.

resources. For example, the Southern and Eastern African Mineral Centre (SEAMIC) in Dar es Salaam is an independent center of knowledge and information for southern and eastern Africa established in 1977, under the guidance of UNECA. SEAMIC offers a wide range of educational, geological, geophysical and laboratory services to its members

RECs also have been involved in the planning of investments that involve more than one country, but only to a limited extent. For example, the NEPAD Infrastructure Project Preparation Facility at the AfDB assists individual countries and RECs to prepare infrastructure projects that transcend borders, although between 2008 and 2010 it had only achieved three projects (UNECA 2010). RECs also help to improve relations among regional countries and provide a forum and secretariat that can help resolve intra-regional disputes.

The Nacala and LAPSET Corridors show how critical the settlement of a cross-border arrangement is to ensure the political stability and the operability of the corridor:

2.3.1 *Nacala Corridor—The importance of bilateral cooperation*

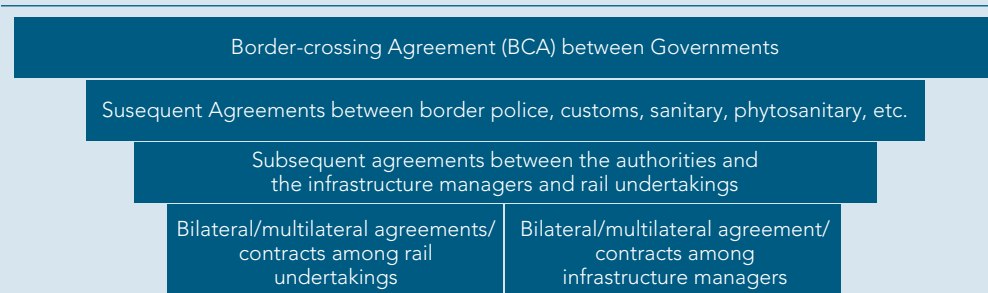
The 2010 Nacala Corridor Assessment⁴² found that logistical issues, such as locomotive and wagon availability and utilization, slow train speeds, and poor timeliness of services, were a major bottleneck for the railway corridor. Vale, as the operator of the coal, general cargo and passenger trains, is in a position to address these problems. However, lengthy administrative processes and unforeseeable delays at the border posts are a significant risk for Vale, as the trains have to pass two border crossings (Box 18 describes arrangements in Europe to facilitate border crossings). Bilateral coordination between the governments of Mozambique and Malawi to reduce waiting

⁴² USAID 2010.

Box 18: Border-crossing agreement in South-Eastern Europe and the Joint Border Zone

The Border-Crossing Agreement (BCA) is a harmonized framework developed for South East European countries to simplify border train dispatching and reduce wait times at border crossings.^a This framework is implemented on a bilateral basis between states collaborating on cross-border infrastructure arrangements. For instance, it was adopted in an agreement between Serbia and Bulgaria in relation to the Dragoman and Dimitrovgrad borders.^b

The five key principles of the framework are to promote: “(i) compliance with open access standards that are required by EU directives; (ii) the introduction of the concept of a Joint Border Zone; (iii) cooperation between border authorities—in particular, the possibility for the border authority of one country to be active in a neighboring country; (iv) police and customs control over moving trains; and (v) the establishment of border-crossing commissions for open access border-crossings.”^c The BCA is the key framework document underpinning the various other agreements relating to border-crossings, as shown in the figure below:



Source: Uhl (2010).

In the Joint Border Zone, a feature that is critical to the BCA, the laws and regulations of the other state are valid, so that persons and goods are treated with the same legal consequences as if they were in their own state.^d Rail infrastructure is managed by the two national infrastructure managers. The rail company “can carry out the necessary technical and commercial dispatching, change locomotives and rail personnel, and carry out the actions required by the respective border authorities—border police, customs, phytosanitary, sanitary, veterinary health authorities, among others—according to the rules and regulations established by the two infrastructure managers and the respective national border authorities.”^e

^a SEETO 2012.

^b See Uhl and Jankovic.

^c Monsalve 2011.

^d “The state to which the territory belongs carries out the procedures before the authorities of the other state carry out their procedures. It also includes actions such a police intervention and the putting into custody of persons with the exceptions that have to be agreed in the agreement or in a separate agreement between the customs and police authorities of the two countries.” (Monsalve 2011.)

^e Monsalve 2011.

times at the border and to streamline customs procedures are therefore crucial for the company. Vale has engaged with the SADC secretariat in order to address this issue.⁴³ The harmonization of customs procedures, which is not necessarily railway- or corridor-specific, could help to improve the efficiency of trade all along the Mozambique/Malawi border.

The SADC protocol provides a useful framework for the regional integration of the railway network. Under the protocol, member countries agree to facilitate the provision of a seamless, efficient, predictable, cost-effective, safe and environmentally friendly railway service that is responsive to market needs and provides access to major centers of population and economic activity (Chapter 7 of the Protocol on Transport, Communication and Meteorology addresses SADC's position on railways).⁴⁴ However, Malawi, Mozambique, and Zambia must be the driving force to implement the necessary changes to guarantee a functioning Nacala corridor. The political will to achieve these changes is evidenced by the Mozambique-Malawi bilateral trade agreement, the trivariate MoU to develop the Nacala corridor, and the recent APEI initiative to improve cross-border trade among these three countries. However, implementation has not yet lived up to the goals of these documents.

2.3.2 *The LAPSET Corridor—The need for regional agreements*

A binding agreement would overcome obstacles to cooperation along the corridor. Such an agreement among the principal partners in the LAPSET corridor could reduce the potential for disputes concerning access, cost-sharing, and pricing, as well as reduce the likelihood of countries imposing barriers to trade, such as tariffs, quotas, taxes, and administrative red tape that could sabotage the project. Neither South Sudan nor Ethiopia are among Kenya's major trading partners (these are Tanzania and Uganda and, secondly, the other Great Lakes nations, including Rwanda). Currently, coordination for LAPSET between Kenya and South Sudan and between Kenya and Ethiopia is based on MoUs, which pertain mostly to issues of fund-raising, planning and development, rather than operations and regulation.⁴⁵ Moreover, as South Sudan and Ethiopia are not members of the East African Community, trade relations between them and Kenya do not benefit from provisions in these regional arrangements. More binding agreements among South Sudan, Ethiopia and Kenya, as well as the former two countries joining the East African Community, would reduce operational and regulatory risks surrounding LAPSET. On the other hand, South Sudan and Ethiopia joining the EAC could increase some of the well-documented problems surrounding the often overlapping, and sometimes conflicting, nature of these frameworks. This potential problem also pertains to Uganda's possible involvement in LAPSET.

⁴³ Interview with Vale Mozambique, 2014.

⁴⁴ Southern African Development Community 1996. Provisions include a harmonized regional railway policy, which foresees the development of supportive regulatory legislation (article 7.2); common standards for infrastructure and rolling stock (articles 7.3 and 7.5); operational cooperation by, among other things, establishing a single railway invoicing system which is acceptable for customs clearance throughout SADC and compatible with other transport modes (7.4); and setting up a railway route management group that will serve as a consultative body in order to improve the efficiency of the corridor (article 7.8).

⁴⁵ LAPSET Development Authority website, available at: <http://www.lapsset.go.ke/bilateral>, last accessed: August 23, 2014.

2.4 Summary of policy implications

Planning for open access at an early stage in project preparation is essential to ensure that technical specifications (e.g. the railway gauge or pipeline structure) are consistent with the requirements of potential users, and that the demand from the mining project does not permanently exhaust carrying capacity. This becomes especially important when third party users are not identified at the construction phase, but may require access once the corridor is already in operation. Open access provisions must be based on objective criteria so that disputes can be adjudicated effectively: for example, the lack of technical specifications in Liberia's open access requirements has impeded enforcement. Requiring separate ownership of the mines and transport infrastructure can encourage open access, because the transport operator has an incentive to maximize use. However, difficulties in coordination and in obtaining adequate finance may make integrated user concessions the only feasible means of achieving some inter-state extractive resource projects.

Successful enforcement of open access rules requires legislation defining the regulatory institution's responsibilities, strong regulatory provisions, an effective and independent regulator, and provision for the adjudication of disputes by either the regulator or the courts. Combining the functions of regulator, owner and operator of government-owned resources does not provide the oversight critical to efficient exploitation. Mining investments benefit from stable regulatory frameworks, although some care should be taken in the design of stabilization agreements that guarantee firms against adverse changes in rules, given the uncertainty over future conditions and the limited ability of current governments to constrain future governments.

Contractual safeguards can be used to ensure that the public enjoys the long-term benefits of project development, for example through build-operate-transfer concessions where ownership is eventually transferred to the government, by retaining ownership of the right of way so that other forms of infrastructure (e.g., fiber optic cable) can benefit from the clearance of routes, and by providing for adequate government influence over decision making (e.g., by taking an equity stake or requiring a golden share).

Effective collaboration between governments is essential to achieve rational cost sharing, adequate provision for maintenance, and appropriate pricing. Some form of commitment, for example the passage of legislation, may be necessary to establish the credibility required for effective cooperation. Agreement on measures to speed customs clearances and overcome potential logistics bottlenecks is critical for corridor efficiency. RECs can contribute to inter-state coordination by continued efforts to reduce trade barriers and harmonize import requirements, by participating in the planning of regional extractive resources projects, and by serving as a forum for resolving disputes.

Although the focus of this paper is on infrastructure, it does not mean that infrastructure alone can ensure that extractive resources investments contribute to regional integration and development. Equally important are institutional reforms to improve the business climate, improved logistics performance, and investment in education.

Political Economy Challenges to Regional Extractive Resource Projects

3

Hydrocarbon and mineral wealth in Sub-Saharan Africa often has been associated with a deterioration of political institutions, limited economic development and, in extreme cases, armed conflict. These political economy challenges also affect the development impact of cross-border extractive resource projects. In addition, the different strategic and political interests of participating states can impede cross-border projects. The LAPSSET and Northern Corridors illustrate how competing state interests can impede the development of extractive resources that require regional cooperation. In turn, the Nacala Corridor illustrates how an alignment of the interests of major stakeholders can support a cross-border infrastructure project.

This chapter first considers how the availability of extractive resources can erode domestic political institutions in the African context. It then discusses how political economy issues can impair the efficiency of cross-border extractive resources projects, and the role that regional organizations, governments, donors, and the private sector can play in resolving the challenges facing cooperation.

3.1 Mineral and oil wealth in Africa has been associated with a deterioration of domestic institutions

The experience of Equatorial Guinea demonstrates how oil wealth does not necessarily result in development. The exploitation of oil has boosted GDP growth to nearly 17 percent per year since 2000. The country has a population of 736,300 and produces over 300,000 barrels of oil per day, resulting in a per capita income of about \$24,000. The World Bank classifies Equatorial Guinea as high income. Nevertheless, 60 percent of the population remains poor, and the infant mortality rate has remained constant since 2000. In 2011, Equatorial Guinea had the 45th highest per capita income (in purchasing power parity dollars of 2005) in the world but was ranked 136th according to the UN's human development indicators.⁴⁶ In many cases, dependence on extractive resources has been associated with a fall in output. Collier (2007a) finds that while resource riches and a price boom does benefit a country in the short term, the long-term effect is to reduce total output by around 25 percent.

There are many reasons for the failure of exploitation of hydrocarbons and minerals resources to result in improved economic conditions in Africa. The principal issues include: (i) the collapse of tradable sectors (especially agriculture and manufacturing) due to the “Dutch disease;” (ii) exploitation contracts that have been biased towards mining companies; (iii) overspending during commodity booms followed by sharp cutbacks when commodity prices fall, resulting in excessive macroeconomic instability that is detrimental to economic growth; (iv) poor governance, including the diversion of oil revenue to personal accounts of government officials; and (v) political instability occasioned by grievances over the mismanagement of natural resource revenues that have often resulted in coups and/or outright civil war.

