African Department

# Mozambique Rising

## Building a New Tomorrow

Doris C. Ross
*Editor*

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# Overview: Mozambique Rising—Building a New Tomorrow

***Doris C. Ross***

This publication highlights Mozambique's remarkably strong growth over the two decades since the end of the civil war in 1992 as well as the major challenges that remain for the country to rise out of poverty and further its economic development. Mozambique has a unique opportunity to build on the discovery of ample natural resource endowments that, if managed well, will allow it to achieve its social development goals and overcome its reliance on foreign aid.

Chapter 1 provides an *overview of Mozambique's growth experience* over the two decades since the end of the civil war in 1992. While initially dominated by post-war reconstruction, government policies also laid the foundations of a market economy. These policies were supported by a favorable external environment, donors, and, more recently, the discovery and development of natural resources. The volatility of the earlier decade gave way to steadier, stronger growth over the most recent one. The economy has experienced some structural change, including in the agricultural sector. This was driven largely by foreign investments, especially megaprojects—large capital-intensive investment projects. Except for the Cahora Bassa hydropower station and Mozal, which transforms imported bauxite into aluminum for export, the other megaprojects focus on mining and natural resource exports.

Agriculture remains the dominant source of employment, and growth in that sector has come more from an expansion of the cultivated area and of agribusinesses than from increases in low yields in subsistence farming. Public policy challenges include a relatively young population, continued strong population growth, low average education levels, and public health issues such as a high prevalence of HIV/AIDS. Thus, the authorities' most recent poverty reduction strategy (2011–14) focused on increasing production and productivity in agriculture, promoting employment, and fostering human and social development.

The government complemented its generally sound macroeconomic policies with a series of structural reforms amid favorable global economic conditions (commodity prices) and sustained strong donor support (development aid). The initial focus was on exchange and trade liberalization, reducing fiscal imbalances, and the role of the state in the economy. Later the focus shifted to reducing vulnerabilities and increasing resilience to shocks. Institutional capacity is still weak in many areas such as economic analysis and policy formulation, and investment planning and implementation. While such broad capacity-strengthening will take time, a framework is urgently needed to assess the priorities and trade-offs in the composition of investment—for example, weighing investment in the infrastructure needed to develop natural resources against investment in agricultural productivity (more supportive to inclusive growth) and/or broader social infrastructure (water, health facilities, schools). Also, the development of the country's riches in gas poses major challenges for the government's policy formulation in the next few years, yet also provides an opportunity for major advances.

Chapter 2 provides an overview of the development and role of *megaprojects* in Mozambique's economic growth. These are large, foreign-financed projects, often in the natural resource sector, that are capital-intensive and export-oriented. Such projects often invest in purpose-built infrastructure to serve their specific needs. This has made the projects less sensitive to Mozambique's comparative disadvantage in the limited availability of infrastructure and skilled labor. These projects have made a significant contribution to growth, but generated only limited employment. Nonetheless, they do provide opportunities for local contractors both in terms of job creation and knowledge transfer that remain to be fully exploited. The government could facilitate these indirect benefits by further improving the business climate. Megaprojects contributed little to fiscal revenues until recently. In part this reflects the large upfront investment needs of these projects, and the fact that standard tax legislation allows investors to amortize investment costs when calculating profits. However, Mozambique's tax legislation was also particularly favorable to the early megaprojects—probably one factor in the country's ability to attract these investments. As the initial contracts come up for renewal, the government has pledged to renegotiate the parameters. The concession agreements for the later megaprojects reflect updates in Mozambique's tax legislation to conform more closely to international standards. Megaprojects carry inherent risks related to the vagaries of international commodity markets that can affect their profitability considerably.

Chapter 3 explores *infrastructure development* in Mozambique. Despite high levels of public investment in terms of GDP over an extended period of time, investment remains low in absolute terms and access to networked electricity, roads, improved water sources, sanitation, telecommunication, and Internet services is still relatively poor in most areas. In addition, there are significant

urban-rural disparities in access to basic infrastructure. The expansion of the infrastructure network is a central component of the government's growth and poverty alleviation strategy. For investment to succeed, it needs to be (1) managed effectively, that is, be of high quality, address identified key gaps, be implemented effectively, and be maintained and operated in a way that ensures continuity in service delivery; and (2) accompanied by improvements in "soft infrastructure" of transport logistics and the business environment to allow the private sector to develop its full potential. While efforts are under way to improve public investment management, these initiatives will take time, and increases in public investment should be paced alongside the strengthening of public management capacity. Improvements in the business environment are essential to translate these efforts into private sector activity and job creation.

Chapter 4 discusses the emergence of the *debate on inclusive growth*—growth in which the benefits are widely shared across the population—and how that debate evolved into strategies, policies, and actions in Mozambique. While the national poverty headcount was reduced sharply from 69 percent in 1997 to 54 percent in 2003, the results of the 2009 household survey showed stagnation in overall poverty rates after 2003. These findings heightened social tensions and led to an intense debate on how to make growth more inclusive. Building on these developments, Mozambique's Third Poverty Reduction Strategy (*Plano de Accão de Reducão de Pobreza*—PARP) 2011–14 was adopted focusing on improving agricultural productivity, creating jobs through improvements in the business environment and training, developing more focused and better-designed social protection programs, and preserving macroeconomic stability. While the PARP is in line with the general design of macroeconomic policies and macro-critical reforms conducive to inclusive growth, additional specificity could have been provided in its priorities, sequencing, and measurable actions. Also, channels for interministerial coordination to ensure accountability in cross-cutting areas were missing, and the data available to measure some of the performance indicators are of low quality and frequency. The authorities have started to address these gaps in the design and implementation of policies and reforms. The next household survey is planned for 2014–15, with the results expected to become available in 2016.

Chapter 5 explores *long-term demographics and the structure of employment* in Mozambique, focusing on the likely transformation of the economy from agriculture to industry and the services sector over the medium and long term. Given the young population and continued strong population growth, industry and services are not likely to be able to absorb all of the projected labor force growth. The absolute level of employment in agriculture is likely to continue to rise over the next 20 years. Thus policies should support the diversification of economic structures, while at the same time enhancing productivity in agriculture in order to improve the welfare of the population in the countryside—and in doing so reduce poverty and improve the inclusiveness of growth.

Chapter 6 provides an overview of *the challenges in developing the agriculture sector* in Mozambique, the source of livelihood for more than three-quarters of the population, even though it contributes only about a quarter of GDP. Mozambique remains a net food importer, and malnutrition is chronic and pervasive. While the sector has experienced strong growth over the past two decades, there is both a need and an opportunity for significant further development. The government is implementing a number of policy and institutional reforms—including seed technology, fertilizer availability, irrigation, land rights, market access, business environment, financial services, and nutrient fortification—that should provide incentives for private investment and facilitate the integration of smallholders into value chains. However, the sector investment plan is ambitious, and public resources will need to be allocated strategically, with access to markets playing a crucial role.

Chapter 7 describes the focus of efforts in Mozambique on *development corridors*—regions that, due to their geographic location or natural resources, hold the promise to stimulate nationwide economic growth led by regionally-focused infrastructure investment. Similar spatially based development initiatives are also under way elsewhere in Africa. There are three major growth corridors in Mozambique—the *Maputo Corridor* to the South African border; the *Nacala Corridor* linking the central and northern provinces of Mozambique and neighboring countries (Tanzania, Zambia, and Malawi) to the Nacala deep water port; and the *Beira Corridor* linking Mozambique's central provinces and neighboring Zimbabwe with the Beira port. Infrastructure investments are focused on these areas, and there has been some success, but much remains to be done to strengthen the linkages between large investments and smaller enterprises and smallholders. In light of the business environment barriers, Mozambique's private sector remains weak, poorly organized, and largely informal. The sector does not have the business and financial capacity to capture the spillover benefits from large investments in construction, agribusiness, services, and light manufacturing, which have significant potential to create jobs. Going forward, key sector-specific constraints should be addressed systematically in partnership with the private sector.

Chapter 8 discusses *financial inclusion to date and the challenges of deepening it*. Despite the expansion of banking institutions and financial services in recent years, most Mozambican households and small and medium-sized enterprises (SMEs) remain financially excluded and addressing this is an important pillar of the authorities' inclusive growth strategy. In 2013, the government adopted the 2013–22 Financial Sector Development Strategy to bring about far-reaching changes in access to and efficient use of the country's financial services. This will require effective coordination with all stakeholders as well as structural reforms that facilitate the extension of financial services to rural areas. It will also require that people and businesses have the ability to use existing financial services (i.e., issues such as availability of cell phone service,

low productivity and incomes in rural areas, geographic distribution of households, and low managerial capabilities of SMEs).

Chapter 9 presents the results of collaborative work with the International Labor Organization on the *Social Protection Floor* (SPF) Initiative in Mozambique. The expansion of social protection coverage is important both to support vulnerable groups and to generate a more inclusive growth pattern, hence reducing the risk of social tensions and contributing to a better economic environment. The focus in Mozambique is on noncontributory social protection (such as transfers), because contributory subsystems (such as pension schemes) have limited coverage to date. The evidence shows that progressively building an SPF adapted to Mozambique's needs does not present a threat to fiscal sustainability. SPF spending has been made possible by the rewards of revenue reforms and the reprioritization of expenditures. However, taking into account operational-capacity limitations—particularly because many of the most vulnerable live in remote areas—such an expansion would only be feasible if accompanied by significant investment in the development of more effective and efficient service delivery systems. The development of a new management and information system, including a single registry, new payment modalities (e.g., mobile banking), new processes of identification and selection of beneficiaries, and monitoring and evaluation mechanisms, is essential and currently ongoing, with support from various partners.

Chapter 10 lays out the *fiscal challenges of the natural resource boom*. While the contribution of the mining sector to the Mozambican economy is small for now, coal mining is expanding in line with transport capacity, and recent natural gas discoveries are likely to transform Mozambique into a major resource-rich country. Managing this process well would allow Mozambique to escape the "resource curse" and leverage the new wealth to boost development. This will require substantial changes in the current approach to fiscal policy formulation. The chapter discusses analytical tools that can help assess the trade-offs associated with alternative policy decisions. Fiscal policy will need to strike the right balance between the need to scale up investment in priority sectors, taking into account capacity constraints, and long-term fiscal sustainability and exhaustibility considerations. It will be important to shield the annual budget from price volatility through the adoption of fiscal rules, and to strengthen key institutions, including by enhancing public financial management to ensure that resource wealth is used efficiently and transparently. Even though capacity constraints in Mozambique seem high and hence the pace of using resource wealth should be gradual, the country has a unique opportunity in its new resource wealth to accelerate its development and transform the economy.

Chapter 11 models the *nexus between natural resource wealth, public investment strategies, and implications for growth and debt*. The world-class gas discoveries

off the northern coast could begin to provide significant economic benefits to Mozambique, including government revenues, by the end of the decade. The model results show that a gradual scaling-up of public investment anticipating some, but not all, of the future gas revenue would be appropriate given Mozambique's vast infrastructure needs, the uncertainty of gas production and revenue, and debt sustainability implications. To reap the full returns on public investment scaling-up, reforms would also need to enhance the efficiency of investment through strengthened investment planning and coordination; project assessment, selection, and monitoring; improved governance; and provision of complementary infrastructure.

Chapter 12 discusses the *challenge of avoiding Dutch disease*, that is, the danger that a boom in the natural resource sector could lead to an appreciation of the real exchange rate that would make exports from other sectors of the economy less competitive. While there is no strong evidence of Dutch disease in Mozambique to date, as the magnitude of resource revenue rises tensions are likely to mount and the government should prepare policies to support the competitiveness of the nonresource economy. Drawing on cross-country studies and experiences, options include (1) establishing, early on, fiscal rules governing the use of resource revenue to anchor fiscal policy and provide transparency; (2) based on the fiscal rule, creating a sovereign wealth/development fund with clear rules and adequate oversight to provide accountability and resources to finance public investment; (3) establishing a well-designed public investment strategy/plan consistent with the national development plan and medium-term budget to ensure the allocation of public resources to those projects that lead to higher and broad-based growth; and (4) strengthening institutional and human capacity to assess investment projects in order to optimize the development and implementation of the public investment strategy in the best possible way to facilitate economic development.

To sum up, Mozambique has come a long way from the ravages of civil war and has achieved high and sustained growth over the past two decades. The country's immediate priorities are to share the benefits of this growth more broadly among the population, and to address the challenges of the economy's ongoing transformation from its traditional agricultural base to the dominance of large-scale activities in mining, agro-business and processing, and services. To address these challenges will require continued institutional and capacity building in public administration to further improve the foundations and structures of economic policymaking and governance that have been created and make them fully operational. It will also require further opening to the private sector, which will be the primary source of future employment, and working with private operators, small and large, to make Mozambique more business-friendly and competitive. This should allow the Mozambican people to truly rise to their potential and, to quote from Mozambique's national anthem, "build a new tomorrow."

CHAPTER

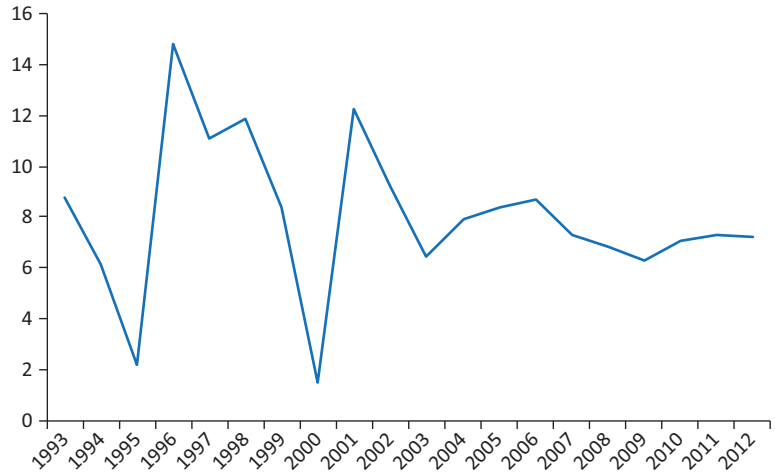
# 1 Mozambique's Growth Experience, Macroeconomic Policy Mix, and Institutions

*Iyabo Masha and Doris C. Ross*

Mozambique has been among the fastest growing economies in sub-Saharan Africa over the last 20 years, with average annual real GDP growth of 7.4 percent (Figure 1.1). This followed years of civil strife that devastated the country and ended with the Rome peace accord of 1992. Various indicators of human development progress—such as GDP per capita, poverty headcount, and life expectancy—have significantly improved. This strong performance was aided by the determined implementation of credible macroeconomic policies and structural reforms, a favorable external environment, donor support, and in recent years, the discovery and exploitation of natural resources.

Notwithstanding this progress, large challenges remain. Mozambique's per capita income, though rising, stood at $567 in 2012, less than 40 percent

**Figure 1.1. Real GDP Growth**
***(GDP at market prices, percent)***




Source: Mozambican authorities.

of the average for sub-Saharan Africa. Though macroeconomic policies largely remain prudent, the structural reform agenda is long and unfinished, and capacity-building needs are pervasive. The discovery and development of natural resources in recent years has provided a boost to growth, and Mozambique is expected to become one of the world's leading exporters of coal and gas within the next decade. This also heightens the challenge to manage resources prudently while diversifying the economy and distributing the gains more evenly.

This chapter first presents stylized facts about trends in Mozambique's growth, followed by a focus on the macroeconomic environment that enabled growth performance. The chapter then reviews the role of institutions and governance in growth outcomes, examines the evidence from a growth accounting exercise, and concludes with a look at some of the remaining challenges.

## Mozambique's Growth from 1992–2012: Stylized Facts[1]

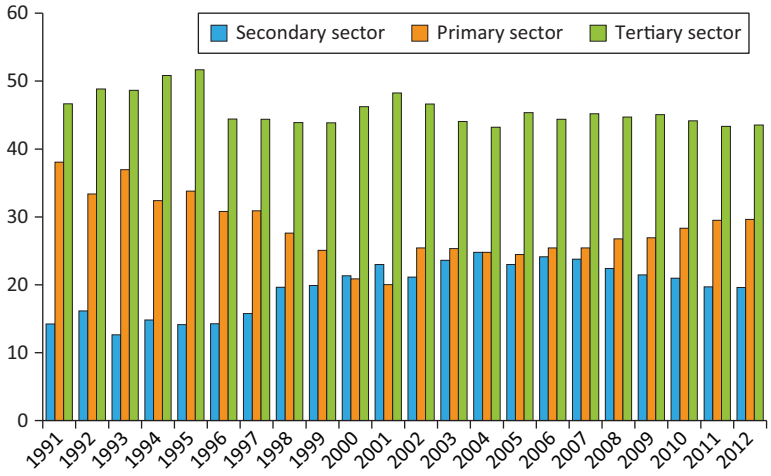
Mozambique's growth experience is best understood in a two-period framework. In the post-war decade (1992–2002), government policies focused on reconstruction and laying the foundations of a market economy. Since then the focus has been on consolidating the gains and maintaining high rates of economic growth. Overall economic performance was strong throughout the two periods, but growth was more volatile in the first decade, with considerable dips in economic performance in 1995 and 2000 owing to weather-related shocks (floods). Economic performance owed much to the market liberalization and privatization policies pursued. In the second period, growth was driven more by investments in megaprojects. Donor support was high throughout the period.

Economic production is not very diversified, although the economy has experienced some structural change. During the decade of post-war reconstruction, the share of agriculture (primary sector) fell from 38 percent of GDP in 1992 to 20 percent in 2001, reflecting the rebuilding of the economy, rehabilitation of the Cahora Bassa hydropower station (1995–97), and construction of the Mozal aluminum smelter (1998–2003) (Figure 1.2). Mozal was Mozambique's first post-war megaproject, and foreign investors were attracted by generous fiscal incentives and access to low-cost electricity. Thus, the share of the secondary sector (mining, manufacturing, electricity, and construction) in GDP grew steadily to about 25 percent by 2004. Since then, with the start of several large investments in commercial farms, agricultural growth has outpaced growth in other sectors, and in 2012 the share of the primary sector stood at around 28 percent of GDP. The tertiary sector (mainly commerce, transport, and government services) ranged around 45 percent of GDP throughout the period.

[1] See Clement and Peiris (2008) and IMF (2004).

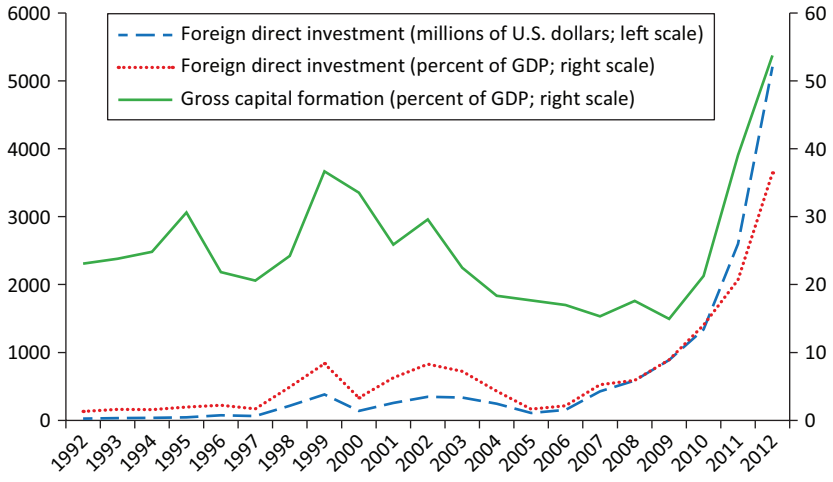
Investment, especially in megaprojects, boosted growth, accounting for an estimated 2–4 percentage point increase in growth in each year of active construction (Figure 1.3).[2] Investment in the early post-conflict years reflected

**Figure 1.2. Sectoral Distribution of Gross Domestic Product**
***(Percent of GDP)***




Sources: Mozambican authorities; and IMF staff estimates.

**Figure 1.3. Net Foreign Direct Investment and Gross Capital Formation**
***(Millions of U.S. dollars, and percent of GDP)***




Sources: Mozambican authorities; and IMF staff estimates.

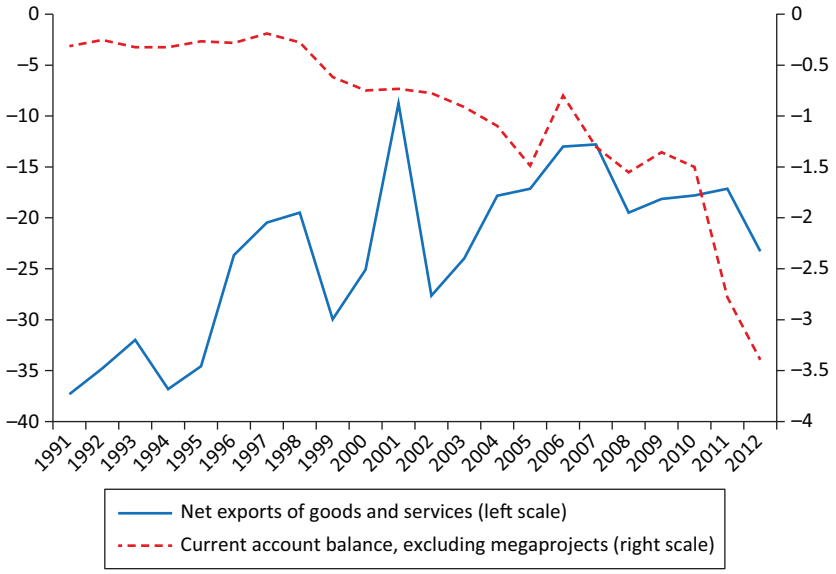
[2] Megaprojects are large foreign-owned and capital-intensive, island-type activities that rely on extracted resources and/or imported intermediate goods, and which export almost all of their production. See IMF (2011, Appendix II); IMF (2013b, Appendix III); and Melina and Xiong (2013).

aid-financed reconstruction, but attention soon shifted to infrastructure projects and foreign direct investment (FDI), mainly the Cahora Bassa, Mozal, and Sasol (gas pipeline to South Africa) projects. Since 2004, several mining projects have started, including the Kenmare heavy sands project, the Vale and Rio Tinto coal mines, and, more recently, the successful gas exploration by ENI and Anadarko in the Rovuma basin off the shore of northern Mozambique (see Chapter 2 for more details).

With the post-war reconstruction and market reforms, Mozambique's net exports of goods and services recovered strongly (Figure 1.4). The pickup in investment and FDI inflows since 2007 has been linked to import growth, and net exports weakened again after 2011. The export base has moved away from traditional exports such as prawns, cotton, timber, raw cashew nuts, and sugar—which dominated in the first post-war decade—to exports from megaprojects (mainly aluminum, electricity, and coal), which now account for about 70 percent of total merchandise exports, though traditional exports continued to grow in absolute size (Figure 1.5). Imports are now driven by bauxite, fuel, and other extractive industry-related imports, and the external current account deficit reached 46 percent of GDP in 2012. Excluding megaprojects, the current account after grants has been close to balance.

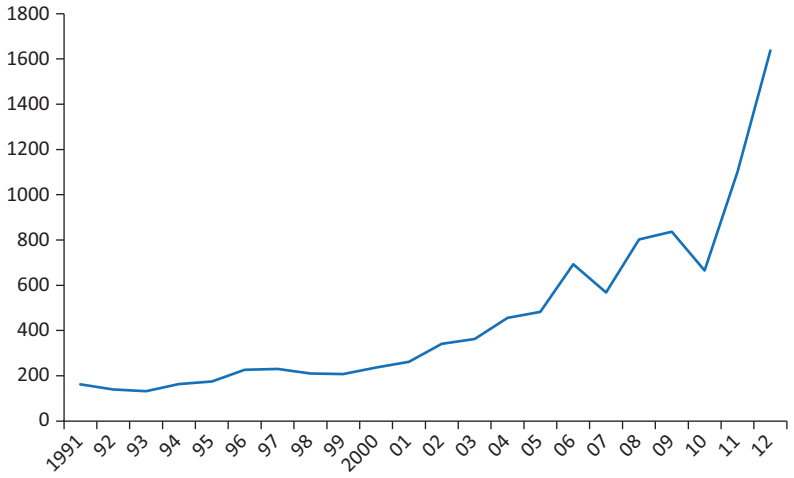
With sustained growth, progress in reducing poverty was significant early on but then tapered off. The poverty headcount, as measured by the

**Figure 1.4. External Current Account and Net Exports of Goods and Services**
***(Percent of GDP)***




Sources: Mozambican authorities; and IMF staff estimates.

**Figure 1.5. Traditional Exports**
***(Millions of U.S. dollars)***




Source: Mozambican authorities.

national poverty line, fell from 69 percent in 1996/97 to 54 percent in 2003 (Table 1.1). The decline was particularly strong in rural areas. Other indicators and measures of human development, such as primary school attendance, vaccination coverage, and attended births, have improved in line with the decline in poverty. Poverty reduction was aided by an increase in agricultural incomes and increased access to education.

However, the latest household survey data of 2008/09 showed at best stagnation in poverty rates since 2003, with more than half the population living below the poverty line.[3] Improvements have been most pronounced in the already-more-affluent southern regions and in urban centers, especially the Maputo area, while nationwide rural poverty continues to be severe. This reflects a number of factors. First, the growth in industry after 2000 contributed little to poverty reduction, as few jobs were created due to the enclave character and capital-intensity of the megaprojects. Second, the spillover effect through technology transfer or skills development, which could help to improve factor productivity, has been small. Employment remains dominated by agriculture (around 80 percent of the economically active population), mostly in subsistence activities with very low productivity. Agricultural productivity—and thus growth—has been stronger for larger farmers and agribusiness than for smallholders (see Chapter 4). Since Mozambique's recent growth has been less pro-poor than other African high-growth economies (IMF, 2013a), its Human Development Index remained at a steady rate below the sub-Saharan African average (Figure 1.6).

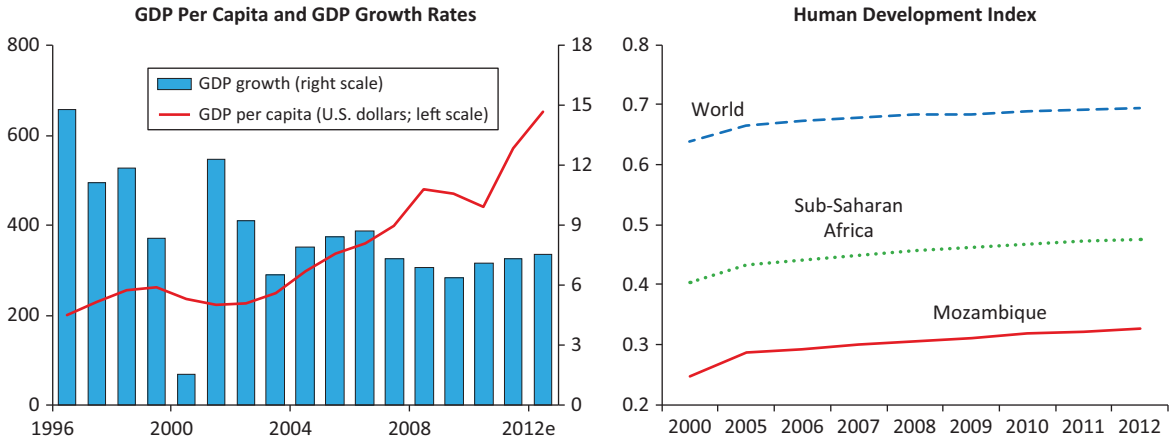
[3] See Chapter 9 for a more comprehensive presentation of recent developments in poverty dynamics in Mozambique.

**Table 1.1. Millennium Development Goals**

| | Mozambique | | | SSA |
|---|---|---|---|---|
| | 1995 | 2005 | 2011 | 2011 |
| Population (millions) | 16 | 21 | 24 | 875 |
| National household survey poverty incidence (percent) | 69.0 | 54.1[1] | 54.7[2] | . . . |
| GDP per capita (2000 U.S. dollars) | 233 | 308 | 402 | 648 |
| Primary school enrollment ratio (percent of net) | 56 | 76 | 90 | 76 |
| Ratio: girls to boys in primary/secondary education (percent) | 75 | 84 | 90 | 90 |
| Under 5 mortality rate (per 1000) | 183 | 162 | 103 | 108 |
| Prevalence of HIV, total (percent of population aged 15–49) | 10 | 12 | 11 | 5 |
| Access to improved water sources (percent of population) | 42 | 45 | 47 | 61[2] |

Source: World Bank, Development Indicators database.
Note: SSA = sub-Saharan Africa.
[1] Refers to the 2003 and 2008 household survey results.
[2] 2010.

**Figure 1.6. Development Indicators**




Sources: World Bank, World Development Indicators; and United Nations, Human Development Index.

An important challenge for Mozambique is its young population and strong population growth, at about 3 percent a year, with the labor force increasing even more rapidly (see Chapter 5). Also, average education levels are low and will take time to improve; more than 90 percent of the labor force has either none or only up to five years of formal education. The mismatch of education in the labor force and what is required for formal job generation constrains growth (World Bank, 2012; Jones and Tarp, 2012). Manufacturing requires a higher education profile (grades 6–12 and beyond) than is usually available in the country's labor force (Fox and Oviedo, 2008). In addition, HIV/AIDS, with a prevalence rate of 16 percent—twice the sub-Saharan

African average—poses a serious threat to economic growth through its effect on the labor force. Life expectancy of persons with HIV/AIDS is about 37 years, compared to 50 years for persons without HIV/AIDS (World Bank, 2012). Thus continuing to prioritize investment in education and public health is essential.

Responding to these long-term challenges has been at the core of the government's poverty reduction strategy. The most recent strategy document—Mozambique's third *Plano de Accão de Redução de Pobreza* (PARP)—covers 2011–14. Its key pillars are to increase production and productivity in agriculture, promote employment, and foster human and social development.

## Macroeconomic Policy Mix

Mozambique's growth has reflected sound macroeconomic policies, complemented by a series of structural policy reforms, strongly supported by donors and favorable global economic conditions, especially for commodity prices. In the immediate post-war phase, macroeconomic policy reforms focused on liberalizing the exchange and trade system, and reducing fiscal imbalances and the role of the state in the economy. Later on, as market institutions and mechanisms began to operate, macroeconomic policies sought to reduce vulnerability and increase resilience to shocks.

### Fiscal Policy

Fiscal policy has been prudent throughout the two decades examined here. In the context of programs supported by the International Monetary Fund (IMF), policies aimed to strike a balance between securing and maintaining macroeconomic stability by mitigating pressures on domestic demand and implementing structural reforms to support development. The initial period focused on strengthening resource mobilization through tax reform and improved efficiency in tax administration, while at the same time making government expenditure more effective. The introduction of the value-added tax (VAT) in 1999 was an important milestone, followed by a new and more transparent income tax code in 2003. The revenue authority (*Autoridade Tributaria Mocambicana)* was established in 2005, and Mozambique commenced a new phase of reforms to improve direct taxation and reduce distortions and tariff barriers. Expenditure policies focused on prudent management of fiscal resources for the benefit of priority and social sectors, and channeled aid resources to building infrastructure and assisting the socially disadvantaged population. A privatization program helped reduce fiscal risks from the operations of state-owned enterprises (SOEs), and by 2000 the role of SOEs had been reduced to less than a third of industrial

output. However, more recently SOEs have again been gaining in importance, including through their involvement in production-sharing agreements for natural resources.

### Monetary and Exchange Rate Policy

Control over monetary aggregates and the overall thrust of monetary policy were strengthened by the transition to indirect instruments of monetary control in the early 1990s. Interest rates were fully liberalized in 1994 and barriers to entry to the financial sector were removed. A bond market commenced in the late 1990s and an interbank money market was introduced in 1997. Periods of high inflation due to exogenous shocks (e.g., in late 2010) were managed through a combination of fiscal consolidation and increased flexibility in the exchange rate. Mozambique has also been able to manage exchange rate volatility, especially in periods of high international commodity prices, through market-based actions.

### Financial Sector Policy

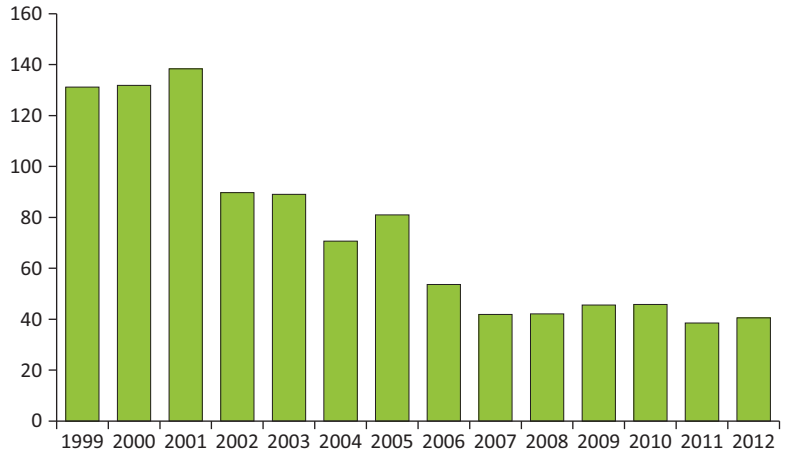
Financial sector reform policies focused on developing the institutional framework for commercial banking and establishing a strong supervisory regime. A financial institutions law and a central bank law were passed in 1991, introducing banking supervision rules. In addition, prudential regulations for on-site and off-site inspections were introduced. More recently, attention has focused on increasing the resilience of the banking system to vulnerabilities from concentrated ownership and strong credit growth through appropriate supervisory and prudential frameworks.

### External Financing and Debt Policy

Mozambique benefited from strong donor support—among the highest in the world—in the form of large amounts of foreign grants and highly concessional financing throughout the post-conflict period. In addition, in the past decade the government sought to attract FDI and public-private partnerships to fund investment. Mozambique benefited from debt relief through the Heavily Indebted Poor Countries (HIPC) Initiative in 1999 and 2001, and from the Multilateral Debt Reduction Initiative (MDRI) in 2006, which substantially reduced its external debt (Figure 1.7).

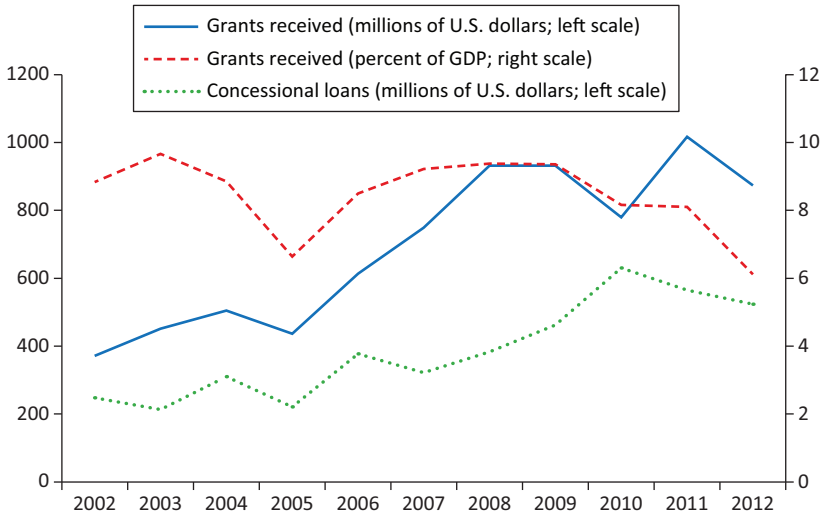
Between 1998 and 2004, Mozambique's foreign grants and loan receipts accounted for 15 percent of GDP, on average, 70 percent of which was in the form of grants. Though donor support has declined somewhat since then, grants still constituted around 6 percent of GDP in 2012 (Figure 1.8).

**Figure 1.7. Total Public Debt**
***(Percent of GDP)***




Source: Mozambican authorities.

**Figure 1.8. Donor Flows**




Sources: Mozambican authorities; and IMF staff estimates.

The grants and loans were allocated mainly to the priority sectors defined in Mozambique's poverty reduction strategy (PARP). The main sectors benefiting were agriculture, road construction, education, and health. Most loans were contracted on terms under the World Bank's International Development Association (IDA) or other concessional terms.

The government's focus on prudent macroeconomic policies supported the country's strong economic performance. At the same time, the strengthening of the institutional environment played an important role.

## Role of Institutions

Mozambique's institutional framework has evolved substantially in the past two decades. The country emerged from the civil war with a socialist economy based on state control, central economic planning, and administered prices. While this model remained in effect during the first few years after the end of the civil war, a gradual move toward building the institutional foundations of a market economy commenced in tandem, allowing resources to be allocated more efficiently. A wide-ranging structural reform program contributed to progress in institutional development, with key initiatives in public financial management, financial sector development, debt strategy and management, business climate reform, and extractive industry transparency.

At the same time, institution building remains a major challenge. While the government has prepared a number of strategy documents, both economy-wide[4] and sector-specific, these are often prepared in isolation rather than in an integrated and coordinated manner (IESE, 2012). More coordination and cooperation between various ministries and the setting up of strong interministerial coordination groups would be helpful to maximize the benefits of the government's institution-building and reform efforts, contain costs, and enhance government effectiveness and strengthen the reform consensus.

### Public Financial Management

Fiscal structural reforms improved the achievement of overall fiscal policy objectives. An ambitious program of public financial management reform commenced in 2002 with the promulgation of the Integrated Financial Management Information System Law (SISTAFE). The goal was to develop a computerized integrated public sector budget and financial management system that fosters transparency in the management of fiscal resources. Over the years, updates of the underlying legal framework and the implementation of various modules—such as those on planning and budgeting, financial execution, accounting, financial reporting, and internal and external controls, as well as the deployment of information and communication technology—have contributed to improvements in overall public financial management. In successive Public Expenditure Financial Accountability assessments, scores have improved on a variety of indicators, putting Mozambique among the stronger public financial management (PFM) performers in Africa. Good scores on the Country Policy and Institutional Assessment also earned Mozambique a "medium capacity" rating (Table 1.2).

[4] These include the national development strategy, the poverty reduction strategy (PARP), the five-year development strategy (PQG), annual economic survey reports (PES), the public investment plan (PII), the medium-term debt strategy, and the annual debt sustainability analysis (DSA).

Table 1.2. Country and Policy Institutional Assessment (CPIA)

| | Mozambique | SSA (average) |
|---|---|---|
| **Economic Management** | **4.5** | **3.4** |
| Monetary and Exchange Rate Policy | 4.5 | 3.6 |
| Fiscal Policy | 4.5 | 3.3 |
| Debt Policy | 4.5 | 3.3 |
| **Structural Policies** | **3.5** | **3.2** |
| Trade | 4.0 | 3.6 |
| Financial Sector | 3.5 | 2.9 |
| Business Regulatory Environment | 3.0 | 3.1 |
| **Policies for Social Inclusion and Equity** | **3.5** | **3.2** |
| Gender Equality | 3.5 | 3.2 |
| Equity of Public Resource Use | 3.0 | 3.3 |
| Building Human Resources | 4.0 | 3.5 |
| Social Protection and Labor | 3.5 | 2.9 |
| Policies and Institutions for Environment Sustainability | 3.5 | 3.1 |
| **Public Sector Management and Institutions** | **3.4** | **2.9** |
| Property Rights and Rule-Based Governance | 3.0 | 2.7 |
| Quality of Budgetary and Financial Management | 4.0 | 3.0 |
| Efficiency of Revenue Mobilization | 4.0 | 3.4 |
| Quality of Public Administration | 3.0 | 2.8 |
| Transparency, Accountability and Corruption in Public Sector | 3.0 | 2.7 |
| **Overall CPIA Score** | **3.7** | **3.2** |

Source: World Bank 2013 CPIA.
Note: SSA = sub-Saharan Africa. The CPIA consists of 16 criteria grouped in four equally weighted clusters: Economic Management, Structural Policies, Policies for Social Inclusion and Equity, and Public Sector Management and Institutions. For each of the 16 criteria, countries are rated on a scale of 1 (low) to 6 (high). The scores depend on the level of performance in a given year assessed against the criteria, rather than on changes in performance compared to the previous year. The ratings depend on actual policies and performance, rather than on promises or intentions. The ratings reflect a variety of indicators, observations, and judgments originated in the World Bank or elsewhere.

## Financial Sector Development

Mozambique's first generation of financial sector reforms focused on privatizing the previously state-owned banks, promoting financial sector stability, and improving depth. Since then, good progress has been made in strengthening and developing the financial sector, as noted in the IMF's and World Bank's 2009/10 Financial Sector Assessment Program Update (see Chapter 8). Private banks now represent about 95 percent of total financial sector assets. The ratio of domestic deposits to GDP rose from 24.5 percent in 2003 to just under 35 percent in 2012. During the same period, private credit to

GDP almost tripled to about 30 percent. The system is well capitalized, has low nonperforming loan rates (3.2 percent of total loans), and is profitable. Nonetheless, the banking sector is highly concentrated, with the three largest banks accounting for 85 percent of banking system assets in 2011, down from 100 percent in 2004. Fifteen of the 18 existing banks are locally incorporated subsidiaries with more than 50 percent foreign ownership.

As financial sector soundness and stability improve, official policy has turned to broadening access to financial services, which is recognized as important for the poverty reduction program, as well as for the agenda on business environment improvement and private sector growth.[5] A 2013–22 Financial Sector Development Strategy adopted in early 2013 provides a broad vision and roadmap for financial sector development. Follow-up actions are to include the establishment of private credit registry bureaus, promotion of mobile banking, strengthening of the insolvency framework, and setting up of a moveable collateral registry. A Financial Sector Contingency Plan was adopted in April 2013, and a Deposit Insurance Fund is to begin operations in 2014.

### Debt Strategy and Management

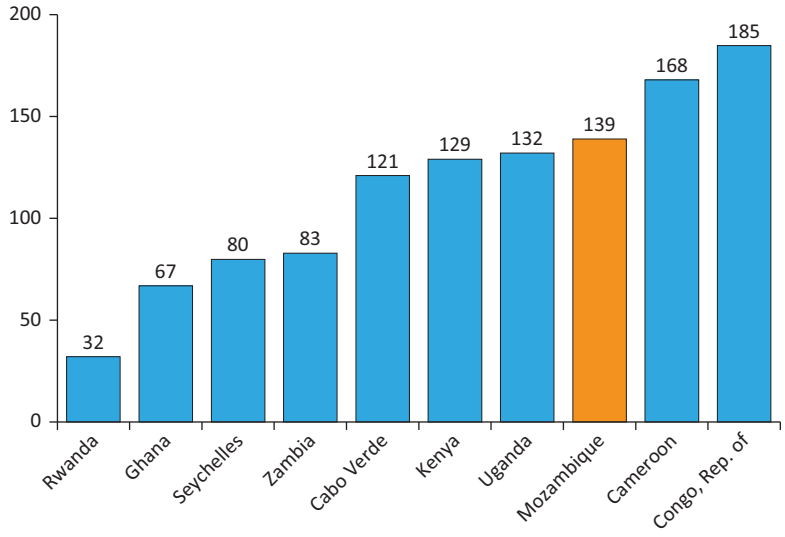
Mozambique obtained a new lease on life when it obtained HIPC and MDRI debt relief, which reduced debt service and created fiscal space of 12 percent of GDP during 2001–10. Though debt levels have since risen again, debt accumulation was mostly on concessional terms until 2011 and proceeds were used mainly to improve infrastructure or for other priority projects. Mozambique is developing the institutional framework for debt management, and adopted a medium-term debt strategy in late 2012. The challenge is to translate the strategy into ongoing analysis that can inform policy choices and decisions. Recent efforts are geared toward aligning debt management and investment planning so as to improve economic and social returns, while safeguarding debt sustainability.

### Business Climate Reform

Recent rankings in the World Bank's Doing Business Survey indicate that Mozambique has made progress in areas such as "dealing with construction permits" and "trading across borders," but its overall ranking in 2013 remained low at 139 (out of 189 economies surveyed) (Figure 1.9). Similarly, in the World Economic Forum's 2014 Global Competitiveness Index, Mozambique scored 137th out of 152 countries, lower than most

[5] Access to finance was ranked as the top constraint to doing business in Mozambique in the World Economic Forum's *Global Competitiveness Report* (2011). See Chapter 8 on financial inclusion.

**Figure 1.9. Doing Business Ranking**
***(Rankings from 1–189)***




Sources: World Bank, *Doing Business Indicators 2014*; and Fitch.
Note: The rankings for all economies are benchmarked to June 2013. Countries included in the figure are Mozambique's peer sub-Saharan countries with B or B+ Fitch ratings.

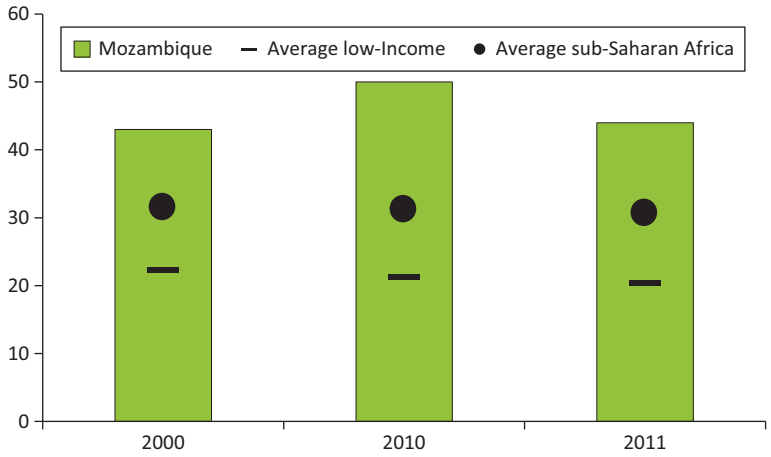
African countries. To attract more investors, and in cooperation with the International Finance Corporation, the private sector arm of the World Bank, the government has established a one-stop investment center to facilitate faster and more efficient interaction with prospective investors. Also, various regulations have been introduced or changed to improve investor property rights and contract enforcement. Overall, however, much remains to be done and there is a danger that resource-related high growth rates may lead to complacency instead of renewed impetus on strengthening activity in the nonresource economy (CTA/ACIS, 2013; CTA/MPD 2014).

