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**Working Paper**

## The construction sector in Mozambique: An overview

WIDER Working Paper, No. 2018/117

**Provided in Cooperation with:**

United Nations University (UNU), World Institute for Development Economics Research (WIDER)

*Suggested Citation:* Cruz, António S.; Fernandes, Francisco; Mafambissa, Fausto J.; Pereira, Francisco (2018) : The construction sector in Mozambique: An overview, WIDER Working Paper, No. 2018/117, ISBN 978-92-9256-559-6, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, <https://doi.org/10.35188/UNU-WIDER/2018/559-6>

This Version is available at:

<https://hdl.handle.net/10419/190164>

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WIDER Working Paper 2018/117

## **The construction sector in Mozambique**

*An overview*

António S. Cruz,<sup>1</sup> Francisco Fernandes,<sup>2</sup> Fausto J. Mafambissa,<sup>3</sup>  
and Francisco Pereira<sup>4</sup>

September 2018

**Abstract:** The construction sector value added in Mozambique grew at an average annual rate of 12.8 per cent in 1993–2015. Investment in the basic infrastructure of health, education, and housing improved families’ and communities’ living conditions. Investment in roads, communications, and office facilities boosted economic activities and reduced transaction costs. Construction value added grew by only 1.1 per cent in 2016. Challenges ahead include enabling a business environment conducive to expanding small and medium companies in the formal sector; reducing production costs and increasing international competitiveness; improving the prioritizing and programming of public investments; and improving training systems and basic public infrastructure quality.

**Keywords:** Companies, construction costs, construction sector, Mozambique, national accounts data, public infrastructure quality

**JEL classification:** C43, D24, H54, L74, O18

**Acknowledgements:** We are grateful to Finn Tarp, Fotini Antonopoulou, and Luke Finley for their comments on and revision of this paper. We appreciate John Page’s dedication to industrial policy in particular in Africa.

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This study has been prepared within the UNU-WIDER project on ‘Natural resources, structural change, and industrial development in Africa’ as part of a larger UNU-WIDER research project on ‘Jobs, poverty, and structural change in Africa’; and also within the project on ‘Inclusive growth in Mozambique—scaling up research and capacity’, implemented in collaboration between UNU-WIDER, University of Copenhagen, University Eduardo Mondlane, and the Mozambican Ministry of Economics and Finance. The project is financed through specific programme contributions by the governments of Denmark, Finland, Norway, and Switzerland.

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Information and requests: [publications@wider.unu.edu](mailto:publications@wider.unu.edu)

ISSN 1798-7237 ISBN 978-92-9256-559-6

Typescript prepared by Luke Finley.

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## 1 Introduction

The construction sector in Mozambique has long played an important role in the economy, with an annual average growth rate of 12.8 per cent between 1993 and 2015. However, this sector proved to be vulnerable to economic fluctuations such as those which emerged after 2014 with the macroeconomic and debt crisis, and faces challenges which will have to be addressed through long-term sector policies.

International experience shows that investment in infrastructure and human capital can play a key role in economic development by enabling expansion in activities, deeper intersectoral integration, and structural transformation in the long run. However, when countries face high construction costs, this can negatively affect the quality of public infrastructures, as is the case for road networks. Moreover, bottlenecks affecting construction companies prevent them from expanding their production, which leads to an increase in costs and prices when there is a surge in demand.

As evidence indicates that Mozambique is experiencing similar trends to other countries, this study aims both to identify the main bottlenecks affecting the construction sector, and to present policy measures that could reduce production costs and enable this sector to respond to increases in demand.

After the introduction, Section 2 presents the conceptual approach to construction and development, while Section 3 briefly describes the evolution of the Mozambican economy. Section 4 presents the construction sector's historical background, economic structure, and dynamics; the structure of construction and building materials companies; construction costs; and procurement issues. Section 5 identifies bottlenecks and advances recommendations, and Section 6 summarizes the findings of the study.

## 2 Construction and development: conceptual approach

The construction sector—civil and public works—has a broad value chain in terms of both production and labour market (Figure 1). The sector uses a wide network of inputs, while providing positive externalities to other activities and generating multiplier effects upstream and downstream due to features such as:

- wide and diversified range of clients—public, semi-public, and private large, medium, and small companies, down to self-construction;
- diverse range of products, from traditional housing to roads, smart buildings, and dams;
- multidisciplinary engagement of specialties and technologies to deal with concrete, water, electricity, soils, carpentry, and built-in machinery;
- a diversified offer from companies with large means, capacities, and technology alongside companies with a limited use of advanced technologies but abundant use of labour.

The role of the construction sector in economic dynamics and structure has been studied for various countries (Perobelli et al. 2016). The following aspects are seen as relevant for Mozambique and are being further explored:

- While national economies experience cyclical trends, either positive or negative, construction tends to have a pro-cyclical reaction, with expansions more marked than the

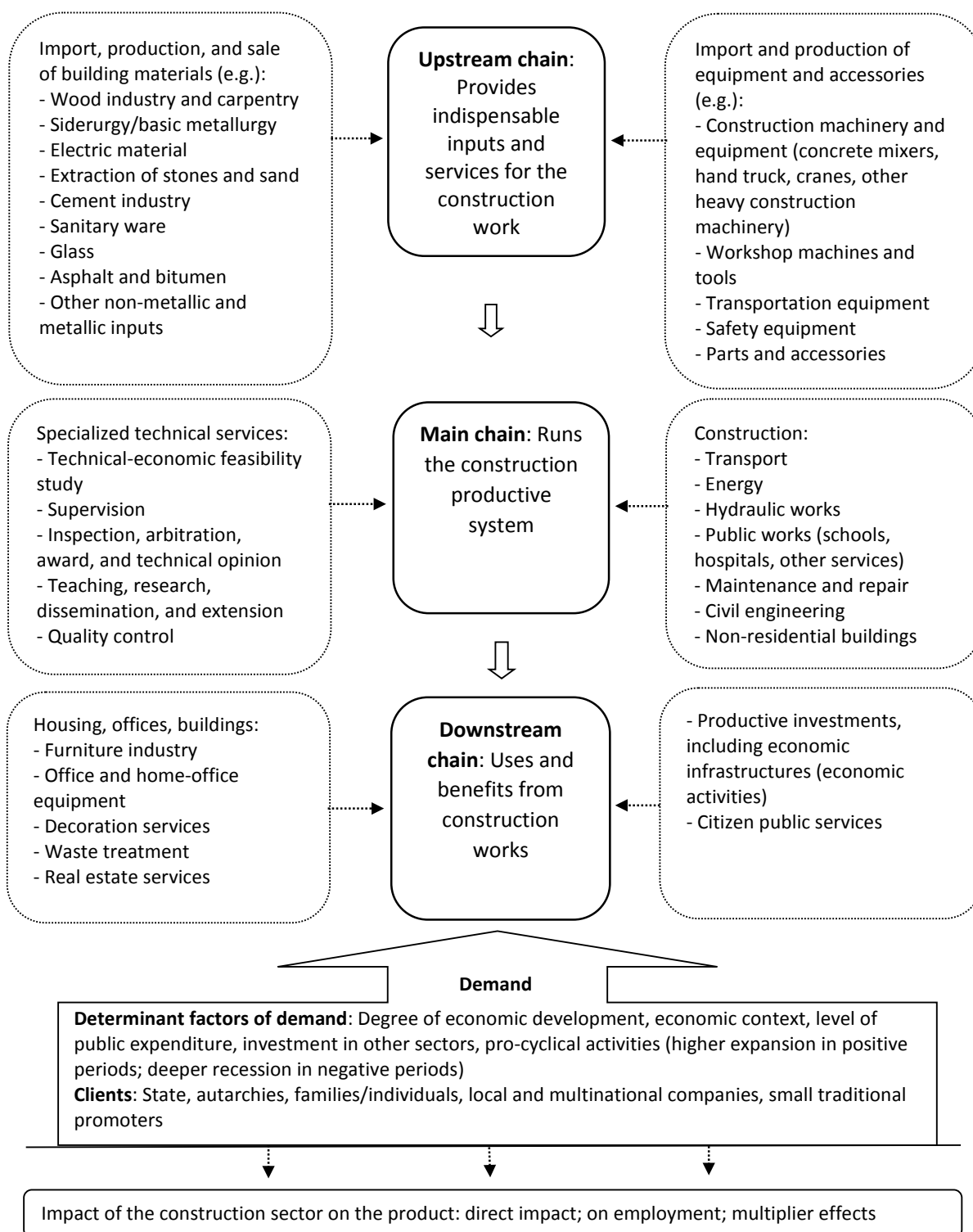
those of global economy in positive phases of the cycle and deeper recessions in negative periods.