The availability of extractive resources has not been supportive of democracy in African countries. On balance, the evidence suggests that dependence on natural resources does not

⁴⁶ AfDB 2013

necessarily cause a decline in democratic standards. Rather, it makes it harder for authoritarian states to transition to democracy, or for moderately democratic states to see improvements towards greater democratic consolidation.⁴⁷ The empirical evidence from research on the relationship between resource dependence and democratic consolidation in Africa confirms this general observation.⁴⁸

Even in democratic countries, an abundance of resource rents tends to fundamentally alter the nature of politics, enabling the executive to simply buy off other political agents instead of bargaining with them on the basis of political equality. The huge income from extractive resources essentially can destroy the checks and balances between executive, legislature, and courts. Instead of being representatives of their constituents, political elites become agents of the executive arm of government. Indeed, under certain conditions the combination of resource rents and democracy can be inimical to economic growth.⁴⁹ A rise in levels of political competition due to electoral democracy also creates strong incentives for market-distorting dependence on patronage.

Extractive resources wealth does not inevitably lead to a deterioration in institutions. Examples abound of countries that have fared well both economically and politically while at the same time having an abundance of natural resources, for example Chile, Finland, Malaysia, Sweden, and the United States. While their experience has been diverse, common elements in these countries' success include trade liberalization to boost domestic economic competition, investment in technology and education, targeted interventions to support firms' participation in minerals extraction and as suppliers to foreign investors, and heavy investment in infrastructure (see Box 19).

The negative impact of resource dependence on institutions is particularly strong where state capacity and institutions of accountability are weak to begin with.⁵⁰ In these countries—a category that includes most African states—endowment with natural resources is positively correlated with political and economy instability, including a higher likelihood of conflict.⁵¹ Research shows that while a typical country with no natural resources has a probability of civil conflict of 1 percent, while the risk rises to 22 percent in countries for which natural resource dependence (as a share of GDP) is 33 percent.⁵² This is because revenue windfalls from natural resources make it more attractive for armed groups or government insiders to stage a coup in order to gain control of state finances, especially if the state has weak institutions and little administrative capacity.⁵³

The presence of point resources (mining is the premiere example) in the context of weak state capacity has been singularly destabilizing in the African context. So-called “blood diamonds” and “blood coltan” have fueled particularly brutal civil wars in the Mano River region, Angola, and the Great Lakes region. This is due to the effect of point resources on the industrial organization of rebel groups.⁵⁴ In the context of civil wars, point resources encourage the formation

⁴⁷ Ulfelder 2007.

⁴⁸ Jensen and Wantchekon 2004. “

⁴⁹ Collier and Hoeffler 2009.

⁵⁰ Robinson, Trovik, and Verdier 2006. “

⁵¹ Herbst 2000.

⁵² Collier and Hoeffler 2004.

⁵³ Fearon, and Laitin 2003.

⁵⁴ Weinstein 2007.

Box 19: Benefiting from natural resources: the experience of successful countries

Several countries have capitalized on the presence of abundant natural resources to achieve rapid development.

U.S. policies encouraged the development of mineral resources (Wright 1997), and resource intensity was a pervasive feature of the country's industrial and technological development (Wright and Czelusta 2004). Large-scale exploration of minerals wealth, built on huge investments in transport infrastructure and in the generation of geological knowledge, led to progress in refining and manufacturing technology. The minerals sector remains linked to technological progress.

By the middle of the 20th century, Finland's competitive energy prices, the development of a strong engineering sector, a long domestic value chain, and an efficient logistics system bolstered the prominence of mining. Imported machinery involved in minerals extraction was gradually replaced with domestically manufactured versions, which were later exported. However, it took a period of 100 years for Finland to make the transition from an importer of technology and exporter of raw materials, to a developer and exporter of a range of knowledge-intensive goods and services (Walker 2004a & 2004b).

While the government boosted efficiency by opening the domestic market to foreign companies, early resource-based industry in Finland was largely developed under state ownership. Finnish companies relied on cooperative networks and cartels in the period after the First World War to compete effectively; they also applied protective tariffs and entered into bilateral trade agreements (Walker 2004a). The government also emphasized research and development (technology centers were opened throughout Finland to promote co-operation between academics, industry, and government, leading to a growth in high-tech spin-off companies—Walker 2004a) and education (public, free education through 9th grade was instituted in the late 1960s, coupled with support for widespread access to higher education).

Sweden's commitment to education and research was critical to achieving rapid growth while building on minerals wealth (see Walker 2004a and Blomström and others 2002). The government made substantial investments in rail and electricity provision, financed from foreign borrowings and the reinvestment of export earnings. Significant in the Swedish process of industrialization was the low level of corruption in the public sector and the high degree of cooperation between public officials and the industrial workforce (Walker 2004b). Initially dependent on the export of sawn wood and iron ore, production transitioned to specialty steels, bearings, and a variety of fabricated metal products when competition from Brazil and Australia reduced Sweden's market share in iron ore (Walker 2004b).

Sweden's success was bolstered by the early liberalization of trade, exchange rate stability (exchange rates with all major trade partners were fixed under the European Free Trade Association), a tax system that provided incentives to entrepreneurs while reducing returns to rentiers (Walker 2004b quoting Korten 1995), and encouraging research and development through tax incentives and government funding.

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Box 19: Benefiting from natural resources: the experience of successful countries
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Chile has been successful in developing its economy based on mineral resources through strong institutions and regulatory oversight, investment in the development of mining-related technology and in education to increase the supply of engineers and skilled technicians, and targeted interventions to encourage development, for example supporting equipment and service providers to mining operations (Korinek 2013). Chile has generated substantial revenues from taxation of the minerals sector through higher rates for more profitable firms, and limited spending to the amount compatible with long-term income, thus reducing the cyclicity of revenues from booms and busts in minerals prices. Trade liberalization and an effective duty drawback system have supported exports. The government also has facilitated production through collection of market information and support for the formation of associations of exporters to promote Chilean products.

Finally, Malaysia has diversified its economy based on its oil, forestry, and palm oil sectors (AfDB 2013). The state-owned oil company, Petronas, played an important role in exploitation and negotiating technology transfers from multinational firms, and now competes successfully in the international market. Structural transformation and a diversification of Malaysia's economy were facilitated by macroeconomic stability, high rates of saving and investment, and economic openness. Malaysia invested heavily in energy and infrastructure and advanced telecommunication systems, and built a network of highways linking it to neighboring countries.

of rebel groups that are less centralized and therefore more anarchic and likely to engage in mass atrocities against civilians.

Africa's political geography has contributed to the negative impact of oil and mineral wealth on institutions. Ethnicity is a key organizing principle in many countries in the region,⁵⁵ and both ethnic groups and natural resources tend to be geographically concentrated. Thus disputes over the sharing of revenue from natural resources often take on an ethno-political dimension. The effects of this type of political geography are not trivial. For instance, research shows that within African states, the tax rate on primary commodities (mainly agriculture) is conditional on the ethnicity of the president.⁵⁶ Related research also shows that the relationship between ethnicity and natural resources determines the growth rate of resource dependent states.⁵⁷ These findings suggest that the design of revenue sharing and corporate social responsibility initiatives should take into account Africa's unique ethnic make-up.

On the economic front, the adverse effects of natural resources arise through different mechanisms, many of them contingent on institutional quality and state capacity. The most often

⁵⁵ Ekeh 1975.

⁵⁶ Kimuli 2007.

⁵⁷ Opalo 2014. r

cited economic effect is the “Dutch Disease”, in which the development of the natural resource sector results in an appreciation of the real exchange rate and collapse in a country’s tradable sectors.⁵⁸ The “Dutch Disease” effects are particularly acute during cycles of commodity booms. Indeed, most government projects initiated during commodity booms tend to be over budget and designed to siphon patronage.⁵⁹ It is therefore not surprising that dependence on natural resources is positively correlated with high levels of corruption.⁶⁰

Furthermore, the presence of high levels of rents from natural resources increases the likelihood of state capture by vested interests bent on controlling the economy by monopolizing strategic sectors.⁶¹ Natural resources also have structural effects on the economy that can be inimical to welfare-enhancing economic growth over the long term. The exploitation of natural resources is capital intensive and limits the extent to which a country’s labor force can learn transferable skills through learning by doing.⁶² Foreign direct investment (FDI) in manufacturing can be, on average, up to 17.5 times more labor intensive than FDI in mining. The case of Nigeria is instructive. As the country’s dependence on oil rose, capacity utilization in manufacturing dropped, from a peak of 77 percent in 1975 to about 35 percent since the mid-1980s. The decline in manufacturing had a real impact on living standards in Nigeria: between 1970–2000 the poverty rate in Nigeria increased from 36 to 70 percent.⁶³

The broad conclusion of research on resource dependence is that countries are better off if the development of strong institutions of accountability, accompanied by generally high levels of administrative capacity precedes the exploitation of natural resources is preceded. Stated differently, the presence of natural resources provides strong disincentives for elite investment in institutions of accountability. Interventions aimed at limiting the deleterious effects of resource dependence should therefore focus on reinforcing and creating multiple accountability chains. First and foremost, there must be intra-elite accountability. This means the strengthening of parliaments and granting them a greater oversight role over the natural resource sector. Intra-elite accountability is critical because groups of elites tend to be smaller and more knowledgeable than the general population, thereby facilitating collective action. Second, there must be vertical accountability. In order to prevent collusion among representatives and the executive arm of government, vertical accountability chains must be created and reinforced. This can be done through having more transparent elections, strengthening of civil society organizations, and general voter education through transparency initiatives, among other means.

Both vertical and horizontal accountability chains are important for effective management of the resource sector. Absent the former and you get collusion among elites. Without the latter, the result tends to be runaway kleptocracy. Democracy and elections alone will not ensure that resource wealth is used to promote development. There must also be strong parliaments, courts, and

⁵⁸ Trevino 2011.

⁵⁹ Collier and Gunning 1996.

⁶⁰ Caselli 2006.

⁶¹ Auty 2007.

⁶² Matsuyama 1992.

⁶³ Sala-i-Martin and Subramanian 2003.

civil society organizations that can effectively balance each other and provide voters with actionable information about the management of the resource sector. Transparency and openness initiatives must be designed in a manner to make their outputs both legible and actionable from the perspective of the lay public, so that these initiatives can complement the existing political channels of accountability to voters.

3.2 Achieving and maintaining agreement on efficient exploitation strategies has proved challenging

Domestic political and economic considerations, administrative arrangements, limited technical capacity, and competing strategic interests can impede the inter-state cooperation required to exploit extractive resources efficiently. Moreover, conflicts between the strategic interests of states and the profit motivation of extractive resource companies can lead to sub-optimal compromises and significant delays. One example of how domestic political considerations affect negotiations over joint infrastructure projects is the LAPSSET project in East Africa. In some of the countries involved, the timing of elections has been an important source of pressure for rapid progress, as administrations or political parties wish to begin oil exploitation while they are in power. In Kenya, tension has emerged over land deals connected to the LAPSSETT project. Media reports of well-connected individuals and companies illegally acquiring community lands in speculative ventures along the proposed LAPSSET corridor led to violence in Lamu and rumbling among affected communities.⁶⁴

Similarly, political issues may affect the timing and feasibility of efforts to exploit Guinea's iron ore reserves. The fact that national elections must be held in 2015 will provide a further impetus to speed development of the ore deposits, particularly since Guinea Forestiere—where much of the country's iron deposits are located—is predicted to be the swing region in the presidential election. In neighboring Liberia, one possible route for the shipment of Guinea's iron ore to the sea, political conditions in the run up to the 2017 elections are likely to remain extremely sensitive. After the recent peace settlement, the United Nations Mission in Liberia remains in charge of everyday policing, the manning of prisons, and the protection of senior government officials. Maintaining the political stability required for massive investment in transport infrastructure in the context of continuing ethnic tensions and the unsettled security situation will be a challenge.