## Governance

Mozambique performed better than both sub-Saharan Africa and low-income countries in the World Bank's Worldwide Governance Indicators, with improvements in key areas such as government effectiveness, regulatory quality, and the rule of law, but rankings continue to suffer in other areas (Figure 1.10) (World Bank, 2013).[6] Similarly, Mozambique scored better than sub-Saharan African countries on the Mo Ibrahim Index of Governance, ranking 20th out of 53 countries in the 2013 edition, with 54.8 out of 100 maximum points (Mo Ibrahim Foundation, 2013). The index covers four

[6] The six dimensions of the index are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.

**Figure 1.10. Governance Indicators**
***(Percentile rank; average)***




Source: World Bank, World Development Indicators Database.

broad categories—safety and the rule of law, participation and human rights, sustainable economic opportunity, and human development. While Mozambique scores strongly on gender issues, human development indicators are relatively weak, although they have improved over time. Nonetheless, the perception of corruption in Mozambique is pervasive. The country scored 119th out of 177 in Transparency International's Corruption Perceptions Index with 30 out of a maximum of 100 points (Transparency International, 2013). Anticorruption legislation has been on a very slow road through drafting to parliamentary approval and implementation on the ground.

### Extractive Industry Transparency

As the size of the extractive industry expands, the authorities have begun to strengthen the legal frameworks and fiscal regimes for the mining and hydrocarbon sectors, and to increase transparency in operations and reporting. In 2009, Mozambique applied to the Extractive Industry Transparency Initiative and was declared fully compliant with EITI rules in 2012 with its second report covering 2010. Mozambique also endorsed the Global Partnership for Social Accountability in 2012, which aims to improve development results by supporting enhanced citizen participation and feedback.

## Evidence from Growth Accounting

A growth accounting exercise provides additional information on the different roles played by the main drivers of Mozambique's growth, capital, and labor,

while allowing for drawing policy lessons.[7] The results are broadly in line with growth accounting exercises for sub-Saharan Africa and validate the evidence from Mozambique's growth experience:

- Mozambique's growth has been largely capital-intensive, with capital accumulation accounting for a larger share of growth than other factors in the two periods analyzed. Though the share of capital declined in the second period, it still contributed substantially to economic performance. This is consistent with evidence from the large investment in plants and infrastructure.

- Labor's contribution to growth has remained more or less constant in both periods, reflecting population growth.[8]

- The size of the contribution of total factor productivity (TFP) confirms that determinants other than capital and labor were also instrumental to growth outcomes. While in the first period TFP contributed 13 percent to growth outcomes, by the second period its contribution had risen to 36 percent. The second period coincided with prolonged peace, credible macroeconomic programs, and institutional development, which supported investment. With the removal of socialist-era controls, markets began to function and productivity improved. Given that Mozambique had not yet exploited natural resources on a significant scale during this period, good policies and institutional development were largely instrumental to the outcome. Though on average growth was lower in the second decade, it was more sustainable because it was driven by TFP rather than pure factor accumulation.

## Remaining Challenges

Mozambique's recent economic performance owes much to sound macroeconomic and structural policies, a favorable external environment, and donor support. While much has been achieved, more remains to be done to address the evolving challenges facing the country. The discovery of huge natural resources positions Mozambique for a profound transformation in the years ahead and adds new challenges to managing the natural resource boom. Yet the key challenge remains to maintain economic growth and make it more inclusive so as to achieve a more durable reduction in poverty. This requires a focus on policies beyond the resource sector.

[7] The empirical framework is based on standard growth accounting theory. See Appendix 1.1 for a brief presentation.

[8] Given the data limitations and the assumptions about the growth of the labor force (see discussion in Appendix 1.1), the interpretation of this result is limited.

*The role of prudent macroeconomic policies* is very important. Mozambique's two decades of prolonged growth have been associated with strong macroeconomic policies. As the economy becomes more dependent on natural resources, the role of prudent policies in marshalling these resources becomes even more important. Key among these are designing an appropriate fiscal regime and framework for natural resource management to hedge against volatility in government revenue, while meeting infrastructure and social investment needs and ensuring optimal intergenerational allocation. There is also need for policies to support the competitiveness of the non-natural-resource sectors.

*Institutional and structural reforms* should remain at the top of the policy agenda. This includes continued capacity-building in public administration in economic analysis and policy formulation, implementation, and monitoring. At the same time, ongoing business climate reforms should progress at a faster pace and on a very broad scale to promote private investment and activities that hold the promise of providing formal or informal employment to an increasing share of the fast-growing labor force. In parallel, given the current dominance of agriculture in employment, the government needs to strengthen efforts to improve productivity in agriculture (including by improving rural road and irrigation infrastructure; access to electricity, safe water and sanitation; access to agricultural markets and services; the quality of seeds and fertilizers; and the availability of basic financial services). More broadly, continued investment in human capital to achieve improvements in health and education levels will be crucial to strengthen average skill levels in the labor force, which in turn is crucial to reducing poverty.

*Policy coordination*, both at the senior and technical levels, should be strengthened. While the government is producing many strategy documents, for the most part these are not coordinated within the government and implementation is typically slow.

## Appendix 1.1. Growth Accounting Framework

The theoretical framework for the exercise is based on a Cobb-Douglas-type function:

$$Y_t = AK_t^{\alpha} L_t^{(1-\alpha)}. \qquad (1)$$

Equation (1) specifies that real output in the economy is a function of labor, capital, and total factor productivity, where $Y$ is the aggregate output, $K_t$ is the capital input, $L_t$ represents labor input, all measured in efficiency units, and $t$ is the time index. $A$ is the rate of technological change over time, $\alpha$ is the share of capital in aggregate output, and labor's share is derived residually.

The growth accounting exercise undertaken builds on past work on Mozambique, particularly IMF (2005).[9] Key variables for the exercise include:

- ***Output***: Real output is measured by GDP at constant prices as published by the Mozambican National Institute of Statistics (INE).
- ***Labor***: Due to the lack of a complete employment dataset, labor input is estimated using the population and the population growth rate as a proxy. Though qualitative information is now regularly applied to growth estimation, a lack of data on educational attainment precludes this study from doing so.
- ***Capital***: Using official data on real investment, a series on capital stock was computed based on the perpetual inventory accumulation method, consistent with past studies.[10] To perfect the perpetual inventory accumulation method, two further assumptions were made on the capital series. The initial capital output ratio is assumed to be 1:5, and the depreciation rate is set at 6 percent a year. Therefore, the capital stock dynamics is captured as

$$K_t - K_t\text{-}1 = I_t - \delta K_t\text{-}1,$$

where $K$ is capital accumulation, $I$ is gross investment, and $\delta$ is the depreciation rate.

**Table A.1.1. Sources of Economic Growth**
***(Percent)***

| | 1993–2002 | 2003–12 |
|---|---|---|
| | (Average) | |
| Real GDP growth | 8.6 | 7.4 |
| Share of factor | | |
| Capital | 5.7 | 3.1 |
| Labor | 1.8 | 1.6 |
| Total factor productivity | 1.1 | 2.6 |
| In percent of contribution | | |
| Capital | 66.1 | 42.2 |
| Labor | 21.0 | 22.1 |
| Total factor productivity | 12.9 | 35.7 |

Sources: Mozambican authorities; and IMF staff estimates.

[9] See also Jones (2006) and Ndulu and O'Connell (2000).
[10] Results compare well to IMF (2005), which found that during 1996–2004, total factor productivity accounted for 50 percent of GDP growth.

The equation is estimated for 1992–2012, as a whole, and in a two-period model coinciding with this analysis. Following assumptions in developing countries generally, we assume a factor share of 0.6 for labor and 0.4 for capital (Tahiri and others, 2004).

The results of the exercise are shown in Table A1.1.

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CHAPTER

# 2 The Role of Megaprojects and Their Relationship to Jobs and Growth

*Yi Xiong*

Foreign direct investment (FDI) in Mozambique is closely linked to megaprojects—large-size, foreign-owned projects, often in the natural resources sector. This chapter discusses why FDI in Mozambique has been mostly in the form of megaprojects, and how these projects can be made more conducive to jobs and growth going forward.

## Cahora Bassa and Mozal

Located on the Zambezi River in Tete Province, the Cahora Bassa dam is the object of national pride in Mozambique. Standing 560 feet high by 994 feet wide and equipped with five 415-megawatt turbines, the dam is comparable to the Hoover Dam both in size and in electricity generating capacity. "Cahora Bassa is ours!" declared President Armando Guebuza when the Mozambican government obtained a majority stake in the dam in 2007.

Construction of Cahora Bassa started in 1969 during the Portuguese colonial period. The project is export-oriented by design. The dam has a maximum electricity generation capacity of about 2,000 megawatts, far exceeding the electricity demand of the whole country at the time construction started. An electricity supply agreement was signed between the Portuguese and the South African governments, and the construction of a 1,400 km transmission line linking Cahora Bassa to South Africa was part of the project. It took almost 10 years for the project to be completed. Cahora Bassa reached its maximum electricity generating capacity in 1979, only to have the transmission line destroyed in 1980 in the midst of the civil war and the export contract with South Africa suspended. After the civil war, extensive repair work was undertaken during 1995–97, and full power transmission capacity was restored by 1998.

There was sufficient generating capacity to allow Mozambique to host Mozal, a $2 billion aluminum smelter near Maputo that was the first major FDI project in Mozambique's history. Aluminum production is very

energy-intensive. Because of the abundant electricity supply from Cahora Bassa, Mozal was able to secure long-term electricity supply at relatively low costs. After 2½ years of construction, the first phase of the Mozal project was completed in 2000. Construction of the second phase started in 2001 and was completed in 2003, doubling Mozal's capacity. Since completion of the second phase, Mozal has consumed about 900 megawatts of electricity, which is about half of Cahora Bassa's capacity and more than four times the rest of Mozambique's electricity consumption. Mozal was later proven to be a commercial success, generating high investment returns partly because of high aluminum prices in the mid-2000s.

Cahora Bassa and Mozal were later followed by other megaprojects, including the Sasol onshore natural gas extraction, the Kenmare heavy sands project, and a number of coal mining projects in the Tete province, among which the two largest are operated by Vale and Rio Tinto (Table 2.1).

**Table 2.1. Megaprojects in Operation and under Consideration in Mozambique**

| | Company Name | Sector | Location (city, province) | Capacity/Reserves | Construction | Production |
|---|---|---|---|---|---|---|
| **Current and extensions under consideration** | | | | | | |
| 1 | Hydroelectrica Cahora Bassa (HCB) | Electricity generation | Cahora Bassa, Tete | | | |
| | HCB | | | 2,075 MW | 1995–97 | 1998 |
| | HCB_North | | | 1,240 MW | | |
| 2 | Mozal | Aluminum smelter | Beluluale Industrial Park, Maputo | | | |
| | Mozal I | | | 245,000 tons | 1998–2000 | 2000 |
| | Mozal II | | | 245,000 tons | 2001–03 | 2003 |
| | Mozal III | | | | | |
| 3 | Sasol | Natural gas | Pande and Temane gas fields, Inhambane | 154 GJ | 2002–04 | 2004 |
| | 50% expansion | | | 183 GJ | 2011 | Ramp up by 2016 |
| 4 | Kenmare | Heavy sands | Moma, Nampula | 600,000 tons | 2004 | 2007 |
| | 50% expansion | | | 300,000 tons | 2011–12 | 2013 |
| 5 | Vale (CVRD) | Coal | Moatize mine, Tete | 25 million tons per year | 2007–11 | 2011 |
| 6 | Rio Tinto | Coal | Benga mine, Tete | 45 million tons per year | Acquisition in 2011 | 2012 |
| 7 | JSPL | Coal | Changara district, Tete | 10 million tons | | 2012–16 ramp up |
| 8 | Beacon Hill | Coal | Moatize, Tete | 87 million tons of reserve | Acquisition in 2010 | 2013 |

(Continued)

Table 2.1. (*concluded*)

| Company name | Sector | Location (city, province) | Capacity/Reserves | Construction | Production |
|---|---|---|---|---|---|
| **Under consideration** | | | | | |
| 1 Mphanda Nkuwa | Electricity | Zambesi river, Tete | 1500 MW | 2014–18 | 2018 |
| 2 Anadarko (US) | Natural gas | Rovuma basin | 10 million tons per year | 2014–19 | 2020 |
| 3 ENI (Italy) | Natural gas | Rovuma basin | 10 million tons per year | 2014–19 | 2020 |
| 4 Statoil (Norway) | Natural gas | Rovuma basin | | | |
| 5 PETRONAS (Malaysia) | Natural gas | Rovuma basin | | | |
| 6 Minas de Revuboè | Coal | Revuboe, Tete | 5 million tons per year | 2013–15 | 2016 |
| 7 Ncondezi (integrated mine and power plant) | Coal and thermal power | Tete | 1.2 million tons per year / 300 MW | 2015 | 2016 (mine), 2017 (power plant) |
| 8 Baobab Resources | Iron ore | Tenge/Ruoni deposit, Tete | 725 million tons | | |
| 9 ENRC | | | | | |
| Coal transport logistics | Rail line | Tete | 40 million tons per year | 2014–15 | 2016 |
| Coal mines | Coal | Tete | 20 million tons per year | 2014–15 | 2016 |
| 10 Corridor Sands | Heavy sands | Chibuto, Gaza province | | | |

Sources: Mozambican authorities; and project operators.

## The Economics of Megaprojects

Both Cahora Bassa and Mozal share the common characteristics of typical megaprojects in Mozambique:

- They are large-size projects financed by foreign investment. Cahora Bassa was foreign-owned until the transfer of ownership to the Mozambican government in 2007; Mozal is 96 percent owned by a group of foreign investors.[1]

- They focus on natural resources. Cahora Bassa uses hydropower resources, and Mozal depends on Cahora Bassa. The other megaprojects are in the areas of coal, heavy sands, and natural gas extraction.

- They are capital-intensive. Mozal, for example, involves a total investment of $2 billion, but employs less than 3,000 permanent and contractor staff.

[1] Mozal is 47 percent owned by BHP Billiton (Australia), 25 percent by Mitsubishi (Japan), 24 percent by IDC (South Africa), and 4 percent by the Mozambican government.

Even by taking into account an estimated 10,000 jobs indirectly generated by Mozal, the project is still extremely capital-intensive, creating one job per $160,000 of investment.

- They are export-oriented. Most of Cahora Bassa's electricity has been either exported to South Africa or consumed by Mozal, which in turn exports almost all of its aluminum output.

- They sometimes invest in specific-purpose infrastructure that cannot be used by the general public. The 1,400 km high-voltage direct current (HVDC) transmission line between Cahora Bassa and South Africa has some 900 km in Mozambican territory, but it is not connected to Mozambique's electrical grid because, by design, HVDC transmission lines are more suitable for transmission between two points, not for multiterminal systems. Mozal also constructed and used railways and port facilities specifically for its purpose.

The capital-intensive megaprojects appear to reflect the comparative advantage of Mozambique at the time they were built. More precisely, they were less affected by Mozambique's comparative disadvantage in infrastructure (see Appendix 2.1).

## Contribution of Megaprojects to Growth

Because of these characteristics, megaprojects have been criticized for not contributing to the Mozambican economy or generating any significant benefits to ordinary Mozambicans.

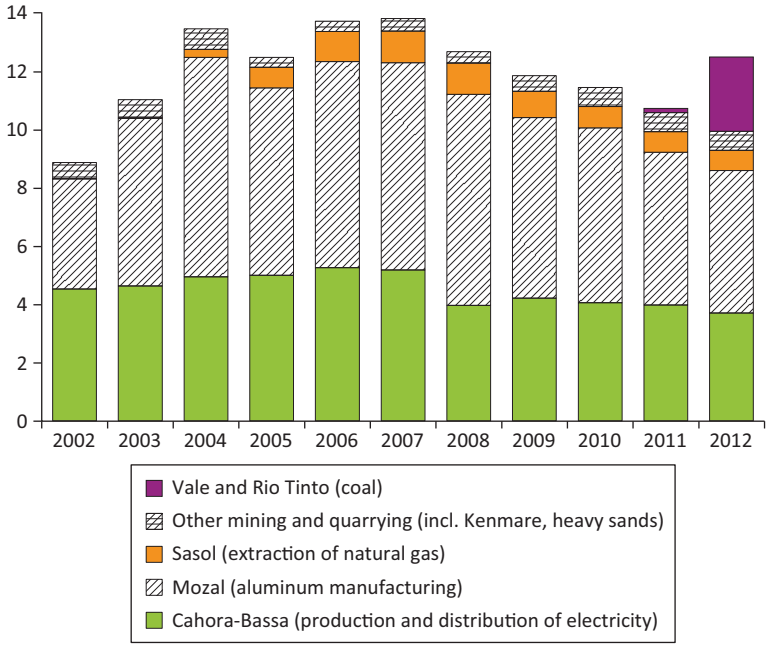
From a national accounts perspective, however, megaprojects have made sizable contributions to economic growth and become a vital part of the economy (Figure 2.1). Historically a 2–4 percentage point per annum boost to economic growth was observed in the years when a major megaproject started production (IMF, 2011). These include 1998–99 (the relaunching of power generation at Cahora Bassa) and 2001–03 (the launch of Mozal). Even though no major megaproject became operational between 2004 and 2011, it is estimated that the share of megaprojects in value added remained stable at above 10 percent. Their contribution to exports is also significant, accounting for 60–70 percent of total exports in recent years.

Looking forward, megaprojects in two emerging natural resources sectors, coal and natural gas, are set to contribute significantly to economic growth:

- Confirmed coal deposits in Mozambique are over 32 billion tons. Full exploitation of these resources could make the country one of the world's leading coal exporters. Coal production reached 5 million tons in 2012, constrained mainly by railway and port capacity.

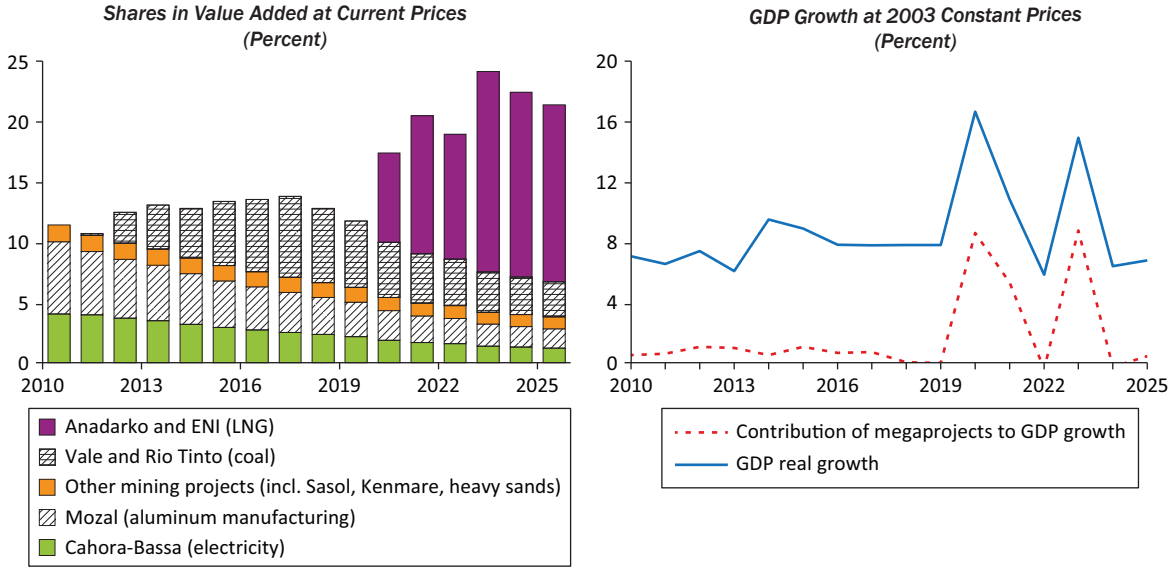
- Abundant and high-quality natural gas reserves have been discovered offshore in the Rovuma basin in northern Mozambique. The natural gas operators (Anadarko and ENI) plan to start construction of liquefied natural gas (LNG) extraction, manufacturing, and transport facilities by 2014, and start exporting LNG by 2020.

**Figure 2.1. Contribution of Megaprojects to Nominal GDP**
***Shares in value added at current prices***
***(percent)***




Source: IMF staff estimates.

**Figure 2.2. Projected Contribution of Megaprojects to Value Added**




Source: IMF staff estimates.

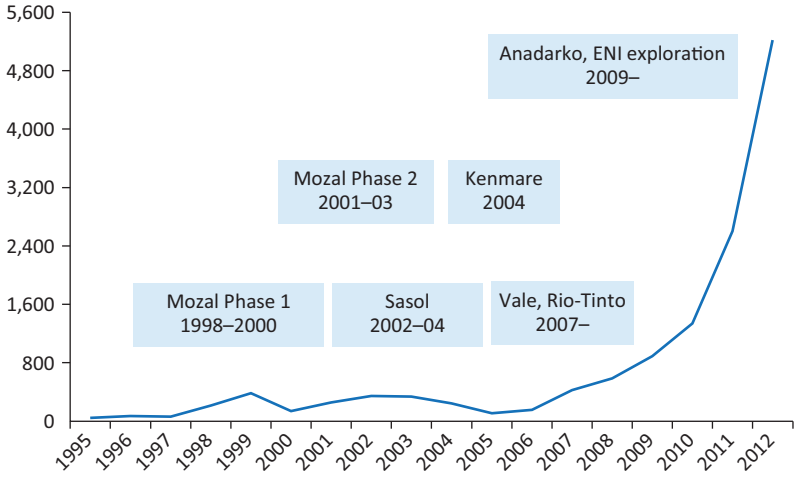
The value added from coal and LNG production is projected to exceed by far that from existing megaprojects over the next decade (Figure 2.2). The value-added share of the coal and LNG sectors is projected at about 20 percent of GDP by 2023, while the share of existing megaprojects will decline to less than 5 percent. Coal and gas contributions to GDP growth will average 2 percentage points per year between 2013 and 2023. GDP growth will reach double digits in the years when some LNG trains become operational.

## Benefits to the Mozambican Economy

The primary objective of the early megaprojects was to showcase that Mozambique can carry large investments. This objective was achieved successfully, although at the price of the government giving up part of the fiscal revenue potential.

The first megaprojects catalyzed foreign investment into Mozambique. Investor confidence in the country had been eroded during the prolonged conflict period. FDI to Mozambique was a mere $65 million in 1997 (less than 2 percent of GDP), right before the launch of Mozal. The Mozal project "demonstrated that large scale investments could be successful in the country's post-conflict environment," according to a 2007 World Bank report. The Mozal project immediately boosted FDI and its success was soon followed by other projects. FDI averaged some $400 million to $500 million per year in the 2000s. The surge in the late 2000s was due to large investments in the coal and natural gas sectors (Figure 2.3).

**Figure 2.3. Foreign Direct Investment**
***(Millions of U.S. dollars)***




Source: Mozambican authorities.

Megaprojects themselves do not create many jobs, as their scope of direct job creation is limited by their capital-intensive nature. Mozal has about 1,100 permanent staff and 1,600 contractors (Mitsubishi, 2006). As a project that has contributed about 5 percent to GDP each year, it employs only 0.02 percent of the labor force. Job creation on a similar scale can be expected of other megaprojects, and it is unlikely that they will become a large source of employment for ordinary Mozambicans.

However, several factors add to the contribution of megaprojects to job creation in other ways, making their impact not as limited as it first appears:

- The construction of megaprojects provides extra job opportunities. During Mozal's two phases of construction (1997–99 and 2001–03), it reportedly hired 15,000 people, most of whom were Mozambicans. The construction was still capital-intensive and relied largely on imported inputs: only 6 percent of Mozal's construction costs were spent on Mozambican goods and services, including labor (Andersson, 2000). Nevertheless, because of the project size, the contribution to the domestic economy was still large.

- Once operational, megaprojects may create jobs indirectly through local contractor firms. Between 2002 and 2007, Mozal's operational spending on Mozambican companies increased from $5 million to $17 million per month (African Development Bank, 2013; OECD, 2013). There are no accurate statistics of how many jobs Mozal has indirectly created, though some have estimated the number at around 10,000 jobs (World Bank, 2007).

- Megaprojects could have positive spillovers through training and on-the-job knowledge transfers, creating job opportunities that otherwise would not be there. Mozal established several training and technical capacity-building programs for its subcontractors. Warren-Rodriguez (2008) found that firms that subcontracted work with Mozal on average had higher levels of skills and higher sales growth in 2003, although he was not able to identify whether this was because of technology transfer from Mozal or selection bias (i.e., that Mozal picked those more capable firms as subcontractors).

Megaprojects can also contribute to the domestic economy through the fiscal channel. The government can obtain a share of megaprojects' value added through taxes, dividends, and profit-sharing agreements, although a large portion of megaprojects' earnings go directly to pay off its foreign shareholders and/or creditors, especially early in the production phase when the debt incurred by the project needs to be paid off.

However, the fiscal channel did not play much of a role in the past in Mozambique. The primary motive for the first megaprojects was to establish

the country as an attractive destination for FDI after a long civil war, and therefore the fiscal terms of those contracts were favorable to the foreign companies. Indeed, megaprojects' contribution to fiscal revenues has been low: on average, they contributed less than ½ percent of total fiscal revenues during 2007–11.

Tax regimes for megaprojects and extractive industries have evolved over time. Tax terms were brought closer in line with best international practice with the revision of fiscal legislation for mining and hydrocarbons in 2007 and have applied to contracts signed since then. The government is also planning to reopen discussions on tax treatment for older megaprojects when their initial terms expire (typically after 20 years).

Thanks to these changes, fiscal revenues from megaprojects are expected to increase going forward. In particular, revenues from the coal and gas projects are projected to become an important source of government revenue in a decade when LNG production is projected to reach full capacity (2023). Until then, fiscal revenue will increase only gradually. This is because of standard tax provisions for investors, including that (1) gas companies pay lower corporate income tax in the first 8–10 years of production, and (2) the government's share in profit from gas will increase only gradually due to cost-recovery provisions. The combined revenue from coal and LNG is projected to reach about 10 percent of GDP, or a third of government revenue, by 2030.

## Making Foreign Direct Investment More Conducive to Jobs and Growth

Mozambique has proven to be attractive mostly to natural-resource-based megaprojects in the recent past. Going forward, the fundamental challenge for the country is to create an environment conducive to other types of foreign investment, that is, projects that are less capital-intensive and have more linkages to the domestic economy. To attract these projects, the identified gaps in supporting infrastructure and the cumbersome regulatory framework need to be addressed so that investment can achieve economically viable rates of return. There is still a long way to go: Mozambique ranks 139th on the 2014 World Bank's Doing Business Index. The special economic zones and industrial free zones that Mozambique has opened in Beira and Nacala could play a crucial role in attracting FDI. If investment policies are well designed and implemented, development of these zones could move forward rapidly.

At the same time, Mozambique will likely continue to attract investors to develop large natural resource projects, given its natural endowment and its lack of capital and capacity to develop these projects on its own. Regarding

existing and pipeline megaprojects, Mozambique should ensure that they are brought under an adequate and unified fiscal framework. Adopting and implementing adequate fiscal laws for megaprojects and the extractive industries is crucial, as it would put megaprojects under regular taxation requirements and avoid the use of project-by-project fiscal regimes that could turn out to be overly favorable to foreign investors. The use of tax incentives to attract megaproject investments should also be limited.

Mozambique can continue to leverage the stimulus role of megaprojects in infrastructure development. Infrastructure constructed by megaprojects should be accessible to other industries to the extent possible. The construction of the Nacala railway line to transport coal from the central province of Tete to the coast was an encouraging example. Although most of the railway capacity would be allocated to coal transportation, the railway can also be used for other cargo and passengers. In other words, demand from the coal mines made the railway project viable, but has not constrained its use.

The fiscal space created by megaprojects could support additional public investment and other expenditures that could translate into growth and jobs. To fully benefit from the fiscal channel, the government needs to sustain its efforts to ensure that an adequate fiscal framework is applied to existing and future megaprojects, and that sound public investment policies are in place to guide the project selection, evaluation, and implementation processes.

The government should continue to encourage knowledge transfers from megaprojects to the rest of the economy. It should encourage megaprojects to consistently provide training programs to their employees and to use qualified local firms as subcontractors. In this regard, the government could provide incentives for the use of training programs targeting local small and medium-sized enterprises that are current or potential subcontractors for existing megaprojects, learning from its experiences with such programs associated with the Mozal project.

## Appendix 2.1. A Small Model of Megaprojects

Capital-intensive megaprojects appear to reflect the comparative advantage of Mozambique at the time they were built. More precisely, they were less affected by Mozambique's comparative disadvantage in infrastructure.

To illustrate this point, assume an investment project in which production efficiency is linked to basic public infrastructure: roads, railway, ports, airports, and access to electricity and water. The rate of return for the investment would depend on the production function $f$, public capital $\bar{k}$ that represents infrastructure, and wage level $w$. For a country with adequate levels of public

capital, an investor chooses capital input $k$ and labor input $l$ to maximize its return on capital:

$$r_1 = \max_{k,l} \frac{f_1(k, l, \bar{k}, w_1)}{k}.$$

For a country where the level of public capital is extremely low, however, the investor would no longer take $\bar{k}$ as given and would contribute a certain amount of investment for the improvement of infrastructure. The rate of return would be

$$r_2 = \max_{k,l} \frac{f_2(k, l, \bar{k}, w_2)}{k + a\bar{k}},$$

where $0 \leq a \leq 1$ is a parameter that measures investor contribution to public capital.

Obviously, if production functions are the same and all else is equal, $r_2 < r_1$, therefore the project would not be competitive in a country with low public capital. For a project to yield higher returns in the latter country, one or more of the following conditions would have to be met:

(1) Production is significantly more efficient in the country ($f_2(.) > f_1(.)$)

(2) Unit labor cost is significantly lower in the country ($w_2 \ll w_1$)

(3) Production is not dependent on public infrastructure and therefore the investor does not need to invest in public capital ($a \rightarrow 0$)

(4) The investment is very large and therefore the additional investment in public capital becomes small $k \gg \bar{k}$.

A capital-intensive megaproject in the natural resources sector is very likely to satisfy conditions (1), (3), and (4). Production can be more efficient because of the natural resource endowment. Some natural resource projects require infrastructure for a specific purpose and therefore do not use common public infrastructure. Large and capital-intensive investment projects tend to have large $k$, therefore their rate of return is less affected by low public capital levels.

Conversely, although labor-intensive investments may benefit from low wage levels, they generally follow similar production technology and have similar production functions in different countries, require smaller investments, and are more dependent on public capital, making them less likely to meet the other conditions above and therefore not competitive in countries with low public capital.

Foreign direct investment in the form of megaprojects is thus aligned with Mozambique's competitive advantage.

It is worth noting that for illustration purposes, the discussion above is simplified to the extent possible, and thus does not cover some other factors that could also affect investment rates of return, including tax rates and pricing of key inputs (e.g., low energy prices). Nonetheless, taking these factors into account does not change the conclusion.

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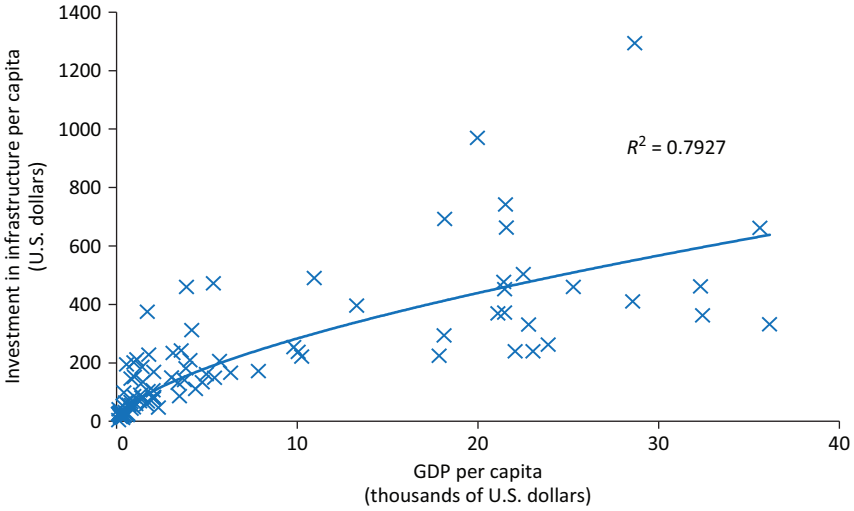
CHAPTER

# 3 Infrastructure and Public Investment

*Enrique Blanco Armas*

Infrastructure and growth are closely connected. Infrastructure investments can accelerate growth, while higher income levels demand better infrastructure, suggesting a positive relationship between infrastructure and growth (Figure 3.1). Calderon and Serven (2004) argue that infrastructure, through its positive impact on an economy's overall productivity, has a positive and significant impact on long-run economic growth and contributes to a decline in income inequality. Recent work covering both developed and developing countries shows that a 10 percent increase in infrastructure development contributes 1 percentage point to growth in the long term (Calderon, Moral-Benito, and Serven, 2011). In sub-Saharan Africa, infrastructure development has contributed about half of the recent acceleration in growth (Calderon, 2009).

**Figure 3.1. Relationship between Infrastructure and Growth**




Source: World Bank (2010).

## Infrastructure Development in Mozambique

Mozambique is a large country that is relatively thinly populated and subject to recurrent harsh weather, particularly during the rainy season when there is periodic flooding. Despite sustained and sizable public investments, infrastructure is still relatively poor in meeting basic needs in most areas, such as access to networked electricity, roads, clean water sources, sanitation, telecommunication, and Internet services. Expansion of infrastructure networks is a key component of the government's growth and poverty alleviation agenda. Availability and reliability of infrastructure services are viewed as critical to private sector growth, and there are significant urban-rural disparities in access to basic infrastructure (World Bank, 2012b). The integrated investment program (*Programa Integrado de Investimento*—PII) approved in September 2013 identifies investments in transport, energy, and irrigation as key priorities for Mozambique. The PII does not explicitly refer to making growth more inclusive, but nonetheless identifies several key development objectives to be achieved by infrastructure investments, including infrastructure that (1) contributes to Mozambique's integration and not exclusively to the major infrastructure corridors that connect neighboring countries with export markets; and (2) allows Mozambique to maximize the benefits from megaprojects (Chapter 2), with particular attention on growth poles to be developed along development corridors (Chapter 7).

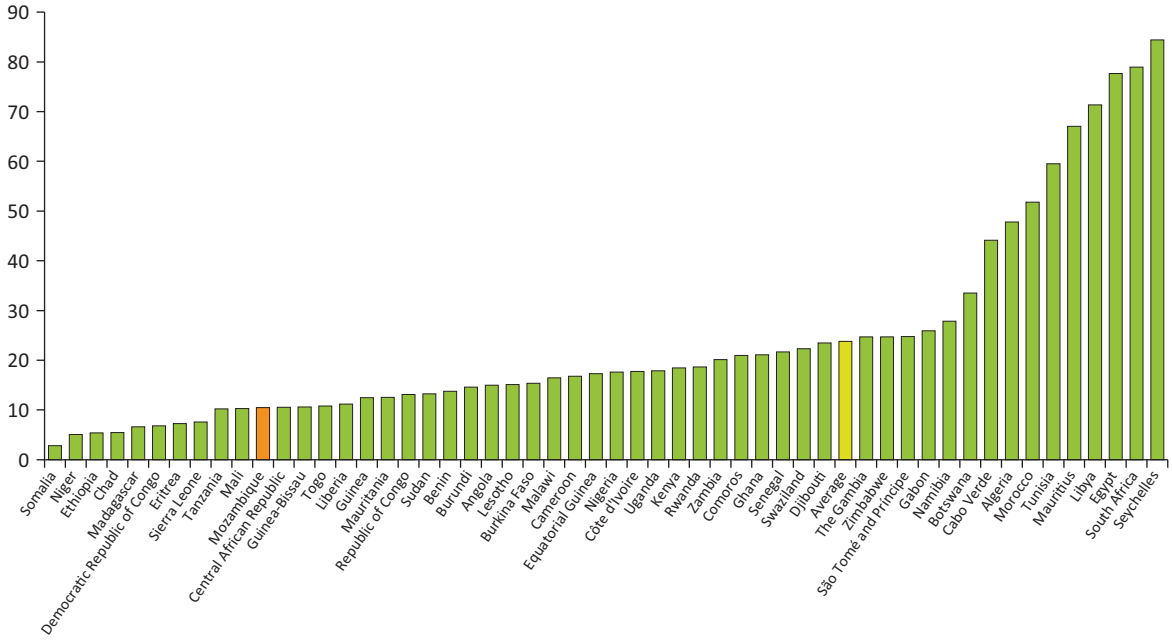
The relatively poor state of infrastructure is confirmed by the index of infrastructure development compiled by the African Development Bank, which ranked Mozambique 11th from the bottom out of 53 countries in 2010 (Figure 3.2).[1] Despite improving its scores, Mozambique has had a similar ranking since 2000, suggesting little improvement in infrastructure over the past decade relative to the progress achieved in other countries. With strong growth projected in the medium and long term, infrastructure has been and could remain a major constraint for sustainable and inclusive growth.

### Transport

Transport infrastructure in Mozambique has developed transversally to serve neighboring countries, with relatively poor connectivity between the north and south of the country and between the transversal development corridors (Domínguez-Torres and Briceño-Garmendia, 2011). Due to its geographical position, Mozambique plays a key role in transport in the region, being the main transit route for exports to several neighboring countries (Swaziland, Malawi, Zambia, Zimbabwe, and the Gauteng region in South Africa). Mozambique's importance in regional markets extends also to the energy, information, communications, and technology sectors (Domínguez-Torres and

[1] The infrastructure development index is a composite index that looks at different types of infrastructure. Mozambique has the lowest scores in transport and water infrastructure.

**Figure 3.2. Africa Infrastructure Development Index**




Source: African Development Bank (2013).

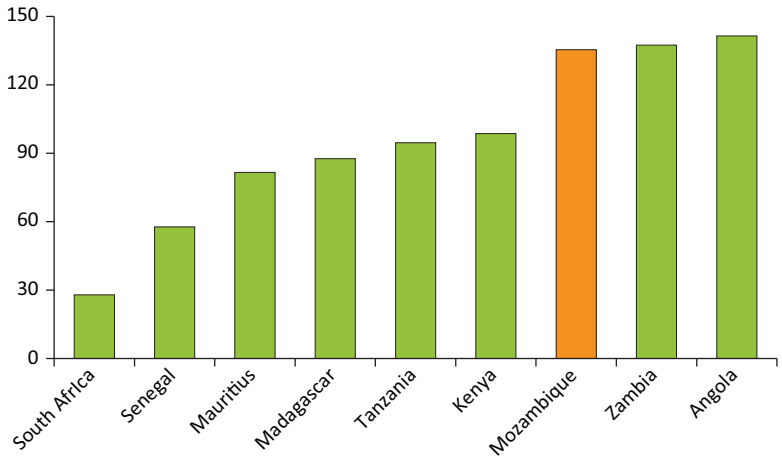
Briceño-Garmendia, 2011). Although the quality of this infrastructure overall is sufficient, to meet current demand Mozambique will need to significantly upgrade and rehabilitate existing infrastructure and build new infrastructure if it wants to become a major transport and energy hub in the region.

Major infrastructure investments will not necessarily succeed, however, unless they are accompanied by efforts to improve the "soft infrastructure" of transport logistics. Mozambique continues to score relatively poorly on the Logistics Performance Index (LPI) (Figure 3.3), and Mozambique's Country Economic Memorandum identifies a number of constraints in logistics and transport reliability that prevent it from becoming a major transport hub in the region (World Bank, 2012a). These constraints include the time needed for port clearance, perceived incidence of bribes, high scanning fees, and poor integration of trucking services with the rest of the subregion. This is in line with a number of other international rankings such as the World Economic Forum's Global Competitiveness Index, which ranks Mozambique's economy as 137th out of a total of 148 countries, with a particularly poor score in the infrastructure component of this index. The report accompanying the Global Competitiveness Index found that 10 percent of firms interviewed for the survey said that infrastructure is the biggest constraint to doing business in Mozambique (World Economic Forum, 2013).

Mozambique's road density per land area is low at 46 meters per square kilometer due to the large size of the country (Figure 3.4). Of Mozambique's

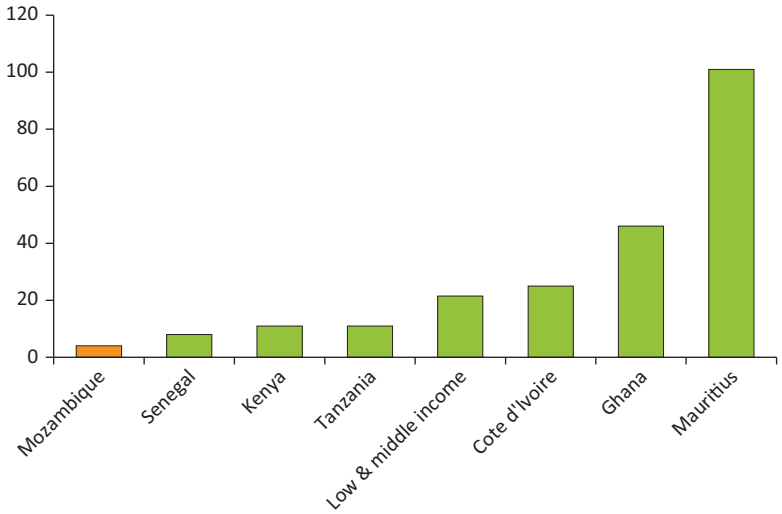
network of 37,000 kilometers of roads, only about 6,000 kilometers are paved, with most of that in the primary road network. The condition of the network is poor, particularly in rural areas. Without a rail network that covers the country and with limited shipping between cities, the road network presents the only transport option for a large majority of the population. Poor road conditions contribute to high vehicle operating costs, high transport costs, and low traffic volume, posing major constraints to agricultural areas.

**Figure 3.3. Logistics Performance Index (LPI)**
***(Ranking)***




Source: World Bank (2010).

**Figure 3.4. Road Density, 2007–09**
***(km of roads for 100 sq km)***



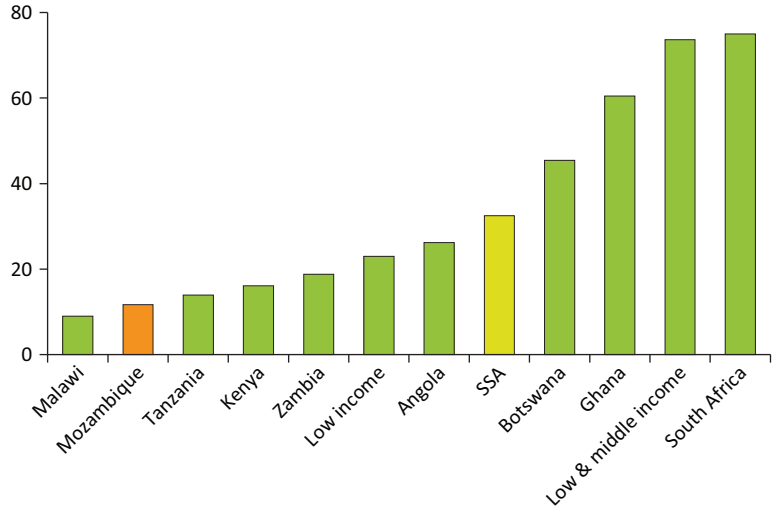

Source: World Bank, World Development Indicators (2013).

Rail transportation in Mozambique is divided into three essentially independent networks in the south, center, and north of the country, connecting neighboring countries with main ports in Mozambique (Maputo, Beira, and Nacala, respectively). The government's strategy for investments in rail transport seeks to link the south and the north of the country, link the provincial capitals, and facilitate access to areas with extractive industries. It also seeks to reach the areas with more economic potential, such as agricultural lands, touristic regions, and areas designated for industrial and natural resources development.

## Energy

Mozambique continues to have one of the lowest electrification rates in southern Africa, with approximately 15 percent of households having access to electricity, half of them in Maputo and other urban areas (Figure 3.5). Mozambique is endowed with huge energy resources. The Cahora Bassa dam is one of the largest hydropower installations in Africa, generating 2,075 megawatts (or 85 percent of the country's current energy production capacity), with most of this power exported regionally. The country has significant hydropower potential, which could be realized with large investments currently under consideration. Most of the potential is currently in Tete province in the center of the country, while demand is likely to increase most in the south and north, highlighting the need for large investments in both energy generation and transmission. Priority projects at different stages of preparation include a gas-fired thermal plant in Ressano Garcia to serve the south; the

**Figure 3.5. Access to Electricity, 2009**
***(Percent of population)***




Source: World Bank, *World Development Report* (2013).
Note: SSA = sub-Saharan Africa.