- Mozambique presents evidence of a 12.8 per cent average annual growth rate for the construction sector, when the gross domestic product (GDP) was expanding at 7.9 per cent in the period 1993–2014. More recently, construction grew 1.1 per cent in 2016, when GDP growth was decelerating at a rate of 3.8 per cent (INE 2017a).
- In developed countries there is a tendency to reduce the participation of the construction sector in GDP, with greater reliance on maintenance expenditures rather than on new investments. Conversely, in developing countries GDP growth can be accompanied by an over-growth of the construction sector, relying on greater demand for public works and works to support new economic units.
  - As illustrated in sections below, the construction sector has over-grown compared to GDP, in particular in 1993–2014. Although a lower degree of reliance on maintenance expenditures has been a policy trend for developing countries like Mozambique, it is debatable whether this is the best approach, or whether alternative policies would be feasible and might lead to better results.
- Promoting the integration of the construction sector with other sectors is a more effective policy instrument than promoting only direct expenditures on the sector.

Construction sector linkages with other sectors in the economy are shown in Figure 1. These linkages occur in the following stages:

- Upstream: the larger the capacity of building materials and equipment enterprises, the smaller the need to import.
- Main chain: the activity of the construction sector generates employment and creates added value.
- Downstream: the downstream chain comprises companies producing furniture and household and office equipment; supplying energy, water, sanitation, irrigation, and communication services; and providing infrastructure maintenance, decoration, banking, finance, insurance, and legal services. This chain also includes the provision of education, health, and other services to citizens and businesses.

Figure 1: Construction sector production chain



Source: Authors' illustration based on personal experience and Perobelli et al. (2016).

### 3 Overall evolution of the national economy since independence in 1975

After independence in June 1975, Mozambique went through three major transformations with deep implications for the income levels and general living conditions of its citizens. The first transformation was the implementation of a centrally planned economy based on a one-revolutionary-party state, run by Frelimo.<sup>1</sup> In 1976 an armed conflict began with the former Rhodesia and later with the Republic of South Africa, as well as a civil war with Renamo.<sup>2</sup> From 1975 to 1986 GDP per capita declined by 44.4 per cent, with the level of activity in the construction sector declining, as was happening in many other sectors (Sulemane 2002).<sup>3</sup>

The second transformation began in 1987 when the government introduced a structural adjustment programme,<sup>4</sup> moving thus from a centrally planned to a market-oriented economic system. After the end of the civil war in 1992, the first democratic and multiparty elections followed in 1994. In the next two decades, political, economic, and social reforms were implemented, developing and strengthening democratic institutions and mechanisms. GDP grew at an average annual rate of 7.9 per cent from 1993 to 2014 (Figure 2), while general living conditions in the country improved gradually (Arndt et al. 2016; Committee of Counsellors 2013; GoM 2001; IMF 2004; PoM 2005; Ross (2014); Tarp et al. 2002). Construction activity boomed in this period.

The high-growth period was not enough to lift about half of the increasing population out of poverty (Castel-Branco 2012, 2015; Cunguara and Hanlon 2010; Mosca 2014). The poverty headcount index reduced from 69.4 per cent in 1996–97 to 49.2 per cent in 2014–15, but income distribution inequality increased, as indicated by the Gini coefficient, from 0.40 in 1996–97 to 0.47 in 2014–15, with even higher levels of inequality in the larger cities (MEF 2016: 10, 27). From a longer-term perspective, the positive economic and social developments did not yet represent a perceptible structural economic transformation of the country (Cruz and Mafambissa 2016).

From the early 2010s onwards, the policy focus shifted to high-value natural-resource exploitation and to the increase in demand for non-concessional loans for public investment and guaranties. In 2015, the country entered a macroeconomic crisis, mainly due to biased policies, which was aggravated in April 2016 after hidden government debt became known to the public (Francisco 2018; Hanlon 2016; IMF 2016; Wirz and Wernau 2016). At this stage the country had entered the third transformation cycle, with signs of a weaker democratic system. In 2016–17, the annual growth rate of GDP slowed to 3.8–3.7 per cent—close to the annual population growth rate of 3.4 per cent (IMF 2018; INE 2017a, 2018b, 2018c). The construction sector was particularly affected, growing only 1.1 per cent in 2016 (INE 2017a).