The negotiations over fixing the location of transport lines can be further complicated by developmental issues. Tanzania and Uganda are particularly concerned with ensuring that the exploitation of natural resources is linked to rapid development. Thus, Uganda wishes to construct an oil refinery to process crude, while Tanzania plans to establish gas-fired plants to export power to Kenya before constructing a pipeline to ship gas to Mombasa to generate power. Tanzania also prefers to locate any LNG plants designed for the Asian markets onshore, to increase demand for

⁶⁴ The Star 2014.

local workers and suppliers. These issues have been difficult to resolve, given that the proposals would raise the costs of projects and therefore reduce the incentive for, or scale of, participation by the international extractive industry firms.

On the other hand, extractive resources as “cash cows,” whose developmental impact is limited to the generation of revenues for investment in other sectors, also has its perils. In the context of weak institutions, there is no guarantee that the revenues generated will be used for efficient investments, while ignoring opportunities to use extractive resources to support other sectors will increase the dangers of Dutch disease. Thus, a fine line must be negotiated between imposing excessive costs on projects in the interests of development, versus choosing investments that are low cost but increase a country’s dependence on the minerals and oil sectors.

The structure of the domestic private sector can affect negotiations over mineral projects. In some countries, most of the larger private enterprises are owned by foreigners, who are not well placed to have a substantial impact on politically charged reforms, such as whether development is focused on regional trade. These firms often exercise their influence by finding informal means to affect enforcement of existing policies, rather than pushing for comprehensive policy changes. Thus, the private sector often does not become an effective source of pressure for the comprehensive reforms to the trade and investment regimes that are often necessary for extractive resources projects to have a positive impact on development.

The nature of administrative arrangements can also have a major impact on natural resource projects. Reaching and maintaining a commitment to agreements with other states and international firms can be easier where political power is centralized within a few institutions. For example, the long conflict with Sudan and the existential nature of the challenge presented by finding an alternative outlet for oil resources has meant that the South Sudan military plays a major role in discussions over infrastructure projects. By contrast, reaching political consensus can be more complicated in Liberia, where several agencies, including the Ministry of Finance, the Liberia Investment Commission, the National Bureau of Concessions, the Ministry of Lands, Mines and Energy, the president’s Economic Management Team, and the House of Representatives have a say in the process of contract approval. And in Tanzania, the ongoing constitutional review process that will determine the key institutional environment governing the oil and gas sector will have to resolve Zanzibar’s request for greater autonomy in the management of its affairs, including its oil and gas sector. It is uncertain whether a comprehensive law will be passed before the election, as disagreements have stalled the process several times. The decentralized nature of political influence can result in high costs of negotiations for potential investors and other states.

Limited technical capacity, or the limited influence of technocrats versus political elites, can increase reliance on donors and multinational companies in extractive resources planning and the formulation of contract provisions. For example, it appears that the Ministry of Commerce and Industry (MOCI) in Liberia is not as involved in policy development and implementation as some other ministries and the Office of the President. While close political attention to mining issues is essential, given their enormous economic importance, a strong technocratic influence is also critical to ensure appropriate consideration of the economic impact of infrastructure investments.

The pursuit of individual countries' interests can also lead to excessive competition in the provision of infrastructure. One example concerns various proposals for the construction of port facilities in East Africa. In order to compete for the regional market, Tanzania has recently signed an agreement with China to build a port at Bagamoyo, which reportedly will be bigger than both the Dar es Salaam and Mombasa ports combined.⁶⁵ Interestingly, China has also played a leading role in container infrastructure at Mombasa port, as well as oil pipeline and railway investments throughout Kenya.⁶⁶ This competition between the two leading trading hubs of the region endangers the rationalization of infrastructure investments according to anchor projects, distance and comparative advantages, which could lead to the underutilization of the infrastructure once completed. If, for example, the northern part of East Africa further improves the hard and soft infrastructure through coordination and regional integration, even more traffic might be diverted from the Central Corridor to the Northern Corridor, thereby making the planned investments in Tanzania, such as the Bagamoyo port, financially unviable. On the other hand, careful planning could ensure that the new ports in East Africa serve complementary functions (Box 20).

Box 20: The potential for competition between ports in East Africa

The increase in traffic in East Africa and its corresponding bottlenecks, as well as the potential construction of Lamu port, have led governments to rethink the equilibrium and the complementarity of infrastructure in the region. The plan seems to be best summarized as: competition within ports, through the introduction of private terminal operators, but not between ports, which should be looking for complementarity and specialization. While this plan is regularly discussed at the regional and national levels in East Africa, it is unlikely that Tanzania and Kenya are prepared to accept giving up on competition for the same cargo.

The first step for a more efficient regional port infrastructure system would be to convert the ports of Mombasa and Dar es Salaam from a service to a landlord port model,^a which foresees the state retaining the port infrastructure and regulatory functions, while the private sector is put in charge of port operations. African and international experiences show that this model has often proved to be more efficient than having the public sector perform all of these functions. The ports of Rotterdam, Antwerp, New York, Singapore, as well as Abidjan, Tema, Takoradi, Luanda, and Douala, are all examples of landlord ports that function relatively well. This can largely be traced back to private terminal handling companies, such as Bolloré, being better at adjusting to market requirements and making the necessary investments to handle more cargo. However, there is the risk of overcapacity resulting from various private operators competing for the same customers.^b

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⁶⁵ Tracking China Development Finance website: “\$10 Billion Bagamoyo Port Project,” available at: <http://china.aidda-ta.org/projects/30332>

⁶⁶ African Business Magazine 2014.

Box 20: The potential for competition between ports in East Africa *(continued)*

There is also a pressing need to cater for increased container throughput and build a regional container hub similar to Durban port. Mombasa may be able to cater for additional container throughput, especially if Lamu port, which will be able to handle the larger cargo ships anticipated in Asia following the planned expansion of the Panama Canal,^c specializes in bulk cargoes and frees up space at Mombasa. Under this scenario, Lamu and Mombasa ports would complement each other.^d For this to materialize, the Northern Corridor rail and road network would have to be connected to the LAPSET Corridor. A discussion about potential export routes with the mining companies currently owning exploration licenses in the region could also inform the debate. Such infrastructure may also encourage the exploration of the iron ore and coal deposits in Kenya's Mui basin.^e With Lamu port servicing heavy bulk cargo, Mombasa port could service less bulky commodities such as gold, copper, and nickel concentrate.^f

The construction of the LAPSET Corridor is not expected to cause major congestion at Mombasa port, as the Mombasa port is in the process of increasing its capacity to be able to handle double its current container capacity. Moreover, the first phase of the project foresees the construction of three berths at Lamu port, which would guarantee another entry point for machinery and materials necessary for the construction of the LAPSET Corridor.^g

^a This is an agenda pushed by the donors such as the World Bank and JICA (see: Briceño-Garmendia and Shkaratan, 2011; JICA, 2009) but also endorsed by the government of Kenya and Tanzania according to JICA and SADC (Master Plan).

^b JICA 2009.

^c Stratfor Global Intelligence 2013.

^d Lamu will of course host container terminals (source: Skyscrapercity website, available at: <http://www.skyscrapercity.com/showthread.php?t=856442&page=16>) but relatively speaking Mombasa, given its proximity to urban areas and industrial activities will be more suited to build a comparative advantage on container cargos.

^e Africon 2011.

^f Such as: The hydrocarbon resources of the DRC (Lakes Kivu & Albert), Rwanda (Lake Kivu), Uganda (Lake Albert) and Sudan; The nickel deposits of Burundi at Musongati and Muremera; – The copper cobalt deposits and stockpiles in Uganda at Kalembe; Kwale mineral sands in Kenya (source: "RSDI & NEPAD Spatial Development Program: UNECA Presentation," The Department of Trade & Industry - International Trade and Economic Development Division, South Africa, 2008, available at <http://www.mcli.co.za/mcli-web/events/2008/23jul2008/RSDI%20Presentation%20to%20UNECA%20ws%20July%202008.pdf>).

^g Interview with Godfrey Onyango, former executive secretary of the NCTTA, August 2014; Government of Kenya (Ministry of Transport), Japan Port Consultants and BAC/GKA "Lapsset Corridor and New Lamu Port Feasibility Study and Master Plans Report," (March 2011). See also the Lamu Port project website, available at: <http://www.lapsset.go.ke/lamu> (last accessed August 23, 2014).

Establishing a legally binding framework, under both international and domestic law, is often necessary to ensure the permanence of inter-state agreements on the exploitation of natural resources. An intergovernmental agreement that includes binding terms on how cross-border operational, managerial, and technical issues are to be addressed will reduce the risk to both the potential users of the infrastructure and the financiers. Such an agreement should set out the types of goods that will be transported on railway lines established to service the mines, the principle of transit cargo, and the open access rules. The establishment of an intergovernmental rail authority to help supervise the tariff structure and pricing mechanisms of rail services, as well as to adjudicate disputes, could be particularly helpful, although there are no examples of such an authority in the African context.

3.2.1 LAPSSET Corridor: Political and economic considerations affect interstate coordination

Depending on the ultimate design of transport links, the LAPSSET Corridor may involve coordination among Kenya, Tanzania, Uganda, the South Sudan, and Ethiopia. A functional regional oil pipeline and port would increase profitability (through scale/efficiency gains), reduce the uncertainty affecting South Sudan and Uganda's oil sectors, and ensure the commercial viability of emerging oil plays in northern Kenya and Ethiopia. However, the promise of the LAPSSET Corridor as a multifaceted, multi-component infrastructure project is to unlock regional trade—in particular, by opening up markets and trade between Kenya (as the dominant economy of East Africa), South Sudan (a new nation in search of new economic and political allies) and Ethiopia (a populous country with massive growth potential). Tanzania has natural gas deposits that could be used to generate power domestically and in Kenya, depending on the construction of a pipeline. While all these countries stand to benefit from a successful LAPSSET Corridor, the expected benefit for each country varies, and depends critically on project design. Thus, the Corridor has become a major issue in regional politics.

Kenya is the driving force behind the proposed LAPSSET Corridor. For Kenya, the narrow focus on the pipeline revolves around its objective of being the route of choice by neighboring countries to market their oil and gas. Given Kenya's anticipated need for a pipeline of its own (for oil and gas finds in north-west Kenya), there are benefits related to economies of scale from establishing links to the pipeline to South Sudan and Ethiopia (and potentially to Uganda, which, due to the waxy nature of its oil, would require different technical specifications around the pipeline). Kenya has the clear objective of being the infrastructure fulcrum for the emerging regional energy sector.

The benefits to Kenya, however, extend beyond oil and gas. In part to ensure that South Sudan and Ethiopia do not pursue alternative pipelines (such as to Djibouti), Kenya has crafted a broader vision for the LAPSSET Corridor, one that offers South Sudan, Ethiopia, and potentially Uganda (all landlocked) access to global and regional markets.⁶⁷ For Kenya, a burgeoning trade relationship with Ethiopia is of great strategic importance.

For Ethiopia, deeper trade links with Kenya, the biggest economy in East Africa, and access to Asian and Middle Eastern export markets through the Lamu port are potentially very attractive. Moreover, links to an established oil and gas pipeline and export infrastructure would give renewed impetus to exploration and investment in Ethiopia's burgeoning carbon sector. South Sudan's participation is critical for the pipeline's viability, especially if Uganda does not participate, and the government is determined to find an alternative to Sudan to export its oil.⁶⁸

⁶⁷ Government of Kenya, "Vision 2030 Development Plan," available at: http://www.vision2030.go.ke/index.php/pillars/project/macro_enablers/181 (last visited August 23, 2014), and Statement by the Heads of State of Kenya, Uganda, Ethiopia and South Sudan on the Lamu Port Southern Sudan-Ethiopia Transport Corridor Project, July 31, 2014, available at: <http://allafrica.com/stories/201408010252.html> (last visited August 23, 2014).