Mphanda Nkuwa dam, the transmission line from Tete to Maputo, and the Cahora Bassa North hydropower plant in Tete province; and smaller hydropower development and transmission lines in the north.

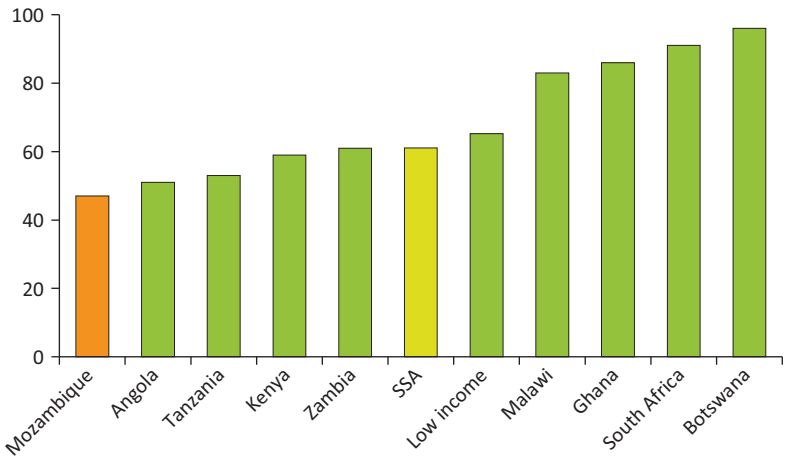
### Water and Sanitation

Low-level access and poor service delivery characterize water supply and sanitation in Mozambique. Only 43 percent of the population has access to safe water and 19 percent to adequate sanitation (Figure 3.6). These figures mask significant disparities between urban and rural areas. Water supply in the main cities has improved markedly over recent years, and the delegated management model being used is now being extended to cover smaller systems. Investments in some of the fastest-growing urban areas (Nacala, Tete, Pemba) need to continue to support growth. However, rural water supplies are still seriously inadequate. Poor and uneven access to safe drinking water and, particularly, adequate sanitation (especially in informal urban settlements in the main urban areas) are responsible for regular outbreaks of cholera and diarrhea, a major cause of child illness and death. Inadequate sanitation is estimated to cost Mozambique over 1.2 percent of its GDP per year.

### Irrigation

Agriculture continues to provide a living for almost 80 percent of the population. Improvements in agricultural productivity will therefore be necessary to alleviate poverty in Mozambique. Yet irrigation infrastructure, key for

**Figure 3.6. Improved Water Source, 2010**
***(In percent of population with access)***




Source: *World Development Report* (2013).
Note: SSA = sub-Saharan Africa.

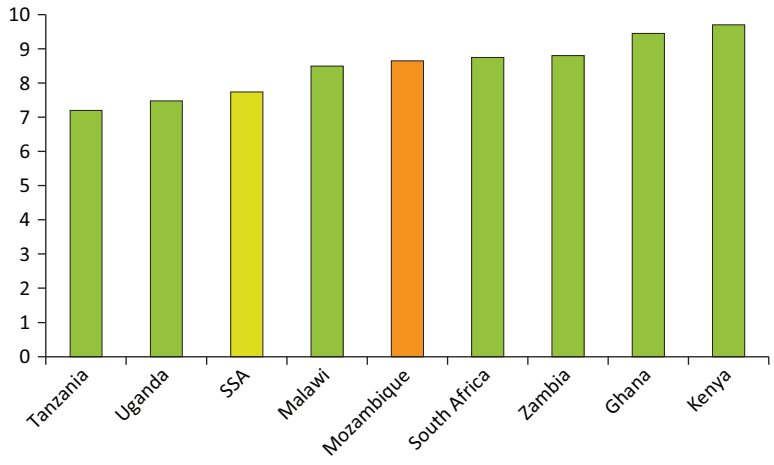
productivity improvements, is rare. About 95 percent of agricultural land is rain-fed and less than 50 percent of the area developed for irrigation is effectively irrigated. Mozambique has the potential for 3 million hectares of irrigable land, but only about 1 percent of that is irrigated and for food production, very low when compared to food production needs (Government of Mozambique, 2013).

## How Much Is Mozambique Investing in Infrastructure?

Mozambique has been spending a share of public expenditure on infrastructure that is comparable to its peers in Africa (Figure 3.7), but on a per capita basis this remains very low and inadequate for the country's significant infrastructure development needs (Figure 3.8). Domínguez-Torres and Briceño-Garmendia (2011) argue that public expenditure needs in Mozambique are among the highest in the region and that a significant increase in spending will be needed to cover the infrastructure gap.

However, a large and sudden increase in investment spending would raise questions about absorptive capacity constraints, including in labor markets and aggregate demand, as well as the appropriate pace for increasing infrastructure spending. Mozambique is allocating a large share of its economy to investment (Figure 3.9), a picture mirrored in the allocation of public investment (Figure 3.10). Given Mozambique's large infrastructure needs, the government should continue allocating a large share of resources to infrastructure investments, but there may be a need to improve the efficiency of this investment, and the government's capacity to manage this level of investment may be stretched too thinly.

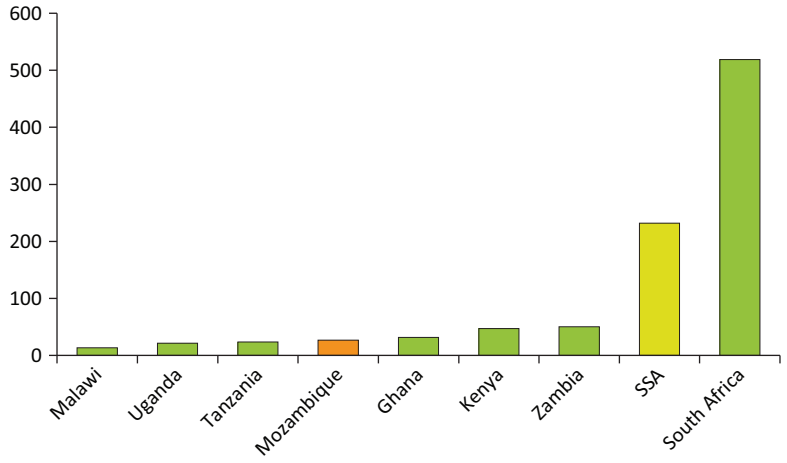
**Figure 3.7. Public Spending on Infrastructure, 2001–06**
***(Percent of GDP)***




Source: Briceño-Garmendia, Smits, and Foster (2008).

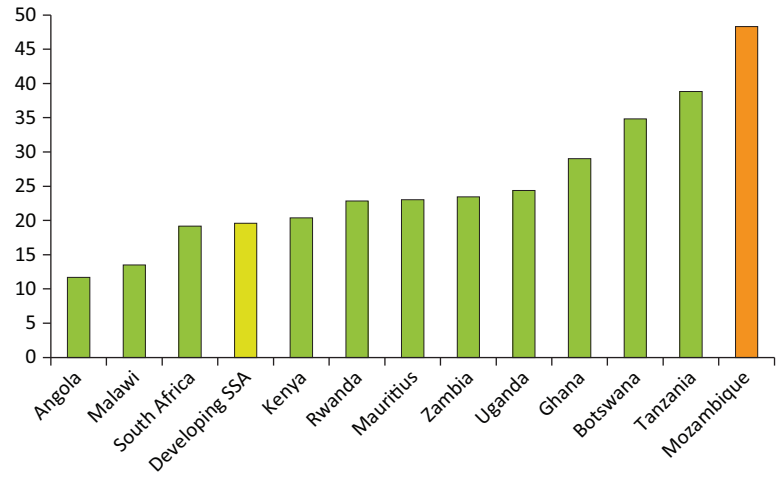
Note: SSA = sub-Saharan Africa.

**Figure 3.8. Public Spending Per Capita on Infrastructure, 2001–06**
***(Million of U.S. dollars)***




Source: Briceño-Garmendia, Smits, and Foster (2008).
Note: SSA = sub-Saharan Africa.

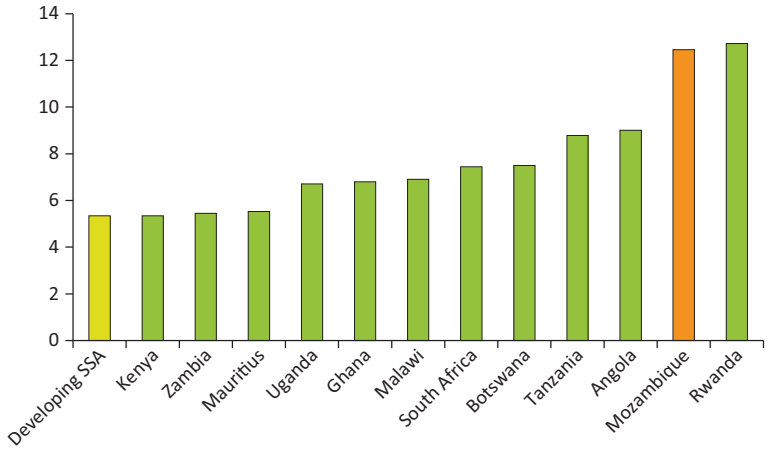
**Figure 3.9. Total Investment, 2011**
***(Percent of GDP)***




Source: World Bank, *World Development Indicators* (2013).
Note: SSA = sub-Saharan Africa.

In addition, prolonged high levels of public investment are likely to put pressure on the government's capacity to maintain these investments. For example, Mozambique is currently allocating less than 20 percent of what would be required to maintain its road network—the highest gap in financing of all countries in Africa (Dominguez-Torres and Briceño-Garmendia, 2011). This

Figure 3.10. Public Investment, 2011
*(Percent of GDP)*




Source: World Bank, World Development Indicators (2013).
Note: SSA = sub-Saharan Africa.

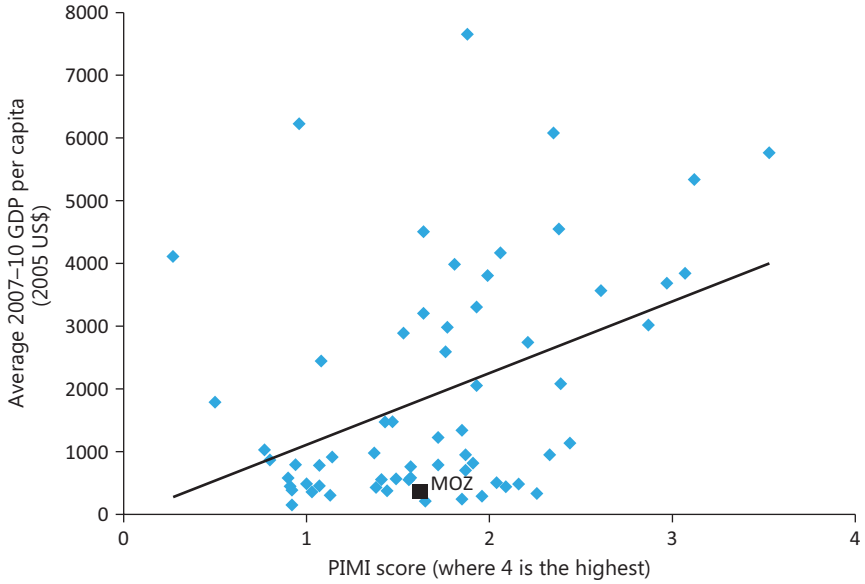
could be interpreted as a sign of stress in the government's capacity to manage these investments. The challenge to the government's investment management capacity is not unique to roads, though, and also applies to continued high levels of investment elsewhere, including the health sector and education.

## Impact of Investment Quality on Growth

Mozambique's ability to accelerate growth through infrastructure investments to a large extent will depend on the quality of that infrastructure, as suggested by recent research on this issue (Arslanalp and others, 2010; Gupta and others, 2011). For sustainable growth, it matters not only how much a country invests, but also how well it invests. Infrastructure investments should address the key gaps identified, be implemented effectively, and be maintained and operated in a way that ensures continuity in service delivery. Mozambique already has relatively high spending levels (as a share of GDP), and public investment has grown very rapidly in the past few years, which suggests pressure on the government's capacity to manage further increases in public investment.

The quality of investments could be supported by stronger public investment management systems. Strong systems to manage public investments seem to be positively related to a country's income levels (Figure 3.11). While many countries have tried to increase public investment, the results have not always been successful due to factors including poor project selection, delays in project completion, weak procurement practices, cost overruns, incomplete

Figure 3.11. Public Investment Management Score and GDP Per Capita, 2007–10



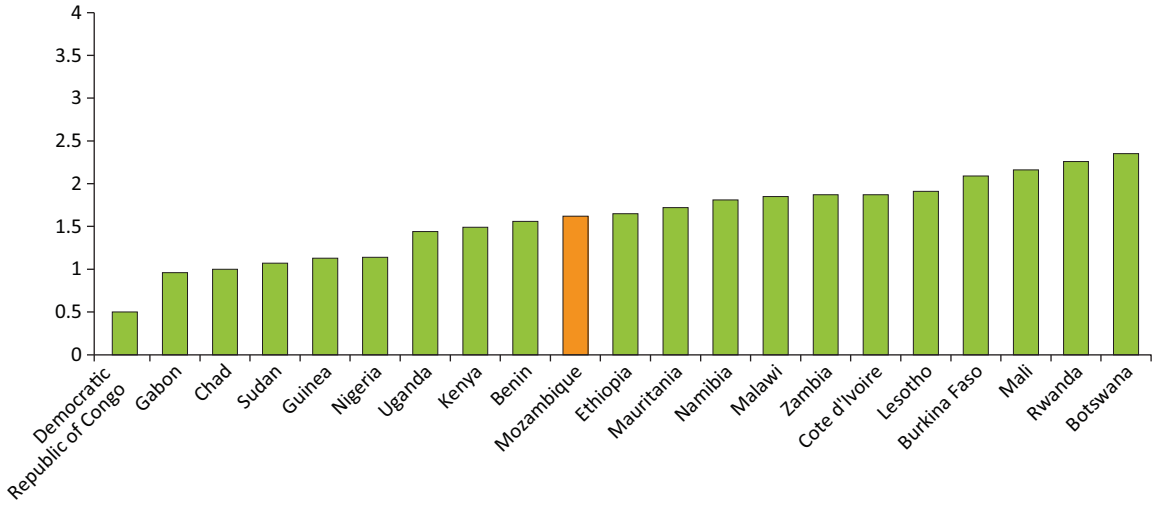

Sources: World Bank, World Development Indicators (2013); Dabla-Norris and others (2010); and World Bank staff estimates.

projects, and inadequate operations and maintenance. This highlights the importance of having efficient public investment management processes.

An index that measures the efficiency of public investment management systems has recently been developed. Mozambique's system scores relatively poorly according to this index—slightly below peer countries (Figure 3.12)—highlighting the need to improve its ability to manage a potentially increasing resource envelope for infrastructure investment. As illustrated in Figure 3.13, a properly functioning public investment management system has several features: (1) a clear strategy to provide investment guidance, project development, and preliminary screening of projects; (2) a process for formal project appraisal; (3) independent review of project appraisal; (4) project selection and budgeting; (5) project implementation; (6) project adjustment; (7) facility operation; and (8) project evaluation (Rajaram and others, 2010).

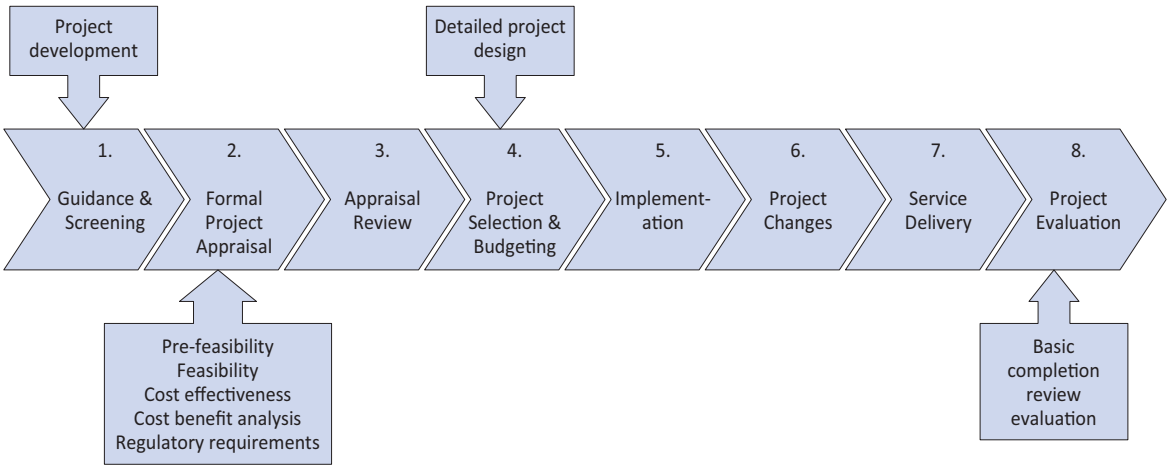
Poor management of public investments could lead to cost overruns, poor project selection (often affected by undue political interference) and implementation, and delays in the design and completion of the project. Poor public investment management usually manifests itself in the post-investment phase, often neglecting the operation and maintenance of the assets created. Mozambique's stated intention of increasing infrastructure investments to close the infrastructure gap is appropriate, but it should be done gradually, since the country is already allocating a large share of public spending to

**Figure 3.12. Public Investment Management Score**
*(Score range: 1–4)*




Sources: World Bank, World Development Indicators (2013); Dabla-Norris and others (2010); and World Bank staff estimates.

**Figure 3.13. Key Steps in Managing Public Investments**




Source: Rajaram and others (2010).

infrastructure investments. Increases in public investments should be made in line with improvements in public investment management to avoid the types of problems discussed here.

## Ongoing Efforts to Improve Public Investment Management

Efforts are under way to improve the process by which public investment projects are appraised, evaluated, and selected, but these are medium-term

reforms and it will take a number of years before a robust system is in place and capacities have been strengthened. Mozambique's efforts so far have focused on the preparation of a number of tools that can guide project preparation and strengthen the institutional set-up for project preparation and evaluation, but much more remains to be done. To implement successful public investment management, Mozambique will need to make progress on six pillars on which such a system rests:

1) An appropriate *legal framework* that establishes that all project proposals need to be evaluated before receiving any financing. This legal framework could create a "national public investment system" with the corresponding institutions. The legal framework should clearly differentiate between project proponents and evaluators to avoid conflicts of interest.

2) An *institutional set-up* to ensure the independence of the project evaluation process. As mentioned above, project proponents and evaluators should belong to different agencies and the system should shield evaluators from political interference in their evaluations. The Ministry of Planning and Development, in charge of ensuring the quality of public investments, will need to put in place a structure that facilitates the fulfillment of this task.

3) A permanent *capacity-building program* at different levels that focuses on enhancing the technical capacity of teams in charge of both appraising and evaluating public investment projects across government. The training should be provided at three different levels, a basic one for project proponents, an intermediate one for project evaluators, and an advanced course that trains trainers so that domestic capacities can slowly be built up.

4) A *uniform set of norms, procedures, and methodologies* for project preparation and evaluation that will allow for comparing projects and ensuring the independence of evaluations. At a minimum, it should include a manual that provides guidance in project formulation and evaluation, and that establishes norms and processes to govern the public investment management system and the calculation of the main shadow prices to be used (discount rates, foreign exchange, labor, fuel, etc.). Future maintenance needs should also be incorporated when evaluating projects' rates of return.

5) An *integrated projects bank* such as those that have been introduced in many systems around the world. This system manages the large amount of information that will be collected through the submission, evaluation, implementation, and monitoring of public investment projects. It is usually an online system with different user levels. It contributes to enhanced transparency and more effective knowledge management.

6) An *ex post evaluation* system for projects during implementation and operation. The evaluation should focus initially on measuring and interpreting indicators, and only gradually seek to understand the impact that projects may have had, since this is usually a more difficult type of analysis.

## Conclusions

Infrastructure investments are necessary for sustainable and inclusive growth because of the impact they have on an economy's productivity. Despite large investments over the past few decades, infrastructure development in Mozambique is still relatively poor and there remain significant needs in basic access to infrastructure, as evidenced by most international comparisons. Mozambique has the potential to become a major regional player in both transport services and energy generation and distribution, but large investments will be necessary before it can fulfill that role.

Current spending levels are still relatively low (on a per capita basis), and increases in infrastructure spending will be necessary to close the existing gap. But Mozambique already has one of the highest investment levels as a share of GDP, and public investment has been growing very rapidly over the past few years. These trends raise concerns about the government's absorptive capacity and how it will manage further increases in public infrastructure spending, even acknowledging the wide infrastructure gap.

The quality of investments is a key determinant in the relationship between public investment and growth. An effective public investment management system will have a number of features, including formal project appraisal, a system to evaluate and prioritize public investment projects, and ex post project evaluation that allows for learning and improvements in the preparation and implementation of investment projects. Mozambique has a relatively weak capacity to manage public investments, and this capacity will be tested by further increases in public investments. Efforts are under way to improve the public investment management system in Mozambique, but results will only be achieved in the medium to long term. Mozambique should link further increases in public investment to its ability to enhance its public investment management system.

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CHAPTER

# 4 Mozambique's Quest for Inclusive Growth

*Victor Lledó*

The pursuit of inclusive growth in which the benefits are widely shared across the population has become a central macroeconomic challenge in both advanced and developing economies. Significant increases in unemployment among advanced economies, which were at the epicenter of the global financial crisis, brought to the limelight the need for growth to be accompanied by job creation so as to be inclusive (IMF, 2013). Among developing countries, including a number of fast-growing "sub-Saharan African lions," the general perception has been that high growth has not made a significant dent in widespread poverty or income inequality—that is, it has not been inclusive (Garcia-Verdu, Selassie, and Thomas, 2012).

This has been particularly the case in Mozambique. Results from the latest poverty survey in Mozambique in 2009 ignited a lively debate about why growth has not been inclusive and what strategy and related policies should be adopted to attain more inclusive growth. This debate helped to shape Mozambique's latest poverty reduction strategy and, more importantly, a number of policy initiatives that are at different stages of implementation and with varied degrees of success.

This chapter illustrates how the inclusive growth debate emerged and evolved into strategies, policies, and actions in Mozambique. The focus is on the design and implementation of macroeconomic policies and macro-critical reforms conducive to inclusive growth. The chapter then identifies, on a preliminary basis, gaps in the design and implementation of such policies and reforms that need to be closed going forward.

## What Is Inclusive Growth?

There is no single definition of inclusive growth. Beyond the general definition given above, there is no agreement on a more operational definition that would lead to a common metric and frequent assessment over

time and across countries.[1] One widely accepted operational definition is that inclusive growth reflects output growth that is sustained over decades, is broad-based across economic sectors (thus engendering structural transformation), creates productive employment opportunities for the majority of the country's population, and reduces poverty noticeably (Commission on Growth and Development, 2008; Ianchovichina and Lundstrom, 2009).[2] Reductions in excessive income inequality have also emerged as a prerequisite for inclusive growth, supported by some growing evidence that inequality undermines growth, for example by amplifying the risk of crisis or making it difficult for the poor to invest in education (Berg and Ostry, 2011; IMF, 2013). In sum, inclusive growth is about the pace and distribution of economic growth.

The economic fundamentals that have accompanied high and sustained economic growth are well known (Commission on Growth and Development, 2008). Common characteristics include (1) macroeconomic stability; (2) high rates of private and public investment (including in education and infrastructure) matched by domestic savings; (3) openness to the global economy; (4) respect for market signals but not absolute deference to markets; and (5) committed, credible, and capable governments. At the macroeconomic level, economic fundamentals entail a mix of fiscal and monetary policies, removal of distortions in the allocation of foreign exchange, and the implementation of structural reforms to (1) ensure sustainable fiscal and current account deficits, a stable debt-to-GDP ratio, low and stable inflation, and adequate international reserve levels; (2) increase public and private investment and savings rates in physical and human capital; (3) liberalize trade; (4) enforce property rights and the rule of law; and (5) foster good governance and transparency in the public sector.

The economic debate on inclusive growth is still taking shape. An overarching principle is that policies and structural reforms should provide equality of opportunity so that all segments of society can share in the growth and expanding employment; redress some of the inequalities in outcomes, particularly those experienced by poor and vulnerable segments of the populations; and preserve social cohesion. A number of elements are emerging from the debate on economic growth, as detailed below.

[1] See Anand, Saurabh, and Peiris (2013) for a recent study.

[2] This definition is in line with the absolute definition of pro-poor growth. Under the absolute definition, growth is considered to be pro-poor as long as poor people benefit in absolute terms, as reflected in some agreed measure of poverty (Ravallion and Chen, 2003). This is in contrast to the relative definition, whereby growth is pro-poor if, and only if, the incomes of poor people grow faster than those of the population as a whole, that is, inequality declines (Dollar and Kraay, 2002).

### Macroeconomic Stability Remains a Necessary Condition for Inclusive Growth

Recent evidence indicates that moderate inflation and lower output volatility are negatively associated with inclusive growth measurements (Anand, Saurabh, and Peiris, 2013). This seems to reinforce the role of macroeconomic stabilization policies as one of the preconditions for inclusive growth.

### Quality Investment in Human and Physical Capital Is Also a Necessary Condition

Case and empirical studies also confirm that education and investments in infrastructure are drivers of inclusive growth (Commission on Growth and Development, 2008). While significant investment needs remain to be filled, emphasis has also been placed on ensuring the quality of investment. On the education front, efforts need to go beyond improving enrollment rates and toward tackling gaps in the quality of education starting at the primary and secondary levels.[3] Regarding infrastructure and physical capital, the priority is to foster an environment for both public and private investment in labor-intensive sectors. Reforms should also improve institutions and institutional capacity underlying the selection, approval, and execution of public investment projects.

### Attempts to Overvalue and Undervalue the Exchange Rate Should Be Avoided

There is ample empirical evidence that prolonged overvaluation of the exchange rate hurts growth and employment, and hampers structural transformation, particularly if it goes hand-in-hand with the "resource curse" or Dutch disease phenomenon (Rajan and Subramanian, 2011).[4] An overvalued real exchange rate erodes a country's external competitiveness, and could lead to an unsustainable current account deficit. Evidence does not support some recent views (Rodrik, 2008) that undervaluation is good to foster growth (Montiel and Serven, 2009; Anand, Saurabh, and Peiris, 2013). All in all, the evidence extends to inclusive growth the already-established view that it is business environment reforms rather than exchange rate interventions that matter for enhancing external competitiveness and sustaining growth.

[3] In some countries, there is still significant scope to increase enrollment rates for girls.

[4] See Chapter 10 for a more detailed discussion of policy frameworks to promote inclusive growth in resource-rich countries, and Chapter 12 on Dutch disease.

### Promoting Productive Employment in Agriculture: A Structural Transformation Priority in Most Low-Income Countries

In most low-income countries, the majority of the population in rural areas is trapped in low-productivity subsistence agriculture. Inclusive growth strategies prioritize job creation in commercial agriculture, while facilitating the matching of subsistence agriculture workers to jobs in these areas. Rather than picking specific winners, policies and reforms should aim to improve the business environment for agriculture as part of the overall business environment. This could be done by (1) promoting public and private investment in infrastructure and logistics to connect rural areas to markets; (2) price liberalization (e.g., dismantling of price controls, marketing, boards, and export taxes); (3) moving away from direct subsidies for certain agricultural products and toward subsidies and in-kind provision of agriculture inputs such as fertilizer and seeds; and (4) providing public goods such as basic research, infrastructure, and agricultural extension services.[5]

### Use of Fiscal Policy to Reduce Inequality and Preserve Social Cohesion as Structural Transformation Ensues

Fiscal policy can facilitate structural transformation and mitigate income losses, prevent income inequalities from increasing excessively, and thus alleviate social tensions during the process of moving labor to more productive sectors. This is particularly the case for developing countries, given the lower progressivity of their tax and spending systems and their underdeveloped social safety net schemes (Bastagli, Coady, and Gupta, 2012). On the tax side, the focus should be on broadening tax bases by reducing tax exemptions, closing loopholes, and improving tax compliance, rather than on raising tax rates. Among resource-rich countries, there is usually scope for improving the progressivity of the fiscal regimes applied in the resource sectors.[6] On the spending side, progressivity can be improved by removing general price subsidies for energy; ensuring that education and health expenditures are targeted to the needs of the poor; and increasing the coverage of social protection floors to a larger share of the population.[7]

[5] For more on agriculture, see Chapter 6.

[6] The level of progressivity should not render existing and future projects unviable, so as not to compromise government revenue in such projects.

[7] By protecting people rather than jobs, these policies will not only improve equity, but also lead to a more efficient allocation of resources.

## How Inclusive Has Growth Been in Mozambique?[8]

Despite high levels of economic growth in Mozambique, growth has not been as pro-poor as in other successful countries and has become less pro-poor over time (Figure 4.1).

- Mozambique's economic growth in the past two decades was among the highest in non-fuel-exporting countries in the region. Real GDP per capita almost doubled after 1992. This performance has been anchored on sound macroeconomic management and structural reforms.

- Poverty reduction was initially significant. The poverty headcount fell from 69 percent in 1997 to 54 percent in 2003, as consumption per capita grew by a cumulative 50 percent over the same period. The reduction in rural poverty was even more pronounced, declining from 71 percent to 55 percent during the same period.

- Poverty reduction did not reach the magnitude observed in other high-growth countries. Cross-country estimates of the elasticity of the headline poverty rate with respect to the growth of real GDP per capita suggest an average elasticity close to 0.20, which is only a fraction of that observed in countries like China, Viet Nam, or even Uganda.

- Similarly, evidence from household survey data shows that over 2002–03 and 2008–09 growth did not follow an inclusive or pro-poor pattern. In particular, the growth incidence curve shows that households in the bottom three deciles of the distribution of per capita expenditure experienced absolute declines, while the other seven deciles experienced positive growth. This sharply contrasts with the experience of other countries, such as China and especially Brazil, over the last three to four decades.

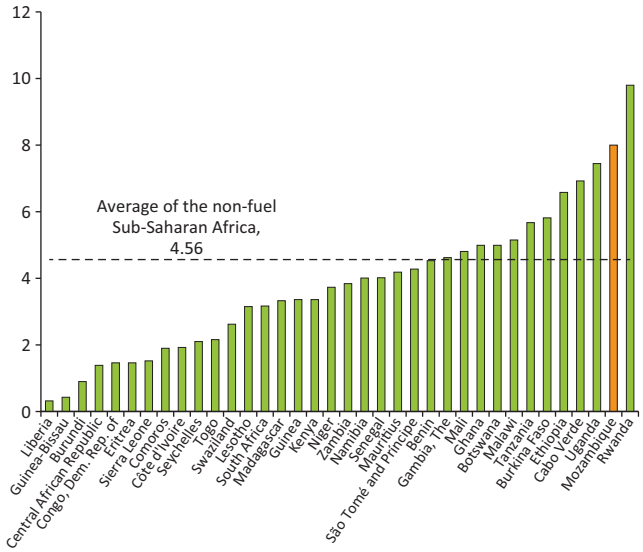
- Not only has growth in Mozambique been less pro-poor than in other successful countries, but such pro-poor characteristics appear to be declining over time. With growth remaining relatively high, poverty numbers have stagnated in the new millennium. The latest National Poverty Report (MPD-DNEAP, 2010) suggests that the poverty rate in 2008 remained high, at about 54 percent, with rural poverty increasing slightly to 57 percent.

[8] This section draws on an annex by Victor Lledó and Rodrigo Garcia-Verdu prepared for Mozambique's 2011 IMF Article IV consultation (IMF, 2011).

## Figure 4.1. Growth and Poverty Reduction

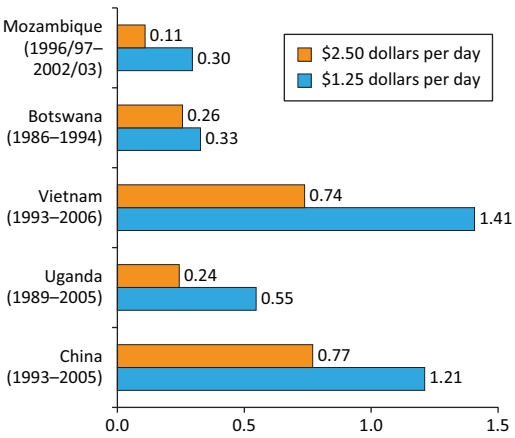
Mozambique's growth rate has been the second highest among non-oil-exporting countries in sub-Saharan Africa.

**Real GDP Growth in Non-Fuel-Exporting Sub-Saharan African Countries (Percent; averages 1995–2010)**



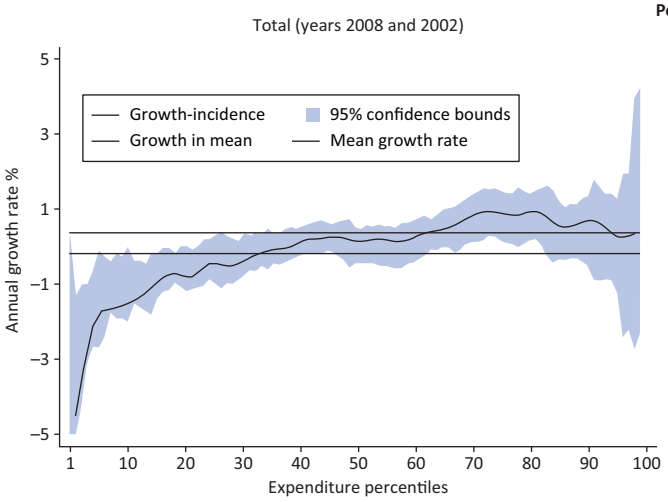

Nonetheless, growth in Mozambique has been less pro-poor than in other high-growth countries both inside and outside Africa.

**Elasticity of Headcount Poverty Rate with Respect to Growth in Real GDP Per Capita**



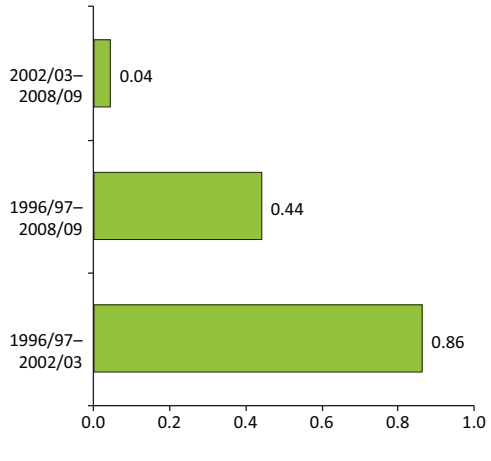

The growth incidence curve for Mozambique also confirms that growth has not been strikingly pro-poor over most of the last decade.

**Growth Incidence Curve for Mozambique**




Mozambique's growth's pro-poor characteristics also appear to be declining over time.

**Elasticity of Mozambique's National Poverty Line Headcount Poverty Rate with Respect to Growth in Real GDP Per Capita**




Sources: Mozambican authorities; and IMF staff estimates and projections.

If economic growth in Mozambique is to become more inclusive, it needs to be sustained, broadened, and diversified. Mozambique's growth takeoff started around 1992 and needs to be sustained for several more decades to match other successful growth cases. Indeed, all the countries considered by the Commission

on Growth and Development (2008) to be successful cases of inclusive development have sustained high growth rates for at least three decades.

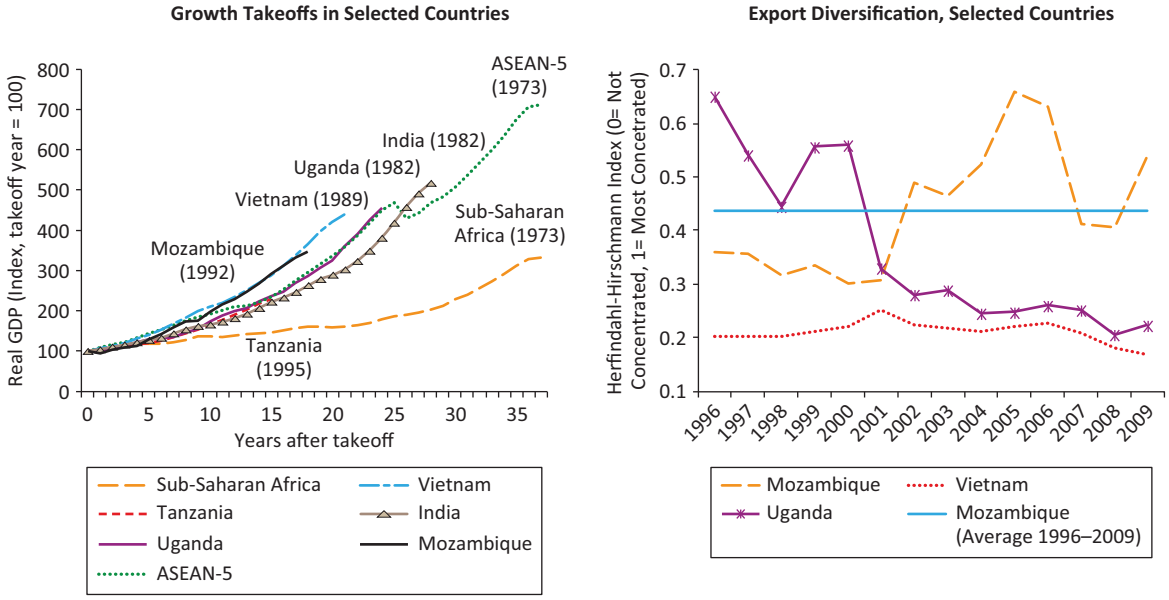
- Growth has not been accompanied by economic diversification. Measured by the Herfindahl-Hirschman index, Mozambique's export base has become increasingly concentrated—a reflection of the emergence of megaprojects. This contrasts with the experience of countries like Uganda, which was able to successfully diversify its exports notwithstanding its low level of initial GDP per capita, its protracted civil conflict, and the fact that it is landlocked.

- Growth has not been translated into structural transformation (Figure 4.2). Most of the Mozambican population lives in rural areas on subsistence agriculture. Productivity gains in agriculture would be important for the structural transformation of the economy, as they endow the surplus labor released from agricultural activities with additional skills to facilitate the transition toward processing and industrial activities and eventually to services (McCalla, 2011). Mozambique is still in an early phase of this transition. In fact, the share of the population employed in agriculture experienced little change between 2002–03 and 2008–09, which suggests stagnant agricultural productivity (Fox, 2011).

**Figure 4.2. Growth and Structural Transformation**

Despite Mozambique's impressive performance over the past two decades, growth still needs to be sustained for several more years...

...and be accompanied by greater economic diversification.




Sources: Mozambican authorities; and IMF staff estimates and projections.

Note: ASEAN = Association of Southeast Asian Nations.

## Mozambique's Evolving Inclusive Growth Strategy

The publication of Mozambique's latest poverty survey in 2010 and its finding of high but insufficiently pro-poor growth heightened social tensions and led to an intense debate on how to make growth more inclusive. The government, civil society, and development partners discussed how to adjust Mozambique's growth model. The debate intensified after street riots by the urban poor over rising living costs in late 2010.[9] A high-level conference was organized in Maputo by the government in February 2011 in close coordination with the World Bank, International Monetary Fund, African Development Bank, and bilateral donors. It attracted some 100 participants, including representatives from the private sector, civil society, and academia, and was widely reported by the media. The conference disseminated practices from other countries, including China and Brazil, which have recently experienced more successful inclusive growth episodes. The conclusions were presented and discussed in a ministerial meeting chaired by Mozambique's Prime Minister.

Building on this, a new Poverty Reduction Strategy (*Plano de Acção para Redução da Pobreza* – PARP) for 2011–14 was adopted in May 2011 to foster more inclusive growth.[10] It made inclusive growth its overarching objective. In particular, it recognized that in order to allow more Mozambicans to benefit from economic growth, ongoing efforts to promote human and social development needed to be complemented by an economic strategy that would boost productivity in labor-intensive sectors and unleash the structural transformation and diversification of the economy (IMF, 2011).

The PARP was based on core inclusive-growth ingredients. It had three main pillars: (1) increasing production and productivity in the agricultural and fisheries sectors; (2) promoting employment; and (3) fostering human and social development. Two supporting pillars focused on fostering good governance and preserving macroeconomic stability (Box 4.1). The PARP's focus on improving agriculture productivity, creating jobs through improvements in the business environment and training, developing more focused and better-designed social protection programs, and preserving macroeconomic stability is clearly in line with the general recommendations to achieve more inclusive growth outlined earlier in this chapter. That said, the governance pillar would have benefited from more specific objectives. The PARP also provided mixed signals on exchange rate policy by stating the government's commitment to promote competitiveness through the exchange rate.

[9] Similar riots also occurred in Maputo and other large cities in Mozambique in 2008.

[10] The PARP is Mozambique's third poverty reduction strategy. It followed the Action Plan for the Reduction of Absolute Poverty (PARP) for 2002–05 and its successor, PARP II, for 2006–10.

**Box 4.1. Pillars and Objectives of Mozambique's Poverty Reduction Strategy for 2011–14**

1. **Increase in the production and productivity of the agricultural and fisheries sectors:**
   - Improve competitiveness and market penetration of Mozambican agricultural and fisheries products.
   - Increase private and public investments in enabling physical and economic infrastructure in order to improve storage, handling, transport, water resource management, banking and insurance services, and market information.
2. **Promotion of employment:**
   - Create jobs through improvements in the business environment.
   - Accelerate regulatory reforms to improve the business climate.
   - Attract more foreign investment in labor-intensive industries.
   - Increase public investment in general education to augment basic skills, and in vocational and technical training to augment the employability of local semiskilled workers.
   - Increase linkages between small and medium-sized enterprises and megaprojects.
3. **Fostering of human and social development:**
   - Achieve universal access to seven years of primary education.
   - Improve social infrastructure, including access to improved water supply and basic sanitation services, urban transport, electricity, and housing.
   - Expand the coverage of the social protection floor.
4. **Fostering of good governance:**
   - Improve access to and quality of public service delivery, the fight against corruption, decentralization and local governance, and consolidation of democratic state building.
5. **Preservation of macroeconomic stability:**
   - Sustain reform efforts in public financial management, tax administration, and financial sector development.
   - Increase the focus on enhancing the public investment architecture and the management of natural resources.

The PARP, however, stopped short of delivering a fully implementable inclusive-growth strategy. Beyond general objectives, most of the pillars lacked specificity about priorities, sequencing, and measurable actions. In other words, underlying strategies were mostly unfinished and needed to

be consolidated. Channels for interministerial coordination to ensure that consolidation delivered a coherent strategy and to ensure accountability in cross-cutting areas were also missing, and the data available to measure some of the proposed performance indicators were of a low quality and frequency. Shortcomings with poverty and agriculture productivity measures were particularly noticeable. The lack of a proper performance budget framework has also been a common complaint among donors, as it prevented budget allocations to specific PARP objectives to be identified and tracked.

Aware of these shortcomings at an early stage, government officials designed the PARP as a dynamic and flexible document. In contrast to previous poverty reduction strategies, PARP III allowed the government to adjust priorities and targets in light of changing economic and social conditions and international developments, and in tandem with the implementation of sectoral strategies. The objectives and indicators would be updated in the annual Economic and Social Plan and reflected in the Performance Assessment Framework agreed upon with development partners providing budget support.

Progress in strengthening the design and implementation of the PARP has been broadly satisfactory. Key strategies have been finalized in the agriculture and employment pillars, but actions have yet to be translated into a clear increase in the production and productivity of small-scale agriculture or in meeting the increasing demand for technical and vocational skills.[11] Significant progress has been observed in increasing the coverage and scope of social protection through the implementation of new programs and increases in budget allocations.[12] Progress has also been strong on improvements in school enrollment and infant/maternal mortality rates. On the macroeconomic front, a sustained strengthening of tax administration has helped broaden the tax base and improve revenue mobilization. On the other hand, the expenditure system could be more progressive (e.g., by abolishing energy subsidies), and efforts to improve the selection and prioritization of infrastructure projects will need to be stepped up in order to safeguard their economic and social returns.

Looking ahead, a number of steps can be taken to improve the inclusiveness of Mozambique's growth strategy. Developing a strong monitoring system with results-based indicators could measure and assess progress more frequently. The next household survey is planned for 2014–15, and the results should be available by 2016. The next poverty reduction strategy will be approved by the

[11] The strategies for agriculture are the Sector Development Strategy (PEDSA) and Investment Plan (PNSA). For employment, they are the Financial Sector Development Strategy (FSDS) and a new business environment strategy.

[12] See Chapter 9 for a more detailed account of developments in the social protection area.

new government slated to take office in 2015. More progress in reforming the business environment and public investment management would help accelerate public and private investments and create jobs. Above all, Mozambique needs to develop a clear vision of how to leverage the country's largely unexplored resource wealth in order to transform and diversify its economy.