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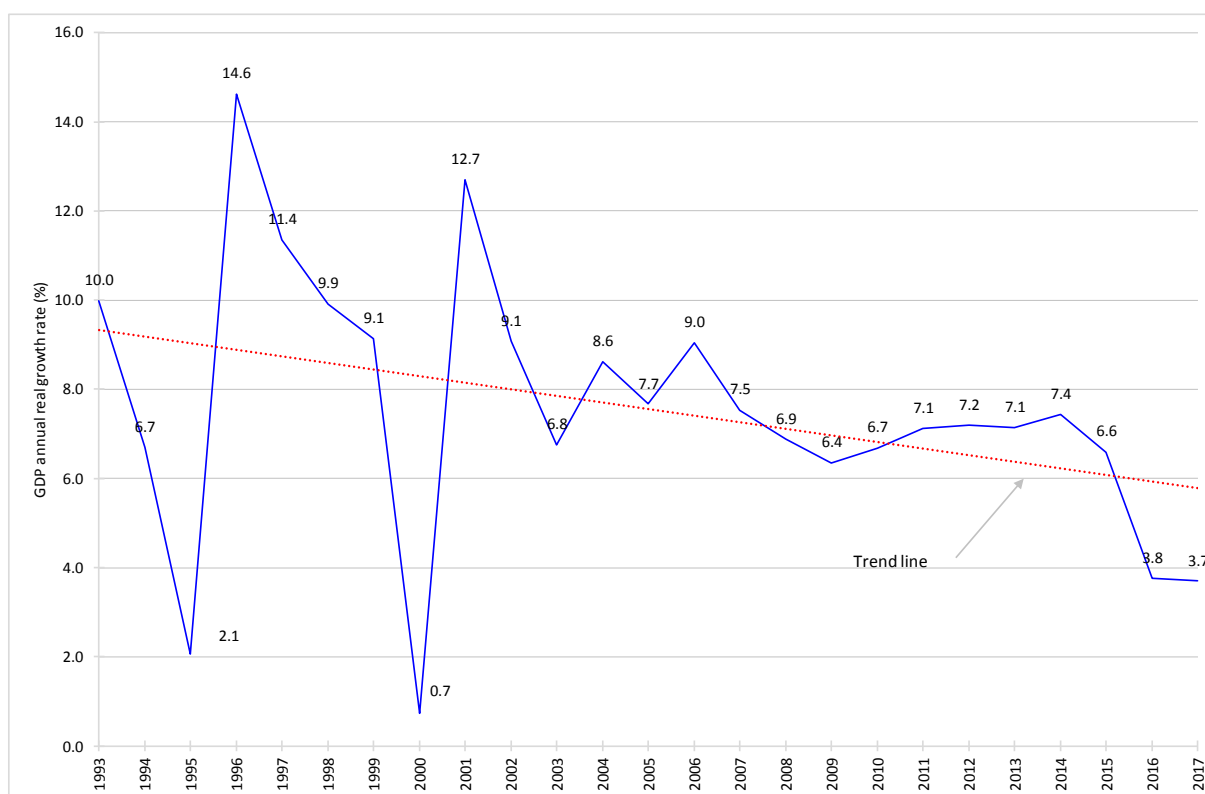
<sup>1</sup> Frelimo is the Frente de Libertação de Moçambique (Mozambique Liberation Front), which has been in power since independence.

<sup>2</sup> Renamo is the Resistência Nacional de Moçambique (Mozambique National Resistance), the armed opposition to Frelimo. It has been the main opposition party in parliament since 1994. The authors consider this armed conflict a civil war (Arndt and Tarp 2017; Cruz and Mafambissa 2016; Oeter 1997; Pereira 2017), even though there is polemic about it in the literature (Coelho 2004; Gersovitz and Kriger 2013; Ghaddar 2016).

<sup>3</sup> The decline of 44.4% refers to GDP/capita in 2003 constant prices.

<sup>4</sup> 'Programa de Reabilitação Económica' (PRE) in the Portuguese language.

Figure 2: High-growth period on average for Mozambique, for about two decades up to 2014



Source: Authors' illustration based on INE (2017a, 2018b).

## 4 Construction sector analysis

### 4.1 Historical background in Mozambique

The construction industry in Mozambique was created in the first half of the 1900s, with the production of cement and bricks (Biggs et al. 1999; Maugeri et al. 2015). The main construction activities were carried out by non-resident Portuguese companies or by foreign consortia of companies. As Portugal had a tradition of good-quality construction, it allowed the skills development of local craftsmen, which was a source of cheap labour.

In 1974–75, the Portuguese left Mozambique. This mass emigration of company owners, managers, and technicians left the network of companies almost deactivated, including construction companies. The Mozambican government took the opportunity to fill those positions with Mozambicans, by creating Management Commissions<sup>5</sup> occupied by the most qualified personnel with support from technicians in the state bureaucracy. This decision allowed the companies to continue their operations, employing thousands of Mozambican workers. Construction companies were under the state supervision of the Public Works Ministry.

From the beginning of the regional conflict with neighbouring countries and the civil war in 1976 until the 1992 peace agreement, the construction market was constrained and localized due to the lack of both security and investment funding. These factors added to the inefficient running of

<sup>5</sup> Comissões Administrativas de Gestão, in the Portuguese language.

state companies, and the restriction of foreign currency imposed by the central bank led to the bankruptcy of many dozens of companies.

After the peace agreement in 1992, the construction sector expanded and contributed to the economic growth in the country. The average share of construction sector value added in total GDP was 2.2 per cent for the entire period of 1993–2016 (Table 1). In 1993 this share was only 1.7 per cent, but it increased gradually afterwards, up to 2.3 per cent in 2015. The high rate of expansion of the construction sector between 1993 and 1998 was due to public investment in replacing infrastructures destroyed during the war, the return of private investment in infrastructures—such as the Maputo–Witbank Highway—and large-scale projects, like the rehabilitation of 1,750 km of energy power lines from Cahora Bassa Hydroelectric (HCB) power plant, feeding South Africa and Zimbabwe at a cost of US\$175 million (Murison 2003; Ross 2014).

Road networks, railways, and electric-energy lines were reopened and rehabilitated. Development corridors linking Mozambique to the hinterland countries of Malawi, Zambia, and Zimbabwe or to hinterland provinces of South Africa were reopened or newly constructed. Family savings gradually increased, allowing for the expansion of own-account construction. The number of construction and building materials companies increased across the country, and in particular in the Maputo province. Production of woodwork, cement, and metal products increased (Cruz et al. 2014).

Table 1: Construction growth was particularly dynamic up to 2015 (%)

	1993–98*	1999–2004*	2005–15*	2016*	1993–2016*
Construction/GDP**	2.8	2.5	1.8	2.1	2.2
Construction value added growth rate***	21.0	6.1	12.0	1.1	12.3

Notes: \* Annual arithmetic average in the column; \*\* based on values at current prices; \*\*\* based on values at constant 2009 prices.

Source: Authors' calculation based on INE (2017a).

Between 1998 and 2004, foreign direct investment (FDI) expanded for new projects: Mozal<sup>6</sup> aluminium smelter in Beluluane, Maputo province, amounting to US\$1.34 billion; and Sasol natural gas exploitation in Temane, Inhambane province, costing US\$400 million (Andersson 2002; Ross 2014: 27, 28, 31). Most of the aluminium output is exported for the international market and the natural gas is sold to South Africa. These projects are intensive in capital, and are loosely integrated in the domestic economy.

After a period of slower growth in 1999–2004, the construction sector accelerated its growth rate again in 2005–15, to 12 per cent. Besides public investments in infrastructures, foreign capital has been directly invested in the Kenmare Heavy Sands project in Moma, Nampula province, since 2004, and in the Rio Tinto/Vale/JSPL/Beacon Hill mineral coal mines in Moatize, Tete province, since 2007. FDI reached US\$592 million in 2008 (Bank of Mozambique 2017). Since 2009, ENI and Anadarko have been investing in projects exploring natural gas in the Rovuma basin, offshore in the north of the country (Ross 2014). FDI reached a maximum value of US\$6.2 billion in 2013, equivalent to 38 per cent of GDP, and then declined to US\$3.1 billion in 2016 (Bank of Mozambique 2017; INE 2017a).