⁶⁸ "South Sudan's Kiir says Khartoum using pipeline as 'weapon of threat,'" *South Sudan Tribune*, June 31, 2013; and "Oil dependence is South Sudan's boon—and bane," *The National* (UAE), September 10, 2013, available at: <http://www.sudantribune.com/spip.php?article46995>; and "Oil dependence is South Sudan's boon—and bane," *The National* (UAE), 10 September 2013, <http://www.thenational.ae/business/industry-insights/economics/oil-dependence-is-south-sudans-boon-and-bane>.

Both South Sudan and Ethiopia do, however, have alternatives to the LAPSSET pipeline, notably through Djibouti. Some experts⁶⁹ have argued that, judged in isolation, a pipeline to Djibouti could make more sense—certainly for Ethiopia, but potentially also for South Sudan. Also, given the distances and costs involved, a pipeline to Djibouti could be built more quickly than one to Lamu, especially if the Djibouti route were limited to a pipeline project. On the other hand, South Sudan has strong political ties to Kenya and Uganda, who supported South Sudan’s independence. Moreover, South Sudan would benefit from the wider commercial and trade links (through rail and road) with other East African countries that the entire LAPSSET project would bring. In particular, the prospect of joining the East African Community (EAC) is an incentive for both South Sudan and Ethiopia to build the pipeline through their territories. Entry into the EAC is an important benefit for South Sudan, as it is a land-locked country and nearly all imported products come into the country through Uganda. Nevertheless, South Sudan’s entry into the EAC is not yet certain, and thus neither is the argument that access to the EAC outweighs the additional costs of the more expensive pipeline route.

Landlocked Uganda has substantial unexploited oil deposits, which will require transport through another country to reach the coast. However, Uganda was not originally part of the LAPSSET vision, having indicated its initial preference for piping its oil through Tanzania to Dar es Salaam. Much of Kampala’s resistance to the LAPSSET Corridor was attributed to its (and Tanzania’s) intra-regional political and economic rivalry with Kenya.⁷⁰ However, the Kenyatta government in Kenya has made a major effort to bring Kampala back to the discussion table, which resulted in the inclusion of the Ugandan head of state in a recent four-country leadership summit on the LAPSSET Corridor, hosted in Nairobi.⁷¹ Uganda’s cost-benefit assessment of the Lamu vs. Dar es Salaam calculation remains complex and multi-faceted; however, as a landlocked country with already-expensive costs of extraction, the country urgently needs to gain access to a viable pipeline.

The feasibility study of the LAPSSET Corridor includes many different projects, apparently, at least in part, to accommodate the interests of the different countries. However, with the exception of the pipeline and possibly the Lamu port (as a result of the congestion in Mombasa), it is unclear how these projects will be financed. It remains to be seen whether the pipeline project will be prioritized in order to dissuade South Sudan and Uganda from agreeing to alternative oil export routes, or whether Kenya and Ethiopia will insist on the simultaneous development of the other projects in the feasibility study, thereby risking a delay in the implementation of the LAPSSET Corridor. Kenya has already issued RFPs for an oil pipeline linking Uganda’s oil deposits at Hoima with Kenya’s port at Lamu, and the heads of state of Uganda and Kenya signed a memorandum of understanding on the project. However, the MoU includes a rider that guarantees that the “cheapest” route for evacuating oil will be used. Whether this will have any bearing on the ultimate design of the project remains to be seen.

⁶⁹ “Grand Kenya port plan faces headwinds despite oil finds”, *Reuters*, August 30 2013, available at: <http://uk.reuters.com/article/2013/08/30/kenya-port-idUKL6N0GT17F20130830>; and “All eyes on South Sudan as Kenya, Uganda push for Lapsset corridor project”, *The East African*, October 26, 2013, available at: <http://www.theeastafrican.co.ke/news/Eyes-on-South-Sudan-as-Kenya-Uganda-push-for-Lapsset-project/-/2558/2048206/-/ivygvo/-/index.html>

⁷⁰ York 2012.

⁷¹ Government of Kenya, Office of the Presidency 2014,

Concerns about the costs involved in LAPSSET need to be resolved. Kenya plans to have a trio of roads, railways, and pipelines to transport oil and other goods. Given the current size of the market, it is unclear whether it will be economically viable to have all three, especially given the fact that railways and pipelines can be easily substituted. All the countries involved in the LAPSSET project will incur substantial commercial debt during the construction phase, so ensuring an appropriate return will have important implications for the macroeconomic program. Of course, the ultimate design of the project has not been determined, and agreement by all potential participants has not been secured.

3.2.2 The Guinea-Liberia Corridor: The power of the country where the natural resources are located

The cost savings and shorter time to develop required infrastructure provide a strong incentive for the mining companies to lobby for the export route via Liberia. Liberia would also gain from a cross-border Simandou-Nimba-Liberia transport corridor. In 2010, the Liberian Ministry of Planning and Economic Affairs (MoPEA) published a study on development corridors, which stated that "...the development corridor strategy will allow growth to accelerate by crowding in investment, creating synergies among diverse activities along growth axes where users can share road, rail, port, power, telecommunications and water infrastructure."⁷² The same study identified the Nimba-Buchanan corridor, with ArcelorMittal's operations as an anchor mining project, as one of the main growth corridors, with possibilities to extend into southeast Guinea. The government of Guinea, however, has maintained that Simandou's reserves would be shipped via a yet to be constructed, 670 km trans-Guinean railway line from the southeast of the country to a port near Conakry.

The Government argues that the gains from developing the Southern Growth Corridor within Guinea outweigh those from transporting the ore through Liberia. The latter include lower capital costs and operational expenses, potentially achieving access to the Nimba iron-ore reserves, and greater regional integration. On the other hand, preliminary estimates indicate that the Southern Corridor through Guinea could add as much as \$3 billion to Guinea's GDP, which was half the size of the economy in 2011.⁷³ As Guinea's State Minister of Mines and Geology, Kerfalla Yansané, announced in the joint press release issued following the conclusion of the signing of the Rio Tinto investment framework: "This estimated US\$20 billion project, aiming to develop blocks 3 and 4 of Simandou along with the infrastructure [connecting Simandou to Conakry], will boost Guinea's whole economy and spur our Southern Growth Corridor through mining, agriculture, forestry, livestock, and trade. It's about unlocking our huge potential, supporting our efforts to tackle poverty through jobs creation and economic diversification, and getting more attractive to foreign direct investment."⁷⁴

Guinea stands to gain a substantial increase in transport infrastructure from the project. New construction would include (i) a 650km multi-purpose railway line, which will offer both a

⁷² Ministry of Planning and Economic Affairs 2010.

⁷³ Dobbin international 2013.

⁷⁴ Government of Guinea, Rio Tinto, Chinalco and the IFC Joint Press Release 2014.

passenger service with 6-7 stops on the eastern side of the Mamou mountain range and a general freight service that can transport agricultural produce and timber along the entire corridor once a week; and (ii) a multi-purpose deep-sea port in Fourécariah just south of Conakry. The construction of the new infrastructure has the potential to facilitate trade and create considerable employment opportunities in Guinea. At the peak of its construction, an estimated 18,000 people will be employed by the project, at least 50 percent of which will be Guineans. The construction and operation of the new rail and port infrastructure also will lead to the establishment of new business and jobs in other industries like agriculture, as well as considerable local procurement opportunities. The Government of Guinea envisages that “hub towns” such as Forécariah will emerge along the corridor based on the provision of services generated by the project.⁷⁵

Disagreement over the route for evacuating iron ore from Simandou has delayed the project. While an in depth cost-benefit analysis to determine whether the cross-border or Guinea-Conakry corridor solution is more beneficial to Guinea and the region is beyond the scope of this study, it is clear that the corridor route and the request by the government to grant third-party access to the railway line, which further increases the operating costs due to a loss of efficiency,⁷⁶ has been a major issue of contention and reason for delay of the project. Rio Tinto has held rights to the Simandou blocks since 1997, and under a 2011 deal to settle past disputes, agreed to start production in 2015. The start date was pushed back to 2018 due to the difficulty of obtaining infrastructure funding⁷⁷ and it has recently been reported that the Government and Rio Tinto acknowledge that the new target date might not be met.⁷⁸ The limited availability of financing, sharp fall in iron ore prices and new iron ore projects coming on-stream in the coming years have reduced for the appetite high-risk, greenfield projects. The recent purchase of mining rights in southeast Guinea by ArcelorMittal, which insists that its operations in the country will be conditional on being able to use the Liberia route, has placed further impetus on the latter. Some mining companies appear to have withdrawn from exploitation of ore in southeast Guinea due to concerns over the cost of the trans-Guinean route. For example, before the ArcelorMittal deal, Brazilian company B&A Mineracao pulled out of talks to buy BHP Billiton’s stake in Euronimba over fears of political stability and the strict Guinean policy against ore evacuation through the much cheaper Liberia route.⁷⁹

3.2.3 The Nacala Corridor: Competing pressures surrounding the development of resource-based transport infrastructure

A functioning Nacala railway corridor could harm existing transport providers. In offering the hinterland countries a low-cost and timely export route, the corridor could harm trucking companies and those countries in the region that are currently benefitting from cargo throughput from/ to Malawi and Zambia, or foresee playing a major cargo transit role in the future. The influence of

⁷⁵ IFC Sustainability Exchange 2014.

⁷⁶ Toledano et al. 2014.

⁷⁷ Santhebennur 2013.

⁷⁸ Wilson and Burgis 2014.

⁷⁹ Wilson and Burgis 2014.

these interest groups should not be underestimated. The 2003 Malawi Diagnostic Trade Integration Study (DTIS) highlighted the problem of the domestic trucker cartel pushing up internal transport costs, and recommended addressing this issue by ensuring access by foreign truckers. According to the 2013 Malawi DTIS (10 years later), improvements have only partially been achieved, as there has been strong resistance from the domestic cartel, which include politician investors.⁸⁰ The truckers are likely to view the railway corridor as a direct competitor for business. If this interest group has strong ties to decision makers, this could potentially be a stumbling block to improving rail operations in Malawi (thereby affecting potential rail cargo throughput to Zambia).

The countries that potentially would see trade diversion as a result of a functioning Nacala corridor are South Africa and Tanzania. Zambia primarily uses the North-South and Central Corridors for trade. Some 20 percent of Malawian exports are routed via Durban port,⁸¹ which trading agents continue to use despite its longer distance than the Nacala and Beira Corridors, due to its higher reliability. Both Tanzania and South Africa therefore have an interest in promoting the continued use and expansion of the North-South and Central Corridors. These countries are the largest economies in the SADC, and their significant influence on the REC's decisions may have affected the rating of these two corridors as high priority in the SADC Regional Infrastructure Master Plan, while Beira and Nacala are only rated as medium priority (see below). To accelerate progress in regional trade integration, Malawi, Mauritius, Mozambique, Seychelles and Zambia (which includes the three key countries affected by the Nacala Corridor) launched the Accelerated Program for Economic Integration (APEI) initiative in September 2012. The initiative aims to increase trade among the signature countries by improving the business environment, eliminating trade barriers, promoting trade-in-services, and building capacity through peer-to-peer learning.⁸² This initiative has the potential to revitalize the efforts to improve the “soft” infrastructure along the Nacala Corridor and reflects an alignment of interests among the countries who may reap the largest benefits from the corridor.

