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Towards industrialising society by 2025: why national competitiveness matters

Fostering regional industrialisation through backward linkages from the extractive sector: the case of the capital equipment sector in Mozambique and South Africa

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Abstract

Linkages with the extractive sector can be strengthened by developing manufacturing capabilities in the capital equipment sector in the SADC region, particularly because of the large scope for developing strong complementarities between mining, construction and rail infrastructure and agriculture. Yet, capital-intensive economies such as Mozambique and South Africa have failed to diversify out of the core base within the minerals-energy complex and are experiencing de-industrialisation albeit with differing dynamics. On the one hand, Mozambique increased demand derived from capital-intensive mega projects has been met largely through imports due to weak and narrow productive capabilities. On the other hand, South Africa's capital equipment sector, which is an example of strong backward linkages from the mining industry, is losing capabilities and competitiveness. It is within this context that through a combination of primary and secondary research, the paper examines how trade and investment linkages in capital equipment and related industries in and between South Africa and Mozambique have evolved and can be further developed for industrialisation. This study argues that there is a need for a collaborative approach to regional industrial development and policy that is structured not just around expanded market opportunities but fundamentally on developing local manufacturing capabilities and competitiveness across the region.

JEL classification: L52, L64, 014

Key words: capital equipment, mega projects, manufacturing, regional industrialisation

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1. Introduction

Industrial competitiveness is essentially the capacity of countries to increase their presence in international and domestic markets whilst developing industrial sectors and activities with higher value added and technological content (Lall, 2001; UNIDO, 2013, 2002). Thus, a crucial driver of national competitiveness is manufacturing development and its ability to multiply productive linkages within the economy. Yet, the idea of fostering manufacturing development as means of achieving broad-based economic development has been marginalized over the past three decades, as shown by the on-going process of premature de-industrialisation in the continent. For instance, growth in the Southern Africa Development Community (SADC) has been largely driven by mining and other resource related activities with weak diversification towards manufacturing activities. Indeed, the average manufacturing value-added (MVA) as share of gross domestic product (GDP) in the region has been gradually declining from 17,4% in 1990 to 12,7% in 2015 (WDI, 2018). Nevertheless, there are still significant differences in terms of manufacturing capabilities development within the region, which offers a potential for intra-regional collaboration in a perspective of regional industrialisation.

South Africa and Mozambique, in particular, have failed to build industrial competitiveness out of the core base within the mineral-energy complex (MEC), and present different patterns of premature de-industrialisation. On the one hand, Mozambique has weak and narrow productive, investment and technological capacities such that increased demand due to capital-intensive mega projects has been met largely through imports. On the other hand, South Africa's capital equipment sector, which is an example of strong backward linkages from the mining industry, is losing capabilities due to declining demand from domestic and regional mining activities. Interestingly, over the past two decades, economic linkages between South Africa and Mozambique have been centred on trade and investment relations, with growing linkages around capital equipment and related products given the capital-intensive nature of growth in Mozambique. Thus, the sector present an opportunity for the collective development of capabilities for trade, regional industrialisation and capability development, with strong complementarities between mining, construction and rail infrastructure and agriculture.

Therefore, within a context of regional industrialisation with the capital equipment being of high importance for both countries and drawing from the linkages-agency theoretical framework, this paper intends to investigate how can capabilities and competitiveness in capital equipment and related industries be maintained and further developed in South Africa and Mozambique. Empirical research was primarily based on interview data collected using semi-structured questionnaires in South Africa (Gauteng Province) and Mozambique (Maputo Province) covering 30 interviewees, including capital equipment manufacturing firms and related services providers, large buyers, industry councils, private sector associations, government departments and development agencies, training institutions and donors. The criteria to identify firms comprised of four factors: (i) capital equipment firms that are present in both South Africa and Mozambique to assist in revealing any differences in dynamics in the two countries and how this impacts capability accumulation and therefore regional industrialisation; (ii) South African capital equipment firms exporting to Mozambique or the region; (iii) megaprojects i.e. large buyers of capital equipment goods or related services in Mozambique; and (iv) capital equipment and related services firms currently supplying or providing services to megaprojects and those that supplied mega projects at some point but the linkage was later interrupted. These were further supplemented with quantitative data

collected from secondary sources including government central statistical offices, international organisations and other data sources.

The rest of the paper is organised as follows. Section 2 presents the linkage-agency theoretical framework used for understanding industrial development and the accumulation of capabilities within a context that is both local and regional. Section 3 considers industrial development in Mozambique and South Africa and explores how linkages in the capital equipment sector have evolved between the two countries. Section 4 presents the empirical findings emerging from the research and section 5 provides conclusions and policy recommendations.

2. Industrial-led structural change and the linkage-agency approach

Economic development is about building industrial competitiveness spearheaded by the expansion of manufacturing. This has been the experience of both the early and late industrialisers (Amsden 1989, 2001; Chang, 2002). Industrıal development is best understood as the process of sectoral re-composition of an economic system through inter-sectoral transition (i.e. moving across sectors, from low to medium and high productivity sectors) and of intra-sectoral deepening (i.e. moving within sectors, from low to high value added sub-sectors), and thus, it includes underlying transformation of its productive and technological structures as well as demand composition (Andreoni and Scazzieri, 2014; Chenery, Robinson and Syrquin, 1986; Landesmann and Scazzieri, 1990; Pasinetti, 1981). Hence, at the core of economic development is a diversification often based on linkages towards more sophisticated, higher productivity, higher value-added products within a sector and moving towards higher productivity sectors.

A linkage exists whenever an ongoing activity gives rise to economic or other pressures that lead to the taking up of a new activity (Sender and Smith, 1986). The linkages identified in the economic literature over the years include those arising directly from the production (backward, forward and sideways linkages), consumption or demand, but also from infrastructural externalities, lateral migration of technologies and fiscal revenues, (Hirschman 1958; 1981; 1992; Mtegha et al., 2012; Walker and Jourdan, 2003).

Some countries have been more successful ensuring that linkages materialise than others and this is tied to the mechanisms that are employed, or the agency. The interplay between linkages and agency (not necessarily the state) determines the system of accumulation of economies which in turn shapes the structure of the economy (Fine and Rustomjee, 1996). A system of accumulation can be understood as a core set of industrial sectors with strong linkages with one another while having relatively weaker linkages with other sectors (Ashman, et al 2013). These core sectors are located in relation to the state, finance, class relations and value creation.

In other words, success and failure in building industrial competitiveness have been determined by the combination of different institutional arrangements and policies and how they affect the learning process of firms and organisations, as shown by the experience of Japan for example (Dasgupta and Singh, 2006). Japan protected its industries from import competition but complemented this with a pattern of fierce oligopolistic competition between the Japanese firms to guard against collusive or monopolistic prices and as a result nurtured

technological dynamism. On the contrary, in Latin America, industrial policy failed to ensure that the rents were used productively and instead they were channelled to entrench market power with limited or no conditionalities, which resulted in poor outcomes. In the African context, Ethiopia has recently emerged as a successful case of industrial policy implementation to promote technological learning to boost exports (UNECA, 2016). Rapid growth in exports was associated with the adoption of a strategy linking foreign investment with the provision of incentives, technical support, finance, infrastructure and large-scale manufacturing investments through state-owned enterprises, development banks and agencies (Oqubay, 2015; Abebe & Schaefer, 2015).

In the case of South Africa and Mozambique, both economies have failed to diversify out of the core base within the MEC, and this structure of production remains critical to understanding poor growth and enduring levels of unemployment. Productive activity within the MEC tends to be capital intensive and the weaknesses of linkages between the core and other productive sectors means that its expansion has fewer multiplier effects (Ashman et al, 2013). The challenge of diversification of these economies requires concerted effort and the agency of the states. Therefore, this research will seek to understand the dynamics and tensions emerging from the interaction between linkages and agencies and their relationships with capability development in a context that is both local and regional.

Indeed the challenge for most African countries has been how to develop on the basis of linkages to the mineral wealth of the continent. In this regard, studies in selected resource rich countries in Africa have found that local content policies can have a great impact on linkage development, giving great importance to production as well as lateral migration linkages (Morris, Kaplinsky and Kaplan, 2011)[2]. Cases such as of Botswana in diamonds, Nigeria in oil, and Gabon in timber show that local content policies can facilitate linkage deepening or acceleration (Mbayi, 2011; Oyejide and Adewuyi, 2011; and Terheggen, 2011). However, there are instances where poorly focused or implemented government intervention has led to a slow down or shallower linkages. Thus the research will also consider how local procurement and localisation policy initiatives have facilitated development through linkages in the capital equipment sector.

Capability dynamics within an economy are linked to the structural change dynamics that manifest (Andreoni, 2013) and are critical for both sectoral transitioning and deepening. While there are multiple understandings of capabilities in economic literature such as Lall (1992) technological capability matrix that comprised of investment, productive and linkage capabilities, and Bell and Pavitt (1993) differentiation between static capabilities (those required to produce goods at a given level of efficiency) and dynamic capabilities (those required to absorb, adapt and change processes and techniques), a more useful approach is to consider these concepts together as they need to work together in order to produce the desired outcome of firms' competitiveness.

[2]The paper studied South Africa, Zambia, Botswana, Nigeria, Ghana, Angola, Tanzania, and Mozambique.

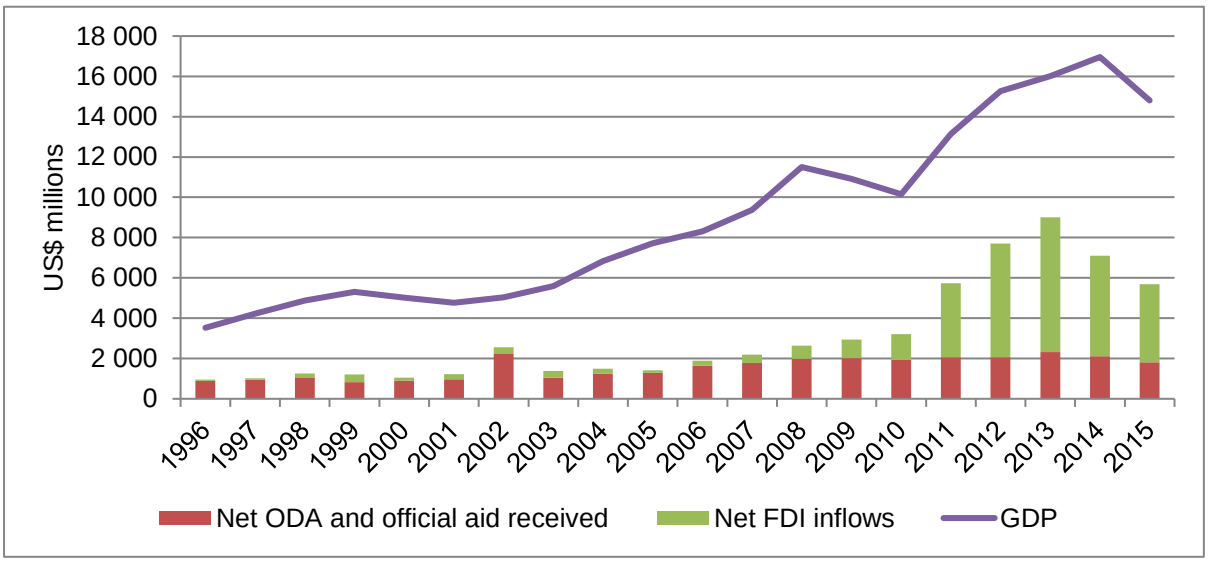
3. Industrial Development and patterns of integration between South Africa and Mozambique

Industrial development patterns in Mozambique and South Africa outline the importance of capital-intensive mega projects for the Mozambican economy and the need for developing productive and technological capabilities, while also noting the importance of machinery and equipment as a diversified sector for South Africa's export basket. This section highlights that with growing trade linkages around capital equipment and related products South African capabilities in this sector can be maintained and used to develop productive capabilities of Mozambican firms in order to establish linkages with the FDI megaprojects.

