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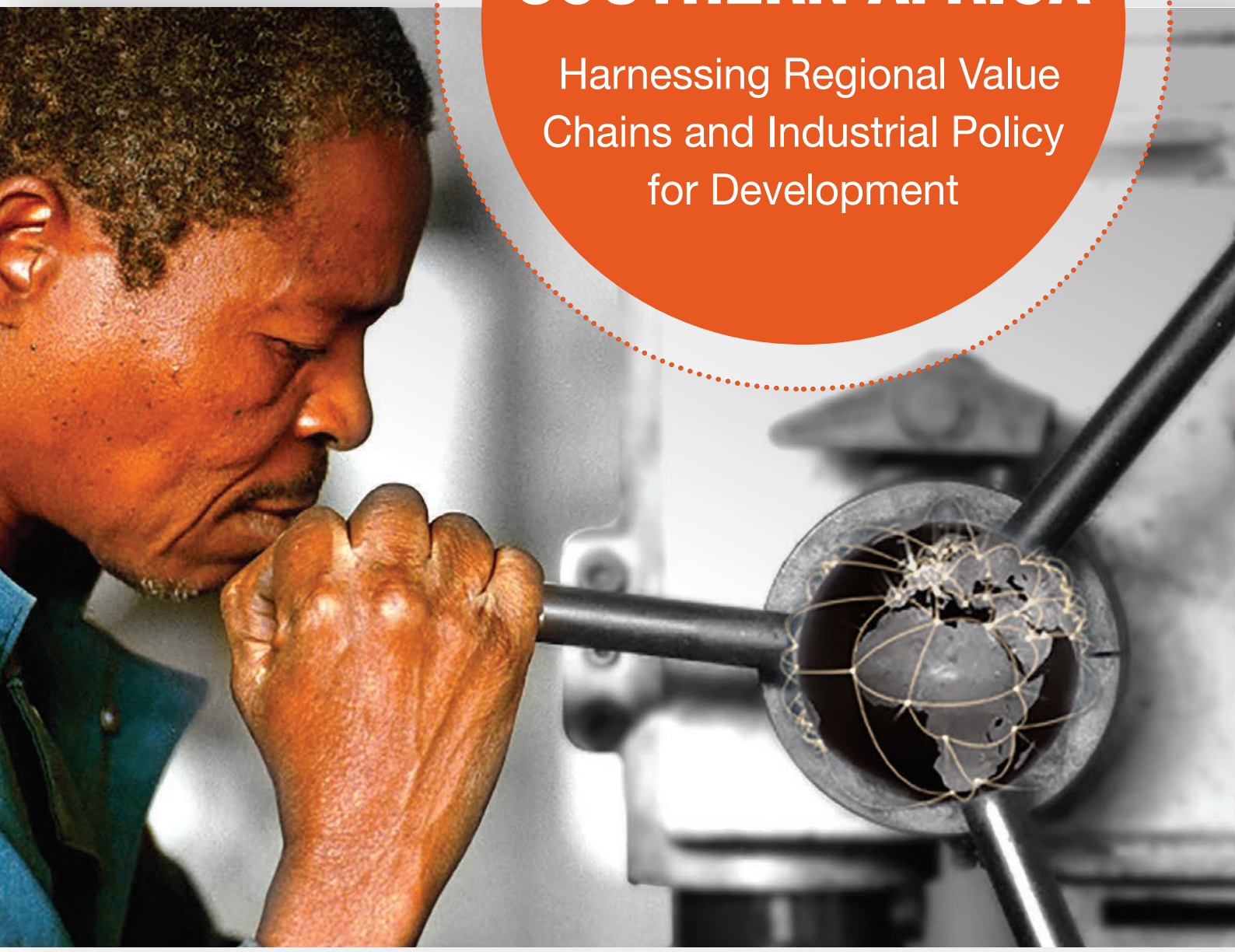
TRANSFORMING SOUTHERN AFRICA

Harnessing Regional Value Chains and Industrial Policy for Development



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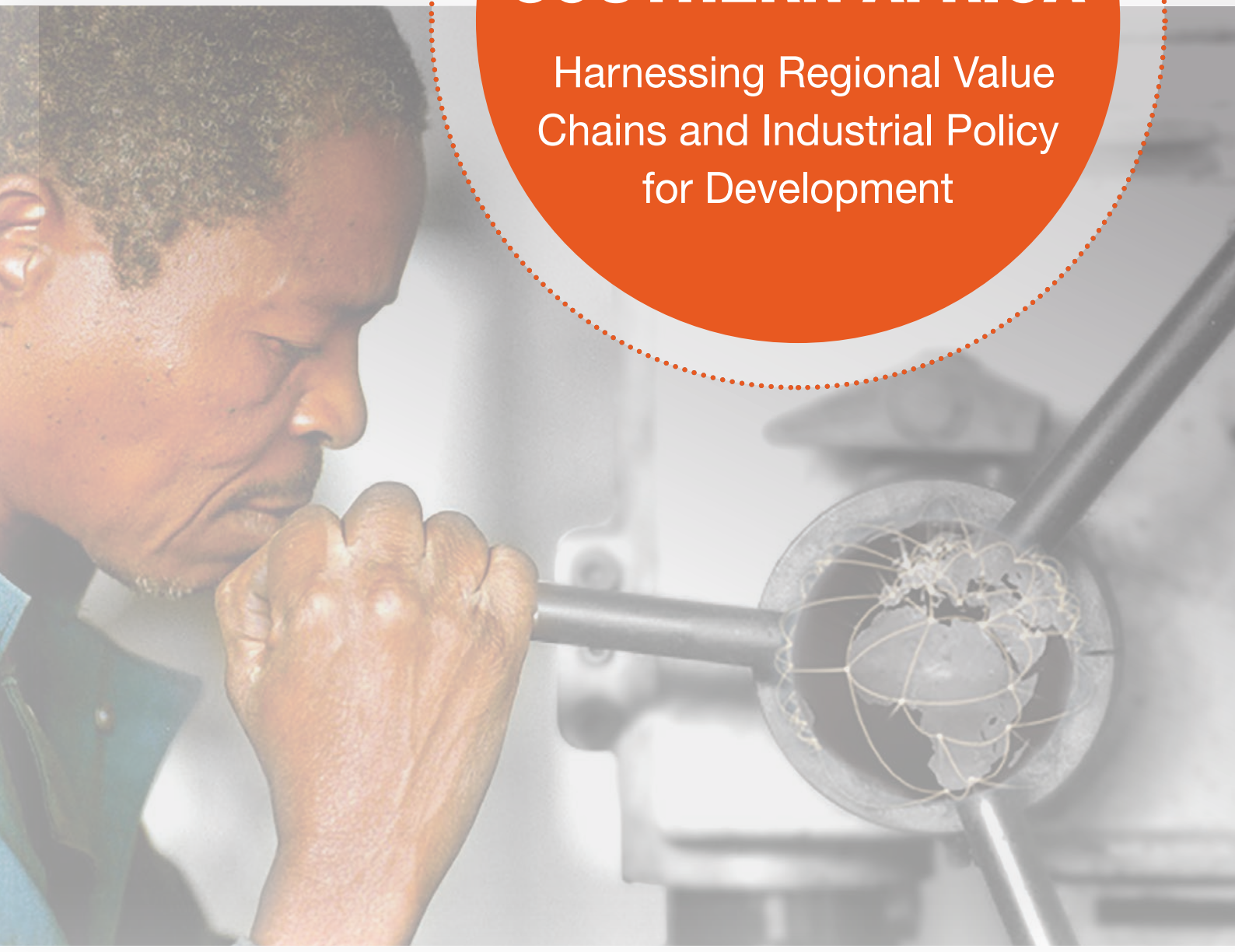

UNITED NATIONS
Geneva, 2021

United Nations Publications
405 East 42nd Street
New York, New York 10017
United States of America
Email: publications@un.org
Website: https://shop.un.org/

United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/GDS/ECIDC/2021/1

ISBN: 978-92-1-113007-2
eISBN: 978-92-1-005621-2
Sales No: E.20.II.D.38

PREFACE

This technical report brings together a series of contributions from leading economists and experts on the challenges and the opportunities faced by Southern African economies in their attempt to strengthen trade and productive integration. The project has been carried out by the Division of Globalization and Development Strategies of UNCTAD in the framework of its activities aimed at fostering regional integration and at sustaining the SADC industrialization strategy, among other things through the strengthening of industrial policy capacity and coordination.

The studies have benefited from the discussion that took place in two regional workshops held in Pretoria and Dar-es-Salaam in 2017, with the participation of key regional actors from the academia, public institutions, and the private sector and organized in close cooperation with several partner organizations (SADC, OECD Development Center, UNECA and UNIDO).

The book has been prepared under the guidance and supervision of Piergiuseppe Fortunato with the support of Francesca Guadagno. The feedback and advices from Richard Kozul-Wright, Rashmi Banga, Giovanni Valensisi, Rohit Ticku, Annalisa Primi, Simon Roberts, Antonio Andreoni, Neema Manongi, Rishi Domun, Muyumbwa Kamenda, Olga Oficio Munguambe and Nigel Gwynne-Evans, as well as the editorial assistance of Carter Dougherty, are gratefully acknowledged.

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Saul Levin is the Executive Director of Trade & Industrial Policy Strategies (TIPS). in April 2013 and was appointed Executive Director in December 2014. He was previously a chief director in the Economic Development Department (EDD) with oversight of the Development Finance Institutions reporting to EDD, including the Industrial Development Corporation and the Small Enterprise Finance Agency. He also worked as the chief of staff for Lindiwe Hendricks, heading her office while she was Minister of Water Affairs and Forestry and when she was Minister of Minerals and Energy. He has a Masters Degree in Industrial Sociology from the University of Witwatersrand, with his thesis on small business development.

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CONTENTS

INTRODUCTION

Advanced economies are experiencing one of the slowest recoveries in history, and this loss of momentum is generating knock-on effects for emerging and developing countries that will force policymakers to draw up new strategies for sustainable development. After the 2008 financial crisis and global slowdown, growth rates in African economies fell by half. With insufficient global demand, trade remains sluggish. But the problem runs deeper. Even when demand is buoyant, and exports growing, the role of trade in spurring industrialization and development is no longer what it used to be. International commerce aided unprecedented growth in East Asian economies. Now, put simply, it does not generate the wealth it once did. UNCTAD studies (2016) show that most developing economies experienced in the last 25 years an increase in the total value of their exports of manufactures relative to GDP, but a decline in the contribution of manufacturing's value added to GDP.

This phenomenon has many causes. Today's global economy is a much more open and contested space than when the East Asian late industrializers began their ultimately successful effort to catch up in the 1960s, but not only because of their success. Subsequent liberalization across the world, and the emergence of former centrally planned economies with their supply of low-skilled labour, radically transformed conditions for exporters. With a multitude of countries simultaneously trying to realize the promise of export-led industrialization, competition has intensified enormously.

At another level, new information and communication technologies have triggered what has been called a "digital revolution." Stronger intellectual property rights and weakened labour laws have shifted the balance of power towards larger firms, whose dominant market positions allow them to generate "super" profits (UNCTAD, 2017). In the face of fewer restrictions on how these firms can move capital across borders, it become easier and cheaper to organise far-flung production networks and to govern those networks in ways that fortify the advantages of leading firms. This new geography of production, despite facilitating access to international markets, has confounded developing economies with limited productive capacities. These economies have remained trapped in the lowest value-adding activities at the bottom of value chains, which can ultimately result in superficial industrialization and slow economic growth. This situation has contributed to increasing anxiety over economic strategies at precisely the time when the international community has set ambitious and transformative objectives in the Sustainable Development Goals (SDGs).

In light of these difficulties, many developing economies have sought new opportunities. They have strengthened their emphasis on regional and South-South markets that can help generate economies of scale, with the goal of creating employment, fostering diversification, and upgrading productive capacity. East Asian economies, for example, and particularly the Republic of Korea, Taiwan Province of China, Singapore, and China (despite its global reach) have long recognized the importance of the East Asian regional production network. The African continent is facing up to this challenge. One year ago, 44 out of the 55 African countries signed the continental free trade agreement (CFTA) in Kigali, completing the negotiations that had begun in 2015. In the Southern part of the continent most of the countries participating in the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC) have already ratified the Tripartite Free Trade Agreement.

In this volume, we investigate the status of regional integration in Southern Africa, discuss the critical challenges to be overcome, and survey the most interesting opportunities for achieving deeper integration. As we argue, all the initiatives to stimulate regional integration – such as those mentioned above – are very timely, given the current economic landscape. Even when the scenario was rosier in the 1990s, African economic growth flowed from external factors, such as high commodity prices and productivity gains associated with the increase in demand for domestic services. The continent has a whole has been growing rapidly but transforming slowly especially since the early 1990s.

Southern Africa does not represent an exception in this respect. Nowadays less than the 10 percent of Southern African workers find jobs in manufacturing, and among those only a tiny fraction of them are employed in modern, formal firms with adequate technology. Furthermore, despite the relatively high growth rates of the 1990s and early 2000s, private investment in modern industries remains too low to sustain transformation and most economies of the region are still undiversified and highly dependent on few and unsophisticated commodities, mainly in the primary sector.

Southern Africa is especially well placed to take advantage of the opportunities of regional integration. Urbanisation is underpinning fast-growing regional demand for goods and services, with a seven-fold increase in consumption of high-value processed foods forecast by 2040. Firms in the region have a unique opportunity to tap into this growing demand. Countries should build on existing efforts to integrate regional markets. Furthermore, Southern African economies seem particularly well-placed to develop value chains at the regional level. As shown by a recent Economic Report on Africa (ECA, 2015), Southern Africa is the most integrated region within Africa. Southern Africa also displays the highest value on the merchandise trade complementarity index, which assesses how the structure of a country exports matches those of its imports from potential partners, giving us information on the likelihood that two economies can complement each other.

As discussed by **Levin and Makgetla (Chapter 1)**, early data on the potential of Regional Value Chains (RVCs) to promote development in the region are encouraging. South African clothing manufacturers, for example, moved into countries such as Lesotho and Swaziland, leading to an expansion of the value chain driven by South African retailers (Gereffi, 2014), and Mauritius' textile producers are following the same path by expanding their operations in Madagascar.

These RVCs can be instrumental in increasing value added in the developing regions (Kozul-Wright and Fortunato, 2019). RVCs are characterized by the end-product being exported by a country within the region, often to a regional partner, and with many high value-adding activities also undertaken within the region. They can, therefore, contribute significantly to the creation of value at the local level and offer more opportunities to participate, gain experience, and build the capacities needed to compete globally. RVCs, in short, are a stepping-stone to integration into global networks (UNCTAD, 2015). Compared to global markets, regional markets might also offer better opportunities to upgrade, design, marketing, branding, and distribution. Furthermore, given the size and capacity constraints faced by many developing countries, an inward-looking industrial strategy might quickly reach its limits. A regional perspective also offers opportunities to leverage economies of scale and promote vertical integration and horizontal specialization.

This volume analyzes in detail some specific value chains that already exist in the region and that offer significant opportunities for further development. **Paremoer (Chapter 2)** maps the most important regional chains in the agro-processing sector and explores the linkages and the opportunities still unexploited. In a related contribution, **Vilakazi (Chapter 3)** examines the causes of high intra-regional road freight rates for food and commodities in the region. Moving closer to the final consumer, **Das Nair (Chapter 4)** studies the rapid growth and spread of supermarket chains and the opportunities that such growth offers to local suppliers. Finally, **Fessehaie (Chapter 5)** examines the potential for further strengthening of regional productive integration in mining capital equipment, a sector which offers unexploited opportunities of upgrading along the entire value chain.

All the chapters identify precise policy priorities both at the domestic and at the regional level. Expanding regional productive integration beyond the current limits, in fact, will turn on the capacity of developing countries to provide an environment conducive to nurturing domestic firms that can participate in these RVCs. The coordination of transformative policies across different economies is likewise as important as the design of effective measures at the national level. This volume offers a contribution toward achieving both these goals.

CHAPTER 1.
REGIONAL VALUE CHAINS AND INDUSTRIALISATION: THE SOUTHERN AFRICAN EXPERIENCE

Saul Levin and Neva Makgetla

1. INTRODUCTION

In the late 2010s, southern Africa remained one of the poorest and most unequal regions in the world. Moreover, from 2014 the economies of the 12 countries in continental SADC[1] grew slower than the rest of the global South. These outcomes resulted in large part due to being shaped by colonialism to be unusually small and dependent on mining and to a lesser extent plantation agriculture. Decades after colonial rule ended, regional manufacturing remained small, disproportionately located in South Africa, and centred on minerals refineries plus food and beverages.

Greater regional integration would support economic diversification and industrialisation in southern Africa by expanding markets for consumer and capital goods as well as drawing together capacities from a variety of countries. It would, however, require a greater degree of specialisation between nations in order to permit economies of scale. In this context, the concept of regional value chains proves useful in identifying opportunities for more integrated industrialisation. On the one hand, it underscores the potential for enhancing economic integration based on improved specialisation and competitiveness in the partner economies. On the other, it provides a framework for systematic analysis of factors that prevent investment and growth.

This paper starts by outlining the evolution of the value-chain concept as a way to understand opportunities for industrialisation. Utilising the value chain framework in the regional context shifts the focus away from global demand and partnerships to local and regional markets and relationships. It underscores the importance of managing the difficult trade-offs involved in deepening the regional division of labour. In southern Africa, it can help identify opportunities for developing new industries, based on regional advantages and needs, while structuring a more equitable regional economy.

The second section of the paper describes the southern African economy, which was disproportionately unequal and dependent on commodity exports. The end of the international metals boom that lasted from around 2002 to 2011 saw a sharp fall in the value of regional exports, which accelerated from 2014. This largely explains the slowdown in the late 2010s, underscoring the long-term drawbacks of continuing to rely on extractive exports.

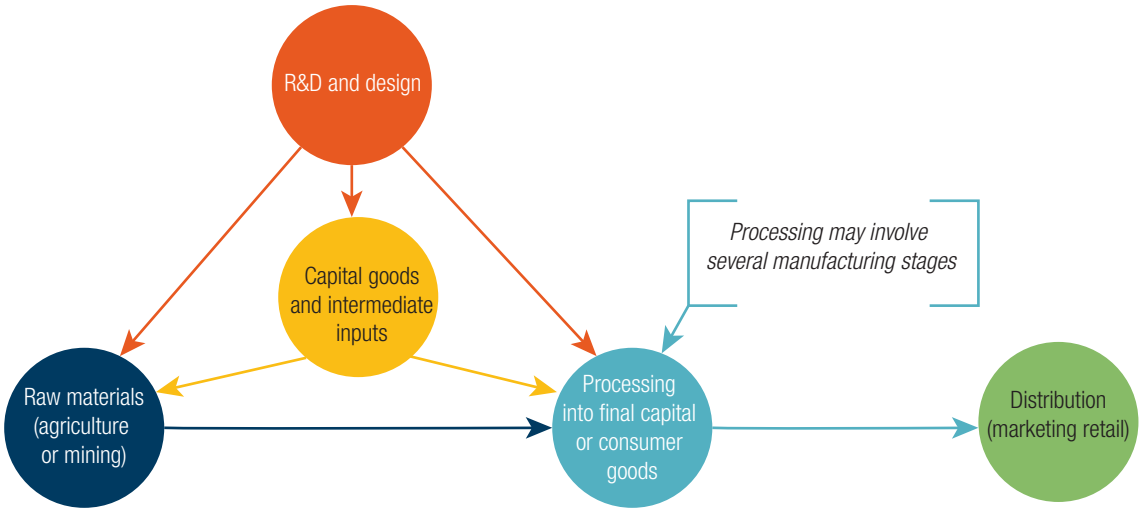
The final section starts by reviewing existing trade in continental SADC. It then evaluates the effects of freight transport as a cross-cutting constraint. A case study of copper manufacturing illustrates the utility of value chains to guide analysis. The section points to key blockages to diversification, notably the difficulty of improving coordination between national policies and challenges around reshaping the division of labour to promote regional industrialisation without excessive costs to South African producers.

[1] The data here refer only to continental SADC, that is Angola, Botswana, the DRC, eSwatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe. It excludes the members that are islands - Mauritius, Madagascar and the Seychelles.

2. VALUE CHAINS AND REGIONAL INTEGRATION

At its most basic, value chains are a descriptive concept that delineates the stages of production of a final good. Figure 1 illustrates the concept, which can be made more detailed or abstract, depending on analytical requirements.

Figure 1. The main components of value chain analysis



Value chain analysis differs from studies of separate industries or clusters by foregrounding upstream and downstream linkages. This in turn directs the research agenda for policy toward:

- Potential multipliers for employment and production as a result of upstream and downstream linkages;
- The effects of input availability, quality and price on manufacturing growth;
- The implications for producers of whether targeted markets are local, regional or global, and how they are accessed; and
- The geographic location as well as the nature of company control over the different phases of the value chain, and the implications for the allocation of benefits and for growth between regions and countries.

The concept of value chains has been used in varying contexts and for divergent purposes since it became widespread in the late 1990s. Its policy applications range from efforts to understand the changing location of production globally to export promotion in developing economies to reframing industrial policy. Re-purposing it for regional development, shifts the focus towards the regional division of labour within value chains. This section briefly outlines the various uses of value chains in the policy context in order to distinguish the implications of shifting to a regional approach.

Framing trade in terms of global value chains (initially termed global commodity chains) emerged in the 1970s as a way to understand the evolving reproduction of underdevelopment (See Hopkins and Wallerstein 1977). From the late 1990s, it was used largely to explain outsourcing, especially that of manufacturing from the global North to a few regions in the global South, mostly in Asia and later in central America (See Baldwin 2013).

This discourse explained the movement of manufacturing to the global South as the result of new mechanisms of control by the dominant companies in manufacturing value chains. Lead companies exercised power through their control of technologies, branding and marketing, rather than direct ownership of manufacturing facilities. Combined with rapid improvements in logistics, these techniques enabled them to move production to other countries while maintaining their ultimate control over the production process and the bulk of profits. Foreign producers could not independently break into global markets because they depended on the dominant multinationals for technology support, marketing and branding, and for the development and maintenance of standards. They were further bound by contract law and the associated sanctions. (See Gereffi *et al.* 2005)

Discussions of global value chains in this connection typically focus on East Asia and, to a lesser extent, Latin America. However Africa barely features. In a collection of papers published by the WTO on global value chains in 2013, Africa outside of South Africa is mentioned just ten times, although South Africa alone gets almost 20 mentions (mostly in a single article on value chains and industrial policy). In contrast, the volume mentions Asia over 100 times and has innumerable separate references to China, Korea, Taiwan and Vietnam. (Elms and Low 2013)

Using the concept of global value chains to understand changing trends in international manufacturing is less relevant to southern Africa for two reasons. First, mining still dominates the economies of most of the countries, as shown in section 3 below. Global mining companies still typically own their production sites directly, despite some shift in the past 20 years toward commodities trading by companies like Glencore and Anglo American. Second, manufacturing value chains in southern Africa produce primarily for domestic and regional markets, with only limited participation in global value chains. Manufacturing industries that are strongly integrated into global value chains are largely limited to the South African auto assembly cluster and its (much smaller) processed fruit sector, plus some clothing production principally in Lesotho and Swaziland.

A second approach to global value chains shifts from a description of global realities to a policy platform. This approach holds that the analysis of global value chains points to ways that producers in developing economies can access global markets more effectively. If they become suppliers in global value chains, they could both leverage technology transfers from the dominant companies and have access to virtually unlimited demand. Unlocking these opportunities requires that they establish relations to the dominant companies, whether retail chains for food, or manufacturing brands for products ranging from clothing to cars. The core policy question becomes how the state can support this kind of integration, for instance by reducing the cost of logistics, promoting upgrades in production to meet global standards, and securing procurement arrangements with lead companies. (See for instance Gereffi and Sturgeon 2013:353-354; UNCTAD 2013:150; Ferrantino 2013)

Southern African exports of agricultural products to the global North typically depended on links to dominant companies in agricultural value chains. But the path was less clear for other manufacturing industries. Southern African economies were latecomers to global manufacturing, competing with far more established and much larger economies in Asia and central America. They lagged behind in terms of transport and electricity infrastructure, technological capacity and a history of supplying major companies. Today, these factors outweigh low wages in competing for global manufacturing opportunities. (See Rodrik 2018:14) As a result, in practice few southern African producers have been able to break into global manufacturing value chains, and the share of African countries in global trade tended to decline from 1995. (Rodrik 2018:3)

Value chain analysis has also increasingly informed the understanding of industrial policy, understood broadly as strategies aimed at promoting industrialisation in developing economies. Industrialisation is often effectively defined as “moving up” the value chain from production of raw materials to manufactures, and ultimately to capital goods, technology development and design. (see Gereffi and Sturgeon 2013)

More substantively, value chain analysis underscores the importance of linkages between phases in the value chain both in understanding constraints on producers and in maximising the multipliers for growth and employment. (See Kaplinsky and Morris 2016) Constraints on value chains arise from inadequate information and infrastructure; the cost, quality or reliability of inputs and skills; the regulatory framework; and the role of dominant companies. The dual policy challenge becomes, first, to identify the most important constraints on industries that could become viable, and second, to design and implement effective and sustainable measures to alleviate them.

In contrast to these approaches, a regional value chain analysis focuses attention on how the different phases of a value chain can contribute to a more effective regional division of labour. This view starts with the argument – certainly valid in southern Africa – that national markets in most developing economies are too small to achieve competitive scale. In many industries, if they simply duplicate their neighbours' manufacturing capacity, none will reach the scale required to compete either locally or globally. This approach incorporates the understanding that infant industries need to start with nearby markets, which are more accessible and easier to serve. If all goes well, experience in meeting local and regional needs may ultimately build up the competitiveness required to break into overseas exports.

Implicit in this argument is that the benefits of regional integration outweigh the costs of deeper regional specialisation and exchange. These costs take two main forms. First, countries have to agree in practice, if not up front, that they will not engage in some forms of production in order to permit others to achieve economies of scale. In southern Africa, South Africa might have to accept downsizing or slower growth in light industries such as clothing and soya in order to promote growth in the region. Second, coordinating policy between governments to promote regional value chains in itself imposes institutional and political burdens. Unless the benefits of measures to support regional value chains clearly outweigh these costs, they will not be implemented or sustainable over time.

3. COMMODITY DEPENDENCE, GROWTH AND INEQUALITY IN SOUTHERN AFRICA

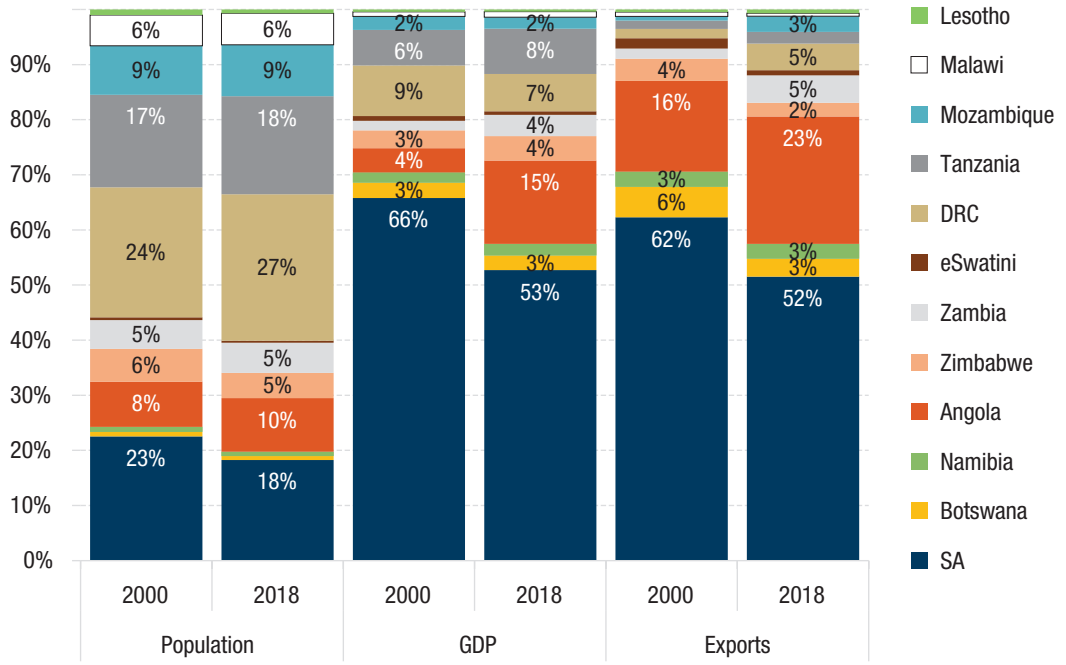
Regional value chains are particularly relevant for southern Africa because the economies in the region are small, deeply inequitable, and far from the major global markets. That makes it difficult to develop new industries without access to regional markets and resources.

This section first benchmarks the size and growth of economies in the region against peer developing countries, excluding China. It then considers structural factors that make a value chain approach particularly useful – in particular, the size of the local economies, the degree of commodity dependence, and the extent of inequality both within and between countries.

A comparison with other developing countries points up the small size of most southern African economies. In 2018, the 12 continental members of SADC had a population of 316 million and a GDP of US$700 billion. Even excluding China, other developing countries had an average population of 48 million; in continental SADC, the average country was half that size. Just three countries – the Democratic Republic of Congo (DRC), South Africa and Tanzania – had a population that was above 50 million, while in four (Botswana, Namibia, Lesotho and eSwatini) the population was under three million. The discrepancy was larger for the GDP. The average SADC GDP was a fifth as large as the average for other developing countries, again excluding China. (Calculated from World Bank 2019)

South Africa loomed large in the region. In 2018, it accounted for 18% of the population and 53% of the GDP of continental SADC. Its share had however fallen by both measures – in 2000, it had contributed 23% of the regional population and 66% of the GDP. Still, both its population and GDP were more than twice as large as the average for other upper middle income economies excluding China.

Figure 2. Share of continental SADC members in regional GDP (a), population and exports in 2000 and 2018, by World Bank income level



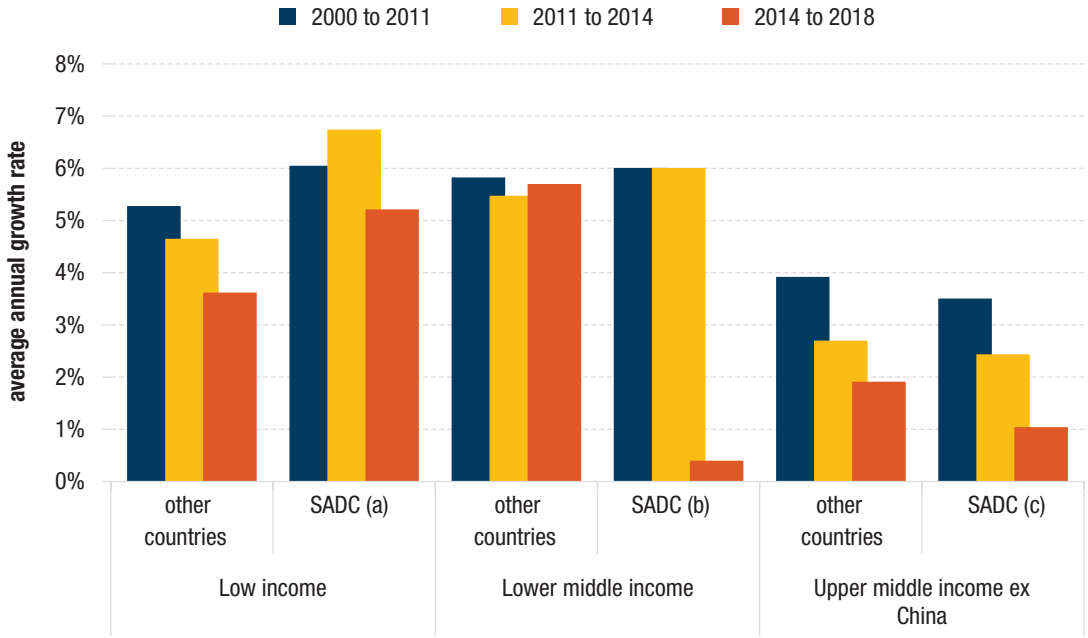
Note: (a) In current U.S. dollars (b) Botswana, South Africa and Namibia: Upper middle income (blue shades); eSwatini, Angola, Zimbabwe, Zambia and Lesotho: Lower middle income (brown shades); Tanzania, DRC, Mozambique and Malawi: Lower income (green shades).

Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

Since 1995, growth in SADC as a whole has dragged the rest of the global South even if we exclude China, which is an outlier in terms of both its size and its reported growth rates. From 1995 to 2018, the regional economy grew under 120%, while other developing economies outside of China expanded by 140%.

Average growth in southern Africa was boosted because the region contains a large share of lower income countries, which typically grow faster than other economies. As Figure 3 shows, low-income SADC countries also grew more rapidly than other low income economies. In contrast, middle-income SADC economies lagged behind their peers. If low-income countries contributed the same share of the GDP as other parts of the global South – just 2% - SADC's regional economy would have grown under 100% from 1995 to 2018, lagging even further behind other developing economies, again excluding China.

Figure 3. Average growth rates by income group in continental SADC compared to other developing economies excluding China, 1995 to 2018



Notes: (a) Tanzania, DRC, Mozambique and Malawi. (b) eSwatini, Angola, Zimbabwe, Zambia and Lesotho. (c) Botswana, South Africa and Namibia. South Africa accounted for over 90% of value added in this group.

Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

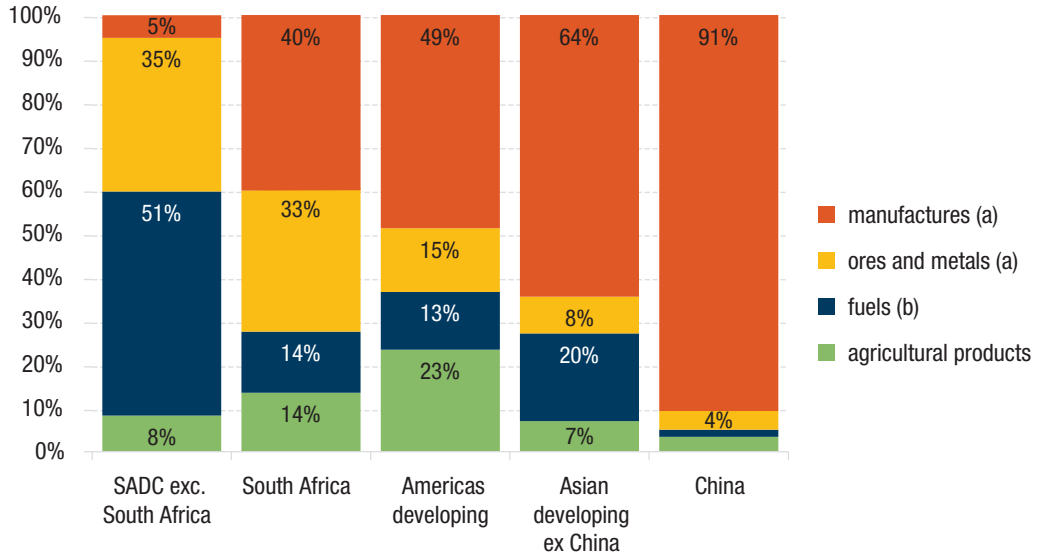
The slow growth in the SADC region compared to peer economies can be explained in large part by its high degree of dependence on commodity exports, especially minerals and fuels, combined with unusually deep inequalities.

Dependence especially on mining and fuel exports is associated with vulnerability to international commodity price cycles. It leads to rapid expansion when international prices spike, offset by longer periods of slower growth during the down phase of the cycle. In practice, the result was that compared to other developing economies, continental SADC grew rapidly during the 2002 to 2011 commodity price boom, but slowly both before and after it.

As Figure 4 demonstrates, southern Africa as a whole was significantly more dependent on commodity exports than other regions in the global South, especially Asia. Even for South Africa, the most industrialised economy in the region, exports from the mining value chain and agricultural products[2] made up 60% of total exports in the late 2010s. For the rest of southern Africa, commodities accounted for 95% of exports, with extractive industries contributing 85% (and over 95% for Angola and Botswana). For other developing countries excluding China, manufacturing made up 60% of foreign sales. For China, the figure was 90%.

[2] Including refined metals but not coal-based chemicals under mining value chain, and sugar-based chemicals under agriculture.

Figure 4. Exports from continental SADC compared to exports from China and from other developing economies by region, 2018



Notes: (a) Manufacturing excludes basic foodstuffs, which are included under agriculture, and iron and steel products, which are included in ores and metals. (b) Mostly oil and gas outside of South Africa, and coal for South Africa.

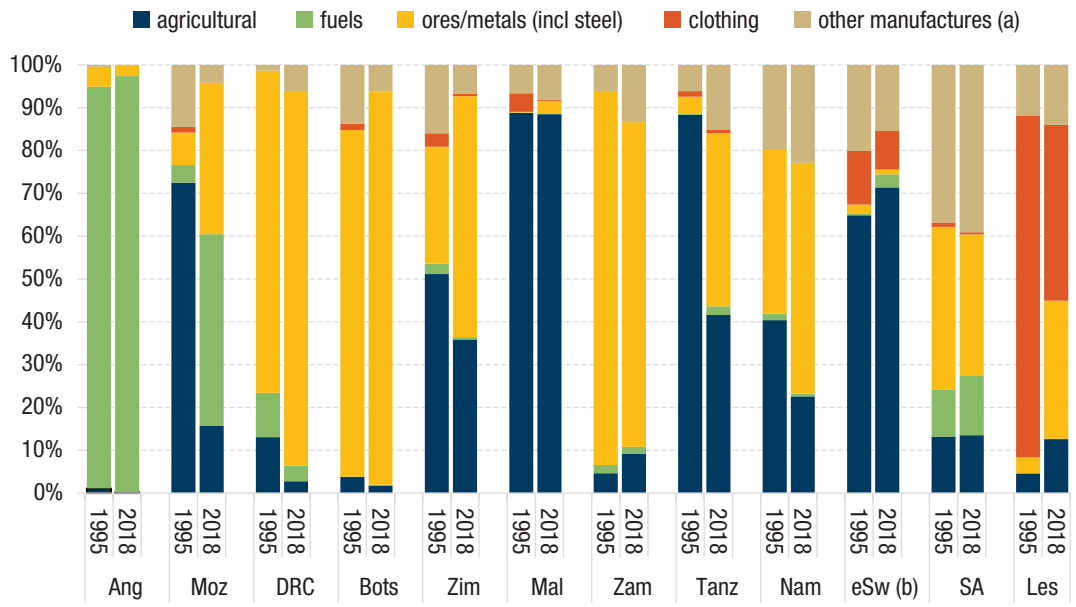
Source: Calculated from UNCTAD. UNCTADSTAT. Interactive database. Downloaded from www.unctad.org in October 2019.

Southern Africa's commodity dependence barely budged over the past two decades. A few countries saw modest shifts toward manufactured exports, but others increased the share of commodities. That said, developing economies as a group also saw virtually no change in the relative export shares of manufacturing and commodities over the past 20 years.

In terms of manufacturing, Swaziland expanded into sugar-based chemicals, largely soft-drink syrup for regional exports. Lesotho's exports were dominated by clothing sold almost exclusively in the U.S. and South Africa. Its total exports came to only 1% of total continental SADC exports, as noted above. A larger change was the development of mining and fuels exports in some historically agricultural economies, notably Mozambique and Tanzania and to a lesser extent Zimbabwe. By the late 2010s, only Malawi and Swaziland depended principally on exports from the agricultural value chain.

Given heavy dependence on commodity exports, southern Africa experienced considerable economic and political stress when commodity prices crashed in 2011. As the following graph shows, the prices of the region's major mining exports reached a 30-year high in 2011, then fell by between half and two thirds through 2015 before stabilising.

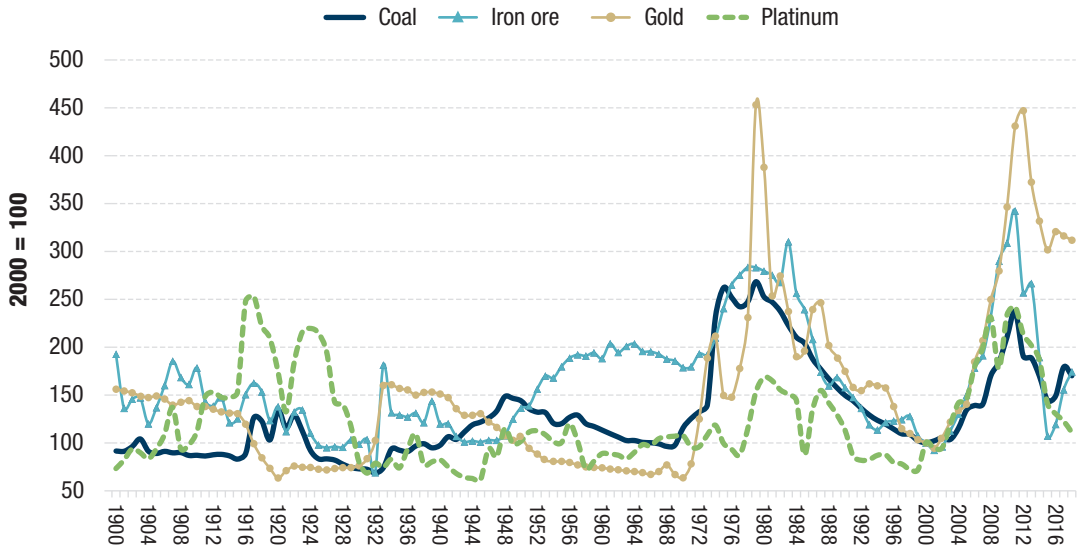
Figure 5. Structure of exports by continental southern African economies, 2000 and 2018



Notes: (a) Foodstuffs are included under agricultural exports, and steel under ores and metals. (b) Sugar-based chemicals are included under agricultural.

Source: Calculated from UNCTAD. UNCTADSTAT. Interactive database. Downloaded from www.unctad.org in October 2019.

Figure 6. Index of prices of major mining commodities in constant U.S. dollars, 1900 to 2018 (2000 = 100)

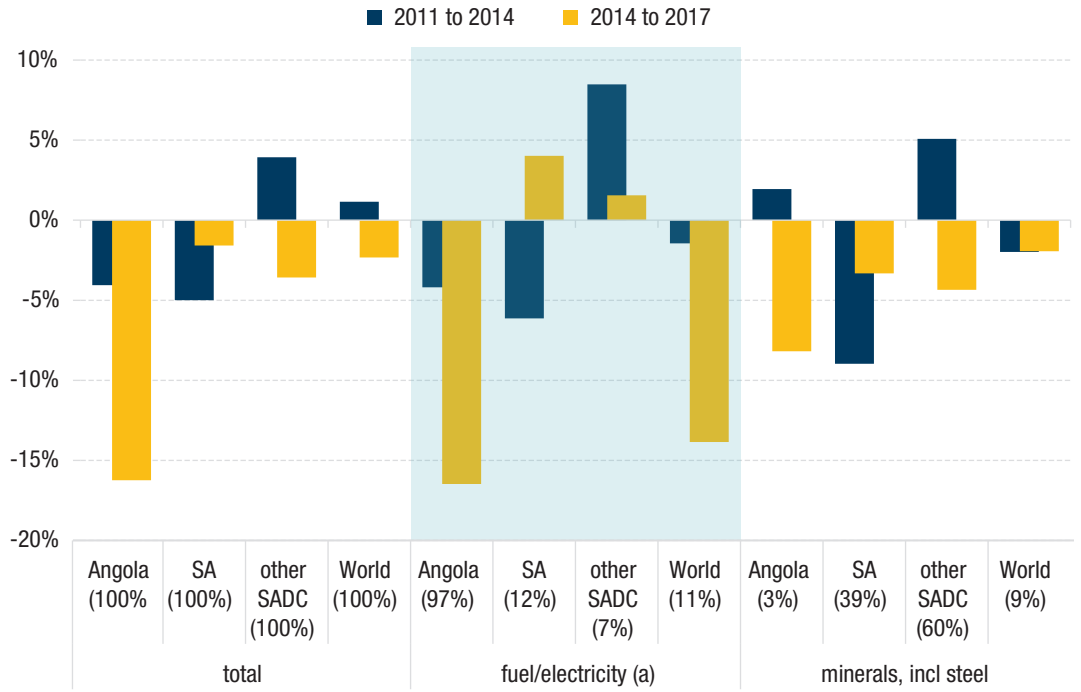


Source: For 1920 to 2015, calculated from Jacks, D.S. 2016. Chart book for "From Boom to Bust." February. Downloaded from www.sfu.jacks.ca in June 2016. Update of David S. Jacks. 2013. "From Boom to Bust: A Typology of Real Commodity Prices in the Long Run," NBER Working Paper 18874. For 2016 to 2018, deflate with U.S. CPI; calculated from Kitco data on gold and platinum, downloaded from www.kitco.com; Index Mundi data on iron ore and coal, downloaded from www.indexmundi.com; IMF data on copper cathode prices, downloaded from IMF commodity prices data set at www.imf.org; and ITC TradeMap data on export unit values for flat-rolled steel, downloaded from www.trademap.org. All downloads for updates were undertaken in October 2019.

The decline in metals and fuels prices after 2011 brought about a sharp fall in the dollar value of exports from continental SADC countries, which accelerated from 2014 outside South Africa. Data on the volume of exports are not complete and vary by country. Still, overall fuel and minerals sales appeared to remain largely stable in quantity terms from 2011. That is, the decline in exports resulted primarily from the fall in global prices.

As Figure 7 shows, in current U.S. dollars, total exports by continental SADC countries excluding South Africa dropped 1% a year from 2011 to 2014, but then plunged 10% a year in the next three years, for a fall of over a third. The fall was driven by energy, ores and metals, which accounted for 70% of the decline. South African exports shrank 5% annually from 2011 to 2014. They fell only 2% a year from 2014 to 2017, in current dollars, cushioned largely by rising auto sales.

Figure 7. Growth rates in total and extractive exports by Angola, South Africa and other continental SADC countries compared to the rest of the world, 2011 to 2017, in current U.S. dollars
(figures in brackets are share of product in total exports)

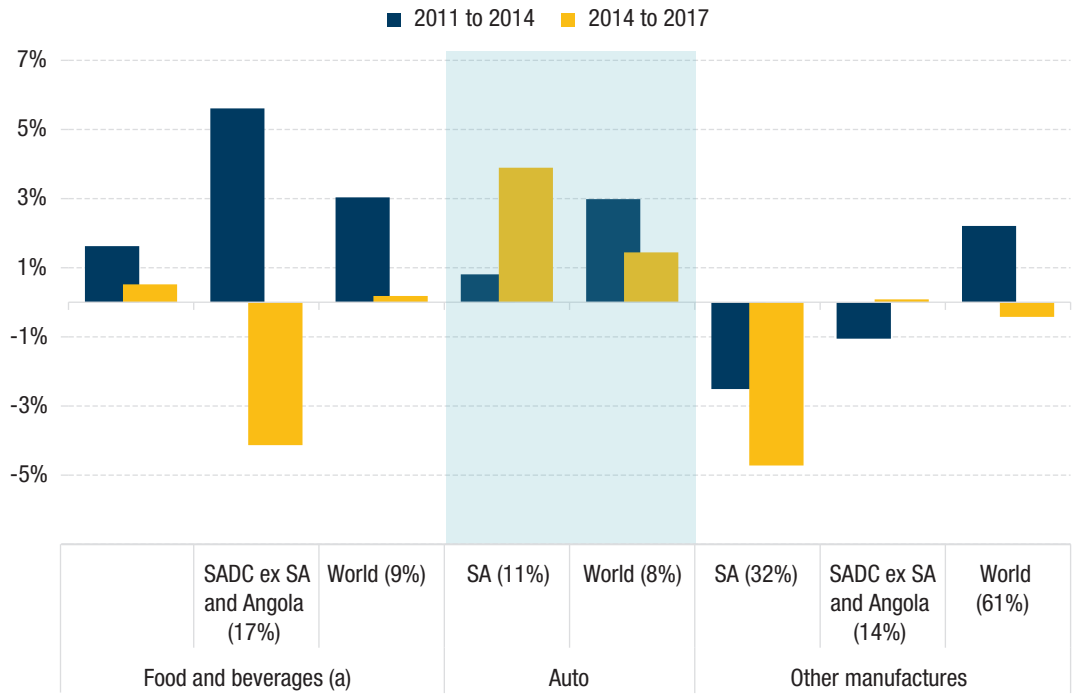


Note: (a) Includes iron and steel. South Africa exports electricity to the regional grid, and Mozambique exports it to South Africa.