Up to 2014, the government invested in schools, hospitals, roads, railways, ports, communications, and administration services. Economic growth allowed, and was influenced by, the increase in

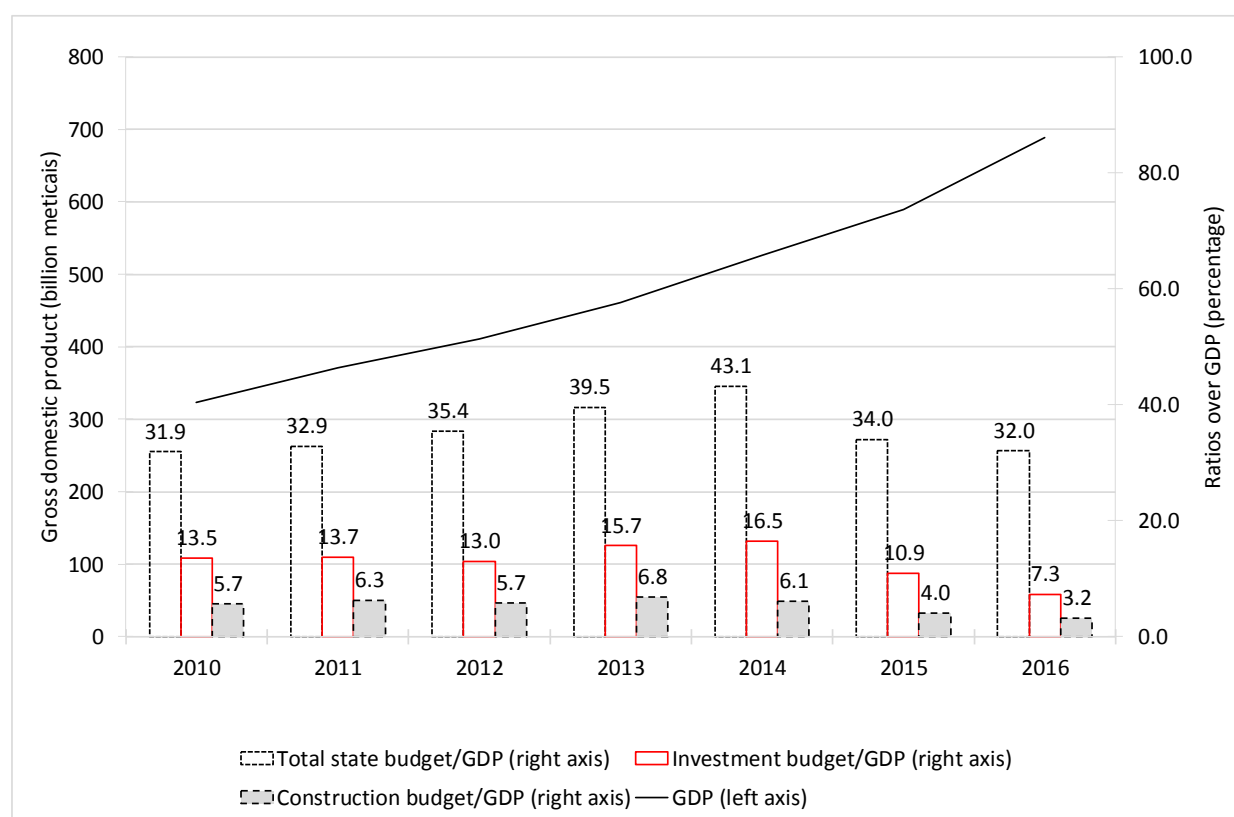
<sup>6</sup> Mozal aluminium smelter construction phase I in 1998–99, expansion phase II in 2002–03.

public investment in infrastructures, contributing to construction activity expansion, in 2010–14 (Table 1; Figure 3). The influence of public investment on the dynamics of the construction sector has previously been documented (Lopes 2007).

Since 2015, Mozambique has faced a particularly unstable macroeconomic environment, in which economic activity has begun to decelerate, with inflation pressures and the sharp depreciation of the metical<sup>7</sup> against the main foreign currencies. The metical/US\$ exchange rate<sup>8</sup> depreciated by 42.6 per cent and 57.7 per cent in 2015 and 2016, respectively (Hanlon 2017). The annual inflation rate rose from 10.6 per cent in 2015 to 23.7 per cent in 2016 (INE 2016, 2017c).

Despite the low GDP growth rate of 3.7 per cent expected in 2017, the macroeconomic situation improved modestly, as the exchange rate of the metical against the US dollar appreciated during the year, and inflation decelerated to a single digit, 5.7 per cent in December 2017 (IMF 2018; INE 2018a, 2018b). Nevertheless, imports are still relatively expensive, and construction companies are facing a depressed market demand for building services. The underlying economic and financial crisis in Mozambique since 2015 has affected the construction sector (Table 1). The state investment budget has been significantly cut, while most of the private sector has held back new investments, thus reducing demand for construction activities (Figure 3). About half of the private contractors are facing pre-bankruptcy, according to the Mozambican Federation of Contractors, in 2018 (FurtherAfrica 2018).

Figure 3: Construction volume in the State Budget is fluctuating, but was increasing up to 2013



<sup>7</sup> The metical (MT) is the Mozambican currency.

<sup>8</sup> This depreciation affected other main exchange rates, namely MT/euro and MT/rand.

Source: Authors' illustration based on GoM (2011–2015, 2016a, 2017).

### *Financing sources for construction projects*

After independence in 1975, the main public infrastructures were built or rehabilitated through State Budget funding. From 1993 onwards, most of the funds came from international aid or international concessional loans. Throughout the past two decades, the contribution of domestic public funds gradually increased as a percentage of the investment State Budget (Ross 2014: 147). Exceptionally, the Maputo–Gauteng Transport Corridor was financed through a public–private partnership in the 1990s.

In the 2000s and 2010s, private funds participated in financing investment in railways which were designed to transport mineral coal from the inland mines to the ocean ports for export (GoM 2014: 26).<sup>9</sup> As of 2010, the government changed its policy and obtained external loans at market interest rates to finance selected public infrastructures (GoM 2014: 9; IMF 2010: 18, 19, 20, 41; Verdade 2010).<sup>10</sup>

### *Structure of companies in the construction sector*

In 2014–15, there were 2,097 construction companies<sup>11</sup> operating in the formal sector in Mozambique, according to the enterprises census (Figure 4). Small companies with fewer than 50 workers represent 81.4 per cent of the total. However, 68.5 per cent of construction workers are employed in large companies. The information on the total number of construction companies in the formal sector varies according to the source, signalling a shortfall in the quality of data publicly available. For instance, Maugeri et al. (2015) report a total number of 2,493 construction companies in the formal sector, based on a Ministry of Public Works, Housing and Hydric Resources (MOPHRH) source. One explanation for this disparity in the total number of formally registered companies could be the difference in classification.

The number and structure of construction companies in the formal sector, classified by activity type in 2014–15, is as follows:

- 1,164 companies (56 per cent) are dedicated to the construction of buildings.
- 680 companies (32 per cent) work on civil engineering, including services to large infrastructure projects, such as highways, roads, bridges, and water transportation networks.
- 253 companies (12 per cent) are specialized in construction activities, including demolition, preparation of construction sites, electric installations, plumbing, air conditioning, carpentry, plasterboard frames, floors, and various finishing services (INE 2017b:14).