3.1 Industrial Development in Mozambique

For most part of the last two decades, GDP in Mozambique has been growing at an average rate of nearly 8% a year, placing Mozambique among the fastest-growing economies in Africa (Radelet, 2010). At the core of rapid economic growth have been increasing levels of official development assistance (ODA) and foreign direct investment (FDI), in the form of export-oriented megaprojects (Figure 1). In particular, the discoveries of vast coal and gas reserves in the centre and north of Mozambique, respectively, resulted in an FDI boom between 2010 and 2013, with investments being made in extraction and support infrastructure (railways, ports and roads).Yet, falling commodity prices since 2014 coupled with the freezing of ODA due to massive debt incurred by the government triggered a deep macroeconomic crisis, as shown by the steep decline in FDI flows and consequently GDP in 2014 and 2015.

Figure 1: Evolution of ODA, FDI and GDP in Mozambique

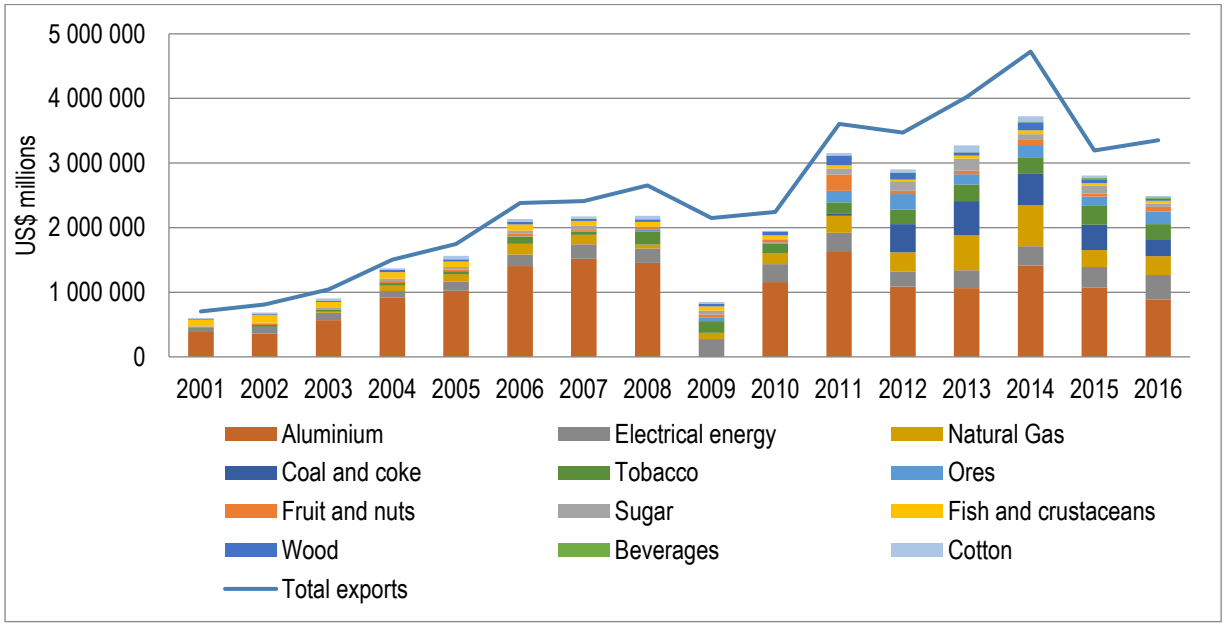


Source: World Development Indicators

Export orientation of FDI megaprojects in Mozambique means that the export basket of the economy shows high dependence on a few natural resource-based goods with particular dominance of the MEC (aluminium, gas, coal, electrical energy and ores), forming the core of the system of accumulation in Mozambique, followed by few agricultural commodities (sugar, cotton, fruits, nuts and wood) (Figure 2). In turn, MVA growth has only been significant when large FDI projects started production (sugar, beverages and cement, and then the aluminium smelter), followed by a continuous decline since 2004. This excessive dependence on

external flows of capital and exports of primary commodities implies that the economy is highly vulnerable to cyclical crises of accumulation due to global shocks. The drastic fall in export levels between 2015 and 2016 due to the fall in commodity prices internationally illustrates this vulnerability.

Figure 2: Composition of Mozambique's exports



Source: Trademap

Furthermore, studies point out that not only are new products not emerging in the Mozambican industrial sector (Castel-Branco, 2010) but there is also an on-going technological obsolescence combined with progressive simplification of production processes in the manufacturing sectors, weakening firm's technological capabilities and skill base (Warren-Rodriguez, 2008, 2010). Indeed, a study found that over 62% of companies surveyed had not made major acquisitions of new technologies since the 1990s, their machinery was over 20 years old and they were consequently finding it hard to maintain or repair spare parts (Cruz, Guambe, Marrengula and Ubisse, 2014). Overall, the manufacturing sector excluding megaprojects shows patterns of premature deindustrialisation, characterised by the gradual loss of productive and technological capabilities in industrial activities with high complexity in favour of increasing concentration in the most primary activities (Langa, 2017).

In this context, there is a large potential for enhancement of productive and technological capabilities of Mozambican firms through the establishment of productive linkages with FDI investments, as they are currently the most dynamic market. However, previous research has shown that in order to effectively develop industrialising linkages with megaprojects specific challenges associated firms productive and financial capabilities have to be addressed (Castel-Branco and Golding, 2003; Langa & Mandlate, 2013, 2015; Langa 2015; Mandlate 2015). In addition, industrial development in Mozambique also requires improving the coordination of instruments of industrial policy as well as between sectors, government levels and different actors (Castel-Branco 2002; Cramer 1999; Cruz et al., 2014; Krause and Kaufmann 2011; Warren-Rodriguez, 2008). The challenge then for Mozambique is understanding how to leverage linkages between megaprojects and the rest of the economy

in order to accumulate capabilities to diversify the economy towards more complex products and reduce reliance of the economy on FDI from megaprojects.

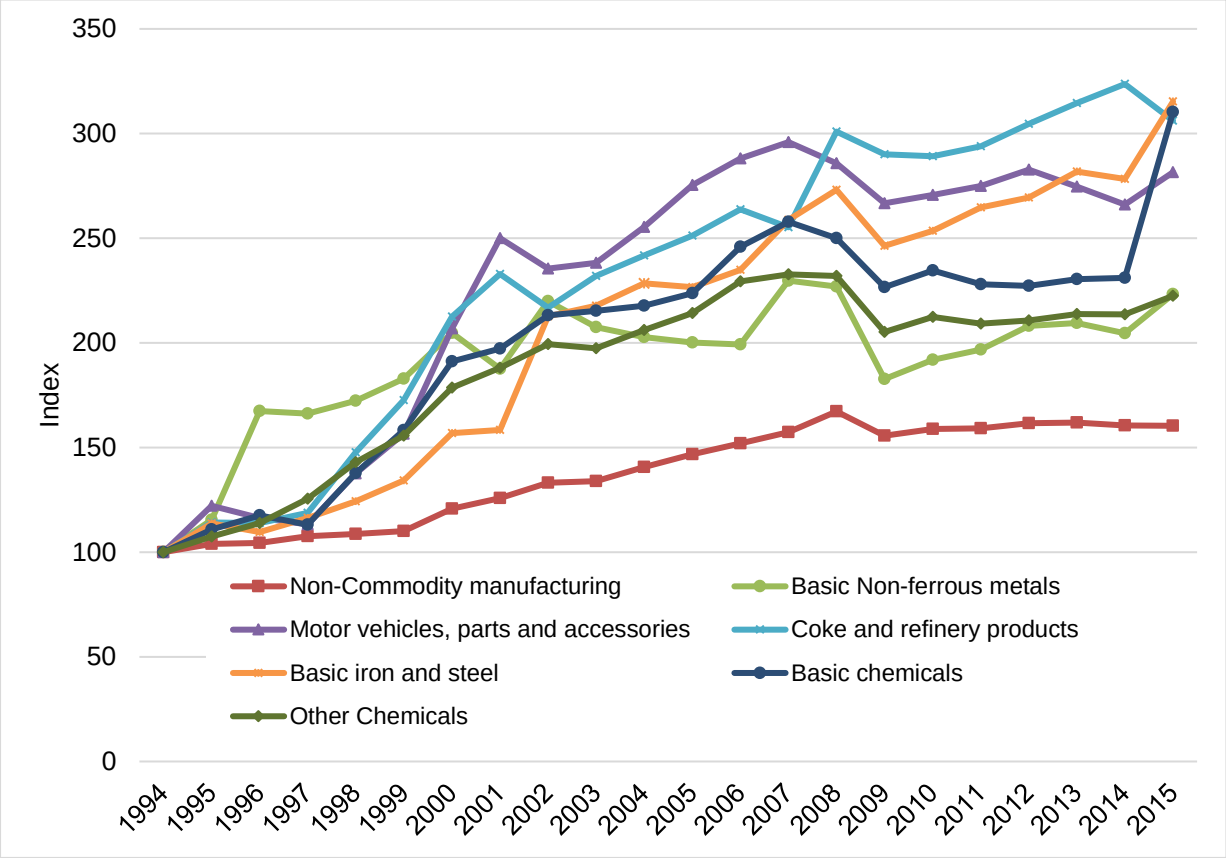
3.2 Industrial Development in South Africa

The South African economy is yet to fully recover from the 2008 financial crisis and has recorded relatively low rates of GDP growth in the period following the recession. This happens in the context of a gradual reduction in the contribution of manufacturing value added to GDP from 21% in 1994 to 13% in 2015.[3] While employment in manufacturing as a share of total employment declined from 14% in 1994 to 9% in 2015.[4]

The poor performance of the South African manufacturing sector can also be illustrated by the patterns of sectoral output growth overtime. Between 1994 and 2015, the manufacturing sectors that have recorded relatively high rates of output growth are the commodity sectors. This is indicative of weak diversification away from the commodity core which has underpinned the lack of change in the structure of the South African economy (Figure 3). In the period of 1994 to 2015, non-commodity manufacturing[5] recorded the lowest output growth, while coke and refinery products; basic iron and steel; and basic chemicals have recovered to pre-financial crises levels, non-commodity manufacturing, other chemicals; motor vehicles, parts and accessories and basic non-ferrous metals have not.

[3]World Bank Development Indicators
[4]Calculated from Quantec industry trends data. Calculated as total manufacturing (sic 3) employment (formal and informal)/ total employment in the economy (sic 1-9) (formal and informal).
[5]Composed of manufacturing less basic non-ferrous metals; motor vehicles parts and accessories; coke and refinery products; basic iron and steel, basic chemicals; plastic; and other chemicals.