Source: Calculated from UNCTAD. UNCTADSTAT. Interactive dataset. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Downloaded from www.unctad.org in October 2019.

Agricultural and manufactured exports were stable compared to extractive exports. From 2011 to 2017, continental SADC saw its exports of food and beverages, both processed and unprocessed, increase in dollar terms. South Africa's small but competitive auto industry also expanded. In contrast, the region's exports of manufactures outside of food and auto generally declined, but not as precipitously as mining and energy products.

Figure 8. Growth rates for exports of food and beverages, autos and other manufactured products by South Africa and other continental SADC countries compared to the rest of the world, 2011 to 2017, in current U.S. dollars (figures in brackets are share of product in total exports)



Note: (a) Includes both processed and unprocessed products.

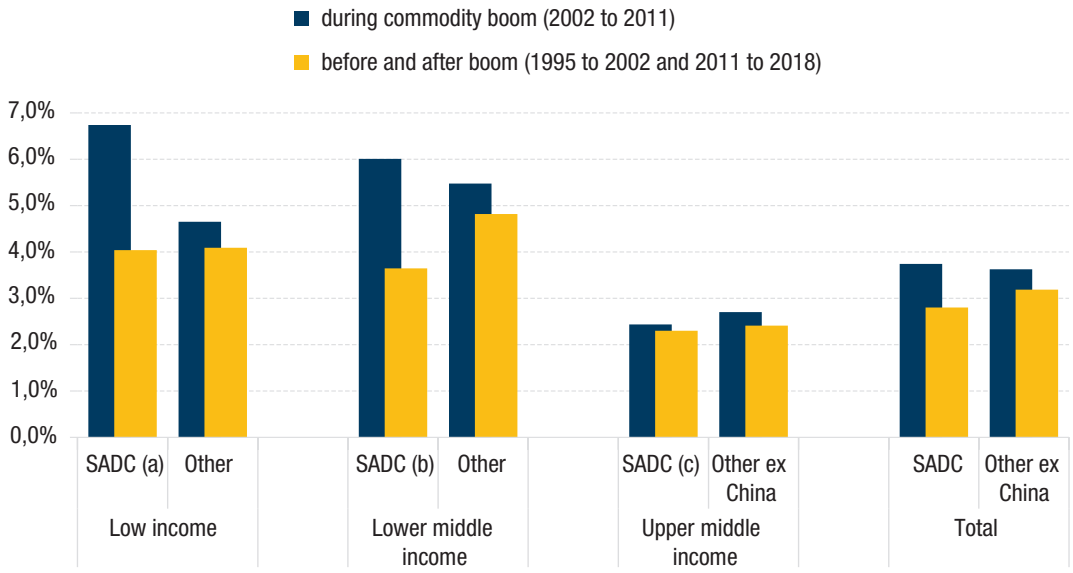
Source: Calculated from UNCTAD. UNCTADSTAT. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Interactive dataset. Downloaded from www.unctad.org in October 2019.

The effects of continued commodity dependence on growth are summarised in Graph 8. As it demonstrates, the commodity boom had a decisive impact on the economies of the region. When metals and fuel prices were high, regional economies expanded around a percentage more than before and after the boom. The difference was greatest for the low and lower-middle income economies in the region. It was significantly larger for lower income SADC countries than for peer economies in other parts of the world, which were less dependent on mineral and energy exports.

Dependence on extractives combined with the legacies of colonialism to entrench unusually deep inequality both within and between countries in southern Africa. Discrepancies in income and ownership in themselves generated bitter policy conflicts while limiting domestic and regional demand. These tendencies made it more difficult to pursue industrial policy.

Between countries, inequality appeared in the relatively large share of the population living in low-income economies. In continental SADC, almost 60% of the population lived in low-income countries, compared to just over 10% in other developing economies. In terms of GDP, low-income countries accounted for 15% of the SADC economy, compared to 2% for the rest of the global South.

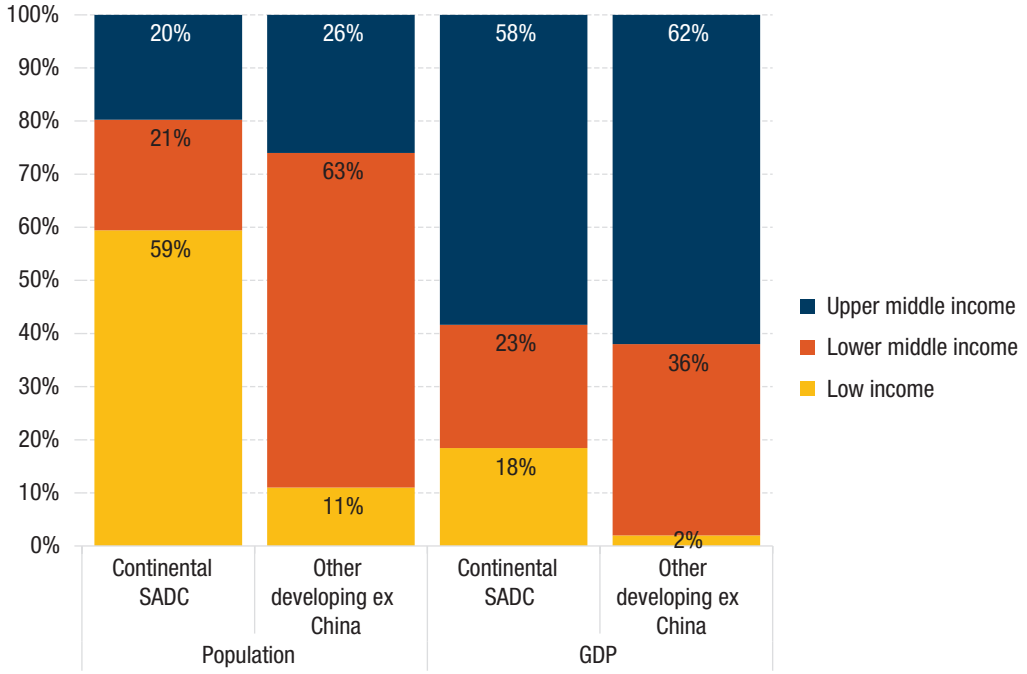
Figure 9. Growth during the commodity boom (2002 to 2011) and before and after it (1995 to 2002 and 2011 to 2018) in continental SADC compared to other regions by country income group



Notes: (a) Tanzania, DRC, Mozambique and Malawi. (b) eSwatini, Angola, Zimbabwe, Zambia and Lesotho. (c) Botswana, South Africa and Namibia. South Africa accounted for over 90% of value added in this group.

Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

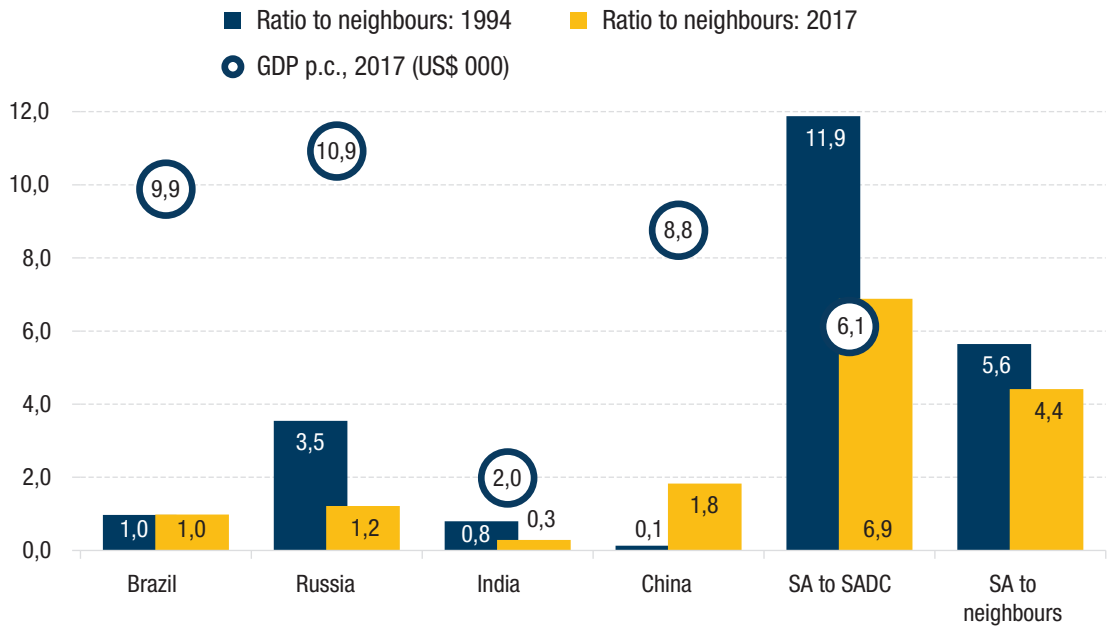
Figure 10. Share of population and GDP by income level in SADC compared to other developing countries, 2018



Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

The inequalities between economies meant that the gap between South Africa and the region was far greater than for the other regional powers. In 2017, South African's GDP per capita was almost seven times that of continental SADC. For other members of the BRICS grouping, the GDP per capita was between 0,3 and two times that of their neighbours. As a result, the other BRICS enjoyed larger regional markets. They could also mobilise stronger regional partnerships to improve regional infrastructure and logistics, facilitating trade both with neighbours and internationally.

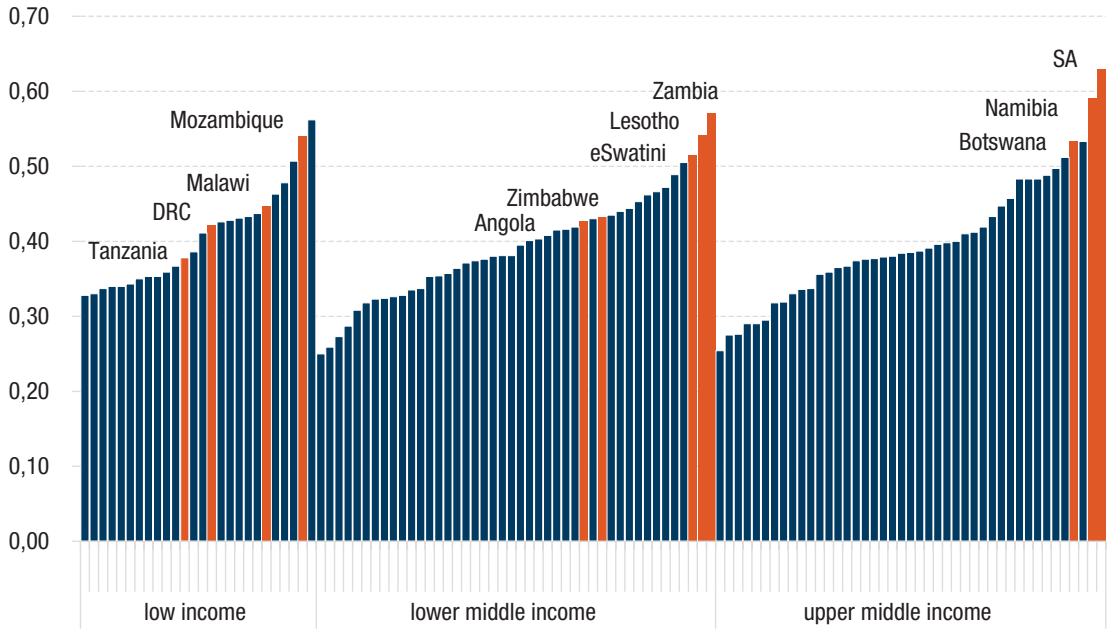
Figure 11. Ratio of GDP per capita for BRICS members to neighbours, 1994 and 2017, and GDP per capita in current U.S. dollars in 2017



Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

Continental SADC was also characterised by unusually deep income inequality within countries. The average Gini coefficient in the region (weighted by population size) was .48 in the 2010s, compared to .38 for other developing economies excluding China. Only 13 countries in the world reported a Gini coefficient of over .50; of these, seven were in continental SADC. That said, many countries outside of SADC did not report a Gini coefficient at all, and a number of these – including most Middle Eastern petro-economies - would likely have been highly inequitable.

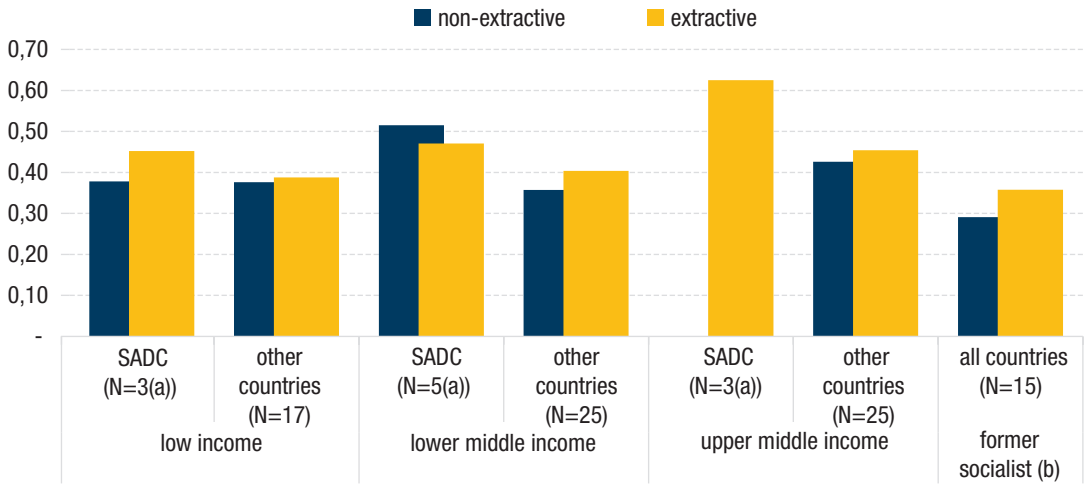
Figure 12. Gini coefficients in continental SADC compared to other countries by income level (latest available figure from 2007 to 2017)



Source: World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

The importance of extractive industries in southern Africa explained some, but not all, of the high inequality in the region. As the following figure demonstrates, the population-weighted average Gini coefficient was typically higher for reporting economies that relied on mining and fuel exports than for other countries. Still, even compared to other mining-dependent countries, the nations of southern Africa were unusually unequal.

Figure 13. Population-weighted average Gini coefficients for continental SADC and other developing economies, comparing extractive dependent and other countries by income level (a)



Notes: (a) Extractive dependent economies defined as over 25% of exports from fuels, ores or metals. The sample used includes all countries where data are available for exports and for Gini. Gini coefficients are the latest available from 2007 to 2017. For lower-middle-income SADC, the non-extractive economy is eSwatini.

Source: Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019; and where the World Development Indicators did not provide export data in some cases, from ITC. TradeMap. Interactive dataset. Downloaded from www.trademap.org in October 2019.

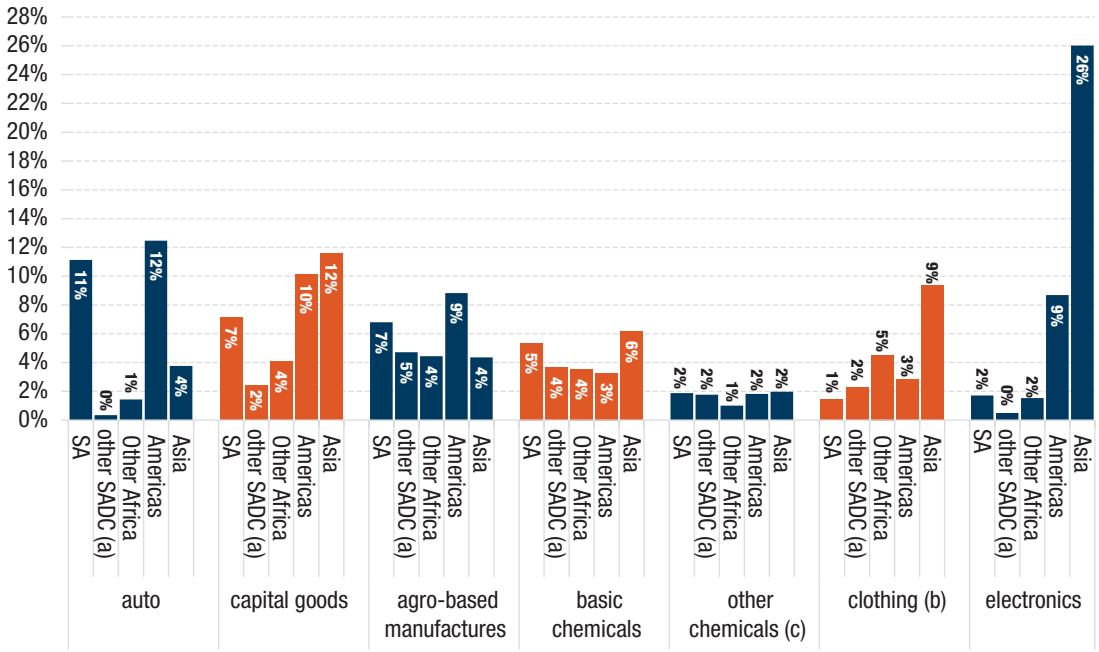
The unusually deep inequalities in continental SADC had significant negative effects, including the following.

- They led to stronger policy contestation, notably around land and mine ownership as well as labour rights, which slowed investment and fuelled fierce political conflict.
- Rivalry for mineral rents often led to corruption, typically related to access to mining rights and mine ownership, procurement and taxation.
- Inequality between economies in the region underpinned large-scale migration to South Africa. That in turn led to conflict over housing, jobs and customers for small business in some low-income communities with a relatively high share of foreign-born residents. Moreover, many skilled people such as nurses and educators ended up unable to work in their professions in South Africa.
- Deep inequality limited domestic demand for mass-produced goods and services, which in turn constrained industrialisation. In South Africa, the richest 10% of households accounted for over half of domestic consumption, and they were more likely to buy imports and artisanal luxury products.

Southern Africa's manufacturing industry ended up dualised. Its major export sectors beneficiated commodities – metals and coal refineries plus fruit processing. South Africa also had a globally competitive auto assembly industry. But its other industries were geared almost exclusively to domestic and regional markets. Excluding the smelters and refineries, the largest single manufacturing sector in the region outside of South Africa was food and beverages. South Africa's lead manufacturing industries were metals, auto, machinery (especially for use in mining and construction), food processing and coal-based chemicals.

Compared to the rest of the global South, continental SADC lagged particularly far behind in appliances and clothing production and exports. As a result, manufacturing growth bolstered national revenues from exports and taxes, but did not generate employment or support small business on a significant scale. That made it more difficult to build broad social support for industrial policies.

Figure 14. Manufactures by type as percentage of total exports from continental SADC compared to developing countries in other regions



Source: Calculated from UNCTAD. UNCTADSTAT. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Interactive dataset. Downloaded from www.unctad.org in October 2019.

In sum, continental SADC was characterised by unusually strong commodity dependence and economic inequality. In this context, South Africa had a far larger and more advanced economic base than its neighbours. These factors made the region vulnerable to swings in the commodity cycle, but also added to the economic and political challenges facing industrialisation. In this context, analysing actual and potential regional value chains could help generate a roadmap to greater regional specialisation and exchange as the basis for more equitable and diversified growth.

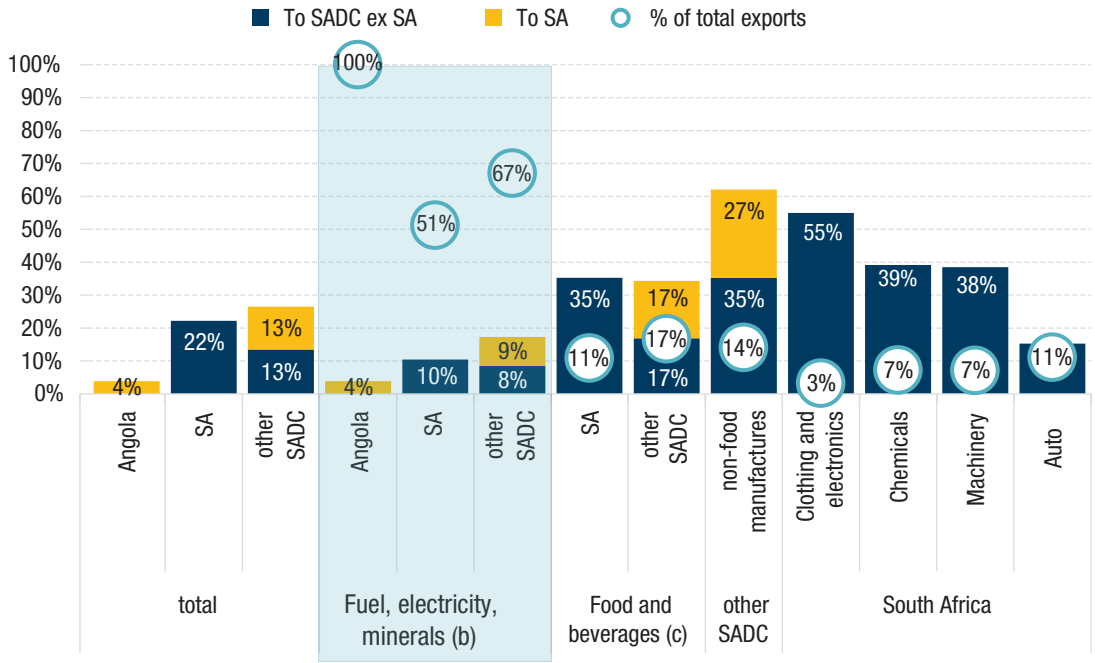
4. REGIONAL VALUE CHAINS IN SADC: EXPERIENCES AND CHALLENGES

This section starts with an overview of the current structure of regional value chains in southern Africa as reflected in trade patterns. It points to the crucial importance of regional markets for manufactured exports outside of the commodity value chains and auto assembly. The following section reviews the central challenges around regional logistics, which constitute a central blockage to the development of regional trade. A brief case study of the regional copper value chain concludes the section.

Mapping regional value chains

In continental SADC, only a tenth of mineral and fuel exports were sold within the region, compared to around two fifths of manufactured exports. For South Africa, other southern African countries accounted for around a fifth of total exports but almost two fifths of manufactured exports excluding auto. For the rest of continental SADC, regional trade made up a seventh of total exports, a third of food and beverages exports, and over half of exports of other manufactures (Figure 15).

Figure 15. Share of regional sales by South Africa and other SADC countries (a) as a percentage of their total and sectoral global exports



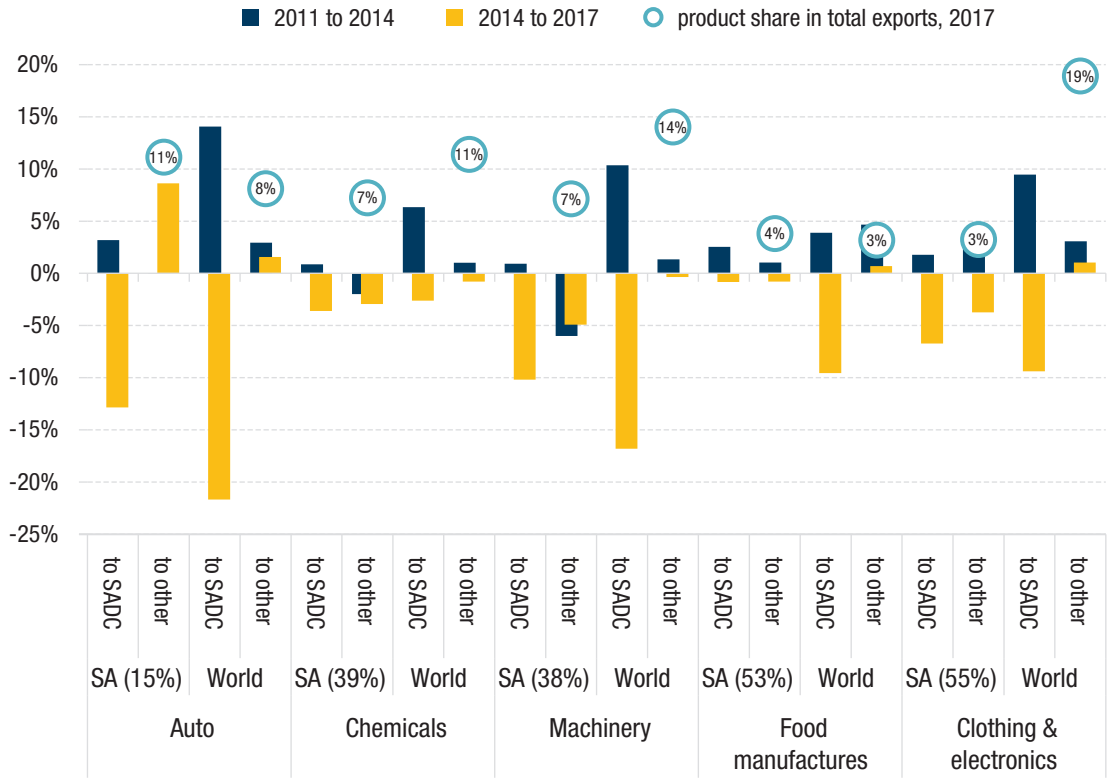
Note: (a) The source does not publish data for Angolan exports other than fuels and minerals. (b) Includes substantial exports of electricity from SA to SADC and from Mozambique to SA; also copper ore from the DRC for refining in Zambia. (c) Both processed and unprocessed products.

Source: Calculated from UNCTAD. UNCTADSTAT. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Interactive dataset. Downloaded from www.unctad.org in October 2019.

This pattern of trade was associated with significant imbalances within the region. Regional exports of raw materials mostly went to the global North, China and India, but imports were sourced largely from South Africa. As a result, South Africa ran a surplus with the rest of continental SADC that partly offset its deficit with the rest of the world. Overall, in 2017, South Africa exported goods worth US$20 billion to continental SADC but imported only US$6 billion. The discrepancy was even larger for manufactures. South Africa sold to other SADC countries US$12 billion in non-food manufactures in 2017, but imported less than US$2 billion from them.

South Africa produced around nine tenths of all of continental SADC's manufactured exports. This relationship was particularly important for South African exports of capital equipment and chemicals, largely for the mining industry and infrastructure. When the regional economy slowed from 2014, its sales of these products declined sharply. Over half of South African exports of consumer manufactures went to other continental SADC countries, in particular Namibia and Botswana. South Africa's clothing and electronics industries were small, however, although it was a significant exporter of manufactured foods. The regional market for these products shrank from 2014 to 2017, but not as rapidly as demand for capital goods and equipment.

Figure 16. Average annual growth in exports of selected manufactures from South Africa by destination, in current U.S. dollars, from 2011 to 2017 (figures in brackets represent the share of SADC in South African exports by the relevant industry)



Source: Except for food, calculated from UNCTAD. UNCTADSTAT. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Interactive dataset. For food, calculated from UNCTAD. UNCTADSTAT. Merchandise trade matrix – detailed products, exports in thousands of United States dollars, annual. Downloaded from www.unctad.org in October 2019.

Trade patterns in SADC indicate the relative strength of mining as a regional value chain in the 2010s. The case study of copper in sub-section 3.3 below indicates the limitations of these relationships as well as the way they distributed benefits between countries. Other manufactured exports within the region were mostly produced only at the national level and in some cases associated with stiff competition for domestic markets.

Stronger regional value chains faced two main challenges. First, path dependency favoured continued reliance on extractive industries rather than broader industrialisation. Second, the region did not have institutions to manage the trade-offs between countries that would result from a more coordinated approach to regional specialisation and exchange.

Path dependency refers to the tendency of established production and investment structures to reproduce in the absence of a strong disruption, whether from market outcomes or strong policies. In the case of extractive industries, path dependency is fostered by a combination of cyclical and longer-term factors.

At the cyclical level, international commodity booms merger periodically, reinforcing the attractions of mining. In southern Africa, the rapid run-up in metals prices through 2011 reinvigorated both private and public investment in mining and petroleum. Copper was a major beneficiary of the boom, and both the DRC and Zambia saw a rapid growth in production. In South Africa, mining investment peaked at 12% of total capital formation from 2009 to 2011, fell gradually to 11% in 2014, then plummeted to 6% in 2015 before recovering to 10% in 2018. In addition, during the boom southern Africa generally saw stronger exchange rates thanks to relatively strong capital inflows and rising export revenues. That in turn discouraged manufacturing growth by making exports less competitive and imports easier.

In during periods of lower metals and fuel prices, a range of entrenched systems prevented a shift into new economic opportunities. In infrastructure, freight transport in the region was geared primarily to moving bulk mineral products to the coast for export overseas. In addition, during the commodity boom substantial investments were made in coal-based electricity, resulting in new coal mines especially in South Africa and Botswana.

Market systems also functioned principally to serve well-established commodity exports. In contrast, regulatory frameworks and market institutions were less supportive of emerging manufacturing and service producers. To start with, when regional mineral rents fell, the big mining houses in the region tended to move overseas to other mining and beneficiation centres rather than diversifying into innovative opportunities in southern Africa. Financial systems were designed to serve mining, with less experience in other industries.

Trade systems also favoured mining. Standards, tariffs and quotas for manufacturing products such as pharmaceuticals and food oils varied between countries, often hindering regional trade. Moreover, as described in section 3.2 below, products outside of mining were far more likely to experience significant delays at regional borders.

In these circumstances, strengthening regional value chains would require strong institutions that could address key blockages and manage trade-offs. Inherent to deeper regional specialisation and exchange was the presumption that

- South Africa specialise increasingly in providing advanced inputs and equipment based on its competitive machinery and heavy chemicals industries, while providing a growing market for mostly consumer goods produced in other SADC countries;
- In this context, over time some forms of manufacturing would grow faster outside of South Africa, narrowing the scope for growth in some industries there – a tough challenge given South Africa's extraordinarily high levels of joblessness and comparatively advanced industrial base; and
- Other SADC members would similarly specialise in some products and relinquish the option of investing in others, in order to enable achievement of economies of scale.

Ultimately, these trade-offs seem an unavoidable component for successful regional development and deepening industrialisation both in South Africa and in the rest of the region. But they required coordination to manage the demands of local businesses for protection from neighbouring countries and to support infant industries consistently. In practice, no such institutions existed, either to provide dispute settlement for trade conflicts or to identify and take advantage of opportunities for regional specialisation and exchange. SADC adopted two policies promoting industrial policy in 2015 and 2017, but they did not reflect on, much less establish, capacity or systems to identify opportunities and constrains on regional specialisation or mediate the associated trade-offs. (SADC 2015 and 2017)

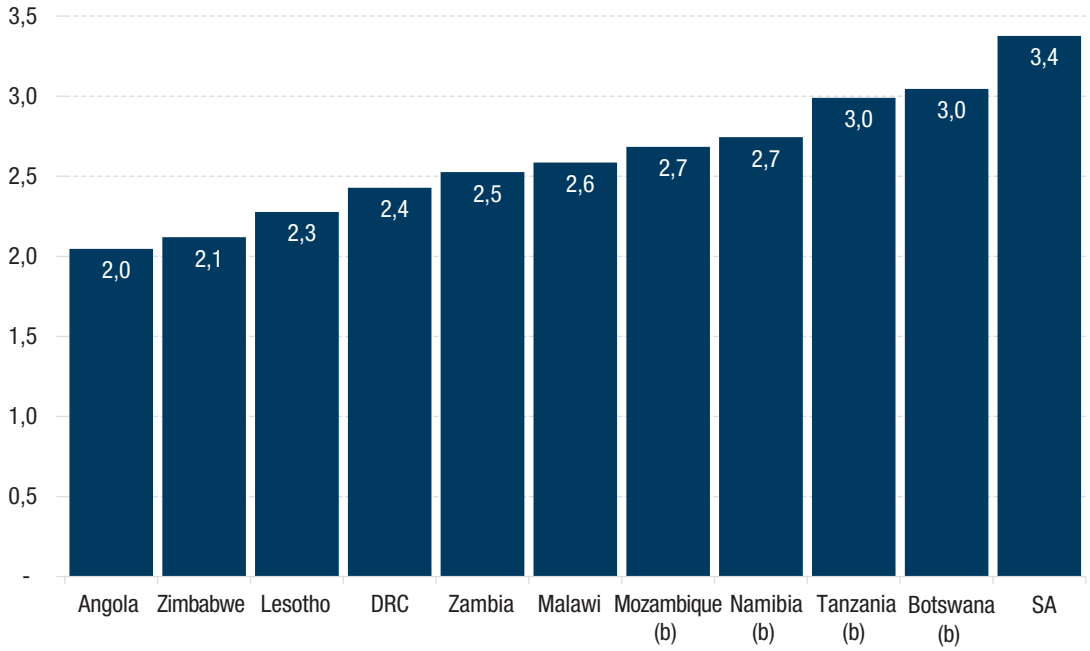
Freight transport

In terms of its physical geography, long-distance freight transport was particularly important for regional trade in southern Africa. On the one hand, the region is distant from all of its major trading partners, which places a premium on ports and to a lesser extent air transport. On the other, it is characterised by large distances between cities. Mining centres are mostly inland with transport arteries generally going to coastal ports rather than creating a network to support intra-regional trade.

In practice, regional freight transport was costly and slow. Estimates suggested that the cost per kilometre was around twice as high in SADC outside of South Africa as in South Africa itself, at around ten U.S. cents per kilometre. (Vilakazi and Paelo 2017:16)

In the World Bank's Logistics Performance Index, only three countries in continental SADC – South Africa, Botswana and Tanzania – scored or three or more, which is the minimum seen as required for engaging in international trade. (The survey did not cover eSwatini.) The index is based on perceptions of service providers in the industry. It found that South Africa ranked very high compared to other upper-middle-income economies, reflecting a long-standing selling point for the country. Its strengths centred on export lines - bulk shipping for the mines and coal-based chemicals to the coast; roll-on, roll-off facilities that sustained auto exports; and the cold chain for fruit.

Figure 17. Scores in the World Bank Logistics Performance Index for continental SADC countries (a), 2018

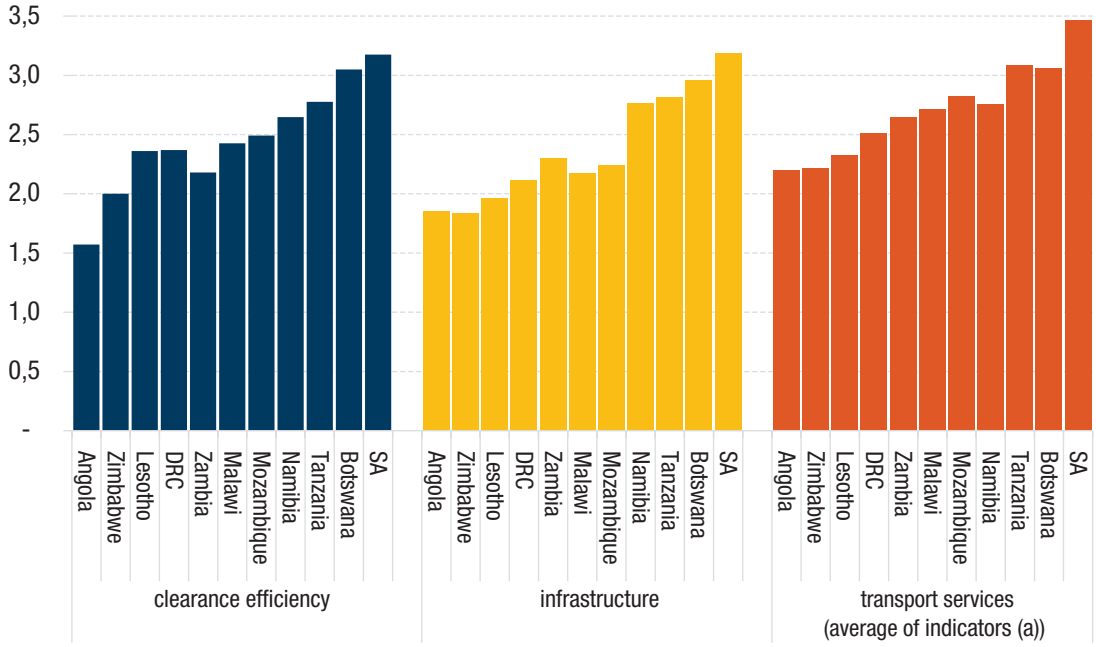


Notes: (a) The survey did not include eSwatini. (b) 2016.

Source: World Bank. Logistics Performance Index database. Interactive database. Downloaded from www.worldbank.org in October 2019.

The cost of operating transport – maintenance of vehicles, fuel and labour – were not particularly high in southern Africa. This emerges from the Logistics Performance Index breakdown of key factors affecting performance. The issues surveyed largely reflect the quality and capacity of private logistics suppliers. It is noteworthy that for continental SADC members, the lowest scores typically emerged for physical infrastructure and border clearance times rather than the cost and quality of private-sector services.

Figure 18. Scores for clearance efficiency, infrastructure and freight transport services (a) in the World Bank Logistics Performance Index for continental SADC countries (b), 2018



Notes: (a) Unweighted average of scores for logistics services, ease of international shipments, tracking and on-time shipping. The survey did not include eSwatini. (b) eSwatini was not included. Scores for Mozambique, Namibia, Tanzania and Botswana are for 2016.

Source: World Bank. Logistics Performance Index database. Interactive database. Downloaded from www.worldbank.org in October 2019.

Structural factors behind comparatively high transport costs arose from three broad systemic challenges, which reinforced each other. They were asymmetrical trade; delays in border crossing; and inadequate, poorly maintained infrastructure.

First, the combination of exports of commodities overseas and imports of manufactures from South Africa, and the associated trade deficit with South Africa, led to unequal demand for freight transport within the region. Containers of manufactures were disproportionately shipped from South Africa; ores and metals were transported through South African ports, but also through Mozambique, Tanzania and Namibia. The share of goods going to continental SADC outside of South Africa that originated in South Africa was estimated at between 50% and 63%. (Vilakazi and Paelo 2017:13)

The trade imbalance meant that companies found it difficult to get equal value loads in both directions. Low returns on trips from the inland back to South Africa led transport companies to raise the price for loads leaving South Africa. At the same time, the major mining companies were large enough to negotiate favourable rates on their bulk exports. The shipping cost for imports ranged up to twice as high as the cost for exports. (Vilakazi and Paelo 2017:15)

Second, substantial delays at some important border posts constituted a significant cost burden for road transport companies and acted as a disincentive for lower-value loads. Companies sometimes preferred to send trucks that had carried manufactures to inland centres back to the coast empty rather than risk delays for a low-value return load.

Transport companies saw border delays as the main cost driver in the region, and passed them on to customers both through their regular rates and as surcharges when they were unusually long. A day's delay was generally estimated to cost a shipper around US$400 for an eight-axle truck, or around a quarter of the price of a load from Harare to Lusaka. While border crossings averaged two days, they could take up to eight. (Vilakazi and Paelo 2017:15ff) Because of persistent delays at the crossing from South Africa to Zimbabwe, companies often preferred to ship to Lusaka through Botswana, which added 600 kilometres to the route. (Lowitt 2017)

Border delays resulted from a combination of inadequate infrastructure, weak organisation, and large numbers of physical inspections.

Inadequate feeder roads fuelled congestion and in many cases meant that even pre-cleared loads had to queue. Cuts in electricity led to closures that in turn aggravated congestion. Most countries did not have fully electronic clearance systems and the systems were not uniform, adding to delays as well as the administrative burden on companies and drivers.

Most SADC members inspected around a third of loads. For the DRC and Tanzania, however, the figure rose above two thirds while for South Africa and Namibia it was under a tenth. For comparison, Germany physically inspected less than 3% of loads. Moreover, phytosanitary, customs and other inspectorates generally conducted separate inspections, with up to ten agencies present at some border crossings. Requirements changed frequently and were not coordinated across borders. That in turn opened the door to corruption .(Lowitt 2017)

The border delays incentivised transporters to return trucks empty to South Africa, as the cost of delays exceeded the comparatively low rates on return loads. Bringing copper from Zambia to South Africa was particularly fraught because of complex customs requirements on the Zambian side that aimed to address a history of criminal activity. Transporters estimated that loads of copper would take 75% longer to clear customs than agricultural or manufactured goods. (Lowitt 2017) In response, South African transporters often maximised revenues by returning empty so as to increase the number of outbound trips.

Because border delays were a key cost driver for regional shipping, the failure to address them was particularly paradoxical. The solution was not that hard: the establishment of one-stop border crossings to reduce paper work on the roads from South Africa and Maputo led to a 50% decline in transit times. (National Treasury 2019:30-31) Long-standing plans to open one-stop border crossings elsewhere, however, had not been implemented as of 2018. (Cross Border Road Transport Authority 2018:29)

Finally, major shortcomings in regional logistics infrastructure persisted for decades. The orientation toward international trade led to overloading (and deterioration) of infrastructure on the main export routes, and inadequate funding for arteries that did not serve mining centres. The main weaknesses in the regional transport networks were the dysfunction of many internal rail lines; the poor state of roads over long stretches on some main routes and generally on feeder networks; congestion around virtually all of the ports, especially Durban, Maputo, Beira and Dar es Salaam; the failure to provide safe rest stops for drivers on long-distance roads; and a lack of feeder roads. The shortcomings in physical infrastructure largely reflected the effects of the commodity cycle as well as the effects of deep inequalities.

On the one hand, commodity booms were too short to sustain the long-run investments required to maintain rail and, to a lesser extent, road networks. In turn, the decline in rail systems from the 1970s led to a shift in very heavy loads from rail to road, which resulted in faster deterioration in the roads.

In the late 2010s, copper from the DRC and Zambia was shipped largely by road, which is both economically and environmentally inefficient.

On the other hand, colonial governments had provided European-style household services in the settler suburbs, raising expectations in all communities. Rapid rural-urban migration added to the stress on urban infrastructure. In these circumstances, it was often politically easier to delay meeting depreciation needs on economic infrastructure in order to free up funds for water, electricity and roads for households. As a result, by the 2000s countries often needed to rehabilitate long-neglected economic and bulk systems, at a much higher cost. Meeting these needs became even more difficult when commodity prices fell.

The transport malaise underscored importance of stronger collaboration between SADC governments in dealing with constraints to industrialisation in the region. In practice, however, SADC institutions provided an inadequate platform for negotiating key priorities and securing enforcement of commitments. Virtually every SADC document from 1996 recognised that border delays were a problem, and several included commitments to address them, but in practice little as done. (Lowitt 2017) At the bilateral level, South African policies officially recognised the importance of building regional value chains. In practice, however, its industrial policy focused more on managing domestic challenges and expanding overseas exports than on identifying and pursuing priority interventions to promote regional development.

A case study: The copper value chain[3]

In the 2010s, southern Africa was a significant centre for the production and refining of copper. In the late 2010s, it accounted for around 10% of global ore and concentrates production and over 5% of refined copper metal. A core question for regional development became if and how the copper value chain could be leveraged to promote industrialisation. In practice, beneficiation of copper seemed less likely to succeed than production of machinery and equipment for mining and refineries. For both upstream and downstream industries, however, South Africa's strong head start imposed difficult trade-offs on efforts to deepen the regional division of labour.

Copper goes through five main production phases: mining; producing concentrates through smelting and chemical processes; refining into basic metal; processing into semi-manufactures such as wire and pipes; and finally further manufacture into cable for use in construction and utilities, as well as incorporation into final products such as cars, electronics and electrical machinery.

The increase in value add at each phase can be estimated using the unit price in international trade. In 2017, the unit price per tonne of the refined metal was between 2,5 and four times as high as the unit price for concentrates. The unit price of semi-manufactures was however only around a fifth higher than refined metals, and the premium fell to 10% for southern Africa. The value of copper in final products is harder to evaluate, because copper was a fairly small share of the final price. For South African car exports in 2017, the unit price was around four times the unit price of semi-manufactured copper; for valves, over three times; and for transformers, 2,5 times. In contrast, the export price of insulated cable barely exceeded that of bare copper wire.[4]

From colonial days, virtually all southern African copper was exported as concentrates (especially in the case of the DRC) or more or less pure metal (largely from Zambia). In contrast, continental SADC accounted for only half a percent of international semi-manufactured copper exports. The E.U. contributed 40% of global semi-manufactured copper exports, following by China (the largest producer, but mostly for domestic use), Taiwan and the U.S. at between 6% and 10% each. Outside of South Africa, virtually no southern African country exported final products using copper inputs.

[3] This study largely summarises Makgetla *et al.* 2019.

[4] Data on exports in this section are calculated from ITC 2019.

South Africa dominated SADC production of semi-manufactures, although it produced only small amounts of copper. In 2017, it exported wire, cable and pipes worth US$200 million. Zambian exports of semi-manufactures, mostly copper wire with some cable, [5] came to US$100 million, less than 2% of its total copper exports. The share had fallen from a high of 8% in 2005, as the commodity boom encouraged growth in local mining but not downstream manufacturing. For the DRC, semi-manufactures brought in only US$10 million. That was under 0,5% of its copper exports, down from over 4% from 2003 to 2005. Zimbabwe produced some cables but did not report any exports.

Virtually all Zambian exports of copper semi-manufactures went to SADC, with about two thirds to South Africa alone. Most of the rest was sold to East Africa. In contrast, the bulk of South African exports went overseas. In 2017, SADC bought a quarter of South African copper pipe exports and a tenth of its wire and cable exports.

Copper fabrication illustrated the challenges to deeper specialisation and exchange within SADC. The Zambian industry faced an array of domestic blockages, in particular because it paid the full export price for copper, while infrastructure and regulatory shortcomings inflated its costs. At the same time, it struggled to compete with the long-established South African cluster. In the 2010s, Zambia's copper fabrication industry, including foundries, had around 40 enterprises, none of which employed over 1000 workers; used under 20 000 tonnes of copper; and contributed about 0,1% of GDP. It was dominated by Zamefa, which was established as a state-owned company in the 1960s, privatised in the 1990s, and ultimately acquired by Reunert, a South African cable producer, in 2016. As early as the 1980s, observers noted that Zamefa had limited technological spillovers and depended largely on foreign expertise. (Mphaisha 1988:90)

The South African copper fabrication industry encompassed almost 60 medium and large cable producers employing over 10 000 workers; about 50 manufacturers of pumps, valves and related equipment, which used a variety of metals including copper and copper alloys; and over 80 foundries using 14 000 tonnes of copper. (Estimated from WOW 2019) Imported copper metal, mostly from Zambia, contributed around a quarter of the raw material used, with the rest produced locally from a copper mine at Palaborwa and as a by-product from other minerals.

Ultimately, Zambia's copper fabrication industry faced the challenge of being a latecomer in the context of a regional economy that was too small to sustain producers in every country. The minimum economy of scale for wire and tube production came to 10 000 tonnes a year (World Bank 2011:27ff), just below Zamefa's production in 2018 and substantially larger than either of the two other Zambian producers. The Zambian industry also faced an array of supply-side constraints, which more than offset various incentives and supports introduced to promote fabrication. These included an income tax subsidy, the introduction of stricter standards on imports of semi-manufactures (which proved hard to enforce), and a ban on scrap-metal exports.

The most important supply-side constraint was the cost of copper. The mining companies sold metal to local users, not at a cost-plus price, but at the international price less transport costs with a regional premium. (World Bank 2011:25) By extension, the rents that should have made downstream fabricators competitive ended up being captured by the mining companies. Zambia also imported most of the copper scrap needed for semi-manufacture production, further reducing the potential cost advantage. (World Bank 2011:12)

Infrastructure shortcomings added to the challenges facing copper fabrication. As discussed in the previous section, transport costs were high. In addition, Zambia's electricity was often unreliable in the late 2010s, and tariffs rose steeply thanks to a policy of eliminating historic controls. (See Bank of Zambia 2017:60 and 62) The commodity boom brought a rapid increase in electricity demand in

[5] Zambian exports of plate are counted as raw metal here because it appears that before 2013 they were in fact misclassified cathodes – that is, first-stage refined copper metal. (World Bank 2011:19).

central Africa; its end reduced government revenues and scope for borrowing. Both of these trends made it harder to maintain the national electricity system.