3.3 Strengthening democratic processes and legal institutions can achieve more efficient infrastructure investment

Transparency can bring to light corruption and inefficiencies that impair cross-border infrastructure investments. International initiatives, including the African Peer Review Mechanism, Extractive Industry Transparency Initiative, Kimberly Process, Revenue Watch, and OECD guidance can be useful in formulating rules for transparency that reflect best practice, and serve as a commitment mechanism to improve trust and facilitate the work of domestic organizations that lobby for improved transparency. Pressures for transparency in the exploitation of natural resources are building internationally, and governments in countries where oil and mining companies are

⁸⁰ Hoppe et al. 2013.

⁸¹ Raballand and Whitworth 2011.

⁸² Van Hove 2012.

located are serving as an increasing source of information on contracts. For example, the U.S. Dodd-Frank Act 2010 (Section 1054) requires that U.S.-listed companies report payments to host governments on a project by project basis. Similar initiatives in Canada (host to several mining companies) and the European Union will soon require disclosures by mining companies to accompany regulatory filings. The EU's Transparency and Accounting Directives require country-by-country reporting by companies in the natural resource sector (including logging, which is not covered by the Dodd-Frank Act).⁸³ The U.S. Security and Exchange Commission has the EDGAR depository of regulatory filings, Canada has SEDAR, and the European Union is currently working on a disclosure law that will also allow for easy access to contracts filed by mining companies.

Obstacles to transparency can be formidable. Strong political pressures, coupled with the desire by extractive industry companies to maintain proprietary secrets and avoid exposure of contract terms that could impair their competitive position in negotiations with other countries, have limited the availability of public information. In East Africa, only Tanzania has met the requirements for EITI membership. The main information on contract terms has come in the form of Model Production Sharing Agreements (MPSA) that provide little information on the actual structure of contracts. The potential benefits and difficulties involved in transparency were illustrated when the terms of the production sharing agreement between the Norwegian company Statoil and Tanzania's TPDC were revealed.⁸⁴ The Statoil PSA caused an uproar as it revealed a worse deal than stipulated in Tanzania's own MPSA. Estimates suggest that conditional on total annual output, Tanzania could lose as much as \$400 million compared to the MPSA published by the government. One positive step is Guinea's decision to publish all the mining contracts signed in Guinea since independence in 1958.⁸⁵

Involvement of community interest groups and other civil society organizations can improve transparency, limit local environmental damage, and more generally protect the public interest. The Kenyan Civil Society Platform on Oil and Gas (KCSPOG) can serve as a model for a regionalized approach to advocacy for efficient development and management of the sector. It is important that such advocacy be informed by constructive engagement, aimed at not only highlighting government and oil company misdeeds, but also at developing capacity for formulating solutions.

Taking into account the interests of host communities can ease opposition to projects that generate benefits to the country as a whole. In addition, the adverse environmental effects of extractive resource projects provide a compelling case for some compensation to local communities, although they are also better placed to gain jobs and incomes from these investments. One model is the Andean regional initiative for promoting effective corporate social responsibility, which aims to improve communication between local populations and extraction companies, while assisting local communities in building projects that encourage sustainable development for people living in and around sites of resource extraction (UNDP 2012). One approach is to provide

⁸³ Gil 2014.

⁸⁴ Available at: <https://onedrive.live.com/view.aspx?cid=0EC42B180C06D0B8&resid=EC42B180C06D0B8%21107&app=WordPdf>

⁸⁵ See here: <http://www.contratsminiersguinee.org/about/projets.html>

a specific revenue allocation for community development in addition to other local government structures (which may not necessarily cater to community interests since such government heads are typically central government appointees).

3.4 Donors, the private sector, and regional institutions can help overcome obstacles to extractive resource projects

Donors can facilitate efficient exploitation of extractive resources through finance, technical assistance, and support to RECs. Donors may help identify the champions that will take the initiative to drive the agenda necessary for a functioning corridor. In the case of the Nacala Corridor, Vale provides the anchor investment and is the operator of the CDN and CEAR network. Vale could therefore be a driving force to accelerate regional integration efforts between Mozambican and Malawi. The experience of the Maputo Development Corridor, which is largely viewed as a success story, shows the pivotal role that the private sector can play. BHP Billiton's investment in the Mozal aluminum smelter in the 1990's played a key role in developing the infrastructure around the port and attracting public and private investment in and around the corridor to Mpumalanga province. Without this anchor project of Mozal, it is debatable whether or not the full corridor project would have gone ahead.⁸⁶ The private sector also plays a key role today in improving the efficiency of the corridor.

Donors should coordinate and streamline their support for infrastructure investment at the regional and country level. For instance, 11 bilateral donors and four multilateral donors were directly supporting SADC or its programs in 2006.⁸⁷ Similarly, according to the Mozambican donor coordination portal,⁸⁸ the African Development Bank, the European Commission, JICA, the World Bank, and USAID have been working with the Government of Mozambique to improve the infrastructure and/or regulatory environment, specifically for the Nacala corridor. While this assistance is much needed, it has to be provided in close coordination among the donor agencies. According to Tjønneland, "...there is little harmonization of external development assistance to SADC. Common arrangements for planning, funding, disbursement, monitoring, evaluating and reporting are almost absent. This has reduced the effectiveness of external aid."⁸⁹ Lastly, donors should prioritize the funding of preparation costs, as a lack of preparation, planning, and cost-benefit analyses is a common reason for the failure of infrastructure development.⁹⁰

The private sector plays an enormously important role in ensuring the success of regional extractive resources projects.⁹¹ Governments may be more sensitive to pressure from large multinational corporations, such as Vale or BHP Billiton, than from regional institutions, as the successful

⁸⁶ Byiers and Vanheukelom 2014.

⁸⁷ Tjønneland, 2006.

⁸⁸ Official Development Assistance to Mozambique Database, available at: <http://www.odamoz.org.mz/>

⁸⁹ Tjønneland 2006.

⁹⁰ See for instance: PPIAF Gridlines 2007.

⁹¹ Also recognized by SADC 2012.

implementation of such large projects provide visible and quick wins for the political elite (for example, job creation resulting from a new mining project tends to be more visible than that from increased trade with neighboring countries due to regional harmonization). These companies, along with other private sector actors involved in the corridor, should provide an important feedback channel to the governments about the ongoing bottlenecks that need to be addressed to further improve efficiency.

The Guinea—Liberia Corridor illustrates the potential role of the private sector in facilitating inter-state cooperation. Sable Mining supported collaboration by Guinea and Liberia, in order to be able export iron ore from its Nimba concession in Guinea via Liberia. In October 2013, Sable finally obtained authorization from the Government of Guinea to export its iron ore via Liberia,⁹² following which it entered into a memorandum of understanding with the Government of Liberia to seek assistance in, among other things, ensuring that the company can access the existing rail and port infrastructure in the transport corridor.⁹³ In March 2014, Sable Mining facilitated a meeting attended by the Ministers responsible for mineral development in Liberia and Guinea. A memorandum of understanding was signed by the two governments to implement the modalities that would enable Sable Mining's subsidiary, West Africa Exploration, to produce and export its ore cross-border.⁹⁴ Unfortunately, no details are available as to the contents of the MoU, although it is expected that Sable Mining will continue to work with both governments to ensure its implementation.

Regional organizations can play an important role in facilitating cross-border infrastructure projects. Successful regional cooperation is more likely if there are high barriers to entry (which also means high costs of exit), lack of outside options (which increases the value of existing cooperation arrangements), and a self-enforcing equilibrium of cooperation among several domains (which fosters issue linkage and the spread of norms, thereby making enforcement capacity even stronger).⁹⁵ Absent these conditions, states engage in international cooperation merely to reinforce domestic political economy structures, rather than tie their hands through cooperation.⁹⁶ The challenge for many African countries is therefore to ensure that regional cooperation initiatives (especially within the myriad regional economic communities) are sources of both constraints and norms generation rather than mere extensions of inefficient domestic structures of patronage and corruption. Box 21 illustrates the importance of both domestic political commitment and regional cooperation to the success of joint efforts to develop natural resources.

Cross-border resource corridors are inherently regional. Thus, REC Secretariats have an important role to play in facilitating the benefits from cross-border resource corridors (ECOWAS⁹⁷

⁹² Browne 2014.

⁹³ Mining Weekly 2013.

⁹⁴ "Liberia, Guinea striking a mining deal," *Inquirer* (March 21, 2014), available at: <http://allafrica.com/stories/201403241413.html?viewall=1>

⁹⁵ There is a vast literature on the dynamics of interstate cooperation, and the factors that favor the strengthening or weakening of interstate relations. See for example, Chekel 1998; Schimmelfennig and Sedelmeier; and Barnett and Finnemore. 1999.

⁹⁶ The idea here is that for international organizations to have meaning, they must be sources of constraints on domestic political others. Otherwise they are epiphenomenal and merely tools to be used by their most powerful members. See Krahnmann 2003.

⁹⁷ The Mano River Union should theoretically be well placed to coordinate cross-border resource corridors. However, to date, it has been bypassed as an institution in relation to the cross-border arrangements between Liberia and Guinea, which have been made on a bilateral, rather than a regional basis.

Box 21: Lessons from the Greater Mekong Sub-Region

The Greater Mekong Sub-Region (GMS), which includes Thailand, Burma, Cambodia, Laos, Vietnam as well as the province of Yunnan and Guangxi Zhuang Autonomous Region of China, is arguably one of the most successful cases of economic integration among developing countries. Initiated by the Asian Development Bank (ADB) in 1992, the goal of the GMS was primarily to coordinate the exploitation of natural resources (particularly the Mekong River) and infrastructure development in the sub-region, to encourage private investment in trade, agriculture, industry, tourism, and other services. The initial phase of the project focused primarily on road infrastructure, as defined in the DMS Transport Master Plan of 1995. As of 2012, the ADB had supported \$15 billion in investment projects in the Sub-Region, including \$289 million in technical assistance.

Empirical studies have documented the positive impact of infrastructure development in the sub-region on both exports and imports. Road improvements have reduced the incidence of poverty in rural areas of Laos within the GMS. Within the GMS as a whole poverty rates were relatively higher in the less integrated areas. The channels for poverty reduction through sub-regional economic integration included improved job opportunities, greater access to high quality goods and health centers, and the spread of better farming techniques.^a

The success of the GMS can be attributed in part to the commitment of Thailand and China. Thai authorities have invested considerable diplomatic and economic effort to ensure that growth-enhancing projects are prioritized in the sub-region. For Thailand, the GMS fits well in its national strategy of developing its relatively poorer northeast. For China, the GMS provides an important platform around which to build a development strategy for its landlocked southwestern province of Yunnan. China has been at the forefront in pushing for transportation infrastructure on the Mekong River to link Yunnan province to Southeast Asia.^b

The GMS program has also sought to address policy and institutional issues, particularly in relation to trade and transport facilitation. These have included the exchange of traffic rights, harmonization of vehicle standards, and lowering of barriers to trade (including through both bilateral and multilateral discussions). The governments in the sub-region agreed to the Cross-Border Transport Agreement (CBTA), which seeks to reduce transportation delays by having single-stop, single window inspections; exemptions from single customs inspections, bond deposit, escort, and other inspections; standardization of road-worthiness vehicle requirements; and the standardization of infrastructure, including road and bridge design standards, road signs, and signals.^c

The GMS is not without its challenges. The GMS has encountered problems stemming from the lack of uniformity in institutional competence and political will across the member states. Bilateral transport agreements continue to be preferred by the private sector due to weak coordination among the various national and regional authorities and agencies, limited capacity at border posts, and political factors, including sluggish institutional changes and the effects of vested interests. In addition, both tariffs and non-tariff barriers to trade continue to limit trade flows in

(continued on next page)

Box 21: Lessons from the Greater Mekong Sub-Region (*continued*)

the region. Member states have failed to rationalize their tariff structures after joining other free trade and preferential trade areas, as well as bilateral trade agreements. The resulting multi-tier tariff system has created room for rent-seeking behavior among bureaucrats lacking the capacity to effectively implement it. Furthermore, due to the slow pace of diversification the GMS members remain vulnerable to external shocks to the export sector.^d

^a Edmonds and M Fujimura 2008; Singh and Mitra 2006; Menon and Warr 2006.