Figure 3: South Africa manufacturing output performance



Source: Authors calculations based on Quantec data

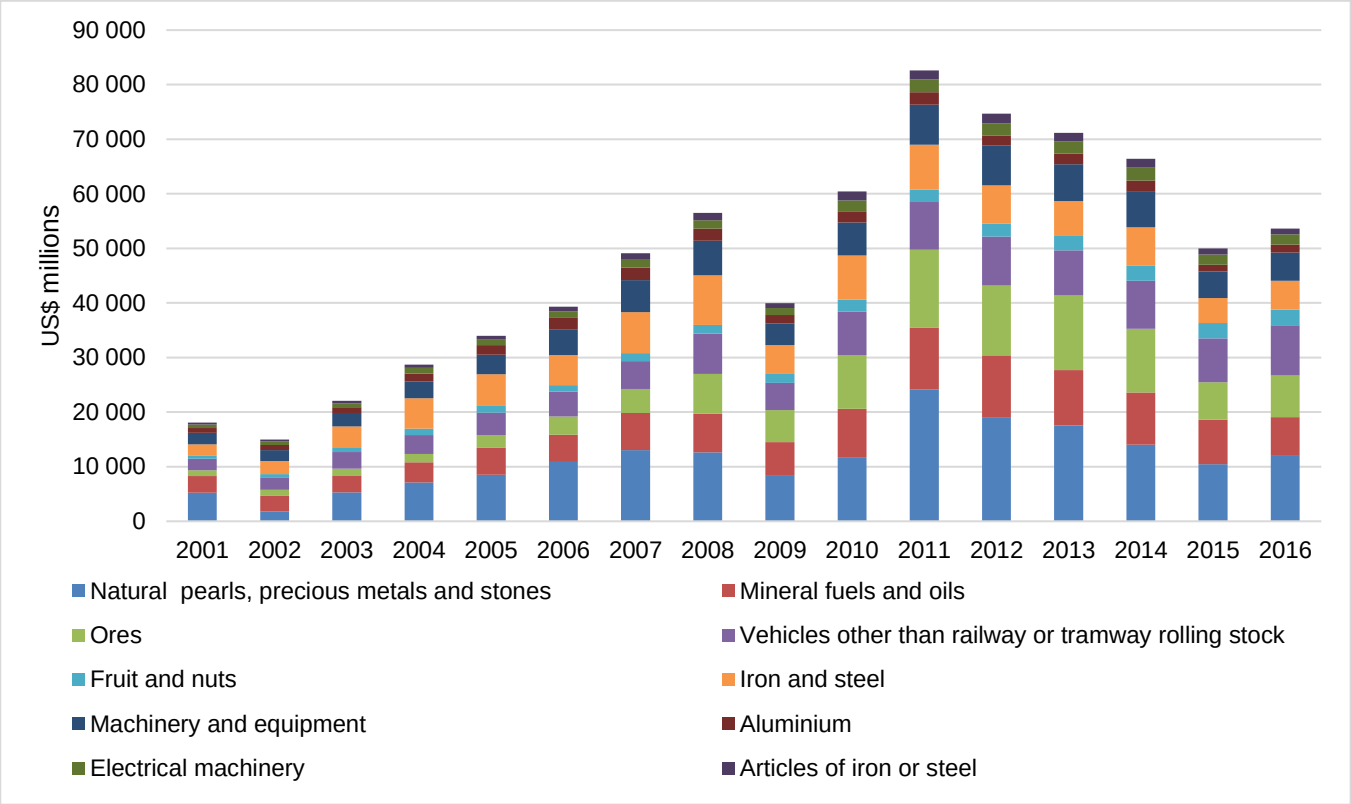
Notes:

- *Non-commodity manufacturing = Manufacturing less basic non-ferrous metals; coke and refinery products; basic iron and steel, basic chemicals, other chemicals and motor vehicles, parts and accessories.*
- *Motor vehicles is part of non-commodity manufacturing, however, has had a different trajectory from other sectors due to the industrial policy strategy for the sector.*

The structure of industrial development in South Africa is therefore characterised by an overdependence on capital-intensive resource industries. The slow growth in non-commodity manufacturing sectors requires industrial diversification of the economy, which should be part and parcel of a broader industrialisation and policy agenda.

A country's export basket is illustrative of the country's capabilities and the more complex or sophisticated the products that are exported by the country the more advanced the capabilities within the economy (Lall, 1992; and Hidalgo and Hausmann, 2009). South Africa's export basket continues to be skewed towards mineral commodities, with the exception of one agricultural commodity (edible fruits and nuts) (Figure 44). The top 10 exports are therefore dominated by minerals, but also fruit and nuts and vehicle exports. Exports of natural pearls and precious metals cluster (on average US$11 billion, 18% of South Africa's total exports) over the 2001-2016 period have consistently been the highest export category in terms of export value. Followed by vehicles, ores slag and ash and mineral fuels and oils, all averaging around US$6 billion (between 9% and 11% of total exports) in the same period.

Figure 4: Composition of South Africa's top 10 exports



Source: Trademap

As in the case of Mozambique, heavy dependence on mineral and agricultural based industries leaves the economy vulnerable to global commodity booms and busts. Though the composition of the MEC has changed somewhat this has continued to characterise the economy and export basket (Ashman et al., 2013). The country has failed to diversify away from the MEC and towards more labour absorptive industries within the MEC. Moreover, with the decline in mining and consequent reduction in demand for mining related inputs and services there is a notable decline in the industries producing these goods and providing these services. Backward linkages from South African mining have been machinery and equipment; transport equipment; wood products; fabricated metal products; non-metallic minerals (cement, bricks, etc.); chemicals and petroleum products; electricity; water; transport services; construction and civil engineering; finance and business services (IDC, 2013). Machinery and equipment represented the strongest backward linkage. The top 10 export product groups for South Africa since 2001 includes capital equipment and related industries highlighting the importance of the capital equipment cluster for South Africa's export base (Figure 4). Though machinery and capital equipment are linked to the MEC, the industry requires relatively more advanced capabilities and paints a successful story of diversification in niche markets.

From a policy perspective, South Africa's industrial development during apartheid was driven by mineral and energy-intensive industry and import-substitution industrialisation for infant industries, with an industrialisation path also linked to heavy fixed investments in aluminium production, petrochemicals and later mining investments (i.e. mega projects) with little diversification outside the minerals-energy complex (MEC) core (Zalk, 2014).

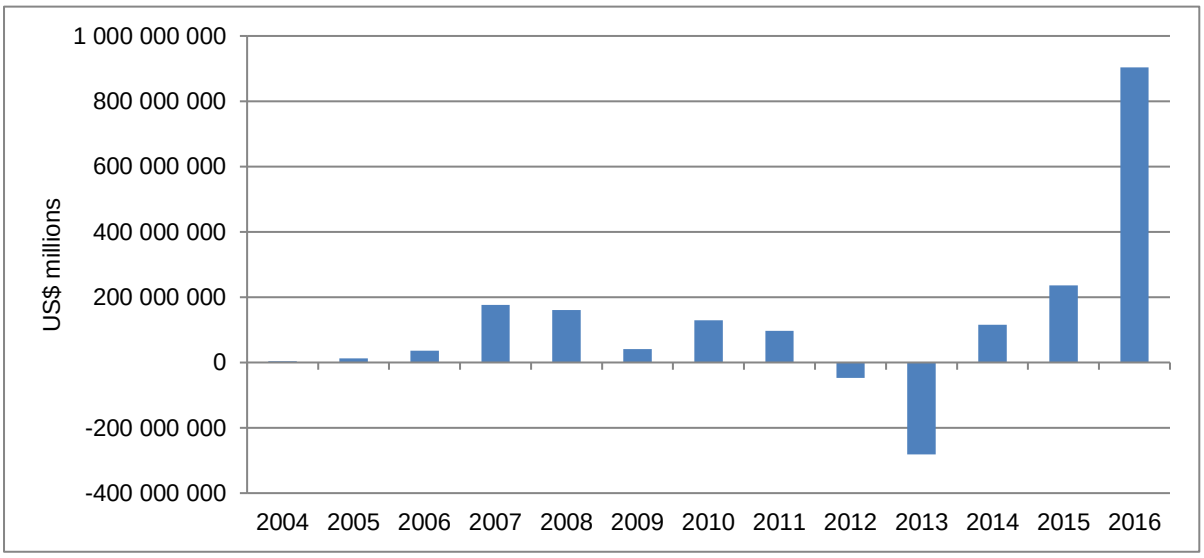
The post-apartheid government inherited this structure, and embarked on a liberalisation agenda, focusing on supply side interventions (Altman and Mayer, 2003). However, these supply-side incentives have failed to alter the pattern of investment and industrial development (Figure 4 and 5) and further reinforced by continued benefit from government incentives and development finance by large, resource and capital-intensive firms (Mondi and Roberts, 2006 and Gumede, 2010). Although there are a few pockets of success, with South Africa's industrial policy adopting a more sectoral approach for priority industries (since 2007), its industrial structure in terms of composition and diversification has generally not seen any changes (Mondliwa, 2017).

3.3 Investment and trade relations between South Africa and Mozambique and the importance of capital equipment

Historically, Mozambique provided migrant labour and transport services for the MEC in South Africa, but economic linkages between both countries shifted from the 1970/80s onwards to being dominated by relations of trade and investment (Castel-Branco, 2002). In particular, the weak and narrow productive base in Mozambique vis-à-vis the strength of the South African economy has led to a pattern of integration of both economies where South African FDI and imports dominate the Mozambican economy (Figure 6).

Indeed, Mozambique has in South Africa one of its largest investor (Figure 5), with South Africa being among the top three investors in Mozambique for most part of the past two decades. South African FDI accounted for 27.4% of total approved FDI in Mozambique between 1997 and 2014. In terms of sectoral allocation, 65% of the projects have been allocated to industry, followed by agriculture and agro-industry with 18% and tourism with 8%. The largest investment realised include Mozal aluminium smelter and Sasol's gas pipeline megaprojects, Illovo and Tongaat Hulett sugar industries, SAB-Miller beer industry, SABCO soft drinks industry and the NMI cereal milling industries.

Figure 5: South African FDI in Mozambique 2004-2016

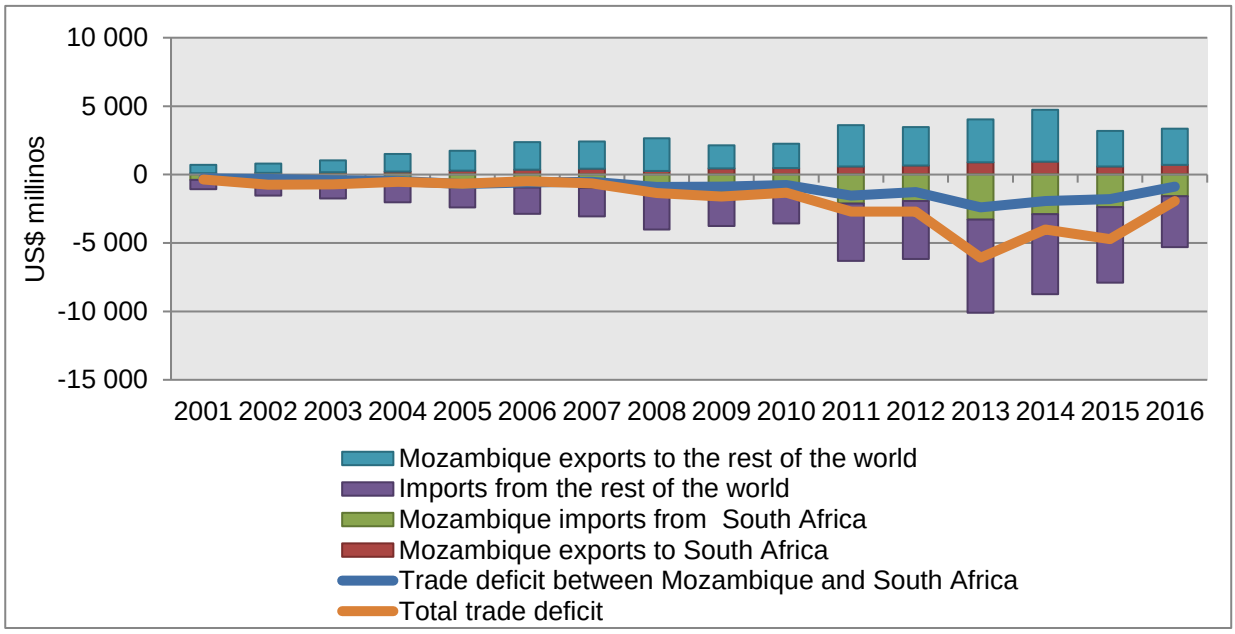


Source: Bank of Mozambique

South Africa has also been a major trading partner of Mozambique. In 2015, 30% of Mozambique's imports and 18% of exports were from and to South Africa, respectively. The

weakness of the Mozambican economy relative to the regional dominance of the South African economy implies that trade relations between the two countries are characterised by a chronic trade deficit for Mozambique of around $881 million in 2016, after a peak of $2,397 million in 2013 (Figure 6). It can also be seen that during the FDI boom period (2011-2013) import levels both from South Africa and the rest of the world rose drastically, reflecting the weakness and inability of the Mozambican economy to respond to increasing levels of demand for goods and services. By 2013 the total trade deficit was three times higher than what it was in 2010.