With the end of the commodity boom, slowing growth squeezed government revenues. In response it delayed tax refunds, placing a severe burden on producers. Zamefa said that losses in 2018 resulted almost entirely from delayed refunds on VAT and a duty drawback scheme, which equalled around a sixth of its sales revenue. (Zamefa 2018:5)

A regional value chain approach to copper fabrication could assist in developing a stronger industry in Zambia. Such a strategy would, however, require decisive action especially from the South African government to replace overseas products. It would also entail difficult decisions about the division of labour in copper fabrication between South African and Zambian companies. After 2014, slow regional growth made the trade-offs harder, as stagnant demand for copper wire and cable intensified competition between producers. Lastly, Zambia would have to find ways to reduce the cost of copper metal inputs, improve infrastructure, invest in high-level skills, and ensure more efficient tax systems. (See GRZ 2012)

Militating against these strategies were the realities that the industry was highly capital intensive. By extension, it would generate relatively few jobs and require substantial investments. Yet the added value of semi manufactures compared to refined metal was limited. In Zambia in the late 2010s, proposals for industrialisation tended to emphasise diversification through the agricultural value chain instead. (See BOZ 2017; GRZ 2018)

Increased value add from the regional copper value chain could also be achieved through local production of capital goods for mining. Here, South Africa effectively constituted the regional industry, although it was increasingly squeezed by overseas companies with access to more trade finance and ties to overseas mining companies. Zambia only had some small copper and alloy foundries that supported the mines, as well as enterprises that provided maintenance and repairs. The DRC had even less local capacity.

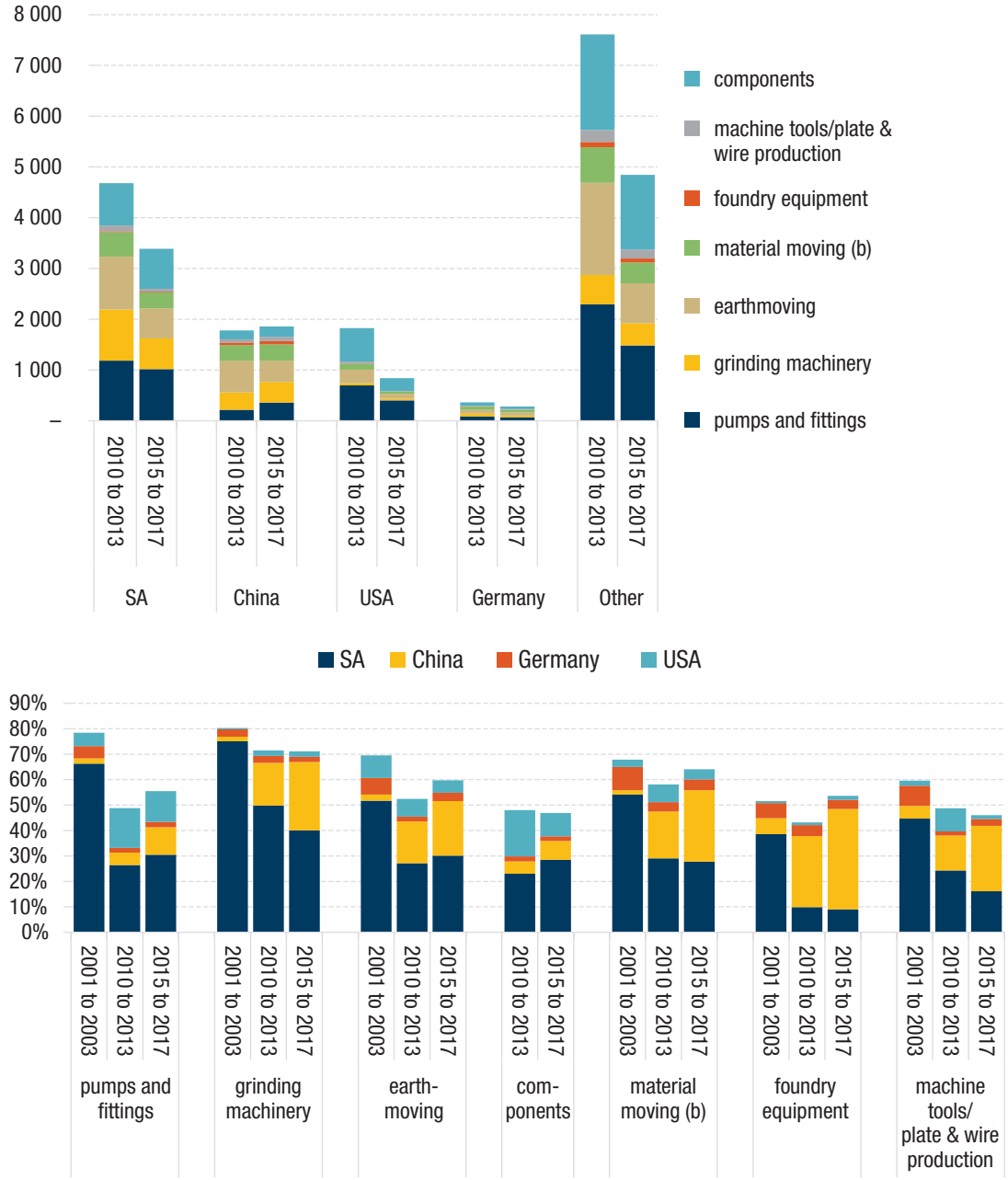
Zambia's largest foundry was the Non-Ferrous Metalworks (Zambia), which was founded in the 1960s and had over 50 workers in the mid-2010s. (Non-Ferrous Metalworks (Z) 2019) The foundries experienced an upsurge when the commodity boom revitalised Zambian mining, but times were harder from 2011.

In contrast, the production of capital goods for mining was a significant cluster within South African manufacturing. Capital equipment accounted for around 8% of manufacturing value added in South Africa in the 2010s, up from 6% in the preceding decade. Production of capital equipment reportedly grew, in aggregate, by almost 6% a year from 2000 to 2008, then levelled out after the global financial crisis in 2008/9. It declined after the commodity boom ended, however, shrinking 2,3% a year from 2012 to 2016.

In 2018, the South African capital goods industry had around 5000 companies with 75 000 to 80 000 employees. (Calculated from SARS 2019, sheet A3.4.1 and Statistics South Africa 2018) Like the rest of South African manufacturing, the industry was fairly concentrated, with a few companies employing over a thousand workers. Depending on the subsector, in capital goods production the top five companies accounted for between a third – the norm for manufacturing as a whole - and three quarters of revenue. (Calculated from Statistics South Africa 2016:35-6)

The top manufacturers were virtually all linked to foreign original equipment manufacturers (OEMs), either as subsidiaries or through licences. Usually it was not possible to determine the import content of their sales in SADC. Still, smaller companies had a crucial role in designing and installing capital equipment for companies and utilities, in manufacturing specialised products, and in providing after-sales maintenance, service and repair. These companies ensured a responsive, flexible supply of capital equipment. Many had a symbiotic relationship with the dominant mining, construction, infrastructure and manufacturing companies.

Figure 19. Imports of capital equipment for the mining value chain by SADC countries excluding South Africa, by exporting country, in billions of constant (2018) U.S. dollars and as a percentage of total for major product groups (a)



Notes: a. Data in constant dollars are deflated using average U.S. dollar CPI for the period, rebased to 2018. Before 2010, trade figures exclude South African exports to SACU and are therefore not comparable to later statistics. The graphs use three-year totals because the project-based nature of investment leads to significant annual variations. b. Includes cranes, conveyer belts, forklifts, etc.

Source: Calculated from ITC. TradeMap. Electronic database. Exports of insulated cable, wire, pipes/tubes and fittings at HS 4-digit level in U.S. dollars. Downloaded from www.trademap.org in March 2019.

South Africa's revealed comparative advantage points to its relative strength in capital goods for the mining value chain. Depending on the product, heavy equipment for mining ranged between 0,1% and 0,4% of all South African exports in 2017, although the share had decreased somewhat with the end of the commodity boom. For other upper middle-income countries, the share varied from under 0,05% to 0,3%. For metal fabrication equipment, in contrast, South African exports were well under 0,01% of its total foreign sales. Of these three categories of capital goods, only mining equipment made up a larger share of exports for South Africa than for China, and even there the Chinese industry produced far more than South Africa in absolute terms. (See Makgetla *et al*. 2019:25)

South Africa dominated exports of capital equipment to the mining value chain in southern Africa. Its share fell from the early 2000s, however, while the regional slowdown brought a sharp decline in the total value of these imports. South African exports centred on pumps, grinding, earth-moving and material-handling machinery, valued at US$1,5 billion a year between 2015 and 2017. Southern African imports of machine tools, foundry equipment and metalworking machinery were much smaller, averaging US$165 million a year. South Africa provided a third of mining-related capital goods imports by SADC, but less than a fifth of imports of machinery for metal-working and foundries.

From 2016 to 2018, South Africa provided between 25% and 40% of foundry, grinding, material handling and earthmoving machinery imported by Zambia, as well as 60% of pumps and fittings. In every category, however, South Africa's share had declined while China's had grown. In constant U.S. dollars, the value of Zambian imports of capital goods for the mining value chain climbed rapidly during the commodity boom, then fell sharply mostly because it bought less earth-moving equipment. (Makgetla *et al.* 2019:22)

Important constraints on South Africa's ability to compete in the region included limited export finance and ties to overseas mining companies; the South African government's constrained fiscal space for supporting research and development; and the comparatively small size of South African producers. Exports of capital goods require large and often long-term financing packages. In consequence, they usually rely on public export insurance and, in many cases, credit. In 2004, South Africa established an export-credit agency, the Export Credit Insurance Corporation (ECIC), but it remained small by global standards. In 2018, it covered just 0,005% of South African exports excluding commodities, and 0,008% of exports to Zambia. Estimates suggested that in China, state export insurance covered 18% of exports, up from under 3% a decade earlier. In India, the state insured 10% of exports. (David 2018:154) In contrast, German credit insurance fell from around 10% in 1960 to 1,3% in 2017. (Euler Hermes 2018:4) The U.S. Eximbank covered a similar share of exports in 2014, but by 2018 had downsized to 0,3% due to domestic political contestation. (Eximbank 2018:4)

As the following table shows, in 2016 the (limited) available data suggest that despite its relatively small size, South Africa was able to compete on export credit insurance to Zambia. The figures for China are understated, however, because data were available only for the Chinese Exim Bank, and not for the export-credit agency Sinosure.

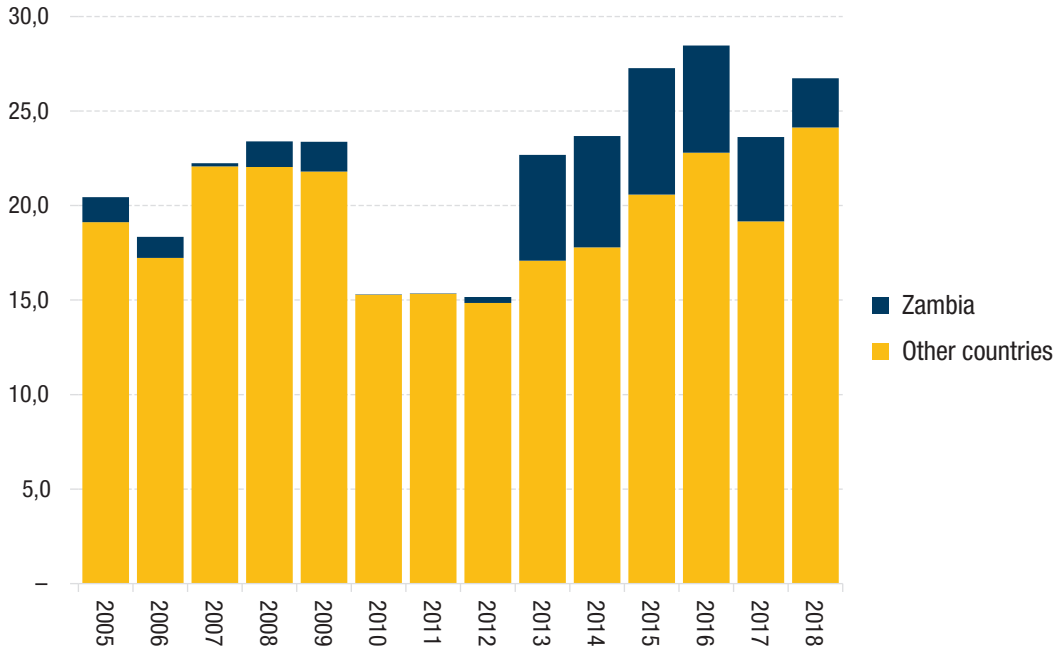
Table 1. Export credit insurance extended to Zambia, FDI stock and other foreign equity and debt, in millions of U.S. dollars, 2016

	Exposure by export credit agency	FDI in Zambia	other foreign equity and deb
South Africa	350	1 413	1 990
China (Exim only)	300	1 969	1 033
US	73	n.a.	234
India	48	n.a.	n.a.
Germany	n.a.	450	n.a.

Source: For South Africa export credit exposure, ECIC. 2016. *ECIC Integrated Report 2015/16*. Centurion. Page 93; for U.S. exposure credit exposure, U.S. EximBank. *Annual Report 2016*. Washington, D.C. Page 9. Other information from Bank of Zambia. 2018. *Foreign Private Investment & Investor Perceptions in Zambia – 2017*. Lusaka. Page 25 ff.

Although South African export credit insurance was fairly high for sales to Zambia from 2013 through 2018, it fluctuated substantially over the years, as the following graph shows. ECIC did not publish its lending by industry or project, but it appeared that most of its lending to Zambia financed inputs for mining, including construction services.

Figure 20. ECIC lending to Zambia and other countries in constant (2017) rand (a), 2004 to 2018



Note: (a) Deflated with average annual CPI.
Source: Calculated from ECIC Annual Integrated Reports for relevant years.

Overseas governments were able to provide substantially greater support for research and development than South Africa. For instance, in 2016 Sweden spent €25 million on "world-class research" in mining-related areas, while generally promoting collaboration between businesses and researchers. Finland invested €30 million in private companies and public research institutes to make Finland a global leader in the sustainable use of mineral resources. (Dobbs *et al*. 2013:82) In 2018/19, in contrast, South Africa's entire budget to the Centre for Scientific and Industrial Research (CSIR) and Technology Innovation Agency to support all industries, not just mining, came to US$132 million. (National Treasury 2018) In 2018/9, the CSIR planned to spend a total of US$7 million to support industrial technologies. In addition, in 2017/18, the South African Department of Trade and Industry invested around US$10 million to support technological development especially by relatively small companies in 2017/18. (the dti 2018:21)

Producers of capital goods often argued that overseas companies favoured capital goods from their home countries, although published evidence was scarce. The largest Zambian mines belonged to companies from Canada, Europe and India, with smaller operations owned mostly by Chinese and South African companies. (Zambia Chamber of Mines 2019) In the DRC, Chinese companies dominated copper production in the mid-2010s. (KPMG 2014:20)

Finally, many South African producers of specialised capital equipment were relatively small and specialised. That made it difficult to sustain exports and to meet demand for some products. While the dominant companies were fairly large, the average metalworking enterprise had around 15 workers. Absent support from a dedicated marketing agency, whether through a cluster institution or government, it proved difficult for the smaller firms to identify and pursue clients, manage the financial and logistical

arrangements required for exports, and provide on-going maintenance and support. This lack of capacity tended to counteract the advantages of proximity for many smaller South African capital goods producers. The South African Department of Trade and Industry responded by establishing the South African Capital Equipment Export Council and through two programmes to support local capital goods producers – the National Tooling Initiative and the National Foundry Technology Network.

Overall, the copper value chain shows the challenges as well as opportunities for developing regional value chains based on mining industries. On the downstream side, expanding beneficiation would increase local value add. It proved difficult, however, because of the inherent capital and skills intensity of metals fabrication; limited regional markets; low levels of value add for semi-manufactures; and the significant technological gap between semi-manufactures and final products using copper. Upstream, capital goods production promised greater technological spillovers. But it would require substantial support to expand production outside of South Africa, including to expand the skills pool and establish new production processes. That would likely run into opposition from South African as well as overseas suppliers. Moreover, to compete with overseas producers, all southern African capital-goods manufacturers needed greater export finance, technological support, and measures to encourage regional procurement.

5. CONCLUSIONS

Regional value chains provide a useful conceptual framework for industrial policy and regional integration, as recognised in principle in the relevant SADC policies. (See SADC 2015 and 2017) In particular, they generate an agenda for systematically identifying opportunities arising out of specialisation and exchange within a region, as well as the constraints that block growth at different phases of production. Effective use of the concept, however, requires both realistic and evidence-based analysis of opportunities and constraints, and regard for the political economic as well as more purely economic realities. In particular, deepening specialisation and exchange inevitably imposes costs as well as benefits on regional economies, which need to be managed to ensure visible benefits for all the countries involved.

The experiences of continental SADC in the late 2010s highlighted the challenges to development of regional value chains. The region as a whole was relatively large and rich in resources. But the individual economies were largely small and unusually dependent on exports of ores, basic metals, coal and petroleum. As a result, they faced a slowdown when the metals' price boom ended from 2011. Moreover, inequalities were stronger than in most other regions both between economies and within them. In these circumstances, a regional value chain approach could both help identify realistic opportunities for industrialisation, and indicate approaches to dealing with specific constraints. In practice, however, implementation would have to overcome a range of factors that fostered replication of the current growth path, including long-standing regulatory frameworks and infrastructure designed to serve mining as well as the short-term interests of the leading mining and petroleum companies.

In this context, the unusually pronounced role of South Africa as the regional power in SADC brought both opportunities and risks. On the one hand, South Africa itself could not hope to industrialise without stronger regional synergies. In particular, the rest of SADC was a key market for South African manufactured exports outside of auto. On the other, South Africa had much to offer the region in terms of technological capacity, finance and markets. These strengths, however, also meant South African companies could often out-compete infant industries in other parts of the region. Moreover, South Africa's apartheid past entrenched a deeply unequal and mining-dependent economy, which made it more difficult for it to free up resources and capacity to support development in other countries.

In these circumstances, establishing stronger regional value chains would require considerable capacity to identify appropriate measures and strengthen regional cooperation. Deepening regional specialisation and exchange needed an institutional framework able to identify realistic projects, manage trade-offs between countries, and secure alignment around regulatory frameworks, trade facilitation and infrastructure maintenance and development.

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CHAPTER 2.

EXPLORING LINKAGES AND OPPORTUNITIES IN THE AGROPROCESSING SECTOR ACROSS FIVE SADC COUNTRIES

Tamara Paremoer

1. INTRODUCTION

Global value chains (GVCs) describe the full range of cross-national value addition processes and activities that firms and workers engage in to transform raw commodities into final products or services (Gereffi and Fernandez, 2011; Farole, 2015; 2016). The global value chain framework provides a useful methodology for tracing patterns of value creation and understanding power and governance within an industry by exploring the linkages amongst geographically dispersed economic activities and actors (Gereffi and Fernandez-Stark, 2011; Kaplinsky and Morris, 2000).

For many low-income developing countries, the ability to insert themselves into a global value chain is important for economic development and as stepping stone to integration into world trade (Gereffi & Fernandez-Stark, 2011). But for GVCs to be beneficial to growth, it presumes that firms or countries can access value chains, can compete within them, and can capture the benefits for local economic development. Historically, many African countries have been incorporated into GVCs at the low-skill and low-value parts of the chain where there are limited opportunities for upgrading into more complex technology-based and skill-intensive industries (SADC, 2015). Partly due to this trend, regional value chains (RVCs) have emerged as a complementary development tool to both GVCs and national industrial policy.

Regional value chains (RVCs) emphasise increased regional trade, regional investment and regional corporate ownership. The logic of regional value chains as development tool is closely linked to the logic of regional integration, and views increased market size and greater economies of scale as potential growth drivers. Firms generally face lower barriers when entering regional value chains which tend to be less concentrated and have less powerful lead firms compared to lead firms in global value chains (Keane, 2015). Despite the potential for coordinated regional value chains to drive growth in many sectors, policymaking has not yet grasped the potential for regional cooperation to bring win-win outcomes through increased value addition and upgrading at the firm, value chain, and industry levels across national boundaries (Fessehaie, Roberts, & Takala-Greenish, 2015).

The reasons to focus on the potential for regional value chains to drive economic growth in the agro-processing sectors in particular include the continued growth in agricultural productivity across southern Africa, rising global agro- and commodity prices, and increased demand for processed food within the region (McMillan, Rodrick and Verduzco-Gallo, 2014). Tastes and preferences, which tend to limit trade in processed agro- products across continents, are more similar within regions. Proximity of production areas to processing plants is also a major consideration, with processors preferring to locate their processing plants as close as possible to production areas to reduce transport costs and to limit food waste, particularly at lower levels of the value chain where products are bulky and low in value.

The impact of climate change is a further reason to take a regional value chain approach to agricultural production and markets. Climate change means more variability in rainfall across SADC, with more frequent droughts and floods anticipated. While there is projected to be lower rainfall in the southern-most areas, especially in South Africa, there will continue to be abundant water in the SADC region as a whole. Moreover, when there is drought in El Nino years (such as 2015) in South Africa, southern Mozambique, Swaziland, Zimbabwe, Malawi, Botswana and Namibia, there are good rains in much of Zambia, northern Mozambique, DRC and Tanzania. Developing broader and deeper markets in SADC is an essential part of mitigating the risks associated with climate change. Nurturing these markets requires understanding the facilitating investments required in irrigation, storage, transport, insurance, financing and price discovery. A regional approach also increases the pool of resources available to mitigate the impact of climate change and potentially provides greater regional food security. This will become increasingly important as the effects of climate change become more severe. Despite these pressing challenges, our research finds that the effects of climate change have not been incorporated into national and regional industrial and agricultural policy in a meaningful way. In many cases, it is

simply incorporated as an "add-on" to traditional industrial policy and planning. The fundamental changes that will accompany increasing climate variability and the need for a coordinated regional response is not yet acknowledge in the policy.

This report focuses on providing practical policy proposals to develop regional value chains in agro-processing sectors (and in specific food processing value chains in particular) across five countries: South Africa, Zambia, Tanzania, Mauritius and Mozambique. Recent studies in the animal-feed-to-poultry and sugar-to-confectionery value chains in southern Africa show evidence of underdeveloped regional value chains with significant potential for import replacement and downstream processing (Das Nair, Nkhonjera and Ziba, 2017; Ncube, Roberts and Zengeni, 2016 & 2017). The region continues to depend on deep-sea imports of key inputs to animal feed, such as soybeans and soya oilcake, despite potential to source inputs from neighbouring countries (Ncube, Roberts, & Zengeni, 2016 & 2017). In the sugar sector, Zambia is one of the lowest-cost sugar producers in the region, but has some of the highest-cost industrial sugar in the world which impedes the development of downstream confectionery businesses. As a result, Zambia; and the SADC region as a whole, continue to import processed sugar confectionery products.

The focus on five countries needs to be explained in the context of the regional questions. The countries chosen are important economies in SADC in different ways. Mauritius and South African are relatively more industrialised economies, with the highest GDP per capita in SADC (along with Botswana). Mozambique, Tanzania and Zambia are large countries with enormous potential for growth in agricultural production. In addition, the largest market for processed food in SADC is South Africa, in the greater Johannesburg/Pretoria metropolitan areas, and both Mozambique and Zambia can readily supply food to this market. The paper therefore considers regional value chains which stretch between Tanzania, Mozambique, Zambia and South Africa. Tanzania has a large and growing population projected to reach 140 million by 2050 (double the size of South Africa). Agricultural production is expanding and there is huge potential for ongoing growth including in agro-processing.

In each country, the paper considers the recent trends, variations related to weather, and step-wise changes which have occurred and are underway. Comparative insights are drawn across the countries in key value chains as well as assessing the regional developments including actual and potential cross-country linkages.

The paper proceeds in four parts. Section 2 explores the links between agro-processing value chains, industrialisation and climate change, section 3 reviews agro-ecological conditions and trade patterns in each of the five countries in the study, section 4 takes a closer look at two key value chains in the region in terms of competitiveness, climate change adaption and challenges to value chain development, and section 5 concludes.

Agro-processing value chains, industrialisation and climate change

Many African countries continue to be net food importers while having the potential for substantially greater agricultural production.[6] At the same time, rapid urbanisation is underway which is changing the demand patterns towards more processed foods and changing consumer purchasing towards supermarkets (UNECA, 2017; Lall et al., 2017). Imports of food have supported urbanisation in the absence of a domestic agricultural surplus. However, food in African cities has been found to be

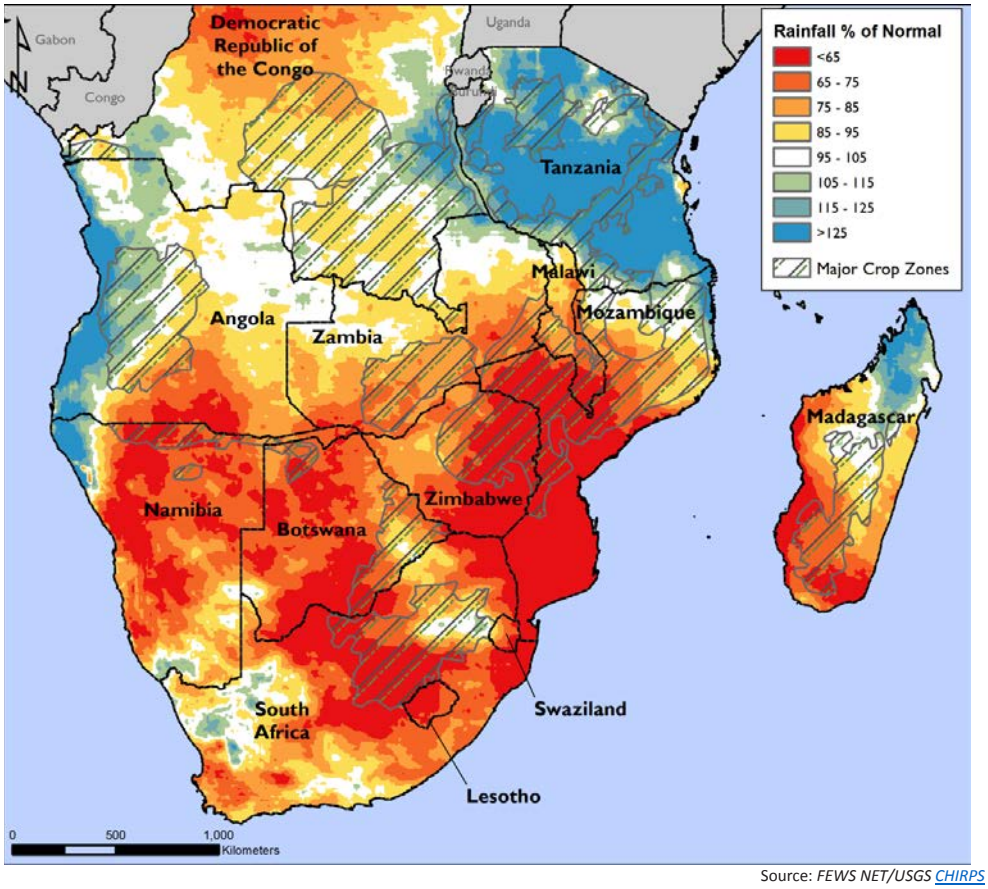
[6] Africa recorded a trade deficit of $24bn in the food, beverages and tobacco category in 2016. This deficit can be attributed to a narrow range of food categories: (1) cereals, with a deficit of $18.3bn, (2) animal or vegetable fats and oils, with a deficit of $4.9bn, and (3) sugar and sugar confectionery products with a deficit of $3.9bn. In each of these categories one product makes up the bulk of imports; namely wheat in the cereals category, palm oil in the vegetable fats and oils category, and raw cane sugar in the sugar and sugar confectionery category. SADC, on the other hand, actually recorded a trade surplus in food, beverages and tobacco products of $1.8bn in 2016, though this was largely due to a surplus of $3.1bn in 'edible fruit and nuts' (largely citrus) and a surplus of $2bn in tobacco. SADC's largest net imports in 2016 were in cereals at -$2.7bn (again, largely wheat) and imports of vegetable fats and oils at -$1.5bn (again, largely palm oil). Food imports are thus concentrated in very narrow categories (wheat, palm oil and sugar).

around 35 per cent more expensive than in comparator countries (Nakamura et al., 2016). This means that if food production is not addressed as an industrialisation question to manufacture and supply the processed food products being demanded by urban consumers, African countries will record growing trade deficits in processed food products.

The industrial development of processed food production is important in its own right, and is a manufacturing sector in which there has been growing regional trade in southern Africa. Developing the sector requires building linked industrial capabilities along with logistics, packaging, testing and certification. Along with this central industrial development challenge we must consider the implications of climate change.

Southern and East Africa as a whole have ample water resources for agriculture and the region has the potential to be a major food exporter to the world. However, climate change means that rainfall will be more variable and that there will be more frequent droughts and floods. But when there is a drought in one sub-region, such as the El Nino-induced drought which in 2015 caused South Africa to record its lowest national annual rainfall since 1904, there will be sufficient rain in other sub-regions, such as the north and west of Zambia, Tanzania and north of Mozambique during the 2015 El Nino drought (Figure 1). As an example of the varying effect of these events, cereal production was 26 to 31% lower than normal after the 2015 drought in South Africa, Malawi, Lesotho and Swaziland but production was 13% higher in Mozambique and 2.4% higher in the DRC.[7]

Figure 1: The 2015/16 Southern African Drought



Source: *FEWS NET/USGS CHIRPS*

Source: UN Office for the Coordination of Humanitarian Affairs.

[7] Note that production in Zambia was 17% lower than normal due to a combination of different factors, including the outbreak of fall army worm, which has again recurred in the 2017/18 farming season.

Regional initiatives to address Climate Change and Industrialisation

In general, responses to climate change are still located within government departments and policy spaces that deal with primary agricultural production and environmental matters. There is no systematic evaluation of the effects of climate change on value chains and it is not seen as an industrial policy challenge. The effects of climate change on the productive economy and on manufacturing enterprises have not been systematically incorporated into the work of practitioners focused on economic development, trade and industry and the capacity of these institutions to identify potential challenges and to respond proactively needs to be developed.

There are several regional initiatives on monitoring, mitigating and adapting to climate change underway at the SADC level (see Appendix 2 for a description). It is difficult to gauge how effectively these strategies have been implemented and whether there is effective coordination amongst the various parties responsible for implementation. In addition to these regional strategies, countries have separate national strategies (often also done on a sectoral level) which do not recognise the potential of developing a regional response to climate change. In general, the national strategies focus on particular sectors or individual challenges and seek national solutions (see Appendix 3).

Thus, though there has been progress towards developing climate change response and adaptation strategies in all countries in this study, the effects of climate change on production within and between countries and what this means for agro-processing firms in particular, has not been evaluated. Both the regional and national climate responses are complex and existing strategies overlap with no clear indication of a phased implementation strategy or priorities. This has contributed to the slow pace of implementation in many countries.

We argue that wider and deeper agricultural markets would reduce the volatility associated with climate change (in both production and food prices) as the supply-side shocks in one area would be proportionately less in a wider market which encompasses areas which had good rains and production. Wider markets require concerted action to improve transport and logistics networks in order to reduce costs and integrate suppliers and consumers across a wider geographic area. The significance of transport costs is illustrated by the example of the costs between Zambia and the greater Johannesburg region in South Africa (a distance of some 1800km) which have been around US$100/tonne or around half of the price of a tonne of maize in South Africa in most years. Such a large price wedge undermines wider regional markets. Interviews with transporters in the region suggest that transport costs for this distance should be no more than US$40/tonne and could fall further with increased trade volumes (Koster, 2016).

In addition, market deepening refers to increasing the number of market participants which can access markets, along with the diversity of trading options and forms such as different pack sizes, volumes and modes of transport. More than simply reducing border restrictions are required. Participation depends on accessing storage and trade finance by smaller participants. For example, there have been competition cases in South Africa relating to silo storage where dominant firms have abused their position. The market failures in financial markets are also well understood, implying that finance may be rationed to smaller participants.

The private sector will under-invest in transport and storage networks relative to social benefits. This is because the investment costs in storage and logistics may not be justified by user charges when the facilities are only used in times of shocks in rainfall. In addition, the social benefit from greater market integration at such times includes the effect across the economy (including on vulnerable groups) from lessening the shocks. These considerations suggest attention needs to be given to the case for public financing, along with regulation.

We need to better understand regional markets to analyse both industrialisation and the implications of climate variability for food production. In this context, markets are shaped both by policies and the influence of large corporations.

The SADC Industrialization Strategy and Roadmap, 2015 – 2063 (SADC roadmap) recognises regional value chains as an important tool in driving structural change and industrialisation. It supports increased participation in regional value chains as a means of expanding production possibilities and

enhancing the utilisation of the natural and human resources of the region as a whole. The key challenge for corporations and governments is to identify and prioritise entry points into value chains.

The development of regional value chains also requires strong government-to-government cooperation as many national governments have prioritised similar sectors in national development policies and opportunities for regional cooperation must always take cognizance of these national priorities.

SADC has prioritized six value chain clusters for potential development. These are:

i. Agro-processing
ii. Minerals Beneficiation and related mining operations
iii. Pharmaceuticals
iv. Consumer goods
v. Capital Goods
vi. Services

Within the agro-processing cluster, 10 potential value chains have been identified along with several countries that have the potential for value chain enhancement (Table 1). The value chains are complex and multi-faceted and a further prioritisation process should be conducted to identify which value chains SADC will target in the short, medium, and long term. Targeted action plans should be compiled that draw from existing research. This paper tries to do this for two agro-processing value chains, sugar and soya, to show the detailed analysis required to identify entry points and potential for growth in value chains, as well as to identify policy challenges that need to be addressed at a national and regional (bilateral or multilateral) level.

Table 1 : Agro-processing Sectors with Potential Value Chain Enhancement in SADC

Sectors	Countries
Soya	South Africa, Zimbabwe, Zambia, DRC, Malawi, Madagascar
Sugar	Malawi, Mozambique, South Africa, Swaziland, DRC, Tanzania, Zambia, Zimbabwe, Mauritius, Botswana
Meat products (poultry and beef)	Botswana, South Africa, Zambia, Zimbabwe, Namibia, Swaziland, Madagascar, Tanzania, DRC
Cassava	Angola, DRC, Mozambique, Tanzania, South Africa, Malawi, Madagascar, Zambia, Zimbabwe
Dairy products	Madagascar, South Africa, Namibia, Tanzania, DRC, Malawi, Botswana, Zambia, Zimbabwe, Swaziland
Fish and fish products	Angola, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia, Madagascar, Malawi, Tanzania, DRC, Zimbabwe
Horticulture (Fruits, Vegetables and Flowers)	Swaziland, Lesotho, Zambia, South Africa, Malawi, Madagascar, Zimbabwe, DRC, Namibia, Tanzania
Wildlife (game meat and hide processing)	Botswana, Namibia, South Africa, Zambia, Zimbabwe, DRC
Forestry – Timber and non-timber forest products (medicinal, cosmetics, essential oils and other herbal products)	DRC, South Africa, Angola, Madagascar, Swaziland, Mozambique, Zimbabwe, Zambia, Namibia, Tanzania, Malawi, Mauritius
Other food and drinks	Angola, DRC, Lesotho (maize), Zambia (oil seeds and livestock products), Malawi (oil seeds), South Africa, Zimbabwe, Swaziland, Madagascar (Rice, maize, black eyed beans, pea), Namibia, Tanzania (maize, rice, oil seeds)

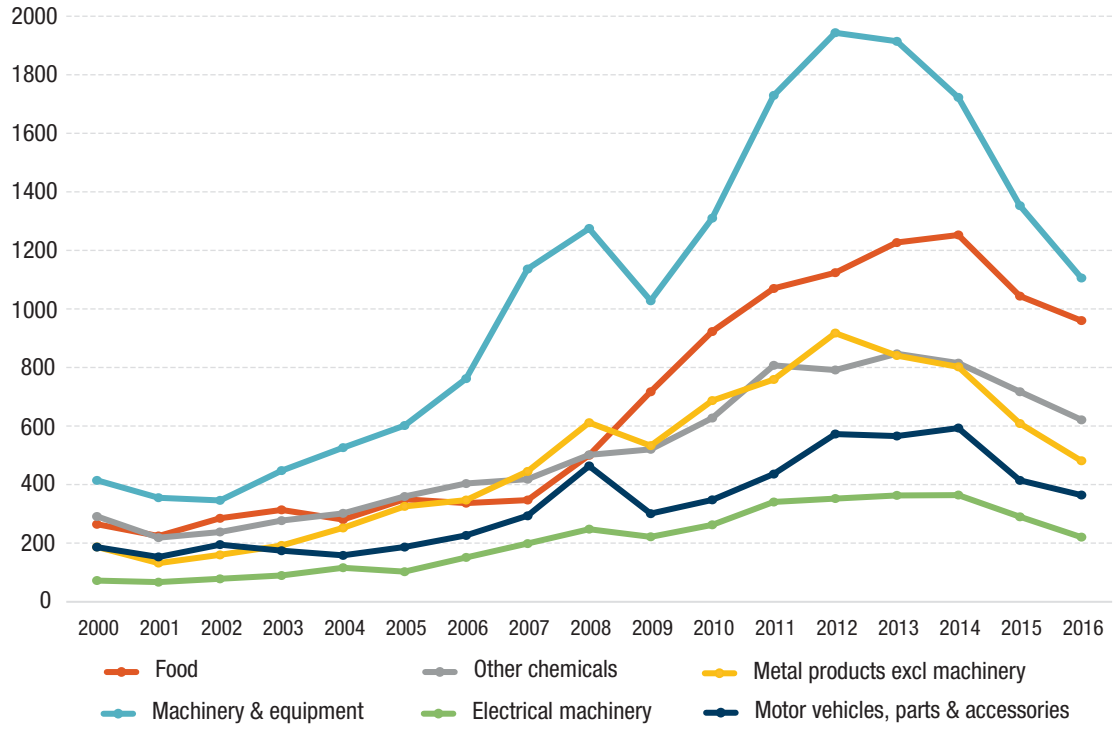
Source: ACTION PLAN FOR SADC INDUSTRIALIZATION STRATEGY AND ROADMAP (2017).

2. REGIONAL VALUE CHAINS IN AGRO-PROCESSING

The importance of agro-processing amongst the sectors selected in the SADC Roadmap is further mirrored by trends in trade data. Specifically, the changes in demand in southern Africa are reflected in the dramatic increase of South Africa's exports of food products to other Southern African Development Community (SADC) countries from 2007 (Figure 2) given South Africa's more advanced industrial base as well as the spread of South African-owned supermarkets through the region.

At the same time, South Africa is also becoming more reliant on agriculture imports given growing demand from cities and constraints on water. This is reflected in growing deficits in grains such as wheat and soya, and periodic deficits in maize in years of poor rains such as in 2015 and 2016, as discussed in the review of country trends in trade of processed food (see section 3.4).

Figure 2: South Africa's leading manufactured exports to SADC countries (US$)



Note: this excludes petroleum, basic chemicals, and basic metals.
Source: Quantec.

The fact that Africa as a whole is a net food importer and has low yields and agricultural productivity, while generally having good conditions for agricultural production, has been widely observed (ACET, 2014; Suttie and Benfica, 2016). There does appear to have been a turning point in some countries from 2005 with some improvements in agricultural productivity (Jayne and Ameyaw, 2016). However, even as improved levels of agricultural production may be attained, there will be a rapidly growing trade deficit in processed food products without a substantially improved performance in manufacturing of these products. Food processing has characterised the early industrialisation stages of many emerging economies, what is at issue is how the southern African region can seize the opportunity for local industrialisation offered by growing demand for processed foods.

There have been extensive policy reforms across African countries. Markets and international trade have been liberalised although there is still protection of sensitive crops such as maize in many countries. There has also been rapid integration into the global economy. Major traders such as Cargill, Louis Dreyfus and Bunge have expanded operations in southern Africa very substantially, as has ETG which has its origins in Kenya.

Cargill and Louis Dreyfus handle 70 per cent of all the maize trading in South Africa (Greenberg, 2017). In South Africa, the two largest agro-conglomerate groups, Afgri and Senwes, both of which evolved out of the former cooperatives supported under apartheid, have been bought by or joint-ventured with international finance and trading companies (Makhaya and Roberts, 2013; Bernstein, 2012). Afgri has been bought by Agrigroupe (with ownership in Mauritius and the Cayman Islands and a controlling shareholder based in Canada). Bunge and Senwes formed a joint venture in 2012.

Louis Dreyfus is a joint shareholder in an operation of a smaller company, NWK. Nava Bharat, an Indian conglomerate with coal mining operations in Zambia is expanding its interests in both Tanzanian and Zambian agri-business. It has been allocated 10 000 hectares of land by Zambian government to grow sugarcane to establish an integrated sugar complex producing refined sugar, rectified spirit and ethanol, and bio-fuels (Nava Bharat Ventures Limited , 2017). In 2013, the company also entered into a deal with the Tanzanian government to establish a 10 000-hectare palm oil plantation. There is increasing global interest in the potential of agriculture and agro-processing in southern Africa with the potential to shape value chains and industrial development in their favour.

Firms' strategies are already regional in nature, investing in areas with production potential and linking these to area of growing demand. These areas often cross national boundaries with areas with the greatest potential for certain crops (such as soya in Zambia) often in different countries to the major areas of demand (such as the demand for poultry in South Africa). The size of the South African market in SADC skews patterns of demand; it has the largest consumer market in the region by far, but the most suitable areas for production are frequently outside its borders, in counties like Mozambique, Zambia and Tanzania which have more arable land and water available for increased agricultural production. As value chain analysis indicates, there is a need to understand existing and potential capabilities across countries and to consider existing governance arrangements and the distribution of rent (and power) within value chains to evaluate how these could work in the interest of collectively beneficial industrial development across SADC. This requires a country-by-country analysis of existing capabilities and an exploration of the regional potential in selected value chains. Ways of linking potential production capabilities to increased regional processing and to consumers is a critical policy question that requires concerted cooperation as we highlight in this paper.

Box 1: Description of categories used in analysis of trade data

The ***food, beverages and tobacco*** category comprises HS Codes 2 – 4, 7 – 12, and 15 – 24. It includes both processed food (such as 'Preparations of cereals, flour, starch or milk; pastrycooks' products' for example) and less processed/unprocessed foods (including grains and cereals for example).

The ***processed food*** category excludes tobacco and beverages and also excludes less processed or unprocessed food. Fruit, raw nuts and cereals, for example, are excluded. The category covers HS Codes 15 – 21 which includes 'Animal or vegetable fats and oils', 'Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates', 'Sugars and sugar confectionery', 'Cocoa and cocoa preparations', 'Preparations of cereals, flour, starch or milk; pastrycooks' products', 'Preparations of vegetables, fruit, nuts or other parts of plants' and 'Miscellaneous edible preparations'.

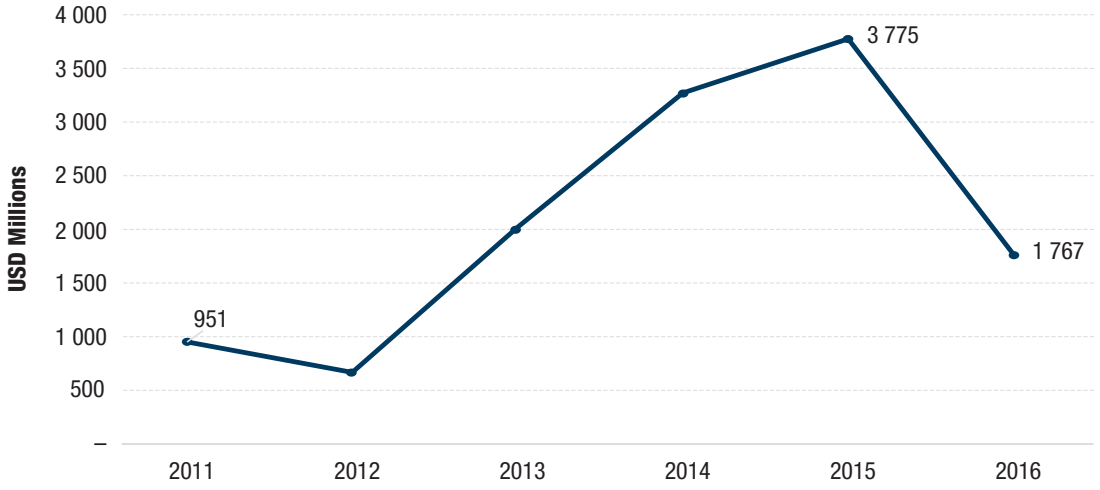
It is, however, worth noting that it is increasingly difficult to pin down exactly what constitutes 'processed food' as it is not always clear where 'primary production' ends and 'processed food' starts. In the fruit value chain, 'fresh fruit' undergoes a number of very complex steps during harvesting, cleaning, sorting, packing, ripening and transportation which adds significant value to fresh fruit. Fresh fruit is, in fact, a much higher-value product than canned or processed fruit because although fruit is sold 'fresh' it has undergone an industrial production process. Cramer and Sender (2015) refer to these as 'fuzzy boundaries', suggestion that the distinction between agriculture and agro (food)-processing is somewhat artificial.

Regional trade in processed food

In 2011, SADC recorded a trade surplus of $951mn in the food, beverages and tobacco category (Figure 3) but recorded a trade deficit in processed food (i.e., excluding beverages, tobacco and unprocessed food) of $1.3bn (Figure 4).

The trade surplus in food, beverages and tobacco was buoyed by the growth in net exports of 'edible fruit and nuts', 'tobacco and manufactured tobacco substitutes' and 'coffee, tea, maté and spices' and by decreases in net imports of 'meat and edible meat offal' and 'animal and vegetable fats and oils' (though these still remained in a net import position). The decrease in net imports of 'animal and vegetable fats and oils' were accompanied by a decline in net exports of oilseeds showing increasing local value addition.

Figure 3: SADC trade balance in Food, Beverages and Tobacco (2011- 2016)



Source: ITC Trademap.

The trade deficit in processed food (HS codes 15 – 21) decreased from -$1.3 billion in 2011 to -$385mn in 2014 but widened again to -$1.5bn in 2016 due to large imports of edible oils and a large drop in net exports of sugar and sugar confectionery (Figure 4).

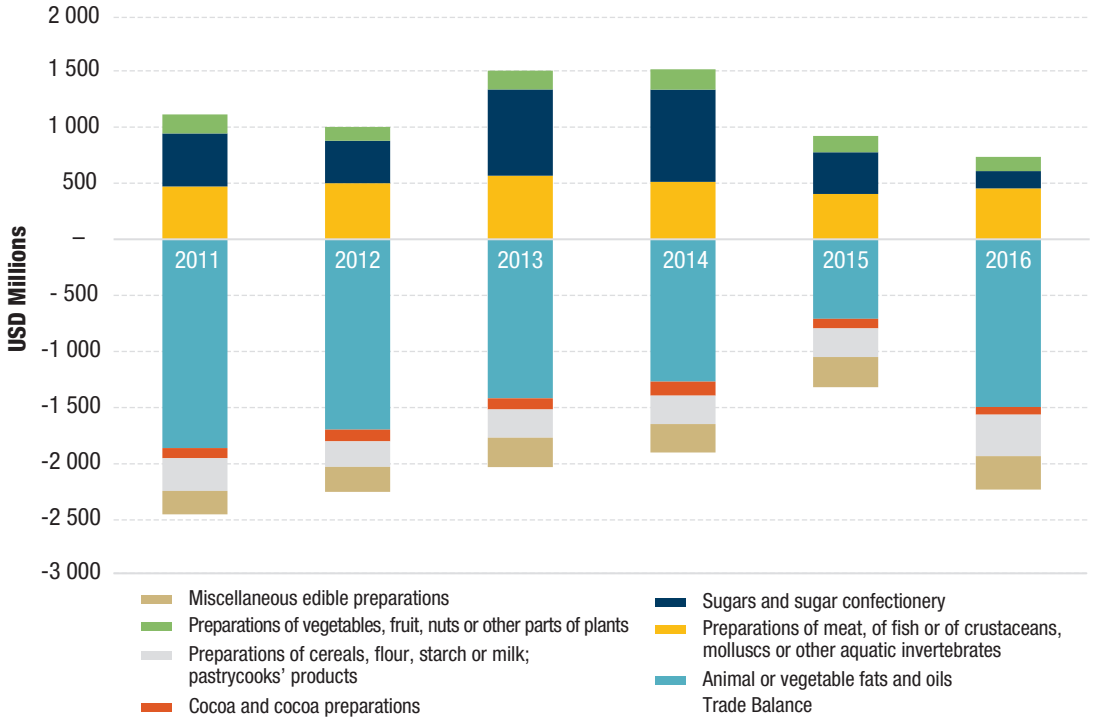
Between 2011 and 2014 the region seemed to be building capabilities in the sugar sector with increasing net exports of sugar and sugar confectionery products, but this gain was eroded in 2015/2016, pointing to some stagnation at the downstream levels of the sugar value chain (discussed further in section 4.2).