^b Masviriyakul 2004. "

^c Asian Development Bank and Australian Aid 2012.

^d Menon, Jayant and Anna C. Melendez 2011.

for Guinea—Liberia, SADC for Nacala, COMESA for the Great Lakes and LAPSET) by encouraging transport and trade reforms in member countries. However, the REC Secretariats have lacked the budget for infrastructure development, so the responsibility for corridor development has remained with the member states and has been facilitated on the basis of bilateral relationships. The limited role of RECs has been compounded by overlapping country memberships and the lack of harmonization among the RECs in Africa. For instance, in East Africa, Kenya and Uganda are both members of COMESA, but Tanzania is no longer a COMESA member. However, all three are members of the EAC. Both Guinea and Liberia are members of ECOWAS, the Mano River Union, and the West African Monetary Zone. Guinea, in addition, is also a member of the Gambia River Basin Development Organization (OMVG), and the Senegal River Development Organization (OMVS).

Multiple memberships in different organizations can erode the quality of regional engagement. The limited number of qualified government staff can be spread thin across these organizations. In addition, the national secretariats of the organizations tend to compete for project funds. Thus, intra-governmental coordination is needed to rationalize REC participation by member states.

National political and economic priorities tend to override countries' interest in regional integration. For example, there has been very little cooperation on mining and mining-related infrastructure development within the Mano River Union (MRU),⁹⁸ which was formed by Guinea, Liberia, and Sierra Leone in 1973 to foster economic cooperation. The Union was suspended during the civil wars in Sierra Leone and Liberia, but was revived in 2008, when Côte D'Ivoire also joined. Guinea has taken a very strong stance on requiring Rio Tinto to export via Conakry, and the arrangements for other potential cross-border mining transport corridors have been pursued between Guinea and Liberia on a bilateral, rather than a regional level.

A controversy surrounding the priority to be accorded to regional infrastructure corridors illustrates some of the difficulties that RECs can face in coordinating regional efforts at

⁹⁸ Bolloré Africa Logistics Guinea webpage, available at: <http://www.bolloré-africa-logistics.com/en/ports-and-terminals/our-container-terminals/port-of-conakry-guinea.html>.

development. SADC's Regional Infrastructure Development Master Plan compares areas with mining and agriculture production potential with the proposed regional transport corridors.⁹⁹ However, despite i) the master plan being based on the JICA study of 18 transport corridors in Sub-Saharan Africa that rated the Nacala corridor as high priority;¹⁰⁰ and ii) knowing at the time of writing that the project would benefit from a strong private sector partner financially backing the project, the Nacala Railway Corridor is only rated as “medium priority” with the North-South, Dar es Salaam and Maputo corridors receiving higher ratings.¹⁰¹ The infrastructure priority ranking of the SADC also does not agree with the ranking of the African Union (AU), of which SADC countries are members.¹⁰² In the AU's Program for Infrastructure Development in Africa (PIDA), the Beira and Nacala Corridors are highlighted as one of four priority projects in Southern Africa.¹⁰³ These disparate conclusions have led to friction, especially for countries that are members of multiple RECs, and have not been conducive to regional integration. SADC, the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) have identified this to be of a particular problem when it comes to transport infrastructure and trade regulations, and therefore agreed in 2004 to jointly plan and implement the regulatory frameworks on these issues.¹⁰⁴

3.5 A proposal for organizing regional contributions to extractive resource projects

One approach to increasing the role of the RECs in corridor planning, while coping with the potential for political economy interference, would be to establish corridor “steering committees,” while the REC Secretariat would only play an oversight role (Figure 14 illustrates the structure). This steering committee would have similar responsibilities as the “corridor management agency” that SADC and EAC proposed in the institutional arrangement between the national and regional level in their master plan.¹⁰⁵ The structure of such a steering committee could follow the structure of the Organization for Cooperation of Railways (OSJD), which has proved a successful model in promoting cross-border transport corridors in Eurasia (Box 22). The steering committee could have representatives from each of the REC's member states, along with an advisory inter-corridor body comprising representatives from the various stakeholders involved in the corridor.

The steering committee would be responsible for regional level planning and provide policy guidance and advice on all aspects of corridor development. The committee would have several specific responsibilities:

⁹⁹ SADC 2013.

¹⁰⁰ JICA 2010.

¹⁰¹ Unfortunately the results of the corridor ratings are not part of the master plan, and it is therefore unclear on what grounds the Nacala corridor is rated as medium priority.

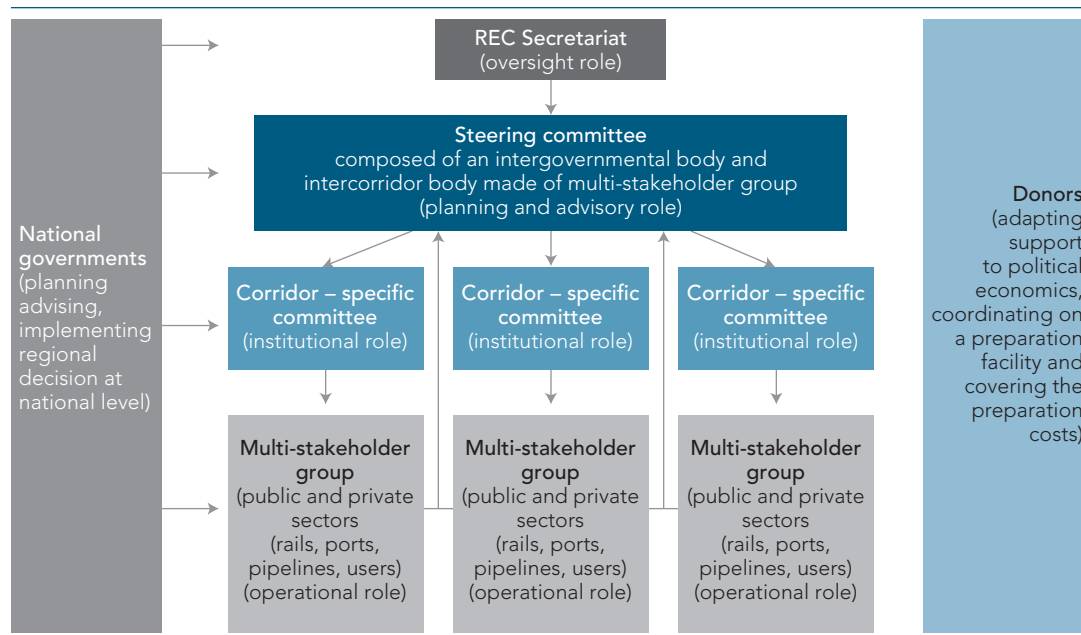
¹⁰² Apart from being members of the AU and SADC, Malawi and Zambia are also members of COMESA.

¹⁰³ Scholvin and Plagemann 2014.

¹⁰⁴ Interview with SADC representative, September 2014.

¹⁰⁵ SADC 2013; and EAC, 2011

Figure 14: A regional structure geared towards the implementation of cross-border corridors



Source: Authors.

Box 22: The Organization for Cooperation of Railways (OSJD)

The OSJD was established in 1956 to support development of the international freight and passenger traffic in the Eurasian region, create a common railway transport environment, increase the competitiveness of the railway system, increase transcontinental railway routes, and promote technological progress and technical-scientific cooperation in the field of railway transport. It is structured at both the intergovernmental level and at the level of railway companies. There are two governing bodies: (i) the OSJD Ministers Conference, composed of 27 member states, which considers the overall direction of the organization's activities; and (ii) the OSJD Conference of General Directors, composed of 26 railway companies, which organizes cooperation through different initiatives, such as reciprocal exchange of information, harmonization of documents, and the adoption of rules for the use of wagons for international services. In addition, there are several levels of cooperation and different types of OSJD membership, including affiliated enterprises with activities related to railway transport, such as mining companies.^a In Asia, members of OSJD had significantly higher traffic volumes than non-member states, even if these were physically connected to the broader railway network.^b

^a OSJD 2014.

^b UNESCAP 2013.

- a. The steering committee would help mobilize funding for regional infrastructure planning and project preparation. Objective criteria, for example forecasted import/export throughput and unmet demand for extractive industries and agricultural produce (as well as general cargo and passenger services), should be used to determine the prioritization of corridors and the corridor route. SADC considers that each member state has to be served by at least two transport corridors to increase competition between the export/import routes and ensure that the market is still served in case of bottlenecks on one of the corridors.¹⁰⁶
- b. The steering committee would advise on the corridor route and what countries should be part of the “corridor-specific committee”. For instance, such a steering committee could provide input on whether it would be more rational to consider LAPSET and the Northern Corridor as one single corridor going forward—especially if the Northern Corridor railways expand to South Sudan, as Uganda as recently envisaged.¹⁰⁷
- c. The steering committee would consult with the steering committees of other RECs, in particular when a corridor passes through two regions, to ensure that the involvement of two or more RECs does not impede the planning/operations of the corridor or the harmonization of procedures.
- d. The steering committee would participate in all continent-wide programs on corridor development, to ensure Africa-wide experience sharing. Existing programs include the Sub-Saharan Africa Transport Policy Program (SSATP),¹⁰⁸ the Program for Infrastructure Development in Africa (PIDA) launched in July 2010,¹⁰⁹ and the Tripartite Co-operation Framework, consisting of the Tripartite Free Trade Area (TFTA).¹¹⁰ Experience sharing will be particularly critical in corridor project preparation.
- e. The steering committee would organize capacity building events for government officials in charge of infrastructure development, regulators, and state owned companies.

Each steering committee would then be divided into several corridor-specific committees, involving only the governments of countries through which a corridors runs. While the steering committee has a planning and advisory role, these corridor-specific committees would play a more active role in the institutional establishment of the corridor. The responsibilities of these committees could include:

¹⁰⁶Interview with Lovemore Bingandadi, Program Manager /Technical Advisor Tripartite Transport and Trade Facilitation Program (TTTFP), SADC Secretariat, August 2014.

¹⁰⁷Interview with Godefroy Onyango, former executive secretary of the NCTTA, August 2014.

¹⁰⁸Established in 1987 by the World Bank and UNECA, it includes major international corridors in Sub-Saharan Africa. Source: SAIIA 2013.

¹⁰⁹PIDA brings together under one program the existing continent infrastructure initiatives such as the Nepad Short Term Action Plan, the Nepad Medium to Long Term Strategic Framework and the AU Infrastructure Master Plans. Source: Source: SAIA, “Traditional and Emerging Partners’ Role in African Regional Economic Integration: Issues and Recommendations,” (October 2013).

¹¹⁰Its objective is to eliminate the issue of overlapping membership between existing REC and accelerate African economic integration. Source: SAIIA 2013.