Figure 6: Trade relations between Mozambique and South Africa and the rest of the world

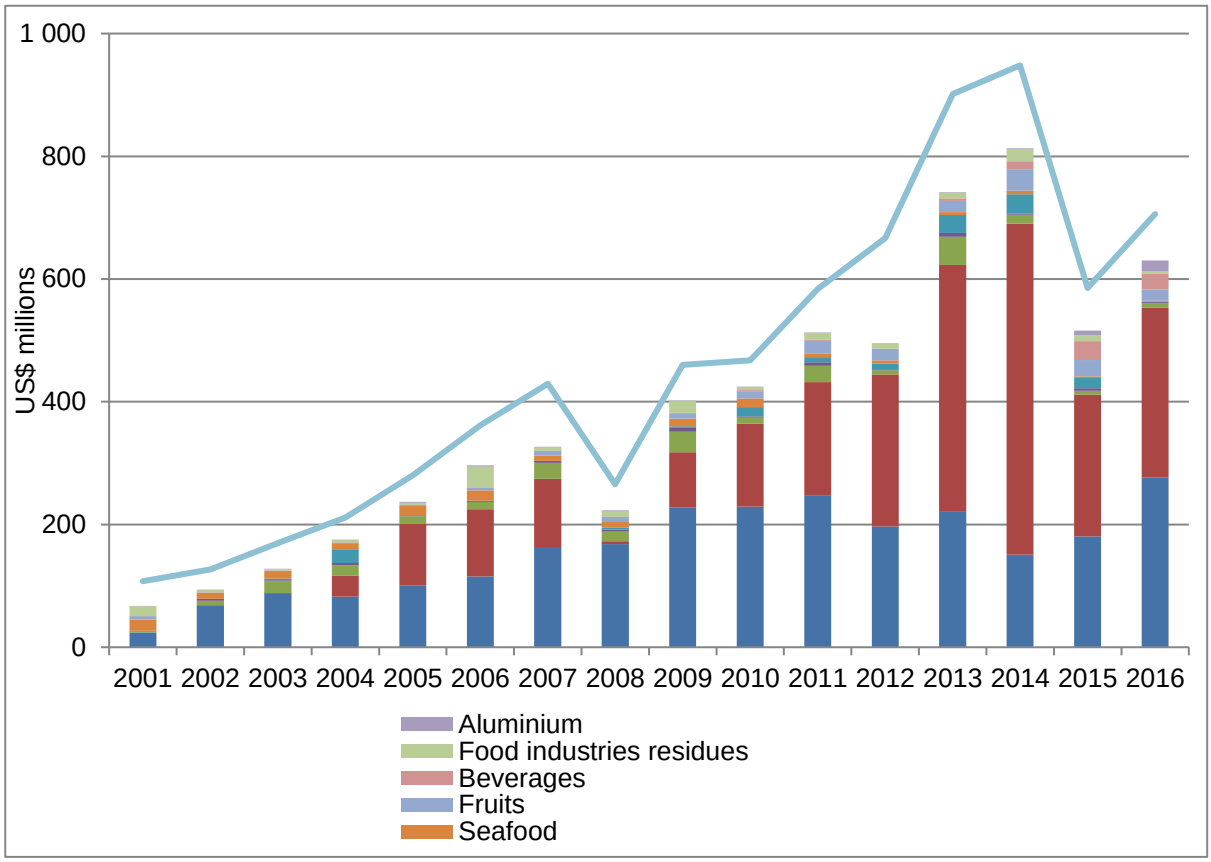


Source: Trademap

A large component of Mozambique's main exports to South Africa over the past 15 years involves a highly concentrated group of primary commodities: electricity, gas, seafood, food residues, fruits and machinery[6]. All except for machinery (which is imported by Mozambique) are primary products with very low, or no processing. The opening of the Sasol's gas pipeline exporting gas from Inhambane in Mozambique to Mpumalanga in South Africa increased the concentration of exports on primary commodities from 2004 onwards (Figure 7). Between 2010 and 2015, core MEC products, namely, electricity, gas and mineral oils represented on average 74% of Mozambique's exports to South Africa.

[6]Mechanical and electrical machinery and parts are imported by Mozambique but are registered as exports to South Africa.

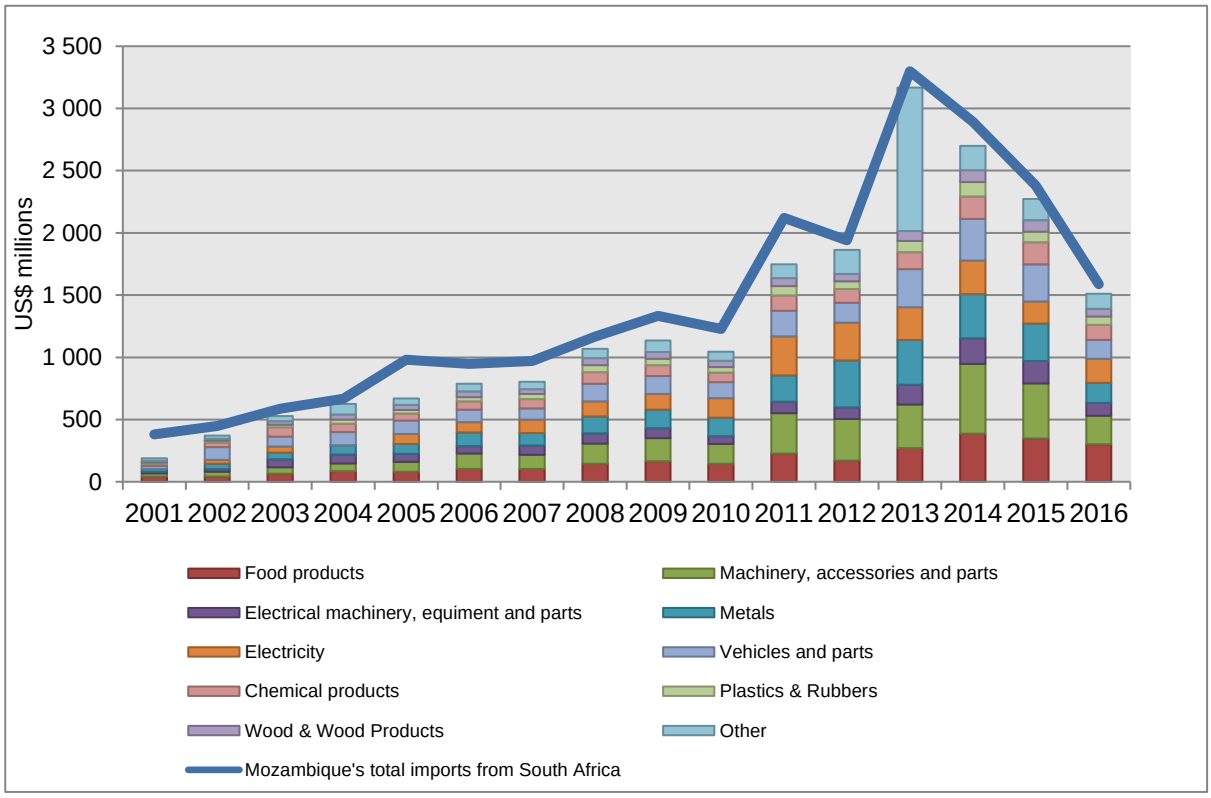
Figure 7: Mozambique's main exports to South Africa



Source: Trademap

South Africa's exports to Mozambique are driven by the growing urban demand for consumer goods and the import-intensive nature of MEC megaprojects operating in Mozambique. Thus, the dominant exports to Mozambique are food products (mostly cereals, beverages, vegetables, dairy and meat), capital equipment and related products (machinery, electrical machinery and base metals), electricity and transportation vehicles (Figure 8). Given the capital-intensive nature of economic growth driven by megaprojects in extractive industries and its support infrastructure, South Africa exports to Mozambique have become increasingly concentrated on capital equipment and related products, particularly during the FDI boom period. The share of Mozambique's imports of capital equipment and related products, as a percentage of total imports from South Africa rose from 24% in 2002 to 40% in 2015, with the average annual growth rate being higher for machinery and electrical machinery (Table 1).

Figure 8: South Africa's main exports to Mozambique



Source: Trademap

Table 1: South Africa's main exports to Mozambique (2002 and 2015)

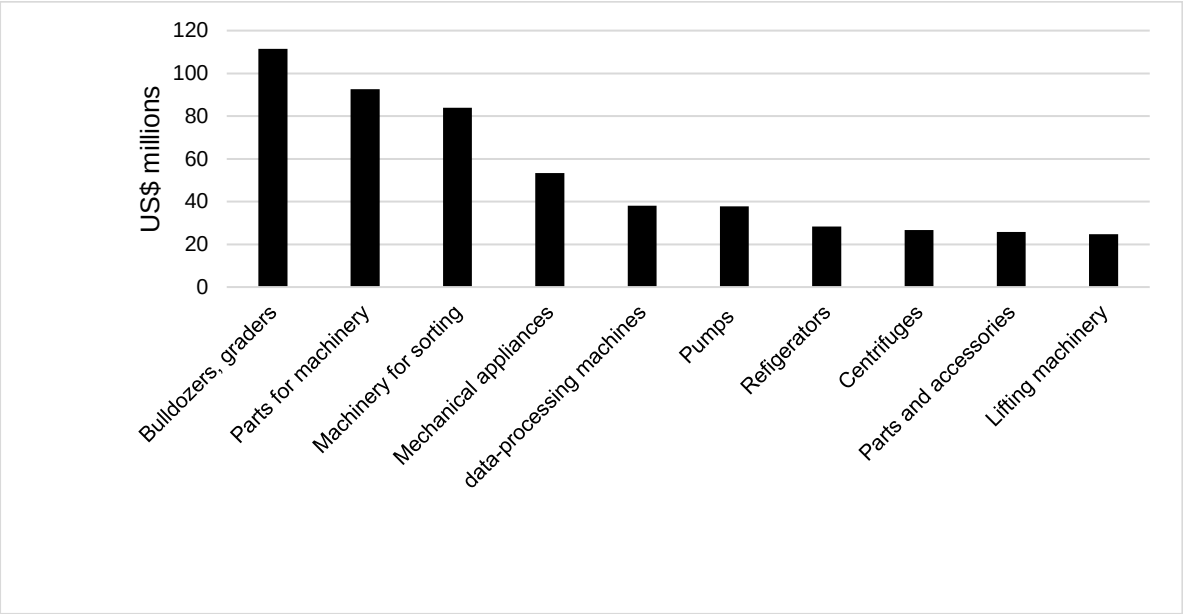
		Values (US$ millions)		Share in imports		Annual Growth Rate
		2002	2015	2002	2015	
Capital Equipment and related industries	Machinery, accessories and parts	39.5	442.4	9%	19%	25%
	Electrical machinery, equipment and parts	21.2	179.4	5%	8%	21%
	Metals	43.9	300.7	10%	13%	19%
	Food products	40.5	348.4	9%	15%	22%
	Electricity	30.7	178.4	7%	7%	17%
	Vehicles and parts	103.2	298.4	23%	13%	10%
	Total imports from South Africa	448.8	2,380	100%	100%	16%

Source: Trademap

The disaggregated trade data shows that earth moving equipment (bulldozers, graders and levellers), parts for machinery and machinery for sorting and screening are Mozambique's top imports of machinery and equipment from South Africa, averaging US$111 million, US$92 million and US$83 million, respectively over the 2012-2016 period (Figure 10). In 2016 alone, Mozambique imported machinery and equipment from the world, to the value of $638 million (of which US$227 million was from South Africa). The products described here are strongly

linked to the construction, mining and agricultural sectors which have historically driven trade and investment between South Africa and Mozambique.