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CHAPTER

# 5 Demographic Factors and Structure of Employment

*Keiichiro Inui*

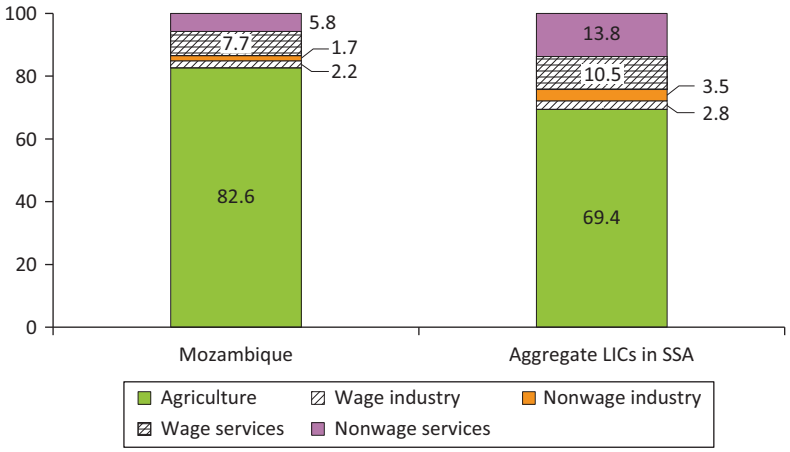
Mozambique's rapid and steady economic growth over the past two decades outperformed population growth, and GDP per capita increased dramatically from $132 to $567. Nonetheless, the absolute level of GDP per capita is still humble, and Mozambique is among the poorest countries in the world. Half of the population still lives in poverty.

Agriculture continues to be the biggest sector in terms of output and labor markets in Mozambique. The share of the primary sector (agriculture and fisheries) in total output was 29.6 percent in 2012, and it is estimated that more than 80 percent of the labor force was engaged in agriculture in 2010 (Figure 5.1).[1] This important sector has much lower labor productivity than other sectors. Average annual growth of the primary sector during the decade to 2012 was 7.1 percent, only slightly lower than the overall GDP growth rate during the period (7.4 percent). Thus, agriculture, despite its low productivity, has been one of the drivers of economic growth in recent years. The size of the agriculture sector in Mozambique is very large even when compared with other low-income countries in sub-Saharan Africa. Based on the experience of economic development in other countries, economic growth is usually accompanied by a gradual shift in the economic structure from the agriculture sector—the lowest productivity sector—to industry and the services sector, with higher productivity. In this sense, Mozambique remains at the early stage of such a structural transformation.

Another key factor in the long-term prospects for the structure of employment in Mozambique is demographic change. Mozambique has a rapidly growing and very young population (Figure 5.2). In 2010, Mozambique had a total population of about 24 million, of which about 45 percent were 14 years old or younger. Thus, about half of the total population is below working age

[1] Based on the estimation of Fox and others (2013). Figure 5.1 includes the estimated low level of unemployment in line with the assumption of simulations in this chapter.

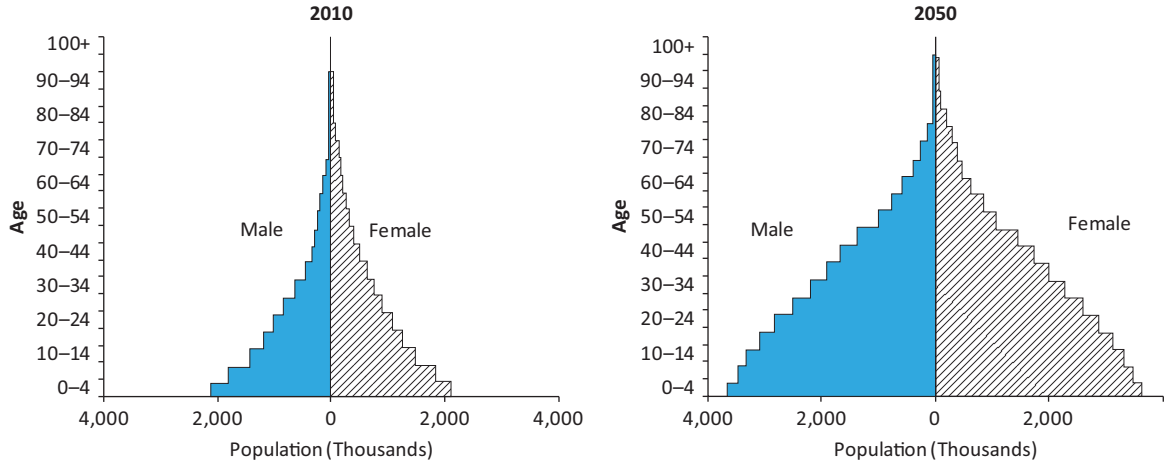
**Figure 5.1. Comparison of Employment Distribution by Sector in 2010**
***(Percent)***




Source: Fox and Thomas (2013).

Note: LICs = low-income countries; SSA = sub-Saharan Africa.

**Figure 5.2. Population Histogram of Mozambique**




Source: United Nations (2012).

(15–64 years old), and the working-age population and the labor force are expected to outpace the continued strong population growth in coming years.

This chapter presents simulations of long-term changes in the structure of the labor force in Mozambique, applying the data and the model used in Fox and others (2013). The main focus is on the transformation of the employment structure from agriculture to industry and the services sector over the medium and long term. The chapter concludes with several policy implications for prioritizing investment projects that would support future drivers of economic growth and improve the inclusiveness of growth.

## Model and Assumptions

This analysis simulates the development of the employment structure in Mozambique until 2050 using an elasticity approach, applying the methodology and data used by Fox and others (2013). First, the model estimates the current employment structure by sector. The sector classification used here is agriculture, wage industry, nonwage industry, wage service, and nonwage service. Nonwage sectors include household enterprises. Fox and others (2013) collected a number of household surveys in each sub-Saharan African country conducted between 2000 and 2010 and processed these micro data to estimate sectoral distribution of the labor force in 2005 or 2010 in a consistent format across countries. In Mozambique, two household surveys conducted in 2002 and 2008, *Inquérito aos Agregados Familiares* (IAF) and *Inquéritos aos Orçamentos Familiares* (IOF), were used as primary data sources.

The model estimates the "employment elasticity of growth" for each sector using the aforementioned household survey data and historical sectoral output growth. The employment elasticity of growth of each sector represents the responsiveness of employment to the real output growth of each sector, meaning by what percentage employment in each sector increases when the real output in the sector grows by 1 percent.[2] With the estimated employment elasticities, employment in each sector can be projected as the employment elasticity multiplied by sector real output growth in each year.

The methodology does not use an employment elasticity of the agricultural sector to estimate employment in this sector. Rather, employment in industry and the services sector is estimated by using employment elasticities of these sectors, and it is assumed that the residual labor force not absorbed by industry or services would be engaged in agriculture.

Fox and Sohnesen (2013) estimated the unemployment rate in Mozambique at about 1.6 percent. This estimate is very low because very strict criteria of unemployment were applied. In reality, it is very difficult to distinguish between unemployment and underemployment or employment in the informal sector in low-income countries such as Mozambique. Therefore, the methodology in this chapter does not distinguish employment in the agricultural sector from unemployment. It should be noted, however, that this assumption does not suggest that the problem of unemployment or underemployment should be ignored.

[2] The relationship of employment and sectoral GDP can be described as $dln(Eit) = \alpha dln(GDPt)$, where *Eit* is the volume of employment by sector at time *t*, *GDPt* is the sectoral output value at time *t*, and $\alpha$ is the sectoral employment elasticity (Fox and others, 2013).

This chapter uses a number of assumptions of economic and demographic indicators. The estimation period of Fox and others (2013) was until 2020 and concluded that the transformation of the employment structure in sub-Saharan African countries would be slower than many had expected. This chapter extends the period of simulation until 2050 to simulate the longer-term trend of the employment structure in Mozambique. Clearly, the longer the simulation period, the more uncertainty there is about the assumption and results. Therefore, sensitivity analyses under different sets of assumptions of population growth are helpful to put the results into perspective.

The set of assumptions used in the baseline scenario is as follows:

- *Population growth*: Data and forecasts are from the 2012 Revision of the United Nations World Population Prospects. According to this data and projection, the average annual population growth rate of Mozambique during 2010–50 is about 2.4 percent.

- *Labor force*: The labor force is estimated using the working-age population (15–64) multiplied by the estimated labor force participation rate (LFPR). Fox and others (2013) estimated the LFPR of low-income countries in sub-Saharan Africa, including Mozambique, as 89 percent and found the LFPR of middle-income countries to be lower than that of low-income countries. This adverse relationship between LFPR and level of economic development can partly be explained by the richer economy having a larger working-age population with the flexibility to leave jobs and undertake schooling or housework. Because this chapter covers the long term to 2050, it is more reasonable to assume LFPR would gradually decrease along with the economic development of Mozambique. Specifically in this analysis, LFPR is initially set at 89 percent, gradually decreasing from 2020 to 79 percent in 2029, and staying at 79 percent after 2029. Despite the gradual drop of LFPR, the average annual growth rate of the labor force in 2010–50 is projected at 2.7 percent, exceeding the overall population growth rate due to the young age structure of the current population.

- *Sectoral GDP growth rates*: Assumptions from the baseline scenario of the debt sustainability analysis (DSA) conducted by the International Monetary Fund in 2013 are used for the period covered by the DSA, until 2033. The overall GDP growth rate in 2033 is estimated at 7.5 percent. After this period, the output growth rate of each sector is kept flat until 2050.

- *Sectoral employment elasticities*: While the baseline scenario of Fox and others (2013) fixed employment elasticities throughout the simulation period until 2020, this chapter assumes changing employment elasticities along with the transformation of the economic structure in Mozambique,

reflecting the development of the country's natural resources. Among other factors, the exploration and exploitation of natural gas in the Rovuma basin has had and will continue to have a large impact on the Mozambican economy. The IMF (2013) assumed that the production and export of liquefied natural gas (LNG) would start by 2020 and increase in scale after that. The baseline scenario of this chapter reflects this structural change in changes in the employment elasticities of each sector. Until 2019, the employment elasticity of the current Mozambican economy, estimated from historical data (see the column "Mozambique" in Table 5.1), is applied. During 2020 to 2023, although the production of LNG would gradually scale up, employment elasticity is calculated as a weighted average of current Mozambican elasticities and special elasticities of the LNG sector.[3] The idea is that LNG production is

**Table 5.1. Estimated Employment Elasticity Parameters**

| | Mozambique | Low-Income | Lower-Middle-Income | Resource-Rich | Upper-Middle-Income (excluding South Africa) | South Africa |
|---|---|---|---|---|---|---|
| Agriculture[1] | | | | | –0.8 | –1.0 |
| Wage industry | 0.5 | 0.9 | 0.8 | 0.6 | 0.6 | 0.5 |
| Nonwage industry[2] | 0.8 | 0.7 | 0.6 | 0.7 | 0.3 | 0.3 |
| Wage services | 0.9 | 0.8 | 0.8 | 0.8 | 0.7 | 0.5 |
| Nonwage services[2] | 0.8 | 0.8 | 0.9 | 0.7 | 0.6 | 0.5 |

**Comparators**

| | Asia 1990–2010 | | ILO, SSA, 1990–2003[3] | |
|---|---|---|---|---|
| | Vietnam, Cambodia, Bangladesh | Indonesia, Philippines | Low- and Lower-Middle-Income | Upper-Middle-Income |
| Agriculture | 0.3 | 0.3 | 0.7 | 0.1 |
| Wage industry | 1.2 | 0.4 | 0.6 | 0.8 |
| Nonwage industry | 1.1 | 0.4 | 0.6 | 0.8 |
| Wage services | 0.7 | 0.7 | 0.8 | 0.7 |
| Nonwage services | 0.7 | 0.7 | 0.8 | 0.7 |

Source: Fox and others (2013).

Note: ILO = International Labor Organization; SSA = sub-Sahara Africa.

[1] Agricultural employment closes the model for low-middle-income, low-income, and resource-rich countries.

[2] Household enterprises include nonwage industry and nonwage services.

[3] Data estimated for 1991–2003 from Kapsos (2005).

[3] This calculation is weighted by the share of the LNG sector and the traditional non-LNG sector in total GDP growth.

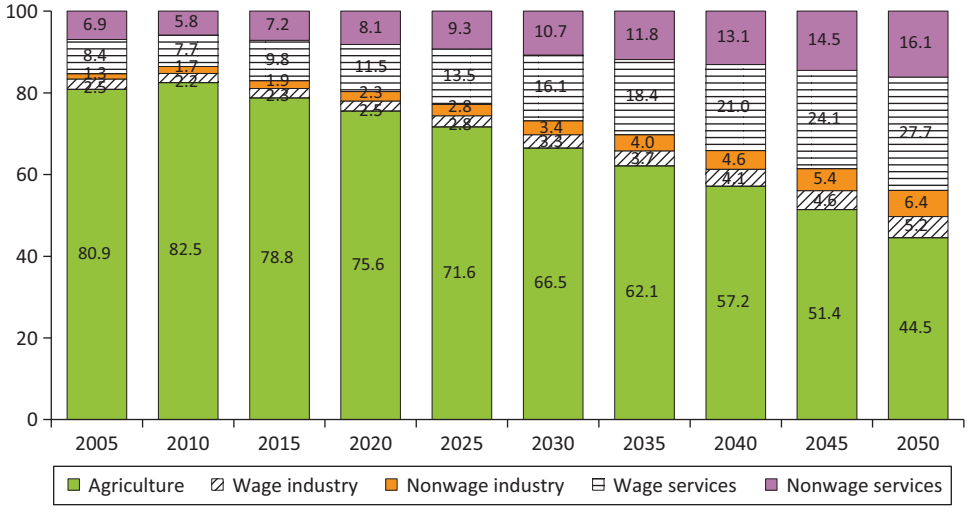
highly capital-intensive and would create much fewer jobs with marginal output growth than traditional sectors do. Although LNG production is categorized as industry, the other sectors would marginally benefit from the expansion of LNG production. The employment elasticities of LNG sector growth are assumed to be 0.2 for wage industry and 0.1 for other sectors. After 2021, the elasticity for resource-rich countries, estimated by current data of other resource-rich countries in sub-Saharan Africa in Fox and others (2013), is used because the extractive sector will constitute a large share of the Mozambican economy in the long run.

## Results of the Analysis

The results of the simulation in the baseline assumptions are illustrated in Figures 5.3 and 5.4. These figures show the gradual transition of Mozambique's employment structure in the long run. Figure 5.3 describes the share of each sector in the total labor force until 2050. The share of agriculture gradually drops from about 83 percent in 2010 to about 45 percent in 2050. The services sector (both wage service and nonwage service) will significantly expand. The share of industry also increases, but from a very small base, reaching only about 12 percent even in 2050.

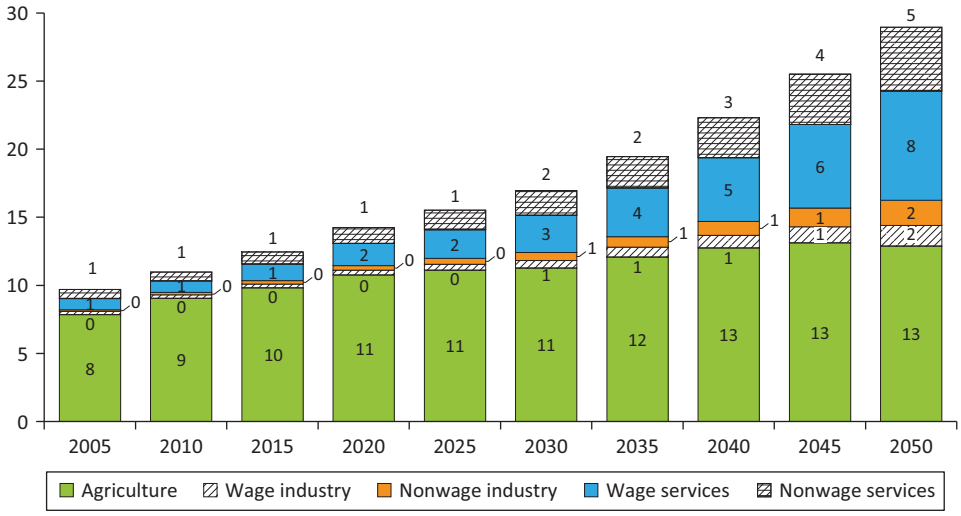
Figure 5.4 shows the absolute number of workers in each sector, which tells a different story from Figure 5.3. Even though the rapidly growing services and industry sectors will absorb most new entrants into the labor market in the next 30 years, the pace of total labor force growth will exceed the pace of services

**Figure 5.3. Results of the Simulation for the Baseline Scenario**
***(Share of each sector in total labor force; percent)***




Source: Author's calculations.

**Figure 5.4. Results of the Simulation of the Baseline Scenario**
***(Millions of workers in each sector)***



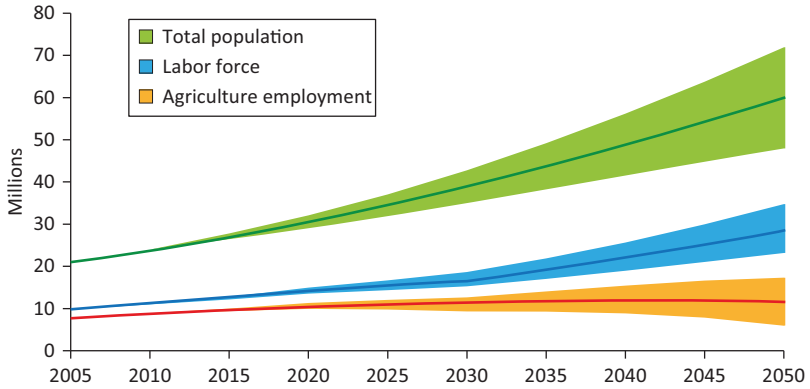

Source: Author's calculations.

and industry employment growth. Because of that, the absolute number of workers engaged in agriculture will keep growing over the next 30 years.

Next, a sensitivity analysis looks at the effect of different paths of demographic change in the future. The demographic projections hinge on certain assumptions of fertility, mortality, and immigration/emigration rates in the country. If some of these indicators diverge from the baseline assumptions, the demographic structure would vary, which would also affect the growth of the labor force. The relevant factors include that (1) the birth rate could decline with economic development, improved sanitation, or other factors, and (2) the labor participation rate may decline because of economic growth and changes in social or family structures. Figure 5.5 illustrates the paths of population, labor force, and workers in the agriculture sector under various assumptions of population growth. An upside scenario assumes the population in 2050 would be larger than the UN's baseline assumption by 20 percent, and a downside scenario assumes a smaller population by 20 percent in 2050. The other assumptions, except population growth, are the same as in the baseline scenario.[4] Figure 5.5 shows that the absolute number of workers engaged in agriculture is somewhat sensitive to the change of the demographic path in the distant future (after 2040). If labor force growth is slower than in the baseline scenario, the pressure on the agriculture sector to absorb the extra labor force will ease to some extent. However, even then the

[4] For simplicity, it is assumed that sectoral output growth would not change pursuant to a change of population growth.

Figure 5.5. Sensitivity to High/Low Population Paths




Source: Author's calculations.

number of workers in agriculture will not drop, and the agricultural sector will remain important in the employment structure during the next 20 years.

## Policy Implications

This chapter has simulated the future employment structure in Mozambique. Although demographic change and economic development will significantly shift the employment structure away from agriculture to other sectors in the long run, the speed of the transition will be very slow. Because of the rapid increase of the population and the labor force, these simulations illustrate that the services and industry sectors likely cannot absorb all new entrants to the labor market, and that employment in the agriculture sector will keep growing, at least over the next 20 years. Therefore, even though the extractive industry would be the main driver of growth and diversification of the economy, reinforcing the resilience of the country in the medium term, economic policies should, at the same time, aim to increase the productivity of agriculture, where the number of workers is large and will keep growing. Creating jobs and raising productivity in agriculture would directly improve the welfare of people in the countryside, making growth more inclusive in Mozambique. Investments to remove infrastructure bottlenecks in rural areas are crucial to raising productivity in agriculture.

Even though this chapter assumes all extra labor is absorbed by agriculture, in reality unemployment is difficult to estimate. Unemployment exists even if not captured in the official statistics. If agriculture cannot absorb the rapidly increasing number of workers, the problem of unemployment will become more severe in the future. Proposing concrete policies to create jobs in each sector is beyond the scope of this chapter, but policymakers should keep a

careful eye on the transformation of the employment structure. A structural shift of the economy, supported by appropriate policies, may change the sectoral growth rates or employment elasticities, resulting in a different outcome in the long term, even though the overall picture is not likely to vary much from these projections in the near term.

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CHAPTER

# 6 Developing the Agricultural Sector

*Jan Joost Nijhoff, Patrick Verissimo, Pedro Arlindo, and Aniceto Bila*

Agriculture is the largest sector in the Mozambican economy, contributing a quarter of GDP and employing about 80 percent of the workforce. Thus, agriculture offers considerable scope to narrow persistent income disparities between rural and urban areas and reduce poverty in regions that have benefited little from the economic gains of recent years.

Mozambique's agriculture sector is dominated by crop production, which represents 78 percent of agricultural GDP, while the shares of forestry, livestock, and fisheries are 9.1 percent, 7.1 percent, and 5.6 percent, respectively (based on the last agriculture census in 2009) (Box 6.1). Agricultural sector growth, which has averaged about 7 percent per year since 2003, has been an important contributor to overall economic growth. Agriculture has grown mainly through an increase in labor and area expansion following resettlement of refugees in rural areas after the civil war ended in 1992.

Mozambique remains a net food importer, mainly of rice to supply urban centers. Total maize production grew by only 3.5 percent per year from 2005/06 to 2010/11, and cassava by only 2.5 percent—barely sufficient to keep pace with Mozambique's 2.7 percent annual population growth. Growth in productivity of food staples has been low, and yields of rice, maize, cassava, and sweet potato are among the lowest in the region.

Agricultural export trade is growing steadily, encouraged by a liberalized trade regime. Although cash crops, including sugarcane, tobacco, cotton, and cashew, account for a small proportion of total area cultivated, they represent the vast majority of agricultural exports. Recent private sector investment and technical assistance from development partners has fueled the emergence of new, export-oriented value chains, particularly for horticultural crops such as bananas, mangos, sesame, baby corn, and green beans. Contract farming and out-grower schemes, linking smallholders with processing entities or large commercial farms, have increasingly provided commercial opportunities for smallholders to join emerging value chains.

**Box 6.1. Key Findings of Mozambique's 2010 Agricultural Census**

The 10-year agricultural census, conducted in 2009–10 by Mozambique's National Statistics Institute (INE) in collaboration with the Ministry of Agriculture, yielded several key findings:

- Cultivated area increased by 24 percent over 1999–2009.
- The number of agricultural producers increased by 45 percent over that same period.
- The share of women-headed agricultural households increased from 23 percent to more than 27 percent over that same period.
- Roughly one-third of farms are smaller than one hectare, while two-thirds are between one and 10 hectares.
- Only 5 percent of producers use irrigation, and less than 3 percent use fertilizers.
- Sesame has become the most important cash crop, grown on 30 percent of the cash crop area.
- More than 40 percent of producers can neither read nor write.

Source: INE (2011), 2009–2010 Agricultural Census.

The agriculture sector is made up of four broad types of enterprises: (1) small-scale subsistence farmers; (2) small- and larger-scale farmers connected to markets; (3) vertically integrated agribusiness firms (operating out-grower schemes); and (4) agribusiness service providers (input suppliers, aggregators). Developing the agriculture sector will require integrating the first group and more of the second group into value chains that are driven by demand and propelled by agribusiness firms (the third and fourth groups). These different actors face different constraints and require different types of support.

Mozambique's agricultural sector has experienced strong growth over the past two decades, and opportunities exist for significant further development. Agricultural transformation is ongoing, based on private investment and the gradual introduction of commercial models. Mozambique's growing ranks of emerging farmers and agribusiness entrepreneurs have the potential to participate in productive commodity value chains that will generate higher incomes for farming households while building an agricultural production base capable of competing in international markets. Stronger agricultural competitiveness, based on improved agricultural productivity and more effective markets, will spur growth in exports and reduce Mozambique's import bill for agricultural commodities.

The government is adapting to the new focus on private-sector-led growth with a development approach that aims to include smallholder farmers into value chains and facilitates agribusiness investments. This new focus on competitiveness is all the more relevant in the context of the ongoing development of the mining and gas industries that could expose the country to the effects of Dutch disease, which would negatively affect the competitiveness of agricultural production and value addition. If Mozambique's mining and gas economy is well managed, it may present an opportunity to grow the agricultural sector and reduce poverty, in particular, by providing revenue for development and boosting demand for consumer products. Demand for food, especially higher-valued products such as horticulture and livestock products, will increase as incomes rise. Urbanization and wealth-associated shifts in consumer preferences will increase overall demand for food, as well as demand for processed foods. Hence, the development of the agricultural sector should focus on (1) expansion and scaling-up of market-led agriculture to increase incomes, enhance food security among larger numbers of households, and respond to emerging demand for processed foods; and (2) intensification to achieve productivity gains that are needed to increase competitiveness and build resiliency in the sector to mitigate any real exchange rate appreciation or other adverse effects of structural changes in Mozambique's economy.

## Outlook

The government's agricultural sector strategy for 2011–20 is characterized by a multi-sector approach. Its strategic objective is to contribute to food security and producer income in a competitive and sustainable manner that guarantees social and gender equity. The strategy for agriculture is built around four strategic pillars and their corresponding goals:

1) *Agricultural productivity:* Increase productivity, production, and competitiveness in agriculture.

2) *Market access:* Enhance services and infrastructure for better access to markets within a framework conducive to investment in the sector.

3) *Natural resources:* Promote sustainable use of land, water, forest, and fauna resources.

4) *Institutions:* Strengthen institutional capacity for the sector.

With the implementation of the sector strategy, the government seeks to achieve annual growth in agriculture of at least 7 percent through a combination of increased farm productivity and an expansion of cultivated

area, specifically, an increase of 25 percent of the area under food crops by 2020, in combination with productivity improvements. The strategy promotes the creation of an enabling environment conducive to stronger private sector participation in the various value chains. The strategy also prioritizes public investments in areas of strong economic potential while supporting local initiatives and nonfarm activities elsewhere. Six development corridors are identified, including the Zambezi Valley and the Beira Corridors in central Mozambique, and the Nacala Corridor in the north (see Chapter 7).

To implement the agriculture strategy, an ambitious agricultural sector investment plan (*Programa Nacional de Investimento do Sector Agrário*—PNISA) was prepared, guided by the framework established under the Comprehensive Africa Agriculture Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD) coordinated by the African Union. The World Bank, other development partners, civil society, and the private sector are committed to supporting the investment plan, the modalities for which are currently being identified. Likewise, the government of Mozambique has committed to supporting the plan through public investments and policy and regulatory reforms that facilitate private investment in agriculture.

## Policy and Investment Priorities

To accelerate and bring to scale the ongoing agricultural transformation process, a number of strategic policy and institutional reforms, combined with public investments, have been identified.

### Seed Technology

Significant gains in farm productivity and agricultural production can be achieved through the adoption by smallholder farmers of technology packages tailored to their specific farming system. These packages include a combination of improved seeds and fertilizer, as well as technical assistance. Less than 10 percent of Mozambique's staple crop area is planted with certified seed. The production of basic seed has traditionally been the responsibility of the Agricultural Research Institute in Mozambique (IIAM), and the involvement of seed companies has not been sufficiently promoted. The Ministry of Agriculture's (MINAG) Seed Department, under the National Directorate for Agrarian Services (*Direcção Nacional de Serviços Agrários*—DNSA) and its counterparts at the provincial level, have traditionally been responsible for seed variety release, quality control, and certification, but have limited implementation capacity. In 2011, for example, the DNSA had a backlog of more than 80 varieties awaiting registration, less than half

of the seed production areas were inspected, and laboratory testing met only about half of the demand.

A recent World Bank report on agribusiness indicators highlights how insufficient capacity in public institutions (including lack of equipment and qualified staff ) affects the outcomes and efficiency of plant breeding and seed multiplication programs (World Bank, 2012). To commercialize the seed industry, incentives for private participation are needed. Recent revisions to seed legislation now provide for the protection of plant breeders' intellectual property rights and facilitate the exchange and release of new varieties within the Southern African Development Community, thus implementing the regional protocol on seed.

### Fertilizer

Fertilizer use is concentrated on a few cash crops, especially tobacco and sugarcane, with minimal usage by small-scale farmers due to high fertilizer prices in rural areas. Fertilizer use in terms of nutrients applied is very low, at 4.3 kilograms per hectare (compared to 9.5 kilograms in Ghana and 8.2 kilograms in Ethiopia). This level is well below the African Union's 2006 Abuja Declaration on Fertilizers, which sets a target for sub-Saharan Africa of 50 kilograms per hectare by 2015.

Fertilizer prices paid by farmers are high due to inefficiencies in the supply chain and distribution network, in large part caused by high transport costs. Given the high cost, the use of fertilizer may not always be profitable at the farm level, meaning that the revenue of incremental production is insufficient to pay for the fertilizer (World Bank, 2012). In addition, even when fertilizer is theoretically profitable, its purchase is limited due to cash flow constraints, often because fertilizer is only available in large quantities.

The distribution of fertilizer in affordable start-up kits for small-scale farmers has been supported in the past by various development projects, particularly following floods and under resettlement programs. The government introduced a voucher-based input subsidy scheme in 2009 with technical assistance from the UN Food and Agriculture Organization (FAO) and funding from the European Union. Under this scheme, implemented by the International Fertilizer Development Center, 25,000 farmers received sufficient seed and fertilizer to plant 0.5 hectare of maize or rice. The program concluded after two years and is under evaluation for potential scaling up.

To offer affordable fertilizer to smallholder farmers, a competitive private sector distribution system needs to develop. An enabling environment is required that will provide the necessary incentives. First, market-distorting

government seed distribution programs should be phased out (except for emergency responses), and private distribution networks supported instead. Second, fertilizer industry rules and regulations must be updated and enforced, ensuring quality, safety, and truth-in-labeling. Further, links between private companies and public research institutions should be promoted. A number of donor agencies are supporting the government and private sector to achieve these objectives.

## Irrigation

Irrigation can raise agricultural productivity and reduce production risk associated with droughts and other kinds of climatic variability, which is high in Mozambique. Only 40 percent of the 120,000 hectares developed for irrigation is effectively irrigated. The large- and medium-scale irrigation schemes and related infrastructure date from colonial times; many were abandoned during the civil war and have since deteriorated. Post-war public investments in irrigation have been inconsistent, in part reflecting the extremely high capital cost of medium- and large-scale schemes. The most recent data indicate that sugarcane accounts for some 60 percent of the effectively irrigated area (driven by private investments on large commercial estates), followed by smallholder horticulture (18 percent) and rice (10 percent).

To improve the performance of the irrigation subsector and transform it into an engine of growth for agriculture, the government has identified the following priorities:

1) Enhance the management of irrigation assets, focusing particularly on cost recovery to finance operation and maintenance. One option would be to promote irrigation organizations that are mandated to act as water-user associations.

2) Improve the legal and regulatory framework on water for agriculture and the efficiency of enforcing the land law. The land law must clarify land-use rights and enhance land-use security to promote producers' access to irrigation as well as private investment in the subsector.

3) Establish institutional linkages and working relationships between the public entities responsible for irrigation (at the central and provincial levels) and beneficiaries (such as smallholder farmer associations, irrigation organizations, individual farmers, and private enterprises) through public-private partnerships for irrigation development.

In recent years, the government has made the development of irrigation a priority. As a result, since 2004 irrigation infrastructure has been rehabilitated or newly built on an estimated 15,000 hectares. The adoption of the

National Strategy for Irrigation in December 2010 resulted in the creation of the National Irrigation Institute (*Instituto Nacional de Irrigação*—INIR), which has representation at the provincial level and will oversee policy, strategic, and operational issues related to irrigation. The government adopted regulations governing water-user rights, implemented through a network of regional water resource management centers that issue water-user rights and collect water-user fees from producers. To improve the poor performance of public irrigation schemes, a joint public-private management structure was introduced to create incentives. The government is currently investing in smallholder irrigation schemes across central Mozambique. The $70 million PROIRRI Project, funded by the World Bank's International Development Association, has an integrated approach that supports irrigation infrastructure, management, farm productivity, and market access.

## Land

Access to land and land rights underpin rural development, environmental protection, and improvement of the investment climate. To unleash the potential of the country's vast land resources, the government needs to establish a well-functioning land administration system and strike a balance among competing interests.

Mozambique's overall land policy and supporting legal framework are generally sound, but major gaps in implementation prevent this framework from yielding tangible social and economic benefits. Land administration capacity at all levels is weak, and there is a consensus that the current rural land taxation system should be addressed. In addition to the very low tax level, recent research led by the World Bank shows that the tax collection rate is extremely low (between 16 and 33 percent). Community land tenure should be strengthened, particularly given the rising global interest in farmland. Land area covered by applications for DUATs (land use rights) increased more than five times from 2005 to 2009. Rural DUATs do not enjoy the same transferability as urban DUATs.

The following priorities have been identified:

1) Enforce and upgrade the land taxation system to pursue more social goods, such as a more efficient land-use pattern, increased local government revenues, and more meaningful decentralization.

2) Strengthen the protection of community land rights and improve the investment climate by scaling up community delimitation, increasing the transferability of rural land-use rights, and improving rural zoning and land use planning.

3) Develop a comprehensive strategy to strengthen the capacity of the land administration and management system at all levels.

Owing to the rapidly increasing demand for land, the enforcement of the Land Law and adaptation of some of its elements to the evolving socioeconomic context have become major challenges for the government. Rising international food and fuel prices in recent years have spurred a global increase in demand for land by international investors eager to seize economic opportunities to produce food, ethanol, and forestry products. Mozambique, generally perceived as a country with vast areas of unused land suitable for agriculture, has attracted considerable interest from foreign investors who have sought land-use rights to implement their projects in agriculture, tourism, and mining. In a number of cases, such projects have generated conflict with local communities and highly publicized reports of "land grabbing" (Oakland Institute, 2011; Justiça Ambiental and União Nacional de Camponeses, 2011). At the same time, the government is increasingly aware that existing practices for allocating or transferring the land-use rights for smaller parcels is cumbersome, lengthy, and inefficient, and provides disincentives for investment in irrigation and other productivity-enhancing measures.

Conflicts between communities and foreign investors have often resulted from weaknesses and failures in the attribution of DUATs. A particular problem is that the required community consultations are often improperly carried out, focusing on investors' promises that are not fulfilled later. Conflicts around land are often exacerbated by the institutional weakness of local government, the vulnerability of poor communities, and incomplete knowledge and understanding of the rights and obligations stipulated in the Land Law on the part of investors, communities, and local authorities. This lack of transparency has generally resulted in poor governance, which is the reason why a moratorium on DUAT attribution for areas greater than 1,000 hectares was imposed between 2009 and 2011. The existing DUAT allocations and the allocation process were reviewed, and the government appears to have adopted a more cautious approach to handling the demand for land by large commercial investors. With support from development partners, including the World Bank's PROIRRI Project, government efforts are under way to accelerate the issuance of certificates of delimitation to communities across the country and DUATs to registered associations. The Millennium Challenge Corporation's Land Administration Project is focusing heavily on strengthening institutional capacity at the National Directorate for Land and Forests and its decentralized entities in order to increase the skills and knowledge of land administration officers in relation to the Land Law.

In support of an improved land administration system, the government of Mozambique and the private sector have confirmed their intention to adhere

to the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security ("the Voluntary Guidelines") adopted by the Committee on World Food Security in May 2012.[1] They will also consider the Principles of Responsible Agricultural Investment produced by several international organizations and endorsed by, among others, the G8 and G20. These principles are undergoing a consultative process through the Committee on World Food Security.

The government recognizes the urgency of tackling the challenges identified and has taken significant actions to address them. In recent years, the government has:

- Approved the donor-supported Community Land Initiative (*Iniciativa de Terras Comunitárias*), with the target of exploring effective models for community land delimitation.
- Agreed to include the number of completed community delimitations as an indicator within the G19 Performance Assessment Framework of its poverty reduction strategy.
- Launched implementation of a land project ($39 million) financed by the Millennium Challenge Corporation, focusing on national policy monitoring, capacity strengthening, and improving land access in selected provinces.

The government has also actively engaged the World Bank in a multiyear land policy dialogue that led to:

- Creation of the National Land Consultative Forum in 2011 to facilitate policy discussions and strengthen civil society ownership.
- Removal of uncertainties related to the documentation required to recognize community land rights, arising from the 2007 Amendment of Article 35 of the Land Law.
- An increase in the rural land tax level (effective 2010), although the new level is still considered low, given its even lower starting point.
- Discussions at the Land Forum of the recommendations of the World Bank/FAO policy notes on land taxation and community delimitation.

[1] The purpose of these Voluntary Guidelines is to provide guidance to improve the governance of the tenure of land, fisheries, and forests, with the overarching goal of achieving food security for all and supporting the progressive realization of the right to adequate food in the context of national food security. Principles for the implementation of the guidelines include gender equality, consultation, and participation and accountability.

### Market Access, Business Environment, and Financial Services

Not surprisingly, household welfare and market access are closely related. Proximity to a main road and access to storage infrastructure are important factors but are not the only determinants of welfare-enhancing market access by smallholder farmers. Recent research conducted by MINAG and Michigan State University (MINAG/MSU, 2013) emphasizes that for smallholders to successfully integrate into a market, additional measures are required to increase cash crop production at a sufficient scale and level of efficiency. Downstream agribusinesses, such as traders and processors, develop contract farming arrangements by which input supply, credit, knowledge transfer, and output market access are integrated into one business model. Out-grower schemes, where a central large production unit supplements its production by contracting growers in the surrounding area, have similar arrangements. In Mozambique, several agribusiness firms are working along these lines, with variable levels of impact on household welfare depending on the commodity. Successful and sustainable integrated input-output business models provide (1) adequate contract enforcement or other incentives that will reduce side-selling by smallholders, and (2) transparency in the form of market information to ensure sufficient bargaining power among producers.

Constraints to agribusiness development were highlighted in a comprehensive diagnostic report on commercial, legal, and institutional reforms in Mozambique's agricultural sector (USAID, 2011). These include licensing procedures, employing workers, obtaining credit, paying taxes, accessing marketing infrastructure, trading across borders, and enforcing contracts. Similar concerns were expressed at the National Forum on Agribusiness, held in May 2011 with representatives from the private sector, NGOs, development partners, and public agencies involved in agribusiness in Mozambique. The discussions identified the most important challenges for the development of agribusiness as:

- Improving access to and affordability of finance.
- Improving input supply in terms of availability, adequacy, and quality.
- Rehabilitating roads and bridges, especially those linking high-potential agricultural areas to the road network.

Despite these constraints, the agribusiness sector has undergone a rapid transformation during recent years. The landscape has long been dominated by traditional, export-oriented cash crops, with highly integrated value chains led by foreign companies in sugar, cotton, tobacco, and cashew production. In recent years, however, new agricultural value chains conducive

to the participation of small and medium-sized enterprises and smallholder farmers have emerged (rice, oilseeds, poultry, bananas, mangos, and green beans, among others).Value-chain development has become a model for the provision of public support, facilitating linkages between farmers, agribusinesses, and financial service providers, and facilitating public-private partnerships.

As part of the launch process for the agriculture sector investment plan (*Programa Nacional de Investimentodo Sector Agrário*—PNISA), the government has committed to focusing on:

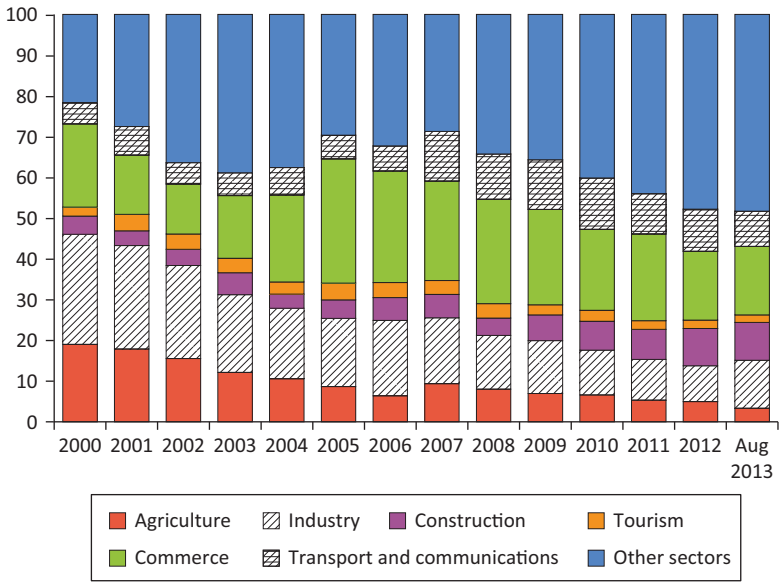
- Consistency and transparency in trade policy.
- Incentives for the private sector, especially in developing and implementing domestic input policies that encourage increased private sector involvement.
- Improving the transparency and efficiency of land administration.
- Developing innovative methods for increasing access to credit by smallholders. In October 2012, the government published a decree authorizing the creation of an agricultural commodity exchange, and is also exploring the feasibility of a warehouse receipt system.

As in many countries in sub-Saharan Africa, commercial lending to agriculture is extremely low in Mozambique. While agriculture contributes 25 percent to GDP, lending to agriculture fell from 20 percent of commercial lending in 2000 to 6 percent in 2010 (Figure 6.1).[2] Commercial financial services have developed more rapidly in areas where export crops are produced, and finance is provided down the production, processing, and marketing chain. Only 2.3 percent of producers report having access to some form of credit. Almost half of those with access to formal financial services in rural areas had to spend more than two hours to reach their financial institution, with more than a third spending more than three hours or even having to travel overnight (INE, 2011). The recent piloting of payment services and information exchanges (such as market prices) via mobile telephone holds some promise for improving access to financial services in rural areas, but this nascent industry must be expanded rapidly to serve as a base for innovation and competition in financial services for rural populations.

Most rural credit that goes to small agribusinesses and small-scale producers moves through government- or donor-funded credit lines and guarantee funds. These funds have subsidized interest rates and are often linked to

[2] Figure 6.1 does not include credit to agricultural processing companies or credit for agricultural equipment and machinery, which account for a large share of credit to the agricultural sector in Mozambique.

**Figure 6.1. Commercial Bank Lending in Mozambique by Sector**
***(Percent of total lending)***




Source: Bank of Mozambique.

rural and agricultural development projects (Ministry of Finance, 2012). In contrast, major investments (e.g., in sugarcane and tobacco) usually are financed through offshore credit or equity capital. The extremely high costs of agricultural credit (25–30 percent per annum, plus fees and commissions of up to 3 percent, plus transaction costs) act to exclude rural entrepreneurs, and most agricultural credit is limited to short-term loans for working capital. Microfinance in rural areas, especially for smallholders, is not well developed owing to the inherent risks in agriculture (weather, crop disease, and market risks), the lack of collateral, and high credit servicing costs. However, positive trends are emerging in the provision of credit to well-structured value chains, consistent with experiences in other countries.

The country's first Strategy for Rural Finance (EFR 2011–17) was approved by the Council of Ministers in April 2011. The strategy focuses on developing and consolidating an inclusive financial system in rural areas to support the socioeconomic development of individuals, groups, and enterprises.

## Nutrition

As detailed earlier, malnutrition seriously compromises Mozambique's human capital and economic growth. Chronic undernutrition has scarcely improved in the past decade, and labor productivity is directly affected by malnutrition. The Ministry of Health's (MISAU) strategy to combat micronutrient

deficiencies involves food fortification, targeted vitamin and mineral supplementation, and dietary diversification.

A key challenge in implementing Mozambique's nutrition agenda is ensuring participation, coordination, and accountability among the various agencies across sectors and ministries and at various levels of government. Food fortification is one example of the challenges of working across sectors and ensuring compliance with nutritional standards. MISAU sets the standards and prescribes safe levels of fortification. The Ministry of Industry and Commerce works through the private sector to fortify foods and ensure adherence to standards. Prospects for success in a mandatory fortification program are higher when the industry in question is concentrated both geographically and commercially, as is the case for wheat flour and edible oil.

Supported by development partners, MISAU is working to develop and implement a micronutrient fortification strategy. It has also put legislation in place for salt iodization, with the result that much of the salt that is produced or processed at scale is iodized (60–70 percent). The government is exploring large-scale fortification of wheat flour and edible oil because of the potential to achieve wide, effective coverage. Wheat flour and edible oil can be fortified with different minerals and vitamins, and wheat flour derivatives such as bread can be enriched with micronutrients. The government can draw lessons from the experience gained with the mandatory iodization of salt already under implementation, where the challenge remains to iodize salt produced by small-scale producers or processors.

## Sector Management and Coordination

The adoption of the CAADP agriculture development framework and implementation of the sector investment plan necessitate the use of a monitoring system that is based on high-quality statistics. Additional demand for data comes from public sector investors (development partners), private sector investors, and agricultural research entities (IIAM and the *Universidade Eduardo Mondlane*).