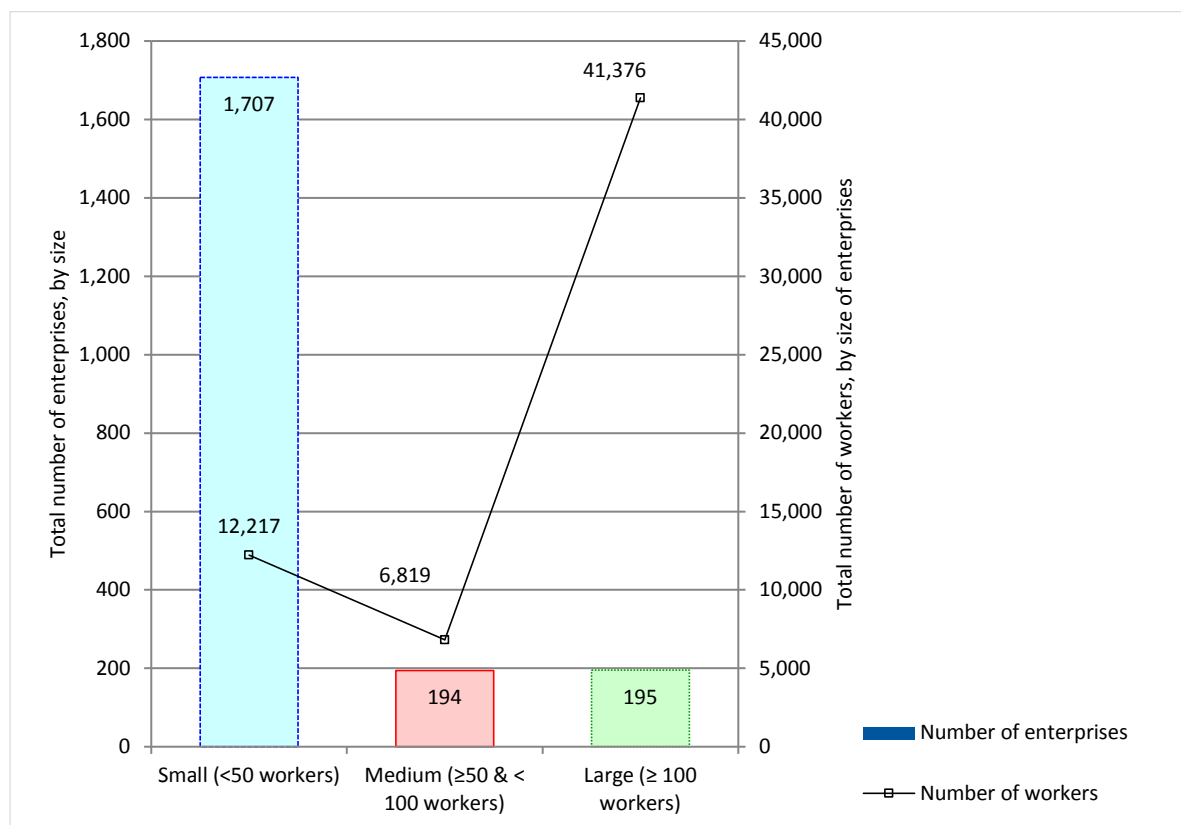
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<sup>9</sup> Mozambique's 'Integrated Investment Plan (Program): Priority Infrastructures for 2014–2017' has information on the dimension of public investments, such as road kilometres and power plants' production capacity, and the total investment cost (GoM 2014: 30, 31, 32).

<sup>10</sup> Before 2010, non-concessional external borrowing was negligible (IMF 2010: 18).

<sup>11</sup> This figure includes all statistical units (enterprises and establishments):  $2,097 = 1,707 + 194 + 195$ .

Figure 4: Formal small construction companies correspond to 81.4 per cent of the total (2014–15)



Source: Authors' illustration based on INE (2017b: 14, 30).

Companies are classified into seven classes according to various criteria. Two relevant classification criteria, 'Maximum value of each work' and 'Minimum equity capital', are reported in Table 2. In 2014, micro and small construction companies—classes 1–3—represented 67 per cent of the total number of construction companies in the formal sector in Mozambique (Table 2).

Table 2: Number and structure of construction companies in the formal sector, 2014

Class	Classification criteria		Rate charged for issuing the permit*	Number of companies (units)	Share of total (%)
	Maximum value of each work (1,000 MT)	Minimum equity capital (1,000 MT)			
1	2,000	20	0.001	126	6
2	3,400	50	0.0008	210	10
3	10,000	150	0.00032	1,069	51
4	20,000	500	0.00030	272	13
5	60,000	1,500	0.00020	189	9
6	200,000	5,000	0.00012	42	2
7	+ 200,000	10,000	0.00018	189	9
<b>Total</b>				<b>2,097</b>	<b>100</b>

Note: \* Applied to the maximum value of each work. The number of companies by class is estimated using the shares given by Maugeri et al. (2015) and applying this to the total of 2,097 construction companies in 2014–15 (INE 2017b). The information in Maugeri et al. (2015) is based on MOPHRH (2014).

Sources: Authors' calculation based on INE (2017b), Maugeri et al. (2015), and MOPHRH (2015).

Most companies are located in Maputo, under classes 1–3 (MOPHRH 2014). The market size and dynamics allowed for a large number of class 1 companies—also considered micro—to operate in Maputo province. Micro companies also operate in large numbers in Sofala and Nampula

provinces. Small companies of classes 2 and 3 are mostly attracted to Maputo city and province. The provinces of Inhambane, Nampula, and Sofala occupy the 2nd, 3rd, and 4th places for these small companies.

### *Institutional features*

Construction companies need to be registered at the Registry Notary<sup>12</sup> in order to develop their activities, presenting documented proof of their technical, economic, and financial capacity (ACIS 2008; MOPHRH 2015; Sutton 2014). They pay a permit fee calculated according to Table 2.

At present, the Unique Registry falls within the competence of the Functional Unit for the Supervision of Acquisitions, which creates and maintains the Unique Registry of Contractors of Public Works, Suppliers of Goods and Service Providers, as well as providing instructions for the use, maintenance, and updating of the Unique Registry, including by electronic means (GoM 2016b: clause 4). These contractors are eligible to participate in contracting by the state.

National companies benefit from a preferential margin of 10 per cent of the value of the contract, without taxes, for public works contracts and service-rendering on public works tenders (GoM 2016b: clause 28).

In order to follow up on contract compliance regarding works, as well as the provision of goods and services, for state institutions, a National Council for Construction is currently being set up. This advisory body will aim to improve contracts and the quality of works, and to promote the participation of national contractors and technicians in large infrastructure projects.

Given the size of the public budget involved, a Roads Fund (FE) was created to manage public funds used to finance the construction and rehabilitation of roads and bridges. The FE operates with funds from international institutions (e.g. World Bank and African Development Bank) and other countries (e.g. European countries, USA, Canada, Japan), and public funds from Mozambique. This pool of funds finances the activities of the National Roads Administration (ANE), which is in charge of managing investment projects.