Figure 30: Mozambique top machinery and equipment imports from South Africa (average 2012-2016)



Source: Trademap

Although the linkages in capital equipment have been growing over the years, analysis of South Africa's machinery and equipment market shares in Mozambique's imports shows a significant decline between 2009 and 2016, implying weaker backward linkages from Mozambique to South Africa (Table 2). South Africa has also lost relevant market share to deep sea markets for iron and steel and its articles, from 85% and 60% in 2001 to 60% and 41% in 2016, respectively. The decline was particularly accelerated during the resource-driven FDI boom and this may suggest a lack of competitiveness in South Africa within these product categories. The median for market shares between 2001 and 2016 for iron and steel products is significantly large at 79%, while articles of iron and steel is 56%, indicating that although South Africa is losing potential market share to deep sea markets, it still has a great majority share of Mozambique's imports of capital equipment. Therefore, the emerging question is whether building and maintaining these linkages can be associated with capabilities development in Mozambique to replace deep sea imports.

Table 2: South Africa's market share in Mozambique's imports of selected capital equipment and related products, 2001-2016

Product cluster	2001	2003	2005	2007	2009	2011	2013	2016	Average
Machinery and equipment	36%	37%	41%	46%	47%	37%	39%	36%	43%
Iron and steel	85%	84%	76%	76%	74%	72%	61%	60%	73%
Articles of iron and steel	60%	54%	60%	53%	58%	42%	44%	41%	54%

Source: Trademap

For Mozambique, capabilities creation and development in the capital equipment and related industries would enhance the economy's FDI absorptive capacities by expanding and deepening backward linkages and diversifying the productive base. With regards to South Africa, as mentioned, capital equipment and related industries are one of the few sectors where there has been success in building advanced capabilities, however, the industry is currently experiencing a decline in capabilities, which calls for concerted efforts to arrest this decline and facilitate further diversification in order to maintain and improve competitiveness of the sector. Thus, the sectors present an opportunity for the collective development of capabilities for trade, regional integration and capability development, with strong complementarities between mining, construction and rail infrastructure and agriculture. Capital equipment manufacturing and activities have strong intra-industry and intra-sectoral linkages to machinery, steel and iron, non-ferrous metals, chemical and plastic products; and even the services sector. A study by CSID (2010) found that electrical and non-electrical machinery have some of the highest backward linkages out of all manufacturing activities[7].

South Africa's capabilities in capital equipment offers an opportunity for the development of productive capabilities in Mozambique, particularly because the industry is characterised by the importance of technological innovation and aftermarket services, amongst other factors (Fessehaie, 2015). With the significant increase in Mozambique's imports of capital equipment from South Africa and the rest of the world, the market for aftermarket services and the sale of replacement parts represents an opportunity for Mozambican firms to benefit from employment, building a local skills base, knowledge transfer and sub-contracting opportunities (Ibid). Aftermarket sales are also an opportunity for firms to focus on value added services and sophisticated, high quality maintenance and operating systems even when greenfield investments are low or have slowed down.

So within a context of regional integration and an important capital equipment market for both countries, mega projects offer an opportunity for the development of productive capabilities through multiple forms of linkages such as skills transfer and industrial upgrading. There is great potential to develop mutually beneficial industrial capabilities in both South Africa and Mozambique (being one of the largest markets of South Africa's exports of capital equipment). Furthermore, given South Africa's capabilities in mining capital equipment, in particular, there is potential for coordinating demand across multiple sectors (agriculture, construction and infrastructure) in order to further develop Mozambique's firm capabilities. This would especially require that regional industrialisation agenda incorporates local content policies in Mozambique and South Africa as a strategy for a broader development of regional capabilities and upgrading, which therefore requires coordinated efforts of multiple stakeholders including South African firms.

[7] Although electrical machinery is amongst South Africa's top exports and also an important import product for Mozambique, for the purpose of this study, it has been omitted as a focus area because the top electrical equipment categories[7] within this cluster are unrelated to the MEC or Mozambique's mega projects. A recent assessment of the machinery and equipment sector (Bell et al, 2017) further indicates that most capital equipment companies with operations in Mozambique appear to operate outside the electrical machinery sector with most falling under industrial engineering, metals, mining and construction materials (Bell, Nhundu, Paelo, Thosago and Vilakazi, 2017).

4. Developing industrial competitiveness in capital equipment and related services: opportunities and challenges for Mozambique and South Africa

The research confirms the existence of a large and important market for **after sales and maintenance services** in capital equipment and related industries across large investments in several sectors in Mozambique, with the most attractive (but vulnerable due to the volatility of commodity prices) sectors being the extractive industries and their respective port and rail infrastructure, followed by traditional industrial activities (beverages, agriculture, cement and construction). While machinery tends to be a more cyclical component of sales, firm interviews point to after sales as the market where a majority of profit is generated and therefore sustaining capital equipment businesses. Critically, product support is increasingly becoming an essential offering for firms in the capital goods industry, which further indicates the potential for this market to generate benefits both for South African and Mozambican firms.

Maintenance and repair contracts (MARC) in particular, which are more long-term, typically three to five year support agreements, represent an opportunity for continuous training and imparting of skills. Indeed, various maintenance contracts with two megaprojects allowed a large foreign firm operating in Maputo province in Mozambique to develop internal capabilities to diversify activities into the manufacturing of spare parts, which now represent 40% of total income. In the Tete province, a South African company interviewed built a facility that provides a parts and components store - an investment of over $30m, which carries parts for 40 (largely mining) trucks running on that site. These trucks are managed by a dedicated team of expert technicians deployed to routinely support these machines, which is critical for ensuring the transfer of skills for the duration of these maintenance contracts.

Given the different levels of manufacturing development in the capital equipment sector between South African and Mozambican firms, in the following two sub-sections we explore sector dynamics, challenges to competitiveness in both countries and then discuss opportunities for cross-country structured collaboration to foster regional industrialisation through the sector.

Manufacturing development and competitiveness of South African firms and challenges of operating in Mozambique

We start by describing the competitive dynamics of South African firms, with a focus on the critical factors and obstacles to competitiveness domestically and internationally, with particular reference to Mozambique.

Competitive dynamics of South African firms

The research confirms that South Africa has existing capacity and **technological capabilities** for local manufacturing, with a lot of companies already using sophisticated design capabilities, quality manufacturing equipment and production processes. Although firms interviewed have not necessarily changed their product offering over time, they have had to grow their service component and/or improve their manufacturing processes. Firms have moved away from conventional machines to the use of Computer Numerical Control (CNC) machines, which have enhanced workforce abilities and increased volumes of production. The ability to provide the skills to maintain and support products also gives firms a competitive strength.

Interview data shows that firms in the industry tend to continuously re-invest in skills and also substantially in information technology systems, with **R&D capabilities** developed in-house, in partnership with an overseas company or in affiliation with a university. Importantly too, is that international OEMs tend to offshore high levels of R&D activities as well as value adding manufacturing activities. In this sector, updated technologies and R&D capabilities are critical for firm competitiveness.

Exports have been a growing business for capital equipment manufacturers with increasing market potential in Africa and the SADC region. The majority of South African firms interviewed have penetrated **export markets**, and Mozambique in particular (some with long-standing relationships with this market), but with evidence of declining shares of imports into Mozambique. Possible explanations for this trend are explored further below. Although SADC is a key market, some companies are also seeing growth opportunities in overseas markets such as Australia and North and South America. These firms are globally competitive and typically have strong engineering capabilities and specialised manufacturing skills and tend to continuously invest in PPE (plant, people and equipment).

Multotec, (a mineral processing OEM), for example, has changed its business model overtime to grow its after sales business and therefore established multiple service centres across South Africa and the continent, which is a reflection of the company's regional competitiveness, particularly in aftermarket sales. Multotec has developed in house technological capabilities and internalised training which has contributed to its competitiveness in global markets. Box 1 below uses Multotec to illustrate the potential for building value added activities and technical capabilities in Mozambique. It also illustrates the possible benefits from a more collaborative approach to industrial policy, where South Africa supports industrialisation in Mozambique beyond making use of its market for capital equipment products.

Box 1: Developing capabilities in Mozambique: the case of globally competitive Multotec

Multotec established its Mozambique service centre in 2011. It has its operations in the coal fields of the Tete province, which services all its East Africa operations (Kenya, Tanzania and Egypt). Their entry into Mozambique was driven by the expansion of coal in Tete.

The company has a deliberate strategy to transfer their technologies to various countries and locations. By identifying what services are needed, Multotec builds local capabilities, gradually and continuously. This service centre offers a complete package, from supplying, maintaining and monitoring equipment to the manufacture of various components (such as pipes).

Multotec employs only local workers, but the process of imparting skills and capabilities is done with 100% support from South Africa's operations and management. Since its establishment in Mozambique, the number of local employees has grown almost seven-fold (from 4 to 26 workers). Local workers not only service clients with spares and support but are also now capable of performing other medium engineering duties such as pipe installation, structural machining and field service.

Although finding the right skill set in Mozambique was initially a challenge, frequent on-the-job training which involved sending South African artisans to Mozambique and sending Mozambican locals to South Africa for specialised training was fundamental for developing workers full capabilities. The company also emphasises that after sales services have been a key driver of developing local capabilities.

On aggregate terms however, South Africa is losing capabilities in capital equipment which it has previously developed strong backward linkages from the mining sector. According to an interviewee, the average capital equipment firm has lost 40% of their business in the past two years due to a plethora of factors ranging from the state of South Africa's economy, dis-investments in the mining sector and prohibitive government policies (such as the new Mining Charter).[8] Yet overall, as discussed below, South Africa's competitiveness and manufacturing development in the capital equipment industry is being affected by deep sea import competition and the price of raw materials, causing firms to focus on quality, product customisation and flexible after sales to remain competitive.

First, the competitiveness of South African manufacturers has been constrained by **import competition** from China, which has had the effect of lowering local turnover over recent years. Companies cite that there has been little to no protection in the capital goods industry making manufacturing less competitive. From an institutional perspective, this is consistent with inefficient targeting of policies for capital equipment firms.

At a firm level, however, company specific factors allow some firms to counter the import competition effects of Chinese products. In particular, interviews reveal that South African manufacturing firms focussed on ensuring **product and service quality.** Interviews suggest that batch producing, over a mass production, for example, ensures their production process is organised to increase efficiency; and not only do such companies produce better quality products, they tend to understand the local market better than Chinese manufacturers.

Offering **customised solutions and flexibility** to respond promptly to clients' needs is also a critical factor for firm competitiveness. Most firms in the sector tend to be involved in the design, manufacture and installation of products, all the way to repair and maintenance, increasingly integrating their product and service offering creating room for customisation and flexibility. However, subsidies on imported Chinese products remain a concern for all firms interviewed. It is possible then that South African firms could be more involved in capabilities on the ground, closer to customers, because there is a strong indication that even with more customisation, South Africa is still losing market share to Chinese products.

Price and cost competitiveness of inputs and components also appear to be a key constraint for equipment manufacturers, as indicated by the case of Bell Equipment[9]. A 15% non-recoverable import duty imposed on imported tyres for the manufacture of dump trucks has ended up as one of Bell Equipment's biggest costs, after overheads. It is important to note here that there are no capabilities to manufacture these tyres locally and therefore no companies are being protected by this tariff. A zero—duty on built up machines means that competing brands are able to manufacture abroad and import built up machines at a lower cost than a company involved in local value addition.

In addition, the firm is subjected to a 12% tariff (an anti-dumping duty) on imported steel[10], which inflates their input costs significantly, making them less competitive globally. After a

[8] A revised Mining Charter which was released in June of 2017 by the Department of Mineral Resource requires a mining license holder to have a B-BBEE ownership of 30% (up from 26%) and to procure locally 70% of mining goods and 80% of services from BEE compliant entities (up from 40%), among other changes.
[9] Bell Equipment is a manufacturer of heavy equipment machinery such as dump trucks, bulldozers and graders, operating in 60 countries.
[10] This grade of steel is not locally available at the required quality

period of six to seven years unsuccessfully trying to get a concession to become more competitive, the company is in the process of relocating its assembly and fabrication plant for its light duty range truck to Europe, where it is easier to source cheaper inputs. This appears to be a problem of trade policy coherence for regional exports which is raising costs for local manufacturers of capital equipment. This implies a huge loss in value addition, investment, employment and revenue, especially because this company has been a significant employer over the last few years (creating about 1200 jobs over the past 10 years).