Every 10 years, the National Institute for Statistics (*Instituto Nacional de Estatistica*—INE) and MINAG conduct the national Census for Agriculture and Livestock (*Censo Agro-Pecuário*), the main source of basic data. The last census was conducted in 2009–10, and a comprehensive volume with basic data tables was published in 2011. Official annual agricultural statistics are generated mainly through two annual surveys by MINAG. The Directorate of Economics conducts the postharvest agricultural survey (*Trabalho do Inquerito Agricola*—TIA), and the Directorate for Agrarian Services conducts the

early warning crop forecast survey (*Aviso Previo*). These data sets have served different purposes, but will now be combined into one survey exercise.[3]

Following the government's commitment under the Regional Strategic Framework for Statistical Capacity Building in Africa (2007) to design a National Strategy for the Development of Statistics (the "Paris 21 Initiative"), INE and the High Council for Statistics developed the National Statistical System (PESEN 2008–12). PESEN did not include agricultural statistics, however. MINAG, with support from the FAO, has drafted a Master Plan for Agricultural Statistics, which includes an integrated framework for agricultural statistics. The draft Master Plan highlights the need to:

- Make agricultural production data an integral part of the agricultural sector strategy.
- Improve coordination among different players and increase institutional efficiency.
- Agree on a core set of indicators for which data should be collected annually.

## Conclusions

An acceleration of growth in agriculture is needed to reduce poverty and remain competitive in meeting Mozambique's growing food needs and export opportunities. Supported by development partners, the government is currently implementing a number of key policy and institutional reforms that will provide incentives for private investment and facilitate the integration of smallholder farmers into value chains. The sector investment plan, however, is ambitious and will require careful management. With the underlying policy intention of attracting private investment, public resources will need to be allocated strategically.

Development partners are and will be supporting the technical execution of key components of the agricultural sector investment plan (PNISA) through project-based funding, both on and off budget. The World Bank is also providing the sector with policy-based lending, supporting most aspects of the policy agenda outlined in this chapter and providing flexible resources to the government. In addition, development partners are in the process of identifying PNISA management support requirements (including analytical capacity) and the annual sector review, policy dialogue, and resource allocation process.

[3] *Aviso Previo* data are used for early warning but also by default for the evaluation of MINAG's annual Social and Economic Plan, whereas data from TIA have been used extensively by MINAG to analyze the agricultural economy and set priorities for research and agricultural investment. See MINAG and INE (2011).

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CHAPTER

# 7 Mozambique's Development Corridors: Platforms for Shared Prosperity

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After the devastation of Mozambique's civil war, it was crucial to jumpstart the economy. "Development corridors" were a key component of the post-war strategy. Due to their geographic location or natural resources, these regions held promise to stimulate the country's economic growth through regionally-focused infrastructure investment. This chapter introduces the background of the spatial development initiatives in Africa, provides an overview and details of the various growth corridors in Mozambique, and concludes with ways to address the challenges and risks of development corridors.

## Economic Geography of Development Corridors and Growth Poles

The concept of development corridors evolved from transport corridors that provide connectivity between countries, or between subregions within countries, to promote both domestic and international trade by providing efficient transport and logistics systems. Often centered on road and rail networks linked to ports, the corridor concept is based on integrated investments in hard infrastructure as well as on the establishment of policies, regulations, and institutions governing sustainable trade and investments along the corridor.

Development corridors are often shaped by historical and political economy factors, as in the case of the east-west alignment of corridors in Mozambique, which has its roots in the Portuguese colonial economy. The corridors support regional integration through the coordinated development of transport infrastructure and freight logistics, especially cross-border trade facilitation; coordinate investments through a common policy framework; and anchor investment projects often linked to extractive industries. The corridor concept envisions a significant role for the private sector in the institutional arrangements as well as the active participation of central and local public authorities. This private-public institutional platform is expected to facilitate

the removal of regulatory and political barriers to the flow of goods, people, and services across borders.

There are many examples worldwide of development corridors with varying degrees of success: the Greater Mekong Sub-region East West Economic Corridor supported by the Asian Development Bank links Myanmar to Vietnam through Thailand and Laos. The Antofagasta region in Chile, which hosts a concentration of mining and mining-related firms, particularly in copper production, is linked to the Capricorn Corridor, which connects Chilean ports with provinces in Argentina and Brazil.

In sub-Saharan Africa, the Southern Africa Development Community (SADC) first promoted the concept of regional transport corridors in the 1980s and early 1990s. The transport corridor concept evolved into the Regional Spatial Development Initiatives Program (RSDIP) initiated by South Africa. The RSDIP was launched in the late 1990s and became part of the overall approach of the New Partnership for Africa's Development (NEPAD). In 2007, NEPAD and the African Development Bank formally adopted development corridors as a tool for configuring, prioritizing, and promoting interrelated infrastructure and large-scale economic investments in defined geographic areas. Twenty-one development corridors covering 16 countries were identified under the RSDIP. Of these, the RSDIP is reportedly actively involved in the following eight corridors: Beira, Limpopo, and Maputo (Mozambique), Mtwara and Central (Tanzania), Bas Congo (Democratic Republic of the Congo—DRC), Trans Caprivi (Namibia,) and the North-South Corridor (Zimbabwe).

The Central Corridor links Tanzania, Uganda, Rwanda, Burundi, and DRC, while the North-South Corridor covers eight countries: Botswana, DRC, Malawi, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe. The North-South Corridor stretches from the port of Dar es Salaam in Tanzania to Durban in South Africa, with a link to the Maputo Corridor. The Northern Corridor links Kenya, Uganda, Rwanda, Burundi, and DRC.There are corridors radiating from the port of Walvis Bay, serving the Trans-Kalahari through Namibia, Botswana, and South Africa; through the Trans-Caprivi, Namibia, Zambia, and DRC; and through the Trans-Cunene, Namibia, and Angola.

More recently, agricultural growth corridors have gained prominence, especially the Southern Agricultural Growth Corridor of Tanzania and the Beira Agricultural Growth Corridor (BAGC) in Mozambique. The spaghetti of corridors in sub-Saharan Africa is often confusing, with overlapping corridors and the common perception that most of these are still in early planning stages, with the most advanced corridors being in Mozambique.

Growth poles are often but not always subsets of development corridors, and are based on the precept that economic growth has typically been uneven

across a nation and concentrated or clustered in and around one or more core sectors or industries around which related activities develop. The expansion of a core industry implies not only the expansion of output, investment, and employment, but also of new technology, knowledge, and industries. Common criteria for the success of growth poles include (1) a geographical concentration of economic activities such as mining, agribusiness, tourism, light manufacturing, or business process services; (2) demonstrated private sector investments; and (3) a capacity for generating growth over a prolonged period of time due to local factor endowments.

The growth pole theory has drawn upon industrial organization theory as well as new economic geography and endogenous growth theories. In more recent literature and application, its scope has been widened to include normative issues of policy intervention and spatially targeted investments for accelerating economic growth. A growth pole strategy is used as a spatial planning tool that draws on economies of scale in production; the nurturing of backward and forward supply linkages and fiscal and final demand linkages; and more generally on economies of agglomeration associated with spatial clusters and geographic concentration of economic activities. While these spatial concentrations often evolve naturally or spontaneously over time, it is increasingly recognized that well-designed initiatives for correcting coordination failures can expedite the process of development. The World Bank is currently supporting growth pole investment programs in Burkina Faso, DRC, Madagascar, and Mozambique.

## Development Corridors in Mozambique

Because of its unique geographical location and natural assets, Mozambique—perhaps more than any other country in sub-Saharan Africa—has been the focus of a number of growth corridors geared toward regional integration. In fact, the RSDIP program began in 1995 with the Maputo Development Corridor (MDC). It seeks to promote trade and investment-led growth along development corridors, focusing on large anchor projects—normally mineral-based—and optimizing investments in infrastructure, encouraging value-added activities, and enhancing the competitiveness of regional economies. In the case of the MDC, the key drivers have been the availability of electricity from Cahora Bassa in the center of Mozambique for the Mozal aluminum smelter near Maputo, and the availability of gas from Imhanbane Province in Southern Mozambique for the Sasol petrochemical complex in South Africa.

The RSDIP also attempts to spread the benefits of economic growth from the large investments along the development corridors through *densification* (providing feeder infrastructure to support smallholder agriculture

producers) and *deepening* (forging backward and forward linkages between the large investments and local small and medium-sized enterprises—SMEs). In March 2010, the Mozambican Ministry of Transport and Telecommunications set up the Coordination Commission for Studies and Projects to build sustainable institutional capacity for spatial development planning within the government and to prepare a series of concrete proposals for spatial development initiatives.

Targeting and concentrating public investments in selected high potential growth poles is expected to catalyze domestic linkages. Private investments in Mozambique are currently concentrated in two provinces: Tete (primarily coal mining and construction) and Nampula (agribusiness, mining, and construction). In the province of Tete, the demand for food, goods, services, and skills is in the Tete municipality, driven by the mining investments in the adjacent Moatize District and the rapidly increasing population from workforce migration. In the case of Nampula, there are pockets of commercial agriculture and mining investments, but economic and population growth is currently concentrated around the Nacala Special Economic Zone due to the new investments in the Nacala port as the terminus of the Nacala corridor. Within these two provinces, spatial overlay analysis of population, social, and economic data, including agricultural production potential, were used to determine the specific districts with the highest potential for project interventions (growth poles).

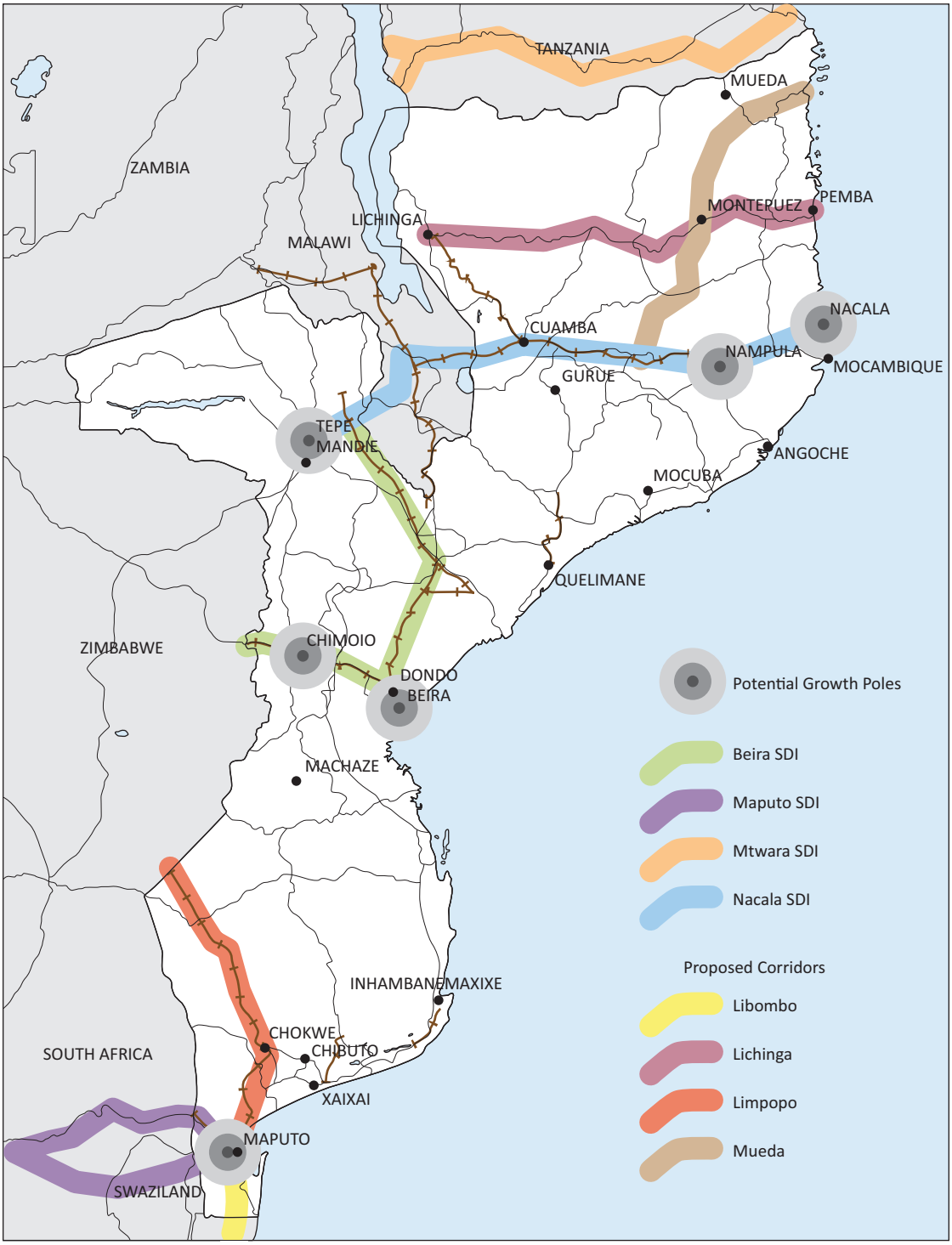
Besides the MDC, the major development corridors in Mozambique include Beira, Mtwara, and Nacala. Other proposed corridors include Lichinga, Limpopo, Lubombo, and Muenda, as shown in Figure 7.1.

### Maputo Development Corridor

The MDC is possibly the most well-developed corridor in sub-Saharan Africa. It serves the highly developed South African provinces of Gauteng, Mpumalanga, and Limpopo as well as Swaziland by providing a cost-effective alternative transportation link for South African firms to the Maputo port instead of the Durban port. The corridor's development program includes the EN4/N4 toll highway through a build-operate-transfer concession, rehabilitation of the Ressano Garcia railway line, the Lebombo-Ressano Garcia border post, the redevelopment of the Maputo and Matola ports through a public-private partnership concession, and the Sasol gas pipeline project.

The Maputo Corridor Logistics Initiative (MCLI) was established in 1994 to provide the public-private institutional support for the corridor's development objectives and has been remarkably successful. The initial anchor project was Mozal, which transforms imported bauxite into aluminium. Mozal started

**Figure 7.1. Growth Corridors in Mozambique**




Source: World Bank.

in 1998 and sent a strong signal to other investors by demonstrating that large-scale investments (megaprojects) could be successful in Mozambique, eventually facilitating the wave of investments in the extractive industries and energy sectors that followed. Subsequent megaprojects included the Beluluane Industrial Park (hosting companies across a number of sectors, including construction, electronics, and medical equipment, among others) and the Sasol petrochemical cluster, using natural gas from Pande and Temane. Mozal and Sasol have invested over $2 billion and $800 million, respectively. Mozal contributes over 48 percent of Mozambique's industrial output and 28 percent of manufacturing value added; it further represents 75 percent of manufacturing exports, 60 percent of all exports, and 42 percent of the country's total export revenues.

Overall, there has been significant growth in traffic and trade along the MDC, with new investments, especially in tourism, and improvements in transit times, road safety, and logistics efficiency. There are ambitious plans for the corridor's second development phase, including further expansion of Mozal, new investments in iron and steel, a fertilizer complex, and potential extension of the highway both to Ponto de Ouro at the coastal border to South Africa and to Macaneta-Bilene north of Maputo.

However, the road and rail capacity of the corridor are currently underutilized and the corridor may be falling short of its potential given the level of infrastructure investments made. In particular, the Mozambican segment of the corridor has seen little growth compared to the South African segment. There are a number of factors behind this, especially difficulties in the railway concession and the resulting underinvestment in railway capacity. More generally, the investment climate in Mozambique remains poor, hampering private activity, and the logistics of cross-border trade could be much more efficient—the proposed one-stop border post is not yet operational. Also, new investments in the competitor ports of Durban and Richards Bay in South Africa could undermine the comparative advantages of the Maputo port and stifle the MDC's development unless there is renewed impetus from the Mozambican government to address the current challenges.

### Nacala Development Corridor

The Nacala Corridor in Mozambique covers the provinces of Tete, Zambezia, Niassa, Nampula, and Cabo Delgado with a total area of over 499,000 square km and a population of about 14 million.[1] Based on a 2004 agreement between Mozambique, Tanzania, Malawi, and Zambia, the Nacala Corridor

[1] There is no standard definition of the actual geographical coverage of the Nacala Corridor, and the Nacala and Beira Corridors overlap to some extent in Tete.

stretches all the way to the Zambian capital of Lusaka via Malawi. Historically, the Nacala Corridor was an international transit corridor for Zambia and Malawi to the Nacala port via the Northern Railway and the Malawian railway system (Nacala-Nampula-Cuamba-Entre Lagos-Lilongwe-Mchinji-Chipata) until the Mozambican civil war disrupted transport links.

The Nacala Corridor is currently attracting significant private and public investments driven by the transport needs of coal mining investments in Tete. Over the past five years, an estimated $5 billion has been invested in the exploitation of mineral resources in Mozambique, much of it in the Nacala Corridor. There is also significant untapped potential in agriculture, forestry, mining, tourism, and industry. Current major infrastructure investments in the Nacala Corridor are as follows:

- A $3.4 billion investment by a consortium led by the Brazilian mining giant Vale for the rehabilitation of the 912 km railway line from Moatize (Tete) to Nacala port, including a stretch in Malawi. The railway line is expected to be completed by late 2014 or early 2015.

- A $1.1 billion investment by Vale in a new port at Nacala Velha to be completed at the same time as the railway line.

- Construction of a large airport scheduled to be opened in 2014.

- Upgrading the Nampula-Cuamba and Cuamba-Mandimba-Lichinga roads, which are currently dirt roads.

- Upgrading the existing Nacala port.

- Development of the Nacala Special Economic Zone established in 2007. Total investment commitments to date are $1.2 billion for 53 approved investments, of which a few agro-processing firms have already started operations.

In addition, the Zambian government is rehabilitating the Mchinji-Chipata railway line. Rail capacity on the Nacala Corridor is expected to increase to 18–20 million tons by 2017, and eventually to 30 million tons, mainly to export the coal produced in Tete.[2] The discovery of natural gas deposits in the Rovuma Basin north of Nacala and the anticipated investments could also become a strong impulse for the Nacala Corridor.

By overcoming existing stifling transportation and logistics bottlenecks, the investments in the Nacala Corridor could transform the economic landscape

[2] Tete has 23 billion tons of identified coal reserves, and coal production is expected to reach 62 million tons in 2017 and 75 million tons in 2020.

not only of Mozambique, but also of Zambia and Malawi. For this to happen, however, there are a number of critical problems to be addressed. Key among these is the absence of an effective institutional platform to plan, coordinate, monitor, and manage the corridor's expansion in a systematic, participatory, and sustainable manner. The success of the Maputo Corridor was attributed largely to the effectiveness of the MCLI platform. The success of the Nacala Corridor will hinge on the establishment of a similar public-private platform and on the significantly increased capacity of public sector agencies, both national and provincial. The institutional capacity of the Zambezi Valley Development Agency, the Special Economic Zones Authority (GAZEDA), and the provincial and municipal authorities, including the Nampula provincial coordinating institution (UCODIN), are weak and should be ramped up rapidly. Public investments in infrastructure (especially roads, water, and energy), improved service delivery, labor skills, and the investment climate are critical to ensure that the spillovers from the private investments enhance incomes and help lift the local population out of poverty. Also, stronger capacity will be critical going forward in the areas of land-use planning, sustainable management of natural resources, and implementation of social and environmental safeguards.

### Beira Development Corridor

The Beira Corridor is traditionally defined as the transport link between the port of Beira and Zimbabwe. More recently, the Beira Corridor definition has expanded to include the road links from Beira to Malawi and Zambia and the rail link to Tete. The key transport links are as follows:

- Zimbabwe: road (EN6), railway, and pipeline
- Malawi: road (EN102/103) and the Sena railway link to Moatize (Tete), with plans to expand to Malawi
- Zambia: road (EN102/221).

The Beira port also provides a transport link to the interior of Mozambique and to Botswana and the DRC. Development of the Beira Corridor is driven by parallel initiatives: the coal mining investments in Tete, and the Beira Agricultural Growth Corridor (BAGC). The Sena rail line was redeveloped and reopened in June 2010 to facilitate coal exports from Tete (both Vale and Rio Tinto are currently exporting coal through the Beira port). Operations on the Sena line in 2013 were disrupted by flooding as well as political violence. There are plans to expand the Beira port and increase railway capacity of the Sena line from the current 6 million tons to 20 million tons per year, but some natural constraints will have to be overcome. Beira is a relatively shallow port

with a long access channel not navigable for large ocean-going ships; in contrast, Nacala is a deep sea port better suited for bulk cargo such as coal. Also, there are plans to develop a new rail line from Tete to Macuse as well as a new multiuser deep sea port.

The BAGC initiative is a partnership between the government of Mozambique, private investors, farmer organizations, the UK Department for International Development, Norway, and the Netherlands. It was launched in 2010 to promote increased investments in commercial agriculture and agribusiness within the Beira Corridor (focusing on Tete, Sofala, and Manica Provinces). The BAGC Catalytic Fund is supporting a range of investments in farming and agro-processing businesses. In partnership with the Alliance for a Green Revolution in Africa, the BAGC is also supporting investments in irrigation and smallholder support services.

The challenges of the Beira Corridor are similar to that of Nacala: institutional capacity to plan, coordinate, and manage the development of the corridor in partnership with the private sector. The timing, scope, and sequencing of infrastructure investments—that is, expanding port and rail capacity—will be especially critical going forward. The private sector is concerned about the increasing political and security risks in northern Mozambique. How these challenges are addressed in the near future will have a key bearing on both the Nacala and Beira Corridors.

## Addressing Challenges and Risks

The growth pole strategy focuses on strengthening linkages between large investments and smallholders and small enterprises. The rationale for growth pole investments is to improve on the record of the megaprojects, from which large foreign direct investment flows have had a limited impact on employment creation and productivity spillovers despite dominating exports. The handful of megaprojects represent 62 per cent of the production value of the manufacturing sector but only account for 3 per cent of the sector's labor force and 2 per cent of urban private sector employment (Ministry of Planning and Development, 2012). These projects have also had limited fiscal benefits due to the prevailing investment incentives.

Given the business environment barriers, the domestic private sector is weak, poorly organized, largely informal, and does not have the business and financial capacity to capture the spillover benefits from large investments in construction, agribusiness, services, and light manufacturing, which have tremendous potential to create jobs. Going forward, key sector-specific constraints need to be addressed systematically in partnership with the private sector. Agribusiness investments are hampered by the high cost of business,

infrastructure gaps in irrigation, energy and roads, low labor productivity, and lack of credit, extension, and standards certification services.[3] Local SMEs, with limited access to competitive factor markets and business development services, are unable to meet quality and procurement standards of large investors, and lack business and management expertise. These constraints need to be addressed through targeted integrated interventions to improve the business environment, upgrade access to infrastructure and skills, and strengthen the capacity of both public sector institutions and the domestic private sector. The World Bank's Integrated Growth Poles Project ($100 million approved in April 2013) aims to support the authorities in dealing with these challenges over the medium term.

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[3] According to the U.S. Agency for International Development's Competitiveness and Agribusiness Program (Agrifuturo) in Maputo.

CHAPTER

# 8 Financial Inclusion in Mozambique

*Felix F. Simione and Yuan Xiao*

Access to finance remains problematic in Mozambique. According to the FinScope 2012 survey, 75 percent of micro, small, and medium-sized enterprises (MSMEs) are financially excluded—that is, they do not use any formal or informal financial products or services (FinMark Trust, 2013). This stands in contrast to the rapid expansion of Mozambique's banking system and microfinance institutions over the past decade. This chapter examines existing statistical evidence and studies in order to analyze the extent to which Mozambique has experienced an increase in financial inclusion in recent years; the factors that constitute binding constraints to financial inclusion; and the policy actions that can be implemented to further broaden access to finance.

A discussion of financial inclusion is against a backdrop of two policy developments in Mozambique. First, the Mozambican authorities are reorienting their policies toward making economic growth more inclusive, with financial inclusion increasingly regarded as a key pillar of inclusive growth policies. Second, since the approval of the Financial Sector Development Strategy in early 2013, the authorities have been designing a financial inclusion strategy to bring more households and businesses into the formal financial system.

## Recent Trends and Challenges

In general, financial inclusion refers to a process that ensures the ease of access, availability, and usage of the formal financial system for all members of an economy (Sarma and Pais, 2011). It facilitates the efficient allocation of productive resources in an economy and thus contributes to economic growth, and also benefits the welfare of individuals by providing financial services. Thus, a high degree of financial inclusion is associated with an advanced stage of economic development and social inclusion, while also enhancing the effectiveness of monetary and financial policies.

Measures of financial inclusion score a country across a range of dimensions for providing access to and use of financial services and products. For example, the Bank of Mozambique uses the indicators shown in Table 8.1 to measure financial inclusiveness and to construct its index of financial inclusion.

Although standard definitions of financial inclusion focus on demand-side indicators, this chapter also includes supply-side perspectives. The supply-side analysis builds mainly on the 2013 study by the Bank of Mozambique on financial inclusion, while the demand-side analysis is based on results from FinScope,[1] a (nationally representative) 2012 survey of MSMEs.

## Supply-Side Trends

From a supply-side perspective, there is some evidence of improvements in terms of geographic and demographic coverage by financial institutions in Mozambique. The Bank of Mozambique study found that the index of financial inclusion, measured as the level of access to formal financial services on a 0–100 scale, rose from 9.2 in 2005 to 13.1 in 2012. This arguably reflects the growing number of banks and branches in urban areas, some of which experienced a rapid expansion toward rural areas. In fact, the number of branches of credit institutions rose from 228 in 2005 to 502 in 2012 (Figure 8.1). This allowed a wider geographic coverage of banks, with the number of entities per 10,000 km$^2$ increasing from 2.9 in 2005 to 6.6 in 2012.

However, while Maputo city had a very high index of financial inclusion at end-2012 (91.8), other provinces remained with very low access to financial services

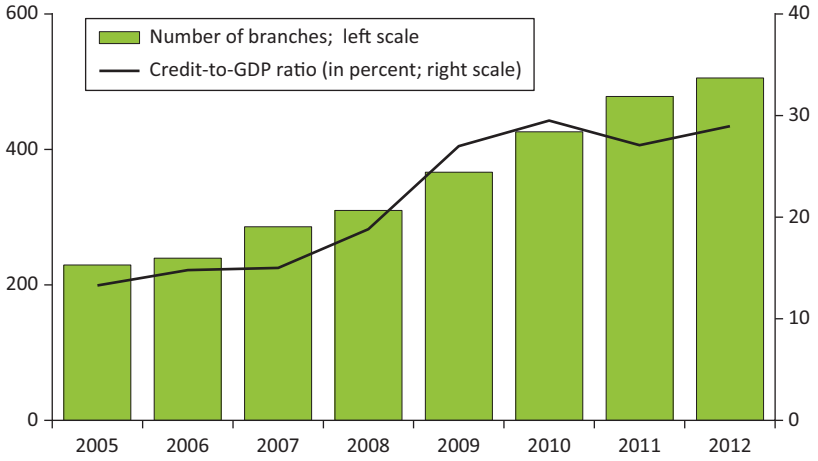
**Table 8.1. Bank of Mozambique Financial Inclusion Index**

| D1. Geographic Access | D2. Demographic Access | D3. Use |
|---|---|---|
| 1. Number of agencies (banks, micro banks and credit cooperatives) per 10,000 km$^2$ | 1. Number of agencies (banks, micro banks and credit cooperatives) per 100,000 adults | 1. Deposits (volume) per 100,000 adults (proxy used): deposits (value) per GDP |
| 2. Number of microcredit operators and savings and loan organizations per 10,000 km$^2$ | 2. Number of microcredit operators and savings and loan organizations per 100,000 adults | 2. Credit (volume) per 100,000 adults (number of loan contracts per 100,000 adults) |
| 3. Number of electronic money institution agents per 10,000 km$^2$ | 3. Number of electronic money institution agents per 100,000 adults | 3. Credit (value) per GDP |
| 4. Number of ATMs per 10,000 km$^2$ | 4. Number of ATMs per 100,000 adults | |
| 5. Number of POS per 10,000 km$^2$ | 5. Number of POS per 100,000 adults | |

Source: Bank of Mozambique
Note: ATMs = automated teller machines; POS = point of sale terminals.

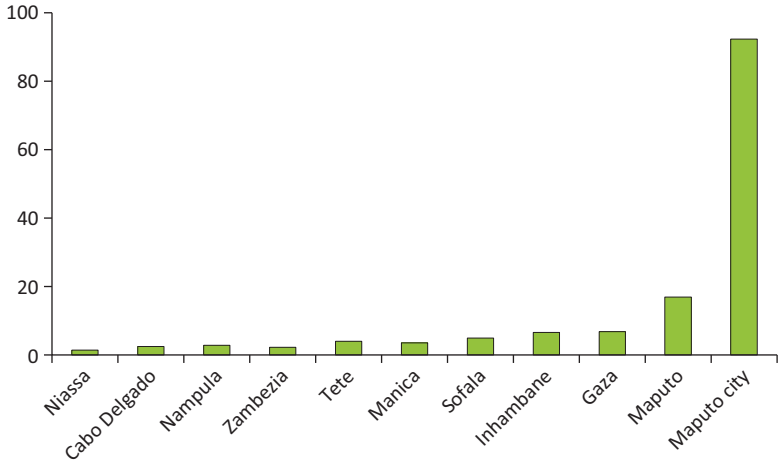
[1] The FinScope MSME survey is a nationally representative survey developed by FinMark Trust focusing on MSME owners and their financial service needs. A nationally representative sample of MSME owners was used.

**Figure 8.1. Banking Expansion and Financial Deepening**




Source: Bank of Mozambique.

**Figure 8.2. Index of Financial Inclusion by Province, 2012**

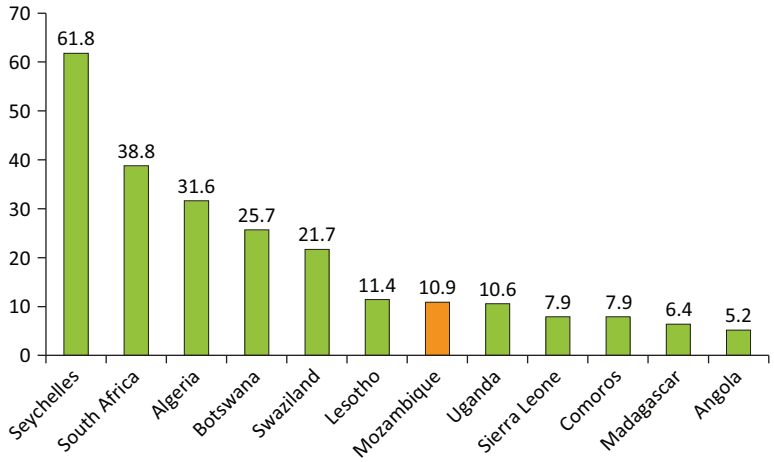



Source: Bank of Mozambique.

(Figure 8.2). As proposed in Sarma (2012), countries with an index of financial inclusion value less than 30, which would include Mozambique,[2] are regarded as low financial inclusion countries. In practice, this means that, on average, those countries have access to relatively fewer financial services and products (bank branches, automated teller machines, point of sale terminals, etc.) per standardized geographic area and adult population. A look at the financial inclusion index computed in Sarma (2012) suggests that in 2010 Mozambique's index outperformed those of Angola and Madagascar, but performed poorly compared to those of Seychelles, South Africa, and Botswana (Figure 8.3).

[2] Despite computing the financial inclusion index for several countries worldwide, Sarma (2012) does not compute it for Mozambique. Mozambique's index discussed in this report is computed by the Bank of Mozambique using an approach largely based on Sarma's approach.

**Figure 8.3. Financial Inclusion Index for Selected African Countries**
***(0–100 scale)***



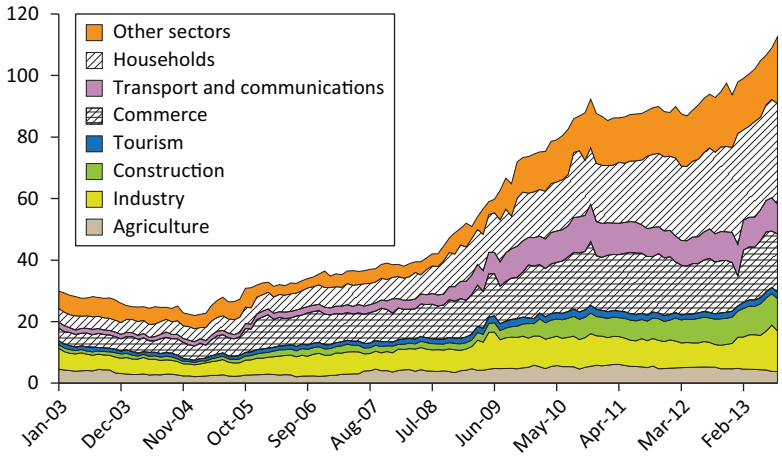

Sources: Sarma (2012); and Bank of Mozambique (2013).

By end-2012, the Mozambican financial sector consisted of 18 banks, eight microbanks, seven credit unions, 11 savings and loans organizations, 202 microcredit operators, one electronic money institution, and 3,051 mobile banking agents. Financial depth—defined as the ratio of private sector credit to GDP—jumped from 13.2 percent in 2005 to 28.8 percent in 2012 (Figure 8.1). The ratio of broad money to GDP also increased notably, from 28.9 percent in 2005 to 45.6 percent in 2012. However, financial deepening has been heavily biased: while the credit-to-GDP ratio increased remarkably, the credit boom has mostly been financing household consumption and services, at the exclusion of agriculture and industry, which together employ over 80 percent of the labor force (Figure 8.4).

## Demand-Side Trends

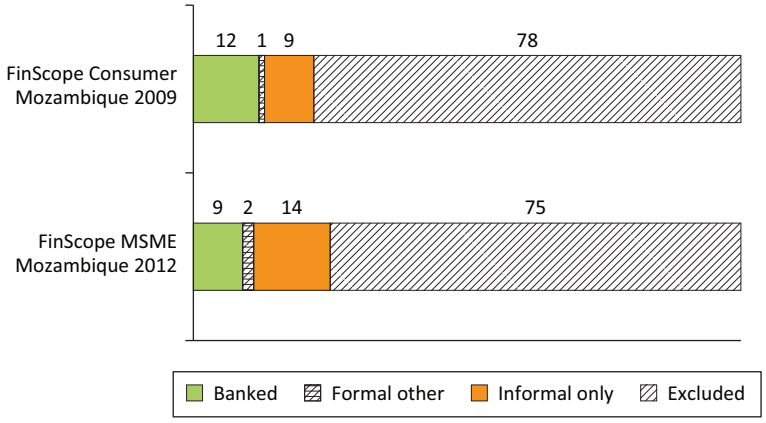
A look at demand-side indicators finds some improvements over time, but overall financial inclusion is still very limited. While the share of adults holding at least one deposit account increased from 6 percent in 2005 to 20 percent in 2012, the share of adults holding at least one credit account is much lower, increasing from 0.3 percent to only 3.9 percent in the same period (Bank of Mozambique, 2013). At the same time, the 2012 FinScope survey found that only 25 percent of MSME owners used financial products or services to manage their businesses, and only 11 percent of MSME owners used some form of formal financial service. Similarly, an earlier FinScope survey of consumers (conducted in 2009) found that only 22 percent of households used financial products or services to conduct their personal finance (Figure 8.5).

**Figure 8.4. Credit to the Economy**
***(Constant 2010 prices; billions of meticais)***




Sources: Bank of Mozambique; and author's calculations.

**Figure 8.5. Access to Financial Services**
***(Percent of sample)***




Sources: 2009 and 2012 Finscope MSME Surveys.
Note: MSME = micro, small, and medium-sized enterprises.

## Challenges

Thus, while the supply of bank services increased remarkably in recent years, the use of those services does not appear to have been very inclusive. At the margin, credit is absorbed more by households than any productive sector. As a starting point for analysis, there are four possible explanations for this situation:

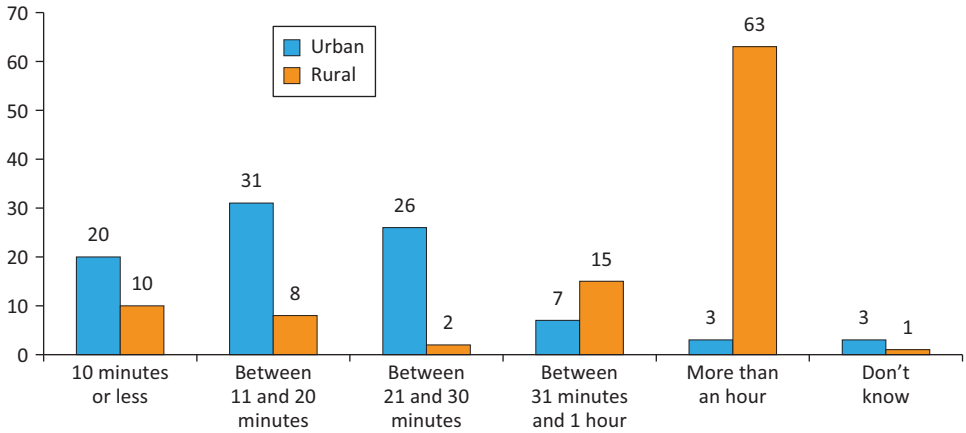
1) *Incomes in rural areas are too low and irregular.* The expansion of banks into rural areas helps promote financial inclusion, but is limited by the low level and uncertainty of rural household incomes, which remain below subsistence levels. Indeed, according to the FinScope 2012 survey,

problems related to low and irregular incomes prevented 55 percent of MSMEs from opening a bank account.

2) *Population density is low, especially in rural areas.* Even when the unbanked have bankable incomes, the logistical costs of opening bank accounts are high. Population density is very low in Mozambique compared to other countries, which implies that bank customers must cover long distances and face related costs to reach a branch. The FinScope survey revealed that 63 percent of MSME owners in rural areas have to travel more than one hour to get to the nearest bank (Figure 8.6). In fact, "banks are too far" is the second most-mentioned (19 percent of MSME owners) barrier to financial inclusion. From a financial inclusion perspective, this means that the marginal contribution of a new branch in terms of reaching new (previously unbanked) customers is likely to be low in Mozambique.

3) *Access to bank financing is too costly.* Interest rates on bank loans, despite having declined over recent years, are still high in Mozambique. Only 5 percent of MSME owners borrowed money or had taken goods on credit for business purposes in the 12 months before the FinScope Survey, or were repaying or owing money/goods for their business. Of those 5 percent, only 1 percent borrowed from a commercial bank. Many MSME owners (42 percent) did not borrow mainly for fear of not being able to pay the loan back. Thus, the large increase in private sector credit observed over recent years is not for financing small businesses in rural areas, but rather for existing customers in urban areas, including household consumption.

**Figure 8.6. Distance from Businesses to Banks**
***(Percent of MSME owners)***




Source: Finscope 2012 MSME Survey.
Note: MSME = micro, small, and medium-sized enterprise owners.

4) *Big banks lack expertise to deal with local MSMEs.* Another factor slowing financial inclusion, particularly when it comes to access to credit, is that most banks' business models require standard conditions for credit that most MSMEs are unable to meet. As evidenced in the FinScope survey, while 87 percent and 46 percent of MSMEs would meet the requirements of being in operation for more than a year and having collateral, respectively, only 6 percent have formally registered their business, only 2 percent have a business plan, and few companies (18 percent) keep financial records. Thus, from a traditional banking approach, MSMEs are perceived as risky and hence usually fail to access bank loans.

## Government Reform Program: 2013–22 Financial Sector Development Strategy

The Mozambican government approved a Financial Sector Development Strategy for 2013–22 (FSDS) in early 2013 that aims to remove the main obstacles for formal financial services to reach the broader population. One of the pillars of the FSDS is to improve financial access and support inclusive growth. The government identified several possible policy actions to support that effort:

- *Promote competition in the banking sector.* Interest rates on loans would likely be much lower if the Mozambican financial system were more competitive. The fact that the top three banks in Mozambique account for more than 80 percent of banking system assets indicates the significant market power of those banks. More competition among banks could help bring interest rates down and diversify the range of financial services available to customers.

- *Foster mobile banking.* The relatively high transaction costs Mozambicans face to reach a bank branch, especially in rural areas, can be dramatically reduced through the use of mobile banking services. Since mobile phones have become available to many Mozambicans, mobile banking could give rural customers access to basic financial products such as deposits at a low cost (see Box 8.1). The effectiveness of mobile banking in reaching the unbanked depends in part on the regulatory framework in place. Some evidence suggests that regulations that promote an open and level playing field are more likely to yield better outcomes (di Castri, 2013). It is therefore important that the authorities develop the regulations governing mobile financial services based on best international practices.

- *Improve the bank–MSME linkage.* Given that most banks' business models are not tailored to MSMEs, two policy actions can be considered.

**Box 8.1. Mobile Banking in Mozambique**

- ***Mobile banking is emerging in Mozambique.*** There are currently two mobile banking operators in Mozambique—mKesh and m-Pesa—licensed in 2010 and 2013, respectively. These operators have so far reached over 150,000 customers and are expanding rapidly.
- ***There is a great opportunity to reach the unbanked through mobile banking.*** The problem of access to banks in rural areas could be overcome by enabling households to access phone-based accounts. The accounts currently offered by mKesh and m-Pesa allow for deposit withdrawals and money transfer and payments.
- ***Financial literacy has increased in areas served by mobile banking.*** There is substantial use of these services in southern Mozambique, where financial literacy and trust outcomes were positively affected by the introduction of mobile banking (Batista and Vicente, 2012). The marginal willingness to remit was increased by the availability of mobile money. Also, mobile money has substituted traditional alternatives for both savings and remittances.
- ***Looking forward, it is necessary to establish the legal framework for mobile banking.*** The success of mobile banking in reaching the unbanked will partly depend on market-friendly regulation. The Bank of Mozambique is working on this. Issues such as interoperability of mobile phone networks, which allows money transfer between different mobile money providers, will be critical to further broadening the use of mobile banking.

Programs could be designed to increase the capacity of financial institutions to serve the MSME market segment, but this could distort financial markets. Instead, actions could be implemented to strengthen MSMEs' ability to apply for credit. These actions include establishing a moveable collateral registry that could help MSMEs secure collateral, and creating private credit registry bureaus that, by providing banks with information on borrowers' profiles, would facilitate risk assessment. The role of private credit bureaus in increasing access to finance is well acknowledged in sub-Saharan Africa (Triki and Gajigo, 2012).

Moreover, further policy actions to remove obstacles to financial inclusion include:

- Provision of basic infrastructure, mainly telecommunications and electricity, which are key for banks' operations in districts with no bank coverage but with proven economic potential.
- Implementation of financial literacy programs aimed at raising rural households' and MSMEs' awareness about financial services and products provided by financial institutions and formal business management tools.

- Acceleration of the decentralization of government's budget execution to rural areas, thus stimulating liquidity in rural areas, a key incentive for opening branches.

- Promoting agricultural insurance programs aimed at smoothing the volatility of rural households' incomes, an important determinant of households' incentive to save through formal banking.

- Improving the collateral framework so as to widen the range of assets that can serve as collateral for lending, especially in rural areas where value is often stored in nonstandard assets such as crops and livestock. These policies, however, should be viewed as complementary to each other rather than in isolation.

International donors and institutions have a long history of providing financial support and technical assistance to Mozambique in financial sector development. Going forward, the implementation of the Financial Sector Development Strategy is a significant undertaking that requires the government to galvanize continued external support. In this regard, the World Bank approved the first Programmatic Financial Sector Development Policy Operation to Mozambique for $25 million in September 2013. The operation will support financial stability, financial inclusion, and long-term development of financial markets. The International Monetary Fund is providing technical assistance in financial sector surveillance, payment systems, and money market development. Other donors are also involved. For example, KfW is helping to establish a deposit insurance fund and, together with the World Bank and the UK Department for International Development, is sponsoring the Financial Sector Deepening Trust Fund to support the development of a deeper, broader financial sector, particularly in rural areas. Continued coordination between these donors' initiatives and the work of the authorities will be critical to ensure success.

## Conclusions

Financial inclusion is an important pillar of the Mozambican authorities' inclusive growth strategy. Despite the expansion of banking institutions and financial services in recent years, most households and MSMEs are financially excluded. To address this challenge, the authorities adopted the Financial Sector Development Strategy to bring about far-reaching changes in access to and efficient use of the country's financial services.

Effective coordination between the authorities and donors will be needed. It will also be important to complement financial sector policies with structural reforms that address the issues of low productivity and incomes in rural areas,

the geographic distribution of households, and the low managerial capabilities of MSMEs. Each of these constraints exerts an adverse impact either on the expansion of banks into rural areas or on the ability of individuals and businesses to use existing financial services.

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CHAPTER

# 9 Toward a Mozambican Social Protection Floor

*Yuan Xiao*

Mozambique has been one of the fastest growing economies in Africa over the past two decades, but recent challenges to translate this positive economic trend into significant poverty reduction have made clear the need for new policy approaches focusing on inclusive growth. In this quest, social protection has become a more central element in the policy debate in Mozambique. Engagement by the authorities in close association with international institutions and development partners has led the country to become a pilot for the Social Protection Floor (SPF) Initiative, an international effort approved by the United Nations in April 2009 in the aftermath of the global financial and economic crisis

In Mozambique, the close international cooperation called for under the SPF Initiative has entailed (1) a World Bank-led review of existing basic social protection programs; (2) costing simulations of programs under the Operational Plan conducted by the International Labor Organization and UNICEF, with technical support from Oxford Policy Management; and (3) an analysis led by the International Monetary Fund of the fiscal space available to implement such programs. The fruit of these collaborative efforts was the adoption of a new National Basic Social Security Strategy (*Estrategia Nacional de Segurança Social Basica*—ENSSB) and Operational Plan in line with international standards. Various international development partners are jointly working to assist the country in the implementation process.