Imports of edible oil also decreased considerably between 2011 and 2015, accompanied by a notable increase in the production of oilseeds in Zambia and Tanzania (see section 3.3), suggesting that increased local production of edible oilseeds is replacing imports. The increase in net imports of edible oil in 2016 is largely due to a sharp year-on-year increase in palm oil imports by South Africa, Tanzania and Angola.

Palm oil is currently produced in small quantities within SADC, mainly by Tanzania and Madagascar with commercial production expected to start in Zambia in 2017. It is used extensively in a wide range of food and non-food processing sectors including in the manufacture of baked goods, sugar confectionery, non-dairy creamers and as a thickener, preservative and antioxidant; in personal care products such as soap and shampoo, in cosmetics and in industrial products including, and

in lubricants, paints and inks.[8] It is unclear whether the increase in palm oil imports was driven by food or non-food downstream uses.

Figure 4: Trade balance in processed food (2011 - 2016)



Source: ITC Trademap.

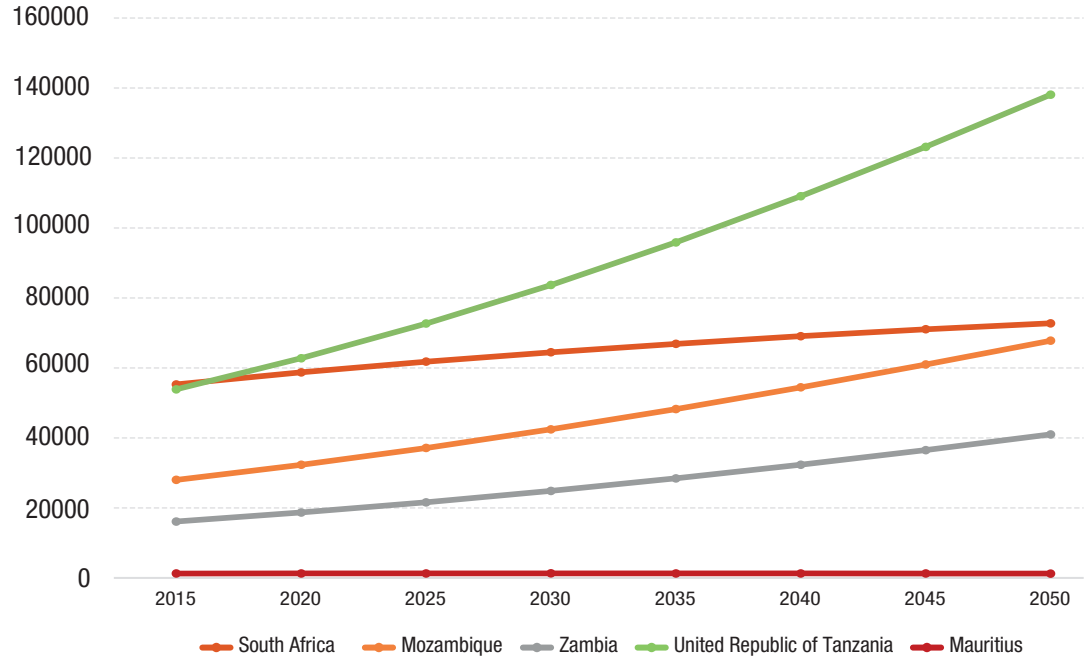
3. TRENDS IN GROWTH AND URBANIZATION

Demand for processed food is driven by population growth and increased urbanization, which also changes where and how consumers purchase food. The most remarkable aspect of projected population growth rates to 2050 is the explosive growth expected in Tanzania, where the total population is expected to increase almost threefold between 2015 and 2050 to reach 138 million. Mozambique and Zambia's population are also expected to grow rapidly, by 142% and 155% respectively while the population of South Africa and Mauritius will remain fairly stable to 2050 (Figure 5).

Along with strong population growth, rapid urbanization will continue. By 2050, 54.8% of the population of Sub-Saharan Africa is expected to live in urban areas. There will be high levels of urbanization in each of the five countries in this study with the proportion of the population residing in urban areas by 2050 expected to reach 49.1% in Mozambique, 53% in Tanzania, 58.3% in Zambia, 46.3% in Mauritius and 77.4% in South Africa (Figure 6). Urbanization goes hand in hand with changes in consumption patterns and increased demand for processed food and rising urbanization thus supports a focus on increasing food processing capabilities.

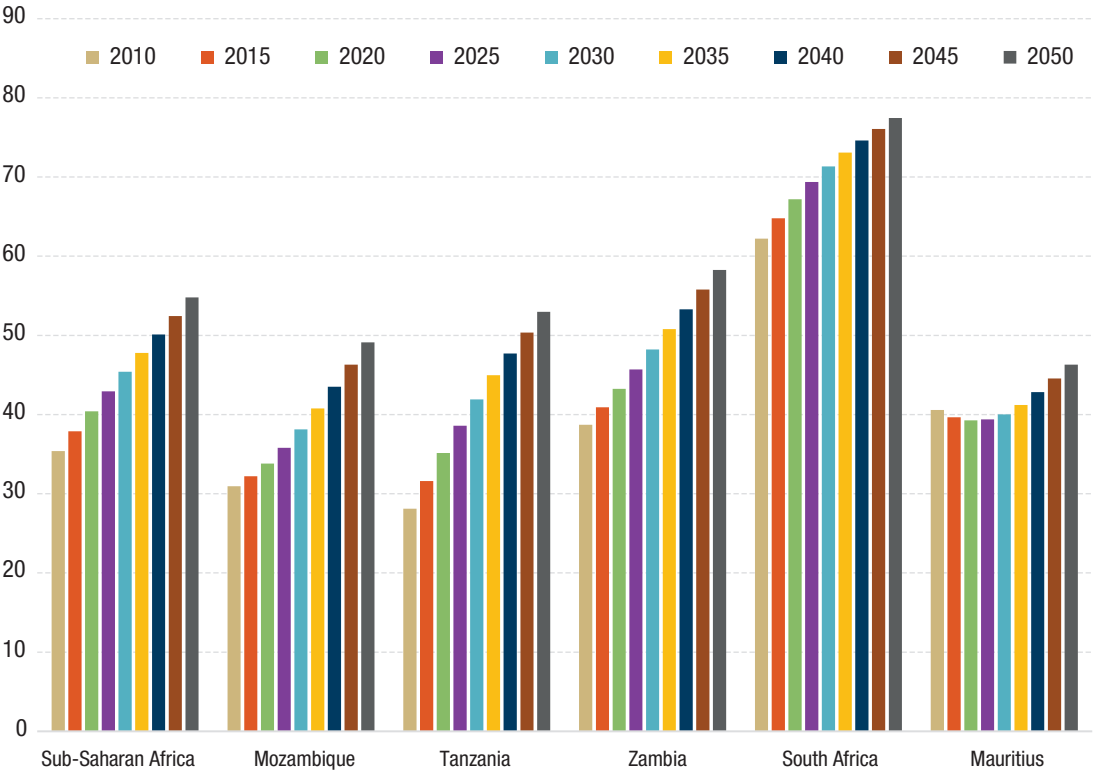
[8] SADC imported $856mn worth of palm oil in 2016. Tanzania and Zambia have both explored opportunities to increase palm oil production. In 2013 the Tanzanian National Development Corporation announced its intention to launch a 10 000-hectare palm oil project in the Ruvu River Basin near Dar es Salaam in partnership with Indian diversified conglomerate, Nava Bharat Ventures Limited. It is unclear how far the project has progressed, but several concerns were raised at the time about the water intensity of the project (which would have required irrigation) and its negative environmental impact on biodiversity in the Ruvu River Basin, much of which is listed as a critical conservation site (see here). More recently, in May 2017, Zambeef (a vertically integrated agro-processing conglomerate in Zambia) announced its intention to start commercial production of palm oil in Muchinga province where it planted 2 873 hectares of palm trees (see here).

Figure 5: Population Projections to 2050



Source: UN World Population Prospects.

Figure 6: Percentage of Population residing in Urban Areas, 2010 – 2015

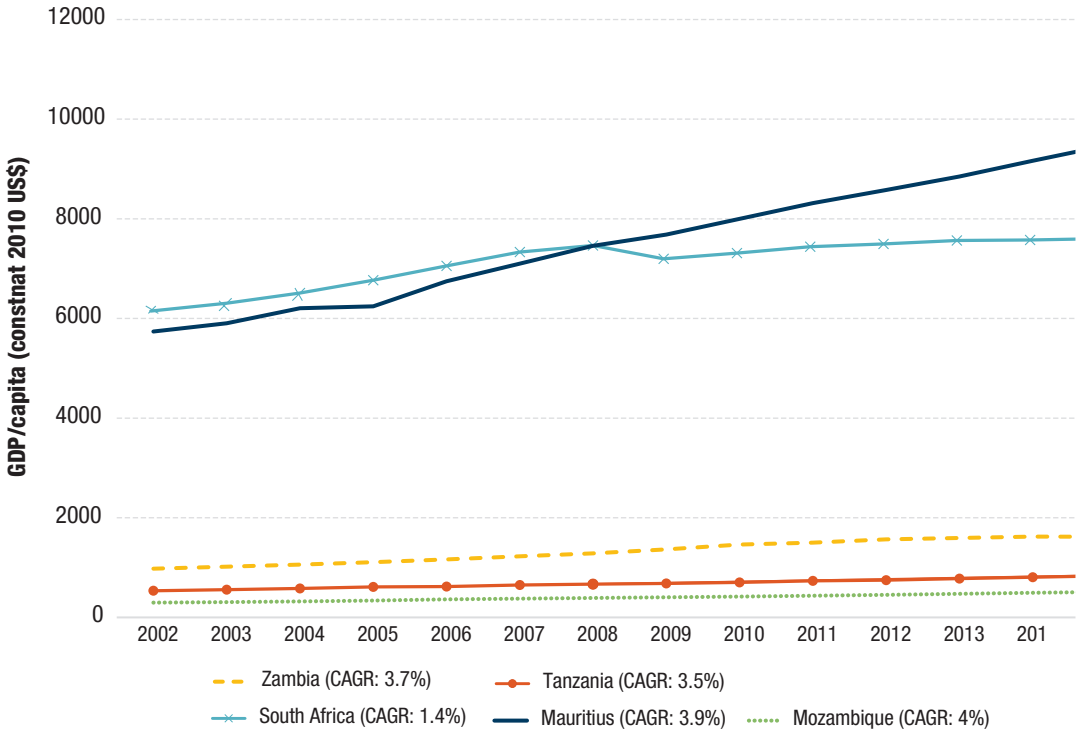


Source: UN World Urbanization Prospects (2014).

4. TRENDS IN INCOME

Over the past 15 years, per capita incomes in Tanzania, Zambia, Mozambique and Mauritius have risen at more than twice the rate of South Africa (although off a much lower base in all countries except Mauritius) (Figure 7). South African incomes peaked in 2008, after the longest sustained period of economic growth in the country's history, but have stagnated since then and show no signs of increasing in the short to medium term. In absolute terms however, South Africa is still a large and important market for processed foods but in the medium term, growth in demand is likely to come from countries like Tanzania, Mozambique and Zambia, which will have much stronger population growth and rising urbanization. The per capita income trends also show how well Zambia is performing relative to Tanzania and Mozambique, with a widening gap in per capita income from 2002 to 2016.

Figure 7: GDP per capita (constant 2010 US$)



Source: World Bank Databank.

5. COUNTRY TRENDS

This section reviews production and trade in food, beverages and tobacco within each of the five countries to give a sense of the productive capacity of the region. It also identifies value chains with significant potential for upgrading and increased trade within the region.

Zambia

Climate

Zambia's climate varies from region to region. On average, annual rainfall is highest in the north and lowest in the south of the country. The southern and central regions of country often experience extreme weather variability in any given year. A 2011 study of the potential impact of climate change

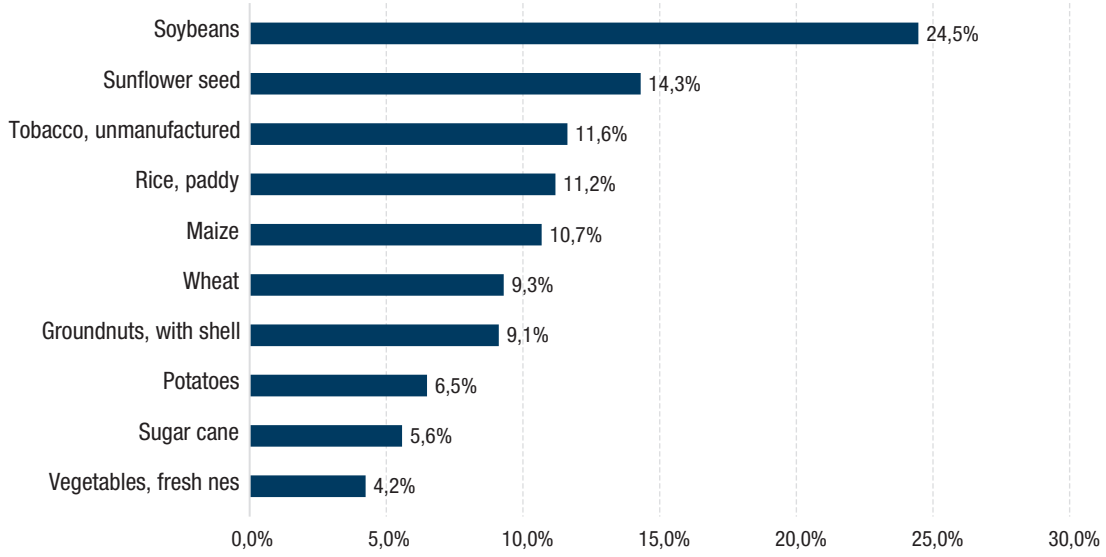
in Zambia estimated that, in the worst-case scenario, climate variability would reduce Zambia's total Gross Domestic Product (GDP) growth rate by as much as 0.4 percentage points between 2006 and 2016, equivalent at the time to a loss of US$4.3bn (Thurlow, Zhu, & Diao, 2011).

Crop production

There is regional variation in the major crops grown in Zambia. Farmers in the northern region grow a range of crops including maize, cassava, groundnuts, beans, sweet potato and various vegetables but in the drier southern and eastern regions, farmers have historically grown maize in a continuous monoculture (Thierfelder, Mwila & Rusinamhodzi, 2013; Stern & Cooper, 2011). Interviews with farmers and animal feed manufacturers around Lusaka indicate that this is changing as farmers across the country are increasingly growing soya in rotation with maize due to the growth in demand for poultry feed across southerm Africa (Imakando, 2017). Many noted that crop rotation, particularly legume intercropping, has additional benefits such as improving crop yields and soil quality, thus reducing the probability of overall yield losses as rainfall becomes more variable (this is supoorted by Arslan, et al., 2015).

The increase in soya production in Zambia has been striking, with a compound annual growth rate of 24.5% between 2004 and 2014 (Figure 8). The production of soya has continued to increase since 2014, with total production of 351 416 metric tonnes in the 2016/17 season, largely due to the incorporation of more small- and medium-sized farmers into the soybean value chain. In the 2016/17 season, small- and medium-sized farmers produced 43% of the soybean crop, a 131% increase from the previous season (Ministry of Agriculture, 2017).

Figure 8: The 10 fastest-growing crops in Zambia, 2004 – 2014
(total production in tons)



Source: FAOSTAT production data.

Imports

Zambia is a large importer of fish, spirituous beverages and vegetable oil (Table 2). Its food imports are mainly from other SADC countries with 77% of fish imports from Namibia, 60% of spirituous beverages imports from South Africa and more than 98% of its soya bean oil imports also from South Africa in 2015. Between 2015 and 2016, Zambia decreased its edible oil imports by 54% from $82.2mn to $37.8mn due to an 88% reduction in palm oil imports which were most likely replaced by increased local production of oilseeds.

Zambia also has large imports of nitrogenous fertilisers which come mainly from other countries within SADC. Fifty-three percent of Zambia's fertilizer imports in 2015 were from South Africa and 14% from Mozambique. Fertilizer prices have historically been quite high, partly due to collusion and other competition concerns in the sector (discussed in section 4). The high cost of fertilizer was identified as a key constraint to increased production by many small and medium sized farmers, the Zambian National Farmers' Union and agricultural traders interviewed in Zambia all of whom cited this as a major factor a major limiting yields and thus reducing throughput to downstream processing business (Imakando, 2017).

Table 2: Zambia's top 5 imports in food, beverages and tobacco, sorted by value in 2016

	Value of imports (USD mn)										
Product label	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016***	**CAGR**
Fish, crustaceans, molluscs and other aquatic invertebrates	7.7	4.6	5.5	6.9	15.8	31.1	50.0	77.3	112.6	96.1	32%
Beverages, spirits and vinegar	9.9	13.6	16.1	16.1	29.0	36.8	35.3	38.1	32.5	72.9	25%
Animal or vegetable fats and oils	72.9	97.1	82.8	90.1	133.0	137.4	110.5	105.7	82.2	37.8	-7%**
Miscellaneous edible preparations	10.1	10.5	12.8	19.7	27.2	27.1	31.1	34.5	29.0	36.4	15%
Preparations of cereals, flour, starch or milk; pastrycooks' products	9.7	14.2	13.1	16.9	21.3	27.1	28.8	31.6	29.7	28.8	13%
Fertilisers	*116.5*	*204.1*	*197.7*	*190.8*	*322.9*	*304.6*	*382.5*	*334.4*	*361.0*	*142.3*	*2%*

Source: ITC Trademap.

* The 2016 Trademap Data for Zambia is mirror data, which may not be a true reflection of trade value.

** Note: the CAGR for animal or vegetable fats and oils is not a good reflection of the trend over the period. Edible oil imports increased from 2007 to 2015 when it dropped sharply. The CAGR for edible oils between 2007 and 2015 is +1.5%.

Exports

Zambia's largest exports in 2016 were unmanufactured tobacco exported to Malawi and Germany. Amongst the next four large import categories, three relate to the cereals value chain (Table 3). Cereal export grew strongly at a CAGR of 7% of the period, but this masks the variability in exports over the period. The growth in cereal exports is mainly due to strong growth in maize exports to neighbouring countries, and the variability may be due to regular export bans placed on maize in the interest of domestic food security. These types of policy decisions may need to be reassessed in the interest of deepening regional markets.

Soya oilcake, which is one of the components of the category 'Residues and waste from the food industries' grew in line with Zambia's increased production of soybeans. Exports of soya oilcake increased at a CAGR of 32.4% between 2007 and 2015 (and at a CAGR of 46.8% between 2007 and 2014), making Zambia the second-largest exporter of oilcake in SADC in 2015 after South Africa. In 2013 Zambia actually exported more soya oilcake than South Africa, which indicates spectacular growth considering Zambia recorded no soya oilcake exports just five years earlier in 2008.

Zambia's third largest export is sugar and sugar confectionery products, but these exports have been under pressure, declining at a compound annual rate of 2% per annum. This is due to a decline in both raw sugar exports (of -2% per annum) and an even larger decline in sugar confectionery products (of -9% per annum), pointing to constraints in Zambia's downstream confectionery industry.

Table 3: Zambia's top 5 exports in food, beverages and tobacco, sorted by value in 2016

	Value of Exports (USD mn)										
Product Label	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**CAGR**
Tobacco and tobacco substitutes	62.0	71.9	89.6	117.8	100.5	156.8	216.9	143.4	106.4	175.0	12%
Cereals	63.1	51.4	24.4	37.2	191.5	419.8	161.7	78.2	204.5	115.9	7%
Sugars and sugar confectionery	90.1	64.3	101.8	149.7	164.5	143.6	188.9	221.6	134.7	77.1	-2%
Residues and waste from the food industries; prepared animal fodder	4.7	5.0	7.0	17.5	27.8	131.7	80.7	75.2	34.4	25.8	21%*
Products of the milling industry; malt; starches; inulin; wheat gluten	23.0	33.3	25.1	33.2	58.0	36.1	68.2	47.6	25.5	1.8	-25%*
Oilcake and other solid residues, resulting from the extraction of soya-bean oil	*1.5*	*0*	*3.1*	*6.6*	*2.4*	*4.9*	*29.6*	*22.0*	*14.2*	*No data*	*32.4% (2007-2014)*

Source: ITC Trademap.

**Note:* the CAGR for these categories is not a good reflection of the trend over the period. Between 2007 and 2013, the CAGR for 'products of the milling industry' was 19.9% but exports declined to 2015 and dropped precipitously in 2016. Similarly, the CAGR for 'Residues and waste from the food industries' between 2007 and 2013 was 60.6% but exports declined steadily thereafter. The reasons for the 2013 peak and subsequent decline are not clear.

Potential agro-processing value chains to explore

Over the past 10 years, Zambia has shown potential to become a leading exporter of maize and soya to the region. Its trade surplus in cereals, primarily driven by maize, grew by 10% per annum between 2007 and 2016 (and by 18% per annum between 2007 and 2015, thus excluding the dampening effect of the El Nino-induced drought on 2016 exports). Interviews with farmers suggest that production and yield of small-scale, rain-fed farmers can be increased further if farmers had access to inputs (particularly more affordable fertiliser) and better infrastructure, including storage facilities.

There are limited opportunities for the development of a strong regional value chain in maize because most countries within SADC are self-sufficient in maize production. Maize also does not offer significant opportunities for further downstream processing, generally undergoing only primary processing to maize meal. The links between maize and adjacent value chains in animal feed are weak because maize oilcake has lower value than soya oilcake, for example, in the animal feed sector. The Zambian government has also imposed restrictions on maize exports in recent years to meet national food reserve requirements, generating uncertainty about producers' ability to participate in export markets. While maize is likely to remain an important crop, interest is increasingly shifting to the soya value chain which provides high-value soya oilcake for the growing poultry sector across SADC.

Zambia has also grown production and exports of tobacco and sugar, and there seem to be opportunities for increased investment in downstream processing within both value chains. Between 2012 and 2016, Zambia was consistently a net exporter of unmanufactured tobacco while imports of manufactured tobacco and cigarettes increased. Across SADC, there was a trade surplus of $2bn in unmanufactured tobacco in 2016 but net imports of $32mn in manufactured tobacco products.

The trends are similar in sugars and sugar confectionery with exports of raw sugar and imports of sugar confectionery products. Zambia is one of the lowest-cost sugar producers in the world but its sugar processing industries are not well developed and its trade balance in sugar confectionery products worsened significantly in 2016. In 2007, Zambia had a trade surplus of $2.9mn in sugar confectionery products, which increased nearly fourfold to $10.8mn in 2015. However, in 2016

Zambia recorded a trade deficit of $5.3mn in sugar confectionery products, despite recording net exports of raw cane sugar of $68.7mn in the same year.[9]

There is also a large and persistent deficit in sugar confectionery products across SADC to be met. Though SADC's trade deficit in sugar confectionery products has reduced over time, it remains significant at -$26.2mn in 2016.

Tanzania

The government of Tanzania has identified the development of agriculture and agro-processing as a core pillar of the country's industrialisation strategy. The *Tanzania Development Vision 2025* envisions that by 2025 Tanzania will be a middle-income country characterised by a competitive and diversified economy with a substantial industrial sector, capable of producing sustainable growth and shared benefits. The *Development Vision* depends in part on achieving annual average agricultural growth of 6% between 2010 and 2025.

The *National Agriculture Policy 2013* provides a summary of the challenges to agricultural growth. These include low productivity of land, labour and production inputs; over-dependency on rainfed agriculture, limited capital and lack of access to finance for the uptake of new technology, poor rural infrastructure and low levels of agro-processing. Weak producers' organizations and depressed commodity prices also limit opportunities in the agricultural sector. Despite a clear articulation of the various challenges to the growth of the agricultural sector, the impact of climate change is notably absent from these development strategies.

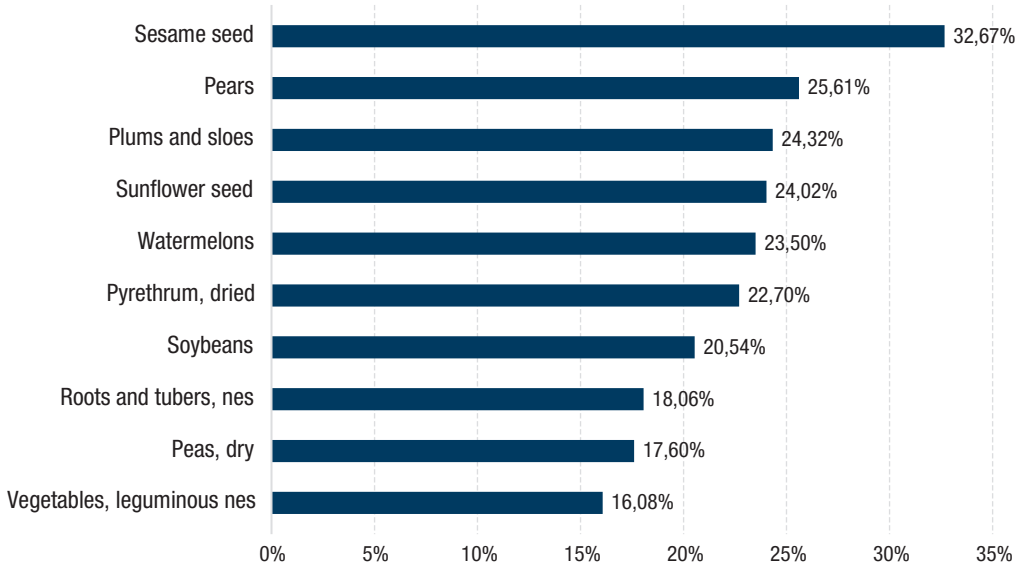
The challenges notwithstanding, there are numerous opportunities for growth in agriculture and agro-processing within Tanzania. The country has abundant natural resources and different agro-ecological zones gives it comparative advantage in the production of various crops. The north-eastern, north-western and northern parts of the coastal belt experience two distinct rainfall patterns with heavy rains between March and May and light rainfall between October and December (Munishi, Shirima Jackson & Kilungu, 2010). In the central, southern, south-eastern and western regions rainfall is uni-modal starting in mid-November until mid-April (Munishi et al., 2010). Due to varying rainfall patterns, planting and harvesting can occur throughout the year, particularly for rainfed crops.

With climate change, rainfall is predicted to decrease in all regions except the north-western region. Forecasts indicate that Tanzanian maize production could decline by as much as 13.0 percentage points between 2030 and 2069 due to climate change (Rowhani et al., 2011, Munishi et al., 2010 and Thornton, Jones, Ericksen and Challinor, 2011). Adapation strategies, including a switch to indigenous drought-resistent crops, will be vital to mitiagte the impact of climate change on the production of maize and other field crops.

The top 10 fastest growing crops in Tanzania over the period 2004 – 2014 (Figure 9) are all in two categories; oilseeds (including sesame, sunflower and soybeans), and horticultural products including fruit (pears, plums, watermelons), vegetables (leguminous vegetables, peas, roots and tubers) and flowers (puyrethrum). A closer look at the oilseeds production data confirms the significant increase in oilseed production, particularly in the three years to 2015 (Table 4).

[9] Zambia's sugar confectionery imports were mainly from South Africa, reportedly by South African-owned supermarkets expanding their footprint across Zambia. This is discussed further in section 4.

Figure 9: Top 10 fastest growing crops in Tanzania, 2004 - 2014



Source: FAOStat.

Table 4: Production of Oilseeds in Tanzania, 2010 – 2015

	2010	2011	2012	2013	2014	2015	CAGR
Total production for primary crops (tons)	23 024 723	24 526 342	25 178 692	29 155 997	31 935 145	32 619 109	7%
Total production for oilseeds, of which:	1 283 200	2 099 675	2 807 442	5 631 410	5 927 607	6 337 772	38%
Seed cotton	267 000	163 644	225 938	357 133	245 831	203 312	-5%
Sesame seed	144 420	357 162	456 000	1 050 000	1 113 892	1 174 589	52%
Sunflower seed	313 110	786 902	1 125 000	2 625 000	2 755 000	2 878 500	56%
Cashew nuts	74170	121070	160000	127947	130124	197 933	22%
Groundnuts	465 290	651 397	810 000	1 425 000	1 635 735	1 835 933	32%
Oil palm fruit	16 110	17 000	24 880	40 500	41 000	41 475	21%
Soybeans	3 100	2 500	5 624	5 830	6 025	6 030	14%
Production of oilseeds as a proportion of total production for primary crops	6%	9%	11%	19%	19%	19%	

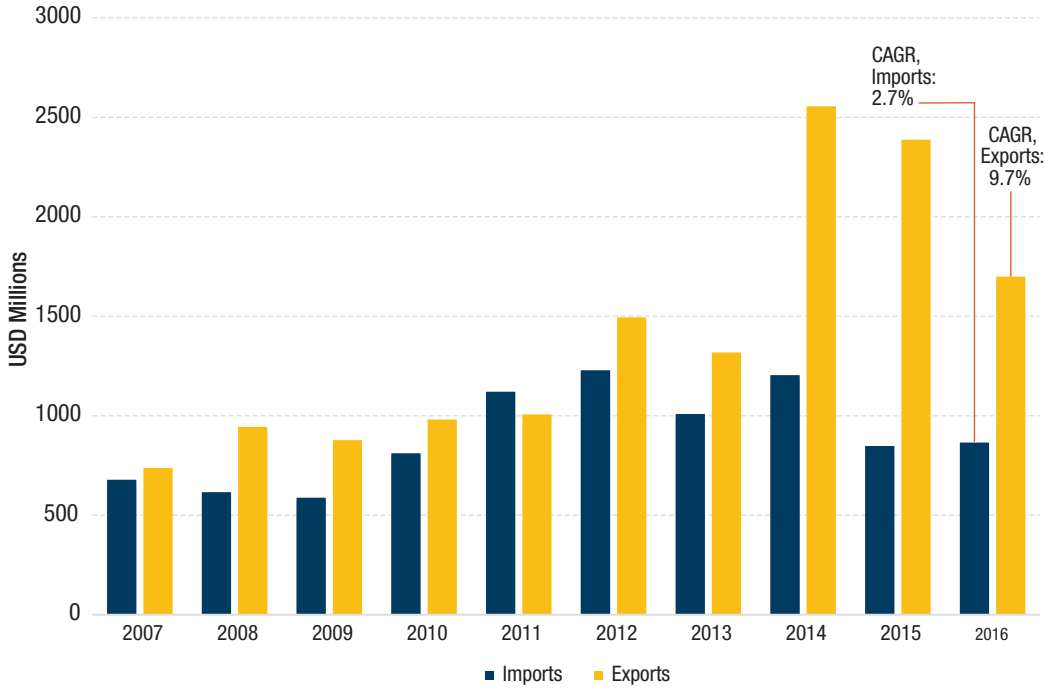
Source: CountrySTAT (Food and Agriculture Statistics).

Trade

Between 2012 and 2016, Tanzania's total imports in the food, beverages and tobacco category increased by a compound rate of 2.7% per annum while exports increased by 9.7% per annum (Figure 10). Processed food imports grew by 3.9% per annum and processed food exports grew by a slightly higher annual rate of 4.6%, but this analysis is skewed by the significance of palm oil in the processed food trade data.

Palm oil constitutes, on average, 54.7% of Tanzania's processed food imports and 18.9% of its exports between 2007 and 2016. Excluding palm oil from the analysis, Tanzania's processed food imports increased by 7.4% per annum between 2007 and 2016 (compared to 3.9%, showing large sustained imports of palm oil over time). Processed food exports, excluding palm oil, grew by 6.7% per annum (compared to 4.6%). Though Tanzania seems to be making progress in turning around its trade deficit in food products the relative weakness of export growth shows that there is significant and growing demand for processed food still to be met. Some authors have suggested that Tanzania is returning to a path of import-substitution industrialisation (see, for example Behuria, 2017) and while the data reflect relative growth in exports, there is a risk that processed food imports will continue to grow faster than processed food exports in the absence of increased investment in agro-processing industries.

Figure 10: Total imports and exports in food, beverages and tobacco (Tanzania)[10]



Source: ITC Trademap.

Imports

Tanzania's largest imports in the food, beverages and tobacco category were edible oils, cereals and sugar and sugar confectionery (Table 5). Within these categories, its main imports were palm oil from Malaysia, wheat from Russia, Canada and Germany and raw sugar from the UAE, India, Malawi and Brazil.

[10] The category 'food, beverages and tobacco' include HS codes 02 – 04, 07 – 12, and 15 – 24. The category 'processed food' includes HS Codes 15 – 21.

Table 5: Tanzania's top 5 imports in food, beverages and tobacco, sorted by 2016 value

	Value of imports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Animal or vegetable fats and oils	250.3	203.6	125.5	211.3	317.7	298.0	233.3	427.4	264.0	301.3	2%
Cereals	242.6	208.0	230.9	308.8	470.7	471.7	400.1	346.7	273.5	213.5	-1%
Sugars and sugar confectionery	67.3	41.5	57.0	92.5	126.0	183.8	147.8	117.3	114.0	153.6	10%
Beverages, spirits and vinegar	28.7	35.3	38.1	52.3	60.4	70.0	67.0	62.4	49.9	46.3	5%
Products of the milling industry; malt; starches; inulin; wheat gluten	25.1	49.7	50.5	65.7	55.5	37.6	24.1	55.1	19.4	23.5	-1%

Source: ITC Trademap.

Exports

Tanzania's largest exports were tobacco, edible fruit and nuts, and edible vegetables and tubers. Within these categories, Tanzania exported mainly unmanufactured tobacco to Belgium, cashew nuts to India and Vietnam and beans and peas to India.

Table 6: Tanzania's top 5 exports in food, beverages and tobacco, sorted by value in 2016

	Value of exports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Tobacco and manufactured tobacco substitutes	96.7	180.6	97.9	141.2	123.3	223.1	129.1	322.9	293.6	367.7	16%
Edible fruit and nuts; peel of citrus fruit or melons	30.0	74.0	92.3	127.6	128.7	189.9	193.8	399.6	279.3	343.7	31%
Edible vegetables and certain roots and tubers	58.1	78.1	64.1	100.4	74.3	133.6	105.1	249.8	398.6	255.2	18%
Coffee, tea, maté and spices	164.6	162.1	204.6	173.3	225.5	281.9	261.1	213.5	229.0	209.8	3%
Oil seeds and oleaginous fruits	47.7	63.4	87.6	77.7	103.6	157.1	170.8	360.5	166.2	146.0	13%

Source: ITC Trademap.

Trade balance and value chains of interest

Tanzania's exports tell a story of growing agricultural productivity with impressive growth rates in the exports of tobacco, oilseeds, vegetables, and nuts. With the impressive growth in oilseeds, Tanzania is in a good position to meet the SADC regional deficit of $103mn in sunflower oil and of $15mn in sunflower seeds.

Mozambique

Climate

Climatic conditions within Mozambique vary significantly with subtropical conditions in the north and central regions, and arid conditions in the south. The northern part of Mozambique has the most arable land and though various crops including maize, sweet potato, sorghum, rice, groundnuts, cowpeas, sesame, cassava, beans, and soya are grown there, it is still significantly underutilized (African Centre for Biodiversity, 2015).

Climate change is likely to have a significant impact on crop yields across the country, but the severity of the impact will vary between regions (Table 7). Central Mozambique seems to be most at risk, with decreases of between 3 and 5.6% expected in the maize yields, and decreases between 3.1 and 6.2% in cassava (Arndt & Thurlow, 2015).

Table 7: Projected changes in crop yields due to climate change: Mozambique (base year = 2007)

Region	Period	Crops (Range of estimated yield change, %, 2007 as base year)
Central Mozambique	2007 – 2050	Maize: Between -3% and -5.6% Cassava: Between -3.1% and -6.2%
North Mozambique	2007 – 2050	Maize: Between -1.9% and -2.9% Cassava: Between -0.1% and -6.5
South Mozambique	2007 – 2050	Maize: Between -3.9% and -4.4% Cassava: Between 0.4% and -3.2%

Source: Arndt et al. (2011).

Imports

Mozambique's largest imports in 2016 were cereals (mainly wheat imported from the UAE and Russia and rice imported from Thailand), edible oils (mainly palm oil imported from Indonesia) and beverages (mainly beer and wine imported from South Africa and Portugal) (Table 8). Mozambique also has a sustained, though volatile, imports of nitrogenous fertilizer over the entire period, mainly imported from South Africa.

Table 8: Mozambique's top 5 imports in food, beverages and tobacco, sorted by value in 2016

	Value of imports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Cereals	181.5	244.2	275.6	149.2	308.3	208.9	405.7	371.3	323.7	301.4	6%
Animal or vegetable fats and oils	48.5	111.9	80.1	77.7	141.2	64.8	185.5	162.5	100.5	93.5	8%
Beverages, spirits and vinegar	12.1	16.1	17.4	22.3	35.5	39.6	79.2	98.5	90.4	77.4	23%
Fish and crustaceans, molluscs and other aquatic invertebrates	24.9	36.1	37.1	33.9	55.4	47.6	88.9	87.8	80.9	59.8	10%*
Dairy produce; birds' eggs; natural honey; edible products of animal origin, n.e.s.	48.6	22.4	25.4	24.6	40.0	50.1	47.4	50.9	44.6	35.1	-4%
Fertilisers	*14.1*	*72.8*	*47.6*	*46.9*	*101.7*	*65.6*	*51.3*	*86.7*	*35.7*	*35.5*	*11%*

Source: ITC Trademap.

**Note:* The CAGR value is skewed by the drop between 2015 and 2016. The CAGR to 2015 is 15.9%.

Exports

Mozambique's largest exports were tobacco and tobacco products, sugar and sugar confectionery, and edible fruit and nuts. In both tobacco and sugar, Mozambique exported mainly unprocessed goods. Unmanufactured tobacco accounted for more than 99.9% of Mozambique's tobacco exports in 2016 and more than 93% of total sugar exports were made up of raw cane sugar. In 'edible fruit and nuts', Mozambique's main exports were cashew nuts ($29.2mn) and bananas ($23.4mn) exported mainly to India and South Africa respectively.

Table 9: Mozambique's top 5 exports in food, beverages and tobacco, sorted by value in 2016

	Value of exports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Tobacco and manufactured tobacco substitutes	2.0	0.3	0.4	0.0	0.1	111.4	52.8	443.2	2.5	455.1	82%
Sugars and sugar confectionery	3.5	17.2	37.8	7.3	64.0	81.3	224.3	7.4	7.1	82.4	42%
Edible fruit and nuts; peel of citrus fruit or melons	26.5	38.1	39.2	43.4	255.5	49.6	55.8	81.3	45.9	72.9	12%
Fish and crustaceans, molluscs and other aquatic invertebrates	6.2	10.8	41.0	28.7	35.2	22.0	26.4	49.0	30.6	35.2	21%
Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	0.8	0.4	2.5	3.0	3.7	1.2	5.2	15.2	32.2	26.1	48%

Source: ITC Trademap.

Potential agro-processing value chains to explore

Mozambique is a net exporter of unmanufactured tobacco and raw sugar. Between 2012 and 2016, it exported an average of $24mn in unmanufactured tobacco per year but imported cigars, cigarettes and other tobacco products. This indicates that there are opportunities for investment at the processing level of the tobacco value chain. However, it is worth nothing that Mozambique already seems to be part of a regional value chain in tobacco products. It exports most of its rolled tobacco to Zimbabwe and imports cigarettes containing tobacco from Zimbabwe. The regional benefits of investing in additional cigarette manufacturing facilities in Mozambique are thus unclear. If a tobacco value chain were developed, it will likely span Zambia, Tanzania (which ara also large tobacco producers), Mozambique and Zimbabwe.

Like Zambia, Mozambique's downstream sugar confectionery industry appears underdeveloped. Mozambique is a net exporter of raw cane sugar but a net importer of sugar confectionery products. Its raw sugar exports are destined mainly for the EU while a large proportion of sugar confectionery products are imported from South Africa (this is also similar to the trends in Zambia). In 2015, about 39% of Mozambique's sugar confectionery products were imported from South Africa, the largest single source of imports by some margin, showing the dominance of South African-based multinationals in regional retail markets. These imports could be replaced by increased local processing within Mozambique, which is discussed further in section 4 below.

South Africa

South Africa is the largest and most industrialised economy in the SADC region, which means that any assessment of its inclusion in regional value chain must necessarily be sensitive to the power and influence of South African large and lead firms and their role in shaping value chain across the region. It is a large exporter of processed food and consumer goods within the SADC region and these exports have increased with the expansion of South African-owned supermarkets throughout southern Africa (das Nair and Chisoro-Dube, 2016).

Although South Africa is currently a large exporter of processed food products to the region, its commercial agricultural sector is expected to come under increasing pressure because of climate change. South Africa is a water scarce country with variable rainfall and high evaporation rates across the country (UNEPFI, 2009). Forecasts to 2050 predict that the Northern Cape and the arid regions of the Free State and Mpumalanga will face the highest incremental increases in temperature in the country, and will become drier as a result. In 2016, these three provinces accounted for 67% of South Africa's maize crop, 81.2% of the sorghum crop and 82.3% of the soya crop and declines in production and yield may have a significant effect on agricultural production in South Africa.

With respect to the other provinces, Gauteng and the North West will face the highest variation in rainfall to 2050 and the coastal provinces (the Western Cape, Eastern Cape and KwaZulu-Natal) are expected to continue to face high incidence of extreme weather conditions which will also intensify soil degradation (Gbetibouo, Ringler and Hassan, 2010). The Limpopo province will likely experience an increase in temperature, reduction in rainfall, and will also get drier as a result (Maponya & Mpandeli, 2012).

Like other countries within the region and in this study, South Africa's principal crop is maize, which is not drought resilient. Due to the recent drought in 2015/16, South Africa experienced a drop in maize yields of 4.6 million tons in 2015, and 2.4 million tons in 2016. Maize supply shortfalls were recovered by imports from Brazil, Argentina, United States, Mexico and Zambia (AFBIO, 2016). The overall decrease in rainfall forecast within South Africa, coupled with increasing temperatures and more extreme weather events, mean that declining yield may be a long-term problem. Because of this, existing production capabilities may no longer be a good indicator of a country's future role within an agricultural value chain.

South Africa has also made significant investments in expanding soya processing capacity to meet the demand for animal feed primarily for the poultry sector. This has, in turn, encouraged increased soya production (see section 3.1). However, as a drought-prone country, South Africa's capacity to further increase soya production is limited and investments have been made in developing drought resistant soya cultivars more suited to the South African climate. If we had taken a regional value chain approach instead, South Africa may look towards countries such as Zambia for unmet soya demand and use scarce water resources for higher value crops such as fruit where it has already penetrated global markets.

Imports

South Africa's largest imports in the food, beverages and tobacco category were cereals, edible oils and meat and edible meat offal (Table 10). The country's 2016 imports were significantly affected by the El Nino-induced drought, particularly in the cereals category where it recorded maize imports of $620mn in one year. By contrast, total maize imports between 2007 and 2015 was $588mn, indicating the magnitude of the 2016 maize imports. The other large cereal imports are rice, imported mainly from Thailand and India, and wheat which is imported from Russia, Germany, the USA, Lithuania and Poland, though the origin of wheat imports varies significantly from year to year. The CAGR for cereals imports masks the annual variability in imports. In non-drought years, cereals imports are largely comprised of wheat (and some rice). Given South Africa's water scarcity, and the water intensity of wheat production, it will not be self-sufficient in wheat in the medium term, particularly not with climate change. In drought years such as 2012 and 2016 there are sharp increases in exports, which reflect maize imports to supplement low local maize production.

South Africa's edible oil imports are largely split between palm oil, soya bean oil and sunflower oil, which accounted for 42%, 22,8% and 16.1% of the total value of edible oil imports in 2016 respectively. Imports in "meat and edible meat offal" were largely frozen poultry products imported from the European Union.

Table 10: South Africa's top 5 imports in food, beverages and tobacco, sorted by 2016 value

	Value of imports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Cereals	784.2	953.7	754.7	728.0	1189.7	1306.2	1127.6	994.3	786.0	1377.6	6.5%*
Animal or vegetable fats and oils	662.8	798.7	542.3	836.5	1083.7	1070.7	813.9	771.0	459.1	682.6	0.3%
Meat and edible meat offal	358.9	295.4	291.7	493.4	698.8	744.7	638.8	563.6	449.4	530.9	4.4%
Beverages, spirits and vinegar	428.0	436.9	444.9	536.6	640.8	654.2	656.4	548.7	429.7	441.1	0.3%
Residues and waste from the food industries; prepared animal fodder	324.8	445.2	419.3	530.1	593.9	618.6	582.0	502.4	326.2	431.6	3.2%

Source: ITC Trademap.

**Note:* The CAGR masks the trends in cereal imports which is related to climate variability (see discussion above).

Exports

South Africa is large exporter of fruit and processed fruit products (Table 11). Fresh fruit is exported largely to the European Union but exports to China, the UAE, Saudi Arabia and Russia have grown well over the past 10 years.

The third largest export category, 'preparations of fruit and vegetables' is made up mostly of fruit juices, purees or concentrates, and canned or preserved fruit. Juice is exported mainly to other SADC countries, which collectively accounted for more than 50% of the 2016 juice exports by value. Canned fruit is exported to a range of countries including the UK (15% of exports in 2016), Japan (10.2% of 2016 exports), Germany (9.8% of 2016 exports) and China (7.2% of 2016 exports).

South Africa is also a large exporter of wine, largely to the EU and north America though exports to China have grown more than 33% per annum (though off a small base) between 2007 and 2016.

Table 11: South Africa's top 5 exports in food, beverages and tobacco, sorted by value in 2016

	Value of exports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Edible fruit and nuts; peel of citrus fruit or melons	1479.8	1588.0	1619.2	2195.5	2301.8	2358.8	2640.5	2823.3	2828.0	2887.6	7.7%
Beverages, spirits and vinegar	904.3	1043.6	1015.6	1299.6	1347.6	1280.3	1439.2	1405.6	1215.2	1199.6	3.2%
Preparations of vegetables, fruit, nuts or other parts of plants	328.5	373.4	388.8	616.9	637.9	620.0	624.0	651.2	555.4	562.9	6.2%
Cereals	51.8*	678.4	497.5	570.1	1103.2	733.5	940.5	804.4	370.4	441.9	-5.2% (from 2008)
Fish and crustaceans, molluscs and other aquatic invertebrates	463.5	487.5	387.9	473.0	507.4	453.8	434.5	483.4	395.8	441.6	-0.5%

Source: ITC Trademap.

**Note:* Cereals exports for 2015 seem low compared to the rest of the data series. The data point is as reported by Trademap but requires verification. The data point is excluded from the CAGR calculation to prevent skewing the trend.

Intra-regional trade: South Africa-SADC trade

Between 2007 and 2016, South Africa's exports of processed food to the rest of the SADC grew by 18.4% per annum (from $273mn in 2007 to $1.25bn in 2016). Overall; exports of food, beverages and tobacco products increased by 21.4% per annum. These large increases are in line with South Africa's position as the largest industrial economy in the region and the increasing processed food exports via South African-owned retailers expanding across SADC (discussed further in section 4).

South Africa's imports from the rest of SADC have also grown over the period 2007 to 2016, though off a small base. In 2007, South Africa's imports from the rest of SADC were about $24.3mn and grew to $326mn in 2016, a CAGR of 33.5%. More broadly, imports of food, beverages and tobacco grew by 20.5% per annum.

The processed food imports that grew most strongly were (1) 'meat of bovine animals' which grew from zero in 2007 to $32.8mn in 2016, (1) wheat flour which grew from zero in 2007 to $13mn in 2016 and, interestingly, (3) malt beer which grew from $0.7m in 2007 to $49.2mn in 2016. This shows how little South Africa imported from the rest of the SADC region even ten years ago and how great the potential for further integration is.

Trade balance and value chains of interest

In processed food, South Africa has large trade deficits in edible oils, chocolate, preserved sardines and pasta. Although there is potential for South Africa to shift its edible oil imports to Tanzania, the rest of the imports are small in value and present limited potential for the development of a regional value chain.

If we look at agricultural imports that could support the development of a regional value chain more broadly, the largest potential lies in soya oilcake for the South African poultry sector. In 2016, South Africa imported soya oilcake worth $201mn, all of which was sourced from Argentina. Other imports, such as South Africa's $342.9mn net imports in rice could also be shifted to Tanzania but unlike the soya oilcake, there is limited potential for further processing or joint upgrading that makes the soya to poultry value chain compelling.