The competitiveness of Bell equipment is further constrained by a lack of export-import finance, which is otherwise a common facility in other countries (including Bell's competitors). Currently, South Africa does not have a local export-import bank, but the Export Credit Insurance Corporation (ECIC) which does not offer favourable financial terms. From Bell's experience, it took approximately 18 months to conclude the ECIC deal, yet similar financing solutions in Europe can be processed in three weeks. With a competitive financing mechanism (particularly for export finance) the company claims it could increase its production significantly and therefore export growth. A lack of **access to export finance** was similarly raised by other interviewees, including smaller capital equipment firms.

Cost competitiveness in regional markets is therefore limited given the above factors. Overseas markets, like Japan, are becoming more attractive for sourcing capital goods, as illustrated by the declining shares of capital equipment exports from South Africa to Mozambique. A large capital equipment company, for example, is concerned about losing its market to Japanese brand Komatsu, primarily because it is competitively priced. The biggest concern for such a firm is the potential loss from all the resources invested in Mozambique, such as investments in facilities and skills.

Key challenges for South African firms operating in Mozambique

Although MARCs (discussed above) present a huge opportunity, investments in manufacturing activities to supply spare parts and related services to large FDI projects in Mozambique, particularly setting up workshops for production using specialised machineries, are constrained by several factors, including the size of the market, inadequate infrastructure, limited access to skilled labour and inputs which are essentially imported from South Africa.

Generally, the sourcing of parts and services in Mozambique appears to be limited to the reconditioning of components and supplying of low skilled labour (at times through labour brokers). Therefore, from the perspective of an individual firm, scale economies become a critical constraint. For this reason, while investments in manufacturing capabilities are not economically feasible for Mozambican firms, for most South African firms it is cost-effective for manufacturing activities to remain located in South Africa. However, this situation reduces the ability to offer flexible after sale services and short lead times for megaprojects because equipment is often transported back to South Africa for repairs.

If investments in manufacturing productive capabilities including skills transfer were made on a collective basis, joint ventures between South African and Mozambican firms would drastically reduce costs, whilst increasing the megaprojects efficiency. Therefore, in order to use capital equipment goods and related services as a platform for developing regional manufacturing capabilities and driving industrialisation, close collaboration between both countries is essential.

For some companies however, Mozambique appears to be a marginal business at present and may be directly linked to the crisis (as explained in Box 3). There are cases where South African companies or facilities are either dormant or closing down in Mozambique due to the decline in (mining) activity with some businesses shrinking 6-7% over recent years (see Box 2). Bell Equipment for example, has recently experienced a loss of shares in the region and a significant decline in its Mozambican operations, indicating a loss in capabilities development in Mozambique.

Box 2: Bell Equipment's exit from Mozambique

Bell Equipment was established in Mozambique over 20 years ago by way of building up a service network of five outlets. As of July 2017, the company has fully exited the Mozambican market.

The company was predominantly involved in the coal mining region of Northern Mozambique, but also in construction projects, although a good size of this market is allocated to Chinese construction companies. Bell also did a fair amount of machinery sales and maintenance for sugar and forestry production.

Bell employed approximately 50-60 people during its peak periods of operation in Mozambique. Workers typically travelled to Bell SA's training centre or took technical training courses on site, in Mozambique to ensure the development of adequate skills.

The key reason cited for exiting the market was as a result of a market collapse, particularly in mining activity. The company has sold off its business to an independent dealer organisation, LonAgro, who will service the Mozambican market going forward. But unless commodity and energy markers rebound strongly, no significant recovery or growth is expected in the machinery sector for the next four to five years. The market is also seen as too small to envisage the production of machinery.

The company however sees growth potential and the development of capabilities in consumer markets and agri opportunities, i.e. a stronger focus on markets with sufficient critical mass that would warrant a significant level of investment. This raises questions of whether there is scope or greater opportunities to be explored for lateral migration in machinery and equipment, branching into other industries.

An agenda for structured collaboration

Indeed, the lack of structured collaboration between Mozambique and South Africa appears to be exacerbating South Africa's loss of competitiveness. Structured collaboration becomes crucial particularly in the context where the capital equipment investment in Mozambique is mostly being funded by Chinese and other foreign investors, restricting the participation of South African firms. This case also appears to apply to professional engineering and construction services which estimate that the value of the work they get out of the total available work in Africa is only 3-4%. This is because projects are bid for on an individual and not collective basis, and companies are forced to compete with Chinese and other large international players all trying to get access to Africa's infrastructure projects, including those in Mozambique.

The IDC for example, has not fully engaged with the region up to this point, despite capital equipment being a key focus area for concessionary development funding. There is no coherent strategy from a regional perspective, although the primary objective going forward is to carry out deals and projects within the region. The IDC is however very active in the domestic market (the machinery and equipment unit had a R1.4 billion capital allocation in the

2016 financial year) while the last project funded by the IDC in Mozambique was the Mozal Aluminium Smelter.

Interviews generally indicate that from an institutional perspective there is no real mechanism for effective co-operation between South Africa and Mozambique, resulting in a lack of engagement across the two countries. There also appears to be complete misalignment across departments and entities, with the dti being the only "voice" for driving industrialisation. This fragmentation and lack of co-ordination of industrial policy instruments between institutions, potentially undermines industrial development. There is therefore an urgent need to develop an initiative and understanding of how such institutions can have a greater impact, both for regional development and the benefit of local South African firms.

A major bottleneck with operating in the region is infrastructure for industrialisation and the IDC has identified South Africa as a key role player in this regard. At present, the IDC is looking into an initiative (along with the dti) to identify regional countries, cities or towns where a supply park could be developed to assist local businesses with infrastructure for assembly, manufacture or after-sales services. This could be beneficial if targeted correctly, at the right industries or sectors.

Regional integration and co-operation initiatives are necessary for sustaining and expanding South Africa's market for capital goods. South Africa therefore needs a growing industry in Mozambique, naturally placing importance on a regional growth agenda.

In summary, the findings of this study point towards the following critical success factors to local and regional firm competitiveness in South Africa:

- Production technologies and R&D capabilities
- Product and service quality
- Customisation and flexibility

Key competitiveness bottlenecks include:

- Import competition, particularly from China
- Price and cost competitiveness (including co-ordination of trade policy instruments) Access to export finance packages

Challenges affecting Mozambican firms in the capital equipment and related services sector

This subsection discusses three main factors affecting Mozambican firms' ability to seize market opportunities in the capital equipment maintenance and repairs sector: i) market size and information asymmetries; ii) development finance; and iii) the weakness of the domestic supply chain for inputs and skilled labour.

As discussed, the capital-intensive investments in Mozambique give rise to an important market for capital equipment maintenance and repair services. Large buyers such as the extractive megaprojects point to the increasing opportunities in the manufacturing and repair of spare parts, as well as electric and hydraulic components. Taking Mozal as an example, maintenance and repair services provided by the suppliers established at the Beleluane industrial park are summarised in Table 5.

Table 3: Backward linkages with Mozal: capital equipment and maintenance services

Sales and maintenance services of mobile equipment for the aluminium industry
Sales and maintenance services of hydraulic technologies
Conveyor belting, feeder and overhead crane maintenance
Anode Handling & Conveying
Boiler and refractory maintenance
Potshell repairs
Manufacturing of heavy metallic structures and repairs
Manufacturing of small tools for aluminium production
Plant engineering

Source: Elaborated by the authors based on interview data

Yet, as Mozambican firms providing these kind of services are entirely dependent on the domestic market, **market size** is a critical constraining factor even for large firms supplying megaprojects, given the high investments in machinery and skills upgrading required. It has been shown that the Mozambican industrial sector, which would create the demand for capital equipment related services such as maintenance and after sales services, has been shrinking over time and increasingly concentrated around a few industries - mainly the extractive industries (aluminium, gas, coal and other minerals), sugar and beverages. This means that opportunities to diversify markets and risks are reducing, which makes large investments in upgrading capabilities unfeasible for the individual firm. Market opportunities have become even more limited with the fall in commodity prices between 2014 and 2016 and the overall deceleration of growth and investment in the country which followed the illegal debt scandal.

Information asymmetries regarding existing market opportunities further aggravate the situation, particularly as platforms through which Mozambican firms can gain access to long-term and detailed procurement plans from the megaprojects and large FDI projects have not yet been established. Mozambican firms interviewed point out that South African firms are often better informed about domestic opportunities given their historical linkages with some of the large FDI projects operating in Mozambique. Indeed, differently to what happened around the Mozal megaproject where backward linkages with Mozambican firms were actively pursued by Mozal, the IFC and the extinct Centre for Investment Promotion (CPI)[11] through supplier development programs, the following extractive investments did not take the same path.

More recently, various dispersed initiatives with the objective of promoting linkages have emerged, but they have fundamentally been of limited impact in terms of scope and scale. One of them is the Subcontracting and Partnership Exchange program (SPX) which has been developed since 2014 by the CPI with assistance from UNIDO aiming at linking large buyers with local suppliers from various sectors by offering profiling, benchmarking and matchmaking services. However, from around 500 registered firms only 10% have been benchmarked. In terms of matchmaking, the platform is not yet functional to allow buyers to interact directly with suppliers. At the moment the agency uses the platform to provide list of suppliers upon request by buyers (so far only 10 of such requests have been received). Similarly, the Institute for the

[11] The centre was recently extinct to give rise to a merger with two other public institutions (Gazeda - Office of Economic Zones for Accelerated Development and IPEX- Institute for the Promotion of Exports), resulting in the Agency for the Promotion of Investment and Exports (APIEX).

Promotion of Small and Medium Enterprises (IPEME) has also a database of supplies and share lists of suppliers to megaprojects upon request but on irregular basis. The Confederation of Economic Associations (CTA), which represents the "voice" of the private sector in Mozambique is currently developing a bureau to share privileged information with Mozambican firms. In turn, initiatives to develop local suppliers by megaprojects are often located in non-core (peripheral) areas of megaprojects activities and associated with corporate social responsibility activities (Langa 2015). CPI and IPEME as well as the megaprojects and the CTA also organise seminars where information about existing business opportunities is shared. Yet, besides seeing them as irregular, for most Mozambican firms these events do not provide long term and detailed information that would guide investment planning.

It is most probable that the impact of such fragmented initiatives in terms of scope and scale would be greater with strategic coordination between government departments, donor agencies and the private sector to avoid the multiplication of small and similar initiatives. It is also not clear how these initiatives are incorporated within the implementation of the national industrial policy. Thus, critical issues for industrial development such as the development of technological capabilities, skills upgrading and development finance are often missed out.

Indeed, Mozambican firms face a domestic environment characterised by the **absence of sources of cheap and long-term finance for productive investments**, as the few commercial banks dominating the Mozambican financial landscape impose high interest rates along with collateral requirements. Financial liquidity constraints imply that small Mozambican firms are not able to take part in large projects which would allow them to grow and develop capabilities due to long pay-back periods. Hence a developmental finance institution specialised in productive sectors is seen as a priority for most Mozambican firms.

In addition, Mozambican firms are constrained by the **deficiencies of the domestic supply chains** as they have to import all of their equipment and inputs (such as steel and other metallic structures) and operate with unskilled or semi-skilled labour. It is worth noting that the fact that metalworking firms and those providing capital equipment maintenance and repair services at the trade free zone of the industrial park around Mozal can import all of their inputs off-duty becomes an impediment for the development of a domestic market for inputs over the long-run. For instance, after five years on hold, a project from a Mozambican firm interviewed to set a foundry is finally being developed only because Mozal is closely involved and ensuring a partnership with a South African investor. The foundry can be an alternative for original spare parts, and thus contribute for import substitution.