- a. Assessing the impact of each country's legal framework on regional corridor development and recommending changes;
- b. Assessing the compatibility of railway gauges throughout the corridor and evaluating the investment necessary to ensure uniformity ;
- c. Assisting countries with the implementation of multi-purpose corridors by mapping out non-mining demand for rail transport along the corridor, including estimated informal trade volumes susceptible to being formalized by governments' targeted policies and currently taking place "in spite of rather than supported by regional integration initiatives;"¹¹¹ planning secondary feeder road networks to the extractive industry-related trunk infrastructure, so that the benefits of a corridor are maximized for local communities; and retaining the right of way when concessioning the railway or pipeline project to ensure that governments can monetize this right of way benefit from the economies of scope (to install optic fiber, for instance).¹¹²
- d. Establishing a corridor- specific railway locomotive and rolling stock leasing pool to ensure that governments can help farmers gain third-party access.
- e. Prompting countries to collaborate around a similar coordination system as the "Regional Cargo Tracking System" that the Northern Corridor Transit Transport Coordination Authority (NCTTCA) has started working on with two other organizations.¹¹³ (The envisioned system requires the collection of data with the various partners for shipping agents, ports, customs, and road and rail transporters to facilitate the electronic tracking of cargo along the logistics chain, which would improve the efficiency of multi-purpose infrastructure by speeding customs clearance.)
- f. Establishing a regional unbiased and independent corridor regulator, which monitors national regulators' adherence to independence, impartiality and predictability; monitors each government's commitment to maintaining the free flow of goods; monitors port authorities' monopoly power to ensure that charges are not inflated on commodities from and to the hinterland countries—in particular in the absence of a customs union binding the corridor countries; ensures compliance with safety standards; and oversees the harmonization of border control procedures;
- g. Urging governments to sign a binding treaty with recourse to international dispute boards, which would increase the credibility of commitments to regional integration and corridor implementation;¹¹⁴ and
- h. Collecting information from governments on the appropriate private and public stakeholders that would participate in the operations and logistics of the corridor.

Each government would establish a unit to coordinate all activities related to regional transport and energy corridors. This could be a dedicated Ministry, similar to EAC member countries'

¹¹¹ Byiers, Vanheukelom, and Kingombe 2014.

¹¹² Also see Toledano et al. 2014.

¹¹³ International Conference on the Great Lakes Region, Regional Program of Action for Economic Development and Regional Integration, Northern corridor: Program for improving transport infrastructure and facilities, August 2006, available at: <https://www.lse.ac.uk/collections/law/projects/greatlakes/3.%20Economic%20Development%20and%20Regional%20Integration/3b.%20Projects/3.3.1%20NCorridor%20Aug06%20-%20En%20-%20Cleaned.pdf>

¹¹⁴ Collier 2011.

Ministries for the EAC,¹¹⁵ or a directorate within the Ministry of Trade or Transport/Infrastructure. However, it is important that this unit has the necessary authority to implement cross-sectoral policy recommendations that enhance regional integration and promote corridor efficiency. This may require a change in attitudes, as often national governments resist integrating regional concerns and priorities in national strategic frameworks. Representatives from this unit would also be part of the corridor-specific committees. One national government could report to several corridor-specific steering committees, if the country depends on several corridors (Zambia, for instance, would report to both the North-South Corridor and the Nacala Corridor specific-committees). This unit would manage the relationships with the different corridor-specific committees.

In addition, governments would be in charge of carrying out the institutional reforms needed in the area of state-business relations. This may involve improvements in the governance of state owned enterprises to facilitate public-private partnerships and the private sector's involvement. Those reforms would also define the role of sub-national governments affected by the corridors. Ensuring the political cooperation and the participation of the sub-national governments situated at the border is particularly important. They would need to benefit from capacity-building programs to ensure that they adhere to the rules of regional integration.

To encourage a better alignment between national, subnational and cross border interests, a free trade center at the border could be established to reinforce cross-border trade, cross border partnerships, and the political importance of the sub-national governments situated at the border.

3.5.1 The Maputo Development Corridor (MDC) and its multi-stakeholder groups

The MDC, officially launched in May 1996, crosses northern Gauteng and Mpumalanga in South Africa and parts of the Gaza and Maputo provinces in southern Mozambique. It is planned to eventually link up with a corridor to Walvis Bay in Namibia, through Botswana. It is the most advanced development corridor in Africa with the excellent (N4) toll road acting as a conduit in facilitating cross-border flows. Maputo port is the geographically closest port to Gauteng (the heartland of South Africa's economy). Roodt (2008) indicates that, besides the road, the modernization of Maputo port, the upgrading of the Lebombo border post and improvements to the electricity supply lines were important aspects of the Corridor. Trade between the two countries boomed, and in 2005 South Africa was Mozambique's biggest foreign investor providing 58 percent of its FDI (Roodt 2008).

The Maputo Corridor Company (MCC) was set up in 1997 as a facilitating entity including public and private actors of South Africa, Mozambique and Swaziland. Its aim was to oversee infrastructure projects, build public sector capacity on trade facilitation, conduct research on measures to enhance investment around the corridor, and facilitate cross-border development initiatives. The MCC also involved local governments, informal entrepreneurs and disadvantaged communities.¹¹⁶ Because of disagreements between Mozambique, South Africa and the donors, the

¹¹⁵Burundi, DTIS 2012.

¹¹⁶Byiers and Vanheukelom 2014.

MCC was replaced by the Maputo Corridor Logistics Initiative (MCLI) in 2003, which is based on private sector participation (Roodt 2008).

MCLI, which consists of infrastructure investors, service providers, and users from South Africa and Mozambique, was set up to promote the logistical development of the Corridor and reduce impediments to cross-border trade. Its objectives are twofold. “The first is to coordinate the views of service providers and users of the Maputo Corridor and to promote development and change in order to make the Corridor the first choice for the regions importers and exporters. The second is to market the strategic benefits and opportunities offered by the Corridor.”¹¹⁷ In short, MCLI’s primary objective has been to make the MDC a cost-effective and efficient transport route.

A Joint Operating Center has been established to improve the operational efficiency of railway transport along the Maputo corridor. The Center was inaugurated in Maputo in September 2014, and houses operators from Maputo port, the Mozambican railways company, the South African railways company, and the Swazi railway company. To ensure the effectiveness of the center, the operators have aligned the investment plans, maintenance and safety standards, as well as skill development initiatives. It is expected that these measures will enhance adherence to scheduled train movements across rail and port facilities throughout the corridor. Transnet is also looking to roll out similar initiatives on the North-South Corridor (Zimbabwe, Zambia, DRC, and South Africa) and the East West Corridor (Botswana and South Africa).¹¹⁸

The evidence on success of the Corridor has been mixed. Schutte (2005) found that gross value added and employment growth was higher and the poverty gap increased at a lesser rate near the Corridor relative to other areas in the period 1995–2003. While logistics costs remain high and border transit suffered from significant inefficiencies, nevertheless the movement of people between the countries increased significantly over the study period. Positive effects of the Maputo Corridor include more efficient access to the border from inland provinces; safer and more reliable passage within Mozambique to the port; and reduced operational inefficiencies. The Maputo port concession, which has significantly improved port operations, has been extended to 2033, allowing for continued investment and improved processes (Bowland and Otto, 2012). Remaining constraints include the operating hours at the border post, unreliable and irregular service from the South African rail company (Transnet), and the high prices for transport on the Maputo line (Bowland and Otto, 2012).

3.5.2 *The LAPSSET and Northern Corridor*

These two corridors should be considered as one, given the overlapping geography and potential synergies of infrastructure development. The corridor-specific committee could be housed in the Northern Corridor Transit Transport Coordination Authority (NCTTCA) that was set up in the mid-1980’s after the signing of the Northern Corridor Transit Agreement by Burundi, Kenya, Rwanda, and Uganda. DRC joined in 1987¹¹⁹ and South Sudan in 2013 (Ethiopia would have to

¹¹⁷Roodt 2008.

¹¹⁸Break Bulk 2014.

¹¹⁹Burundi DTIS 2012.

join to ensure that NCTTCA has authority over LAPSET). The NCTTCA has proved successful to date and implemented several activities facilitating trade along the corridor,¹²⁰ albeit with a limited budget of \$1million/year (from a tonnage-based levy on imports at the port of Mombasa and a budget allocation from member state governments).¹²¹

3.6 Summary of policy implications

Avoiding the adverse impact of natural resources wealth on institutions requires effective checks and balances within the government, coupled with democratic elections and strong civil society organizations. Improving transparency is critical to effective democracy, and in particular revealing the terms of contracts could make a significant contribution to improved governance. Cooperation with international initiatives, including commitment to EITI membership and the Publish What You Pay Alliance, should be made part of regional peer review mechanisms. Other countries could follow Guinea's example of publishing the terms of all mining contracts.

Cooperation with neighbors in exploiting resources will inevitably reflect each country's strategic interests. However, agreement on the inter-country allocation of infrastructure investments, for example in ports or refineries, can be necessary to avoid excess capacity and unviable projects.

Allocating mineral revenues for community development in host communities to compensate for economic disruptions and adverse environmental effects can ease opposition to projects that generate benefits to the country as a whole.

Donors play a key role in infrastructure development through arranging finance, encouraging private sector participation, recommending improvements in the incentives framework, and technical assistance. Greater efforts are required to coordinate donor activities to avoid excessive administrative burden on recipient countries.

The contribution of REC secretariats to regional infrastructure planning could be strengthened by the establishment of steering committees that would play a planning and advisory role, with representation from all major stakeholders. In addition, corridor-specific committees could play a more active role in establishing an appropriate institutional environment for infrastructure development.

¹²⁰Northern Corridor Transit Transport Coordination Authority website, available at: <http://www.ttcanc.org/>

¹²¹JICA 2009.

Annexes

Annex A: Regression results on the impact of natural resources on trade and FDI

The estimates of the impact of natural resources on trade are based on the standard “gravity” model of trade, in which the volume of bilateral trade depends on countries’ market size (GDP) and bilateral trade costs. Column (a) in Annex Table 1 shows the baseline effect: countries without mines tend to import 60 percent more from their neighbors than from more remote countries. However, this effect is much smaller for countries with mines (the second, interacted coefficient). Countries with six or more mines do not import more from their neighbors than from remote countries.¹²² Column (b) shows how being landlocked changes the impact of natural resources on trade. It is still the case that mining countries import relatively less from neighbors, and the effect (−0.527) is even larger than for the world sample. However, landlocked countries without mines import much more from neighbors than from remote countries: 150 percent more.¹²³ With mines, a landlocked country imports even more from one of its neighbors. For each additional mine, the effect is 68.9 percent more imports from neighbors (see bottom panel).

A simplified index is used to capture the impact of mines on trade, based on their distance from population centers (the infrastructure built for remote mines is less likely to be used to transport other goods, and thus affect trade costs). The paper constructed a simplified index that tries to capture this distinction for each mine.¹²⁴ The variable α_d is equal to one if the index is larger than the sample average (meaning mines are likely to reduce trade costs) and zero if it is below the sample average (meaning mines are not likely to reduce trade costs). The result of this exercise is presented in column (c), and the marginal effects of one more mine for different countries is reported in the bottom panel to facilitate interpretation. Interestingly, in Sub-Saharan Africa, the negative effect of mines on trade with neighbors is only important if the index equals one, which is when the mines are close to corridors that are important for imports and thus likely to reduce trade costs. Also, the distinction does not matter for landlocked countries, because in those cases it is unlikely that any mine has its own infrastructure connecting the landlocked country to a transit country: in those cases all infrastructure will connect both mines and cities with the transit neighboring country, reducing trade costs in all cases. Finally, column (d) repeats this result for a sample of Sub-Saharan African countries. The result is similar, although somewhat less precisely estimated due to the smaller sample.

Poelhekke and van der Ploeg (2013) use a gravity model to estimate the expected value of bilateral FDI. Resource FDI captures FDI to the following sectors: extraction of oil, natural gas and other

¹²² $=\exp(0.603/0.317)-1$

¹²³ $=(2.076-0.462)*100\%$

¹²⁴ Individual mine indices were averaged with city population weights to yield one index per country.