## **4.2 Building materials sector**

In Mozambique, there are 184 companies operating in the formal building materials sector (MOPHRH 2014). This is a limited number of enterprises, given the size and dynamics of the construction industry. Only a few subsectors have scale economies, such as the cement companies. Most companies operate in areas with a large volume of activities, and a smaller number operate in fragmented and regional markets. There is a possibility that the number of companies is small due to the existence of other companies operating in the informal sector.

The number and structure of building materials companies in the country, classified by size, are shown in Table 3. As the data displayed in the table reveal, the building materials industry is skewed towards micro and small firms compared to the construction industry. In the latter, one-third of companies belong to class 4 or higher, which are medium and large companies. Conversely, 9 per cent of the companies are medium and large in the building materials industry. It is likely that micro and small companies tend to become informal, in order to survive financially.

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<sup>12</sup> Companies need to request permission to operate from MOPHRH. The permission—*Alvará*—should be granted by the Registration Committee. In Maputo city, the Registry Notary is called CREL.

Table 3: Number and structure of building materials companies

Size	Share of total (%)	Estimated number of companies
Micro (1–9 full-time workers)	57.61	106
Small (10–49 full-time workers)	33.15	61
Medium (50–299 full-time workers)	7.07	13
Large (300 or more full-time workers)	2.17	4

Source: Authors' calculation based on MOPHRH (2014).

The latest data<sup>13</sup> from MOPHRH indicate three structural features of the construction sector in Mozambique:

- First, most of the companies operating in the construction and building materials industries are micro, small, and medium. Due to their size and level of experience, it is hard for these companies to compete with international companies from South Africa, Portugal, or China.
- Second, the building materials companies face strong competition from imported materials.
- Third, there is a high concentration of construction companies in Maputo province, while building materials companies are strongly represented in Sofala and Nampula. One hypothesis is that the latter can better compete with imports from South Africa, due to transportation costs to the centre and north of the country. Moreover, in these parts of the country there are relatively fewer companies in the formal sector.

### 4.3 Construction sector value chain

The value chain in the construction sector is complex, and imposes a significant cost on this industry. In order for the sector to develop, it would be necessary for upstream and downstream activities to operate in a synchronized way:

- About 15 per cent of the upstream value chain<sup>14</sup> is produced in Mozambique, which includes the wood industry and carpentry, producing floors, frames, doors, and windows; the ceramic industry, producing tiles, roof tiles, and tubing; the cement industry; and the extraction of stones and sand.
- All other upstream components are produced outside the country and are imported, accounting for about 85 per cent of total upstream products. These other products are basic metals, ironmongery, pipes and fittings, sanitary ware, glass, electrical material, fuels, asphalts, bitumen, and other metallic and non-metallic inputs.

The main upstream value chain includes specialized technical services, such as studies and projects, inspection, surveys, laboratory tests, and quality control. For current projects, these services are 100 per cent supplied in the country. But for large projects such as large bridges, dams, or special buildings, these services have to be imported. The downstream value-chain activities are mentioned in Figure 1, above.

The importance of knowing the value chain lies in the fact that public policies and strategies can be formulated to encourage local production upstream, mainstream construction, and, sometimes,

<sup>13</sup> Information based on interviews with officials from MOPHRH and working reports, in 2017–18.

<sup>14</sup> Information based on interviews with officials from MOPHRH and working reports, in 2017–18.

the national economy. The next section provides an analysis of the production costs, bottlenecks, and potential.

#### 4.4 Construction costs, household income levels, and procurement issues

Among various construction costs, this study focuses on a selected few as follows:

- housing—representing private construction costs;
- hospitals—public;
- boreholes—rural living conditions;
- roads—public, and transaction costs in the economy.

**Housing** construction and financing is related to household income levels. Based on available information from 2014 to 2015, Table 4 shows the household income distribution as a share of total population.

Table 4: Household income distribution as a share of total population

Household monthly income level (US\$)	Percentage of total population (2014–15)
Up to \$150 (low income)	90.01
\$150–500 (low-middle)	8.75
\$500–1,000 (high-middle)	0.87
More than \$1,000 (high)	0.37

Note: This income estimation is based on average household expenditure on consumption. Therefore, it may represent an underestimation of income levels.

Source: Authors' calculation based on Salvucci (2018); the original income distribution classification comes from Allen and Johnsen (2008: 15).

The FinMark Trust considers that formal bank credit benefits only the high-income group in the cities in Mozambique (Allen and Johnsen 2008). The Housing Promotion Fund (FFH) and microfinance institutions provide limited credit for a small share of households across different income levels.

Households in the low-income group in rural areas and in the cities build their own houses, mostly from local building materials. This construction can also be developed by informal building companies. The construction cost of this type of housing is relatively low compared with the cost in the formal construction sector. An international comparison indicates that in Mozambique there was a house-roofing improvement of about 20 per cent, against about 10 per cent in Tanzania and much lower results in Zambia and Nigeria, between the mid-1990s and the mid-2010s (MEF 2016: 81).

Table 5: Proportion of households benefiting from housing quality facilities

Housing facilities	IAF 2002–03 (% households)*	IOF 2008–09 (% households)
Durable roofing	25.8	30.2
Durable walls	14.2	17.9
Electric lighting	6.9	13.3
Toilet/latrine	11.2	16.0

Notes: Percentage of households out of total number of households at national level. IAF: 'household survey'; IOF: 'household budget survey'. IAF is also a household budget survey.

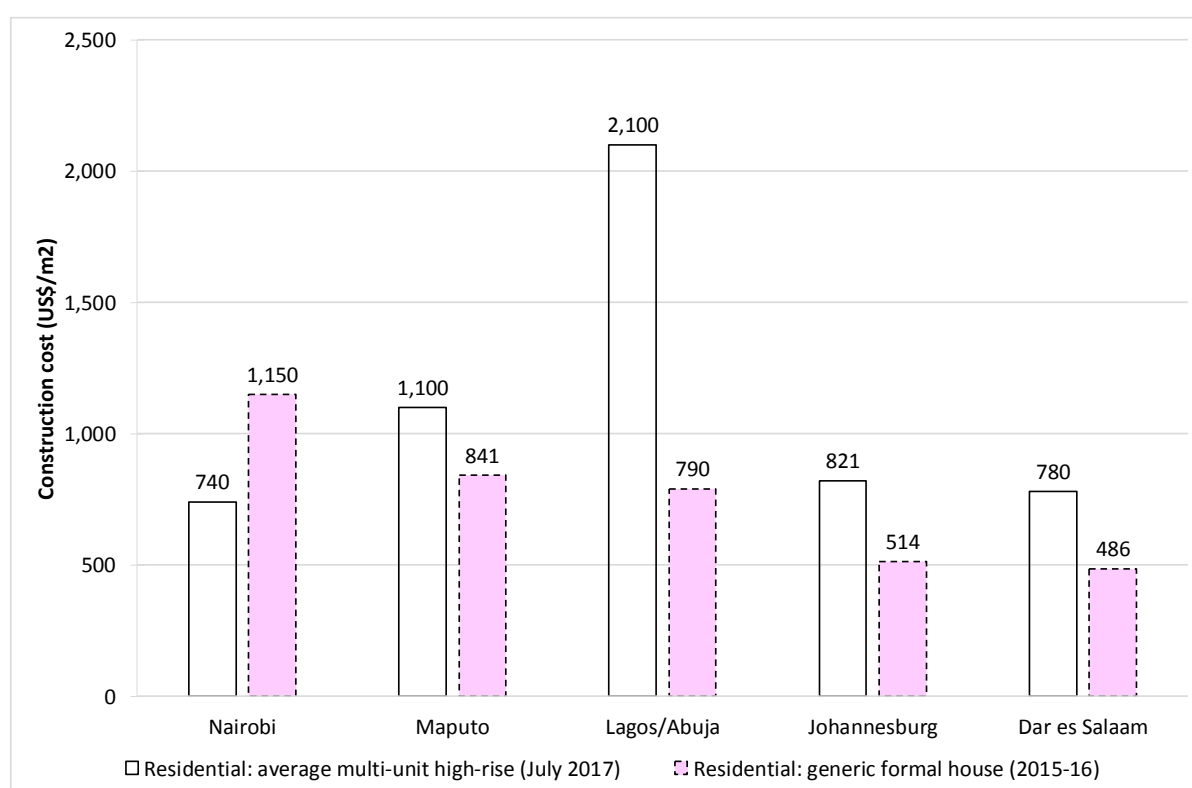
Source: Authors' calculation based on Arndt et al. (2016).