Mauritius

Mauritius is a volcanic island with significant regional variation in rainfall. The western coastal lowlands have relatively low annual average rainfall and can only support agricultural activity under irrigation (Staub, Stevens & Waylen, 2014; Luximon & Nowbuth, 2010). The eastern coast and central plateau have more favourable rainfall patterns that can support rainfed agriculture (Luximon & Nowbuth, 2010). Rainfall variability is expected to increase with climate change, with decreased rainfall along the north and east coasts, and increased rainfall along the south and west coasts (Staub et al, 2014).

Mauritius is mostly suitable for sugarcane production and is a a net importer of many processed food items incluidng flour, rice, pulses, meat, onions and milk products (Luximon & Nowbuth, 2010). The country's 2020 Strategic Plan outlines its intention to break from the monoculture of sugarcane and diversify crop production in an attempt to reduce food imports.[11] In 2015, more than 60% of the arable land in Mauritius (approximately 53 000 hectares) was under sugar cultivation and produced about 500 000 tonnes of sugar. This was down from 87 000 hectares under sugarcane cultivation in 1973 and peak production of more than 700 000 tonnes but still indicates extensive reliance on sugarcane (Jack, 2015).

The end of Mauritius's preferential trade agreement with the EU (the 'Sugar Protocol') dealt a blow to the Mauritian sugarcane industry. Under the Sugar Protocal, Mauritius received favourable access to the EU at prices above the world market price for sugar. With the end of this agreement, Mauritian sugar refiners have looked to other SADC countries, expanding sugar cane cultivation in Kenya and Tanzania and are exploring greater value addition locally to improve returns. Government also implemented significant reforms, including centralising sugar purchases under the 'Mauritius Sugar Syndicate' and reducing the number of processing plants that crush and refine the sugar from 17 to 4 (Ackbarally, 2014). Farmers have been facing lower sugar purchase prices and are responding by shifting to the production of 'fairtrade' sugar, which allows them to earn and additional $60/tonne of sustainably produced sugar (Ackbarally, 2014).

Despite the importance of sugar in the Mauritian agro-processing sector, it is actually a relatively high cost sugar producer, primarly due to low milling capacity and relatively high cost of labour. The rockiness of much of its sugarcane lands also impedes mechanisation, which constrain efficiency improvements.

Imports

Mauritius imports a large amount of its agricultural produce and processed food products. In 2016, its largest imports were frozen fish, dairy products (mainly milk and cheese) and cereals (mainly rice and wheat) (Table 12). In 2015, Mauritius imported frozen fish fillets mainly from South Africa (21% of total imports), but other large processed food imports came from outside SADC. Milk was imported mainly from France (44% of total), cheese from Australia (52% of total) and both rice and wheat flour from India (84% and 94% of total respectively).

[11] See Strategic Plan 2016-2020 for the Food Crop, Livestock and Forestry sectors.

Mauritius is less integrated into food-processing value chains within SADC than the other countries in this study and there are opportunities for greater integration through import replacement, particularly where other SADC countries have established production capabilities. For example, it could import rice from Tanzania, fish from Tanzania and South Africa and dairy products from South Africa, Zambia, or Tanzania. Although Mauritius is a net exporter of sugar, it does import some sugar from Brazil (about $32mn in 2016), which could be imported from Zambia or South Africa instead.

Table 12: Mauritius's top 5 imports in food, beverages and tobacco, sorted by value in 2016

	Value of imports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Fish and crustaceans, molluscs and other aquatic invertebrates	215.9	284.9	208.4	239.5	304.2	363.6	366.3	316.1	242.3	295.8	4%
Cereals	108.2	144.8	114.8	128.0	124.0	142.6	153.5	140.5	109.4	93.3	-2%
Dairy produce; birds' eggs; natural honey; edible products of animal origin, n.e.s.	78.8	105.9	80.5	99.1	112.8	118.4	107.6	125.8	91.9	103.2	3%
Tobacco and manufactured tobacco substitutes	20.2	42.3	38.6	48.2	57.4	70.6	67.3	67.8	60.5	63.1	13%
Animal or vegetable fats and oils	41.0	57.2	44.3	40.8	67.9	68.6	55.1	60.7	40.7	45.9	1%
Sugars and sugar confectionery	20.5	21.5	21.8	23.3	38.0	51.4	36.7	37.7	37.9	42.2	8%

Source: ITC Trademap.

Exports

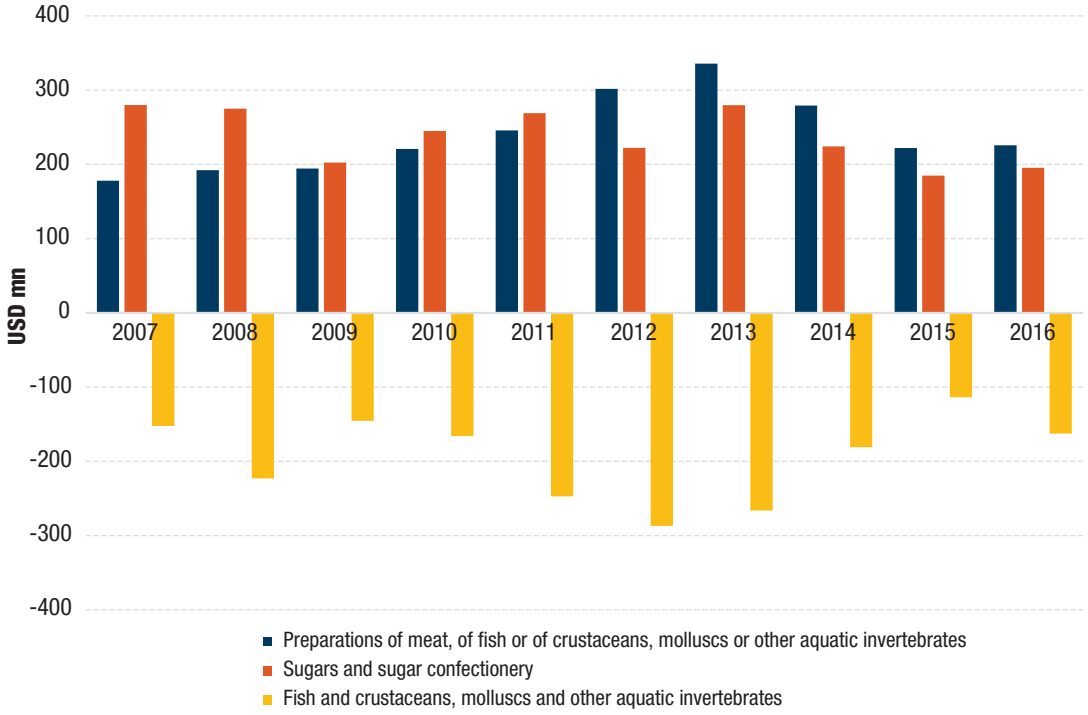
In 2016, Mauritius's largest exports were 'preparations of meat, fish, crustaceans, molluscs and other aquatic invertebrates', sugars and sugar confections and 'fish and crustaceans, molluscs and other aquatic invertebrates' although it is still a net importer in the last category (Figure 11 and Table 13).

Table 13: Mauritius's top 5 exports in food, beverages and tobacco, sorted by value in 2016

	Value of exports (USD mn)										
Product label	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CAGR
Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	198.8	219.7	220.9	250.5	277.8	344.7	375.8	320.6	256.0	263.0	3.2%
Sugars and sugar confectionery	300.6	296.6	224.3	268.3	306.9	273.7	316.5	261.8	222.7	237.5	-2.6%
Fish and crustaceans, molluscs and other aquatic invertebrates	63.4	61.8	62.8	73.3	56.9	76.5	100.0	135.1	128.6	133.2	8.6%
Coffee, tea, maté and spices	1.2	1.6	1.4	3.9	2.0	4.6	2.4	5.9	23.1	49.8	51.5%
Residues and waste from the food industries; prepared animal fodder	11.1	12.7	18.8	15.3	20.7	27.7	29.7	28.3	31.9	28.2	10.9%

Source: ITC Trademap.

Figure 11: Trade balance in 'fish & fish products' and 'sugars & sugar confectionery'



Source: ITC Trademap.

Potential agro-processing value chains to explore

As discussed above, Mauritius is not very integrated into regional food-processing value chains and sources many of its processed food products from European and Asian markets. To integrate Mauritius into regional value chain, one option is to explore opportunities to replace current deep-sea imports with imports from other SADC countries but there may also be potential for Mauritius to lead the establishment of a processed fish value chain within SADC.

Mauritius imports large quantities of frozen tuna from Spain, China and France and exports processed tuna fillets and canned tuna to the UK, Italy, Spain and the Netherlands. It has positioned itself as a hub for the marine industry with investments in light processing facilities (including sorting, grading, cleaning, filleting, and canning), in warehousing and storage for transhipment and re-export, and in ancillary services such as ship handing, ship building and repair. [12] Mauritius has succeeded in growing its fish processing industry and is recording large net exports of processed fish (Figure 11).

There is potential for Mauritius to shift current deep-sea imports of frozen fish from Europe and China to other SADC countries (including South Africa and Mozambique) and for Mauritius to play a lead role in expanding its capabilities and investments in ocean-based aquaculture to these countries. The fish processing value chain also depends on the acquisition of associated capabilities in logistics and the development of a reliable cold chain transportation systems, which are beneficial for growth in other agro-processing exports, including horticultural and meat products which all require cold chain logistics infrastructure.

[12] http://www.investmauritius.com/Seafood/document.pdf and http://fisheries.govmu.org/English/Pages/Fisheries---SEA-FOOD-HUB.aspx

6. IDENTIFYING HIGH-POTENTIAL REGIONAL VALUE CHAINS FOR FURTHER ANALYSIS

The preceding section evaluates trade data on a country-by-country basis to understand high-potential value chains across the region (summarized in Table 14 below). The analysis supports the evaluation of regional value chains in soya to poultry and in sugar and the downstream processing of sugar confectionery products.

A regional soya to poultry value chain can support the growing demand for soya in South Africa derived from growing demand for poultry products. Regional soya production, which is already growing at a significant pace in Zambia in particular, can replace deep-sea imports. The soya to poultry value chain illustrates how we can use existing regional resources instead of taking a narrow national approach to food security (such as investing in drought-resistant soya strains to increase soya production in south Africa, for example). With climate change, identifying and using regional resources to respond to food shocks will become increasingly important.

The sugar to sugar confectionery value chain is interesting for slightly different reasons; it highlights some tensions within the policy environment that can frustrate regional industrial development despite a regional advantage in primary production. The production data shows that all countries in this study have the potential for relatively low-cost and large-scale sugarcane production. However, despite low-cost sugar production, the region is still a net importer of processed sugar confectionery products. This goes to the heart of the challenge of seeing food processing as an industrialization imperative, which we have set out above.

These value chains are thus illustrative of various challenges that impede the development of regional value chains. These include a lack of knowledge of regional production and market dynamics that limits opportunities for joint development and incoherent policy frameworks. Though this study will focus on the soya to poultry and sugar to sugar confectionery value chains, several other value chains of interest have been identified in the analysis of trade date. They are summarized below with a short description of value chain potential and proposed areas for future research. Before discussing these value chains in more detail, we briefly discuss some challenges encountered in doing the value chain studies. The challenges pose some interesting insights for the selection and framing of value chain studies in future.

The first challenge is that similar value chains emerge as ‘high potential’ across all countries which makes it difficult to argue for a particular distribution of economic value within a proposed regional value chain. Apart from Mauritius, all the countries in this study are close to each other, have similar agro-ecological conditions and similar production capabilities. It is unsurprising that similar value chains thus emerged as high-potential across all countries. Under these conditions, it may be tempting to suggest that the countries that already have manufacturing capabilities (such as South Africa in sugar confectionery) should continue to build these capabilities and increase exports to meet the regional deficit, but should shift imports of inputs to other SADC countries. The benefits to the latter are not clear as their mode of incorporation into the regional value chain would be similar to their mode of incorporation into the existing global value chain and the focus on upgrading or moving to higher nodes within the value chain is not apparent.

In cases where the same ‘high potential’ value chain has emerged in several countries, it is also not clear that it is worth pursuing value chain upgrading in all counties. In the oilseeds to edible oil value chain for instance, both Zambia and Tanzania have increased production and exports of sesame seeds but do not have much downstream capacity to crush and process sesame oil. Given economies of scale in crushing and refining, it may not be worthwhile for both countries to pursue upgrading into processed oil. Motivating for only one country to do so is even more difficult.

Another problem arises from the fact that agro-processing value chains are interrelated and difficult to approach as 'discrete' value chains. The soya to animal feed value chain, for example, cannot be studied without regard to the edible oil value chain. Soya oil is an important by-product of the soya crushing process, so understanding the soya to poultry value chain requires an understanding of the dynamics in associated value chains in 'by-products' such as soya oil.

The selection of the value chains we will study is significantly influenced by the *a priori* selection of countries. Different value chains may well have been chosen if we took a different approach.

Table 14: Potential value chains identified in the region

Potential value chain(s)	Countries	Justification for selection as 'high-potential' value chain
Soya Value chain selected for further evaluation in existing study	Zambia South Africa	• Large and growing production of soya in Zambia • Opportunities for smallholder farmers to be incorporated into soya value chain in Zambia • Soya oilcake is a high-value product with forward linkages to SA poultry industry where there is existing (and growing) demand • South Africa's ability to increase soya limited by water scarcity • Potential for high export growth within the region
Tobacco	Zambia Tanzania Mozambique	• Relatively large and growing primary production but with trade deficit in manufactured tobacco products in SADC • Opportunities for downstream processing • Regional value chain to include Zimbabwe, which is not part of current study. Not selected for further study on this basis.
Sugar Value chain selected for further evaluation in existing study	Zambia Tanzania Mozambique South Africa Mauritius	• Lowest-cost producer in region • But, sustained net imports of processed sugar confectionery • There is an existing manufacturing base in Zambia • Opportunities for local processing to replace imported sugar confectionery
Oilseeds Evaluated, to a limited extent, in relation to soya to poultry value chain study	Tanzania South Africa	• Fast-growing production • Existing SADC deficit in edible oil to be met • Potential downstream linkages to margarine and baking fat to be explored as part of regional value chain within EAC, particularly Kenya which has manufacturing capability
Fish	Mauritius Tanzania Mozambique South Africa	• Mauritius is a net importer of fish and net exporter of processed fish and has established industrial capabilities in aquaculture and associated industries • Potential to replace deep-sea imports of frozen fish with regional imports from Mozambique, South Africa and Tanzania to be evaluated, as Mauritius has relatively large imports of fresh fish • Further details required on type of fish required and state of logistical links between Mauritius and rest of SADC for trade in fresh fish
Other products considered		
Fruit & vegetables	Tanzania and rest of world South Africa (limited)	• Limited opportunity for regional trade (same agro-climatic conditions, with the same fruit available at the same time of the year. Most fruit & vegetable trade is across hemispheres) • Main export markets are in Europe, USA which have very high sanitary, phytosanitary and other standards • Expansion of fruit & vegetable sector requires access to markets • Potential for exchange of services, specifically South African export of skills, capabilities and processing equipment but limited potential for trade of high-value raw fruit • Not selected for further study due to limited opportunities for intra-regional trade
Maize	Zambia and rest of SADC	• Policy uncertainty with frequent export bans • Limited opportunities for downstream processing (low value, bulky product) • Not selected for further study due to limited opportunities for intra-regional trade

Analysis of selected value chains

This section reviews the oilseeds to animal feed and sugar to sugar confectionery value chains which both have the potential to deliver regional growth and increase intra-regional trade within SADC. The discussion on the oilseeds to animal feed value chain focuses on soya as an important input into the poultry sector. Zambia, Tanzania and South Africa have all increased soya production over the past decade (though South African soya production is constrained by its dry climate and production has likely reached its upper limit) but the increase in demand for poultry products across the region (particularly in South Africa) continues to drive demand for soya oilcake which is currently sourced from deep-sea markets. We explore opportunities for regional producers to meet this deficit.

Second, we review challenges and opportunities in the sugar to sugar confectionery value chain. There is a large regional production base for sugarcane across many SADC countries (including all five in this study), yet the SADC region has a sustained deficit in sugar confectionery products. We try to understand the reasons for poor manufacturing growth in the downstream processing sector and identify what can be done to meet the regional deficit in sugar confectionery products.

In the introductory section, we emphasised the increasing importance of taking a regional approach to agricultural markets as a response to climate change. In our interviews and review of secondary data, we found that there is very little discussion about the future impact of climate change and the necessity of developing deeper regional markets to cope with changing dynamics. Discussions about climate change are absent from industrial policy and from interviews with small farmers and large firms across the value chain. An overarching theme is thus the importance of bringing the realities of climate change and the likely changes in regional dynamics into discussions on production and agro-processing.

The oilseeds, animal feed and poultry value chain

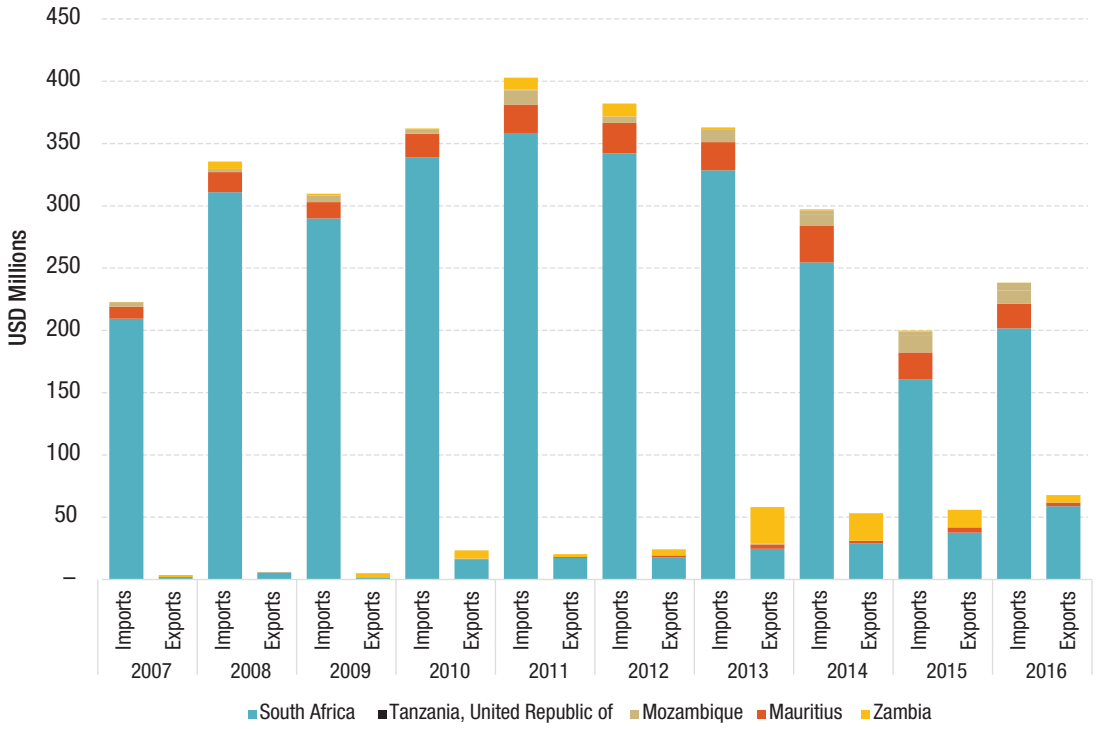
Poultry has strong and important backward linkages to the animal feed production sector and, in turn, to agricultural output. Competitive production of the final output requires linked investments in efficient production facilities at different levels in the value chain with low-cost primary inputs from agriculture (Ncube, Roberts, Zengeni, & Samboko, 2017).

Poultry production in the Southern African region has been led by large, vertically integrated firms, predominantly from South Africa (Bagopi, et al., 2014 and Ncube, Roberts, & Zengeni, 2016). These firms have expanded into the SADC region by establishing vertically integrated operations outside South Africa and also by increasing investment into downstream activities in the respective countries (Ncube, Roberts, Zengeni, & Samboko, 2017). While these developments have occurred in the region, there have been limited moves towards the coordinated development of a regional value chain.

Trade in oilcake and poultry products

All five countries in the study are net importers of soya oilcake, but imports are dominated by South Africa which imported, on average, $279.4 million worth of soya oilcake each year in the 10-year period shown (Figure 12). Cumulatively, South Africa's oilcake imports were over $2.8 billion over the period. Zambia's strengthening export position shows up clearly in the chart below, particularly between 2013 and 2015, although with a decrease in exports recorded in 2016.

Figure 12: Trade in soya oilcake (HS Code 2304)



Source: ITC Trademap.

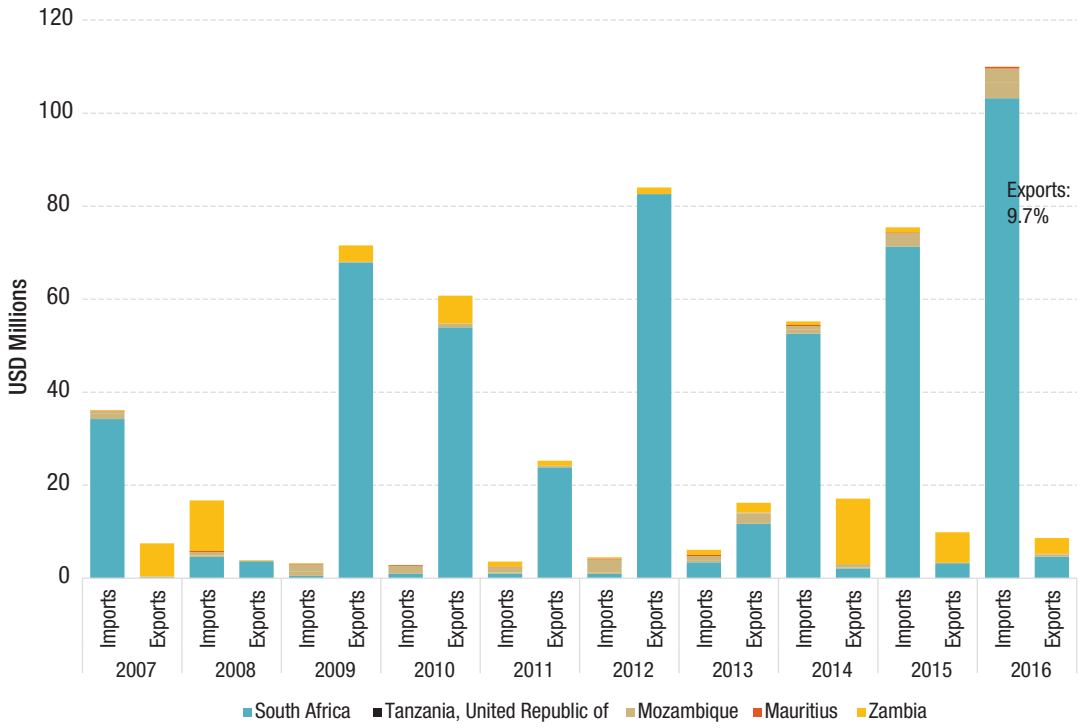
The trade in soybeans is much lower in value and there is much more variability in net trading positions over the period (Figure13). South Africa is a net importer from 2007 to 2009 but increased production from 2009 onwards turns South Africa into a large net exporter with exports reaching more than $80 million in 2012.

The South African Department of Trade and Industry (*the dti*) developed an import-substitution strategy for the soya sector to increase local processing of soybean. Large investments were made in soybean processing facilities which increased South Africa's crushing capacity from 600 000 tons to 2.1 million tons per annum by 2013, far in excess of local production capacity which has been closer to 1 million tons per year (though the latest crop estimates indicate a crop of 1.3 million tons in 2016/2017 season) (Fessehaie, Roberts, & Takala-Greenish, 2015).[13] Many of the processing facilities started operating in 2013 and the trade data shows increased imports from 2014 onwards to take advantage of the additional crushing capacity.

Zambia has also increased its oilseeds crushing capacity in recent years and now has the capacity to process about 400 000 tons of beans per annum, with production of soybeans growing rapidly towards this capacity (Table 14).

[13] Crop estimates are provided by Grain SA and are available here. Note that 1.5 million tons of the additional crushing capacity is also capable of crushing sunflower and the dual crushing capacity has thus increased South Africa's crushing capacity for sunflower too.

Figure 13: Trade in soybeans (HS Code 1201)



Source: ITC Trademap.

The next step in evaluating the potential for an oilseed to animal feed value chain in the region is to understand production capabilities and consumer demand. Below, we evaluate soybean production and the demand for both meat products and edible oils in the region.

Production of soybeans

Sub-Saharan Africa is well suited to soybean production with similar agro-climatic conditions to soy-producing regions in Latin America. Zambia, Tanzanian and the northern part of Mozambique are in similar lines of latitude as Cerrado, the soy basket in Central Brazil which lies mostly between 10° S and 20° S, and have similar rainfall patterns, evapo-transpiration rates, and similar solar radiation rates (Byerlee, Falcon, & Naylor, 2016 and Technoserve, 2011). South Africa is not well-suited to soybean production due to its dry climate and water scarcity and while there is potential for increased soybean production on about 13% of the agricultural land in Mauritius, comparatively greater capabilities exist in continued sugarcane production or a shift to citrus production (Fischer, Hizsnyik, H, D, & Hermann, 2013). The greatest potential for increased soybean production thus seems to be in Zambia, Tanzania and Mozambique.

Production data from 2007 to 2017 show impressive growth in both South Africa and Zambia, but as stated above, South Africa is likely to be at or close to peak production. Zambia, on the other hand, has increased production by 31% between 2016 and 2017 and can support further production by improving the yields of smaller farmers through improving access to inputs and reducing the costs of seeds and fertiliser and increasing the land used for soya cultivation. The Zambian National Farmers Union (ZNFU) and traders of agricultural inputs in and around Lusaka confirm the increasing interest in growing amongst small farmers. The ZNFU emphasised that small farmers have ramped up soya production very rapidly, which shows how quickly farmers can respond to favourable market conditions (ZNFU, 2017 and Livestock Services Co-operative Society, 2017). Soya is a relatively new

crop in Zambia but, in a few years, has become the second largest crop in Zambia second only to maize (ZNFU, 2017). Farmers' output is still constrained by factors such as a lack of finance to access fertiliser and mechanical harvesters, a lack of storage facilities to extend the trading season for their beans and a lack of price transparency in the market. Some interviewees also cautioned that the development of the soya sector could be constrained by conflicting policy position by strong lobbies within the agricultural sector, with livestock farmers lobbying that borders are closed to soya exports and soya farmers and traders lobbying for more open borders.

Table 15: Soybean production (tons)

	South Africa	Zambia	Tanzania	Mozambique
2007	205 000	55 194	3 000	-
2008	282 000	56 839	5 390	-
2009	516 000	118 794	3 900	-
2010	566 000	111 887	3 100	18 000
2011	710 000	116 539	2 500	-
2012	650 000	203 038	5 624	-
2013	787 100	261 063	5 830	15 000
2014	948 000	214 179	6 025	-
2015	1 070 000	226 323	394 067*	-
2016	742 000	267 490	-	-
2017	1 316 370	351 416	-	-
CAGR**	**20.4%**	**20.3%**	**-**	**-**

Source: Grain SA, FAO, Zambian Ministry of Agriculture, Tanzanian National Statistics Bureau, and Technoserve

**Note:* The 2015 production data for Tanzania is from the 2014/15 Annual Agricultural Sample Survey Report published by the National Bureau of Statistics and seem out of line with previous official statistics reported by the FAO. The discrepancy could not be verified.

** No CAGR is calculated for Tanzania and Mozambique due to concerns about the accuracy of the data

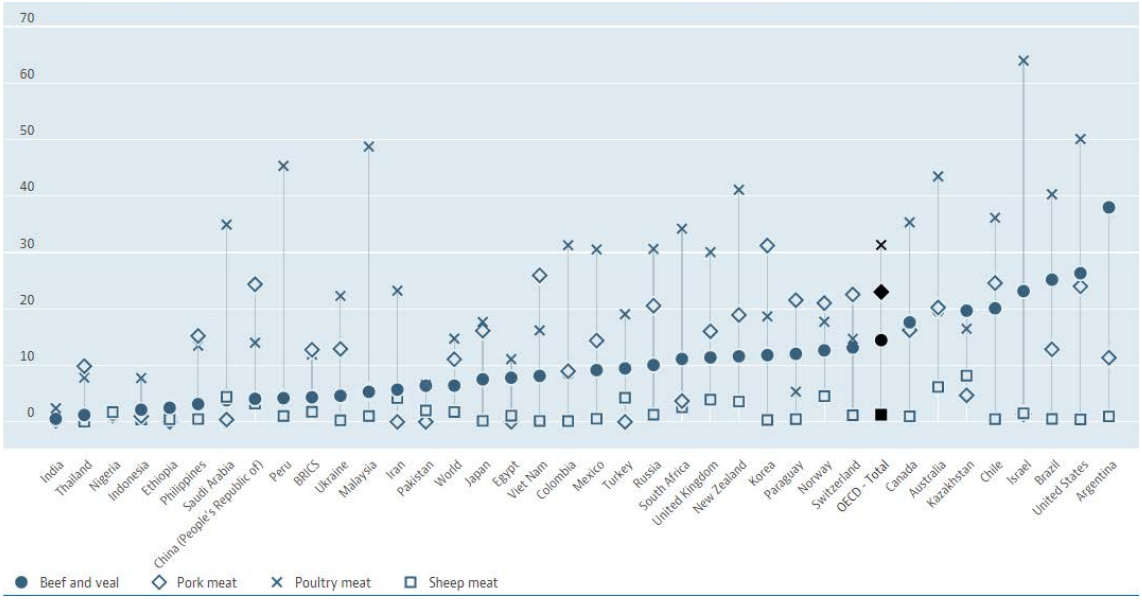
No soybean production data is available for Mauritius.

Demand for meat and edible oils

The OECD estimated of per capita meat consumption data for 2016 is shown below (Figure 14).[14] Mozambique's per capita poultry consumption is at the bottom end of the scale, only marginally higher than India and Sudan and below the average for Sub-Saharan Africa. Tanzania's per capita consumption is above the average for Sub-Saharan Africa, but below both the BRICS and World average, indicating potential for growth. Zambia and South Africa both have per capita consumption values above the World average, but still below the OECD and EU averages, as well as below that of countries with large poultry sectors and significant production of soybeans such as Brazil and Argentina. Overall, this suggests that meat consumption will grow as per capita income in these countries grows.

[14] No data is available for Mauritius.

Figure 14: OECD estimates of meat consumption, 2016



Source: OECD Meat Consumption Data. Available here.

As noted earlier, the soya to animal feed value chain is closely linked to the oilseeds to edible oil value chain. Although soya oil is the less valuable by-product in the soya to animal feed value chain where there is demand for soya meal, vegetable oil is the primary (and most valuable) by-product in the sunflower and sesame value chains. In both Tanzania and Zambia vegetable oils seem to be considered substitutes in use (particularly for cooking)[15] with the result that a tension has emerged between the development of the oilseeds to edible oil value chain in Tanzania and the soya to poultry value chain in Zambia. In Zambia, unlike in South Africa where there is excess demand for soya oilcake, soya processors pay a higher price for crude oil than for beans because they do not have a market for soya meal. In interviews with a large Zambian soya farmer and an animal feed manufacturer, they put forward that the limited local demand for soya oilcake places a limit on the value of soya production and increases tension about edible oil imports from Tanzania. The lack connection between a market of high demand for meal in South Africa and high production in Zambia means that the value of Zambia's increased soya output is not fully realised.

Soybean crushers interviewed in Zambia raised concerns that cheap edible oil imports from Tanzania reduce Zambian crushers' incentive to crush more oilseeds as they cannot find a market for their oil.[16] There has been increased protection of the Zambian industry as a result, with the Minister of Commerce, Trade and Industry imposing restrictions on the importation of refined, packaged and bottled edible in February 2017 (Lusaka Times , 2017). Zambian processors have made further calls for the removal of value-added tax as protection against cheaper oils 'smuggled' into the country (Food Business Africa , 2017).

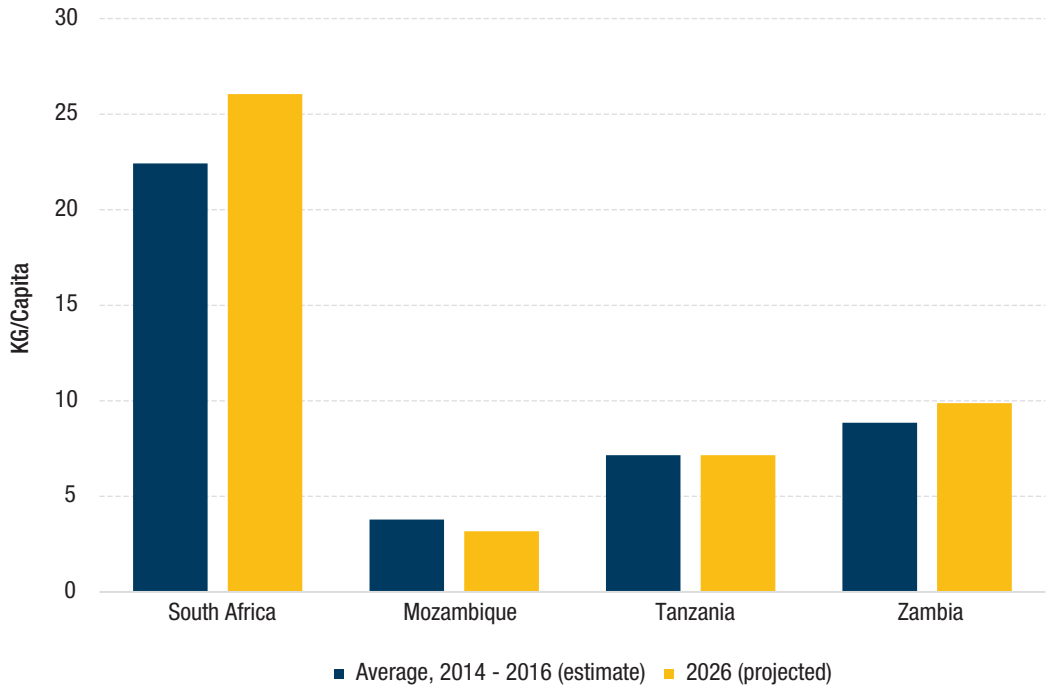
The EAC has also placed edible oils on a list of sensitive products allowing the EAC bloc to increase tariffs on imports, effectively protecting the Tanzania local industry. The EAC tariffs will increase from 25% to 30% in 2017/2018, 35% in 2018-2019 and to 40% in 2019-2020 (Tralac, 2017). Gradually,

15 For example, IAPRI suggests that Zambia's increase in soya production is linked to increased demand for edible oil. See Zambia Agricultural Status Report (2016), page 31.

16 This rests on the assumption that consumers consider soya oil a substitute to cheaper sunflower oil from Tanzania, which may not be the case. A South Africa animal feed manufacturer interviewed for the study said that South African consumers find soya oil unpalatable due to its strong odour and taste profile. (Information on South Africa from interview with Heiko Koster, producer of animal feed and consultant for US Grain Council in Sub-Saharan Africa (2016)).

the edible oil industry in many jurisdictions is facing increased protection even though there is a large regional deficit that could be met and despite projections showing strong growth in demand for vegetable oil to 2026 (Figure 15). The edible oil deficit, and continued increase in demand with population growth, means that both Zambia and Tanzania have a market to meet and the protectionist trend shows a lack of coordination in resolving a regional deficit in favour of short-term protection based on narrower national trends. This approach runs counter to the regional value chain narrative and may undermine the ideal of coordinated investments in the development of a regional value chain.

Figure 15: Projected per capita consumption of vegetable oil (for food use only)



Source: OECD Vegetable Oil Projections.

Challenges in meeting demand and developing a coordinated regional value chain[17]

The potential for a regional value chain in oilseed to animal feed value chain is clear given unmet demand for soya oilcake in South Africa (currently met by deep sea imports from South America) and high potential for increased production of soya in Tanzania, Zambia and Mozambique to replace deep-sea imports. The market for soya oilcake already exists but the challenges are twofold; first how to increase soya and soya oilcake production in Zambia, Tanzania and Mozambique, and second, how to link animal feed producer and farmers across the region so that farmers are assured access to markets. Both the production and coordination challenge are discussed in more detail below with specific reference to the experience in Zambia and Tanzania.

The production challenge: increasing yield and production

Soya beans are largely produced by commercial farmers in Zambia but the share of production from smaller farmers is increasing (Chapoto & Chisanga, 2016). In the 2016/17 season, small and medium-

[17] This section is based on interviews on the soya value conducted in Zambia during February 2017 and interviews on the oilseeds value chain conducted in South Africa and Tanzania between March and June 2017.

sized farmers produced more than 40% of Zambia's soybean crop (Zambian Ministry of Agriculture, 2017). Production by smallholder farmers has increased so significantly and supply considered so reliable that the largest beef producer in Zambia, Zambeef Products Plc, purchases about 70% of its soya demand from small farmers who deliver directly to its gate (Interview with Zambeef Products Plc, 2017). The yields of existing small and medium sized farmers can be increased further if constraints to accessing finance and agricultural inputs are addressed. More farmers would also be encouraged to enter the value chain if they are assured of access to markets through offtake commitments or via a commodity exchange.

In Tanzania, production of sunflower is dominated by small scale farmers with plots of less than 5 acres (about 2 hectares) who account for 95% of producers (though not necessary of production).[18] Medium-sized farmers with land between 5 and 100 acres (2 – 40 hectares) make up 4% of producers and only 1% can be classified as commercial producers. All small-scale farmers employ traditional (non-mechanised) farming techniques using mainly household labour while medium-scale farmers may sometimes use rented ploughing and harvesting equipment (Ministry of Industry, Trade and Investment, 2016).

The key challenges in increasing production are set out below.

i. Access to agricultural inputs

In Zambia, small and medium-sized farmers are relatively efficient and achieve good yields even under rainfed production, but yields can be improved with increased application of fertiliser. Fertiliser use in Zambia is increasing overall (partly due to subsidised fertiliser provided to small farmers under Farmer Input Supply Programme/e-voucher system), but there is significant regional variation in use. Overall, 58.4% of rural households reported using fertiliser in the 2015/16 (up from only 25% in 2007) ranging from a high of 76% in the Lusaka region to a low of only 11.7% in Western Province. However, fertiliser use amongst smallholder farmers decreased by 21.9% from 348 764 metric tonnes in 2014/15 to 272 762 in 2015/16 (Chapoto & Chisanga, 2016). The decline in fertiliser use amongst small farmers is a worrying trend. In interviews, the high price of fertiliser was raised a continued concern and is probably the reason for the decline in fertiliser use by rural households, particularly those far from the economic hub of Lusaka (interviews with ZNFU and ZRC Farms, 2017).

Small-scale sunflower farmers in Tanzania also reported having lower yields due to low fertiliser use, low pesticide use, and the high cost of improved sunflower seed varietals. Farmers seemed particularly concerned about access to improved seed as the (often recycled) open pollinated varieties currently in use have lower yields and a longer growth cycle than the newer improved varietals. However, in addition to the high cost of the seed, farmers require irrigation to ensure the that the new varietals receive sufficient water after planting (they require rain within two weeks after planting) while the open pollinated varieties are more drought resistant and do not need irrigation.[19]

In both Zambia and Tanzania small farmers are keenly aware of what they need to do to improve yields, but do not have the money (or access to finance at reasonable rates) to acquire the requisite inputs. Although the Tanzanian Sunflower Development Strategy attributes low fertiliser use primarily to limited availability at village and district level, studies have shown that Tanzanian fertiliser prices are well above international benchmarks and even higher than fertiliser prices in its landlocked neighbour, Zambia, where prices decreased after cartel conduct was prosecuted by the Zambian competition authority (Ncube, Roberts, & Vilakazi, 2015).

[18] Interviews with District Agricultural, Irrigation and Cooperative Officers in Dodoma and Iringa regions. See also UNIDO (2016), *Tanzania's sunflower oil producers come into bloom* available at http://www.unido.org/news/press/tanzanias-sunflow.html

[19] Interviews with farmers and processors in Dodoma and Iringa.

ii. Access to agricultural equipment for harvesting

Eighty-five percent of Zambian farmers are considered small-scale farmers and most remain un-mechanised (Zambian National Farmers Union, 2017). The lack of access to mechanical harvesting equipment is particularly problematic for soybean, which must be harvested soon after the beans reach maturity (between 12 – 14% moisture content) to avoid the risk that the soybean pods dry out and shatter, thus decreasing yields significantly (Imakando, 2017 and University of Missouri, 2017).

As mentioned above, 95% of Tanzanian oilseed farmers are small-scale farmers with no access to mechanisation. Planting, weeding, harvesting and threshing are all done manually using household labour which increased the risk of yield loss relative to mechanical processes.

iii. Access to storage

In both Zambia and Tanzania, increased production must be accompanied by access to reliable storage facilities where farmers can deliver produce in return for a tradable instrument (or 'warehouse receipt') that can be sold at their discretion (Imakando, 2017 and Ministry of Industry, Trade and Investment, 2016).

In Tanzania, interviewees said that they are often forced to sell their seeds shortly after harvest when supply is greatest and price lowest, even though they could double their earnings if they could store their produce and wait until low season. The effect of this on farmers' profitability is included as Appendix 15.

The coordination challenge: connecting farmers to animal feed manufacturers and edible oil refineries in South Africa

The coordination challenge is more difficult to address and potentially more detrimental to the development of regional value chains than the production challenges where the constraints are clear, well-documented and generally agreed between farmers, policymakers and other stakeholders in the value chain. By their nature, coordination challenges involve disparate parties, in this case from different countries, which introduces complexity. In the animal feed market, the firms that have larger production facilities and excess demand for soya meal are South African firms and often are not aware of regional alternatives, or are sceptical about reliability of supply and quality. They also often have longstanding supply relationships with large international producers which increases their wariness to shift to regional alternatives.

In interviews with stakeholders in the South African poultry value chain for example, it was clear that they were not aware of the significant increase in Zambian soya production and were initially skeptical about factors like the quality of the soya (without basis) and the ability to transport the soya cost-effectively to South Africa. However, shortly after discussing the idea of sourcing Zambian soybeans with an animal feed producer, who was doubtful initially, they decided to import Zambian soybeans and found it of high quality and affordable compared to deep-sea imports transported overland from the port of Durban to the northern part of South Africa.[20] The idea of a regional value chain did not occur to them independently, but they could see the financial benefit once the idea had been floated and the size of the Zambian surplus was confirmed. In interviews with processors of sunflower seed it was even more apparent that Tanzania had never been considered an alternative and processors were surprised by the large increases in production recorded over recent years.

[20] The only (minor) constraint that remained was the fact that the soya is transported from Zambia in bags and not in bulk, which increases offloading costs at their factory. Investment in bulk storage and bulk loading equipment in Zambia, which requires aggregation of output from many small farmers, would resolve this issue.

An important constraint to the development of a regional value chain in oilseeds to animal feed is thus that animal feed manufacturers and oilseed crushers in South Africa do not yet look to the region for alternatives and do not have access to reliable information about the size and quality of the crops to show that regional sourcing is a viable alternative.

Additional coordination challenges are discussed below.

i. Transport costs

The transport challenges between Zambia and South Africa are different to those between Tanzania and South Africa simply because Zambian soybeans would be transported overland while Tanzania has access to a deep-sea port at Dar es Salaam and could ship sunflower seeds or crude sunflower oil to in bulk tankers to the port of Durban.

The effect of transport on the landed price of Zambian soya can be significant, affecting the competitiveness of Zambian soybeans landed in the northern parts of South Africa. In January 2017, the price of Argentinian soya was approximately $380/ton. Transport, insurance and financing costs added about $110/ton, meaning that the price paid by producers in the Gauteng (which is the price against which Zambia would compete) was around $490/t. At the time, Zambian soya prices are averaging around $390/t. The cost of overland transport from Zambia to Gauteng has historically been around $110/t, which means that Zambian soya would land in Gauteng at about $500/t at present. However, these are prices quoted for transport between South Africa and Zambia (likely of consumers goods to South-African owned retailers in Zambia) and the prices are inflated because of the built-in assumption that trucks going from South Africa to Zambia would return to South Africa empty due to uni-directional trade between the two countries. Transport costs drop to around $45/ton if trucking companies are assured a backhaul load from Zambia. Zambian soya exports to South Africa could thus mean cheaper backhauls for soya, which can then be delivered in Gauteng at price that is competitive against deep-sea imports. Taking the January 2017 figures, this means that Zambian soya could be landed in South Africa at $440/ton compared to $490/ton for deep-sea imports.[21] Efficient logistics and border operations mean that transport costs between Zambia and South Africa should be sustainably around $40-$50/t given the distance.

In the oilseeds value chain, the high price of land transport is also a concern. Transport cost is a significant cost component of oil-based consumer goods, second only to the cost of purchasing crude oil or seed itself.[22] Much of this cost is added by roadfreight. South African processors report that the total cost of transporting oil from Indonesia to Durban harbor (about 6000 nautical miles) is $42 - $45/ton ($23/ton excluding insurance and finance). The cost of transporting oil from Durban to Johannesburg (just 562km) is the same at $43/ton.

Tanzania's deep-sea port gives it a cost advantage over landlocked countries like Zambia in terms of exporting goods to South Africa but though seafreight is less costly than road transport, it is also less flexible. A bulk oil tanker requires large and consistent volumes of oil while smaller mixed loads can be transported cost-effectively via road. To compete with existing import markets, Tanzania must be able to export large quantities of seed or crude oil at globally competitive prices consistently.

[21] Note than the relatively high price of road transport divides South Africa into two distinct regions, a coastal region and an inland region. In the oilseeds value chain, for example, it is cheaper to transport oil via bulk tanker from Eastern Europe to Durban than to transport the oil from oil-producing regions in the north of the country via road to Durban. Demand for crude oil in coastal provinces is thus met by deep sea imports while the inland provinces consume locally-produced oilseeds. Similarly, Zambian soybean would compete against the 'inland price' of soybeans, which includes costly road transport between Durban and the Gauteng/Reef area.

[22] Interview with large South African oil processor.

Lastly, consideration should also be given to the cost and state of transport *within* countries, from production regions to ports (land or sea), is also a major constraint. The state of 'feeder' and national road has been mentioned as a major challenge in both Tanzania and Zambia (Chisoro, Jahari, Kilama, & Paremoer, forthcoming and Chapoto & Chisanga, 2016). Intra-country transport links from production areas to ports can be the deciding factor in whether countries are able to integrate into regional value chains.

ii. Grading/quality of beans and seeds

In many agro-processing value chains, small improvements in the handling of products add significant value to the product. In oilseeds, processors say that the first step in adding value to oilseeds is to invest in cleaning, sorting and grading the seeds (Chisoro et al., forthcoming). This allows producers to realise greater by exporting higher grade seed and crushing lower grade seed that would fetch a low price on seed export markets into high-value oil.

Investing in globally recognised grading systems would also allay some of the concerns that South African processors expressed about sourcing soybean from Zambia and oilseeds from Tanzania. The grading systems provides all necessary information for processors to assess the value of the produce and to facilitate trading. Grading is also an important prerequisite for a functioning commodities exchange, which is discussed below.

iii. Commodities exchange/forecasting future prices

Tanzania does not currently have a functioning commodities exchange system.[23] Futures trading is more established in Zambia, where the Zambian Agricultural Commodities Exchange (ZAMACE) has established a warehouse receipt system accepted by local banks as collateral for extending finance (Zambia Business Times, 2017). ZAMACE currently has 6 certified warehouses with total storage capacity of 750 000 tons. Two of its certified warehouse operators are South African agro-conglomerates (Afgri and NWK Limited), 2 are Zambian firms (Zdenakie Limited and CHC Commidities Limited) and one is the Tanzanian agro-conglomerate Mount Meru Millers (Chulu, 2017).

ZAMACE has also entered into an agreement with the Johannesburg Stock Exchange (JSE) to start trading Zambian futures for soya, wheat and white maize on the JSE in May 2017. This facilitates price discovery (at assured quality) and paves the way for increased physical trade between Zambian farmers and South African consumers, an important development for the deepening of the regional soya to animal feed value chain. The contract is traded in US dollars and is traded as a standardized 10-ton futures contract ex Lusaka (JSE, 2017). A similar agreement with the Tanzanian government could facilitate oilseeds trade between South Africa and Tanzania.