This chapter presents the results of the recent collaborative work on the SPF Initiative in Mozambique. The chapter first discusses the motivation for a social protection floor in Mozambique,[1] followed by a description of the principles and elements of the government's plan embodied in the ENSSB. The chapter then investigates the fiscal sustainability of the SPF before putting forth conclusions.

[1] For a full review of the Mozambique experience in adopting a social protection floor, see Cunha and others (2013), the paper upon which this chapter is based.

## The Case for a Social Protection Floor

### Poverty, Labor Market Structure, and Vulnerabilities

Despite Mozambique's strong macroeconomic track record, its poverty reduction efforts have not kept up with economic growth in recent years. The latest National Poverty Assessment Report shows there was no improvement in reducing poverty between 2003 and 2008, with the rate of absolute poverty stagnating and remaining at 54.7 percent in 2008/09. The authorities attributed the halt in poverty reduction to three main factors: (1) very slow productivity growth in the production of key staple crops, with a direct impact on food security and the income of most of the population, who depend on agricultural production; (2) the vulnerability of agricultural production to shocks and seasonality patterns in the distribution of rural income; and (3) the impact of international food and fuel prices on the cost of living. These trends also contributed to increasing social tensions that erupted in urban riots in 2008 and 2010. Not only has growth in Mozambique been less pro-poor than in other countries in the region, the impact of growth on poverty has also declined over time. Social inequalities have also increased.

The lack of a correlation between economic growth and poverty reduction is closely related to the country's labor market structure. Similar to other countries in the region, Mozambique has experienced jobless growth, with the labor market offering limited job opportunities and most households depending on subsistence farming. The economically active population is estimated at around 11 million people, of which the vast majority (more than 60 percent) are self-employed, around a quarter are unpaid family workers, and only 10 percent are salaried employees (4.1 percent civil servants and 6.8 percent in the private sector). Around three-quarters of the work force is engaged in the informal economy and a similar proportion works in agriculture, in the vast majority of cases as subsistence farmers. More productive employment opportunities have been mostly concentrated in capital-intensive megaprojects, leading to a growth takeoff that has not been accompanied by economic diversification (see Chapter 4).

The most recent Household Budget Survey data (INE, 2008/09) indicate a high degree of vulnerability of households to aggregate and idiosyncratic shocks resulting from a mix of high exposure to risks and a lack of capacity and mechanisms to deal with them.

In terms of aggregate risks, the country is highly exposed to weather-related shocks such as droughts, cyclones, and floods, and to external economic shocks such as variations in fuel and food prices and local economic downturns, especially in rural areas. Seasonality is one of the main drivers of food insecurity. Moreover, there is a strong correlation between food insecurity, poverty, and lack of assets, as well as between the high prevalence

of chronic malnutrition, lack of information, and low coverage of public health services.

Idiosyncratic shocks are mainly related to the demographic structure of households and to constraints to the participation in the labor market of potential breadwinners.

A key feature of the Mozambican population is the widespread diffusion of poverty and vulnerability. Not only are poverty rates very high in general, but having a high percentage of the population close to the poverty line leaves a much larger share of Mozambicans very vulnerable to small variations in income, whether seasonal or annual.

The World Bank's Social Protection Assessment in 2012 reveals little difference in food and nonfood average consumption levels across the first four wealth quintiles. This situation makes it difficult to use income/consumption/asset-based indicators to differentiate between individuals for targeting purposes.

## Demographic Structure and Labor Capacity of the Population

Table 9.1 presents a classification of households according to their demographic structure and labor capacity. Three main conclusions can be drawn on the basis of these data and used to guide the design of program targeting in the SPF Initiative:

- The vast majority of poor and vulnerable households are not labor-constrained.
- There is a small but significant group of households that permanently lack productive capacity. The Household Budget Survey results confirm that these households are at the lowest end of income distribution.
- There is a small group of vulnerable households that are only temporarily unable to participate in the labor market because of transitory conditions such as pregnancy, or HIV/AIDS or other serious illnesses.

## Key Challenges to Introducing the Social Protection Floor

The advantage that Mozambique had in developing a national SPF is the existence of a broad and comprehensive statutory social security framework. This has two key legal components: the Social Protection Law (Law 4/2007) and the Basic Social Security Regulation (Decree no. 85/2009). The Social Protection Law organizes the social protection system into three pillars: basic, obligatory, and complementary social security.

Table 9.1. Distribution of Household Types and Household Composition

| Household Types | | Distribution of Households (percent) | | | Demographic Composition | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Household | | | | |
| | | Total | Urban | Rural | Average size | Dependency ratio | Average number of children ages 0–17 | Average number of elderly | Average number of disabled or chronically ill adults |
| Permanently labor-constrained | Elderly, no able-bodied | 8.1 | 5.2 | 9.2 | 2.3 | 1.0 | 0.9 | 1.4 | 0.0 |
| | Chronically ill/disabled, no able-bodied | 0.2 | 0.2 | 0.3 | 2.2 | 1.0 | 1.1 | 0.0 | 1.0 |
| Temporarily labor-constrained | Child-headed | 0.1 | 0.2 | 0.1 | 1.7 | 1.0 | 1.7 | 0.0 | 0.0 |
| | All able-bodied temporarily unable to work | 1.5 | 2.4 | 1.1 | 4.4 | 0.7 | 2.2 | 0.5 | 0.6 |
| Not labor-constrained | Female-headed | 20.2 | 18.4 | 20.9 | 4.1 | 0.6 | 2.5 | 0.3 | 0.1 |
| | Male-headed | 69.9 | 73.6 | 68.4 | 5.1 | 0.5 | 2.7 | 0.1 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 4.5 | 0.6 | 2.5 | 0.3 | 0.2 |

Source: Cunha and others (2013).

However, the system before the current reform had serious deficiencies. One of the main challenges for social protection in Mozambique is the low coverage that the system offers as a whole. The coverage provided through social insurance mechanisms is restricted to certain categories of the economically active population. Additionally, in some cases the already-limited coverage provided by the law does not translate into effective coverage, due to gaps in implementation. The potential of social insurance mechanisms to cover a significant part of the population is thus limited, at least in the short term. Noncontributory social protection is also affected by important coverage gaps. As the system prior to the recent reform was mainly centered on the Food Subsidy Program (*Programa de Subsidio de Alimentos*—PSA), the vast majority of poor households with working-age members and families with children and youth were left out. This in turn reflects the limited budget allocations made for the sector, despite the positive trend in relative years.

Program fragmentation and duplication are also a serious constraint to the development of an effective and efficient social protection system. Implemented by a large number of different governmental and nongovernmental institutions with distinct sources of funding and implementation mechanisms, most of the noncontributory programs are not of sufficient scale to ensure the impact that is expected from a social protection program. This situation translates into a lack of coordination, as ad hoc interventions are sometimes encouraged by international donors and agencies in isolation from the existing policy framework.

Finally, even within an ideal fiscal scenario, an enormous challenge would still remain in the operational capacity to deliver the programs in an effective and efficient way. It is unanimously recognized that the existing systems—including their human resources, management, and information systems, as well as processes of identification, selection, and payment of beneficiaries—lead to excessively high administrative costs and do not offer the most up-to-date solutions. A significant effort in terms of institutional capacity-building will therefore need to take place in order to allow for progressive, sustainable, and efficient extension of coverage and for the progressive extension of the social protection floor.

## Elements of the Current Social Protection Reform

In 2010, the government approved the ENSSB, which sets three main objectives for the 2010–14 period: (1) extending the coverage and impact of interventions; (2) increasing the efficiency of the system; and (3) assuring coordination of different programs and services. The principle of universal coverage—together with the idea of gradual extension of coverage according to the country's capacity and comprehensive organization into four areas of

intervention (direct, health, education, and productive social action)—make the ENSSB a first important step toward implementation of a Mozambican SPF in line with international standards. Subsequently, in September 2011 the Council of Ministers approved a new Strategic Operational Plan for Basic Social Security.

## Design of the Reformed System

The Operational Plan is the basis for implementation of the ENSSB in the areas of direct and productive social action for 2012–14. It revisits lines of action and projections included in the ENSSB and provides for a more coherent policy framework to proceed to the overall expansion and consolidation of the system, designed around the following programs (Table 9.2):

- ***Basic Social Subsidy Program*** (*Programa de Subsidio Social Básico*—PSSB). This is a cash transfer program targeting extremely poor households where no adult is able to work (households headed by the elderly or by persons with disabilities).

- ***Direct Social Action Program*** (*Programa de Apoio Social Directa*—PASD). This provides short-term support to households that are temporarily vulnerable.

- ***Social Assistance Services*** *(Programa de Apoio às Unidades Sociais).* This provides residential care and institutional support for vulnerable or abandoned children, the elderly, victims of violence, and the homeless who require intensive care services.

- ***Productive Social Action Program*** (*Programa de Acção Social Productiva*–PASP). This consists of direct employment in public works projects aimed at building or upgrading infrastructure in poor and vulnerable communities, and providing training programs and other educational opportunities. The PASP focuses on extremely poor households where one or more adults are able to work but face limited employment or income-generation prospects.

The projected coverage and cost of each program based on the Operational Plan are presented in Tables 9.3 and 9.4.

The mix of programs and the main design features reflect four key principles that orient the reform:

- Establishing an integrated and comprehensive system in which poor and vulnerable households are routed to different programs depending on their situation and characteristics, mainly their capacity to work.

Table 9.2. Program Design Parameters of Mozambique's National Strategy for Basic Social Security

| Program | Eligible Group | Target Categories | Type of Transfer | Number of Payments per Year (frequency) | Monthly Transfer Value | Monthly Transfer Amount (2013) | Additional Targeting |
|---|---|---|---|---|---|---|---|
| Programa Subsidio Social Básico (PSSB) | Permanently labor-constrained households | With an elderly member (aged 55+ for females and 60+ for males) and no able-bodied adult | In cash | 6 (bimonthly) | One-third of the poverty line for the main beneficiary, plus 0.25% of the main benefit for each dependent household member up to a maximum of four dependents | MT 253 (main benefit) + MT 63 per dependent | Households in the poorest four quintiles of the total population |
| | | With a chronically ill member and no able-bodied adult | | | | | |
| | | With a disabled member and no able-bodied adult | | | | | |
| Programa de Apoio Social Directo (PASD) | Temporarily labor-constrained households + households facing shocks | Child-headed (where the age of the head is at least 12) | In kind | Varies (monthly) | Basic food basket (proposal to adjust composition to household size) | Average value of MT 985 (proposal to adjust composition to household size) | Households in the poorest four quintiles of the total population |
| | | With adult members temporarily unable to work and no able-bodied adult | | | | | |
| | | With elderly, disabled, or chronically ill bedridden members and no able-bodied adult | | | | | |
| | | With adult members on ART and severely acute malnourished | | | | | |

(*Continued*)

**Table 9.2 (*concluded*)**

| Program | Eligible Group | Target Categories | Type of Transfer | Number of Payments per Year (frequency) | Monthly Transfer Value | Monthly Transfer Amount (2013) | Additional Targeting |
|---|---|---|---|---|---|---|---|
| | | With severely acute malnourished children | | | | | |
| | | Facing a temporary shock (one-off support) | | 1 | Varies | Varies | Not specified |
| Programa de Apoio às Unidades Sociais | Household members in need of institutional care | Children in need and street children; elderly and disabled without support; victims of domestic violence and abuse; repatriated households | Institutional care | Not applicable | Not applicable | Not applicable | Not applicable |
| Programa de Acção Social Produtiva (PASP) | Non-labor-constrained households | Households with at least one able-bodied adult | | Rural: 4 (monthly) | Value of the poverty line (fixed per household) | MT 650 | Rural: 15% of households identified with a combination of geographical, category-based, and poverty targeting |
| | | Priority given to female-headed households; households with elderly, disabled, or chronically ill members; households with malnourished children; households with high dependency rates; and foster families | | Urban: 6 (monthly) | | | Rural: 25% of households identified with a combination of geographical, category-based, and poverty targeting |

Sources: Mozambican authorities; and IMF staff compilation.

**Table 9.3. Operational Plan Coverage Projections for Numbers of Households**

| | 2012 | 2013 | 2014 |
|---|---|---|---|
| Programa Subsidio Social Básico (PSSB) | 280,244 | 287,637 | 311,238 |
| Programa de Apoio Social Directo (PASD) | 37,243 | 46,617 | 58,029 |
| Programa de Apoio às Unidades Sociais (Serviços Sociais de Acção Social) | 2,159 | 2,253 | 2,351 |
| Programa de Acção Social Produtiva (PASP) | 174,994 | 295,629 | 443,363 |
| **Total** | **494,640** | **632,136** | **814,981** |

Source: Ministry of Women and Social Welfare, Operational Plan (2011).

**Table 9.4. Estimated Total Cost of Current Government Proposal**

| | 2012 | | 2013 | | 2014 | |
|---|---|---|---|---|---|---|
| | Total Cost (millions of MT) | Percent of GDP | Total Cost (millions of MT) | Percent of GDP | Total Cost (millions of MT) | Percent of GDP |
| Programa Subsidio Social Directo (PSSB) | 1,303 | 0.30 | 1,473 | 0.29 | 1,707 | 0.30 |
| Programa de Apoio Social Directo (PASD) | 291 | 0.07 | 393 | 0.08 | 499 | 0.09 |
| Programa de Apoio às Unidades Sociais (Serviços Sociais de Acção Social) | 54 | 0.01 | 72 | 0.01 | 86 | 0.01 |
| Programa de Acção Social Produtiva (PASP) | 848 | 0.20 | 1,507 | 0.30 | 2,348 | 0.41 |
| **Total** | **2,475** | **0.58** | **3,425** | **0.69** | **4,617** | **0.81** |

Source: Ministry of Women and Social Welfare, Operational Plan (2011).

- A strict conceptual separation between actions addressed to labor-constrained and non-labor-constrained households.
- The principle that conditioning cash transfers to engagement in work activities (cash for work) is an appropriate solution to transfer resources to poor non-labor-constrained households.
- The decision to target households and not individuals, using the referential individual as an entry point to cover all household members.

Compared to the pre-reform situation, the elements of the Operational Plan constitute a significant improvement that moves toward adherence to the three income security guarantees of the SPF Initiative:[2]

- The income security component for the elderly, disabled, and chronically ill—Guarantee (a)—is provided by the PSSB for members in

[2] Despite important progress, there is still large scope for improvements in the new system if the objective is to fully cover the guarantees as defined in the SPF Initiative.

labor-constrained households, but is now also indirectly extended to members of non-labor-constrained households via the introduction of the PASP.

- Basic income security for children—Guarantee (b)—is also provided indirectly by benefiting their households via the PSSB and PASP. The main element of concern here is the fact that the PASP transfer scheme has not been set up to be adjusted to reflect the size and demographic characteristics of the household (as the PSSB has), meaning that children in larger households will receive lower per capita income support, with negative consequences in terms of equity and effectiveness.

- The redefinition of the PASD target groups constitutes important progress toward providing some source of income security to members who cannot (due to sickness) or should not (in case of maternity) earn sufficient income due to a temporary condition—Guarantee (c). However, coverage is limited to cases in which they are the only breadwinners.

- The introduction of the PASP itself is also an important step forward toward providing a basic guarantee of income security to persons of economically active age who are not able to earn sufficient income due to unemployment or underemployment—Guarantee (c)—depending on the scale and coverage levels that the new program will achieve.

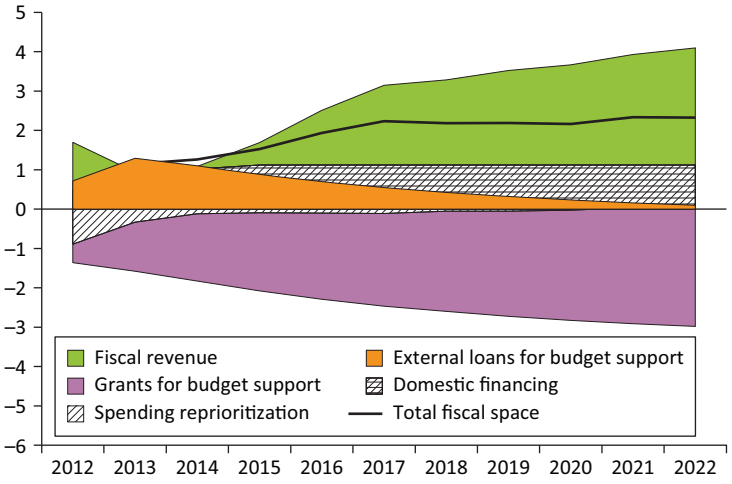
## Expanding the Social Protection Floor: Medium-Term Cost Simulations of Policy Alternatives

### Fiscal Space

The identification of funding or fiscal space in future years is essential to determining the viability of any reform scenario leading to a more comprehensive social protection system in Mozambique. In general, fiscal space can be created either by enhancing the overall spending envelope and/or by reprioritizing different types of expenditures within a given envelope. The overall spending envelope can be enhanced by increasing fiscal revenues, attracting more external grants, borrowing more from abroad, or tapping into domestic borrowing. As a low-income country with huge development needs, Mozambique has been very successful in creating fiscal space for its priority spending in the past. For example, the far-reaching reforms in tax administration enabled fiscal revenues to increase by 6 percent of GDP during 2008–11, and foreign aid has played a crucial role in supporting Mozambique's public investment and development projects, financing about one-third of the budget.

Going forward, revenue collection is projected to continue to rise, albeit at a slower pace, and to remain the driving force for creating fiscal space, with an expected increase by 0.2 percent of GDP per annum over 2012–22 (Figure 9.1).[3] As Mozambique's economy matures, grants for budget support from bilateral donors are expected to decline significantly.[4] Budget support loans, mainly from multilateral donors such as the World Bank, are also projected to decline, but at a more gradual pace. The government is also planning to keep domestic financing limited so as to avoid crowding out the private sector. On a net basis, these factors would contribute 1.2 percent of GDP to enhancing the overall spending envelope over 2012–22, as the increase in revenue collection will more than offset the projected decline in grants. On top of this, the government also aims to reprioritize and optimize its spending programs, mainly through the phasing out of the costly and ill-targeted fuel subsidy, which accounted for 1.1 percent of GDP in 2011 and an estimated 0.6 percent in 2012. A full phasing out of this subsidy would free up resources for priority spending. In total, 2.3 percent of GDP in additional fiscal space could be created during 2012–22 from both mechanisms, which could be allocated to the government's priority spending programs.

**Figure 9.1. Projections for Creation of Fiscal Space**
***(Cumulative during 2012–22; percent of GDP)***




Source: IMF staff estimates.

[3] This conservative scenario is based on IMF (2013) and assumes no significant amount of additional revenues from the nascent natural resource sector. Sizable revenue is expected after production of liquefied natural gas begins in the early 2020s, with its peak contribution beyond the simulation horizon considered in this chapter (see Chapter 11). For updated fiscal projections, see the latest IMF country reports.

[4] For the purpose of this discussion, only external grants and loans that are not specifically earmarked for investment projects are considered.

Several factors could further enhance this outlook. The booming natural resource sector could provide additional resources in the medium term, provided that there are no infrastructure bottlenecks to its development, the fiscal regime for the sector is modernized, and windfall profits are integrated in the budget frameworks. In addition, donor support could be further galvanized.

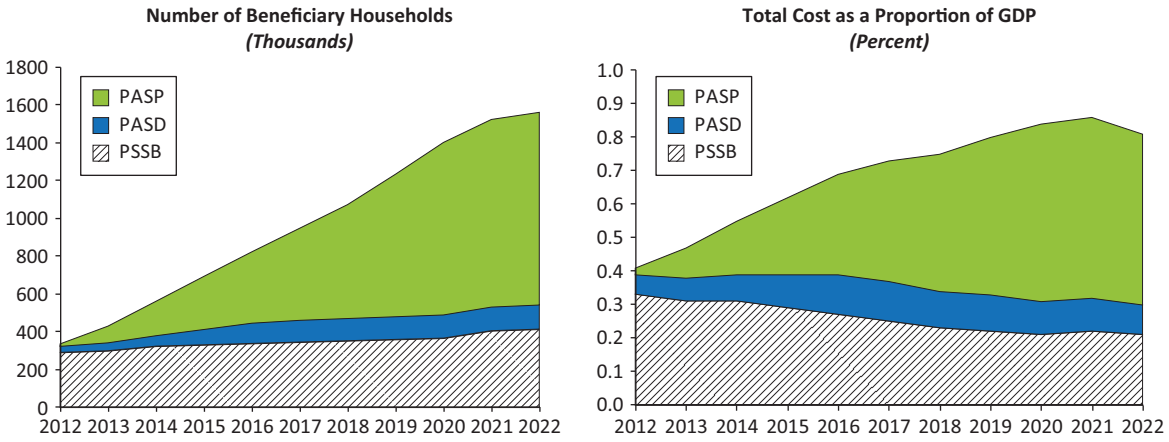
## Alternative Policy Scenarios

Under the government's economic program, a budget allocation of around 0.8 percent of GDP is envisaged for 2014–16. Depending on the progress of reforms to expand implementation capacity and the policy choice of the government, the expansion of the SPF in the longer term can take place under many policy scenarios.[5] Two such scenarios are illustrated here.

### *Policy Scenario A: The Current Government Proposal up to 2022*

This scenario depicts the targets approved by the government in the Operational Plan (except for accounting for the above-mentioned delays in disbursements and implementation in 2012).The main coverage increase would take place in the PASP after 2016 in the form of increased take-up (Figure 9.2). In fact, on the basis of the current reform, this is the program

**Figure 9.2. Policy Scenario A: Beneficiaries and Costs**




Source: Cunha and others (2013).

Note: PASP = Programa de Acção Social Produtiva; PASD = Programa de Apoio Social Directo; PSSB = Programa Subsidio Social Directo.

[5] See Cunha and others (2013) for additional simulations.

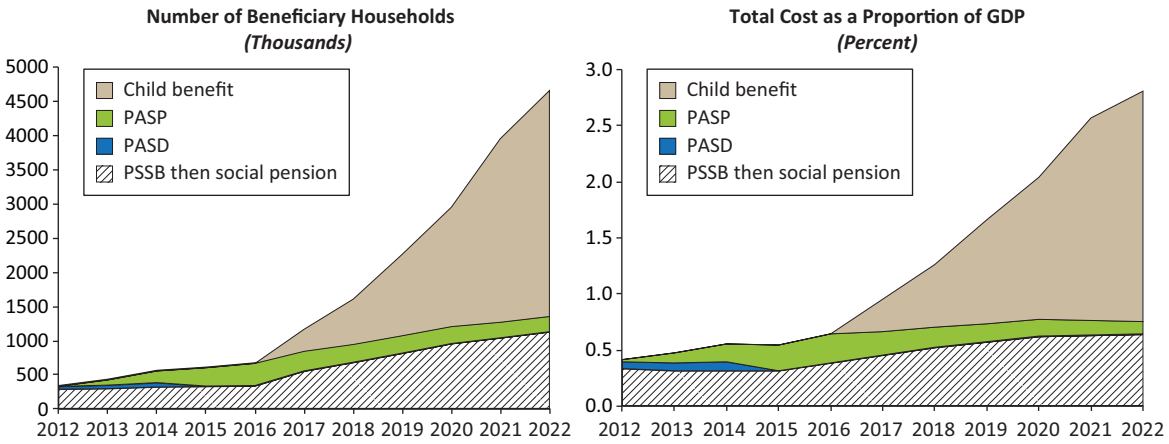
with major potential for coverage expansion, reaching just above 1 million beneficiary households in 2022. Conversely, the PSSB focuses on a well-defined group of households (permanently labor-constrained), which should not exceed 400,000 households (after screening out households in the highest quintile or those receiving a formal pension). As for the PASD, the estimates are more tentative, as the available data do not allow for identification of some of the target groups (such as households with malnourished members on antiretroviral treatment). It is expected that this program will reach about 130,000 beneficiary households at full scale.

This baseline scenario is consistent with the IMF's medium-term fiscal framework for 2012–17 and debt sustainability analysis with a longer time horizon, leaving room for investment and other important spending categories. For the years beyond that, the government will need to regularly assess the costs and affordability of increasing the amount of existing transfers that will generate improvements in the living conditions of beneficiaries, taking into account the progress made in capacity-building and capital investment for service delivery.

### *Policy Scenario B: Program Restructuring beyond 2015*

After 2014, the government will assess the implementation of the National Basic Social Security Strategy and Operational Plan, which might lead to policy changes. Without attempting to anticipate future reform directions, scenario B (Figure 9.3) aligns with some of the recommendations from

**Figure 9.3. Policy Scenario B: Beneficiaries and Costs**




Source: Cunha and others (2013).

Note: PASP = Programa de Acção Social Produtiva; PASD = Programa de Apoio Social Directo; PSSB = Programa Subsidio Social Directo.

the World Bank's Mozambique Social Protection Assessment (World Bank, 2012), which suggests that, for a second phase, the SPF should center around two main pillars: a social pension to focus on the poor elderly, persons with disabilities, and the chronically ill; and a child benefit program to focus on poor households with children and child-headed households. The suggested program structure would imply a shift from the current approach, delinking the allocation from alternative support mechanisms to the assessment of residual labor capacity. This scenario simulates almost universal coverage of some of the benefits, responding more closely to the three income security SPF guarantees, and indicates what the fiscal effort would have to be to approach such a goal. The cost will rise significantly after 2017 compared to the baseline.

## Conclusions

In Mozambique, the expansion of social protection coverage is increasingly seen as an important element to generate a more inclusive growth pattern, hence reducing the risk of social tensions and contributing to a better economic environment. Given the structure of the labor market, the more viable solution for establishing a social protection floor in Mozambique is to expand noncontributory social protection and not to rely only on contributory subsystems. Such an approach is likely to induce a substantial beneficial impact on poverty reduction and—if combined with complementary interventions—profound and sustainable changes in the productive structure of the labor force.

The main conclusion from this joint exercise is that progressively building a social protection floor adapted to Mozambique's needs does not present a threat to fiscal sustainability. Mozambique has been very successful in creating fiscal space for its priority spending in the past. Going forward, the government is expected to continue to reap the rewards of revenue reforms and reprioritization of expenditures, thereby creating the fiscal space required for its various priorities. In terms of financial affordability, the government could make room for a significant expansion of basic social security programs, possibly beyond what was proposed in the Operational Plan.

However, taking into account current operational capacity limitations—particularly as many of the most vulnerable live in remote areas—such an expansion would only be feasible if accompanied by a significant investment in the development of more effective and efficient systems for service delivery. Independent of its fiscal affordability, the largest reform challenge will thus be to establish systems that allow service delivery in an efficient, transparent, and accountable way. The development of a new management and information system—including a single registry, new payment modalities

(e.g., mobile banking), new processes of identification and selection of beneficiaries, and monitoring and evaluation mechanisms—is essential. That effort is in progress with support from various partners.

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CHAPTER

# 10 Fiscal Challenges of the Natural Resource Boom

*Alex Segura-Ubiergo, Marcos Poplawski-Ribeiro, and Christine Richmond*

Natural resource development will have major effects on the Mozambican economy, requiring substantial changes in the current approach to fiscal policy formulation. Resource revenues, while modest to date, are likely to become sizable and provide a unique opportunity to close infrastructure gaps, invest in priority sectors such as health and education, support more inclusive growth, and radically transform the economy. At the same time, international experience has shown that resource revenues can also be a curse, increasing the vulnerability of the economy to external shocks, reducing the capacity to tax the nonresource sector, and contributing to weak political and economic governance. In addition, aid flows—which averaged 9–10 percent of GDP over the last decade—may decline, thus presenting an opportunity to reduce Mozambique's aid dependency.

One need not look far in Mozambique to see the potential for a boom in natural resource development. For example, while the contribution of the mining sector to the economy is small for now, coal mining is expanding in line with transport capacity, and recent discoveries of natural gas are likely to transform Mozambique into a major resource-rich country (Table 10.1). While exploration and appraisal are still ongoing, there are potentially recoverable coal reserves of over 100 trillion cubic feet from recent discoveries by Anadarko and ENI, and additional discoveries could still be made. Over the next two decades, Mozambique could become the third largest liquefied natural gas (LNG) exporter in the world (after Qatar and Australia). In addition, ongoing investments in coal mines and transportation infrastructure, especially by mining giants Vale and Rio Tinto, could place Mozambique among the top five exporters of coal in the world over the next 10 years.

This chapter discusses fiscal challenges associated with the natural resource boom and provides some analytical tools that can help assess trade-offs associated with alternative policy decisions. The chapter first discusses objectives of the fiscal framework in the new resource-rich environment, then analyzes how fiscal policy should strike the right balance between

Table 10.1. Mining Sector Indicators *(Percent; unless otherwise noted)*

| | 2001–10 Average | 2011 | 2012 (estimated) | 2013 (projected) | 2014 (projected) |
|---|---|---|---|---|---|
| Mining GDP (nominal, MT million) | 2,030 | 5,022 | 8,718 | 12,270 | 14,978 |
| Mining GDP (share in total nominal GDP) | 1.0 | 1.4 | 2.1 | 2.7 | 2.8 |
| Mining real growth | 19.8 | 15.5 | 39.3 | 33.4 | 15.6 |
| Mining contribution to total GDP growth (percentage points) | 0.1 | 0.2 | 0.5 | 0.5 | 0.3 |
| *Memorandum items:* | | | | | |
| Total real GDP growth | 8.0 | 7.3 | 7.2 | 7.1 | 8.3 |
| Nonmining real GDP growth | 8.0 | 7.2 | 6.8 | 6.7 | 8.2 |

Sources: Mozambican authorities; and IMF staff estimates and projections.

the need to scale up investment in priority sectors, taking into account capacity constraints, and long-term fiscal sustainability and exhaustibility considerations. The chapter then turns to a discussion of the importance of shielding the annual budget from price volatility, and presents some fiscal rules that Mozambique could consider to support this objective. Some key institutional factors are identified, including public financial management considerations that would have to be strengthened to ensure that resource wealth is used efficiently and transparently.

## Strengthening the Fiscal Framework

A fiscal framework defines how a country chooses priorities and objectives when it formulates its fiscal policy. It is comprised of a set of indicators, rules, and institutions in support of particular policy objectives.[1] The primary fiscal objective would be to leverage natural resource revenues to boost development through large-scale investments in infrastructure and social sectors that generate positive externalities for the rest of the economy, while taking into account the need for savings to smooth out revenue volatility and intergenerational equity considerations. The main fiscal challenge would be to leverage natural resource revenues without compromising macroeconomic stability in a context where fiscal policy formulation will become more complex (Daniel and others, 2013). This will require political will to use natural resource wealth well, transparency to ensure accountability and good governance, and fiscal instruments to help prevent the types of pitfalls that

[1] This discussion draws on IMF (2012a, Section III), which was coordinated by Alex Segura-Ubiergo and modifies the IMF's earlier framework for the analysis of fiscal policy in resource-rich countries. For a summary of the earlier framework see Barnett and Ossowski (2002).

have been observed in other countries. There are three instruments that are particularly important:

- ***Indicators.*** Fiscal indicators will be needed to assess the short-term fiscal stance and medium-term solvency.[2] Traditional fiscal indicators such as the overall fiscal balance, or the domestic primary balance, which Mozambique is currently using, would not be adequate to guide this type of analysis. As the importance of resource revenues rises, Mozambique should start computing the nonresource primary balance (NRPB).[3] Another useful indicator will be the structural primary balance, in which resource revenues are calculated using averages of past and/or expected future prices (see discussion below).

- ***Rules.*** Becoming a natural-resource-rich country will also complicate fiscal policy formulation in two additional respects. First, volatility of future natural resource prices will lead to revenue volatility and complicate fiscal planning. This may require the adoption of a fiscal rule that delinks expenditures from natural resource revenues. Second, unlike other revenues associated with regular economic activity, natural resource revenues are exhaustible. This means that the government will have to deal with issues of long-term sustainability and intergenerational equity, avoiding the need for massive fiscal adjustment once resource wealth has been depleted.

- ***Institutions.*** The fiscal framework also needs to be supported by strong fiscal institutions. Mozambique will have to increase its capacity to undertake long-term revenue forecasts, establish a medium-term orientation of the budget, implement quality public investment projects, and manage special institutions such as natural resource funds.

The key objective of the fiscal framework in Mozambique would be to boost development while maintaining macroeconomic stability. Table 10.2 describes four key objectives of a fiscal framework for resource-rich countries. Contributing to macroeconomic stability is a key objective of any fiscal framework. The relative importance of other objectives can vary depending on the level of capital scarcity and the longevity of natural resource wealth.

[2] In a simplified manner, answering this question requires an assessment of whether the fiscal deficit target is consistent with debt sustainability and short-term macroeconomic stability (e.g., low inflation, a sustainable external current account position, and moderate interest rates) given the economy's cyclical position (i.e., whether real GDP growth is assessed to be above or below its potential level).

[3] The NRPB is equivalent to nonresource revenues minus primary expenditures (i.e., excluding net interest payments and income). When resource revenues are significant, this indicator provides a better measure of the impact of fiscal policy on aggregate demand.

**Table 10.2. Fiscal Framework Objectives in Resource-Rich Countries**

| Decision Matrix | | Natural Resource Revenues | | | |
|---|---|---|---|---|---|
| | | Longlasting | | Short-term | |
| | | **Objectives** | **Examples** | **Objectives** | **Examples** |
| **Capital Scarcity** | **High** | Macroeconomic stability<br>Managing volatility<br><br>Development | Iraq<br>Nigeria<br><br>**Mozambique (Scenario B)** | Macroeconomic stability<br>Sustainability/ Exhaustibility<br><br>Development | Ghana<br>Bolivia<br><br>**Mozambique (Scenario A)** |
| | **Low** | Macroeconomic stability<br>Managing volatility | Saudi Arabia<br>Canada<br><br>Kuwait | Macroeconomic stability<br>Sustainability/ Exhaustibility | <br>The Netherlands<br><br>Norway |

Source: IMF staff compilation.

- In countries with *low capital scarcity and longlasting resource wealth*,[4] one of the key priorities is to smooth out volatility. For example, a country like Saudi Arabia is relatively developed and has oil wealth that could last several generations. Resource revenues are also a large share of total revenues. In this context, issues of exhaustibility are not an immediate concern (i.e., the impact of the depletion of natural resources on public finances). By contrast, making sure that public spending plans are insulated from unexpected swings in resource prices is a key policy objective. Similarly, large resource revenues can create political pressure to increase public spending too fast, which can have unintended consequences through an excessive appreciation of the real exchange rate or higher inflation.

- In countries with *low capital scarcity but short-term resource wealth,* saving a substantial part of the resource wealth for future generations seems appropriate. In Norway, for example, most resource wealth has been saved in a separate account. In other words, resource wealth has been transformed into financial assets that will support the demands of the country's pension and health care system as the population ages. The Norwegian model is recognized throughout the world for its emphasis on fiscal prudence, transparency, and intergenerational equity. However, saving most of the resource revenues in a separate account may provide

[4] Resource wealth is characterized as longlasting when resource revenues are projected to remain at high levels (e.g., over 20 percent of total revenues) for a period of more than 30–35 years.

a lower rate of return than investing in infrastructure when domestic physical capital is low, as is the case in developing countries.

- In a country like Mozambique, with *capital scarcity and massive development needs*, a strategy that saves most of the resource wealth for future generations seems suboptimal. A different framework would be needed, with enough flexibility to allow for scaling up public investment, but taking into account absorptive capacity constraints and the need for transparency to ensure good governance over resource revenue collection and spending. However, given the uncertainty about how long the reserves would last, it is still not possible to decide whether addressing sustainability/exhaustibility issues or managing volatility—natural resource scenarios A and B, respectively, in the discussion below—would be the primary objective of the fiscal framework. In addition, deviating from the prudent framework followed by Norway would only be appropriate when resource wealth is used for projects that offer value for money, which depends on the strength of the public financial management system and the quality of institutions for public investment management.

The design of the optimal fiscal framework in Mozambique is a function of several factors that are not yet fully known.[5] In particular, there are only preliminary indications of the size of the total proven gas reserves, and other fields could be discovered in the near future. Second, the rate of gas production and prices are difficult to predict given uncertainties about the actual investment plans of Anadarko and ENI over the next decade. Third, Mozambique's position in the international gas market has not yet been defined. This could be associated with enormous variability in the level of natural resource revenues that Mozambique could collect. Hence, analytical considerations regarding possible options are preliminary and specific advice on precise policy options is not possible. It seems useful, therefore, to organize the discussion along two possible scenarios: Natural resource scenario A assumes short-term natural reserves (i.e., less than 30 years), where issues of exhaustibility are more important than managing volatility, and natural resource scenario B assumes that reserves are longlasting (i.e., more than 30 years) and that managing volatility is a more immediate priority.

## Natural Resource Scenario A: Assessing Fiscal Sustainability

An illustrative scenario can be generated to assess trade-offs associated with alternative policy decisions in a situation where it is assumed that substantial resource revenues would last about 30 years. This scenario assumes that LNG

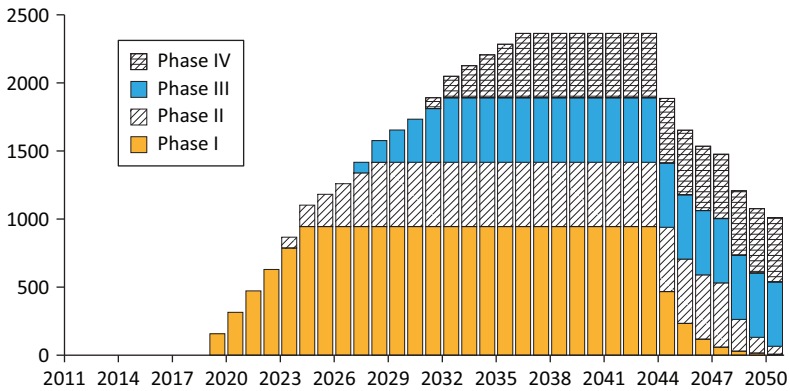
[5] For a more in-depth discussion of these issues see Segura-Ubiergo and others (2013).

production starts in 2019 and increases gradually to reach full capacity by 2036 (Figure 10.1). It then starts to decline after 2043. While the resource horizon is relatively long, exhaustibility issues would still be a significant source of concern in the design of an appropriate fiscal rule. Barring new discoveries, production would decline at a fast rate. By 2055 (about 35 years after the start of production), production levels would have significantly declined. As noted below, this would have a substantial impact on government revenues. Given the decline in resource revenues, the government over time should have saved a sufficient share of resource revenues to prepare for this scenario and invested in productive assets that support growth in the rest of the economy. Should the increase in production assumed in this scenario not materialize, exhaustibility issues would obviously become even more relevant.

In line with the above production profile, resource revenues could reach 15 percent of nonresource GDP and represent up to 40 percent of total revenues by the end of the next decade (Figure 10.2). This would be a substantial source of revenue to the budget and could provide much-needed fiscal space to address pressing development needs. It would be a good opportunity to invest in high-return infrastructure projects in ports, energy production, and the transportation network. At the moment, for example, only 20 percent of Mozambique's roads are paved, only 30 percent of the population has access to sanitation, and some 60 percent of households do not have access to electricity. There are also large social challenges, including how to reduce child malnutrition and improve the skill set of the work force.

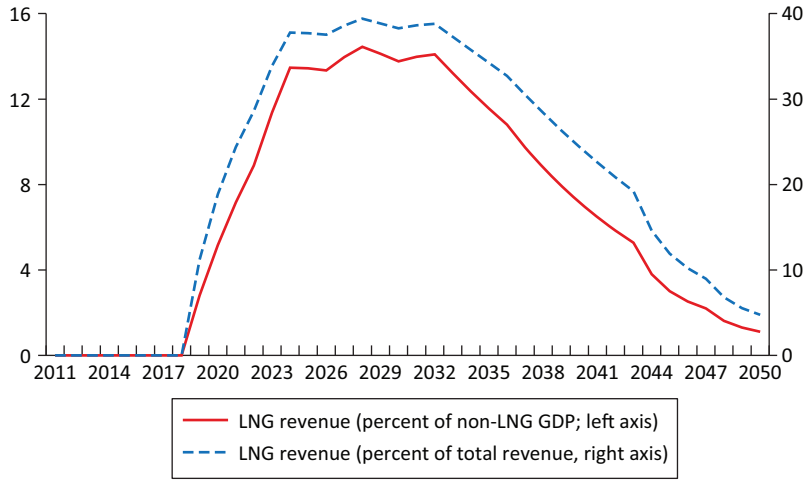
At the same time, however, resource revenues are nonrenewable and the government would have to decide how much to spend and how much to save to support spending in the future. A nonresource primary balance rule

**Figure 10.1. Hypothetical Liquefied Natural Gas Production**
***(Trillions of British thermal units/year)***




Source: IMF staff calculations.

**Figure 10.2. Liquefied Natural Gas (LNG) Resource Revenue**
***(Percent)***




Source: IMF staff calculations.

is particularly appropriate in countries with shorter reserve horizons, where issues of exhaustibility should figure prominently. The target for the NRPB can be set in several ways. The following approaches are relevant to inform decisions in this regard:[6]

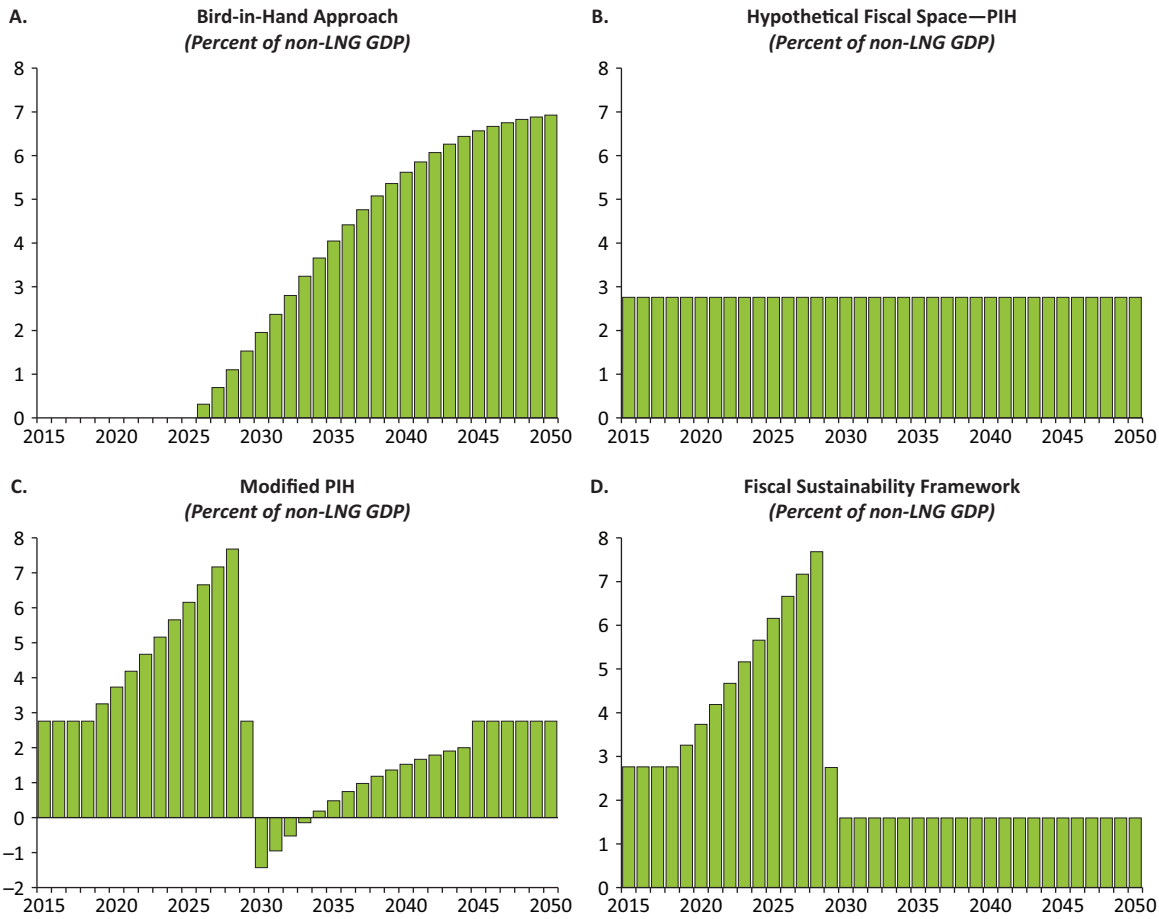
- ***Bird-in-hand.*** With this approach, all natural resource revenues would be saved in a separate account or fund. Only the interest income from the actual financial savings would be spent. Hence, resource wealth would be permanently transformed into financial wealth. Because the value of the savings would rise gradually over time as resource revenues are deposited into the account, the fiscal space generated by natural resource revenues would grow over time (Figure 10.3, Panel A).[7]

- ***Permanent income hypothesis.*** An alternative would be to set the fiscal target (NRPB) at a level that is consistent with "future" financial wealth. This computation basically transforms resource wealth on the ground into "virtual" financial wealth and uses an implicit rate of return. Total resource wealth is the sum of existing financial wealth and future resource revenues measured in net present value. Under this approach, scaling-up could start earlier but would be maintained at relatively modest

[6] The discussion assumes that a country starts from a sustainable fiscal balance and determines the appropriate level of additional spending that would be associated with "natural resource wealth," assuming that nonresource revenues remain constant and that international assistance does not decline. In practice, given that aid flows may decline over time, the amount of additional fiscal space may be lower, as part of the resource revenues would have to be used to offset declines in donor grants.