The indicators shown in Table 5 demonstrate that the proportion of households in Mozambique that benefited from housing quality facilities between 2002–03 and 2008–09 represents an improvement also for lower-income families (Arndt et al. 2016).

Regarding formal-sector housing construction, an international comparison reveals that construction costs tend to be 34 per cent to 73 per cent higher in Maputo than in the closest neighbouring countries' major cities, Johannesburg and Dar es Salaam (Figure 5). In July 2017, a district **hospital** construction in Maputo city cost US\$2,500/m<sup>2</sup>, which was 34 per cent higher than in Johannesburg, and was even 72 per cent higher than in Shanghai, China (AECOM 2017).

Construction costs in Maputo are high due to the costs of importing building materials, machinery, and equipment. Compliance costs (mainly engineers' fees and plan-drafting fees), marketing, finance, and holding costs are also particularly high in Maputo (CAHF 2017).

Figure 5: Formal housing construction costs are higher in Maputo than in neighbouring cities



Notes: The methodology and sources of information used to estimate construction costs are not provided in AECOM (2017). The website [www.aas.org](http://www.aas.org) contains additional information. The 'generic formal house' is a 46 m<sup>2</sup> house plus a 9 m<sup>2</sup> balcony (total 55 m<sup>2</sup>) (CAHF 2017).

Source: Authors' illustration based on AECOM (2017) and CAHF (2017).

In 2009, the average cost of constructing a positive **water point (borehole)** in Mozambique was US\$8,981, including supervision for a depth of up to 43 metres (UNICEF 2011). In 2008, the average cost of constructing a negative borehole was US\$13,032.<sup>15</sup> UNICEF considered that construction costs in Mozambique were comparable to those in other countries, except for the

<sup>15</sup> MCA (2013) and WASHCost (2011) present similar costs. A negative borehole is a 'non-productive' one, i.e., 'dry, low yield or saline' (UNICEF 2017).

cost of pumps, which were more expensive in Mozambique. Danert et al. (2009) provide information on prices or costs,<sup>16</sup> but in some cases do not indicate the depth of the well:

- Kenya: US\$8,400 for a 70-metre-deep well, in 1996;
- Niger: US\$10,000 for a 60-metre-deep well, in 2005;
- Nigeria: US\$11,700 for a 60-metre-deep well, in 2006.

The World Bank (2005: 83) considered that sinking a borehole with a handpump cost:

- US\$10,000 per borehole: Mozambique,
- US\$5,000–7,000 per borehole: Malawi, Tanzania, Zambia, and Ghana.

**Road** construction requires quite detailed specification to allow a meaningful comparison of costs. For instance, it would be hard to compare the average unit cost of \$751/km for asphalt overlays for three roads—in Cabo-Delgado, Niassa, and Zambézia provinces—in Mozambique for the period 2014–16 with the unit cost of \$110/km in Tanzania or \$33/km in the Dominican Republic for asphalt overlays of 40–59 mm in the years 1996–98, since these are two different road types (Collier et al. 2013; MPD 2014).

Alexeeva et al. (2008) provide a useful international basis for comparison. With an average unit cost of \$278.7/km (2007 dollars), Mozambique was the third-least expensive country among seven African countries for two-lane inter-urban road rehabilitation and reconstruction. Congo (DRC) was the least expensive country at \$228.9/km, and Kenya the most expensive at \$955.8/km. Mozambique has high maintenance costs: the average maintenance cost per km of a two-lane inter-urban road was \$197.1/km in Mozambique, against \$87.9/km in Zambia.

From the same paper (Alexeeva et al. 2008), the average unit cost of asphalt concrete in Mozambique was \$154.4/m<sup>3</sup>, while it was \$182.8/m<sup>3</sup> in Tanzania. Portland cement concrete cost \$160.6/m<sup>3</sup> in Mozambique and \$177.8/m<sup>3</sup> in Tanzania. When using a regression model to try to identify factors<sup>17</sup> explaining the unit costs, the ‘government index’—measuring corruption levels—influences the cost of asphalt concrete, and the ‘corruption perceptions index’ from Transparency International also influences both activities. In other words, the higher the corruption levels, the higher the unit cost. Average cost overruns for Mozambique were 18.6 per cent, compared with the lowest-cost country, Congo (DRC), with 12 per cent, and the highest-cost country, Nigeria, with 39.7 per cent.

Collier et al. (2013) also attempt to explain factors—or drivers—influencing road construction unit costs among different countries in the world, and measure the relationship between changes in the drivers and percentage change in the unit costs. These factors are listed here, since they seem to be relevant to Mozambique. In summary, unit costs are higher where there is:

- a higher level of corruption;
- more rugged terrain;
- a longer distance to markets;
- a higher level of country conflict;

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<sup>16</sup> Danert et al. (2009: 2) mention the difference between price and cost: price = ‘cost + overheads, taxes, profit and a margin for risk (e.g. dry holes, payment delays, insecurity and breakdown)’. For the examples provided, it is not always clear if the authors are referring to cost or price (WASHCost 2011).

<sup>17</sup> Alexeeva et al. (2008) discuss other factors which are not mentioned here, such as GDP/capita and fuel prices.

- weaker public investment capacity;
- a poorer business environment;
- worse infrastructure quality.

Measures to reduce corruption levels may shift the focus, but may not change the overall trend. For instance, auditing construction projects with regard to the content of cement or clay might lead to an increase in job positions within the projects for family members of officials. When governments implement transparency initiatives by publishing unit costs in order to prevent overpaying, firms tend to collude, creating cartels. This would also increase unit costs.