[23] A Tanzanian commodities exchange was established in 2015, but had not yet become operational. See Masare, A (16 September 2017), Tanzania's Commodity Exchange Market halted. Available here.

The sugar to sugar confectionery value chain[24]

The main constraints in the oilseeds to animal feed and edible oil value chains were increasing production to meet a regional deficit and improving coordination along the value chain to link producers and consumers of soybeans, oilcake and edible oil. The challenges in the sugar value chain are different. South Africa and Zambia are large net exporters of sugar and Zambia is the lowest cost producer in the region (Ellis, Singh and Musonda, 2010). Both countries are well placed to exploit the opportunities associated with access to low cost sugar to develop low to medium technology value-added products in the sugar and baked confectionery value chain (das Nair, Nkhonjera and Ziba, 2017).

However, in Zambia, low production costs do not actually translate into low domestic prices of either retail or industrial sugar and Zambia actually has some of the highest cost industrial sugar in the world, which stifles downstream processing (Chisanga, Meyer, Winter-Nelson, & Sitko, 2015). South African processors also cite the high cost of industrial sugar as a constraint to processing. So, while South Africa and Zambia are both low-cost sugar producers and have processing capabilities at the downstream level to produce sugar confectionery products (though South Africa's sugar confectionery industry is larger and more established than that of Zambia), there is a sustained deficit in sugar confectionery products in SADC. The main question in the sugar value chain is not about increasing production but about why this deficit is not met by leveraging existing capabilities and what the constraints to growth are in the downstream processing sector. These questions are explored below. First, we review the trade data for sugar and sugar confectionery products for the five countries in this study.

Figure 16 shows that all countries except Tanzania are large net exporters of cane sugar. In 2016, Tanzania imported most of its cane sugar demand from outside the SADC region with only 16.4% sourced from Malawi and 1.6% from Mozambique. The rest was imported from a range of countries including the UAE (20.6%), India (20.6%) and Brazil (14.5%). These imports are quite large in value, ranging from $28.5 million in 2008 to $169 million in 2016. As an illustration of the potential to replace this with regional trade, we compare Zambian exports against Tanzanian imports and find that Zambia could have met Tanzanian imports in all years except 2012, 2013 and 2016.[25]

Table 16: Cane or beet sugar and chemically pure sucrose, in solid form (HS Code 1701)

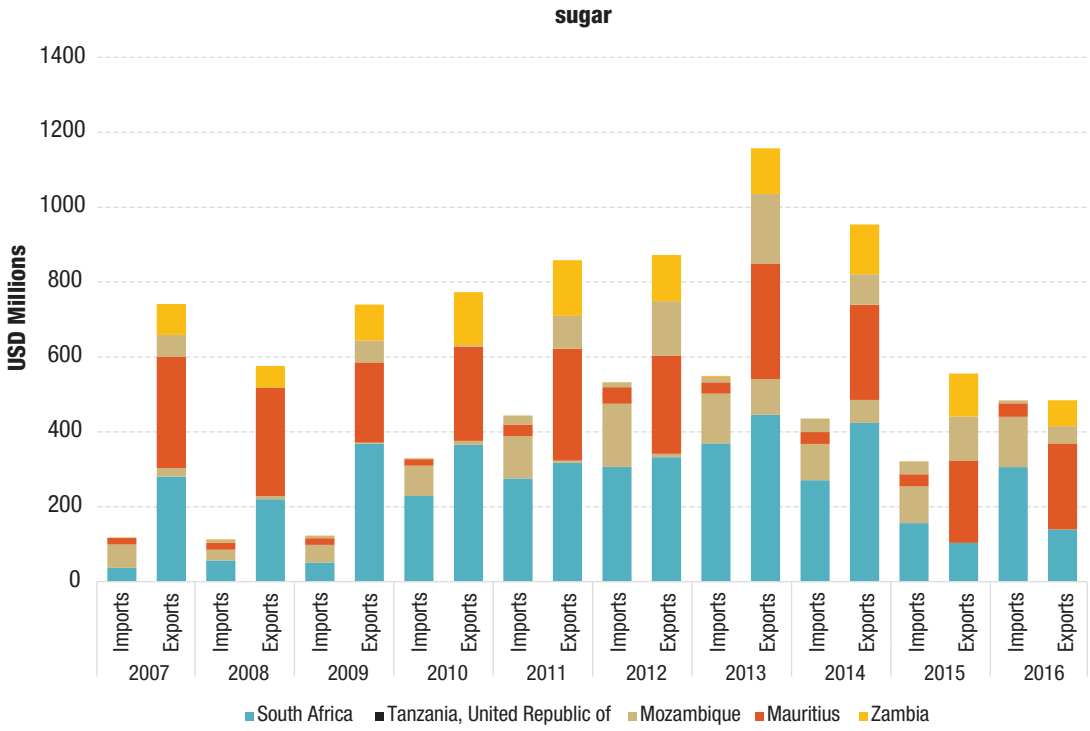
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Imports by Tanzania (USD millions)	62.4	28.6	46.7	81.3	112.7	169.0	132.9	96.6	98.4	134.1
Exports by Zambia (USD millions)	82.4	57.9	96.1	141.6	148.6	123.5	122.0	132.4	115.0	69.2
EX (Zambia) - IM (TZ), USD millions	20.0	29.4	49.4	60.3	35.9	- 45.5	- 10.9	35.9	16.7	- 64.9

Source: IT Trademap.

[24] This section focuses on Zambia and South Africa. Though sugar is also an important crop in Mauritius and both Tanzania and Mozambique show potential for increased production, the interviews and research from which this section draws focused on Zambia and South Africa.

[25] Trademap data for 2016 reflects mirror data and may not account for Zambia's total exports.

Figure 16: Trade in sugar (HS Code 1701)



Source: ITC Trademap.

Figure 17: Trade in sugar confectionery (HD Code 1704)

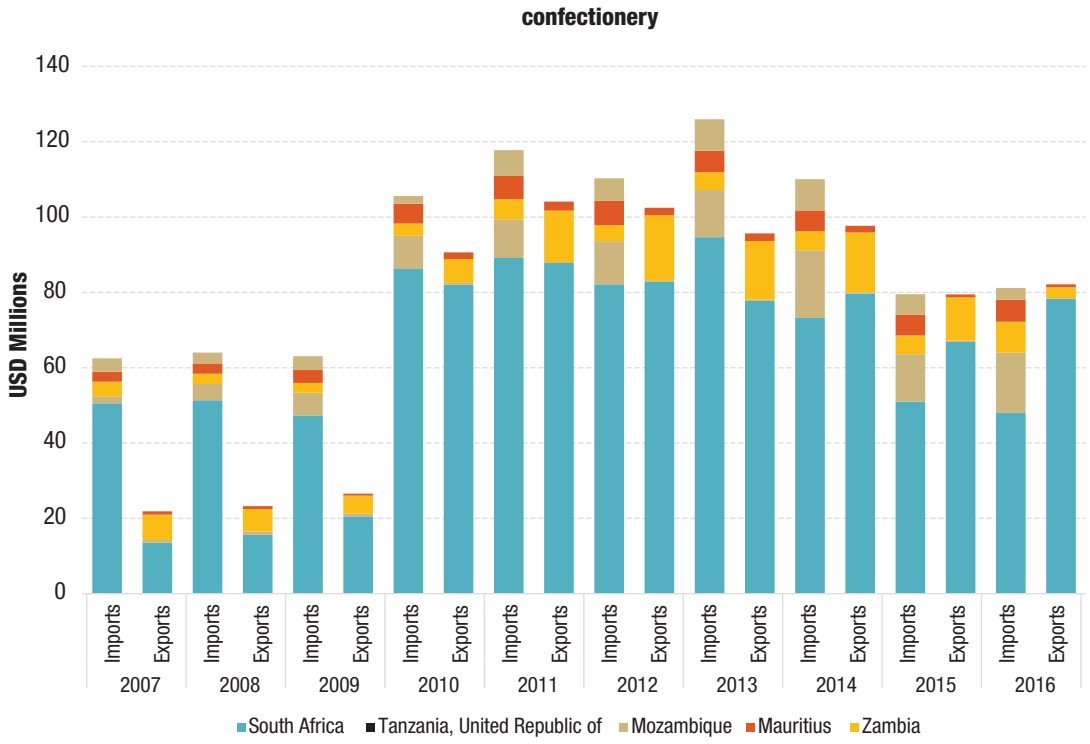


Figure 17 shows trade in sugar confectionery products. All countries have large imports of sugar confectionery products in absolute terms. South Africa has a deficit in sugar confectionery products in the earlier years (2007 – 2011) but turns this around in 2012 when it records a surplus. In 2013 it is again in a net import position but maintains a trade surplus from 2014 to 2016. Zambia is a net exporter of sugar confectionery products over the whole period, but its imports are growing over time. Mozambique, Tanzania, and Mauritius are all large net importers of sugar confectionery products over the whole period. This is surprising for Mauritius, a sugar producer and net sugar exporter, showing that it faces constraints in the development of its downstream sugar confectionery industry.

Factors limiting regional trade in sugar

The sugar sector is heavily subsidized the world over and the world price for sugar is commonly held to be well below fair costs of production. Consequently, national sugar industries are protected worldwide. The SADC region is no different. Several regional and national agreements and legislation protect the local sugar industry from competition (das Nair, Nkhonjera, & Ziba, 2017).

South African sugar producers are offered protection from low world sugar prices through the *'Equitable Export Obligations'* imposed by the Southern African Customs Union (SACU). The price of South African sugar exports is substantially below the domestic price of sugar so producers who sell a greater share of their output in the export market would be disadvantaged relative to as-efficient competitors who sell most of their sugar in the domestic market. To prevent this, redistribution of proceeds from the sale of sugar is effected via the South African Sugar Association (SASA) in terms of the Sugar Act (1978) and the Sugar Industry Agreement (2000).

This works as follows; the Sugar Association allocates each mill a quota for both the local and export markets. The quota is allocated for refined white sugar and brown sugar in proportion with each mill's total saleable production of sugar. If a mill sells more than their allocated quota on the local market (an 'over-performing' mill), they are obliged to pay an amount for redistribution purposes calculated as the excess quantity sold by that mill during that quarter multiplied by the weighted average of the notional local market price less the financial levy imposed by SASA and less a manufacturing allowance determined according to rules laid down by SASA (das Nair, Nkhonjera, & Ziba, 2017). Exports are closely managed by the SA Sugar Export Corporation (Proprietary) Limited who is effectively the sole exporter of bulk raw sugar. Any South African mill that wishes to export sugar above its local quota informs the Sugar Export Corporation who is then obliged to buy the full export quota from millers at prices determined by the Sugar Association (das Nair, Nkhonjera, & Ziba, 2017). These quotas have the effect of controlling local volumes available (and hence local prices), as well as controlling what is available for export to the region.

The *SADC Sugar Cooperation Agreement*, which is incorporated into the SADC Trade Protocol, was put in place with the stated aim of promoting the growth, competitiveness and integration in the regional sugar industry but seems to be a veiled protectionist measure to protect domestic sugar producers against low-priced sugar imports. In effect, the Sugar Cooperation Agreement restricts Zambia, and other non-SACU SADC countries', sugar exports to South Africa. The agreement provides for partial access of the SACU market by other surplus sugar producers in SADC. This partial access is in the form of import quotas governed by a formula that allocates access based on the size of each country's surplus sugar production, and the level of market growth in SACU (das Nair, Nkhonjera, & Ziba, 2017). The rationale is to offer non-SACU surplus producers (Malawi, Mauritius, Mozambique, Zambia and Zimbabwe) the chance to export some sugar to the SACU region duty-free and achieve higher prices than they can get in global markets. The effect of the agreement is to limit the volume of sugar that SADC countries can send to South Africa on a duty-free basis and any exports in excess of the agreed volume would attract duties (das Nair, Nkhonjera, & Ziba, 2017).

In Zambia, the sugar sector is effectively protected from external competition by the legal requirement that all household sugar meant for direct consumption be fortified with Vitamin A. No other country has this requirement, so the fortification requirement essentially acts as a non-tariff trade barrier that protects local Zambian sugar producers. This trade barrier was in fact intentional.

USAID was a partner in implementing the fortification programme in Zambia. In a USAID report discussing the Vitamin A fortification programme, they indicate that the sugar industry was not the initial focus of the fortification programme but that the Zambian government initially considered fortifying maize meal. However, the Zambian maize meal industry is highly decentralised characterised by hundreds of small local hammer mills which mill maize for local markets. This makes it difficult to implement and monitor fortification in the maize industry. The sugar industry, by contrast, was highly centralised with one producer (Zambia Sugar) producing about 99% of household sugar consumed in Zambia (the company still has a market share of about 90%). The USAID report also states that a reason for Zambia Sugar's interest in the fortification program was that there was "an increase in less expensive sugar flooding the Zambian market." Zambia Sugar was said to be "feeling pressure from legal and illegal imports of sugar from Malawi and Zimbabwe in amounts they estimated to reach 25 percent of Zambia's domestic market" and "requested" that the sugar fortification requirement be accompanied by legislation ensuring that only fortified household sugar be sold in Zambia. The report says that the resultant trade-off (that is, prohibiting the sale of unfortified sugar in exchange for mandatory fortification) was "an example of coinciding public and private interest" (Serlemitsos & Fusco, 2001). However, rather than being an overwhelming victory in the public interest, the fortification programme also seems to have entrenched Zambia Sugar's dominant position in the Zambian market and has protected it from lower-priced regional or international imports. The high price of industrial sugar has also stifled downstream production, making it clear that the trade-off was not unambiguously positive.

Another factor that affects regional trade in sugar (and limits access to markets, particularly in South Africa) is the changing retail landscape with large formal retailers becoming a key route to market for many producers of sugar and baked confectionery products. Formal retailers are known to have strict quality, packaging and labelling requirements (often far stricter than national food health and safety regulations) that make it more difficult for new and smaller processors to access their shelves (das Nair & Chisoro, 2016). This has been raised as a concern in Zambia where the Zambian Bureau of Standards sets lower minimum domestic quality and food safety standards specifically to accommodate local firms struggling to compete with imports. Formal retailers, many of which are headquartered in South Africa, impose additional requirements in line with their standards in the South Africa market with less concern for the objectives of capability acquisition than the Zambian government body. The discrepancy in requirements may lock Zambian producers into local markets and prevent them from accessing regional and global value chains (das Nair, Nkhonjera, & Ziba, 2017).

In summary, the challenges in the sugar sector are primarily about the continued protection of dominant upstream sugar producers and millers and the stifling effect that this has on the downstream light manufacturing in the agro-processing sector. The sugar industry is a strong lobby in both South Africa and Zambia and this example shows that the development of regional value chains may be blocked by lobbying of powerful lead firms within the value chain. The questions that are raised by the sugar case study are very different to those raised in the oilseeds value chain and rest on how to sponsor rivalry and facilitate entry of new processors and millers to counter the market power of larger players.

7. POLICY PROPOSALS FOR STRENGTHENING REGIONAL VALUE CHAINS IN OILSEEDS AND SUGAR

This section provides low cost, practical policy proposal to address the constraints in both the oilseeds and sugar value chains. It does not try to address all concerns, but attempts to identify issues that could be addressed relatively easily but could nonetheless deliver significant benefits. Where possible, we identify a person or institution within each country to lead the implementation of the proposal. In some cases, there is a need for greater understanding of the dynamics in the value chain or the behaviour and strategies of large firms and the proposals suggest additional research or independent reviews to provide a more concrete fact-base from which to suggest proposals.

Solving the backhaul constraint between Zambia and South Africa

The high cost of transport between Zambia and South Africa could reduce the competitiveness of Zambian soya against deep-sea imports. The Zambian National Farmers' Union, with support from the European Union, developed a web-based transportation information system called Transzam to solve a similar transport constraint within Zambia. The application was designed to connect parties who require transportation with transporters by notifying registered users of the availability of transport and the associated costs. The Transzam application could be revised and extended to include regional freight.

Improvements in cross-border transport and facilitating the transport of mixed loads will likely to be more beneficial to smaller suppliers and transporters since large players typically enter into long-term contracts with large logistics companies, partly due to insurance and other related services that large transporters are able to offer. The application is likely to reduce search costs and increase competition in the market for the transportation of goods.

Potential partner: All work in Zambia was conducted in partnership with Dr Mwilola Imakando, an agricultural economist and member of the Zambian Parliament. Dr Imakando is also a former member president of the Economics Association of Zambian and an executive director of the Zambia Institute for Policy and Research (ZIPAR). He has extensive experience in managing agricultural cooperatives and has an extensive network within both the public and private sector to support initiatives within the soya value chain and could lead initiatives in this area. Any work on Transzam, which is a trademark of the Zambian National Farmers' Union, will be conducted in partnership with the ZNFU. Transzam already has some level of regional dimension in that it services routes between several districts in Zambia and Durban in South Africa, and Harare in Zimbabwe.

We note that any initiative to increase trade in soya may meet resistance from the local livestock and poultry sector, who may be concerned that this will create a domestic shortage and increase the price of soya in the domestic market. The involvement of organisation such as the ZNFU and consultation with the relevant senior officials in the Minsitry of Livestock will thus be crucial to the success of a regional value chain in soya to animal feed.

Sponsoring rivalry: developing a regional supermarket pact

In Zambia; Shoprite, a South African retailer, supported the growth of a rival sugar supplier, Kafue Sugar, by selling Kafue's sugar at a discount to Zambia Sugar's rival products. This is mutually beneficial in that it promotes Kafue Sugar's products and establishes the brand in the market while also giving Shoprite a rival brand to strengthen its negotiating position relative to Zambia Sugar (das Nair, Nkhonjera, & Ziba, 2017). Partnerships between supermarkets and smaller or new processors to promote rivalry should form part of a coordinated regional agenda to revitalize light manufacturing. The partnerships would work best if they are led by the retailer to solve an existing commercial concern (such as the market power of Zambia Sugar in this case). These 'supermarket pacts' could be voluntary but require the buy-in of large retailers to be effective.

As a matter of practicality, the pacts should be negotiated with individual retailers that have an extensive footprint across southern Africa and need not be multilateral initiatives involving all stakeholder governments. The greatest potential lies in getting the buy-in of Shoprite and Pick 'n Pay, South African retailers with a large and growing footprint across southern Africa.

However, even if the big retailers do support the initiative, large incumbent suppliers may retaliate by offering the retailers lower (even predatory) prices. The supermarket pacts should thus be implemented in consultation with competition authorities who can monitor any anticompetitive response by dominant incumbents. Supermarkets may not immediately recognize the value of these pacts for dynamism and rivalry in the consumer goods market and a firmer directive from local departments of commerce and industry may be required until the commercial benefits and imperatives of such a policy are understood.

Potential Partner: The proposal is to start this discussion with South African-based retailers and, as such, it would be important to find a partner within the South African Department of Trade and Industry to lead negotiations with supermarkets. We understand that Nigel Gwynne-Evans, Chief Director in the Africa Industrialisation may be spearheading a similar project and could be approached to understand support required.

Harmonisation of standards within SADC for key commodities

Quality standards, health standards and product specifications can become important non-tariff barriers in food and processed food markets, limiting the ease with which goods can be traded across borders or increasing costs as products undergo multiple testing procedures in different countries. The East African Community, of which Tanzania is a member, is addressing this constraint through a coordinated Standards Harmonization and Conformity Testing Programme supported by TradeMark East Africa. After its first two years, the programme reported a 59% reduction in product testing cost and a 74% reduction in average testing time across the region, along with a 23% increase in trade values and 50% increase in trade volumes across the region (TradeMark East Africa, 2016).

An independent analysis on the benefits of a similar programme within the SADC region should be undertaken, particularly within the highly traded products identified in this paper (oilseeds, edible oil, oilcake, sugar, sugar confectionery and processed meat and fish). While harmonization of standards will improve trade and enhance regional integration in SADC, a multilateral process will certainly be cumbersome and require sufficient resources and commitment among member states. A phased approach should thus be considered. SADC countries could enter into bilateral arrangements regarding standards and exports of selected products. For instance, the Zambia Bureau of Standards (ZABS) has a Memorandum of Understanding with Botswana on the export of groundnuts, and with Namibia for various products (Bosiu et al., 2017). Similar arrangements can be made with the other countries in this study.

Potential Partner: The bureaus of standards, and ministries of industry will be the primary drivers of the process. In the case of South Africa and Zambia, the Department of Trade and Industry (DTI) and the Ministry of Commerce, Trade and Industry (MCTI) respectively can be approached to initiate conversations with South African Bureau of Standards (SABS) and ZABS for the soya to animal feed and sugar confectionery value chain. Following any in-principle agreements, additional ministries in charge of health and agriculture will also need to be consulted..

Review of policies related to the sugar sector

The longstanding agreements protecting incumbent sugarcane growers and millers across the SADC region must be reviewed. The agreements seem to keep domestic sugar prices high, constraining the development of downstream sugar processing businesses. With increasing constraints on water as climate change progresses, it is also by no means clear that sugarcane production should continue to be protected in South Africa, but water should potentially be diverted to higher value horticultural

crops. As a matter of concern, access to water licenses, smallholder irrigation schemes and land tenure have been identified as constraints for agricultural development in South Africa's Industrial Policy Action Plan (IPAP) iterations.

The existing policies may protect a production structure that no longer makes sense given the changes in climate and rainfall. An independent review of the macro-economic impact of the policies, agreements and legislation in the sugar industry should be conducted to assess the relative benefit of maintaining protection while downstream processing industries stagnate. This is particularly important because rainfed crops such as sugarcane, which are vulnerable to periodic droughts, have significant implications for water use. Thus, crop diversification and potential reorientation of agriculture may need to be explored. For reasons set out above, the interest of incumbent firms will not be served by a review that challenges market power and rents that accrue from protectionist policy. There will likely be significant resistance from incumbents to any changes to the *status quo*. The support of policy departments responsible for industrial development and competition policy would be useful for such a review to succeed.

Building capacity for understanding firm conduct and strategy

There is a lack of information on the enterprise landscape in many countries across SADC. In conducting this study, it was difficult to find information on trends in production and processing within Mozambique and to a lesser extent in Tanzania and Zambia, aside from a few studies at disparate times. This makes it very difficult to understand changes in market structure, the entry and exit of large firms and smaller rivals, and the linkages and strategies of large firms. It would be beneficial to create a 'living' database or 'market observatory' of sorts to track firm conduct and build an understanding of the regional strategies of large firms.

However the implementation of this may be challenging since some of the data on firms is not publicly available, except for companies listed on stock exchanges. The Centre for Competition, Regulation and Economic Development (CCRED), based at the University of Johannesburg, has conducted a couple of studies tracking the investment decisions and strategies of large firms listed on the Johannesburg Stock Exchange (JSE) (see for example Bosiu et al, 2017b; Bell et al, 2017; Nhundu et al, 2017; das Nair & Chisoro, 2017; and Mondliwa et al, 2017). A similar approach can be adopted since most of the large regional players are listed on different stock exchanges, although the challenge will still remain for smaller unlisted firms which are not obliged to make their information public.

Increasing storage capacity in Zambia and Tanzania

Data from interviews with Tanzanian oilseeds farmers indicate that small farmers could double their income if they could store all or part of the crop and sell at times of lower supply. The Zambian Agricultural Commodity Exchange has also encouraged Zambian farmers to consider storing their crops to realise greater value at times of lower supply. Often, however, these farmers simply do not have access to storage facilities. The need to invest in storage facilities is important, given that one of the largest feed producers in Botswana indicated the poor quality of soybeans from Zambia was due to a lack of storage (Ncube et al., 2017).

Potential proposal and partner: Several low-cost storage options are available on the South African market, from smaller 30-ton steel silos that cost approximately R45 000 (about $3200) to larger silos capable of storing upwards of 1000 tonnes. These larger silos can be constructed at R2000/ton, including the cost of civil works required to erect the silo (for 1000 tons, this equates to about $146 000). ABC Hansen, a subsidiary of the ABC Africa Group, provides these (and other) storage solutions within South Africa and across the region. The firm also manufactures and sells a range of oil processing equipment suitable for oilseeds and groundnuts. They have experience working in Zambia and Tanzania and may be a good partner to approach (in so doing, there is a value proposition for South Africa as well).

8. CONCLUSION

The analysis of patterns of food production and trade across the five selected countries provides a number of key insights. Before summarizing these insights we note again the important differences between the countries. South Africa and Mauritius have much higher levels of GDP per capita (at around $7500 and $10 000 respectively) than the SADC average, however, Mauritius is a small country and economy with notable successes in industrialisation. South Africa is by far the largest economy in SADC and has an advanced food processing sector which underpins substantial net exports from South Africa to the region. Zambia has higher GDP per capital than Tanzania and Mozambique and has made important strides in the past decade in growing agro-processing along with agricultural production. Mozambique and Tanzania have extensive potential to increase agricultural production and have recorded high growth rates in this regard, with a very low level of industrialisation in terms of food processing.

The SADC region has a sustained deficit in processed foods, driven by a small number of products; wheat and rice in the cereals category and palm oil in edible oils. The trade deficit seems to be getting worse in some products such as sugar confectionery where countries continue to export raw sugar and import processed confectionery products. All five countries in the study have large imports of wheat, rice and palm oil, but there is variation in other food imports driven by incomes and industrial priorities. South Africa, for example, has large imports of poultry products which is not (yet) seen in the other countries. Zambia, Mozambique and Mauritius have large fish imports but for Mauritius these are inputs into a fish processing value chain. Tanzania's largest processed food import was edible oil and it has developed a strategy to increase local production and has successfully reduced non-palm imports.

Import trends also show the impact of climate variability on trade patterns, particularly in South Africa where production was heavily affected by the 2015/16 drought. In drought years, South Africa's imports of maize increased sharply, and its reliance on grain imports is likely to increase with increasing variability in rainfall. Zambia, Tanzania and Mozambique weathered the El Nino drought better than South Africa, suggesting that South Africa should look to the rest of the SADC region for cereal imports and shift its water use to higher value crops.

There have been notable examples of very high growth in agricultural production reflecting the response to appropriate policies. Zambia has over a period of 10 years gone from negligible soya output to producing around double domestic demand. This has been largely based on supply of oilcake into poultry feed. In 2016/17 Zambia started exporting soya and derivatives to South Arica. Tanzania has also achieved notable successes in growing sesame and sunflower output, with sesame being export oriented and sunflower mainly to meet local demand. Tanzania's sunflower production surpassed South Africa's in 2012. While Zambian soya is produced by a mix of large and small farmers, Tanzania's sunflower is produced by small farmers. By comparison, Mozambique has seen tobacco production and export, with large firms leading out-grower schemes, and similar observations have been made with regard to multinational investment in large-scale production of other crops such as rice and sugar in Mozambique.

South African agricultural production has fluctuated. The country is a large net importer of wheat, rice and soya while in years of good rains is self-sufficient and an exporter of maize. The adoption of GMO has seen higher yields and drought resistant varieties being introduced. However, of the five countries it faces the largest expected reductions in rainfall. It has an interest in growing agricultural production across the region to ensure production of field crops to meet its own demand.

Increasing food processing, as part of structural transformation to move to more productive, higher-value and more complex activities is a challenge across the five countries, noting that the countries start from very different bases. Urbanisation and population growth in Tanzania and Mozambique

imply rapidly growing demand for processed food products which will be met by increased imports unless appropriate policies support local production. Given the strong capabilities which exist in South Africa, there is the potential for regional industrialisation initiatives to leverage these capabilities through cooperation agreements. South Africa could support regional industrialisation through services exports in packaging design, process and product upgrading and supporting institutions that implement and improve quality standards. These partnerships are also part of developing common standards across SADC which aids deeper regional integration along with regional industrialisation.

South Africa's substantial deep-sea imports in a number of products represent opportunities for Zambia and Mozambique given their proximity. The example of animal feed illustrates the potential for South Africa's imports from countries such as Argentina to instead be sourced from countries in the region, especially imports to meet the inland demand in the greater Johannesburg (Gauteng) region of South Africa. This depends on efficient transport and logistics. And, so, there is a role for stronger regional value chains, but this requires overcoming coordination failures and presenting a credible case of mutually beneficial growth in a situation where other SADC countries are (understandably) concerned about a possible mercantilist agenda in South Africa and where South African firms have, in many cases, not even considered regional suppliers as a viable alternative to existing partners.

In the end, debates about the potential for regional value chains are also being overtaken by the reality of climate change which requires measures to build wider and deeper markets for greater resilience against climate shocks. Greater integration of value chains across the SADC region makes better use of regional water resources and can reduce the impact of extreme water events on any one country in the region. Wider and deeper markets would also reduce price volatility associated with climate change as the supply-side shocks in one area would be proportionately less in a wider market which encompasses areas which had good rains and production. This also requires an appropriate set of policies within and across countries supporting more effective use of agricultural land by increasing fertiliser use, providing extension services, storage facilities etc. The effects of climate change on the regional food system has not been incorporated into national and regional industrial development strategies, and the urgency of doing so cannot be overstated.

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10. APPENDICES

APPENDIX 1: REGIONAL RESPONSES TO CLIMATE CHANGE

Regional climate change initiatives

The *SADC Policy Paper on Climate Change* published in 2012 provides a summary of observed and expected climate change in SADC countries as a baseline for the development of adaptation strategies, and to promote regional integration and socio-economic development in the SADC region. [26] It also proposes a SADC climate change programme which includes establishing a Permanent Commission on Climate Change and refining the regional strategic action plan on climate change.

The SADC *Water Sector Climate Change Adaption Strategy* aims to improve climate resilience in the region by ensuring that water management systems can cope with climate variability.[27] It creates an overarching framework for implementing adaptation strategies such as the SADC Treaty, the Regional Indicative Development Plan (RISDP), the Regional Water Policy, the Protocol on Shared Watercourses, River Basin agreements, the Regional Water Strategy, and the 3rd phase of the Regional Strategy Action Plan (RSAP III) on Integrated Water Resources Development and Management. *The SADC's Regional Climate Change Programme for 2009 – 2014*[28] evaluated the impact of climate change on individual transboundary basins in more detail and proposed interventions around water allocation, groundwater management and infrastructure financing requirements.

The *SADC support programme on Reducing Emissions from Deforestation and Forest Degradation (REDD) for 2012-2015*[29] provides a framework to improve the capacities of Member States to design national REDD programmes.

The *SADC Agriculture Policy and the Regional Indicative Strategic Development Plan (RISDP)*[30] published in 2004 promotes the production, protection, processing and storage of all crops in the SADC region to secure food security in the face of the impact of climate change. It also promotes irrigation and addresses impacts of climate change on livestock production.

SADC has also established several bodies to monitor climatic conditions, develop early warning systems and respond to associated challenges such as the effect of adverse weather events on food security, agricultural production and the regional economy at large. Bodies responsible for monitoring and early detection include:

i. The *Drought Management Centre*, established in the early 90s to conduct climate monitoring and develop early warning systems for droughts, floods and other extreme weather events;

ii. The *Southern Africa Regional Climate Outlook Forum (SARCOF)*[31] which brings together climate scientists from SADC National Meteorological and Hydrological Services (NMHSs) and the Drought Monitoring Centre (DMC) to prepare reports on seasonal climate status and outlook;

iii. The *SADC Regional Remote Sensing Unit* which was established in 1988 as a centre of technical expertise facilitating training programmes and technical support in the field of Remote Sensing, Agrometeorology and GIS;

26 See Lesolle (2011). No update on progress since publication.

27 Climate change adaptation in SADC. A Strategy for the Water Sector 2011. There are no updates on implementation since publication.

28 Climate Change Adaptation: Perspectives for the Southern African Development Community (SADC). Long Term Adaptation Scenarios Flagship Research Program (LTAS) Phase 2 (june 2013 – june 2014).

29 SADC (2011).

30 SADC Website. No update on the implementation.

31 Southern Africa Sub-Regional Framework of Climate Change Programmes.

iv. The *SADC Task Force for Monitoring Weather Conditions* which was established in the 90s and comprises the Regional Early Warning Unit, the Regional Remote Sensing Project, the Drought Monitoring Centre and the Famine Early Warning System Project and was established to monitor weather conditions; and

v. *SADC Regional El-Niño Response Team*[32] which was established in response to the impacts of the 2015/2016 El-Niño phenomenon to perform monitoring and evaluation of the response to allow for effective decision making and make recommendations for future disasters

The *SADC Programme on Early Warning Systems (EWS)* is an overarching programme that coordinates the actions of national government and facilitates information sharing. The programme provides information on food crop yields, food supplies and food requirements. National Early Warning Units have been established in all Member States to collect, analyse and disseminate early warning information at country level. The programme faces significant challenges with respect to the quality and availability of data, and thus with information sharing.

Regional insurance mechanisms against adverse weather events

SADC has plans to establish a Regional Drought Fund for member countries but the most comprehensive regional insurance scheme at present is the African Union's 'African Risk Capacity'. Established in 2012 as a Specialised Agency of the AU, African Risk Capacity (ARC) is a risk management and resilience-building platform that provides AU Member States with the financial tools and infrastructure they need to manage natural disaster risk and adapt to climate change. Its package includes Early Warning, Contingency Planning, Climate Risk Insurance, and Climate Adaptation Finance. Through a regionally-driven risk transfer and risk-sharing mechanism, ARC provides early disbursement of emergency response services and funds in affected areas.

One of the products offered by ARC is the *'Extreme Climate Facility'* which is a new financial mechanism that secures direct access for African governments to climate finance to respond to the impact of increased climate volatility. It aims to provide an additional $500 million in climate adaptation financing capacity.

With an initial $90 million the ARC issued drought insurance policies totalling nearly $130 million in coverage for a total premium cost of $17 million to a first group of African governments (Kenya, Mauritania, Niger and Senegal) in May 2014. The first insurance pay-outs of just over $26 million were made to Mauritania, Niger and Senegal because of drought conditions in 2014. After five additional countries joined the pool in May 2015, the drought coverage has increased to over $190 million for the 2015/16 rainfall seasons. ARC aims to reach as many as 30 countries with $1.5 billion of coverage against drought, flood and cyclones, indirectly insuring around 150 million Africans by 2020. Not not all SADC members have ratified the ARC Establishment Agreement. Only Mozambique and Zambia in the five countries under review are signatories.

[32] SADC (2016). No update since announcement.

APPENDIX 2: NATIONAL RESPONSES TO CLIMATE CHANGE

National interventions

Tanzania

The Government of Tanzania has put in place several initiatives to address the challenges of climate change. These include the National Adaptation Programme of Action (NAPA -2007), National Adaptation Strategy and Action Plan (2009), the National Climate Change Strategy (2012) and the Agriculture Climate Resilience Plan (2014). The implementation of these strategies however appears to have progressed slowly due to challenges such as inadequate information on climate change impacts and vulnerability, inadequate capacity of address climate change impacts, and competing policy priorities.

Tanzania's *National Adaptation Plans of Action* was established in 2007 to develop adaptation measures across key sectors including agriculture, energy, forestry and wetlands, health, human settlements, coastal, marine and freshwater resources.

The *National Climate Change Strategy* was developed in 2012 with the goal of enabling Tanzania to effectively adapt to climate change and participate in global efforts to mitigate climate change in line with the Tanzania Development Vision 2025 as well as national sectoral policies.

Tanzania has also developed an *Agriculture Climate Resilience Plan.* Following the publication of the National Climate Change Strategy in 2012, the Ministry of Agriculture, Food Security, and Co-operatives (MAFC) developed a sector-specific response which was published in 2014. The plan seeks to address the establishment of pest, disease, and early warning systems, the development of policy briefs and financial incentives to assist with mainstreaming climate smart agriculture into agricultural programmes, the updating of irrigation master plans to consider availability and climate, and incentivising the development of water management technologies.

The government of Tanzania has identified climate change as a key priority and seems to be incorporating climate adaptation into its agricultural policy planning processing. It has also set up a Monitoring and Evaluation Framework to assist responsible authorities to track progress and evaluate the impact of the adaptation initiatives in addressing the impacts of climate change.

Zambia

Zambia has been implementing climate change interventions over the years with specific strategic policy documents on adaptation and mitigation, including the 2007 *National Adaptation Plan of Action (NAPA)*, the *National Climate Change Response Strategy (NCCRS)*, the *Nationally Appropriate Mitigation Action (NAMA)*, and the *National Policy on Climate Change (NPCC)*. Despite these efforts, Zambia still faces several challenges that affect the implementation and effectiveness of these initiatives, including collecting climate-related data, monitoring the impact of climate change, moving from the development of adaptation plans to implementation by the line ministries, and addressing capacity and financial constraints to adaptation. Furthermore, there is a tendency for efforts to come and go with disasters, and institutional mechanisms tend to become virtually defunct between major disasters.

Consultations for the development of the *National Policy on Climate Change* started in 2010 led by the Ministry of Lands, Natural Resources and Environmental Protection (MLNREP) with support from the United Nations Development Programme (UNDP). A draft of the NPCC was developed and submitted in September 2015 to the Policy Advisory Committee (PAC), an advisory office under Cabinet Office. The Policy is aimed at enabling the country to re-align its climate sensitive sectors of the economy and its society in order to meet its developmental goals through adaptation and mitigation interventions.

The *National Climate Change Response Strategy (NCCRS)* was developed in 2010. The strategy provides a comprehensive national institutional and implementation framework through which climate change adaptation, mitigation, technology, financing, public education, and awareness-related activities in Zambia can be coordinated and harmonized. It also emphasizes the importance of focusing on the most vulnerable sectors of the economy and mainstreaming climate change into development plans.

Nationally Appropriate Mitigation Action (NAMA) are currently being developed for four sectors: agriculture, transport, forestry, and waste management. NAMAs are concrete projects, policies, and/or programmes that shift a technology or sector in a country onto a low-carbon development trajectory.

Mozambique

The Government of Mozambique has developed few adaptation initiatives up to date. These include the *National Adaptation Programme of Action (NAPA) (2007)* and the *2012 National Climate Change Strategy for 2013-2025*. The country has experienced a number of implementation challenges resulting in relatively slow progress. These include developing adequate early warning systems, strengthening planning capacity at the national and local levels, and addressing capacity and financial constraints to carry out adaptation related activities. A lack of coordination and cooperation between the various governmental departments has also been highlighted as the major weakness. However, a Climate Change Coordination Unit was established in 2014 to improve coordination.

The *National Adaptation Programme of Action* aims to coordinate the development and implementation of an action plan for adaptation to climate change for various economic and social development sectors, with an emphasis on disaster risk reduction, early warning systems, agriculture, fisheries, energy, water resources, ecosystems, and coastal zones.

The *National Climate Change Strategy* was launched in 2013 for the 2013 – 2025 period to shift the focus from mere adaptation to mitigation, adaptation and financing. The measures that were highlighted include strengthening early warning systems, strengthening capacity to prepare for and respond to climate risks, increasing capacity to manage water resources; increasing access to, and capacity to collect, store, treat and distribute water, increasing the resilience of agriculture, livestock and fisheries and assuring adequate food security and nutrition.

Mauritius

Mauritius developed a *National Climate Change Action Plan* in 1998 and ratified the *United Nations Framework Convention on Climate Change (UNFCCC)* in 1992. In 2010, it took further steps to include climate adaptation, mitigation and response in government policy with the establishment of a new *Climate Change Office* within the Ministry of Environment and Sustainable Development (MESD), which includes an Adaptation Unit.

So far, the *Climate Change Office* has managed to deliver several initiatives including a National Climate Change Adaptation Policy Framework, Disaster Risk Reduction and Management Strategic Framework and Action Plan, Technology Action Plan for an enhanced Climate Change Adaptation and Mitigation, and Climate Change Information Centre. However, implementation seems to have stalled due to lack of funding, insufficient human resources and the lack of a designated institution responsible for the action identified.

South Africa

Climate change adaptation activities in South Africa currently fall under the ambit of the Department of Environment Affairs. South Africa's first climate change policy, the *National Climate Change Response Policy (NCCRP),* was developed in 2011. The country is also currently developing a National Adaptation Strategy.

However, there have also been several implementation challenges that have prevented the mainstreaming of climate change response and adaptation into the work of the national, regional and local government. Challenges include competing policy priorities given the significant levels of

vulnerability in South Africa, the lack of resources (at all levels of government) to develop adaptation responses, and a lack climate data to monitor effects and design responses.

The *National Climate Change Response Policy (2011)* was the first comprehensive outline of national government's responsibilities relating to mitigation and adaptation. The NCCRP identifies and prioritises short- and medium-term adaptation interventions through a risk-based process. It has also been able to support the integration of climate change into various policies and frameworks including the medium-term strategic framework that set priorities for the 2014 – 2019 electoral term. Further, as a result of this policy, in 2016 all provinces had either completed or were in the process of revising their strategies.

The first draft *South Africa National Adaptation* Strategy was released in 2016. It recommends the creation, capacitation and operationalisation of an institutional structure that allows for integration and coordination between climate change adaptation efforts across sectors and at all levels of government, as well as alignment between climate change mitigation and adaptation in South Africa.

APPENDIX 3: PROFITABILITY OF OILSEED FARMERS IN TANZANIA

Oilseed farming by smallholder farmer in Tanzania is marginally profitable (Table 16). Profits range between $22 and $52 per acre for farmer who sell seeds and between $64 and $94 per acre for farmers who process the seed and sell sunflower oil. Importantly, farmers can almost double their revenue simply by storing their seeds and selling them later in the season instead of selling soon after harvest when supply is at its peak, but many are not able to do this because they do not have access to storage facilities or need income immediately after harvesting.

Table 17: Profitability of small-scale farmers (data obtained from interviews)

Profitability of small-scale farmers			
	Costs/acre		
Input costs	Cost (TSh)	Unit	Explanatory Notes
Seed cost	2 000	tsh/acre	
Clearing land (labour)	15 000	tsh/acre	
Renting tractor to plough	45 000	tsh/acre	
Renting cows to plough (instead of tractor)	35 000	tsh/acre	
Sowing (labour)	6 000	tsh/acre	
Weeding	30 000	tsh/acre	
	35 000	tsh/acre	
Harvesting (labour)	15 000	tsh/acre	
Transport	1 000	tsh/sack	
Processing	130	tsh/kg	
Yield			
Upper estimate	9	sacks/acre	A sack is 65-70kg
Mid-range	6	sacks/acre	A sack is 65-70kg
Lower estimate	5	sacks/acre	A sack is 65-70kg
Market prices			
Sunflower seed (immediately after harvest)	31 300	tsh/sack	Equivalent to $218/ton. This is the average of retail prices quoted in interviews.
Sunflower seed (if stored until 'low season')	62 500	tsh/sack	Equivalent to $436/ton. This is the average of retail prices quoted in interviews.
Sunflower oil (20 L)	50 000	tsh/sack	Calculated. Oil price is Tsh17k/5 litres and each sack delivers 20 - 22 litres of oil

Profitability			
Scenario 1: Small farm (5 acres) with paid labour, selling seeds			
Costs/acre	103 000	TSh	Assumes lowest ploughing and weeding costs
Yield/acre	5	sacks/acre	
Revenue from seeds (immediately after harvest)	156 500	TSh	More likely sales scenario because small farmers have fewer resources to 'wait' for higher prices
Transport costs	5 000	TSh	
Profit (TSh)	48 500	TSh	
Profit (USD)	**22**	**USD**	**Exchange rate (TSh/USD) for July 2017): TSh2205/USD**
Scenario 2: Small farm (5 acres) without paid labour, selling seeds			
Costs/acre	37 000	TSh	
Yield/acre	5	sacks/acre	
Revenue from seeds (immediately after harvest)	156 500	TSh	
Transport costs	5 000	TSh	
Profit (TSh)	114 500	TSh	
Profit (USD)	**52**	**USD**	**Exchange rate (TSh/USD) for July 2017): TSh2205/USD**
Scenario 3: Small farm (5 acres) with paid labour, selling oil			
Costs/acre	103 000	TSh	Assumes lowest ploughing and weeding costs, & oilcake left in lieu of processing cost
Yield/acre	5	sacks/acre	
Revenue from oil	250 000	TSh	More likely sales scenario because small farmers have fewer resources to 'wait' for higher prices
Transport costs	5 000	TSh	Transport of seed to processor (lower end; excludes transport of oil back to market)
Profit (TSh)	142 000	TSh	
Profit (USD)	**64**	**USD**	**Exchange rate (TSh/USD) for July 2017): TSh2205/USD**
Scenario 4: Small farm (5 acres) without paid labour, selling oil			
Costs/acre	37 000	TSh	Assumes oilcake left in lieu of payment for processing
Yield/acre	5	sacks/acre	
Revenue from oil	250 000	TSh	
Transport costs	5 000	TSh	
Profit (TSh)	208 000	TSh	
Profit (USD)	**94**	**USD**	**Exchange rate (TSh/USD) for July 2017): TSh2205/USD**

Source: Compiled by authors based on interviews in Dodoma and Iringa.

CHAPTER 3.

INTRA-REGIONAL ROAD FREIGHT RATES FOR FOOD AND COMMODITIES IN SOUTHERN AFRICA[33]

Thando Vilakazi

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1. INTRODUCTION

In some cases, the only difference between the price of deep sea imports landed in South Africa and those goods from neighbouring countries is the high overland transport cost between Southern African countries ("the region"). Furthermore, the share of South Africa's diversified manufacturing exports going to SADC (Southern African Development Community) has risen to around 30% in 2015 from 15% in 2005.[34] The vast majority of goods, and 70-90% of agricultural goods in Africa (World Bank, 2015), are transported using trucks. As such, the costs of road transport are especially important to understand in the context of regional integration, urbanisation, and opportunities for production and supply across a wider regional market linked to rising food consumption and incomes in the region.

The SADC Industrialisation Strategy and Roadmap recognises high transport costs and inefficiency in logistics systems as constraints on the development of cross-border value chains (SADC, 2015). However, it underplays the importance of efficient and affordable road freight to the success of such a strategy. This paper focuses on key issues relating to reducing transport costs in Southern Africa emerging from recent research on cross-border freight between Malawi, Mozambique, South Africa, Zambia and Zimbabwe. Specifically, we consider the impact of competition, border delays and a lack of return loads on transport rates.

The paper assesses the key determinants of high cross-border road freight prices within Southern Africa, including the roles of regulation and competition bottlenecks. We distinguish between rates for perishable food and commodity transportation by truck between key areas of production and consumption within the region which is most relevant for understanding inter-regional trade and development. The assessment does not consider freight to and from ports for overseas exports and imports. We focus on freight between Harare (Zimbabwe), Johannesburg (South Africa), Lilongwe (Malawi), Lusaka (Zambia) and Maputo (Mozambique).[35]

We show that rates could be reduced significantly with increased availability of return loads for transporters in the region, linked to growing industrial capacity in each country. The implications for regional integration and industrial development in Southern Africa are therefore assessed. Increased competition and reducing delays at border crossings for transporters contributed to a large reduction in transport rates between Lusaka and Johannesburg, with similar effects from Malawi also. Margins charged in refrigerated transport are high due to low levels of rivalry and lack of return loads, amongst other factors. Measures to reduce border constraints could have an immediate downward effect on transport rates in the region which are shown to be above our benchmark for efficient transport.

The insights on each market, as well as transport rates and costs are drawn from information gathered in 33 detailed interviews of transport companies and brokers, industry associations and users of transport services including grocery retailers conducted in each country in 2015. The underlying research relied on verifying and triangulating information from desktop research and interviews in each country to inform the key findings, particularly given a lack of reliable, comparable transport cost and price data across the countries.

The paper is structured as follows: we briefly review the main issues identified in previous studies on transport rates and trade in Africa and the region, and highlight the contribution of this paper to these debates. We then describe the structure of markets in regional transport before presenting the recent evidence on road transport prices and costs and the impact of greater competition in section 4. Section 5 assesses the main additional causes of high freight rates, Section 6 draws together the main findings and implications for industrial development and integration. Section 7 concludes.

[34] Excluding basic metals and chemicals. Quantec data.

[35] There is reference throughout the paper to routes to and from Maputo in Mozambique although this is not a central focus of this paper. Furthermore, information regarding Mozambique is drawn from interviews in the other countries with market participants operating on Mozambique routes.