[7] This model is followed by Norway, which sets an NRPB target that is equal to about 4 percent of the stock value of existing financial assets, as this is the government's estimate of the long-term rate of return on its financial assets.

Figure 10.3. Illustrative Fiscal Space under Alternative Natural Resource Rules




Source: IMF staff calculations.
Note: LNG = liquefied natural gas; PIH = permanent income hypothesis.

levels given large development needs. The permanent income hypothesis rule would provide fiscal space (i.e., capacity to increase spending) equivalent to 2.8 percent of nonresource GDP (Figure 10.3, Panel B).[8]

- ***Modified permanent income hypothesis.*** Given capital scarcity in Mozambique, the rate of return to investment in domestic physical assets and/or human capital may well exceed the rate of return of financial assets saved abroad. Under this approach, it is assumed that part of the resource wealth is spent up front. However, if the scaling-up of public investment does not result in higher growth, there would be a need for fiscal adjustment in the future to rebuild financial assets and ensure

[8] This assumes that the initial budgetary position prior to the discovery of resource wealth was sustainable, and that nonresource revenues remain constant over time.

that fiscal policy remains on a sustainable path. This would be the case because wealth on the ground would be "consumed" without a sufficient increase in physical assets. The modified permanent income hypothesis provides an illustration of how the intertemporal budget constraint would be satisfied if the scaling-up of investment were not having a positive impact on growth (Figure 10.3, Panel C).

- ***Fiscal Sustainability Framework (FSF).*** This framework incorporates ex ante the expected impact of higher investment on nonresource growth and revenues. Fiscal sustainability would be consistent with a drawdown of government wealth (using those assets to build human and physical capital). Lower financial wealth would generate a lower stream of income to the budget than in the framework based on the permanent income hypothesis. However, fiscal spending could still be stabilized at a higher level because higher growth would have "fiscal returns" in the form of larger nonresource revenues (Figure 10.3, Panel D). The net wealth stabilization level would depend on the future nonresource growth assumptions of Mozambique. This contrasts with the other frameworks that focus on preserving the full amount of financial wealth over the long term.

The Fiscal Sustainability Framework would be the most appropriate approach for Mozambique, but its implementation would be challenging. The main difference between the FSF and the other frameworks is that the FSF approach allows a permanent reduction of financial wealth while the other models do not. All the other models assume that natural resource wealth is exhaustible and needs to be saved (i.e., transformed into financial wealth), with differences only in the temporal profile of the savings.[9] By contrast, the FSF recognizes that natural resource wealth is exhaustible and should not be "consumed," but rather transforms resource wealth into physical assets and human capital through higher public investment. Lower financial wealth will generate lower interest income to the budget, but growth will be higher because the country's capital stock (including human capital) will also rise. Higher growth would then generate higher nonresource revenues that ensure fiscal sustainability.

The fast increase in public investment assumed by the FSF would need to take into account absorptive capacity. This would require a careful assessment of the impact of fiscal policy on inflation and the exchange rate. There would also be a need to ensure that the additional fiscal space is used for projects

[9] The bird-in-the-hand approach is the most conservative because only the interest income on the actual savings can be spent. The permanent income hypothesis generates a constant amount of fiscal space based on the assumed rate of return on the value of the wealth on the ground, while the modified permanent income hypothesis allows an increase in spending in the initial phases, but forces fiscal adjustment in the future to rebuild financial wealth and ensure fiscal sustainability.

that provide value for money. This would require improvements in the system for public investment management. In addition, substantial increases in public spending would require decisive steps to improve public finance management to ensure expenditure efficiency and high standards of transparency and good governance.

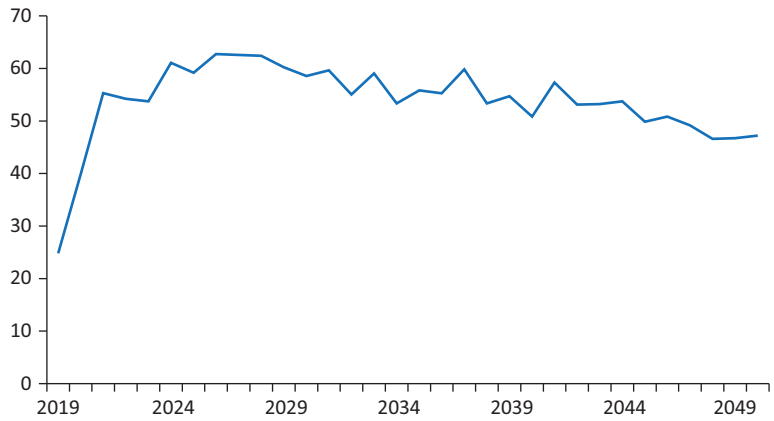
## Natural Resource Scenario B: Managing Volatility

It is conceivable that resource revenues become so large and sustained over time that managing volatility becomes the main source of concern. This would be the case, for example, if additional discoveries of gas were made or if the speed of medium-term development of recently discovered fields were to become faster than anticipated under scenario A. In such a case, resource revenues could exceed 40–50 percent of total revenues and would last for over 35 years (Figure 10.4). Under such a scenario, exposure to volatility would probably become one of the most significant challenges. A fiscal rule that helps shield the government's budget from volatility would be particularly useful in such a case. Scenario B explores what types of rules could be used for this purpose.

There are three sources of revenue volatility that Mozambique may face:

- ***Prices.*** As one player in an international market, Mozambique will be a natural gas price taker and have little power to influence commodity prices. Prices can be influenced by general commodity outlooks, economic activity, and weather, among other factors (Hamilton, 2009). The majority of natural gas prices are either indexed to oil prices or set in

**Figure 10.4. Natural Resource Revenue**
***(Percent of total revenue)***




Source: IMF staff calculations.

the spot market, which indicates that Mozambique will likely be exposed to significant price volatility.

- ***Quantities***. Natural gas production is inherently uncertain. Technical problems can arise at any time, and uncertainty increases as natural gas fields age. With increasing supply competition from new producers (e.g., the United States and Angola), including new extraction technologies and slow demand growth (due to weak international economic conditions), the previous tradition of signing long-term supply contracts of more than 15 years has been replaced with shorter, more diverse supply contracts. This suggests that Mozambique will face quantity volatility.

- ***Institutional arrangements.*** Difficulties may arise in ensuring that the treasury receives all revenues that are due. This can be exacerbated if the national energy company or state-owned enterprise is responsible for marketing the natural gas on behalf of the government and later transferring revenue to the treasury. This potential source of revenue volatility is largely under the control of the government.

Revenue volatility can have negative macroeconomic consequences. Research has found that countries with more volatility tend to grow more slowly, particularly in nonresource sectors. Furthermore, due to the uncertainty associated with volatility, foreign direct investment levels tend to be lower and investors require higher rates of return to undertake projects. For policymakers, medium-term planning becomes more difficult as spending turns procyclical—higher expenditures during periods of high prices, which often will be difficult to reduce during downturns—resulting in lower quality and efficiency.

Price-based structural balance rules are particularly useful to deal with volatility concerns. The rules target a structural primary balance, in which resource revenue is computed by relying on an average of past and futures prices. Focusing on averages of resource prices (rather than current prices) can help reduce volatility. It can also help support solvency through prudent forecasting of structural revenues that deliberately under-projects sustainable resource prices.

## An Application of Price-Based Structural Balance Rules to Mozambique

This section simulates the effect of price-based structural balance rules on Mozambique's fiscal performance beginning in 2019. Mozambique could easily find itself with substantial exposure to revenue volatility once resource

revenue becomes substantial. Generally, a threshold of at least 20 percent of total revenues is used. With a likely positive outlook for LNG production, a favorable fiscal regime, and a significant contribution from other commodities such as coal, this scenario could arise as early as 2020. Thus, a more optimistic LNG production scenario considered here would expose the budget to greater external shocks, thereby suggesting that fiscal policy priorities should tilt toward volatility management.[10]

Three price-based rules that are potentially appropriate for Mozambique are the:

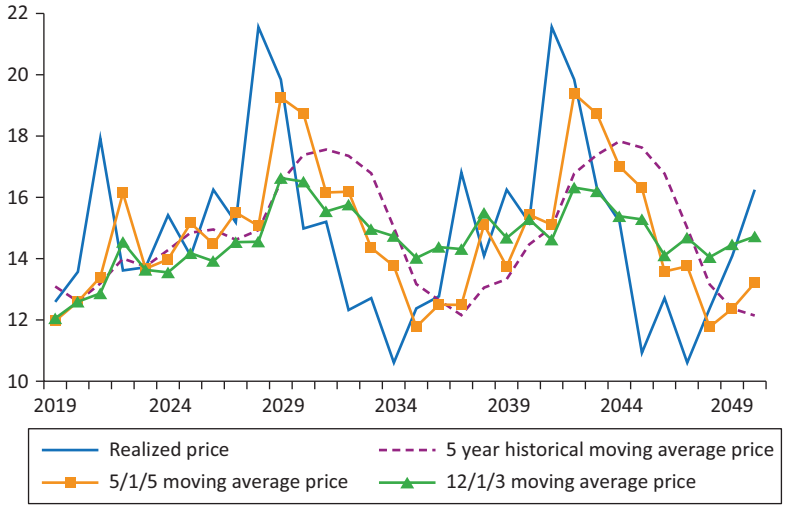
- Ghana rule—five-year rolling average of historical oil prices (5/0/0).
- Trinidad and Tobago rule—rolling average of oil prices for the last five years, the current year, and futures prices for the next five years (5/1/5).
- Mongolia rule—16-year moving average comprised of 12 years of historical prices, a current year forecast, and three years of futures prices (12/1/3).

These price rules would allow Mozambique to build appropriate buffers in order to manage volatility. At least initially, some level of savings may be appropriate and can be determined as a function of Mozambique's existing absorptive capacity constraints and other fiscal objectives (e.g., generating savings for future generations). Accordingly, the structural primary balance target should be positive in order to accumulate sufficient fiscal buffers to address price downturns. A target of 1 percent of nonresource GDP is used in this illustrative analysis. In practice, the target may need to be higher if resource revenues are large, expected volatility is substantial, and absorptive capacity to increase spending further is limited.

The budget can be protected against substantial volatility by adopting a price-based rule. Figure 10.5 shows a simulation of the realized natural gas price Mozambique would receive as well as budget prices implied by the three price rules. All three rules smooth prices, but the Trinidad and Tobago price rule (5/1/5), with its reliance on both historical and futures prices, would expose Mozambique to the most volatility. The Mongolia rule (12/1/3), with its reliance on a long historical price series, would provide for the

[10] Some important assumptions must be made. An oil price path is simulated to incorporate a similar level of volatility to that experienced during the last 10 years. Based on the current relationship between oil and natural gas prices, we hold natural gas prices constant at 14 percent of oil prices and assume that the government receives a fixed 42 percent share of gross revenues. Nonresource revenues are projected to remain at a constant 22.2 percent of nonresource GDP, while the non-LNG sector grows at 13.5 percent in nominal terms. The average real rate of return on financial assets is assumed to be 8.5 percent. For the sake of simplicity, the analysis does not consider Mozambique's outstanding liabilities.

**Figure 10.5. Natural Gas Budget Prices under Price Rules**
***(U.S. dollars per million BTU)***




Source: IMF staff calculations.

Note: See text for explanation of 5/1/5 and 12/1/3 price rules.

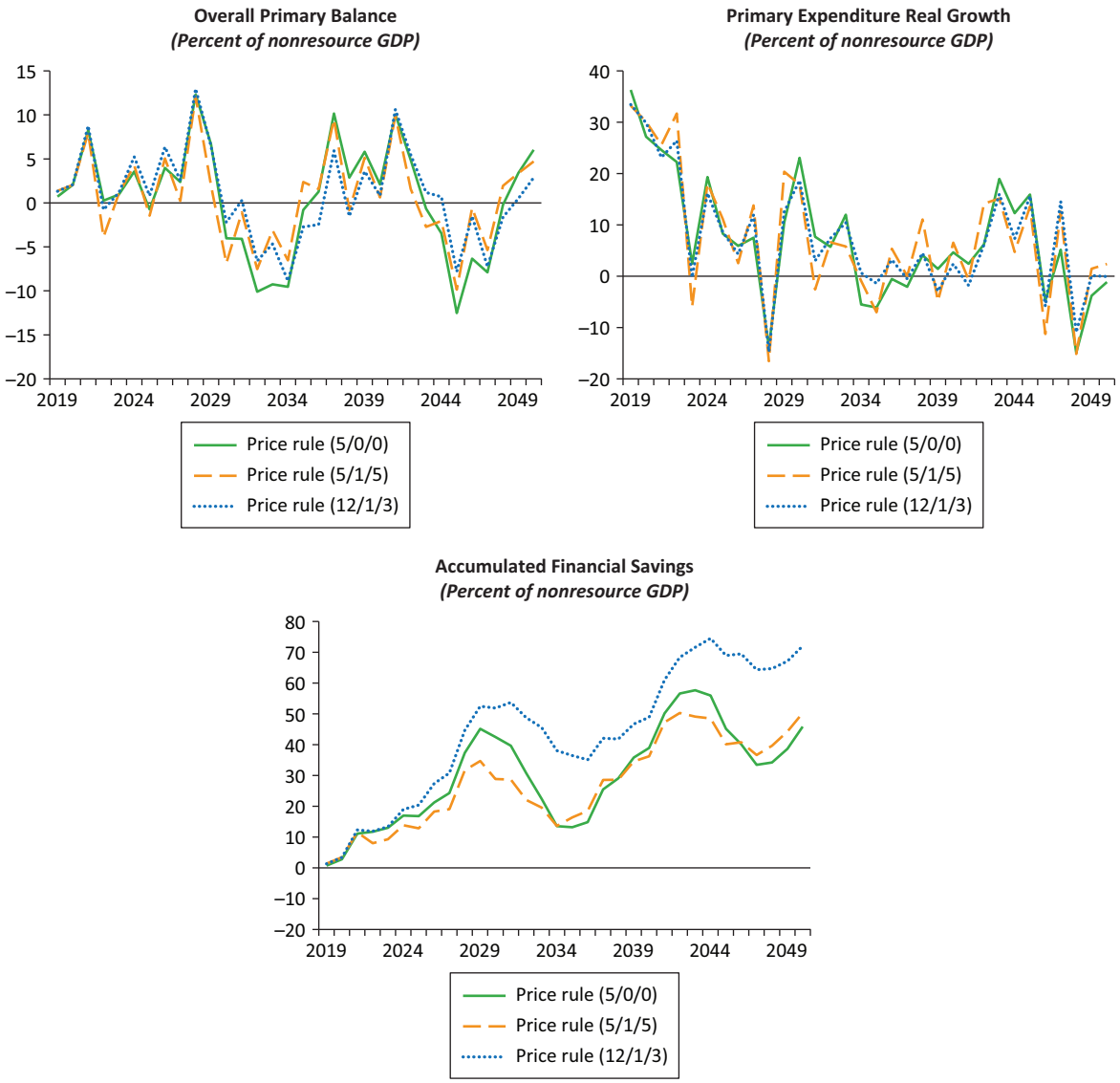
most smoothing of prices. The Ghana price rule (5/0/0) would provide an intermediate level of smoothing. Given the uncertainty about the future path of resource prices, however, past performance provides only limited guidance for future prices.

## Outcomes from Price-Based Rules

Figure 10.6 shows the realized overall primary balance, growth of real primary expenditure, and accumulated financial savings simulated under the three rules. The overall primary balance deviates from the target of 1 percent of the nonresource GDP structural balance, reflecting the volatility to which public finances are exposed.The Mongolia price rule (12/1/3) does the best in terms of expenditure smoothing, but generates a high level of financial savings. This may be too high given Mozambique's substantial investment needs. The Ghana price rule (5/0/0) generates somewhat more volatility but is consistent with lower yet still-sizable financial savings. The Trinidad and Tobago price rule (5/1/5), combining past and future expected prices, generates higher volatility but lower financial savings than the Ghana rule.

A structural balance target of less than 1 percent of nonresource GDP could disrupt budget implementation and lead to an accumulation of debt.

Figure 10.6. Overall Primary Balance, Expenditure, and Savings Outcome under Price Rules

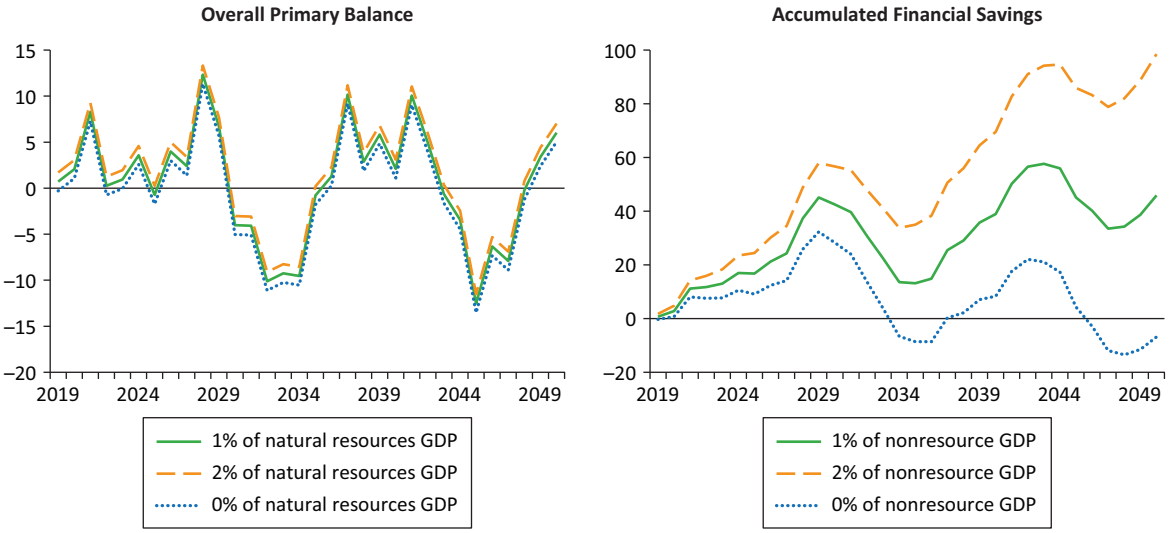



Source: IMF staff calculations.

Note: See text for explanation of price rules.

Figure 10.7 highlights the sensitivity of fiscal performance to different structural balance targets when the Ghana price rule (5/0/0) is followed. While the different structural primary balance targets do not result in substantially different overall primary balances, the small difference in targets can have large consequences for financial savings. Targeting zero percent of the nonresource GDP structural balance would lead to periods of debt accumulation or result in the disruption of budget implementation. More

**Figure 10.7. Fiscal Outcomes under Different Structural Balance Targets**
***(Percent of nonresource GDP)***



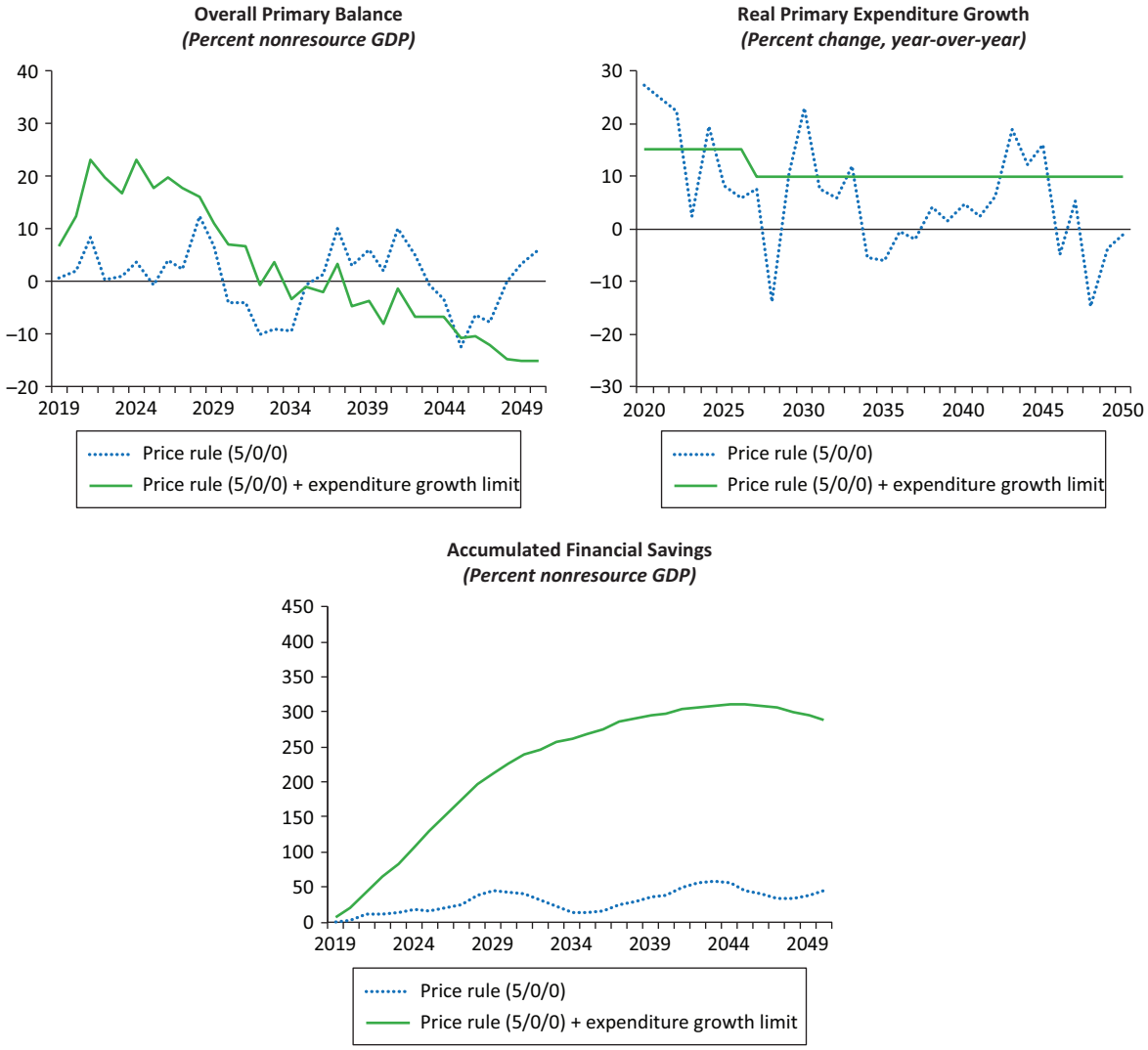

Source: IMF staff calculations.

conservative structural balance targets of 1 or 2 percent of nonresource GDP would ensure that sufficient savings are accumulated to protect against downturns and prevent an abrupt cut in spending.

A simple backward-looking price-based rule could be appropriate for Mozambique. In light of uncertainty surrounding natural gas contracts and Mozambique's limited institutional capacity, a price-based rule with a high weight put on futures prices appears to be risky and potentially costly, and would be more difficult to implement. The Ghana price rule (5/0/0) would offer Mozambique a good degree of price smoothing and help accumulate a sizable fiscal buffer to help stabilize macroeconomic fluctuations while being easy to measure, administer, and monitor. At the same time, given uncertainty about the future evolution of the gas market (including possible downward price pressures from shale gas), it might be useful to add a "prudence factor" whereby the price that comes out of the fiscal rule is somewhat reduced to take into account future price risks (e.g., Mexico multiplies the price by 0.85).

Preferences for greater smoothing could be achieved with the introduction of an expenditure growth rule. Such a rule would serve to complement the price rule by addressing production volatility and ensuring consistency with a medium-term expenditure framework. Figure 10.8 presents the performance under a 5/0/0 price rule with expenditure growth limited to 10–15 percent per year in real terms. The inclusion of this particular growth limit would permit Mozambique to accumulate significant savings (close to 300 percent of nonresource GDP) by 2050.

Figure 10.8. Fiscal Outcomes of 5/0/0 Price Rule with Expenditure Growth Limits
*(Percent of nonresource GDP)*




Source: IMF staff calculations.

## Institutional Aspects

Mozambique needs to strengthen its fiscal institutions to ensure that resource revenues support a scaling-up of productive public spending without compromising sound fiscal policy decisions. Resource revenues will facilitate scaling up public investment in infrastructure and social sectors. However, ensuring that this scaling-up does not compromise fiscal stability will be critical to maintaining a sustainable and more inclusive growth path. Attaining these goals also requires appropriate management of resource revenues, which are likely to face increasing volatility as they become an important share

of total revenues. Successful experiences in some resource-rich developing countries show that a strong public financial management system can help support more efficient use of resource wealth (IMF, 2012b). Particular improvements will be necessary in at least five areas in Mozambique:

- ***Tax administration.*** As resource revenues become increasingly important, the authorities will have to expand their capacity to prepare resource revenue projections. Putting in place a training program at the Revenue Authority's Large Taxpayer Unit to strengthen tax collection capacity, including for the audit of large taxpayers in the resource sector, will be critical to ensure tax compliance as revenues in these sectors increase over time (Watson and others, 2012).

- ***Public investment management***.[11] First, there is a need to reduce and harmonize the number of planning documents. Second, sectoral ministries should be provided with clear "budget markers"—expenditure ceilings within which to restrict public investment program proposals (projects and activities). Finally, the centralized process to certify that particular investment projects offer value for money needs to be upgraded substantially. Investment projects should be prioritized on the basis of well-defined economic and social criteria, which will require developing greater capacity, especially at the Ministry of Planning and Development. Projects that do not meet minimum technical requirements should be rejected. If there is a political decision to include them, there should be clear disclosure to Parliament that the project was added for particular reasons despite not meeting minimum technical requirements.

- ***Budget execution.*** Improvement in cash flow programming and the formulation of a broader cash plan gradually covering the entire financial year are critical for effective budget execution. Cash management currently gives spending units almost no predictability with respect to the availability of funds and very limited time to handle the expenditure process. Furthermore, substantial payments are made in advance, which can affect the quality of spending and increase risks of cost overruns. Finally, excessive in-year adjustments of initial budget appropriations should be avoided, especially across ministries. Such adjustments undermine the usefulness of medium-term planning instruments. These inefficiencies should be remedied before the budget starts receiving substantial natural resource revenues.

- ***Sovereign wealth/development fund.*** This type of fund is a special fiscal institution that can help stabilize the budget, save for future investment needs, and ensure intergenerational equity. Establishing a sovereign wealth

[11] For an assessment of the role of public investment in resource-rich countries, see Berg and others (2012).

fund in Mozambique would be necessary once resource revenues reach substantial levels after 2020. However, the flows into and out of the fund should be based on a preexisting fiscal rule that determines what share of resource wealth should be saved and invested given the considerations discussed earlier in this chapter. The fund should not have independent spending authority and could have two separate accounts: a stabilization account, which could help protect the budget from unexpected volatility; and a savings account to fund future spending needs. The stabilization account should be connected to a single treasury account and have flexible inflow/outflow rules. The savings account should not be used to fund the annual budget, except in well-established emergency situations.

- ***Transparency.*** No fiscal framework can ultimately succeed without a strong emphasis on transparency and good governance. This is particularly important in resource-rich countries where revenues and expenditures can increase relatively rapidly before appropriate internal and external controls and structures for disclosure and accountability are put in place. In the case of Mozambique, it will be important to ensure regular information on production figures and exports and full government disclosure of all revenues received from the natural resource sector. In line with the new transparency standards under the Extractive Industries Transparency Initiative, public enterprises like ENH should report on their financial transfers with other government entities, revenues collected on behalf of the government, and any quasi-fiscal activities they have performed (e.g., expenditures on subsidies, social services, infrastructure, etc.).

A Fiscal Responsibility Law incorporating medium-term fiscal objectives and natural resource revenue management could be appropriate for Mozambique. The scope of the law would relate to the activities involved in determining and presenting the budget balance target; formulation, submission, and approval of a medium-term fiscal framework and annual budget targets; and procedures for approving and making amendments to budget execution. The Fiscal Responsibility Law should include details regarding the calculation of resource revenues, set rules for the establishment of a sovereign wealth fund, and specify when it would be permissible to temporarily suspend the law and how to correct for deviations.

## Conclusions

There are great expectations that Mozambique will become an example of a country that escapes the resource curse and leverages newly discovered natural resource wealth to boost development. However, capacity constraints seem high and hence the pace of the use of resource wealth should be gradual. Given capital scarcity, scaling up public investment could be part of

an optimal economic development strategy, but the authorities would need to strengthen their capacity for macro-fiscal analysis, public investment selection, and management, as well as implement critical public financial management reforms to ensure the efficient use of resource wealth. Despite recent improvements, the government's capacity to evaluate, select, and monitor public investment projects and concessions should be expanded urgently. Scaling up investment gradually as absorptive capacity constraints ease over time would also ensure greater investment efficiency, a quicker expansion of the capital stock, and a potentially higher and less volatile rate of economic growth. This approach would also contribute to moderating exchange rate appreciation pressures or Dutch disease (see Chapter 12).

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CHAPTER

# 11 Natural Resource Wealth and Public Investment Strategy: Implications for Growth and Debt

*Yi Xiong and Giovanni Melina*

Investment and debt are like the opposite sides of a coin, particularly in Mozambique, where infrastructure gaps remain a major constraint to growth and development (Domínguez-Torres and Briceño-Garmendia, 2011). On one side, infrastructure—roads, railways, ports, power plants, electricity networks, water and sanitation networks, schools, and hospitals—is what Mozambique needs most to develop and reduce poverty. On the other side, infrastructure is particularly costly to build in Mozambique, where more than three-quarters of the economically active population still works in the agriculture sector, the population is predominantly rural, per capita GDP is below $700, and fiscal revenue and foreign exchange earnings are limited.

The situation is evolving, with the discovery of huge natural gas deposits in the Rovuma Basin off the northern coast of Mozambique. If the discovered reserves are fully exploited, Mozambique could become one of the largest liquefied natural gas (LNG) exporters in the world. This has strengthened the country's national balance sheet and improved its creditworthiness. In anticipation of future gas revenue, it becomes possible for Mozambique to increase much-needed public investment in infrastructure and social sectors through increased borrowing.

It is not always wise, however, to finance public investment through borrowing, which proportionally increases costs. The more a country borrows in the present, the more it will need to pay in the future to service the interest and principal due on its debt. In contrast, investment often suffers diminishing rates of return. This is because a country's physical and managerial capacity to carry out infrastructure investment has limits. Exceeding those limits will increase investment costs and reduce efficiency. Moreover, natural resource projects have long lead times and are subject to output and price uncertainties, with actual revenues known only several years

This chapter is based on Melina and Xiong (2013).

after the debts are incurred. Future revenue could come in significantly lower than expected. The worst-case scenario is for Mozambique's government to pile up debt but not ultimately generate sufficient revenues to pay it off.

How can Mozambique best manage these challenges and avoid the worst-case scenario? This chapter proposes a three-step approach. The first step is to prepare accurate estimates of natural resource revenue under both regular ("baseline") and adverse scenarios. The second step is to quantify the return and constraints to investment. Using the results from the first two steps, the third step employs a macroeconomic general equilibrium model to analyze different investment paths and determine possible approaches to investment scaling-up.

## Predicting Revenue: The Natural Gas Sector and Its Potential

Mozambique has long been recognized as having potential hydrocarbon resources. The Pande and Temane gas fields in the south of the country were discovered in the 1960s, but civil unrest in the 1970s and 1980s halted exploration. Exploration activities resumed slowly in the 1990s, partly reflecting low oil prices. Activity accelerated in the early 2000s as oil and natural gas prices rose globally. In 2003, Sasol, a South African oil company, carried out extensive exploration in the Pande and Temane onshore blocks, increasing proven gas reserves to 5½ trillion cubic feet (TCF). Mozambique started to export gas to South Africa through pipelines in 2004.

Although the early gas discoveries and commercial activities were concentrated in the south, the future of natural gas in Mozambique lies in the north. Geographic surveys show that the offshore Rovuma Basin close to the Mozambique-Tanzania border has potentially significant hydrocarbon reserves. The Mozambican government has signed exploration and production concession contracts with a number of international partners since 2006. Exploration to date has revealed an enormous amount of recoverable natural gas reserves in offshore areas 1 (operations led by the U.S.-based oil company Anadarko) and 4 (operations led by the Italian oil company ENI). The current plan of Anadarko and ENI is to jointly develop an onshore LNG manufacturing site near areas 1 and 4 and build four LNG plants ("trains") onshore to produce LNG, from which it can be shipped directly to the users. Total gas reserve discoveries in the two areas combined reach 200 TCF and are expected to increase further. The discoveries thus far have made Mozambique's natural gas reserves one of the largest in the world (Table 11.1).

The discoveries in the Rovuma Basin have created the possibility for Mozambique to become a major natural gas exporter. The offshore nature and geographic location of the gas reserves make it economically feasible to liquefy and transport natural gas to South and East Asia, where energy

Table 11.1. Countries with the Largest Proven Natural Gas Reserves
*(In trillions of cubic feet)*

| Country | Reserves[1] | 2012 Exports |
|---|---|---|
| Iran | 1187 | |
| Russia | 1163 | 0.52 |
| Qatar | 885 | 3.72 |
| Turkmenistan | 618 | |
| United States | 300 | 0.03 |
| Saudi Arabia | 291 | |
| United Arab Emirates | 215 | 0.27 |
| **Mozambique** | **200** | 1.02 (by 2013) |
| Venezuela | 195 | |
| Nigeria | 180 | 0.96 |
| Algeria | 159 | 0.94 |
| Australia | 133 | 0.99 |
| Iraq | 127 | |
| China | 108 | |
| Indonesia | 105 | |

Sources: BP Statistical Review of World Energy June 2013; Mozambique authorities; and IMF staff calculations.
[1] As of end-2012, except for Mozambique, which is the latest available information.

demand has been growing rapidly. The size of Mozambique's confirmed reserves can support large-scale LNG production over a long time horizon.

## The Model

It is assumed here that each train will have the capacity to produce 5 million tons of LNG per year, and that the construction of one train will take approximately five years. Given the scale of the construction work and logistical constraints, it is not possible to build the four trains simultaneously. Construction of the first train is expected to begin in 2014–15, and the train is expected to start production before 2020. Construction of the second train would start one year after that of the first train, and production would begin one year later as well. Construction of the third and fourth trains could start two years after the second train. Maximum capacity would be 20 million tons per year once all four trains become operational (IMF, 2013a).

The production plan described above is used as the working assumption for the analysis of this chapter. The planned four LNG trains are expected to process only a small fraction—20–24 TCF—of the proven natural gas reserves in the Rovuma Basin. Technically, the reserves can support a much larger scale

of LNG production, but liquefaction is costly and the realization of LNG production will depend on many factors, such as world price movements, finding investors and customers, securing financing, and overcoming construction capacity constraints. Because of these uncertainties, the four-train LNG production scenario is taken here as the baseline for analysis.

The contribution of the LNG sector to GDP and revenue is projected using the Fiscal Analysis of Resource Industries (FARI) Model developed by the International Monetary Fund's Fiscal Affairs Department (FAD), the details of which can be found in IMF (2012). The FARI Model forecasts the contributions of specific mining and/or petroleum projects to fiscal revenue, balance of payments, and national accounts. Inputs to the model include production, exports, cost structure, and prices assumptions, as well as fiscal regime parameters.

Calibration of the FARI model to fit the context of the Mozambican LNG projects was carried out during two FAD technical assistance missions to Mozambique in 2012 and 2013. The production and cost assumptions in the model reflect their calibration and the planned four-train project as described in the previous section. The key assumptions for the LNG projects are summarized in Box 11.1.

## Liquefied Natural Gas Revenue Projections

The FARI Model results show that the natural gas projects would bring significant economic benefits to Mozambique. Exports peak at 30 percent of non-oil GDP, and the sum of taxes and other fiscal revenue from natural gas, at its peak, reaches 9 percent of non-oil GDP (Figure 11.1). Given that fiscal revenue is currently at 20 percent of GDP, LNG revenue would contribute to a 50 percent increase in fiscal revenue in its peak years.

The government's share is projected to be small in the first few years, when gas production volume is small and the bulk of the revenue is used to cover costs. Revenue is expected to surge in 2023 when all four LNG trains become operational, and would gradually increase thereafter. The composition of revenue also changes over the project horizon. At first the main source of revenue is subcontractor withholding tax. Corporate income tax and payoff from public enterprise participation will pick up a few years after the projects start. Revenue from exploration and production contract sharing will be small at the beginning, but the share of profit from gas will increase gradually along with the R-factor. Eventually, profit gas will become the main source of revenue, accounting for more than half of total LNG-related fiscal revenue.

**Box 11.1. Assumptions for the Fiscal Analysis of Resource Industries Model**

Liquefied natural gas (LNG) production in Mozambique is projected to start in 2020. Production in the first year is projected to be 5 million tons, only a quarter of full capacity because only one of the four trains is expected to be operational in the first year. A second train will become operational by end-2020, boosting production to 10 million tons in 2021 and 2022. LNG production will reach the maximum capacity of 20 million tons per year in 2023.

Total investment is projected at $40 billion over the project horizon, a roughly half-half split between the upstream (natural gas extraction and initial processing) and midstream (liquefaction). On the upstream side, the cost of upfront exploration and development is expected to reach $15 billion by 2021, and another $5 billion will be invested in drilling over the project horizon to maintain gas production levels. On the midstream side, construction of the LNG plants and supporting infrastructure is projected to cost $20 billion between 2014 and 2022.

Financing for the investment will be 30 percent in equity and 70 percent in debt. Debt financing is assumed to be on commercial terms. The government has a 10–15 percent share in the investment.

Upstream (natural gas mining) and midstream (liquefaction) activities will be under separate entities. The upstream gas mining company will have natural gas liquefied by the LNG plants and pay service fees to the midstream company. The internal rate of return for the midstream project is assumed at 8 percent for the purpose of determining the cost of gas liquefaction.

LNG prices will follow oil price movements over the medium term. Oil price projections were obtained from the International Monetary Fund's *World Economic Outlook* (IMF, 2013b). A slope coefficient of 0.14 is applied to convert medium-term oil prices (in U.S. dollars per barrel) to natural gas prices (U.S. dollars/millions of BTUs). The LNG price is assumed to be constant in real terms over the long run from 2018 onward.

The fiscal regime for natural gas activities is comprised of three main elements: a production tax (royalty), a production-sharing agreement, and a corporate income tax levied on the profits of the contractors. Detailed fiscal rules are set out in the exploration and production concession contracts (EPCCs) negotiated between the government and the contractors. The EPCCs for the explorations by Anadarko and ENI were both signed in 2006. Representative parameters from existing EPCCs are used to calibrate the FARI Model (see Table 11.1.1). The terms of the two specific EPCCs remain confidential as of this writing.

The R-factor is a cost-recovery parameter that determines the share of profit gas earned by the government. It is calculated as the ratio of the concessionaire's cumulative cash inflows, net of operating costs and tax, to its cumulative capital expenditures. According to the representative setting, the government's production share starts at 10 percent and will gradually increase to 60 percent as the R-factor increases.

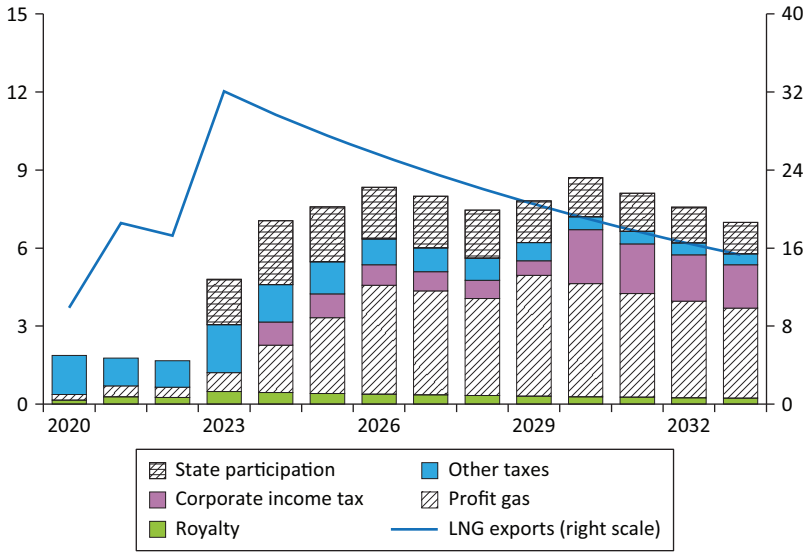
**Box 11.1. (*concluded*)**

**Table 11.1.1. Representative Parameters for Exploration and Production Concession Contracts**

| Tax | | Tax Rate (percent) |
|---|---|---|
| Royalty | | 2 |
| Cost recovery limit | | 65 |
| | **R-Factor** | **Share** |
| Profit petroleum/gas | 1.0 | 10 |
| | 2.0 | 20 |
| | 3.0 | 30 |
| | 4.0 | 50 |
| | >4.0 | 60 |
| Corporate income tax | | |
| In first 8 years from production start | | 24 |
| After first 8 years | | 32 |
| Dividend withholding tax | | 10 |
| Subcontractor withholding tax | | 20 |

Source: National Petroleum Institute of Mozambique (INP).

**Figure 11.1. Liquefied Natural Gas (LNG) Sector Contribution to GDP and Fiscal Revenue**
***(In percent of noncoal, non-LNG GDP)***




Sources: Mozambican authorities; and authors' estimates from the Fiscal Analysis of Resource Industries Model.

## Limits and Constraints to Public Investment

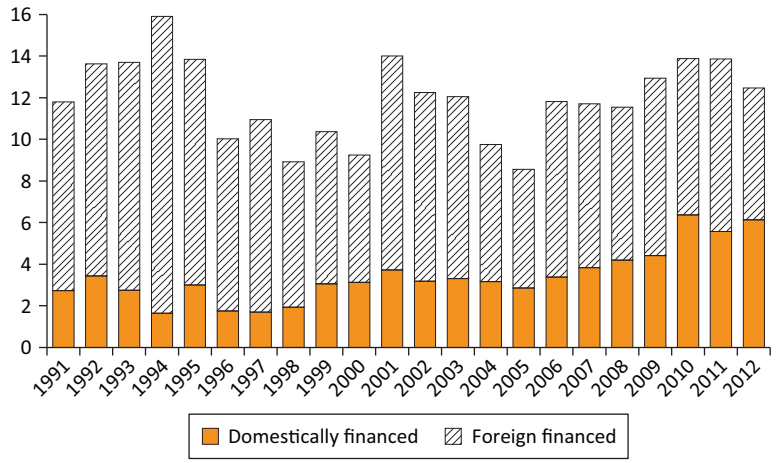
Mozambique has had relatively high public investment levels throughout its post-conflict history. Public capital expenditure exceeded 10 percent of GDP in 16 of the past 20 years (Figure 11.2). The bulk of the investment expenditure was financed by foreign grants and debt, reflecting limited domestic savings, but in recent years domestic financing has increased. Public investment went largely into infrastructure: roads, ports, power plants and electricity, water and sanitation, schools, and hospitals. The need for infrastructure remains significant. However, it is costly to build and maintain infrastructure in a thinly populated country (population of about 25 million with 800,000 square kilometers of land—twice the size of California).

Public investment raises the stock of public capital, which helps productive activities in the economy. Indeed, economic productivity depends on many of the above-mentioned investments, including roads connecting suppliers and consumers, adequate electricity and water supply for production, and a skilled and healthy labor force as a result of education and health services. However, the transformation from public investment to public capital is neither automatic nor complete. This is where investment inefficiency comes into play.

Investment inefficiencies may arise along many fronts. Some poorly planned public investment projects could prove wasteful and may not help productive activities at all (known in development lexicon as "bridges to nowhere"). Other reasons for investment inefficiency include higher-than-expected costs, bad governance, corruption, supply bottlenecks, and lack of complementary infrastructure.

Investment inefficiency is a function of the amount of investment. The more investment projects start at the same time, the more likely it is that some of

**Figure 11.2. Public Capital Expenditure**
***(Percent of GDP)***




Source: Mozambican authorities.

them will be poorly selected, mismanaged, or run into supply bottlenecks ("absorptive capacity constraints"). It is expected that investment inefficiency will be much higher in years when public investment is extremely high compared to normal years when the public investment level is at the historical average. This investment (in)efficiency function is a key input for the model in the next section.

Empirically, however, it is very hard to determine the level of investment efficiency. Investment efficiency can be calculated as the increase in public capital divided by the amount of investment. The latter is observable, but the former is not. Few countries produce statistics related to the stock of public capital, owing to the difficulties of measuring it and lack of standard statistical practices in this area. For Mozambique, unfortunately, such statistics are not available at all. Thus we can only make an educated guess based on cross-country experiences and case studies specifically for Mozambique.

Cross-country studies suggest that average investment efficiency in low-income countries is around 50 percent; that is, only about half of public investment spending translates into actual productive public capital (Gupta and others, 2011). For Mozambique, Domínguez-Torres and Briceño-Garmendia (2011) estimated that as much as $204 million was lost to inefficiency annually in Mozambique during the late 2000s compared to $664 million expenditure annually on infrastructure. Their estimate does not cover all sources of inefficiency and thus could underestimate the losses. Combining the two results, we assumed that investment efficiency is 60 percent in normal times ("steady state"), somewhat higher than the low-income country average.