Examining ‘red flags’,<sup>18</sup> Mozambique presents the highest number among 12 African countries (Alexeeva et al. 2008).<sup>19</sup> The highest-frequency red flags for Mozambique are:

- ‘delay in completion more than 30% of the contract duration period’ (time overrun);
- ‘half or more firms buying bidding documents don’t bid’;
- ‘contract value more than 20% higher than estimate’;
- ‘difference between contract price and read-out bid price is > 10%’.

Concluding from the literature review on construction costs:

- It is necessary to improve the quality of public information on input statistics, outputs, technical specifications, costs, market prices in Mozambique, and reliable international comparisons.
- Expansion and improvement in housing construction has occurred at all levels of household income. The informal sector seems to supply lower-income housing. Banking and formal-sector credit mostly benefit the smaller group at the top income level.
- Construction costs for formal-sector housing and public buildings tend to be higher than in neighbouring countries. One of the factors is the high import cost of machinery, equipment, intermediate materials, and specialized services.
- Road construction costs in Mozambique are about average compared with the costs for other African countries. However, maintenance costs are relatively high.
- There is a need to improve the business environment such that private companies can operate without fear of arbitrary penalties (Berkel et al. 2018).

## 5 Construction sector: bottlenecks and recommendations

The construction industry has great potential to act as a catalyst for comprehensive growth, job creation, capital formation, absorption, and technological development. But despite its potential for promoting structural transformation and economic development, the industry faces institutional barriers, among others, which appear to remain the biggest obstacle to its growth.

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<sup>18</sup> Red flags are ‘alert indicators of the potential entry points of corrupt activities in the procurement of road sector projects’ (Alexeeva et al. 2008).

<sup>19</sup> The countries examined were Congo (DRC), Congo, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Tanzania, Uganda, and Zambia. These comparisons could be more reliable considering that even in industrialized countries there are high-value public infrastructures, with longer delays and much higher construction costs than the original estimate.

Based on a ‘strengths/weaknesses and opportunities/threats’ (SWOT) analysis<sup>20</sup> for the construction sector in Mozambique, a set of recommendations is presented below, following an illustration of such analysis.<sup>21</sup>

- Issue: Labour force
  - Weaknesses:
    - lack of qualified personnel in companies, at various levels: manual worker, technician, and manager;
    - lack of formal training, training programmes, and on-the-job training.
  - Opportunities:
    - expansion of university education in the areas of engineering and management.
  - Threats:
    - inflow of foreign labour, with high costs, in the context of lack of training for locals;
    - technical and professional education still does not respond to demand in quantity and quality.

Following the identification of bottlenecks which the construction sector is facing, the playing field in this sector can be improved through a set of policy measures, such as:

- A. Improvement of the state’s organizational, technical, and human capacity to apply regulations and fight against corruption; and its supervision regarding, for instance, the licensing of the activity, licensing of works, conducting of tenders, importing of goods and services, and land use management:
  - i. improving the quality of tender documents, with clear rules on the criteria for qualification of tenderers and their tenders, such that ministries and UFSA<sup>22</sup> ensure that existing inspection systems are applied and that permanent improvements are introduced—considering grading technical proposals with more than 30 per cent weight over global evaluation score;
  - ii. introducing up-to-date and efficient land registry systems, approving master and detailed plans, and reserving 30 to 40 ha of state land for future priority investments for each structure plan;
  - iii. significantly improving surveillance systems<sup>23</sup> at all stages of the land allocation process—Land Use and Exploitation Rights (DUATs) or building permits;
  - iv. creation by the state of appropriate legislation that allows banks to consider land as a guarantee in transactions, for example by deepening the concept of capital gains and infrastructure improvements on the land.
- B. Establishment of clear policies and strategies to boost and develop the national construction industry and reduce the degree of dependence of the construction sector on the use of external inputs:
  - i. promoting policies and incentives to increase integration in the construction sector (national building materials and equipment industry, technical engineering services, construction services, public and private investments, and financing);

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<sup>20</sup> The SWOT analysis is based on authors’ experience and interviews with MOPRH personnel in 2017–18.

<sup>21</sup> This paper does not present a SWOT table.

<sup>22</sup> UFSA = Unidade Funcional de Supervisão de Aquisições (Functional Acquisition Supervision Unit).

<sup>23</sup> Considering the example of the Millennium Challenge Account programme in Mozambique.

- ii. continuing to improve the institutional rules and mechanisms for prioritizing and programming public investments, which have been published in the ‘Integrated Investment Plan (Program)’;
  - iii. systematically including a provision for public infrastructure maintenance in the State Budget,
  - iv. technical solutions and technologies for the use of available local materials, and innovation for the processing of local raw materials available in the building materials industry;
  - v. establishing common programmes involving the organization of entrepreneurs, socio-occupational organizations, and partners for the national development of the sector;
  - vi. tracking late payments by the state in construction contracts and taking policy measures for prevention and penalization;
  - vii. ensuring that the recent VAT refund measures are carried out efficiently, foreseeing penalties for cases of negligence or corruption;
  - viii. establishing more favourable agreements regarding the use of external financing rules.
- C. Promoting the acquisition of technologies and technical means as well as the technical quality of work, in order to obtain greater efficiency and higher productivity in the sector and allow for greater competitiveness:
- i. ensuring technology transfer and technical training through partnerships with external companies;
  - ii. state investments in research into technologies and building materials appropriate to the country’s conditions;
  - iii. developing sustainable business financing mechanisms, through public funds or concessional credit, while considering that this would be a temporary policy;
  - iv. better-qualified intervention by associations of entrepreneurs and socio-professional associations, for capacity building and certification of companies and professional technical careers;
  - v. promotion of qualification and retraining courses at all levels.

## 6 Conclusion

Since 1993, the construction sector in Mozambique has played a mixed role in GDP growth, improvement of living conditions, and structural transformation. The share of its value added over GDP increased from 1.7 per cent in 1993 to 2.3 per cent in 2015. The construction sector value added grew at an average annual rate of 12.8 per cent in 1993–2015, well above the GDP growth average of 7.9 per cent.

From a qualitative point of view, this sector has contributed to long-term economic expansion, and to the creation of basic infrastructures by improving the health and education conditions for families and communities. Housing construction has been growing and its quality has been improving since 1993. Transportation and communications infrastructures have also been improving. Buildings for private businesses, government, and other not-for-profit services have been expanding and improving in quality.

Construction sector and building materials companies have been growing, with a learning-by-doing process in various construction industry skills for the national labour force.

However, significant challenges remain in terms of social and economic analysis for prioritizing and programming public investment projects; the analysis of investment projects and their impacts on agricultural, fisheries, manufacturing, and other services; supervising and improving the quality of infrastructure investments; creating a provision for public infrastructure maintenance in the State Budget; focusing on investing in training and its quality; and improving the provision of public information on input statistics, outputs, costs, and prices for domestic construction activities and reliable international comparisons.

Mozambican construction companies have not yet reached the stage of diversified and sustainable development that would enable them to weather the down-turn of the business cycle. They have not been able, so far, to compete with other big international construction companies on large infrastructure projects. The business environment in the country is not yet conducive to the expansion of the formal sector to include larger numbers of micro, small, and medium companies, hence the need to reduce unnecessary interference and costs.

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