In terms of skills, the nature of the capital equipment sector makes it very competitive and knowledge and skills intensive, which in itself presents both opportunities and challenges. Evidence from the fieldwork suggests that there is generally a shortage of skills required to supplement the competitiveness of the industry in South Africa as well as a lack of specialised skills in the Mozambican market. In Mozambique, although there is general recognition that the pool of semi-skilled labour has increased considerably over the years, firms point out that there is a considerable mismatch between formal professional training programs and market needs, leading to constant internal re-training of the workforce. Indeed, the IFPLAC which is the government institute for professional training is currently working with large investors to adapt the curricula to international standards.

Nevertheless, particular technical areas such as the machining of parts and hydraulic mechanics still face a huge **shortage of skills** and there needs to be coordination between public and private training institutions and industrial firms to address the problem. For instance, the research identified that on the one hand a private vocational training centre in Maputo equipped to deliver short-term training on CNC machining but the training has never been delivered because the centre is not aware of any firm where students could partake in apprenticeships or be potentially employed. On the other hand, firms using CNC machines report difficulties in acquiring trained workforce to expand their machining. This represents a constraint on the development of manufacturing capabilities, particularly for replacing imports of small spare parts. This could be coupled with the certification of the workforce in specific areas such as welding for example which is currently being done in through South African or Portuguese consulting firms on demand basis and represents an expensive investment for Mozambican firms.

South African firms focused on after sales services in Mozambique highlighted that the after sales business is a driver for developing capabilities, building a local pool of skills and therefore creating potential for more local employment. Although critical artisan skills are limited, South African companies who are large enough to internalise training, such as Multotec described above, have deliberate strategies to transfer technologies to countries in the region and invest heavily in building these capabilities. Multotoec acknowledged that Mozambican locals are able to service clients with spares and support, and are further capable of performing other medium engineering duties. The benefits here are reflected in the evident capabilities of local workers once trained, creating opportunities for expansion into more complex tasks overtime. Other South African firms are more limited in terms of their ability and long-term commitment to impart skills, with some suggesting that government incentives are needed to ensure wider employment opportunities and skills development in Mozambique.

Given this context, exposure to international competition means that Mozambican firms are uncompetitive as they are not able to meet the technical and financial requirements to become a supplier of a megaproject. Hence, as highlighted in previous studies (Castel-Branco and Goldin, 2003; Langa and Mandlate, 2015; Langa 2015; Pretorius, 2005), the fieldwork confirms that the main subcontractors of large FDI projects have been foreign, particularly South African firms. In addition to technical capabilities, South African firms enjoy historical relationships with some of the large investors in Mozambique such as BHP Billiton, Tongaat Hullett and Grindrod. As shown in Table 6 which distributes the firms interviewed in Mozambique according to their main buyers, South African firms dominate the market from maintenance and repair services in the megaprojects and sugar industries, with Mozambican firms often left with much smaller markets such as the beverages industries. Indeed, from the eight Mozal subcontractors for metallurgical and mechanical maintenance services established at the Beleluane industrial park free trade zone (with an average of 70% of their revenues coming from Mozal and/or other free trade zone established megaprojects), only one firm is originally Mozambican.

Table 4: Categories of main buyers for firms interviewed according to their ownership

Main Buyers	Number of suppliers per firm ownership		
	South African	European	Mozambican
Megaprojects (Mozal, Vale, Indian Coal and Kenmare)	10	3	5
Sugar Industries	2	-	2
Beverages Industries (Cervejas de Moçambique and Coca-Cola)	1	1	2

Source: Elaborated by the authors based on interview data

Weak capabilities of domestic Mozambican firms also means that a lot of equipment still gets transported back to South Africa, especially because clients often require that the repairs are done by the OEM so not to void the equipment warranty. Therefore, the megaprojects ability to access flexible and prompt repair services locally is compromised and lead times are increased, besides further limiting the investment opportunities and potential to develop local capabilities in Mozambique. As mentioned, South African and Mozambican firms would both benefit from closer collaboration to develop these capabilities in Mozambique.

Factors impeding the development of domestic capabilities and overall competitiveness in the Mozambican market can be summarised as follows:

- Market size reducing opportunities for investments in upgrading capabilities
- Information asymmetries and weak cooperation between local and foreign suppliers
- Lack of access to long-term capital with reasonable terms, to finance productive infrastructure
- Weak domestic supply chain for critical inputs
- Technical skills shortages
- Absence of strategic co-ordination between multiple stakeholders (government, private sector, donors)

4.1 Local content for capabilities development

The fear of accelerated premature deindustrialisation and import competition has given rise to strong debates around the need to ensure internal protection through measures such as localisation and preferential procurement strategies across many developing countries, including South Africa and Mozambique. In order to ensure that local content provisions effectively contribute for the development of local capabilities and reversal of premature deindustrialisation in the region, they need to be focused on local value addition and enforceable given existing institutional capacities.

In South Africa, firms note that the localisation of manufacturing through local content policies will have a huge positive impact on employment. At present, a lot of companies appear to be importing finished goods (across several industries) resulting in the loss of jobs and existing capabilities. Some firms on the other hand, have a 60-70% target as a minimum local content, which appears to be the industry norm.

Interviews in South Africa reveal critical issues around BEE policies and procurement scorecards. BEE requirements tend to have a strong emphasis on ownership and as a result non-compliant suppliers are penalised for not meeting BEE ownership requirements, although they tend to be involved in local value addition. So as discussed in Section 5, preferential procurement is awarded to firms importing a majority of their parts, while firms manufacturing and significantly sourcing locally do not benefit. Policies therefore appear not to be working in favour of local value addition which is prohibitive for the industry. Previous research by CCRED (2016) similarly suggests that procurement policies do not give sufficient weight to local content and value addition. We note here that South Africa is in the process of implementing local content provisions in the Mining Charter with the aim of tying issues around local value addition and BEE ownership together.

In Mozambique, the local content law currently being developed has moved away from a focus on national ownership to the degree of incorporation of domestic inputs such as raw materials and labour. Yet similar legislation focusing on both national ownership and local value addition can be found for instance in the mining and gas laws as well as the procurement law for public construction projects, but enforcement capabilities have often been weak. Similarly, in South Africa, local content designation has been labelled a good tool for industrial development, but it is not being met and neither is it effectively enforced. The institutional capacity to enforce such policies is constrained by the fact that the laws are often applied to a wide range of activities and industries. Such is the case of the local content law being developed in Mozambique, which is intended to be general to all sectors with sector specific regulation. In a context of weak institutional capacities, targeting particular industries, and goods or services within them can be used as a tool for adjusting policy objectives to existing enforcement capacities.

Localisation requirements are important for ensuring local value addition, upgrading and expanding production in individual countries, which can then feed into export markets and improving regional competitiveness. However, a coherent local content policy for capital equipment industries, in South Africa and Mozambique will also be key in intensifying links and establishing a strategy for investment and value addition in both countries.

4.2 The potential for strategic collaboration between Mozambican and South African firms for increasing competitiveness

Within a framework of promoting regional industrialisation, structured collaboration between Mozambique and South Africa has the potential for reverting the on-going loss in capabilities and competitiveness in the capital equipment sector in South Africa, and developing and transferring local capabilities and skills for Mozambican firms.

Given the context of South Africa losing market shares in Mozambique's capital equipment sector and the Mozambican firms' lack of productive and skills base to seize opportunities from megaprojects, a crucial point emerging is linked to the conditionalities that would need to be in place in order to effectively create productive partnerships between Mozambican and South African firms.

In terms of economic impact in Mozambique, strategic partnerships between Mozambican and South African firms in the capital equipment sector have the potential of increasing local value addition, developing domestic capabilities and transferring skills and technology, and thus

effectively contributing to reducing import dependence. Shifting value addition and capabilities creation to Mozambique through strategic partnerships would happen by ensuring that potential preferential treatment given to Mozambican firms by large FDI projects is not translated into indirect imports as it is currently. As discussed, technological partnerships with South African OEMs in particular would avoid equipment being transported back to South Africa for repairs without violating the warranty tied with the equipment.

In order to ensure that Mozambican firms truly benefit from these partnerships with South African firms, they have to aim at developing local capabilities and skills to: i) effectively support meeting local content requirements while ensuring quality and reliability; ii) develop specialised capabilities to supply in core areas within the activities of mega large FDI projects; and iii) build financial reserves through access to larger and more financially attractive contracts. Given the capital intensive nature of the industry, partnerships may further facilitate access to capital for investment in new machinery and certifications, and also strengthen access to South African industrial infrastructure. In sum, embedding the need to acquire skills and ensuring the transfer of technology through binding partnerships in policy frameworks, along with structured collaboration between the private sector, state agencies and other relevant domestic and regional actors would mean that capabilities of local Mozambican firms are enhanced.

For South African firms, the kind of partnerships described have the potential for expanding their export markets in Mozambique by guaranteeing greater levels of involvement on the sites with reduced initial investment costs with a workshop, machinery and trained labour. In particular, long-term MARC contracts, as explained, do represent an attractive market for firms, represent an opportunity for mutually beneficial collaboration for continuous training and skills transfer. Thus, sustaining regional exports growth requires that regional export promotion and incentives in South Africa do incorporate conditionalities around regional local value addition through partnerships with local firms.

The experience of partnerships between Mozambican and foreign firms promoted by Mozal and the Centre for Investment Promotion as part of Mozal supplier development program shows that a profound discussion of what constitutes a meaningful partnership for Mozambican firms and the role of the state is crucial to promote industrial development. Langa and Mandlate (2015) have argued that over the long run the partnerships established between Mozambican and foreign (mainly South African and Australian) firms to supply Mozal during its first years of operations were of limited impact in terms of technological transfer, financial gains and access to the Mozal market.

The fieldwork demonstrated that most partnerships established by the Mozambican firms interviewed focus on contract-sharing or import facilitation, rather than on technological and organisational capabilities development. In the case of contract-sharing partnerships, the balance of power is often skewed in favour of the foreign firms as they are the direct suppliers of the megaprojects, and therefore have control over the partnership. Generally, and as indicated above, there is a lack of co-operation between South African/ European firms interviewed and Mozambican firms, which weakens the potential for developing mutually advantageous outcomes.

There is, therefore, a need for regulation and enforcing mechanisms that can further give structure and impose conditionalities that allow for mutually beneficial partnerships in the

context of supplying to megaprojects to ensure the acquisition of skills and technology for economy-wide benefits.

5. Conclusions and implications for industrial policy

This paper has explored a number of issues pertaining to de-industrialisation trends in both South Africa and Mozambique, particularly concerning the loss of capabilities and competitiveness in South Africa's capital equipment sector and the weak productive capabilities to develop linkages with the capital-intensive mega projects in Mozambique. It concludes that addressing these challenges and driving sustainable regional industrialisation requires structured collaboration for mutual benefit.

Although megaprojects have not been a base for broad-based development of capabilities, research shows a potential for this, particularly with a growing after sales market. This requires the development of strategies where the development of capabilities for activities such as aftermarket, repair services, service centres and localisation of value adding activities in general is supported in Mozambique, also through leveraging South Africa's capabilities. This requires a **collaborative approach to regional industrial development and policy** that is structured not just around expanded market opportunities but fundamentally on developing local manufacturing capabilities across the region.

Weak productive and technological capabilities of Mozambican firms and competition from mature South African firms means that they are not able to fully access existing market opportunities. Thus, with South Africa being among the main investing and trading partners of Mozambique, the pressures and opportunities arising from regional dynamics and South African corporate strategies have to be a deliberate component of Mozambique's industrialisation strategy. The current pattern of backward linkages with megaprojects is unsustainable for both Mozambican and South African firms due to the social and economic tensions arising from imbalances in terms of productive capabilities and bargaining power with megaprojects. The research highlights the need for more **favourable conditionalities** to effectively develop mutually beneficial partnerships between Mozambican and South African firms and institutions.

There is need to identify the conditions and support to make South African businesses more competitive and attractive in the region. For instance, a crucial area the report raises is the need for further deliberation around the conditions that would need to be in place in order to effectively create **productive partnerships** between Mozambican and South African firms. Such partnerships would in effect mean that the cost to the site is lowered and less equipment would have to be transferred back to South Africa and instead repaired efficiently in Mozambique, while adding value locally and developing capabilities.