In addition, it is assumed here that when public investment positively deviates beyond 50 percent from its initial steady-state level, absorptive capacity constraints start binding and investment will turn less efficient. This is close to the estimates of Pritchett (2000) for sub-Saharan Africa. Average investment efficiency would decline to around 30 percent if public investment were to spike to around 200 percent from its initial steady state.

## Macroeconomic Effect of Investment Scaling-Up

The Debt, Investment, Growth, and Natural Resources (DIGNAR) Model is designed to analyze the public investment and growth nexus together with debt sustainability and natural resource revenue management in developing countries. The framework is a small-economy model with limited asset-market participation to reflect the reality in lower-income countries where households do not typically have access to financial markets. The model features a natural resources sector, and public investment builds up public capital with inefficiencies and absorptive capacity constraints. Without getting into the technical details of the model,[1] this chapter will discuss the key elements and results.

[1] A full description of the model in technical detail can be found in Melina and Xiong (2013).

## The Natural Resource Sector

The natural resource sector includes only the natural gas sector in our model setting. For simplification, other natural resources are not included, as their size is small compared to the natural gas sector.

Natural resource markets are typically subject to substantial uncertainty. One big source of uncertainty is the price volatility that characterizes commodity markets. Nonrenewable natural resources are also subject to exhaustibility, that is, to the fact that the endowment of a particular natural resource will be wiped out completely at a certain point in the future. In addition, there may be cases in which, while the endowment of a natural resource has not been exhausted, market conditions make its extraction and distribution unfeasible or uneconomical and, as a consequence, its production stops or considerably diminishes. This uncertainty is reflected in the revenue that the government may get from natural resources. Although in many cases natural resource sector output is also dependent on public investment, it is not the case for Mozambique because the LNG sector is mostly offshore and does not depend on any public infrastructure.

In order to show the consequences of shocks to LNG revenue in the Mozambican case, we envisaged two scenarios:

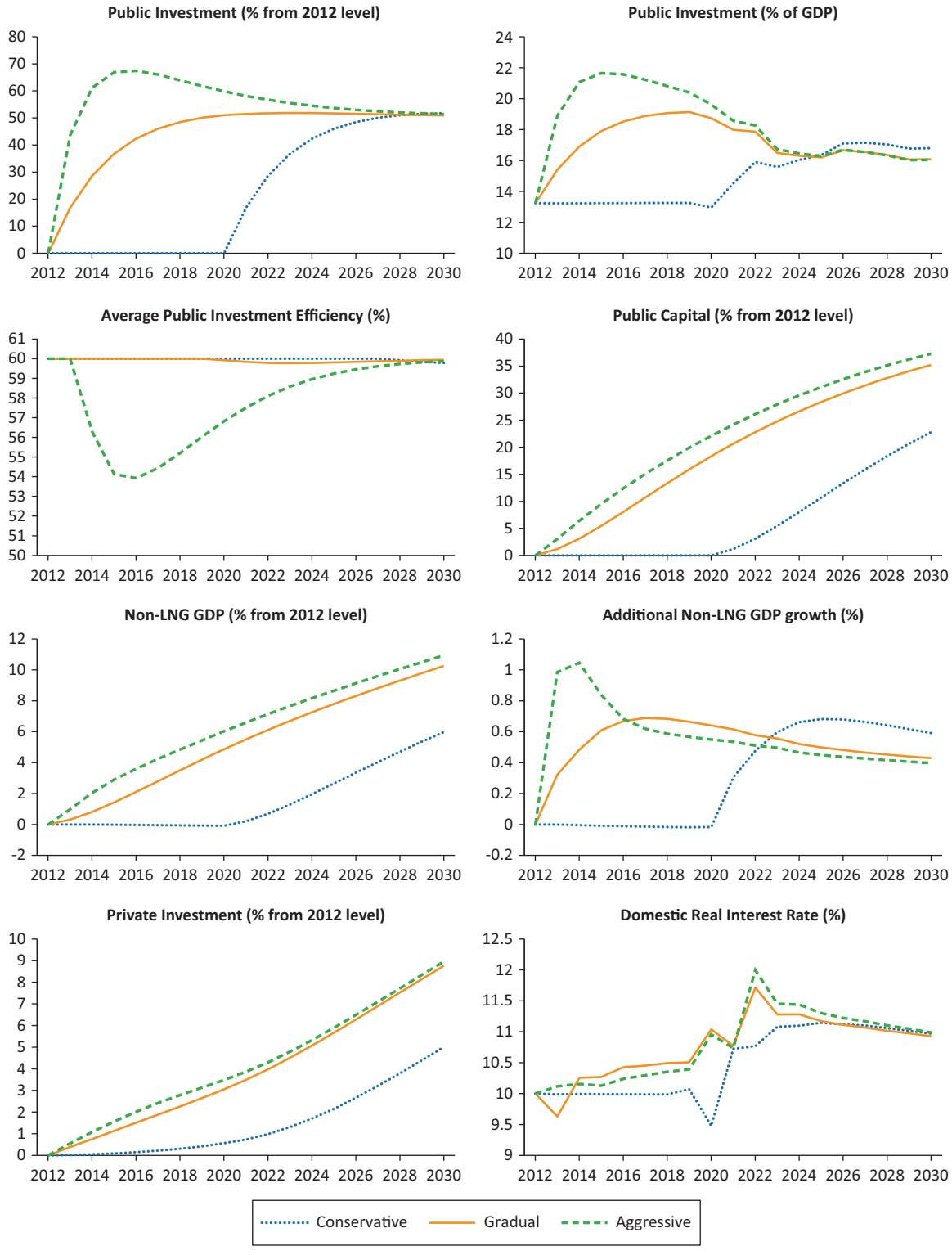
1) A *baseline scenario* in which the LNG production and revenue is in line with that used for the revenue projections obtained from the FARI model, as discussed in the previous sections. In particular, production starts in 2020 and reaches a maximum level by 2023. In this scenario LNG revenue rises to a level of 30–40 percent of total fiscal revenues.

2) An *adverse scenario* in which average LNG production is smaller (80 percent of the level in the baseline scenario), combined with negative LNG price shocks of a size typically observable in oil and gas market crises, as well as an earlier exhaustion of gas reserves. In this scenario LNG revenue peaks at only 20 percent of fiscal revenues.

## Public Investment Paths

The model examines three different approaches to public investment scaling-up that lead to different investment paths (Figures 11.3 and 11.4). Under a *conservative approach,* no additional public investment is made until LNG production starts in 2020, then it gradually increases up to a level 50 percent higher than 2012 in real terms. Under a *gradual approach,* public investment is gradually increased in anticipation of LNG production and revenue reaches its new level by the time production is in place. Under an *aggressive approach,* public investment is massively frontloaded and exhibits substantial overshooting (up to eight percentage points of GDP).

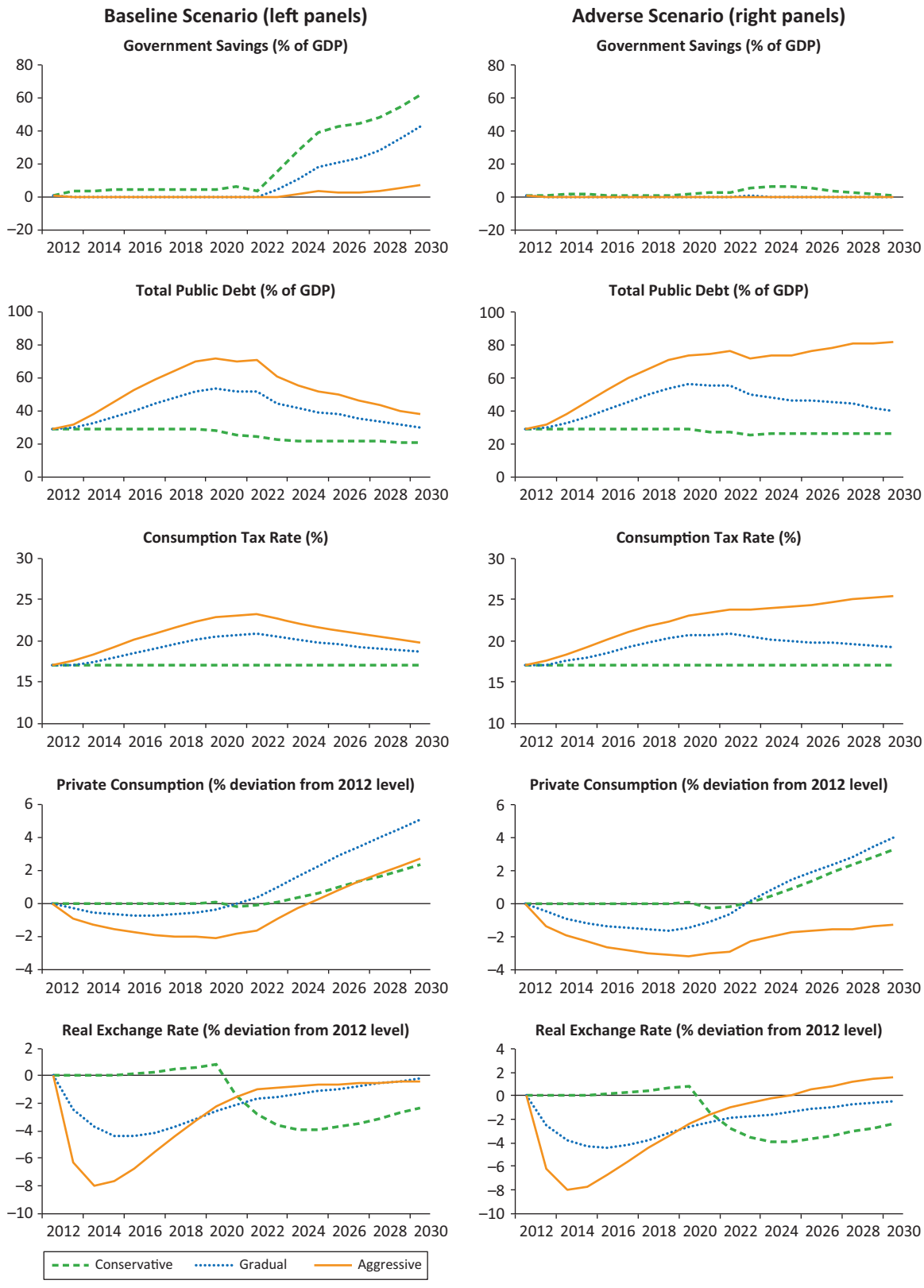
## Figure 11.3. Public Investment Scaling-Up and Growth Outcomes
*(Percent)*




Source: IMF staff calculations.

Note: LNG = liquefied natural gas.

## Figure 11.4. Fiscal Consequences of Public Investment Scaling-Up
*(Percent)*




Source: IMF staff calculations.

Across the three approaches, total public investment expenditures over the simulation horizon differ. Hence, by comparing outcomes, the model allows for choosing both the level and degree of frontloading appropriate to the country's characteristics and goals.

- A *conservative approach* simply awaits the LNG revenues. Spending on growth-enhancing investment projects would increase only in the years when LNG production starts. Public debt does not rise as a share of GDP and declines over the longer term; thus, no fiscal adjustment is required and hence no reduction in private consumption is generated. The start of LNG production would allow building strong fiscal buffers in the form of government savings (up to 60 percent of GDP in the baseline scenario of the LNG market).

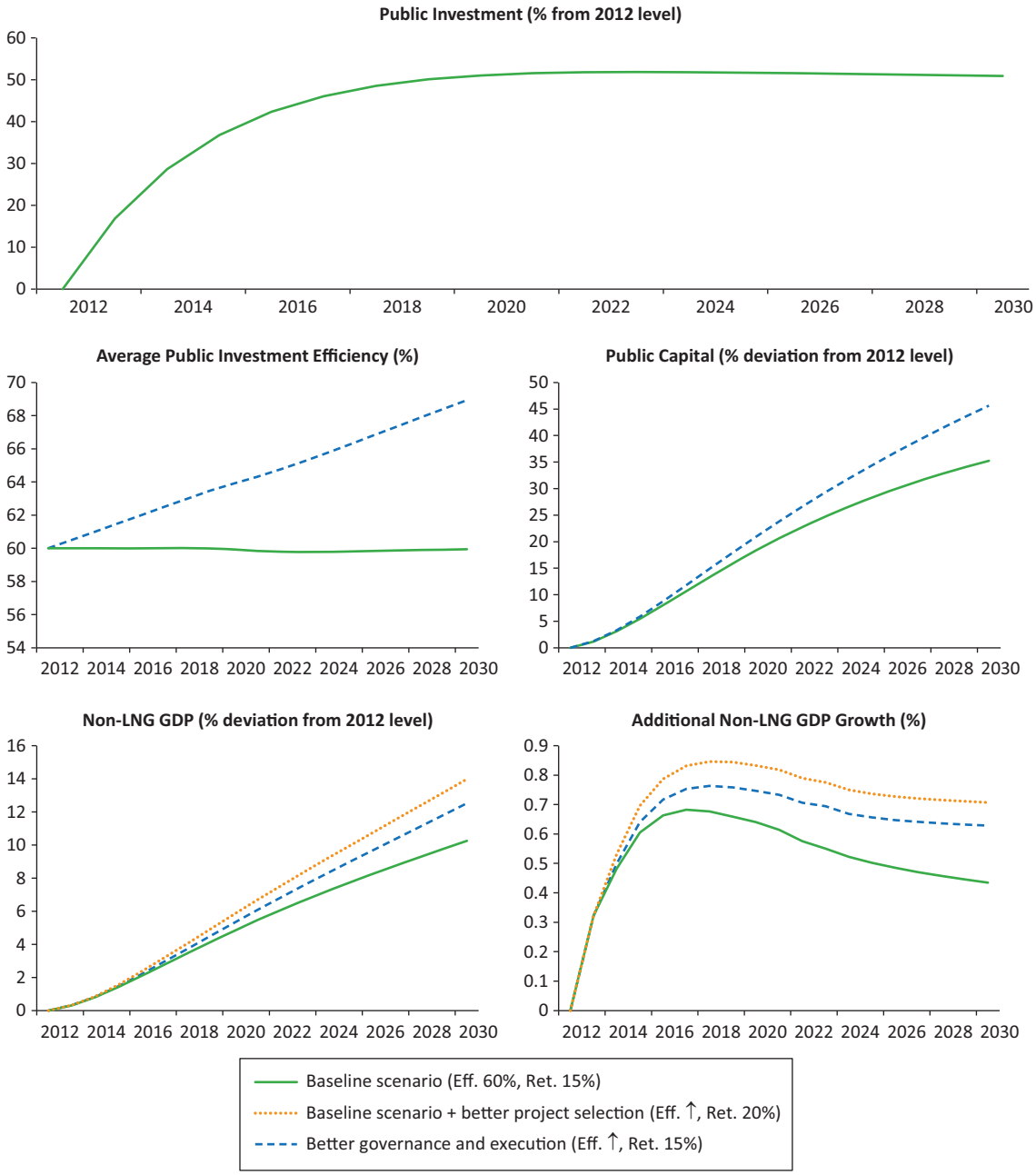
- The *gradual approach* allows for anticipating some of the LNG revenue. Public debt rises gradually to a peak of 50 percent of GDP in 2019–20, then declines over the longer term to more sustainable levels. Thus, fiscal pressure is moderate in the initial years, and is more than offset by natural resource revenue in the latter periods. In the baseline scenario, the full roll-out of LNG production would allow fiscal savings from 2023 on. Private consumption would be lower in the early years, but would catch up rapidly and eventually exceed the levels under the conservative approach. Private investment is not crowded out by public investment. In fact, the buildup of public capital increases the productivity of private capital, which translates into a higher level of private investment. By end-2030 the country would have slightly higher debt levels, but both public capital stock and GDP would be higher (about 10 percent and 5 percent, respectively) than under the conservative approach.

- An *aggressive approach* would fully anticipate future LNG revenues and increase public investment spending massively early on. However, due to absorptive-capacity constraints, higher investment spending would not deliver significantly higher buildup in the public capital stock compared to the gradual approach. Growth would be higher in the first few years, but over the medium to long run, debt would be much higher, and the government would be forced to increase tax rates to service the debt. This would lead to a more pronounced fall in private consumption and lower growth. In addition, the aggressive approach pushes up domestic prices and leads to a relatively more pronounced appreciation of the real exchange rate (a downward movement in the figures implies an appreciation). This feeds into a relatively lower output in the traded sector. Hence Dutch disease effects are more likely with an aggressive approach than with a gradual one.

In an adverse scenario with lower LNG production, lower LNG prices, and an earlier exhaustion of gas reserves, there would be no room to build up significant fiscal buffers. As shown in the right-side panels of Figure 11.5,

government savings would be minimal under all investment approaches. The differences are in debt and private consumption levels. Public debt would (1) not rise under the conservative approach; (2) rise faster under a gradual

**Figure 11.5. Effects of Improvements in Project Selection and Better Governance and Execution**
***(Percent)***




Source: IMF staff calculations.
Note: LNG = liquefied natural gas. Eff. = public investment efficiency; Ret. = return on investment.

approach than in the baseline, but would not require much fiscal adjustment; and (3) rise explosively under an aggressive approach, requiring painful and sustained fiscal adjustment. As a result, private consumption would be permanently lower and never rebound.

### More Efficient Public Investment

We also use the model to simulate the effects of structural reforms in the Mozambican economy. In particular, we let public investment efficiency increase from 60 percent to almost 70 percent over two decades. This positively affects the accumulation of the capital stock. Moreover, we simulate an improvement in the project selection process and project selection capacity by raising the annual net economic return on public investment at the initial steady state from 15 to 20 percent. The combined effect of the two measures is additional non-LNG GDP growth of about 0.2–0.3 percent each year (Figure 11.5).

## Conclusions

The Rovuma Basin, located off the northern coast and close to the Mozambique-Tanzania border, has great potential in natural gas reserves. FARI Model results show that the natural gas projects can bring significant economic benefits to Mozambique, and the sum of taxes and other fiscal revenue from natural gas could, at its peak, reach 9 percent of non-oil GDP, or roughly one-third of total fiscal revenue.

Recent developments in the natural resources sector in Mozambique have triggered a fresh round of infrastructure investment. Indeed, the need for such investment is significant. Public investment scaling-up can help unlock Mozambique's growth potential. However, if debt-financed public investment is scaled up too rapidly, it may also lead to high debt ratios or bump into efficiency constraints.

This chapter has used the DIGNAR Model to simulate alternative public investment scaling-up plans in alternative LNG market scenarios. The chapter considered three different approaches to public investment scaling-up: a gradual approach, a conservative approach, and an aggressive approach.

In sum, a gradual public investment scaling-up anticipating some but not all future LNG revenue would be appropriate given Mozambique's infrastructure investment needs and the uncertainty regarding LNG production and revenue. The gradual approach outperforms the other two approaches under both the baseline scenario, in which the LNG project materializes as planned, and the adverse scenario, in which Mozambique suffers negative shocks to both production and prices. Under the gradual approach, public debt rises gradually

in preparation of LNG production, but then declines over the longer term to more sustainable levels, even in an adverse scenario.

In comparison, a conservative approach that simply awaits LNG revenues is not desirable, because it postpones potential additional growth benefits by almost a decade. An aggressive approach, which fully anticipates future LNG revenues and increases public investment spending massively early on, is also not desirable. In fact, the higher investment spending delivers a similar build-up in the public capital stock as under a more gradual approach. In addition, an aggressive approach implies a much bigger buildup of public debt, which would become unsustainable in an adverse scenario with lower-than-planned LNG production and lower LNG prices.

Why is public investment not "the more, the merrier?" Given that LNG revenues will eventually come, why not start investing now so that the economy can immediately benefit? The simulation results from the model envisage two specific constraints facing Mozambique in light of the upcoming LNG revenue.

- First, public investment scaling-up inevitably runs into the rule of diminishing rates of return. Investment inefficiencies may arise from many fronts: poor planning, higher-than-expected costs, bad governance, corruption, supply bottlenecks, and lack of complementary infrastructure. The more investment projects start at the same time, the more likely it is that some of them will be poorly selected, mismanaged, or run into supply bottlenecks. At some point, the cost of inefficiencies would outweigh the benefits from making the investment up front.

- The second constraint is the risks associated with actually realizing natural resource wealth. The history of LNG prices and experiences from other countries show that uncertainties are large in both production volume and prices. An aggressive investment scaling-up that anticipates all future LNG revenue would fully expose Mozambique to the downside risks, leading to an unsustainable debt path under the adverse scenario of negative shocks to LNG production and prices.

The policy implications from this analysis are straightforward. Mozambique needs to strike the right balance between public investment and debt sustainability. The authorities need to have an integrated investment plan to track and coordinate investment projects undertaken in different sectors and under different line ministries. Debt levels need to be monitored closely, and debt sustainability analysis should be conducted at least annually to ensure that the buildup of debt is on a sustainable path.

To overcome the risk of adverse shocks to LNG production and prices, the public investment strategy should anticipate only a portion of projected

revenue from the LNG sector. The increase in debt-financed investment should be moderate such that the debt path would remain sustainable even under the adverse scenario. Mozambique should not follow the aggressive approach to public investment, under which the debt stock would explode under the adverse scenario.

This chapter has also shown the importance of structural reforms to improve investment efficiency. For Mozambique, such structural reforms include the preparation and implementation of an integrated investment program that strengthens the project selection process and coordination; capacity-building for project appraisal and evaluation; and improving governance and execution of public investment projects. If Mozambique could improve on these fronts, in particular improving investment efficiency and the return of public capital, the public capital stock would build up more rapidly and would become more conducive to private sector growth. The end result would be an even higher positive impact on growth, incomes, and debt sustainability.

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CHAPTER

# 12 Fostering Competitiveness: How to Avoid Dutch Disease

*Perry Perone*

Mozambique is poised to become one of the largest exporters of natural gas in the world. The potential economic benefits of developing the sector are enormous—in the early 2020s, natural gas exports could account for 15 percent of GDP and 50 percent of total exports (IMF, 2013). In addition, exploitation of coal deposits has begun to generate significant exports. While there are many challenges to successfully developing Mozambique's natural resource wealth, as discussed in other chapters, policymakers will also have to manage the macroeconomic effects of the sector's development to help ensure that other sectors in the economy continue to evolve and generate widespread wealth and employment. In particular, a natural resource boom in one sector could lead to an appreciation of the currency, which would tend to make exports in other sectors of the economy uncompetitive, a phenomenon known as "Dutch disease."

This chapter first describes the phenomenon and its possible effects on macroeconomic performance. It then looks for evidence of Dutch disease and concludes that, while there is little evidence of it in Mozambique to date, tensions will mount as the order of magnitude of resource revenues increases. The chapter also presents policies that might mitigate the negative effects of a resource boom, and discusses how a few other resource-rich countries have implemented such policies. The conclusions provide some suggestions that Mozambican policymakers might consider going forward to ensure that development of Mozambique's natural resource bonanza enhances economic growth.

## Dutch Disease Explained

Dutch disease is the counterintuitive phenomenon that an increase in exploitation of a natural resource, which causes a boom in that sector, can crowd out economic activity in other export sectors, thereby causing a decline in overall growth. The same effect can occur, in principle, as a result of high

aid inflows. The primary mechanism by which this may happen is through an increase in foreign exchange revenues from natural resources, which can cause a nation's currency to appreciate, resulting in nonresource exports becoming less competitive (i.e., more expensive for other countries to purchase). The classic economic model describing Dutch disease posits a three-sector economy (Cordon and Neary, 1982): two traded goods sectors (the natural resource export sector and the traditional export sector) and a nontraded goods sector (e.g., services and construction).[1]

A resource boom can affect this economy in two ways:

- A *resource movement effect,* which may occur as the boom increases demand for labor, causing production to shift toward the booming sector and away from the other export sector. This effect is likely to be negligible because natural resource operations, such as development and production of natural gas, generally employ relatively few people.

- A *spending effect*, which is more likely to be significant. A jump in the country's natural resource exports initially raises incomes as a result of the increase in foreign exchange inflows. If the foreign exchange were spent entirely on imports, it would have no direct impact on the country's money supply or demand for nontraded goods. However, to the extent that the foreign currency is converted into local currency and spent on nontraded goods, the real exchange rate (which in this model is the price of traded goods relative to the price of nontraded goods) would appreciate as the price of nontradables would rise, and given that it is assumed the country cannot affect international (i.e., traded goods) prices.

More generally, the appreciation can occur in one of two ways depending on the exchange rate regime in effect. If the exchange rate is fixed, the conversion of the foreign currency into local currency would tend to increase the country's money supply, and the resulting pressure from domestic demand would tend to increase domestic prices. This would amount to an appreciation of the real exchange rate. If the exchange rate is allowed to float, the increased supply of foreign currency would result in an appreciation of the domestic currency, which implies an appreciation of the real exchange rate—in this case through a rise in the nominal exchange rate rather than domestic prices. In both cases, real exchange rate appreciation weakens the

[1] The effect can also be explained in the context of the Hecksher-Ohlin model of international trade, which is based on comparative resource endowments. In this context the increase in the endowment of one factor will lead to a more than proportional expansion of output in the sector that uses that factor intensively and an absolute decline in the output of the other good—what is known as the Rybczinski effect.

competitiveness of the country's exports and, hence, causes its nonresource export sector to shrink.[2]

## Dutch Disease and Growth

The discovery of natural resources means Mozambique has more economic assets, and their exploitation should lead to higher incomes. Rents from the natural resource sector can provide government with additional revenues to finance investment in public goods and development projects. Problems can materialize, however, when the gains come at the expense of longer-term growth. This could occur to the extent that growth is stifled in manufacturing and other nonresource tradable sectors. Development of these sectors tends to enhance long-term economic growth prospects through productivity growth, technological spillovers, and increasing returns to scale—none of which is expected from reliance solely on natural resources. These other sectors are likely to generate more employment, and thus poverty reduction, than the resource sector.[3]

In terms of the labor market, the shift of capital and labor from one sector to another can cause severe transitional problems resulting in increased unemployment. In the case of Mozambique, it may prevent the emergence of a sizable manufacturing sector. Moreover, a shift in resources away from manufacturing sectors that generate "learning by doing" might jeopardize a country's long-term growth potential by choking off an important source of human capital development.[4]

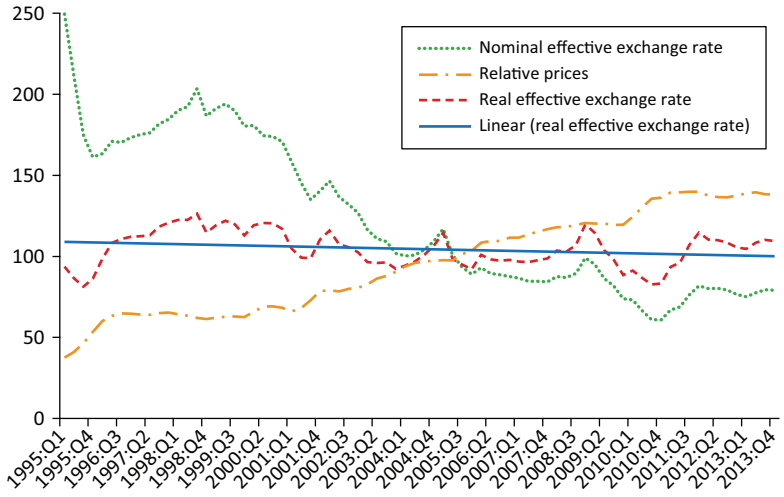
Dutch disease may result in high levels of export concentration, which could make a country vulnerable to high export price volatility and thus greater macroeconomic volatility. If government spending is closely related to natural resource revenues, then it will also become more volatile and, in turn, drive volatility in the real exchange rate through the spending effect described above (Figure 12.1). It has been well established that volatility can impede investment and growth (Aghion and others, 2006; Bleaney and Greenaway, 2000; Ramey and Ramey, 1995).

[2] One can also look at a broader concept of the resource sector, especially when it includes energy sources that may face significant transport costs. The exploitation of this kind of natural resource deposit can generate a competitive advantage in energy-intensive products (e.g., aluminum smelters, steel mills, fertilizer production) developing a whole new source of production and/or exports. Such new local activities would counterbalance the traditional Dutch disease effects affecting the nonresource sector.

[3] See Chapter 10 on the fiscal challenges of managing a natural resource boom.

[4] See Krugman (1987) and Sachs and Warner (1995). In a similar context, if the boom is temporary but revenues from it are high and the country has chosen to spend the revenues rather than accumulate foreign assets, the argument has been made that, because of "learning by doing" effects, the country should subsidize the nonresource-rich sector (Van Wijnbergen, 1984).

**Figure 12.1. Real Effective Exchange Rate and Relative Price Indices**
***(Average 2005 = 100)***




Source: IMF, Information Notice System.

The results of empirical analyses on the relationship between developing natural resources and economic growth are inconclusive. Some researchers have found a strong negative correlation between the two, while others have found some positive correlation (Sachs and Warner, 2001; Lederman and Maloney, 2008). Other studies have concluded that the effect on economic growth from a resource boom depends on governance conditions within the country. For example, there is evidence to show that a resource boom has an unambiguously positive impact on growth in the short term, but in countries with weak governance and "point-source" natural resources (i.e., oil, gas, and minerals for which the revenues flows are concentrated and easy to capture, as opposed to, say, agriculture), the longer-term impact is negative (Collier and Goderis, 2009; Murshed, 2004; Isham and others, 2005). In some cases the development of point-source natural resources has been associated with a deterioration in institutions and governance (Auty, 2000).

## Is There Evidence of Dutch Disease in Mozambique?

The development of natural resources (coal as well as natural gas) on a significant scale is still in the early stages in Mozambique. This is especially true of natural gas, as exports of liquefied natural gas are not expected to materialize until 2018–20. There are, however, significant operations related to exploration and preparation for the construction of the so-called gas trains, which will be used to liquefy and purify the gas in preparation for export. This has resulted in significant inflows of foreign direct investment (FDI), the impact of which on the balance of payments has been largely

offset by imports of goods and services. Regarding coal, exports began in 2011 and are not expected to reach a peak for some years largely due to local transport bottlenecks. However, coal exports already accounted for some 12 percent of total exports in 2012. So it is worth looking to see if there is evidence of crowding-out of traditional exports related to movements in the real exchange rate.

Mozambique's real effective exchange rate has been relatively stable since 1995. The first large megaproject operation in the country was Mozal (the aluminum smelter), which began in 1998 and was officially opened in 2000 (see Chapter 2). This appears not to have had significant effects on the real exchange rate, likely because it uses few local inputs and, during the construction phase, FDI financed capital imports to construct the smelter, and, during the operating phase, earnings from aluminum exports largely covered imports of production inputs (electricity from South Africa and bauxite) and debt service.

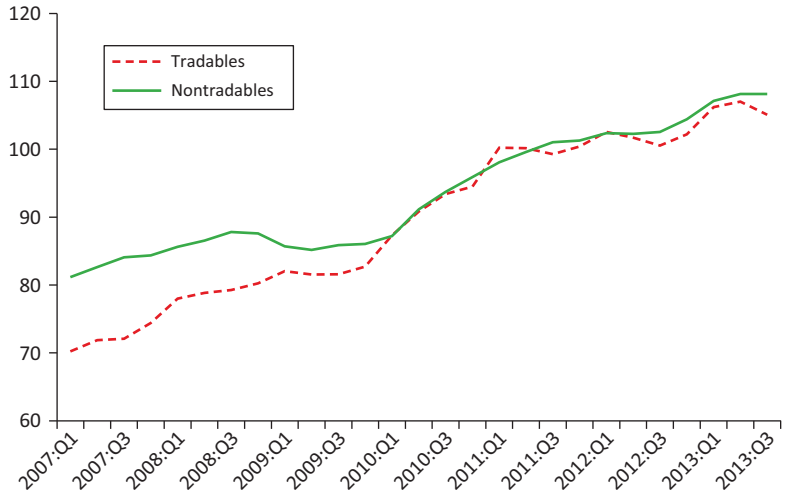
More recently there were some significant fluctuations in the real exchange rate during 2009–12, but they are largely explained by the central bank's significant easing of monetary policy in 2009–10 in response to the global financial crisis that started in 2008, and the subsequent monetary tightening in 2011–12. IMF calculations have shown that the exchange rate is broadly in line with the economic fundamentals (IMF, 2013).

To the extent that there has been a real effective exchange rate appreciation, it is primarily the result of prices rising faster in Mozambique than in its trade partners—especially during 2011–13. This could reflect the onset of Dutch disease symptoms because the period coincides with the coming on line of coal exports and also the beginning of exploration and other preparatory work on natural gas liquefaction. Looking at external competitiveness in the context of the classical model of Dutch disease described above, a loss of competitiveness as a result of the booming resource sector would come about as the price of nontradables increased faster than that of tradables.[5] Since 2011, the price of nontradables has grown about 13 percent, while the price of tradables has grown by about 11 percent. Any loss of competitiveness by this measure is therefore marginal (Figure 12.2).

The main point is that the growth of traditional exports has been strong (Figure 12.3). Between 2006 and 2012, these exports grew by almost 19 percent per year on average, led by sugar, tobacco, and lumber. Even more

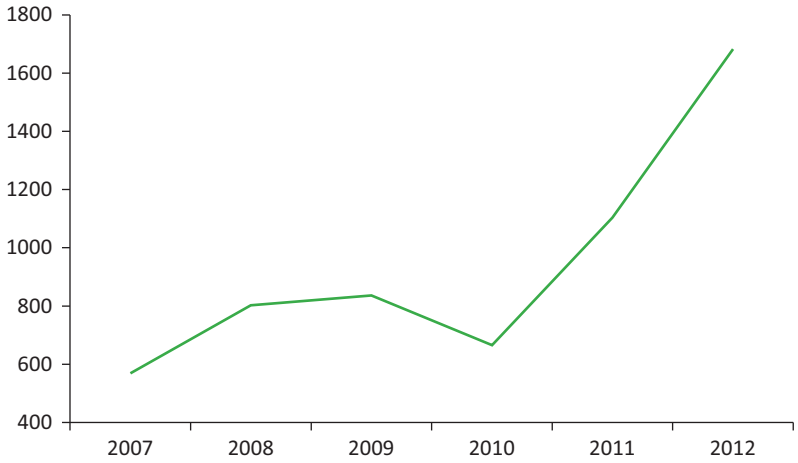
[5] The tradable and nontradable series are based on official price data at the three-digit level from the Mozambican authorities, which IMF staff categorized as tradable or nontradable. The final indicators were derived as a weighted average of the prices in each category.

**Figure 12.2. Tradables and Nontradables Prices**
***(Index: average 2011 = 100)***




Source: United Nations, COMTRADE database.

**Figure 12.3. Traditional Exports**
***(Millions of U.S. dollars)***




Source: Mozambican authorities.

impressive, they grew on average by 40 percent per year starting in 2010. This reflects in part the coming on stream of large new agro-industrial plantations.

Although at present there may not be a strong indication of external competitiveness issues through the real effective exchange rate, this is not to say that Mozambique will be immune to Dutch disease effects. The effects could become quite significant in the medium term and it would be important for the Mozambican authorities to formulate a strategy to support the competitiveness of the nonresource sectors and avoid the problems likely to be associated with the boom in gas and coal.

## Policies to Ameliorate Dutch Disease Effects

There is general consensus around two complementary approaches to ameliorating the effects of Dutch disease. One is to smooth the pace of consumption of natural resource receipts to prevent a spike in the real exchange rate. The other is to boost competitiveness and growth in the nonresource-rich export sectors.

### Sovereign Wealth Funds

Smoothing the pace of consumption of natural resource receipts implies saving some of the current receipts for use in the future, for example in a sovereign wealth fund. While having the effect of slowing the appreciation of the real exchange rate, this approach also reduces the spending effect (thereby alleviating some of the inflationary pressure), stabilizes government revenues over time, and maximizes intergenerational benefits of the exploitation of a nonrenewable natural resource.

Sovereign wealth funds to invest and manage resource savings have been implemented in many countries. Their effectiveness depends, inter alia, on how well they are integrated into the budget process and coordinated with the rest of the public sector, the transparency of the rules and operations, the mechanisms to ensure accountability and prevent misuse of the resources, and the asset-management strategy (Davis and others, 2001).

*Norway*'s oil fund is often cited as a model. The fund is designed to manage accumulated budgetary surpluses but does not have specific rules for deposits or withdrawals of resources, so its operation is flexible. The budget transfers net oil revenues and the fund then finances the budgetary non-oil deficit. The amount saved in the fund depends on oil prices and the fiscal stance in the non-oil fiscal deficit. The assets are under the control of the ministry of finance and managed by the central bank. While such a lack of restrictions is generally not considered an optimal way to structure a sovereign wealth fund, it has worked well because Norway's institutional structure for economic policymaking is strong. It is also worth noting that oil revenues account for less than 15 percent of government revenues, so volatility does not pose as serious a challenge to fiscal management as in more resource-dependent countries. Finally, while lessons can be learned from this case, it is important to recognize that the level of institutional development in an advanced country such as Norway facilitates an approach to natural resource management that is not likely to be directly transferable to developing countries.

*Chile*'s copper stabilization fund has accumulation and withdrawal rules based on a reference copper price determined annually by the authorities. In practice

the copper reference price is based roughly on a 10-year moving average. When the price of copper exceeds the reference price by between $.04 and $.06 a pound, 50 percent of the state copper company's revenue is deposited in the fund. If the price of copper is above this range, 100 percent of the revenues are deposited in the fund. Withdrawals from the fund, which are governed by rules that are symmetric to the deposit rules, have generally been used to subsidize domestic gasoline prices.

*Botswana*'s Pula Fund has some features of a sovereign wealth fund, given its objective is to ensure that national savings are used to contribute to sustainable economic development. It is not, however, considered a full sovereign wealth fund because the assets are part of the central bank's balance sheet and they can be used, like other foreign reserves, for balance of payments purposes (IMF, 2013). In any case, the Pula Fund is composed of the Government Investment Account, which reflects both savings from accumulated fiscal surpluses and inflows of additional government debt, and the broader accumulation of national savings in excess of the central bank's target for liquid reserves. The target is based on six months of import cover, and funds are transferred into or out of the account when the import level deviates from the target by three months of cover in either direction (Ghura and others, 2012).

*Nigeria* has had mixed experience with sovereign wealth funds. The Excess Crude Account (ECA) was established in 2004 and, although it was not properly grounded in domestic law, it was initially successful. The ECA accumulated significant balances as a result of budgetary savings resulting from expenditure decisions based on an oil reference price. The ECA funds helped Nigeria weather the 2008–09 drop in oil prices, as the funds were used to finance large budget deficits. A resurgence of oil prices and the political budget cycle, combined with the fact that the ECA was subject to ad hoc withdrawals and a weak legal framework, led to near depletion of the fund by 2011. In 2012, a more effective sovereign wealth fund was created, but it is still not fully operational and saw large withdrawals in 2013. It has three components: a stabilization fund, an infrastructure fund, and an intergenerational saving fund. It has stricter rules than the ECA, which should enhance the effective management of Nigeria's resource wealth (Lundgren, Thomas, and York, 2013).

## Managing Savings and Fiscal Rules

Another strategy for avoiding real exchange rate appreciation is to increase saving in the economy, which will reduce capital inflows. One way to accomplish this is to increase government savings (i.e., run budget surpluses) through fiscal rules. In this context, the main purpose of such fiscal rules is to manage revenues from extractive industries, as in many resource-rich countries these revenues account for a significant amount of total government

revenue. However, effective rules also help to manage the macroeconomic effects of exploiting a natural resource.

*Chile* is one of the most often-cited cases of a developing country implementing a fiscal rule to manage windfalls from natural-resource-based exports. Since 2001, Chile has structured its fiscal policy around the "structural balance rule," which initially was aimed at generating a structural surplus of 1 percent of GDP per year. This was changed to balance in 2009. The goal is to isolate revenues from cyclical factors. Structural revenue is determined by two independent panels of experts and reflects what revenue would have been if the economy had operated at potential rather than actual output, and what copper revenue would have been at a medium-term reference world copper price rather than the actual price. Under these rules the government can run a deficit larger than the target if output falls short of potential, if there is a recession, or if the price of copper is below its medium-term equilibrium. One of the keys to the Chilean success is the independence of the expert panels. The extent to which the panel membership and decisions are immune from political influences will determine the effectiveness of such an arrangement (IMF, 2009, 2013).

*Botswana*'s mineral wealth management has, since 1994, been based on a rule that allocates nonrenewable resource revenue to investment expenditures or savings in the Pula Fund to transfer mineral wealth to future generations. The "sustainable budget index" principle seeks to ensure that current spending is financed only with nonresource revenues. There is also a medium-term fiscal objective for the cumulative budget balance over a five-year period, which coincides with Botswana's National Development Plan, and a cap on expenditure in terms of GDP.

*Ghana* implemented the Petroleum Revenue Management Act in 2010 ahead of the first full year of its oil production. The act created a stabilization fund, an endowment fund for future generations, and an annual budget fund to earmark funding for public investment. The act sets targets for the distribution of resource revenue between the budget and two wealth funds—up to a maximum of 70 percent to the budget (of which 70 percent must be used on investment projects) and the remainder to the wealth funds. It is too early to assess how well this approach has worked in Ghana, although it is generally accepted that limiting discretion with a fiscal target (such as a nonresource primary balance target or a price-based rule) is the best practice, which Ghana's 2010 act does not do (Lundgren, Thomas, and York, 2013).

## Increasing Competitiveness in Nonresource-Based Sectors

It is generally recommended that to increase competitiveness and growth in nonresource-based export sectors, the government should invest in

public goods such as education and infrastructure and improve the business environment for other nonresource-based economic activities. The use of public investment to bolster growth in nonresource sectors is often unsuccessful.[6] Part of the challenge is how to sustain capital stock built up during the windfall revenue period. In the short run, revenue volatility raises concerns about macroeconomic instability. There is some evidence that combining public investment with a resource fund can help address the macroeconomic problems (Berg and others, 2012).

*Botswana* is widely acknowledged as having been highly effective in its approach to investment in public goods. Successive governments were able to formulate national development plans to determine spending priorities and undertook public investment projects in this context and with a view to avoiding projects for which there was no provision to cover long-term recurrent costs (Sarraf and Jiwanji, 2001). A key element of this success was strong governance, quality regulation, and anticorruption policies such as transparency and accountability in the public sector (Iimi, 2006).

*Chile* is one of the most successful developing countries in terms of effectively implementing an investment program in human resources. For example, in the mid-1960s over 80 percent of men and 70 percent of women in Santiago had less than a high school education. By the mid-1990s, those figures had been reduced to 48 percent and 29 percent, respectively. One of the keys to Chile's general success with public investment was that the country institutionalized one of the best-designed and most operational information systems to be used in decision-making for public investment projects and fiscal capital budgeting. This was made possible because of the large number of public officials trained in project analysis (Fontaine, 1997).

Another challenge relates to the quality of public investment. In cases where windfall revenues from resources are available, government investment policy can be particularly vulnerable to interest groups that benefit from investment projects regardless of their economic or social value. The result can be an unproductive, rent-seeking culture that distorts public investment decisions and weakens institutions. The competition for rents can even result in subsidies and other transfers growing more quickly than the windfall income (Lane and Tornell, 1996). In Nigeria, it has been argued that oil revenues were responsible for deterioration in the quality of public institutions and thus for waste and corruption in public projects and other operations that resulted in its poor economic performance during 1970–2000 (Sala-i-Martin and Subramanian, 2003).

[6] More generally, there is evidence from cross-country data that the presence of resource rents tends to reduce public capital stock (Bhattacharyya and Collier, 2011). There is also evidence that resource-abundant developing countries tend to invest less in education (Birdsall, Pinchkney, and Sabot, 2000).

## Conclusions

While some countries have managed the windfall from resource exploitation in a way that enhanced economic performance (e.g., Botswana, Chile, and Norway), most lower-income countries have struggled to do so, partly because of weak institutions, and partly because the nature of their natural resource wealth (point source) was such that it likely caused a weakening of institutions and the establishment of rent-seeking behavior as a norm.

Drawing from the cross-country studies and country experiences described above, a few suggestions can be proffered for the successful development of natural resources in Mozambique. First, it is essential to establish fiscal rules governing the use of the resource revenues. The sooner such rules are implemented the better. Some rents have already accrued in the form of windfall profits tax payments, and it is important to have the fiscal rules well established and functional before the vast majority of revenues begin to be generated.

Second, having such rules in place would set the stage for establishing a sovereign wealth fund with clear rules and adequate oversight. The rules could allow for using some of the revenues to finance badly needed investment in human and physical capital (especially in light of the inevitable secular diminution of donor concessional financing and the concurrent need to replace it with costly borrowing on market terms). It would be important, however, to clearly specify rules for when resource revenues are deposited and withdrawn from the fund. It would also be important to ensure transparency of fiscal operations related to resource revenues generally and to the sovereign wealth fund in particular. Such funds work best when there is regular and timely public auditing of their operations that holds fund managers and public policymakers accountable.

Third, establishing a well-designed public investment strategy consistent with the national development plan should be a priority. This would help ensure that the resource revenues allocated to public projects finance investments leading to higher and broader-based economic growth rather than financing wasteful current public expenditures with no potential to enhance future economic performance.

Finally, strengthening institutional and human capacity is imperative in order to assess investment projects so that the public investment strategy can be developed and implemented in the best possible way to facilitate economic development.

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