2. TRANSPORT COSTS, INFRASTRUCTURE AND DRIVERS OF TRANSPORT RATES

Poor road infrastructure, high trade barriers and high transport costs constrain economic development in Africa and have undermined the formation of integrated regional markets (Mbabazi, Milner & Morrissey, 2008; UNECA, 2013; UNCTAD, 2013). Given the historical negative economic impact of poor road networks, some estimates show that interventions to upgrade and integrate road networks in Sub-Saharan Africa could lead to an expansion in overland trade of around $250 billion over 15 years based on conservative assumptions (Buys et al., 2010). Importantly, the increase in trade and other economic benefits such as employment is expected to far exceed the costs of upgrading infrastructure (Buys et al., 2010). Development of quality infrastructure can also contribute to increased productivity and output, which has effects in terms of lifting local and rural economies and in some cases contributes to reducing inequality and poverty (Calderón & Servén, 2008).[36]

Domestic economies in the region are relatively small and characterised by high entry barriers, concentration and anticompetitive conduct in key industries (Roberts et al., 2017). It is therefore important to consider that high transport costs, trade barriers, and protectionist measures can reinforce the market power of incumbent firms and entrench concentration in local markets (Gal, 2001; World Bank-ACF, 2016).

Prices for road freight are lower in Southern Africa than other regions in Africa although major routes are highly profitable suggesting a large margin between transport prices and costs (Teravaninthorn & Raballand, 2009). Some of the key costs such as labour and vehicles are lower relative to developed and developing countries, although fuel prices may be comparable or higher (Teravaninthorn & Raballand, 2009; Foster & Briceño-Garmendia, 2011). Improvement in road infrastructure contributes to better outcomes, however road infrastructure on major cross-border trucking corridors is generally considered to be adequate in Southern Africa (Lall et al., 2009; Teravaninthorn & Raballand, 2009). Instead, high costs are largely driven by regulatory and competition constraints (Gwilliam, 2011; Teravaninthorn & Raballand, 2009; Foster & Briceño-Garmendia, 2010). Improving the efficiency of border procedures, addressing bottlenecks and enhancing the efficacy of administrative systems are critical areas for intervention (Byiers & Vanheukelom, 2014). Measures to increase vehicle utilisation and cut travel times by reducing delays at border posts also contribute (JICA, 2010; Foster & Briceño-Garmendia, 2010; Byiers & Vanheukelom, 2014). Delays at border posts, multiple stoppages, corruption, over-regulation and time spent in truck queues actually increase transport rates on cross-border routes by 10-30% even though operating costs are not necessarily higher than in Europe, which is in line with our own assessment (Foster & Briceño-Garmendia, 2010).

Arrangements in transport should be understood as part of integrated value chains where government policy and market power at one level of the value chain can affect competitive outcomes in transport. For example, in Malawi, Tanzania and Zambia the structure of government fertiliser subsidy programmes and anticompetitive arrangements in fertiliser trading have restricted competition in transport (Ncube et al., 2015). On the other hand, regulation to ease entry in trucking and open up to competition from different countries reduced trucking rates on certain cross-border routes from Zambia (Ncube et al., 2015; Raballand et al., 2008).

We extend the analysis in previous papers to include recent information on refrigerated transportation which has generally not been assessed. This refers to transportation by refrigerated container or trailer ("reefer") of perishable goods (focusing on food) including fresh, frozen or chilled goods primarily. This aspect of freight has become increasingly important as the trade and consumption of imported perishables increases in the countries considered. The quality and efficiency of logistics systems is especially important in refrigerated transport given time- and temperature-sensitivity (Zamparini et al., 2011).

[36] There are important caveats in terms of measurement and heterogeneity, usefully outlined by Calderón & Servén (2008).

3. THE STRUCTURE OF MARKETS AND COMPETITION BETWEEN TRANSPORTERS

3.1 Non-refrigerated transport

We focus here on characterising forwarders/brokers and truckers and their links to customers in the region based on the interviews conducted. Trucking companies with less than ten vehicles are considered small and the largest firms have fleets of more than one hundred trucks. The largest trucking and forwarding firms typically have depots and operations in each country and are largely 'regional' (rather than limited to a single country) in their strategies and operations. For example, Imperial Logistics from South Africa is vertically integrated throughout the logistics chain either directly or through various subsidiaries spread across the region, leveraging capacity in terms of fleet size, warehousing capacity and management systems to win major contracts with customers. Large operators of this nature carry far greater bargaining power with customers than smaller operators, given their broad service offering which customers value. This often means that corporate customers may pay more for these services, although this is balanced by the fact that transporters report charging reduced rates if it means they can secure longer term contracts and higher volumes from a customer.

Forwarding agents and brokers are generally concerned with coordinating handling, off/loading, customs and port clearance, warehousing, documentation, sea freight and transportation for clients. The large forwarding firms typically have long-standing relationships with large transport groups that tend to specialise in road transport rather than the provision of related services. There are also small 'briefcase' operators that typically service one-off importers and exporters, although they sometimes compete for larger clients through undercutting on prices.

The structure of markets for forwarding and trucking differ by country. There are specific features of each market in terms of major participants and concentration which affect competitive outcomes, some of which are considered below:

a) In Malawi, there are around 150 registered agents although only eight of these can be considered large, diversified operators with multinational presence. There are less than ten domestic firms with large cross-border transport operations, including AS Investments (over 700 trucks specialising in dry goods and break bulk), Siku Transport, J&J Africa (over 1000 trucks across the region), R Gaffar Transport and Trans-tech.

b) Since the early 2000s there has been consolidation of the largest transport companies in Mozambique from 72 in 2003 to around 20 major firms being represented by the main industry association of large transporters (ASTROCAMA) in 2014, and there is extensive subcontracting to smaller operators (VillageReach, 2014; Meeuws, 2004). The largest firms in road transport such as Lalgy, SuperSteel and J&J Africa (based in Mozambique) have fleets which are close to or exceed 1000 vehicles. Increasingly Mozambican transporters have contested routes to Malawi in particular through offering cheap rates to the Beira and Maputo ports, whereas South African and Zimbabwean transporters had a stronger presence in the early 2000s (Meeuws, 2004).

c) The South African market comprises a relatively large number of transporters of various sizes, although there are around seven main logistics companies in the industry; namely, Imperial Logistics, Value Logistics, Barlow World, Unitrans, Super Group, DHL and Cargo Carriers (Vilakazi & Paelo, 2017a). The largest companies are vertically integrated with operations throughout Southern Africa. The primary industry association, the Road Freight Association, has approximately 450 members and it is estimated that there are around 16000 goods vehicle operators (Vilakazi & Paelo, 2017b).

d) In Zambia brokers and large transport companies control access to the main contracts in copper, chrome and other minerals for exportation. The main truckers' association has over 60 members comprising the largest transporters with total vehicle capacity of approximately 2100.

e) In Zimbabwe brokers control access to the main contracts in tobacco and chrome, and subcontract to preferred transporters. Preferred transporters are in most cases the major transport firms including Cargo Carriers, GDC Whelson, J&J Africa, Leo Pack and Truck Africa (Imperial group). The main truckers association has around 90 members accounting for 5000 vehicles.

f) The main regional or multinational firms operating in forwarding include: Bridge Shipping, Manica, Bollore Africa, Barloworld, UTI, CWT-Aquarius, Alliance. Trucking companies with the largest operations across the region include: Bridge Shipping, J&J Africa, Barloworld, GDC Whelson (Super Group), AS Investments, Imperial Logistics, Unitrans and Trans-tech.

In each country, there is a far greater number of smaller operators relying on subcontracting by large companies to access loads from major exporters. This level of the market is not concentrated and entry barriers are generally surmountable. However, there is a high rate of exit given that smaller transporters tend to use older vehicles and invest less in maintenance, IT systems and fleet redundancy, and typically do not achieve efficiencies in their operations. This means they often offer weak competitive constraint to large companies other than by undercutting on price.

3.2 Refrigerated transport

Markets for refrigerated transport outside of South Africa are highly concentrated with few large operators. In Malawi for example, Bollore Africa is the largest broker involved with refrigerated loads (through subcontracting to trucking companies), in a concentrated trucking market where there are only four reputable trucking companies that service refrigerated loads. High concentration, low demand and high entry costs in Malawi result in rates which are relatively high for reefer trucks. The same generally applies in the Zimbabwean market for refrigerated transport wherein Lonrho Logistics, which is the only major regional player, operates a reefer fleet of less than 30 vehicles in competition with South African operators such as HFR with just under 200 vehicles. The South African market was estimated to have more than 7000 refrigerated vehicles in 2011 (although the majority consist of small vehicles less prominent in cross-border transport) (Oppelt et al., 2015). HFR forms part of a category of large specialist trucking firms that operate primarily in the transportation of perishables in the region. These companies operate in close commercial relationships with the larger logistics operators such as Imperial, Vector, Value, Bidvest, Unitrans and Hestony that offer one-stop, bundled services including warehousing and supply chain management to large food producers and retail groups.

Customers, such as retail chains, with frequent and large loads prefer to contract with a single major logistics provider to minimise transaction and administrative costs. Large multinational forwarding and clearing firms specialise in broker services, but integrate vertically into trucking and storage through subcontracting relationships with preferred transport companies to provide comprehensive services. However, this also means that small- and medium-sized truckers cannot participate in large contracts other than through subcontracting arrangements which are said to significantly disadvantage them due to low margins earned.

Small operators charge 10-15% less than the large operators given lower overheads and expenditure on maintenance of vehicles. However, customers with perishable goods have strict requirements in terms of maintaining the correct temperature and cleanliness of fridge units. Grocery retailers in the different countries indicated that they valued reliability and timeliness (transit times) most in evaluating transporters, over flexibility, frequency and loss and damages. As such, service-level standards are fixed in the terms of contracts with retailers, which apply to any subcontracted firms also. Large

clients will pay more for a reliable and comprehensive service, and as a result transporters promote themselves on the basis of reputation, low accident rates, financial position, management structures, and track record. Many small- and medium-sized firms often lack a strong track record which makes it difficult to win large retail customers.

The requirements of retail groups are complex and in most cases extend beyond the capabilities of transport or forwarding companies. For example, Manica, which is one of the largest multinational forwarding agents in the region, has chosen not to compete for forwarding of FMCG goods and perishables partly because the requirements in terms of staff training, expertise, and operational systems are extensive in order to fully integrate with large retailers. These requirements can constitute a barrier to entry for smaller rivals combined with significantly higher entry costs on refrigerated vehicles. Outside of South Africa, the level of demand often does not justify the entry and maintenance costs incurred, even when second hand vehicles are purchased for refrigerated transport, such that markets are highly concentrated.

4. RATES AND COSTS FOR ROAD FREIGHT AND THE IMPACT OF COMPETITION

Transport rates and costs for reefer and ordinary transportation are drawn from the detailed interviews.[37] These rates are then compared to benchmarks defined for efficient transport in the region and from previous studies.

4.1 Road freight rates

In Table 1 the average rate charged for trucking on each city-pair route is reflected for ordinary flatbed trucking (28-30 ton equivalent trucks, non-refrigerated) typically used for commodity transport and non-specialised loads. The rate is the amount paid to the trucking company for the trip also reflected in US dollars per ton per kilometre (tkm) which is the unit price of transport. The rates include only trucking-related costs such as fuel, insurance, expected tolls, driver and parking fees and petty cash. In the table the average rate refers to the average of the import and export rates charged for 2015. For example, on the pair 'Lusaka-Johannesburg', the import rate is for the leg from Johannesburg to Lusaka, and the export rate is for the corresponding return leg to Johannesburg.

Table 1. Average non-refrigerated truck rates, 2015.

Route	Distance (km)	Export rate ($)	Import rate ($)	Average rate
Lusaka-Harare	495	1500	1800	0.11 (0.10-0.12)
Lusaka-Johannesburg	1576	1800	3660	0.6 (0.4-0.8)
Maputo-Harare	1286	1350	1950	0.4(0.3-0.5)
Lilongwe-Johannesburg	1863	2100	3950	0.6 (0.4-0.8)

Note: Rates relating to 28- to 30-ton flatbed tri-axle truck and equivalent, based on average of import and export rate charged.

Source: Author's own calculation based on information from various interviews.

[37] In the underlying research study, respondents were asked based on standardized interview guides to indicate the average rates paid or charged in 2015 for the transportation of a particular type of good, for example perishable items, by city pairing where applicable. Responses were given in US Dollars, or in local currency terms in which case the rates were converted using annual average exchange rates. Unless otherwise stated, rates included in tables are based on an average of the average rates stated by respondents.

A few important observations can be made. In absolute terms, import rates to Lusaka, Harare and Lilongwe (each in landlocked countries) are always higher than export (outbound) rates. In the case of Lusaka-Johannesburg the import rate is around double the rate for the corresponding outgoing leg, which is largely driven by the lack of return loads for trucks once goods have been delivered. Truckers therefore factor in the costs of returning the truck (often empty) to the city of origin. The average rate per tkm for the relatively shorter distance Lusaka-Harare route is almost double that on any of the other routes, which reflects economies of distance over longer distances as well as competitive dynamics on the route as discussed below.

In Table 2 the rates for refrigerated transport charged for individual legs between cities for 2015 are shown. We focus on the rate for trips originating in Johannesburg to the other cities as South African imports of perishables from the other countries are negligible. The domestic transport rate between Johannesburg and Cape Town in South Africa is also included here as a comparator for efficient transport, as discussed below.

Table 2. Average refrigerated truck rates per leg, 2015.

From	To	Distance (km)	Total rate ($)	$/ton7km
Johannesburg	Harare	1121	4498	0.13
Johannesburg	Lilongwe	1863	5040	0.09
Johannesburg	Lusaka	1576	4548	0.10
Johannesburg	Cape Town	1389	2352	0.6

Notes: Rates for a 40-ft refrigerated container or a reefer container loaded on a 30-ton flatbed truck.
Source: Author's own calculation based on information from various interviews.

The total prices charged for trips using refrigerated transportation are significantly higher than rates for non-refrigerated transport. The difference partly reflects higher energy cost in maintaining cool temperatures in the fridge unit and higher investment and maintenance costs associated with refrigeration units. Transport companies generally charge high mark-ups for refrigerated transportation and low demand outside South Africa has made it unviable for many firms to remain in the market, resulting in high levels of concentration. Compared to Johannesburg-Cape Town, cross-border rates will be higher to reflect additional hassle and risk borne by the transporter, including higher costs of insurance and border delays (which imply additional costs for refrigeration, for example).

4.2 Assessing against benchmarks for efficient transport and over time

Detailed information on costs is generally difficult to access and compile across different companies. As such we consider various benchmarks of what efficient transport rates are in the region and compare the observed rates above to these. This approach allows for an assessment of the relative levels of competition and efficiency on different routes as well as an evaluation of different factors which may drive differences with benchmarks.

For non-refrigerated transport we consider a benchmark rate for efficient transport in the region of $0.04 per tkm for several reasons. This rate is in line with the lower bound of rates for the Lusaka-Johannesburg route which is considered by transporters and in previous studies to be the most competitive in Southern Africa with high demand and several different trucking companies from South Africa, Zambia and Zimbabwe competing to supply services (Raballand et al. 2008; Teravaninthorn & Raballand, 2009). Given current constraints in terms of border delays, we argue that this rate could be even lower than the average $0.06 per tkm and closer to international comparators. For example, transport rates in Pakistan, Brazil, United States, China and France, where transport is generally

considered to be more efficient, were in the range $0.02-0.05 per tkm in 2007 (Rashid & Minot, 2010; Teravaninthorn & Raballand, 2009).[38] Rates of $0.04 and below could therefore be considered as 'target' rates for efficient transport in the region if certain inefficiencies are addressed.

In refrigerated transport we take the rate charged for the route between Johannesburg and Cape Town as the guideline efficient rate, at $0.06 per tkm. This rate is indicative of rates on a highly competitive route with multiple operators, absent any additional risks associated with cross-border transit and delays. Firms in the region with lower overhead costs, lower labour costs and lower fixed investment costs (purchasing second-hand, imported vehicles) could potentially charge rates even lower than this and as such it is likely to be a conservative estimate.

In terms of ordinary trucks, the average rates observed in the region are marginally above the benchmark applied, and the rate for Lusaka-Harare is nearly three times the benchmark. For Lusaka-Johannesburg and Lilongwe-Johannesburg the import rates are double the benchmark rate, even though export rates are in line. This suggests the extent to which transport rates could come down on these routes - the lower export rate accounts for broadly the same distance, costs and border crossings when returning to Johannesburg with a load as the import rate although a lower rate is charged. Effectively, rates on the import leg from Johannesburg could be reduced over time to align with the benchmark level or below, or to the level of the export rates. Importantly however, transporters stated that they are generally only willing to charge less on the outgoing leg if they are guaranteed a return load.

The Harare-Maputo route has slightly different competitive dynamics between operators. The rates are very competitive which is due to aggressive rivalry from Mozambican transporters on the route which passes from the port in Maputo and through South Africa to Zimbabwe.

Total rates for Lilongwe-Johannesburg and Lusaka-Johannesburg are similar despite a marginally longer distance travelled. The route from Johannesburg to Lilongwe has three border crossings including via Zimbabwe (passing through Beitbridge which is the most constrained border post) and Mozambique over a significant transport distance, compared to two on Lusaka-Johannesburg. This suggests that the Lilongwe-Johannesburg rate should be higher in general, although increased competition has had a downward effect on rates.

Ncube et al. (2015) assess 2014 rates in Southern Africa which can be compared to the above rates for Lusaka-Johannesburg. Combined with information from other transporters, the rate from Johannesburg to Lusaka in 2014 was on average $165/ton (or $0.105 per tkm). The price charged for the same route in 2015 appears to have come down further by around 26% to $122/ton (or $0.08 per tkm). This is consistent with the findings that routes to and from Zambia (Lusaka) have become more competitive and cheaper in recent years due in part to greater rivalry from foreign transporters (some of which have subsidiaries registered in Zambia) (Raballand et al., 2008; Ncube et al., 2015). However, there are exchange rate effects and decreases in fuel prices during 2015 that have an important impact. Export rates from Zambia to South Africa appear to have also come down from around $110/ton in 2014 (Ncube et al., 2015) to just below $70/ton by 2015.

Similarly, Lall et al. (2009) estimated rates from locations in Malawi to international destinations in the region to be on average $0.08 per tkm. However, the rate from Lilongwe to Johannesburg has been halved from around $149/ton based on Lall et al. (2009) to $70-75/ton in 2015. Two important factors are considered to have resulted in this change on Malawian routes. The first is the increasing loads from South Africa to Malawi, as well as the availability of backhaul of Malawian tobacco exports going to the Durban port directly (via Johannesburg) and to Johannesburg for processing in some cases. Furthermore, the increased presence of foreign transporters in general on Malawian routes has led

[38] There are almost no recent international studies with reliable comparators that could be applied in this case, or for refrigerated transport.

to rates being competed down. Fuel rates in Malawi have also decreased significantly by 2015 which has enhanced the competitiveness of Malawian transporters that operate on these routes.

For refrigerated trucking a very high margin is applied on most of the routes when compared to the benchmark. For all of the cross-border routes originating in Johannesburg, the mark-ups over the benchmark range from 50% (for Johannesburg-Lusaka which is considered to be more competitive) to 117%.

In thinking about the questions set out initially, the data above show that transport prices particularly on the export leg from South Africa are high relative to benchmarks for efficient transport and international standards. However, the assessment also demonstrates that routes where there is a greater level of rivalry tend to have lower transport rates, other things equal.

5. WHAT ARE THE CAUSES OF HIGH ROAD FREIGHT RATES IN SOUTHERN AFRICA?

High rates on certain routes cannot be fully explained by costs associated with transport and we focus here on additional contributors to high rates. While fuel prices are relatively high in Malawi and Zambia (currently accounting for 40-50% of operating costs on average), these have come down recently yet margins on some routes remain high. We consider the effect of an imbalance in trade flows and border delays.

5.1 The effect of an imbalance in production and trade

South African exports, particularly of perishable goods, are not matched by sufficient return flows from Malawi, Zambia and Zimbabwe which is exacerbated by the limits on the types of goods that can be carried on reefers. This situation may change as Zambia and other countries gradually increase productive capacity and diversify towards exporting various processed and manufactured items. For example, Zambia's non-copper merchandise exports into the region including electrical equipment and machinery, sulfur, animal feed and residues from the food industry have already grown substantially since the early 2000s with potential for further growth in some areas such as sugar exports (World Bank, 2014).

South African exports of perishable goods to Malawi and Zambia have almost doubled since 2010 while those to Zimbabwe have slowed but remain sizeable. For Zambia, the most significant growth has been in fruit and vegetable imports whereas for Malawi growth is led by increases in imports of meat and fruit products.

There are flows of commodities from Zambia in particular (largely copper) that are transported either to locations in South Africa for processing or to Durban. Copper exports from Zambia present an opportunity for obtaining backhaul from South Africa. The same applies to tobacco exports from Malawi, although of course these are more seasonal. These factors contribute significantly to the lower rates available on the Lusaka-Johannesburg and Lilongwe-Johannesburg routes. Compared with the other routes assessed, the greater availability of loads in both directions also attracts truckers to the Lusaka-Johannesburg route.

Truckers estimate that rates charged for the return leg to Johannesburg are on average 70% of the outgoing rate for transportation of non-refrigerated loads. The examples of Lusaka-Johannesburg and Lilongwe-Johannesburg show that the differences can be far greater and up to half of import rates from South Africa. Taking a conservative approach, the total rate from Johannesburg to Lusaka of $3660 could be brought down to around the average of the import and export rate or 70% of the outgoing rate (at $2600) if return loads were regularly available, other things equal.

5.2 The effect of border delays

Each route is affected by border delays arising from the government administrative processes or incomplete information from the customer or broker. There have been significant improvements however. For example, the introduction of a one-stop border post (OSBP) at Chirundu (between Zambia and Zimbabwe) has continued to increase efficiencies since 2009 and has had a downward effect on rates (Curtis, 2009; TradeMark, undated). The effective implementation of pre-clearance of goods has been an important contributor particularly because sealed, pre-cleared loads are able to proceed through the border with minimal inspection delays. Freight companies with good IT systems and forwarding capabilities are able to use pre-clearance to their advantage. On the other hand, the expected transit time through Beitbridge (between South Africa and Zimbabwe) is two days (Curtis, 2014), partly because goods are effectively required to be cleared on the Zimbabwean and South African side. Other main constraints identified through the interviews are as follows:

- Clearance systems between South Africa, Zambia and Zimbabwe do not interoperate and do not have connectivity with one another, although it is apparently technically possible to do so. Bottlenecks also arise when leaving the SACU (Southern African Customs Union) countries due to the use of different electronic systems, tariff structures and coding of certain products for tax and duty purposes.
- Zambia does not give preference to transporters of time-sensitive goods although we understand that this is to be addressed.
- Some border gates, such as Chirundu (between Zambia and Zimbabwe) do not operate on a 24-hour basis which implies queues and parking fees even for time-sensitive refrigerated transport. Authorities are apparently working towards extending hours gradually.

Byiers & Vanheukelom (2014) found that delays at border crossings can cost up to $300 a day for an 8-axle truck. In 2015, delays at the border were estimated by transporters to cost at least $400 a day or $13/ton. This provides a useful benchmark for understanding the costs incurred by a truck operator including additional driver time, petty cash, parking fees and the opportunity costs of servicing less clients due to longer roundtrips. For reefers, there are additional refrigeration costs incurred and possible obsolescence of goods.

Removing the impact of the typical delay of two days on the one-way rate charged from Johannesburg to Lusaka of $3660 or $122/ton (Table 1) could have a large impact, other things equal. Based on $26/ton for two days' delay the rate could decrease to $96/ton ($0.06 per tkm) which is a 21% difference and closer to the efficient benchmarks identified.

5.3 Summary of impact of increased competition, delays and availability of return loads

More intense competition between transporters in combination with other factors on the route from Johannesburg to Lusaka has seen rates decline from $165/ton to $122/ton (a reduction of approximately $0.027 per tkm or 26% on this route).

Eliminating a further two days of delay could bring rates down to around $96/ton or $0.06 per tkm (a further reduction of $0.016 per tkm). On this conservative basis, the rate is more in line with the efficient benchmark. The estimated total decrease in rates is $69/ton, or a 42% saving, although more detailed data is required to assess the full implications which is not currently available in the region.

Rates could be reduced even further with more return loads. Export rates from Zambia to South Africa appear to have also come down from around $110/ton in 2014 (Ncube et al., 2015) to $67/ton by 2015. With additional savings from eliminating even one day's delay on this route, the price on

the export leg could be reduced to $54/ton, and a total reduction from 2014 prices of $56/ton. To place this in context, the price of a ton of Zambian soya bean in 2015 was around $400/ton (delivered in Johannesburg), such that the combined saving against the price of the product is approximately 14%. A further reduction could significantly enhance the competitiveness of soya bean landed in South Africa and perhaps increase the viability of exports from Zambia and other countries competing with deep sea imports to South Africa.[39]

6. WHAT ARE THE IMPLICATIONS FOR INDUSTRIAL DEVELOPMENT AND INTEGRATION?

The rapid internationalisation of South African retail chains such that their supply chains already stretch across borders in the region suggests that the challenges of integration can be addressed (das Nair & Chisoro, 2015). However, this has most likely come at significant cost to the businesses which could be reduced substantially through effective regulation and administration. As discussed, retailers have been prepared to pay more to obtain comprehensive and efficient services. The implications of this are important.

The question is whether regulatory and administrative systems can be used to make efficient transport available for all categories of users? The largest service providers leverage reputation and advanced administrative systems to circumvent bottlenecks, including the ability to place agents at border posts that facilitate documentation and interactions with authorities. Information from the interviews suggests that they also benefit from being able to pass through border posts with limited searches on their vehicles which is a function of established reputations and familiarity with the processes. Through the associations and networks it appears that brokers are also able to influence regulation to favour the largest companies, including strengthening regulations against 'briefcase' brokers that are potential rivals. Coordination between the brokers (possibly covering the whole region) also means that prices and standards for these services are aligned and not reflective of competition.

Small-scale importers and exporters may not have similar capabilities which points to an important role for border agencies and policymakers in easing transit procedures and costs. The discussion in the previous section highlights the impact of enabling greater competition and removing delays at the border (partly from interventions such as the OSBP). The estimated effect on the routes considered was to nearly halve transport rates.

Developing industrial capacity across the region outside of South Africa is likely to lead to lower transport rates overall over the medium- to long-term. Increased access to return loads has a potential effect of reducing rates by around 30% on conservative estimates, although more detailed data would be required to assess this further.

Regulation has an important role to play in enhancing competition between transporters. First, competition can be enhanced through enabling entry, licensing and passage of transporters. In Zambia from the late 2000s a focus was placed on ensuring interoperability and harmonising of rules for trade and transit with neighbouring countries including easing permit processes and finalising bilateral agreements (Raballand et al., 2008). For example, a single permit system was introduced for transit between Zimbabwe and Zambia (RTSA, 2014). An important feature of opening up the market was making it possible for foreign operators to compete on Zambian cross-border routes and exposing Zambian transporters to competition from other operators in the region (Raballand

[39] In a separate chapter in this volume, Tamara Paremoer considers the relatively high transport costs from Zambia to South Africa as a factor which constrains the competitiveness of Zambian soya. Rather than contradicting this point, this chapter reinforces the need for further interventions to ensure there are greater improvements in terms of the reduction of transport costs on this key route. In particular, we note that although transport costs have reduced on this route in recent years, this chapter highlights the impact of an imbalance in trade flows and the remaining scope for rates to decrease further as possible explanatory factors that inhibit the enhanced competitiveness of the Zambian soya exports in South Africa.

et al., 2008). Deregulation in the early 2000s also led to an influx of new transporters including foreign companies with registered businesses in Zambia. Furthermore, the import duty on second-hand commercial trucks and trucking equipment was apparently lifted in 2008/9 allowing more transporters to bring in cheaper used vehicles (Ncube et al., 2015). Together, these factors have enabled greater rivalry on Zambian routes which is enhanced by the continued improvements in the implementation of the Chirundu OSBP which seems to have now reached a high level of effectiveness since implementation in 2009, despite challenges (TradeMark, undated; Woolfrey & Tshuma, 2013).

There remain other challenges to greater competition in cross-border transport. For example, in Malawi there are indications that the transporters' association has in the past issued recommended rates for transport (Ncube et al., 2015). In addition, there is evidence from the interviews of coordinated behaviour between major brokers in Zimbabwe and Malawi whereby guideline rates are published by the association for different services. In Zambia only a select group of companies receive contracts to transport copper for the large mines. This can be efficiency-enhancing by eliminating the hassle factor for mining clients that will pay more for convenience and reliability, but can also have the effect of preventing competition from capable transporters that could compete on lower rates for those contracts.

In South Africa the presence of a few large integrated logistics firms such as Imperial with exclusive access to large producers and clients effectively means that in some segments of the market competition is limited. For example, the South African retailers and major food producers such as Astral Foods (which is an Imperial client and lead firm in the region in poultry production) tend to contract with one main logistics firm that services their entire business and has the capacity in terms of fleet, storage, warehousing, refrigeration units and supply chain management technology to do so. Even large rivals of Imperial, which has made significant investments in capacity most recently, are constrained in terms of storage and distribution capacity to compete for Imperial's largest clients. In the case of Shoprite, the leading retailer in terms of expansion of operations in the region, logistics functions are internalised through a related firm Freshmark which mostly uses a set of preferred transporters from South Africa to export goods, effectively limiting access for other transport operators.

7. CONCLUSION AND POLICY RECOMMENDATIONS

The factors that drive high transport costs in the region are a combination of structural issues and weaknesses in the administration and regulation of cross-border transport. On the one hand, the imbalance in production and trade flows between the countries means that return loads are limited. As such one-way transport costs from South Africa to Malawi, Zambia and Zimbabwe are high meaning inputs to production and food products are more expensive. On the other hand, bottlenecks in the administrative systems for crossing borders mean that transport costs are more expensive by at least $13/ton.

Addressing these issues is critical for various reasons. There are important links established in the literature between upgrading road infrastructure and increasing trade. Improved infrastructure, more broadly, also contributes to growth in productivity and output. It is also clear that deficient road infrastructure networks undermine the potential for greater trade between countries, primarily through the effect on the costs of transit and relative competitiveness of goods. These considerations should place the challenges addressed in this paper at the centre of current efforts by SADC and others to develop industrial capacity and regional value chains. A key contribution of this paper is to demonstrate that along with infrastructure investments, administrative and regulatory bottlenecks are just as important in terms of their effect on competitiveness and competition, which should be a consideration for assessing policy and transport networks in developing countries generally.

There is scope for targeted policy interventions at the country and regional level to improve outcomes across the main routes in the region. One such intervention relates to the reduction of delays at border posts. In this regard, one-stop border posts, which will require large-scale investments, are potentially beneficial. This recommendation is supported by the evidence on the gradual improvements in transit times brought about by Chirundu one-stop border post (Vilakazi & Paelo, 2017a).

There are smaller interventions that can also be made. Across the region, there are border posts that do not operate on a 24-hour basis, which increases waiting times (and thus freight rates). Furthermore, electrical and technical shutdowns in the border systems, limited use of interoperable border technology systems, and inconsistency in the various systems and regulatory procedures used in different countries increase transactions costs. These different areas can be addressed at relatively minimal cost through collaboration between donors, governments, regional bodies and agencies, with a clear focus on gradually improving harmonization.

To the extent that the lack of availability of return loads has to do with coordination and market failures in linking potential transporters without loads with clients, technology-based platforms offer some opportunities to be explored. A practical intervention could involve engaging transporters, retailers, industry associations of potential exporters in each country, and relevant local government agencies and regional bodies to determine the parameters for an online system for 'marketing' of return loads. This type of platform has been explored in other markets, by COMESA through the touted COMESA Electronic Market Exchange System, and private entities such as EmptyTrips[40] (Vilakazi & Paelo, 2017b). Here, appropriate technologies for such a platform could be drawn from experiences in the passenger transport 'sharing economy' models, but would require extensive private sector involvement, harmonization of transport regulations across countries, along with coordination across national government agencies to be effective.

Lastly, there is a lack of comparable and consistent data on prices and the other costs involved in transporting goods across borders which needs to be addressed (Vilakazi & Paelo, 2017b). The impact of bottlenecks, and of interventions to address these, cannot be measured and analysed in the absence of reliable and comparable data on prices and key costs of transportation at the regional economic community and country levels. In this regard, interventions to enhance data collection (which also contributes to market efficiency and transparency), require collaboration between regional bodies such as SADC, national governments, and non-governmental organisations (including the academic community), to formulate strategies for the development of regional databases of this nature. One example of a practical approach for collecting this information would be to record values in the existing administrative documentation filed by transporters, importers and exporters (and their agents) with authorities at border posts, which importers and exporters could fill in and submit as part of regular procedures. While the modalities of such an intervention can be explored further, the potential benefits of such an investment for improving evidence-based policy making in transportation are significant.

Intra-regional links have not been strong in the past as evidenced by the slow progress towards transport sector liberalisation and low levels of intra-regional trade in the 1990s and early 2000s. However, transport networks on main trunk routes have improved considerably and transit times have been reduced. Opportunities exist therefore to deepen integration through further improvements in border processes and using regulation to open up for cross-border rivalry between transporters as part of regional industrialisation strategies.

[40] See EmptyTrips website, available at: https://www.emptytrips.com/aboutus

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CHAPTER 4.
THE INTERNATIONALISATION OF SUPERMARKETS AND IMPLICATIONS ON SUPPLIERS IN SOUTHERN AFRICA[41]

Reena das Nair

1. INTRODUCTION

Growing urbanisation in many countries in Southern Africa since liberalisation in the early 1990s has spurred the spread of modern supermarket formats. This has affected the retail landscape in urban spaces, but increasingly also in peri-urban and rural areas. The expansion of supermarkets both globally and in the Southern African region has not been limited to geography but has extended to the range of supermarket offerings and multiple formats targeting consumers in all income groups (Reardon and Berdegué, 2002; Weatherspoon and Reardon, 2003; Reardon and Hopkins, 2006).

Globally, this growth and spread of supermarket chains over the past three decades has transformed the way consumers purchase groceries and household consumable products. The 'supermarket revolution', or 'supermarketisation', as it is sometimes referred to, describes a growing share of food products sold through supermarkets. Along with supermarketisation, the 'internationalisation' of supermarkets through foreign direct investment (FDI) outside the home countries in which they were established has been characterised in the literature as occurring in 'waves'. Starting in the early 1990s, these waves saw a rapid catch-up of several countries and regions towards countries in Western Europe and North America that had supermarketised earlier over a much longer period. In these countries and regions, the food retail share of supermarkets increased sharply over a relatively short period of time (Reardon, Timmer and Berdegué, 2004 and 2005; Reardon and Hopkins, 2006; Traill, 2006; Reardon, Henson and Berdegué, 2007). In Africa, the spread of supermarkets has until recently been through FDI emerging from larger African economies.

Supermarketistaion and the internationalisation of supermarkets have important consequences for consumers and suppliers alike. Supermarkets benefit consumers by offering a one-stop shopping experience, a wide range of products and an overall shopping experience that is a package of more than just physical products at convenient locations (Betancourt and Malanoski 1999; Betancourt 2006; Basker and Noel 2013). Sometimes referred to as a 'price–quality–range-service' (PQRS) package, this offering can reduce overall costs for consumers, including transport, time, search, information and storage costs (Dobson, 2015). Competition between supermarkets as they spread into new areas can improve these offerings to consumers.

For suppliers, supermarkets allow for greater alternatives for the sale of their products. The spread of retailers opens up larger markets for suppliers to attain the scale to potentially become more competitive in national, regional and international markets.

The modernisation of procurement methods, escalating requirements and increasing private standards have impacted suppliers, requiring them to invest in developing their capabilities. Supermarkets, as a final link between suppliers and consumers play an important role in driving the development of supplier capabilities and facilitating their climb up 'the ladder' in regional or global value chains (Boselie et al. 2003). Large supermarket chains therefore have significant power and influence over suppliers and their development trajectory. A lack of competition in concentrated markets can lead to abuses of buyer power by supermarkets towards suppliers and can hinder their growth and development (Dobson, Waterson and Chu, 1998; Clarke et al., 2002; OECD, 2015; Dobson, 2015).

Modernisation of procurement systems, such as developments in sophisticated distribution centres, has further allowed suppliers to export their products through regional or global supermarket chain store networks. This has impacted trade patterns, especially inter-regional trade, and has also raised political sensitivities with regards to displacement of local suppliers (Reardon, Henson and Berdegué, 2007; das Nair, 2019; das Nair, Chisoro and Ziba, 2018).

Competitive rivalry between retailers is therefore important for both consumers and suppliers. Concerns have emerged around the possible anti-competitive conduct of dominant supermarket chains worldwide. In Southern Africa, these include conduct that results in rivals being excluded or prevented from locating in shopping malls or centres. Such strategic behaviour affects the course,

pace and success of the internationalisation of supermarkets. Oher concerns include the unequal bargaining power, strong buyer power and the demanding requirements of supermarket chains, which often means that small and medium-sized suppliers struggle to supply them. The supplier base continues to be dominated by a few large suppliers who can meet these requirements. This hinders the participation and growth of new entrants and smaller suppliers in the region.

This paper assesses the internationalisation of supermarkets, the factors that affect this and the implications on competition and suppliers in the Southern African region. **Section 2** provides a literature review on supermarket internationalisation globally and on the interaction between supermarkets and suppliers. In **Section 3**, descriptive evidence on the trends in supermarketisation and internationalisation in selected southern African countries is presented, highlighting the different outcomes in the different countries. **Section 4** discusses the findings of the role of supermarket chains in driving regional trade patterns, the implications of their spread on the competitive landscape and the impact this has on supplier development. **Section 5** offers policy recommendations for developing regional suppliers, with supermarkets as key routes to market. This contributes to SADC industrialisation objectives and to goals of the African Continental Free Trade Agreement.

2. LITERATURE REVIEW

In the context of retailers, internationalisation can be viewed as the extent to which retailers operate outside their home country. International retail operations have been defined as the operation, by a firm or alliance, of shops, or other forms of retail distribution, in more than one country (Dawson, 1994). This has been measured by different metrics in the literature, for instance, by the value or volume of total sales or profits generated internationally relative to total sales/volumes, or by the growth in the number of stores and the number of countries that a retailer operates in (or geographical spread) (Sullivan, 1994; Ietto-Gillies, 1998; Coe and Hess, 2005; Wrigley and Lowe, 2010; Coe and Wrigley, 2018). Linked to the internationalisation of supermarkets are the terms 'supermarketisation' or 'supermarket revolution', which broadly describes the trend in which retail food sales in a given country or region are increasingly happening through supermarket chains (Reardon, Timmer and Berdegué, 2004; Traill, 2006), marking a shift away of food sales from independent retailers and traditional wet markets.

Demand-side factors traditionally attributed to retailer internationalisation include growing urbanisation, increased per capita income, increased demand for convenience, services, product diversity and quality, and the rise of the middle class (Tschirley 2010; Weatherspoon and Reardon 2003; Battersby and Peyton 2014). Supply-side factors include outward retail FDI by multinationals, spurred by saturation of home markets and greater sales and profitability opportunities in developing countries (Humphrey 2007). These trends in outward FDI follow new market seeking motives of internationalisation where investors search for new markets given limited growth potential at home (Lall and Narula 2004; Narula and Dunning 2000; Dunning 1993). Growing economies of scale and scope, the modernisation of procurement systems including through centralised distribution, efficiency in logistics and inventory management, and the need to diversify risks have also been attributed to the spread of supermarkets.

Patterns of supermarketisation and internationalisation of supermarket chains

The supermarket revolution globally has happened in a number of waves. The first wave occurred in the more affluent South American countries (such as Brazil, Argentina and Chile), northern central Europe (Czech Republic) and East Asia (excluding Japan and China) in the early 1990s. In these regions, the food retail share of supermarkets increased sharply to 50–60 per cent in 2004 from

10–20 per cent in the early 1990s and as high as 80 per cent in some European countries. The second wave covered the spread in Mexico, Central America, South Africa, Southeast Asia and south-central Europe, although some studies place South Africa as part of the first wave (see Reardon, Henson and Berdegué, 2007). The share of food retailing through supermarkets in these regions grew from 5–10 per cent in the 1990s to between 30 and 50 per cent in 2004. The third wave hit India, China, poorer Latin and Central American countries, and Eastern Europe in the late 1990s and early 2000s with a share of food retailing through supermarkets growing rapidly from 10–20 per cent. The most recent documented wave, the fourth wave, involved mainly eastern and Southern African countries outside South Africa and Kenya, but also other South Asian countries (Weatherspoon and Reardon, 2003; Reardon, Berdegué and Timmer, 2005; Reardon and Hopkins 2006; Reardon, Henson and Berdegué, 2007).

In Africa, South Africa and Kenya were the front runners in the growth of supermarkets in the first round of expansion. Countries in the second round of growth are largely recipients of FDI from South Africa. Weatherspoon and Reardon (2003) predicted that the trend of giant waves of FDI by global multinationals such as Ahold, Walmart and Carrefour that had hit Latin America would probably spread to Africa around 2008.

The predictions in the literature in the early 2000s were that supermarketisation and internationalisation in developing countries would continue to be significant. Especially on the African continent, supermarketisation and internationalisation were predicted to take off rapidly and on a large scale in the mid- to late 2000s. It was predicted that global multinational or transnational supermarket chains (for instance, chains like Walmart, Carrefour and Metro) would enter Africa by around 2008-2010, repeating patterns evidenced in Latin America and East and Southeast Asia (Weatherspoon and Reardon, 2003; Reardon, Timmer and Berdegué, 2004; Traill, 2006).

These chains, and others, have indeed spread internationally, with implications on the levels of concentration in markets. At a global level, the share of the global market accounted for by the largest 100 retail firms has been steadily increasing (Dawson, 2007). In 2013, the constitution of the top 20 transnational retail chains in terms of revenues earned in international markets (dominated by grocery retailers) has been the same for the past decade, although relative positions have changed (see Coe and Wrigley, 2018). This highlights the concentration and dominance of the same small group of grocery retail chains globally who have held these positions for many years. This concentration is reinforced through the high barriers to entry given large economics of scale and scope, and other high sunk costs (Dobson, 2015; Ellickson, 2004).

Levels of concentration and market power

The high levels of concentration in many markets and the high barriers to entry are reflective of the oligopolistic nature of supermarket chains from an industrial organisation perspective. The International League of Competition Law in 2015 highlighted the degree of concentration in the grocery retail sector in different countries. In Australia, the Netherlands, Austria, Finland and Belgium, the 2- and 3-firm concentration ratios (CR) in the grocery retail sector were between 55 and 87 per cent. Therefore, 2 or 3 firms held between 55 and 87 per cent of the defined markets. The 4-firm CRs in Germany, Sweden and the UK were 85, 80 and 85 per cent respectively (Jenny, 2015). The levels of concentration in Europe more broadly have also been increasing. In 2000, the top 10 European retailers accounted for 26 per cent of retail sales, and this increased to 30.7 per cent in 2011 (European Commission, 2014).

Theories of imperfect competition predict that such high levels of market concentration can reduce effective competition and can allow sellers (buyers) with market power to increase (reduce) prices. This raises concerns of firms with market power possibly abusing this power, not just in terms of raising prices, but through their strategic behaviour that can exclude rivals. This can have negative effects on consumers and on suppliers.

A type of strategic behaviour that has been prevalent in the retail sector in several countries has taken the form of restrictive vertical agreements between mall owners, landlords or property developers and supermarket chains as anchor tenants. Exclusivity clauses in leases grant anchor tenants the rights to operate as the sole supermarket in the mall/shopping centre. Property owners or landlords would then require permission from the incumbent if they wished to rent space to other ancillary tenants who overlap with the incumbent supermarket's offering. If incumbents refuse to allow new entrants into the premises, competition would be stifled in that location. By its very nature, leases with such clauses are exclusionary. With fewer competing supermarkets in a given location, customers are left with reduced choice in terms of product range, pricing and quality. While there could be efficiency justifications for exclusive leases, those that span long periods of time are more likely to be anticompetitive. Internationally, the Australian Competition and Consumer Commission and the UK Competition Commission have found exclusive leases to be an impediment to competition (Competition Commission, 2015).

Another key area of concern in several countries of the rapid growth of a few, large supermarket chains is the potential impact of the exertion of buyer power on suppliers. Concerns of buyer power of large supermarket chains and the impact this has had on suppliers have emerged in many countries such as the UK, Australia, Japan, Germany, Hungary, Bulgaria, Finland, the Netherlands, Austria and Romania, amongst others (OECD, 2015; Dobson, Waterson and Chu, 1998[42]). This can negatively impact supplier participation and the development of their capabilities, thus also hindering upgrading efforts into higher-value products or into global value chains. Buyer power is exerted mainly through controlling pricing in trading terms by dictating elements such as listing fees, rebates, advertising allowances, promotion fees, payment period terms, settlement discounts and new store openings fees amongst others (Clarke et al., 2002; Reardon and Gulati, 2008; OECD, 2015). Supermarkets can also charge slotting allowances that food processors or other suppliers have to pay for to access shelf space or specific placements. Slotting allowances may help retailers screen products and determine which products are more likely to sell. Slotting fees can however also be a means by which retailers can extract rents or share of surplus from processors (OECD, 2013).

A combination of increasing retail concentration and significant barriers to entry limits the choices that suppliers have in terms of the competing means of distributing their goods in many countries (Dobson, 2015). In a number of countries, market inquiries or studies are initiated by competition authorities given such concerns around buyer power (Kobel et al. 2015).

The impact of modern retail formats and requirements on suppliers

Escalating supermarket requirements

Modern retail formats, requirements and procurement practices can also significantly affect the development and participation of suppliers. A defining characteristic of modern supermarket chains is the heavy investment in infrastructure and supply chain. Large investments include those in distribution centres (DCs), advanced internet technology, data collection and analysis systems, logistics and inventory management, and transport fleets and warehouses in order to get a wide range of products on shelves at the lowest possible costs. Modern supermarkets in many parts of the world have switched to centralised DCs instead of store-to-store procurement (Reardon and Hopkins, 2006). Since Sam Walton started the concept of building distribution centres to service Walmart stores in villages and small towns in the US in the sixties (Reardon and Gulati, 2008), supermarket investments in DCs have been a key pathway to retail modernization. DCs reduce transaction costs, coordination costs

[42] Buyer power has been defined when a firm or a group of firms, either because it has a dominant position as a purchaser of a product or a service or because it has strategic or leverage advantages as a result of its size or other characteristics, is able to obtain from a supplier more favourable terms than those available to other buyers (OECD, 2013: 23). It has also been defined as a situation where a firm or group of firms obtain from suppliers more favourable terms than those available to other buyers or would otherwise be expected under normal competitive conditions (Dobson, Waterson and Chu, 1998: 5).

and congestion diseconomies. These can outweigh the transport costs to and from DCs that are located in more remote parts of the city (Reardon and Hopkins, 2006). The perishable nature of food further requires supermarkets to make large investments in storage facilities, and supermarkets are increasingly investing in cold storage DCs that can handle perishables. While DCs can also reduce the costs for suppliers, an implication is that small suppliers that only have the scale to supply some stores through localised procurement under a store-to-store model may be excluded. This is also driven by supermarket chains' requirements to maintain consistency across all store outlets nationally.

Supermarkets have also moved away from spot purchases to adopting specialised procurement agents, dedicated wholesalers or procuring directly from farmers and processors. Specialised agents and wholesalers can act as 'channel captains' and enter into relationships (formal contracts, including contract farming or verbal agreements) on behalf of supermarkets with processors and farmers to ensure quality and consistency is maintained. Dedicated procurement agents and wholesalers are usually efficient as they cut costs in terms of search, transaction and coordination costs. They also assist in maintaining private standards and contract terms between supermarkets and suppliers. However, this has shifted power away from small farmers and processors to supermarket chains. This further gives supermarkets more direct influence over pricing, quantities, terms of delivery and product quality. It has the adverse effect of shrinking the supply base by using only preferred suppliers (Altenburg et al., 2016) and bypassing traditional wholesale markets (Humphrey, 2007). A key reason for increased pressure on the supply value chain is the risk faced by supermarkets and increased competition to access shelf space. Humphrey and Schmitz (2002) emphasise the importance of continuity and consistency of supply in terms of non-price competition parameters such as quality, response time, and delivery, all of which affect supermarkets' reputation.

Procurement trends differ for categories of products. Supermarkets tend to source from medium-to-large suppliers of meat, dairy and processed food companies. Fresh produce also tends to be sourced from medium-to-large farmers (Reardon, Henson and Berdegué, 2007), which presents difficulties for small-scale farmers in developing countries especially if they do not supply export markets. Supermarkets tend to only source indirectly from smaller farmers through wholesalers and processors, but even these smaller farmers are those that have better capital assets and equipment, access to infrastructure and are more commercially oriented in that they use hired labour and chemical inputs and thus have training advantages (Reardon and Hopkins, 2006). Supermarkets typically prefer to procure from large suppliers to reduce transaction costs as large suppliers have the capacity to supply all the outlets of a supermarket chain, therefore ensuring sufficient volumes, consistency and quality of products. These changes in procurement practices have had an impact on the development of suppliers in the value chain.