Regional integration initiatives are not only important from an economies of scale perspective but could include regionalising capabilities by developing regional testing centres and regional infrastructure links which could play a similarly important role in boosting regional industrial activity. Although there is an important role for the state, this would also need to be facilitated by interactions between industry and government institutions. Furthermore, strategic partnerships between firms in the region have to be embedded in regional industrialisation strategies. At present the IDC and other institutions have a weak orientation

towards the region, suggesting that more could be achieved, as meaningful partnerships require relevant and working institutions.

In order to effectively promote regional industrialisation, forms of regional integration between countries have to address specific constraints faced by firms. Having discussed the possible reasons for South Africa's loss of capabilities and competitiveness in the region, the paper draws attention to the need for **trade policy coherence** that supports intra-SADC exports and local value addition (as in the example of Bell Equipment above).

Furthermore, access to long-term **development finance** for productive investments was widely emphasised for both South African and Mozambican firms. While Mozambican firms need long-term development finance to be able to invest in upgrading capabilities, for South African firms, access to an export finance facility is key.

Sustaining regional export growth requires that **export promotion and incentives** are put in place, particularly in assisting smaller manufacturers become export ready and gain access to a greater market.

Furthermore, the paper has highlighted that industrial development in Mozambique requires **supporting markets for capital equipment inputs** such as foundries for spare parts manufacturing, which can be achieved with effective coordination between government departments, the private sector and donor agencies.

Furthermore, linkages between domestic Mozambican firms and megaprojects require a collaborative approach but also government's stronger emphasis on **local content requirements** to support growth in local manufacturing and the development of new technologies. Local content provisions can effectively contribute to the reversal of premature deindustrialisation

In both Mozambique and South Africa, however, policy orientation appears to neglect the **institutional capacity** limitations to effectively promote and monitor the development of capabilities. As different sectors demand different productive capabilities, skills and technology as well as close collaboration between the private sector, policymakers and training institutions for effective implementation, selecting priority sectors and products or services within these sectors is crucial. An important criteria for sector selectivity needs to consider the potential to multiply and diversify linkages within the economy i.e. side streaming linkages to catalyse other sectors including industry, agriculture and infrastructure development.

Overall, the study shows that structural transformation of the economy requires **strategically coordinated state intervention through industrial policy**, to generate effective incentives to develop productive capabilities as well as increase firm competitiveness.

Moreover, the study alludes to the need for mainstream debates on regional integration to go beyond promoting increasing levels of trade and investment between countries, to greater consideration of **building long-term productive** relationships to complement and upgrade existing investments and capabilities through technology and skills transfer.

References

Abebe, G., Schaefer, F., 2015. Review of Industrial Policies in Ethiopia: A Perspective from the Leather and Cut Flower Industries, in: Noman, A., Stiglitz, J.E. (Eds.), Industrial Policy and Economic Transformation in Africa. Columbia University Press, New York.

Altman, M. & Mayer, M. 2003. Overview of industrial policy. Human resources development review: education, employment and skills in South Africa. Cape Town: HSRC Press. Pp 64-85.

Amsden, A. H. 1989. Asia's next giant: South Korea and late industrialization. Oxford University Press: Oxford.

Amsden, A. H. 2001. The Rise of 'The Rest': Challenges to the West from Late-Industrializing Economies. Oxford University Press.

Andreoni, A., 2013. Manufacturing Development, Structural Change and Production Capabilities Dynamics (Doctoral dissertation, University of Cambridge).

Andreoni, A. and Scazzieri, R., 2014. Triggers of change: structural trajectories and production dynamics. Cambridge Journal of Economics, 38(6), pp.1391-1408.

Ashman, S. & Newman, S. 2013. Industrial Policy and South Africa's economic trajectory from apartheid to present day. Available at: http://iippe.org/wp/wp-content/uploads/2013/07/Samantha-Ashman-and-Susan-Newman_MEC.pdf

Bell, J., Nhundu, N., Paelo, A., Thosago, M. and Vilakazi, V. (2017). Research project on large firms and system for regular tracking of their strategies and decisions: Machinery and equipment sector assessment. Forthcoming Centre for Competition Regulation and Economic Development working paper

Bell, M. and Pavitt, K., 1993. Technological Accumulation and Industrial Growth: Contrasts Between Developed and Developing Countries. Industrial and Corporate Change, 2(1), pp.157-210.

Castel-Branco, C.N., 2010. Economia Extractiva e Desafios de Industrialização em Moçambique, in: Economia Extractiva E Desafios de Industrialização Em Moçambique. IESE, Maputo.

Castel-Branco, C.N., 2002. An investigation into the political economy of industrial policy: the case of Mozambique (PhD Thesis). SOAS, University of London, London.

Castel-Branco, C.N., Goldin, N., 2003. Impacts of the Mozal Aluminium Smelter on the Mozambican Economy (Report submitted to Mozal.). Maputo.

Chang, H-J. 2002. 'Breaking the Mould – An Institutionalist Political Economy Alternative to the Neo-Liberal Theory of the Market and the State', Cambridge Journal of Economics, 2002, vol. 26, no. 5.

Chenery, H., Robinson, S., Syrquin, M. (Eds.), 1986. Industrialization and Growth: A Comparative Study. Oxford University Press, New York.

Centre for Competition, Regulation and Economic Development (CCRED). 2016. Gauteng City Region machinery and equipment: Sector strategy 2016-2019. Mimeo.

Cramer, C., 1999. Can Africa industrialize by processing primary commodities?: the case of Mozambican cashew nuts, in: World Development. pp. 1247–1266.

Cruz, A.S., Guambe, D., Marrengula, C.P., Ubisse, A.F., 2014. Mozambique's Industrialisation (No. 10), Learning to Compete/Africa Growth Initiative. Africa Development Bank Group/UNU-WIDER.

CSID. (2010). The development of an industrial policy for Gauteng province. Unpublished report prepared by CSID WITS for Gauteng Province Department of Economic Development.

Dasgupta, S., and Singh, A. 2006. Manufacturing, services and premature deindustrialization in developing countries: A Kaldorian analysis (No. 2006/49). Research Paper, UNU-WIDER, United Nations University (UNU).

Fessehaie, J., 2015. Regional industrialisation research project: Case study on the mining capital equipment value chain in South Africa and Zambia. Centre for Competition, Regulation and Economic Development working paper no. 2015/1.

Fine, B and Z Rustomjee. 1996. The Political Economy of South Africa: from Minerals-Energy Complex to Industrialisation. London: Hurst.

Gumede, W. 2010. Participatory development planning in a democratic developmental state. In Mclennan, A and Munslow, B (eds), The Politics of delivery (Vol. II). Wits University Press, Johannesburg.

Hidalgo, C.A., Hausmann, R., 2009. The building blocks of economic complexity. Proceedings of the National Academy of Sciences of the United States of America 106 (2) 10570–10575.

Hirschman, A. 1958. The Strategy of Economic Development, New Haven: Yale University Press.

Hirschman, A.O. 1981. Essays in Trespassing: Economics to Politics and Beyond. Cambridge University Press Archive.

Industrial Development Corporation (IDC). 2013. The interface between the mining and manufacturing sectors in South Africa. Available at: https://www.idc.co.za/images/Content/IDC_research_report_Interface_between_Mining_and_Manufacturing.pdf

IPAP. 2016. Industrial Policy Action Plan 2016/17-2018/19: Economic sectors, employment and infrastructure development cluster. Department of Trade and Industry.

Krause, M. and Kaufmann, F., 2011. Industrial policy in Mozambique, Discussion paper. Deutsches Institut für Entwicklungspolitik, Bonn.

Lall, S. 2001. Competitiveness, technology and skills. Edward Elgar, Cheltenham, UK.

Lall, S., 1992. Technological capabilities and industrialization. World Dev. 20, 165–186.

Landesmann, M. and Scazzieri, R. 1990. 'Specification of Structure and Economic Dynamics', in Baranzini M. and R. Scazzieri, eds., The Economic Theory of Structure and Change, Cambridge: Cambridge University Press.

Langa, E., 2017. Dependência de Megaprojectos e Desindustrialização Prematura em Moçambique, in: Desafios Para Moçambique 2017. IESE, Maputo.

Langa, E., 2015. «Ligações Minadas» O Caso dos Fornecedores Nacionais da Vale e da Rio Tinto em Moçambique, in: Desafios Para Moçambique 2015. IESE, Maputo.

Langa, E., Mandlate, O., 2015. Ligações entre grandes projectos de investimento estrangeiro e fornecedores locais: promessa de desenvolvimento, in: Castel-Branco, C.N., Massingue, N., Muianga, C. (Eds.), Questões Sobre O Desenvolvimento Produtivo Em Moçambique. IESE, Maputo.

Langa, E., Mandlate, O., 2013. Questões à volta de ligações a montante com a Mozal, in: Desafios Para Moçambique 2013. IESE, Maputo, pp. 175–210.

Lydall, M. 2009. Backward linkage development in the South African PGM industry: a case study. Resource. Policy, vol. 34. pp. 112-120.

Mandlate, O., 2015. Capacitação das empresas nacionais e conteúdo local de megaprojectos em Moçambique, in: Brito, L. de, Castel-Branco, C.N., Chichava, S., Forquilha, S., Francisco, A. (Eds.), Desafios Para Moçambique 2015. IESE, Maputo.

Mbayi, 2011

MIC, Ministério da Indústria e Comércio, 1997. Política e Estratégia Industrial 1997-2006.

Mondi, L. and Roberts, S. 2006. Industrial development and industrial policy in South Africa - a ten year review. University of the Witwatersrand.

Mondliwa, P. 2017. A 20-year review of manufacturing performance and industrial policy in South Africa. Mimeo.

Morris, Kaplisnky and Kaplan

Mtegha, H., Leeuw, P., Naicker, S., and Molepo, M. 2012. Resources corridors: experiences, economics and engagement; a typology of Sub-Saharan African corridors. School of Mining Engineering and Centre for Sustainability in Mining and Industry (CSMI), University of the Witwatersrand, Johannesburg.

Oyejide and Adewuyi, 2011.

Oqubay, A. 2015. Made in Africa : industrial policy in Ethiopia. First edition. Oxford, United Kingdom: Oxford University Press

Pasinetti, L.L. 1981. Structural Change and Economic Growth, Cambridge: Cambridge University Press.

Radelet, S.C., 2010. Emerging Africa: How 17 Countries are Leading the Way. CGD Books.

Sender and Smith, 1986

Terheggen, 2011.

UNECA, 2016. Transformattive industrial policy for Africa. United Nations Economic Commission for Africa, Addis Ababa, Ethiopia.

UNIDO, 2002. Competing through innovation and learning. Industrial Development Report

UNIDO, 2013. The industrial competitiveness of nations: looking back, forging ahead. Industrial Development Report.

Wade, R., 1990. Industrial policy in East Asia: Does it lead or follow the market. Manufacturing Miracles: Paths of Industrialization in Latin America and East Asia, pp.231-66.

Walker, M. and Jourdan, P. 2003. Resource-based sustainable development: an alternative approach to industrialisation in South Africa. Mineral Energy, vol. 18. pp. 25-43

Warren-Rodríguez, A., 2010. Uncovering Trends in the Accumulation of Technological Capabilities and Skills in the Mozambican Manufacturing Sector. Oxf. Dev. Stud. 38, 171–198. doi:http://www.tandfonline.com/loi/cods20

Warren-Rodríguez, A., 2008. Linking technology development to enterprise growth: evidence from the Mozambican manufacturing sector (No. 160). School of Oriental and African Studies, University of London.

WDI, 2018. World Development Indicators Database.

Zalk, N. 2014. Industrial policy and the economic legacy of apartheid. The African Programme on Rethinking Development Economics (APORDE). Available at: http://www.aporde.org.za/current-events/49-industrial-policy-and-the-economic-legacy-of-apartheid