Annex Table 1: Principal regression results from Bonfatti and Poelhekke (2014)

Dependent Variable: $\ln(\text{trade})$	(a)	(b)	(c)	(d)
	baseline	adding landlocked interactions	adding mine impact index interactions	SSA
	World	Africa	Africa	SSA
Neighbors	0.603*** (0.209)	-0.462 (0.700)	-0.923 (0.686)	-2.007*** (0.757)
Neighbors * $\ln(\text{destination mines}+1)$	-0.317*** (0.072)	-0.527* (0.310)	-0.145 (0.264)	0.066 (0.347)
Neighbors * $\ln(\text{destination mines}+1)$ * mine impact index			-0.566* (0.313)	-0.814** (0.339)
Neighbors * landlocked destination		2.076** (0.833)	2.214*** (0.809)	3.032*** (0.826)
neighbors * landlocked destination * $\ln(\text{destination mines}+1)$		1.217*** (0.398)	0.885** (0.438)	0.568 (0.480)
Neighbors * landlocked destination * $\ln(\text{destination mines}+1)$ * mine impact index			0.538 (0.534)	0.876 (0.545)
Neighbors * destination income, and neighbors * origin income	N	Y	Y	Y
Observations	27,023	6,026	6,026	5,225
R-squared	0.729	0.685	0.685	0.675
<i>Marginal effect of 1 more mine on $\ln(\text{trade})$ with neighbors if destination is:</i>				
Coastal		-0.527*		
Landlocked		0.689***		
Coastal, with low mine impact index			-0.145	0.066
Coastal, with high mine impact index			-0.711**	-0.748*
Landlocked, with low mine impact index			0.740**	0.634*
Landlocked, with high mine impact index			0.711**	0.695**

Note: Robust standard errors in parentheses: *** <0.01, ** <0.05, * <0.1. Africa sample refers to all bilateral trade flows in which the destination country is in Africa. All regression include importer and exporter fixed effects, standard multilateral resistance terms: shared empire dummies, log distance, shared language, currency and legal origin, colonial history, RTAs, WTO and ACP membership (and an interaction between neighbor and a country's land area in columns b to d).

minerals, processing industries of oil, coal and fissionable material, and the base metal industry. Non-resource FDI includes FDI to all other sectors. Countries attract more non-resource FDI if they represent a large market, as captured by population size and per capita income, and if they offer an educated work force, as captured by the average years of schooling achieved by the population aged 25 and older. Other positive determinants are FDI in the previous period, which captures the tendency of firms to invest where they have invested before, and a positive spatial lag: since multinationals increasingly form fragmented production chains across countries, they invest close to other countries where they also invest. Anything that influences FDI positively therefore tends to

benefit the region as a whole. Analogously, negative effects on FDI to one country also affect the region negatively. Notably, distance from the home market affects FDI negatively in the host country, meaning that multinationals tend to invest more, the closer the host market is to home, despite the decrease in average trade costs during the last century. Issues of span of control over affiliates may partly explain this. Also, a higher price level in the host country, and a larger tax burden (as approximated by the size of government) decreases a host country's attractiveness. Finally, a natural resource boom, as captured by the amount of hydrocarbon rents in the economy (drawn from the export of oil, natural gas and coal) significantly decreases non-resource FDI.¹²⁵

Annex Table 2 provide the estimation results. The second and third columns in Annex Table 2 provide the estimated level or average of each independent variable for both Sudan and South Sudan together, and for the region of Sub-Saharan Africa. Because many variables are in natural logarithms, the fourth and fifth columns also report exponents which can be read in the units of each variable (i.e. U.S. dollars or thousands).

¹²⁵Rents are defined as production times the world price net of extraction costs and represent a pure profit.

Annex B: Maps of the Northern and Central Corridors

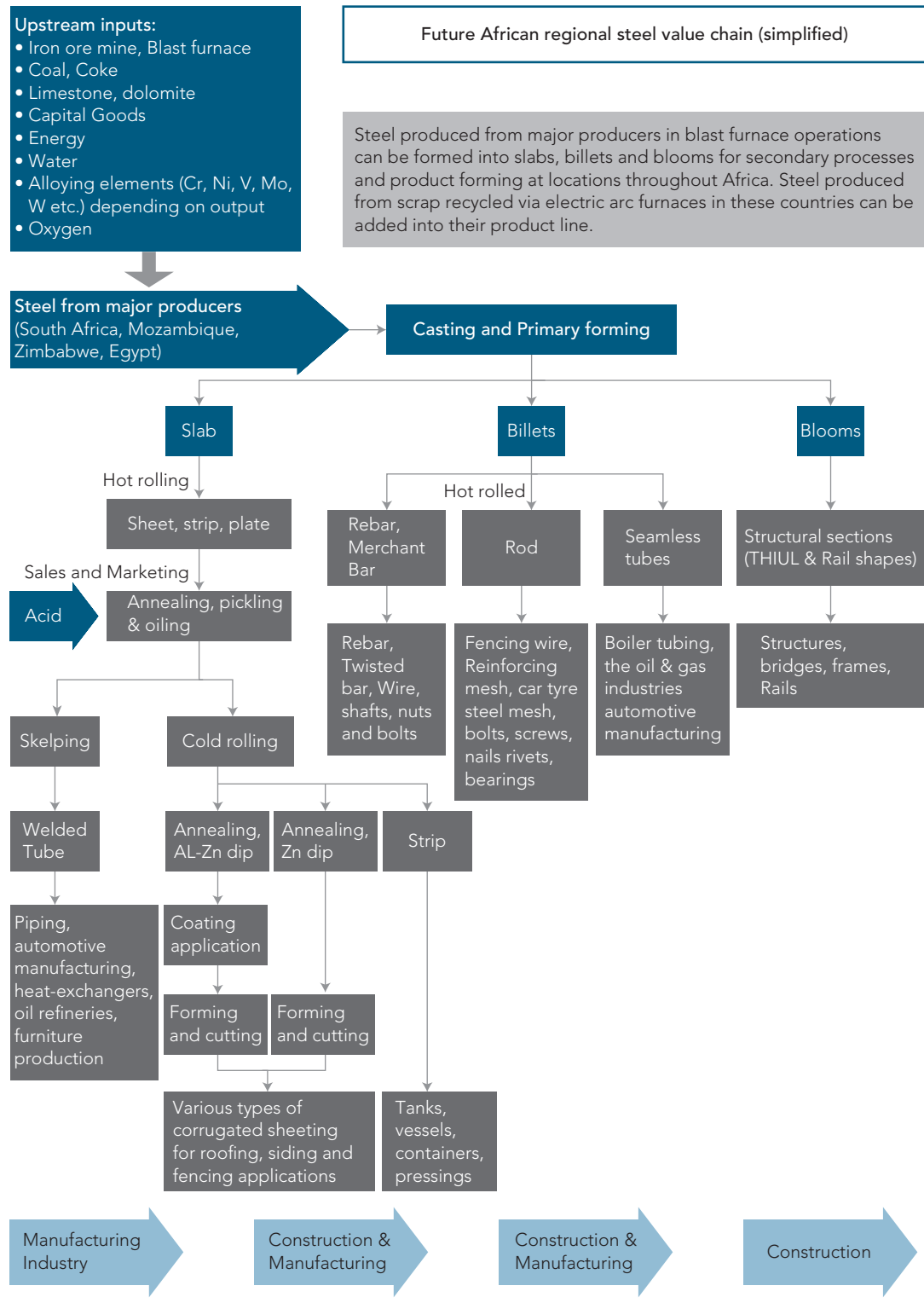


Source: World Bank, IBRD 41620 (May 2015).

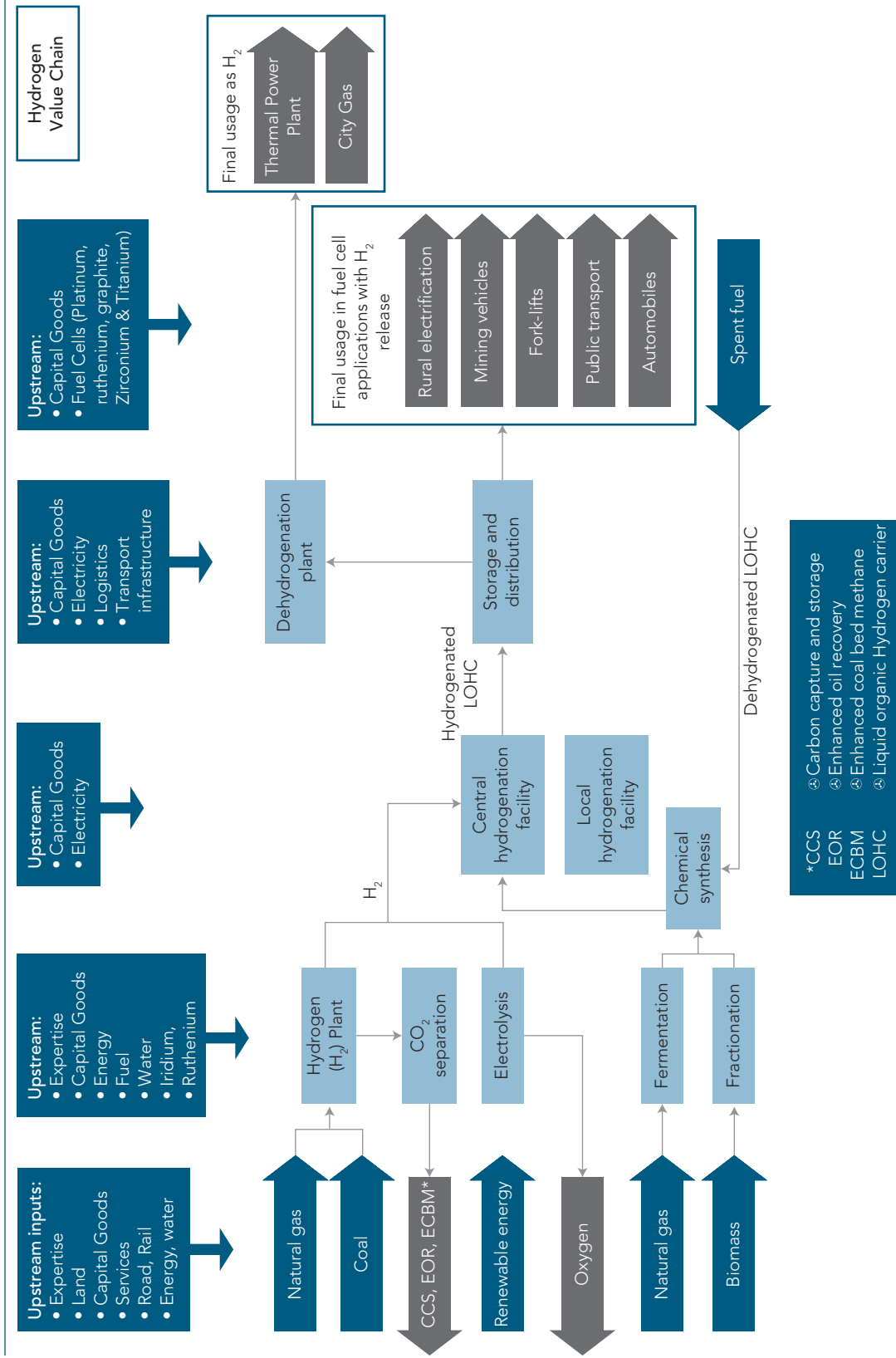


Source: World Bank, IBRD 41623 (May 2015).

African steel value chain



Hydrogen value chain



Source: Okada & Shimura (201X), Haddish (201X), Jensen et al. 2012.

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The issues of exploiting natural resources and regional integration are inextricably linked but poorly addressed by policy makers. This report explores the relationships between extractive resources, regional integration, and economic diversification. It looks at how regional approaches can increase the local employment and production effects of extractive resources projects, and how African countries can grow sustainably through exploiting their resources by designing infrastructure and policy and regulatory frameworks in mutually supportive ways to support increasing trade and economic diversification through the movement of goods, services, and people. The analysis makes frequent reference to three case studies of efforts to create trans-boundary transport corridors driven by mineral and hydrocarbon resources, including the Nacala Corridor in southern Africa, proposals for the exploitation of iron ore in Guinea and Liberia, and the ambitious LAPSSET corridor in East Africa to ship oil and gas from South Sudan through Kenya to ports on the Indian Ocean.