The modernisation of procurement systems has therefore placed considerable pressure on suppliers with regards to the ability to supply the required volumes, maintain consistency, ensure quality, and contain cost of supplying products, amongst other factors as discussed below (Dakora, 2012).

Legal and private standards

Large supermarket chains globally are imposing escalating private quality and processing standards on suppliers (Boselie, Henson and Weatherspoon, 2003; Barrientos and Visser, 2012). This allows them to compete and create points of differentiation from rivals. These standards are over and above the country-specific and basic legal standards that suppliers have to adhere to. In the case of multinational retailers, international standards are often applied in all their operations (Gibbon and Ponte, 2005; Coe and Hess, 2005). Some of these standards however are not triggered by supermarkets, but by collective consumer and social movements. These include sustainability goals, responsible environmental practices, ethical sourcing requirements, fair labour practices, and corporate social responsibility, which may lead to conventions shaped by social movements. (Dallas, Ponte and Sturgeon, 2018).

The capabilities of local suppliers (particularly small-scale farmers, small food processors and producers of household consumable goods) to meet these standards and reach the required scale to compete with imports are important for their sustainability. Suppliers require significant capital, technological, managerial, organisational and financial investments and upgrades to meet these requirements. Marketing of fresh food produce to supermarkets has been particularly difficult for suppliers in developing countries as often the institutional, physical and financial infrastructure support systems are weak (including bar coding, packing houses, cold chains, shipping equipment, credit facilities, standards and certification processes). For fresh fruits and vegetables, sanitary and phytosanitary protocols are extremely important (Tschirley, 2010), especially for producers in developing countries. Suppliers are usually responsible for all activities up until the product is delivered to a DC or a supermarket, and suppliers are solely responsible for the costs of escalating private standards, and the accompanying audits by supermarkets.

Impact on regional trade

Acquiring the capabilities to meet these escalating standards are directly linked to patterns of trade of products sold through supermarket chains. Supermarkets have evolved to become 'global sourcing companies' and have important implications for regional sourcing, a potentially powerful avenue for growth in agro-processing and manufacturing value chains.

Supermarkets are more likely to source their products via imports if they are foreign-owned chains than if they are locally owned (Altenburg et al., 2016). A range of factors have facilitated this - lower relative costs of sea and air freight, tariff reductions, trade liberalisation, innovations in communications, improved transport systems and increased capital mobility (Brown and Sander, 2007). This is more so the case for regional sourcing, with transport costs being lower from the region given proximity than for deep-sea imports.

When foreign retailers first enter into a host country, they tend to import a large share of their supplies from their home base, and over time, they increase their share of local sourcing (Cattaneo, 2013). Using supermarket experiences in different countries (Shoprite's in Zambia and Madagascar, Carrefour's in Morocco and Tunisia and Metro in Kazakhstan), Cattaneo (2013) highlights three phases of connection to the 'global' value chain:

- Phase 1: Lead retailer in developing country imports most of its products given the lack of capabilities and capacity of local producers to satisfy its requirements and standards.
- Phase 2: As local producers build capabilities and capacity, they begin to grow their supplies to lead retailer.
- Phase 3: Local producers that meet high standards export their products to the retailer's regional/ global network.

The duration of each phase is likely to be very dependent on the type of products, the existing level of supplier capacity and capabilities in a given country, as well as country-specific institutional and political factors. Foreign supermarkets are most likely to first source perishable agricultural products locally given the importance of short cold chains for such products. It is often only a few large farmers that can meet the stringent requirements of supermarkets, and it is these that are able to transition to exportation.

A framework to evaluate both buyer power and upgrading of suppliers?

A framework that adds value to the industrial organisation or competition economic concepts of buyer power is the global value chains (GVC) framework. A value chain describes the full range of activities that firms engage in to bring a product from its conception to end-use (Gereffi and Fernandez-Stark, 2011). GVC analysis evaluates inter-firm linkages and vertical relations regarding design, production

and marketing of products, as well as value addition, which involves a chain of activities divided between different enterprises often located in both developed and developing countries.

Evaluating the implications on suppliers of the spread of supermarkets in Southern Africa through a combination of a GVC framework and industrial organisation approaches to buyer power enriches the understanding of global and regional value chains. Elements of each framework and tools for analysis strengthens the other. While there is a rich literature on GVCs, its use in assessing competition dynamics has been very limited to date. It is however an area where competition authorities in developing countries are becoming interested in to better understand and foster conditions where markets can work better.

A value chain approach can provide important insights into vertical dimensions such as the relationship between supermarkets and suppliers. An important contribution of the GVC framework is the governance of the chain and the impact of this on the upgrading and development of players in the chain. Governance is seen as the process of exercising control along the chain through specification of what type of product needs to be supplied, what quantity, at what price and how it should be produced (Gibbon and Ponte, 2005). Governance therefore refers to authority and power relationships that determine the allocation and flow of resources within a value chain (Gereffi, 1994; Dallas, Ponte and Sturgeon, 2018; Gereffi and Lee, 2012; Gereffi and Lee, 2014; Gereffi and Fernandez-Stark, 2011). The governance of value chains offers insights on the distribution of rents and power dynamics at each level and can add to the assessment of buyer power.

The GVC literature has recognised bargaining power as the most common form of power, usually in the context of dyadic and direct relationships between clearly identifiable buyers and sellers. This power has been categorised as 'coercive' power where lead firms 'utilize(s) incentives or sanctions directly to compel another actor to act according to their wishes' (Dallas, Ponte and Sturgeon, 2018: 1). While the GVC literature has progressed and broadened to include other forms of power (Dallas et al., 2018), there is merit in going deeper into understanding dyadic and direct relationships between buyer and seller in GVCs through assessing buyer power from an industrial organisation perspective. Understanding when and how buyer power is exerted in the region, and the implications this has for supplier participation adds to the GVC literature. Similarly, the competition economics framework which has traditionally narrowly focused on consumer welfare in many jurisdictions can benefit from the wider perspectives a GVC framework offers in terms of the importance of upgrading and participation of suppliers in regional value chains. This allows for tailored policy interventions in value chains to reduce the ability of supermarket chains to extract rents at the expense of supplier participation.

Governance and buyer power are critical to understand opportunities or challenges to supplier upgrading. Upgrading can be categorised as process upgrading (the transformation of inputs into outputs more efficiently by reorganizing the production system or introducing superior technology); product upgrading (moving into more sophisticated product lines); functional upgrading (acquiring new functions to increase overall skill content of activities); and intersectoral upgrading (moving into new productive activities (lateral migration) (Humphrey, 2004; Gibbon, 2004).

Upgrading capabilities requires effort from all stakeholders in value chains including governments. Upgrading initiatives in the supermarket sector can include public and private investments in wholesale infrastructure developments, construction of distribution and warehouse facilities and developing cold chains. It can also include investment in systems to improve the sorting, grading, labelling, tracking, inventory maintenance and managerial systems of suppliers. Suppliers further have to upgrade in plant and machinery to meet food quality, health and safety standards; as well as packaging and logistics requirements.

The GVC framework has the added benefit of allowing for practical policy actions in terms of developing a particular level of the value chain, redistributing rents or upgrading certain actors, particularly in developing countries. This hybrid approach in understanding the impact of the spread of supermarkets on suppliers is utilised in this chapter.

3. TRENDS IN SUPERMARKETISATION AND INTERNATIONALISATION IN SOUTHERN AFRICA

The literature on internationalisation and supermarketisation suggests that the level and growth in income per capita is an important consideration for the spread of retailers. Greater income per capita indicates greater spending power. Consistent with the empirical literature, GDP, income per capita levels and population growth indeed appear to be key considerations in the expansion plans for the supermarket chains as reported in the public documents for the listed chains.

However, GDP average levels and growth rates are not the only factors that affects internationalisation. Countries with high GDP growth rates have not necessarily had the highest store growth rate. For instance, countries such as Mozambique, Mauritius and Tanzania have slow growth of supermarkets despite high GDP growth rates, although these generally have lower GDP average levels. Others, like Zambia, have relatively low levels of GDP on average, but have seen high growth rates (Table 1).

Table 1: GDP per capita average levels and growth; average urbanisation, 2007–2017

	Average GDP per capita (2007–2017, constant 2010 US$)	GDP per capita growth (annual %) Average 10yrs (2007–2017)	Average urban population % (2007–2017)	Urban population growth (2007–2017 average annual %)
South Africa	7418	0.8	63	2.1
Botswana	6892	2.4	64	3.6
Zambia	1501	3.2	40	4.2
Zimbabwe	956	2.1	33	1.6
Namibia	5508	2.0	44	4.3
Tanzania	761	3.5	30	5.5
Lesotho	1224	3.2	26	2.9
Mozambique	454	3.3	33	4.4
Mauritius	8605	3.8	41	0.0
Malawi	460	2.3	16	3.9
Angola	3622	2.4	61	4.7

Source: World Bank Open Data.

Rising urbanisation levels are also claimed to be a driver of both supermarketisation and internationalisation (Reardon, Timmer and Berdegué, 2004; Tschirley, 2010). Aspirational consumption as a result of higher urban incomes and upwardly mobile consumers with changing consumption patterns has spurred retail investment in Africa (Abrahams, 2009). Table 1 above also shows the proportion of urban population for selected SADC countries. South Africa and Botswana have the highest proportions of urban population, followed by Angola. Angola has also had high urban population growth rates (between 2007 and 2017). Only one large chain from South Africa, Shoprite, has grown strongly in Angola, while the other chains have not entered or have a minimal presence. In Tanzania, there is a relatively low proportion of urban population, but one that is growing fast. However, there has been very slow growth of modern retail in the country.

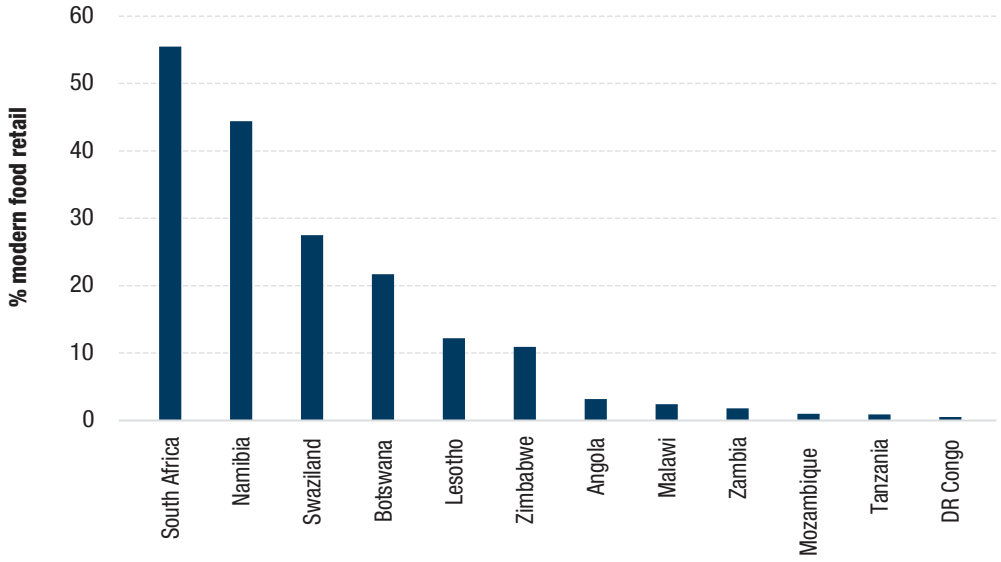
Related to urbanisation, population levels and growth are also considered important factors by the retailers. Growing population means a growing customer bases, and with a combined population of over 900 million (excluding South Africa in 2015), sub-Saharan Africa is clearly attractive. Yet the most populous countries in Africa, like Nigeria, have not seen significant growth of modern supermarkets. Therefore, other factors such as culture, local policies and political economy issues, and proximity to suppliers are important in explaining some of the trends seen in the region. These are discussed in Section 3.1 and 3.2 below.

Spread of supermarkets in South Africa

South Africa has the most advanced grocery retail sector in the Southern African region. It is estimated that supermarket chains hold over 70% of the formal grocery retail segment, with the South African supermarket chains, Shoprite Holdings, Pick n Pay Stores, the SPAR[43] Group South Africa and Woolworths Holdings collectively holding a market share of 72% based on turnover figures for 2015 (Competition Commission, Grocery Retail Market Inquiry, 2019). The balance is held by relatively new entrants Fruit and Veg City (Food Lovers Market), Botswana-owned Choppies and Walmart-owned Game and Cambridge. Other estimates for 2015 (see Figure 1) suggest that modern food retail accounts for a lower 56 per cent of total food expenditure in South Africa (calculated as the percentage of all supermarket sales, both chains and independents, over total food expenditure). Rough shares based on number of stores also show that the main chains hold over 70% of the national market (see Figure 3; das Nair, 2017). Namibia can be seen as an extension of South Africa as it was under South African administration until March 1990. The relatively higher levels of food share through modern formats for Namibia in Figure 1 below are reflective of this, with a strong presence of South African retailers present.

The other countries in the region started their supermarketisation much later than South Africa (as part of the fourth wave identified in the literature), and the internationalisation into selected countries has essentially been mainly about the expansion and extension of South African supermarket chains into these countries.

Figure 1: Modern food retail share in selected countries in Southern Africa, 2015



Source: Formalising African Retail, Sagaci Research, 2017 (underlying data AfDB, IMF and World Bank and Sagaci Research).

Data on South Africa show that the share of packaged food going through formal supermarket and hypermarket channels decreased from 69.7 per cent in 2003 to 65.2 per cent in 2017 (Euromonitor International, 2018), although overall share of sales of packaged food through modern retail channels has remained high in this period (around 80 per cent, but also declining, see Table 2). The share of

[43] Not all the SPAR franchises in the region are South African-owned. In Zambia and Zimbabwe, the licences are owned by SPAR International (Netherlands), although SPAR South Africa is increasing its shareholding in these countries.

'traditional' grocery retailers in packaged food also declined slightly over the period from 14.3 per cent in 2003 to 13.1 per cent in 2017 (Table 2). However, it has not been lost to supermarket and hypermarket formats, but to convenience stores and forecourts, which in South Africa, nonetheless also belong to the large supermarket chains. The growth of forecourts and convenience stores reflects the mature nature of grocery retail in South Africa. Similarly, in fresh food, the share sold through traditional grocery retailers increased between 2008 and 2017, accounting for around 40 per cent in 2017 from 39.4 per cent in 2008 (Euromonitor International, 2018). In both packaged and fresh food categories therefore, the share through supermarkets and hypermarkets has reduced over the period considered. In Table 2, independent retailers are shown under the traditional grocery retailers' category. The traditional grocery retailer category, according to Euromonitor International, is dominated by independent small grocers, but also includes specialist food, drink and tobacco retailers, independent small grocers and other grocery retailers. This also, at least partially, covers informal retail through spaza shops that buy from formal retailers such as cash and carrys and from wholesalers.

In South Africa particularly, but also in the region, there has been a general narrative in the last ten years that growing supermarketisation has been at the expense of independent retailers.[44] This Euromonitor data suggests that supermarketisation has already happened in South Africa, and is now slowing down, and that independent retail has remained resilient. Since the early 2000s, South Africa already had mature levels of supermarketisation. This maturity was reached early given apartheid economic planning with highly formalised economic structures serving mainly in white, urban areas. Traditional retailers and informal spaza shops were limited to township areas serving black communities during this time. Following the end of apartheid and zoning restrictions in South Africa, the formal supermarket chains took grocery retail closer to where majority of the population lived. This was seen through their spread into township, peri-urban and even rural areas. The share of food sold through supermarkets, however, did not necessarily increase as a result of this from the early 2000s. Supermarkets and hypermarkets already constituted a large proportion of sales of fresh and packaged food. What did evolve were the formats that the chains introduced in these areas to target lower-income consumers (see Table 3 below). This also led to the evolution of traditional independent grocery retailers to adopt alternative formats of retail through organising under buying groups[45] to compete with the new formats of chain supermarkets. Buying groups address some of the barriers to entry faced by independent retailers such as economies of scale in procurement and logistics, and advertising costs. These are an important alternative retail channel for both consumers and suppliers. While independent retailers have been resilient to some degree in cases where they have been supported by buying groups, these are not direct rivals to the full PQRS offerings of chain supermarkets and compete mainly with the lower-end format offerings of the incumbent chains in peri-urban and rural areas.

As highlighted in the literature review, these trends in supermarketisation are consistent with South Africa being part of the first or second wave of the supermarket revolution where shares of food retailing through supermarkets grew from 10–20 per cent to 50–60 per cent in the first wave and from 5–10 per cent to 30–50 per cent in the second wave between 1990 in 2004). The proportion of food sales through supermarkets and hypermarkets in South Africa was even higher than the literature estimated for the first wave with regards to the packaged food category. The declining supermarketisation in South Africa also points towards new market-seeking motivations for internationalisation, when there are limited growth prospects at home.

[44] See for instance, the terms of reference, submissions and testimony at the Competition Commission of South Africa's Grocery Retail Market Inquiry.

[45] The main buying groups - Buying Exchange Company, United Management Services, Independent Cash & Carry Group and Independent Buying Consortium - support many independent retailers under their respective banners.

Table 2: Share of packaged food sold through different retail channels in South Africa, 2003–2017

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Store-Based Retailing	**99.7**	**99.7**	**99.7**	**99.7**	**99.7**	**99.7**	**99.7**	**99.7**	**99.8**	**99.8**	**99.7**	**99.7**	**99.6**	**99.6**	**99.6**
Grocery Retailers	**94.3**	**94**	**93.8**	**93.6**	**93.5**	**93.4**	**93.2**	**93**	**93**	**92.8**	**92.6**	**92.4**	**92.1**	**92**	**91.9**
Modern Grocery Retailers	**80**	**80.1**	**80.1**	**80.1**	**80.1**	**80.3**	**80**	**79.8**	**79.6**	**79.6**	**79.4**	**79.3**	**79.1**	**79**	**78.8**
Convenience stores	4.9	5.1	5.2	5.5	6	6.3	6.6	6.7	6.8	6.9	6.9	6.9	7	7	7.1
Discounters	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
Forecourt retailers	4.9	5.1	5.3	5.5	5.7	5.7	5.7	5.8	5.7	5.7	5.7	5.7	5.7	5.7	5.6
Hypermarkets	5.6	5	5	5.5	5.6	5.8	5.8	5.7	5.6	5.6	5.6	5.7	5.7	5.7	5.6
Supermarkets	64.1	64.3	64.1	63.1	62.2	61.8	61.3	61	60.7	60.7	60.4	60.2	60	59.8	59.6
(Supermarkets + Hypermarkets)	***69.7***	***69.3***	***69.1***	***68.6***	***67.8***	***67.6***	***67.1***	***66.7***	***66.3***	***66.3***	***66***	***65.9***	***65.7***	***65.5***	***65.2***
Traditional Grocery Retailers	**14.3**	**14**	**13.7**	**13.4**	**13.4**	**13.1**	**13.1**	**13.2**	**13.3**	**13.2**	**13.2**	**13.1**	**13**	**13.1**	**13.1**
Food/drink/tobacco specialists	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Independent small grocers	9.8	9.6	9.5	9.4	9.6	9.6	9.8	9.9	9.9	9.8	9.8	9.7	9.8	9.8	9.9
Other grocery retailers	4	3.9	3.7	3.6	3.4	3.2	3	2.9	3.1	3.1	3.1	3.1	2.9	2.9	2.9
Non-Grocery Specialists	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Health and beauty specialist retailers	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other foods non-grocery specialists	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Mixed Retailers	**5**	**5.3**	**5.5**	**5.7**	**5.7**	**5.8**	**6**	**6.1**	**6.2**	**6.3**	**6.4**	**6.5**	**6.8**	**6.8**	**7**
Non-Store Retailing	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
Vending	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Home shopping	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internet retailing	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.2	0.2	0.2
Direct selling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Euromonitor International database, 2018.

Note: All grocery retail includes modern grocery retailers (convenience stores, discounters, forecourt retailers, hypermarkets, supermarkets) and traditional grocery retailers (specialist food, drink, tobacco retailers, independent small grocers and other grocery retailers).

Most of the supermarket chains in South Africa have diversified their formats to include hypermarkets, supermarkets, convenience stores at fuel forecourts, liquor outlets and fast food offerings, amongst others (Table 3). Except for Woolworths, which only targets high income customers, all the chains have extended their offerings to multiple branded formats of differing sizes, targeting customers at different income levels. The different formats leverage off a common base in terms of logistics,

distribution, sourcing and branding. Supermarket chains thus compete by offering a range of formats, with competition in any given market being between the stores of similar formats. The extent of different formats is more limited outside South Africa, highlighting the relative maturity of South Africa. This shows segmentation of markets, with fewer competitors within segments with the same formats. This has implications for competitive rivalry in given markets.

Table 3: Formats and offerings of the main supermarket chains in South Africa

	Shoprite	Pick n Pay	SPAR	Woolworths	Walmart/ Massmart	Fruit and Veg City	Choppies
Formats:							
Supermarket	✓						
Hypermarket				x			
Low-to-middle income segment supermarket				x			
Wholesalers, cash and carry's, hybrids	x	x	x	x	✓	x	x
In store delicatessens	✓	✓	✓	✓	✓	✓	✓
Convenience store at fuel forecourts	x	✓	✓	✓	x	✓	x
Offerings (in addition to groceries and/or as separate outlets):							
Financial and other services	✓	✓	✓	✓	✓	x	✓
Fast food outlets	✓	✓	✓	x	x	✓	✓
Liquor outlets	✓	✓	✓	x	✓	✓	x
Furniture	✓	x	x	x	✓	x	x
Clothing	✓	✓	x	✓	✓	x	✓
Pharmacy	✓	x	✓	x	x	x	x
Other (electronics, DIY)	x	x	x	x	✓	x	x

Source: Websites and annual reports. Supermarkets and hypermarkets include food, general merchandise and personal care.

Spread of supermarkets in Southern Africa

The saturation of supermarkets in the South African market provides motives for the internationalisation of South African chains. The infiltration of multinationals and transnational retail chains from other countries outside the region has however not been as significant in Africa as the early literature predicted. Only three of the top 20 global grocery retailers (Coe and Wrigley, 2018) – Walmart, Carrefour and Casino – were present in Africa in 2018, with only one chain – Walmart – in Southern Africa. Carrefour, Metro and Casino are further operational in other parts of Africa, although to a very small degree. Walmart acquired an existing store network through its takeover of South Africa's Massmart in 2011. The number of grocery retail outlets of Walmart is still much less than the South African chains and in fewer countries in the region. Its expansion into the continent in terms of supermarket offerings has been limited. Instead, in Africa, it is mainly a handful of supermarket chains from South Africa and Kenya that have spread in the Southern and East African regions respectively.

South Africa, Botswana, Zambia and Zimbabwe were selected for the UNU-WIDER research. In the Southern African region, most supermarkets are South African-owned. Therefore, an evaluation of the South African supermarket sector is an appropriate starting point to understand dynamics in the region. As the only other African multinational chain in the region, Botswana's Choppies Enterprises has entered and grown rapidly in SADC in the past 10 years, recently entering East Africa. Its growth

trajectory provides insights on internationalisation, as well as barriers to entry. Zambia has seen relatively fast-growing GDP, with a growing presence of South African supermarkets. This growth of foreign chains highlights the relatively low barriers to entry for supermarket chains in Zambia, including limited competition and few restrictions to FDI. Zimbabwe is studied given the relatively weak presence of South African supermarket chains, despite it being an immediate neighbour to South Africa. The reasons for this are discussed below and include political economy considerations.

Table 4 shows the main chains operating in Southern Africa and their ownership. What is seen is more a 'regionalisation' of mainly South Africa chains and more recently, Botswana-owned Choppies in the SADC region (see also Barrientos et. al., 2016; Crush et al., 2017). Transnational chains like Walmart and SPAR International, although present, have not grown as rapidly as the South African chains and Choppies.

Table 4: Formal supermarket chains operating in selected Southern African countries and their ownership

Botswana	South Africa	Zambia	Zimbabwe
Ownership: South African			
Shoprite	Shoprite	Shoprite	
Pick n Pay	Pick n Pay	Pick n Pay	TM/Pick n Pay – Zimbabwe/SA JV
Food Lovers' Market	Food Lovers' Market	Food Lovers' Market	Food Lovers' Market
Woolworths	Woolworths	Woolworths	
SPAR Group	SPAR Group		
Ownership: Global			
Game/Walmart – USA	Game and Cambridge/ Walmart – USA	Game – USA	
		SPAR International – Netherlands	SPAR International – Netherlands
Saverite (Walmart) – USA		PoundStretcher – UK	
Ownership: Other African			
Choppies – Botswana	Choppies – Botswana	Choppies – Botswana	Choppies – Botswana
Shoppers (Sefalana) – Botswana (only national)		Melissa – Zambia (only national)	OK Zimbabwe – Zimbabwe (only national)
			Food World – Zimbabwe (only national)

Source: Author's own compilation from annual reports and interviews

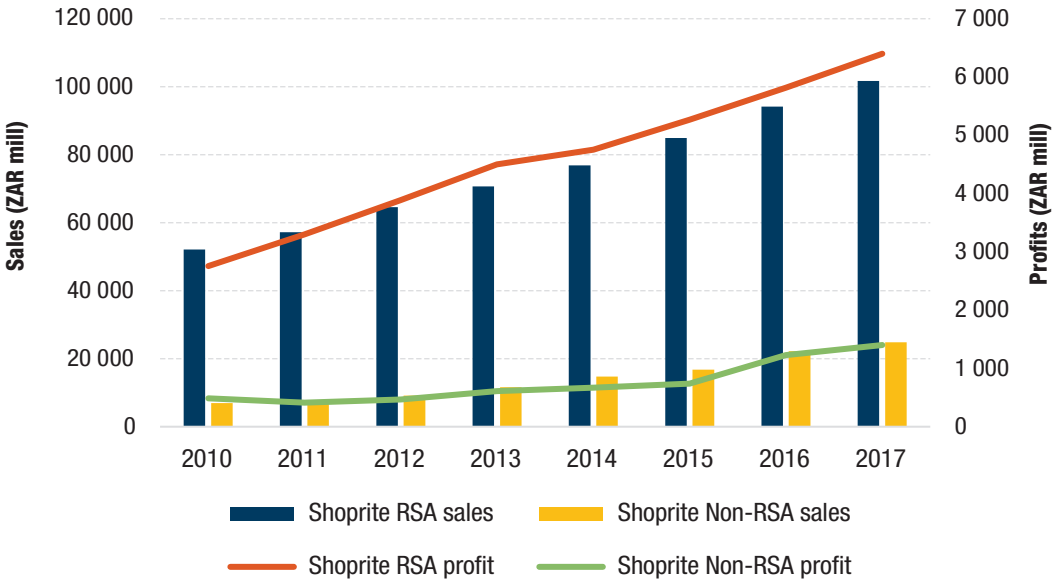
As described in Section 2, in the early 2000s, it was predicted that global multinationals supermarket chains would enter Africa by around 2010. While US' Walmart indeed entered Southern Africa in 2011 through the acquisition of South African Massmart Holdings, its entry in grocery retail through its Game and Cambridge store network has been relatively recent. The growth of these stores has also been very limited, especially outside of South Africa.

Regional supermarket chains have been more successful in Southern Africa than transnational retail chains. This suggests that there may be specific location advantages that have allowed regional supermarket chains to grow more rapidly in the region. One such location advantage is the proximity to strong supplier networks in South Africa, built over many years by the South African chains, around which sophisticated distribution systems and supply networks have been developed. The South African chains import significantly from their suppliers in South Africa for their store networks in the region as seen in regional trade flows assessed in Section 4.1 below.

Other factors that have affected internationalisation in Southern Africa include local policies and political economy dynamics. These have clearly affected the pace of internationalisation in the region. For instance, policies like the indigenisation requirement in Zimbabwe to have 51% local ownership of FDI under the 2011 Indigenisation and Economic Empowerment requirement (Chigumira et al., 2016) impact how easily multinational retailers can enter and grow in Zimbabwe. South Africa's Pick n Pay therefore has had to enter through a joint-venture with Zimbabwean chain, TM Supermarkets. Similarly, the national protection of certain local food industries, like cooking oil or poultry, and 'soft' local content policies in some of the SADC countries limit the ability to expand if there is lack of local production capacity. Political economy dynamics, such as preferential treatment towards certain players by governments (which has included import tariff and tax concessions, amongst other favourable treatment towards certain chains in the selected countries) or lobbying by powerful interest groups for support for specific industries further has an impact on the pace of spread.

Shoprite Holdings is the largest chain in terms of store numbers and revenue in the region. While having grown in terms of store numbers and revenues outside South Africa (Figure 2), it has not grown significantly beyond the region.

Figure 2: Shoprite's South Africa and non-RSA supermarket sales and profits, 2010– 2017



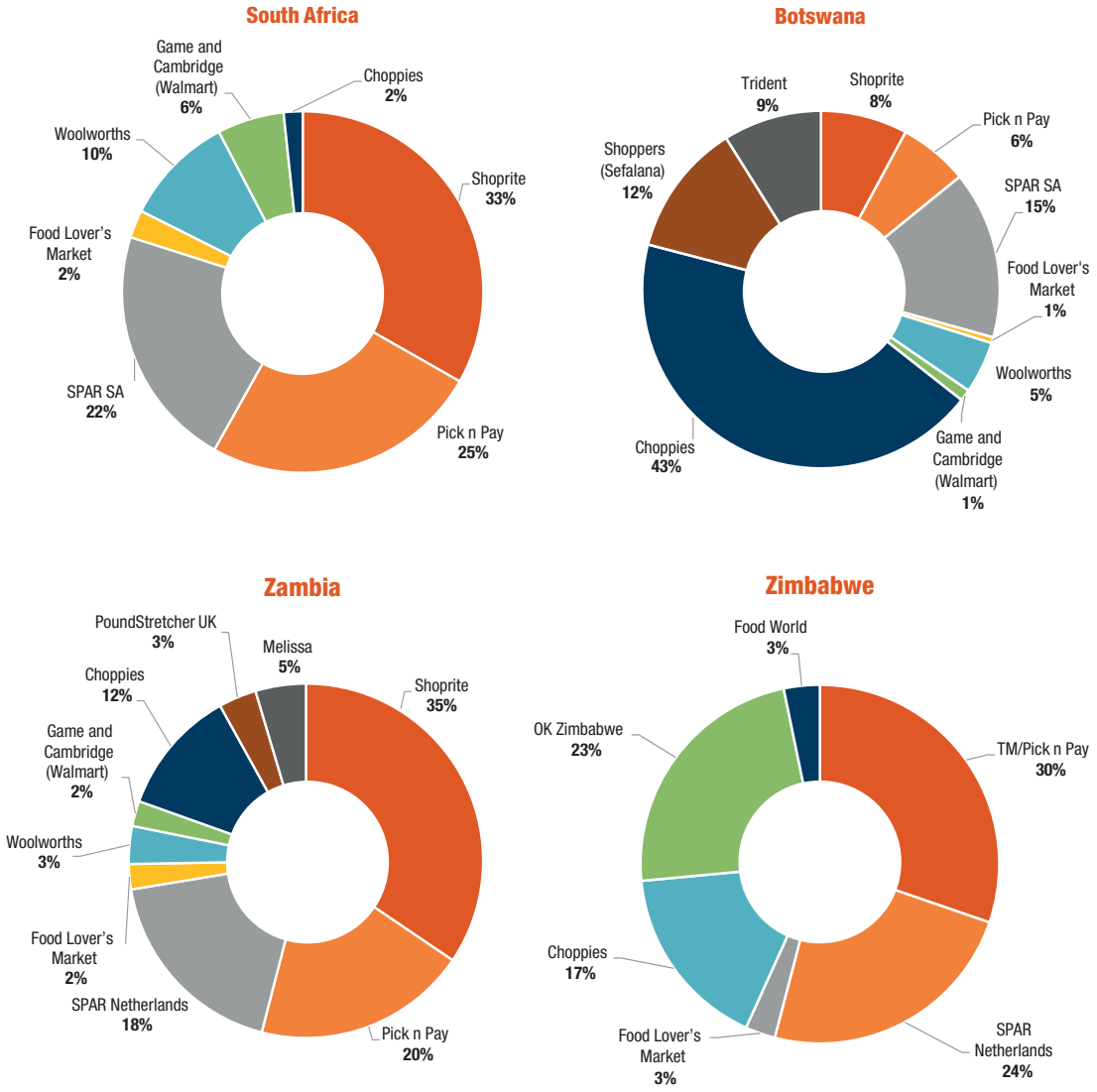
Source: Shoprite annual reports.

Note: The sales figures represented by bars are on the primary (LHS) axis, while the profit figures represented by lines are on the secondary (RHS) axis.

Estimated proportions of supermarket chains in terms of store numbers in each of the selected countries is shown in Figure 3 below. South African supermarket chains accounted for significant proportion of the number of supermarket stores in selected Southern African countries (Zambia (59 per cent), Botswana (35 per cent) and Zimbabwe (33 per cent, although this is through the TM JV)[46] in 2017.

[46] Revenue or sales data by country for each supermarket is a better measure of relative size in each country. This data is, however, not consistently publicly available per country for all supermarkets.

Figure 3: Proportion of stores of formal supermarket chains in selected Southern African countries, 2017



Source: Author's own compilation from annual reports and interviews.

Note: These only include grocery retail outlets of the chain as far as possible. It also does not include independent retailers and retailers under buying groups.

Figure 3 however does not show the extent to which independent retailers, both formal and informal, participate in these countries. The formal independent and informal retail landscape in each country differs widely.

4. THE ROLE OF SUPERMARKET CHAINS IN DRIVING REGIONAL TRADE PATTERNS, AND THE IMPACT ON COMPETITION AND SUPPLIER DEVELOPMENT

Impact on intra-regional trade

The expansion of supermarkets is driving important changes in the trade of food and household products within the region. Increased intra-regional trade reveals improving capabilities of suppliers as it shows that suppliers who are exporting have engaged in upgrading to meeting the standards and requirements of supermarket chains.

Table 5 uses trade data to show trends in export values from South Africa to the SADC region between 2001 and 2018. The products selected include those that are part of a typical basket of products that customers would purchase from supermarkets, such as fresh fruit and vegetables, fish and meat, processed food products like coffee, tea, milled products like maize meal and flour, cooking oils, sugar and confectionery, dairy products and beverages. It also includes household consumables like soaps and detergents. Cereals (such as wheat, rice, rye, barley, oats, maize, corn), although not processed to the degree of the products mentioned above, are also included.

A large proportion of supermarket products in Botswana, Zambia and Zimbabwe, and in the rest of the region, are imported from South Africa. Past studies have also highlighted this (see Emongor and Kirsten, 2009; Ziba and Phiri, 2017). The value of South African exports of supermarket products to the region has been growing, highlighting the importance of the region to South African suppliers. This is largely a result of the South African supermarket chains with store networks in host countries continuing to import from their established supplier bases in South Africa as they spread (see also Goldstein, 2003; Charalambides, 2013; Bronauer and Yoon, 2018). The rapid growth of South African exports into the region is closely linked to the supermarket take-off mainly South African chains which started in the early 2000s (concurring with past studies that claim that the growth of supermarkets is associated with increased trade of processed foods (Reardon and Weatherspoon, 2003)). This happens essentially through 'intra-firm' trade within supermarket chains, importing from South Africa mainly through their DCs located in South Africa.

Both Pick n Pay and Shoprite serve their stores in the region through massive DCs located mainly in South Africa. Shoprite's centralised distribution network enables the management of the supply of products to its stores across the continent. Choppies Enterprises also has five DCs across eight countries for groceries, as well as fresh and perishable produce DCs into which it imports products from South Africa and deep-sea sources. The rise of regional procurement systems by South African supermarkets stimulates intra-regional trade in SADC. As noted by Weatherspoon and Reardon, this is through 'essentially using the powerful logistical mechanisms of supermarket procurement systems to collapse the fragmentation of markets' (2003: 14).

As seen in Table 5, the compound annual growth rate (CAGR) of all exports from South Africa to the SADC region was around 12 per cent between 2001 and 2018. The growth of exports of a number of supermarket products (11 out of the 15) have matched or outstripped this average growth rate in all product exports.[47] There are obviously also other factors that affect these patterns of exports that are not directly linked to supermarket expansion (such as demand-side considerations, tariff and non-tariff barriers).

[47] It should be noted however that the use of CAGRs only offer very high-level insights on the trends in the growth in exports. There is considerable variation within years and a simple CAGR masks these nuances.

This trade however has generally mainly been one way, with South African supermarkets in the SADC region importing from their established supplier bases in South Africa. A key reason for this skewed pattern of trade is the lack of capabilities of suppliers in the host countries that South African supermarkets operate in, which negatively affects the reliability, quality and consistency of supply by local suppliers, as well as the ability to supply large volumes for all stores within the chain. This has been compounded by onerous requirements and buyer power of supermarket chains discussed in Section 4.3 below. South African imports of supermarket products are instead mostly from deep-sea markets.

The potential for large supermarket chains to be strong catalysts for more equal two-way trade in the region is substantial. This is especially the case for suppliers of value-added products in countries that have the potential to manufacture consumer products that are demanded in the region. Presently, trucks of the main supermarket chains leave South Africa full of products but come back to South Africa from the region largely empty.

There are also other reasons for this skewed trade. Tariff and non-tariff barriers impact trade of supermarket products. Despite the countries being part of SADC, each country pursues its own policies to protect respective national industries and local suppliers. These restrictions are a lever which can be deployed by governments, including in response to local lobby groups. These restrictions can take many forms, including local content requirements and trade restrictions. Local content policies require MNEs to source a minimum proportion of goods locally (Altenburg et al, 2016).[48] The different countries further have different import restrictions that serve to protect local manufacturing industries. Some of these import restrictions, such as duties and quotas, are put in place following heavy lobbying by powerful interest groups and in many cases, serve to support a handful of powerful producers/manufacturers. This affects the internationalisation of supermarkets, especially in countries where a large proportion of products is imported given very limited local manufacturing capacity and capabilities. In the selected countries, protectionist measures are strongest in Zimbabwe with high import duties levied on a range of supermarket products (such as cooking oil, maize meal, rice, salt and wheat flour). In Botswana and Zambia there have been outright bans on imports of poultry and maize meal, and other non-tariff barriers such as vitamin A fortification for sugar and non-GMO requirements for grain (in Zambia). While South Africa, Botswana and Zambia have 'softer' local content requirements for supermarkets, Zimbabwe's competition and tariff by-laws set a hard threshold that stipulate supermarkets are to procure at least 20 per cent of products locally (Chigumira et al. 2016).

[48] There are implications for enforcing local content and local sourcing requirements under World Trade Organisation (WTO) law. The significance of this on regional supplier development requires further research.

Table 5: South Africa's exports of supermarket products to SADC (2001–2018), Value in US$ thousands

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	CAGR
All products	3030030	3041804	3634628	4119952	5012936	5250319	6456586	8945898	7239417	19954518	22727881	23728310	23608438	23820684	20438773	18572435	20252990	21737888	12%
Fish and crustaceans, molluscs and other aquatic invertebrates	9866	9806	10469	11016	13941	19783	16670	12338	15596	41687	48579	48615	56839	52463	44411	42002	38361	39573	9%
Cocoa and cocoa preparations	4995	6685	8449	8447	15622	10837	11455	14342	18572	44541	51085	48090	44787	54176	49210	40847	50882	49580	14%
Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	4979	5483	6654	8399	7469	9728	9950	10579	12404	66063	77765	84494	76540	78754	72932	68981	82152	73362	17%
Coffee, tea, maté and spices	9866	7971	7130	9772	7503	10883	8364	12007	16972	83621	87109	95688	95575	100046	91576	86081	102511	108167	15%
Products of the milling industry; malt; starches; inulin; wheat gluten	27837	50166	29269	16808	112920	21379	18722	68246	94957	160462	176429	205043	227288	203204	171515	184881	160762	128553	9%
Edible fruit and nuts; peel of citrus fruit or melons	18098	23125	34082	38734	19537	31889	37735	38354	36731	138213	138650	143833	148637	137805	131678	122697	131121	139137	13%
Meat and edible meat offal	13904	16774	13400	10032	7681	8208	9935	16221	41868	201944	193711	170233	157038	185986	172732	154787	175702	156091	15%
Edible vegetables and certain roots and tubers	13881	15335	21635	20027	21088	25532	24892	27300	29626	153670	165357	163553	162321	166465	147980	162207	169277	165361	16%
Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal ...	25435	24409	27564	27861	27253	28397	27071	47351	99353	248927	335605	352457	268725	257174	228882	237125	224911	214925	13%
Cereals	40693	145064	137499	93132	217080	130162	31620	503497	172598	316581	349596	375667	444115	463105	344852	409920	300854	217808	10%
Preparations of cereals, flour, starch or milk; pastrycooks' products	14006	15419	18982	17291	16629	19936	26342	41782	57522	171586	199479	203585	209052	220515	200494	191213	220383	224273	18%
Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere ...	26461	37368	36059	29905	22352	27262	29900	46641	66705	223074	236418	258960	280101	286834	244831	205146	250156	238849	14%
Preparations of vegetables, fruit, nuts or other parts of plants	15026	18881	25471	24590	26953	31065	36762	52127	73641	233760	245016	240168	231677	258489	242304	220540	247042	256120	18%
Sugars and sugar confectionery	70761	73574	91120	86193	46354	104842	111168	108989	138065	373485	351624	350418	409855	331744	234392	206091	243066	276244	8%
Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial ...	56779	48157	61930	64200	69499	83161	77051	106935	141856	364099	429195	420413	440065	401602	381253	339911	388223	406801	12%

Source: TradeMap (based on UN Comtrade)

Impact on competition

Notwithstanding the slower than expected internationalisation, the spread of supermarkets in the region has impacted the competitive dynamics in markets and has had significant implications for consumers and suppliers. In turn, the pace of internationalisation and supermarketisation has also been affected by competitive dynamics in markets.

In South Africa, the exertion of market power of the large supermarket chains has been an area of concern for competition authorities. In South Africa, the Competition Commission (CCSA) undertook a Grocery Retail Market Inquiry (GRMI) looking into various concerns of market power. Even prior to the inquiry, complaints were lodged against the large supermarket chains engaging in strategic behaviour to maintain their first-mover advantage. This was mainly with respect to 'locking in' of lucrative store sites by entering into long-term exclusive leases with property developers in shopping malls.[49] Following such complaints and other concerns, such as buyer power of supermarkets and the displacement of independent retailers in townships, the CCSA investigated this as part of the GRMI.

The use of exclusive leases in shopping malls is a historically widespread practice in South Africa. Supermarket chains enter into leases in prime shopping locations with property owners that contain exclusivity clauses. This prevents new entrants from locating in these retail spaces, limiting their ability to enter or expand. An outcome of incumbency advantages and path dependency, this conduct acts as a barrier to entry and expansion and entrenches the position of the incumbents. The first movers who are able to access mall space secure themselves against competition in that space by entering into such leases as anchor tenants in that mall. This allows them to grow at the expense of rivals, thereby making it easier to secure other lucrative retail spaces in the future.

Competition concerns around this practice have been exposed both by large supermarket chains and by smaller independent retailers alike. Fruit and Veg City lodged a complaint to the CCSA on not being able to access mall space for this reason when it started growing in the early 2000s. More recently, complaints were lodged by Walmart's Game on being refused to expand into grocery retail offerings (from its previous model of only non-grocery offerings) in malls in which the incumbent anchor supermarket tenant had exclusive leases in place.

Neither Fruit and Veg City nor Game was successful in winning these complaints before the competition authorities. This is as a result of the way the Competition Act has been interpreted in the past and the emphasis that the authorities have placed in proving substantial effects of the conduct on end consumers often only through price effects. Complainants are often not able show that their exclusion results in a substantial lessening of competition in terms of higher prices. Limiting the scope of effects on consumers to just this is a static and narrow approach and dismisses the importance of the process of effective competitive rivalry itself and the potential for new chains to enter and grow to be even more effective competitors to the incumbents in the future. Non-price dimensions in which supermarkets compete such as location, format, range, quality, convenience, ancillary offerings, a one-stop-shopping experience, ambiance and others, are not considered when only looking at price effects. As discussed under Table 3 above, markets are segmented by format, with similar formats competing more closely with each other. While large incumbents are likely to be able to offer lower prices than new entrants and independent or specialist retailers given economies of scale, this is only one dimension of offering in the PQRS bundle. New entrants and independent retailers may be able to effectively compete on other dimensions. Further, the significance of 'mall culture' in South Africa, and the costs of transportation, may mean that a mall is a relevant market on its own for antitrust purposes. Exclusive leases that incumbent supermarkets enter into have the effect of preventing entry in a given mall, potentially undermining the dynamic process of competitive rivalry.

[49] Competition Commission Media Release: Competition Commission findings of the supermarket industry probe, 27 January 2011. See also: http://www.compcom.co.za/wp-content/uploads/2015/03/Competition-Commision-January-Newsletter-WEB.pdf

The ambit of the GRMI is however wider than applicable provisions of the Competition Act currently, allowing it to address conduct that has an adverse effect on competition if any feature, or combination of features, prevents, distorts or restricts competition in that market. Indeed, the 'first-mover' advantage of supermarket chains into malls, and the subsequent lock-in of these spaces, has recently been found in the Commission's preliminary Inquiry report to have resulted in the distortion of competition. This includes hindering the entry and expansion of smaller 'challenger' retail chains and independent stores, including specialist retailers. The bargaining power of the large supermarket chains means they have been able to require exclusive leases with property developers which have effectively made the chains the custodians of retail development within malls in South Africa. The Inquiry found that exclusive leases reinforced the high levels of concentration in the formal retail segment; entrenched incumbency by the national supermarket chains; and raised barriers to entry for small and independent retailers. The exclusion of other retailers is compounded, as found by the Inquiry, by property developers being forced to transfer costs onto other retail tenants in malls as the large chains have the power to bargain for lower rental rates. This further increases the costs of access to malls for challenger retailer chains and independent stores, with widespread implications for broader economic participation.

Preliminary recommendations by the Inquiry include immediately ceasing to enforce the existing exclusive leases with respect to speciality stores, not including exclusivity clauses in new leases or extensions. and the phasing out over three years of any exclusivity clauses in existing leases with respect to other grocery retailers. These appear appropriate given the positions already attained by the major chains.

Relationships between South African property developers and supermarket chains extend throughout the Southern African region. It is often the same set of South African supermarkets and property developers that operate in the region, and similar concerns have emerged in other countries (for instance in Botswana and Zambia). This affects the pace of the spread of chains in the region. The Competition Authority of Botswana (CAB) has also inquired into practices that affect suppliers (Bagopi et al., n.d), as well as competition in retail and wholesale markets in Botswana (Mokubung, 2014). Emanating from a recommendation from the latter inquiry, the CAB subsequently undertook another inquiry into the nature and state of competition in the Botswana shopping mall retail property market (Bagopi and Daman, 2016). The Competition and Consumer Protection Commission (CCPC) of Zambia has also investigated conduct relating to supermarkets in shopping malls.

Impact on suppliers

Supermarkets have substantially affected food supply chains in the region – from their evolving procurement methods and requirements, to their negotiation of trading terms in supply agreements and private standards. Even with alternative retail channels present, supermarket chains are an important route to market in the region and play a gatekeeper role for suppliers of food and household consumable products in accessing wider national and regional markets.

As discussed in the literature review, this offers huge opportunities to suppliers to develop their capabilities. However, by exerting significant power and control over suppliers, large supermarket chains control production through setting and enforcing product and process parameters. Further controlling trading terms in the contracts with suppliers and exerting buyer power over them affects supplier margins and their ability to participate in supply chains.

The analysis here utilises both qualitative and quantitative data from a combination of primary data from field interviews and secondary data from trade and statistics databases. As part of the UNU-WIDER studies, over 170 tailored semi-structured interviews were conducted in Botswana, South

Africa, Zambia and Zimbabwe, with supermarkets, suppliers[50], wholesalers, independent retailers, industry associations, competition authorities and government departments. This included a survey conducted in Zambia by Ziba and Phiri (2017) on suppliers. Broad insights are further drawn from over 50 interviews in further studies undertaken for the Department of Trade and Industry in South Africa.[51]

Supermarket requirements

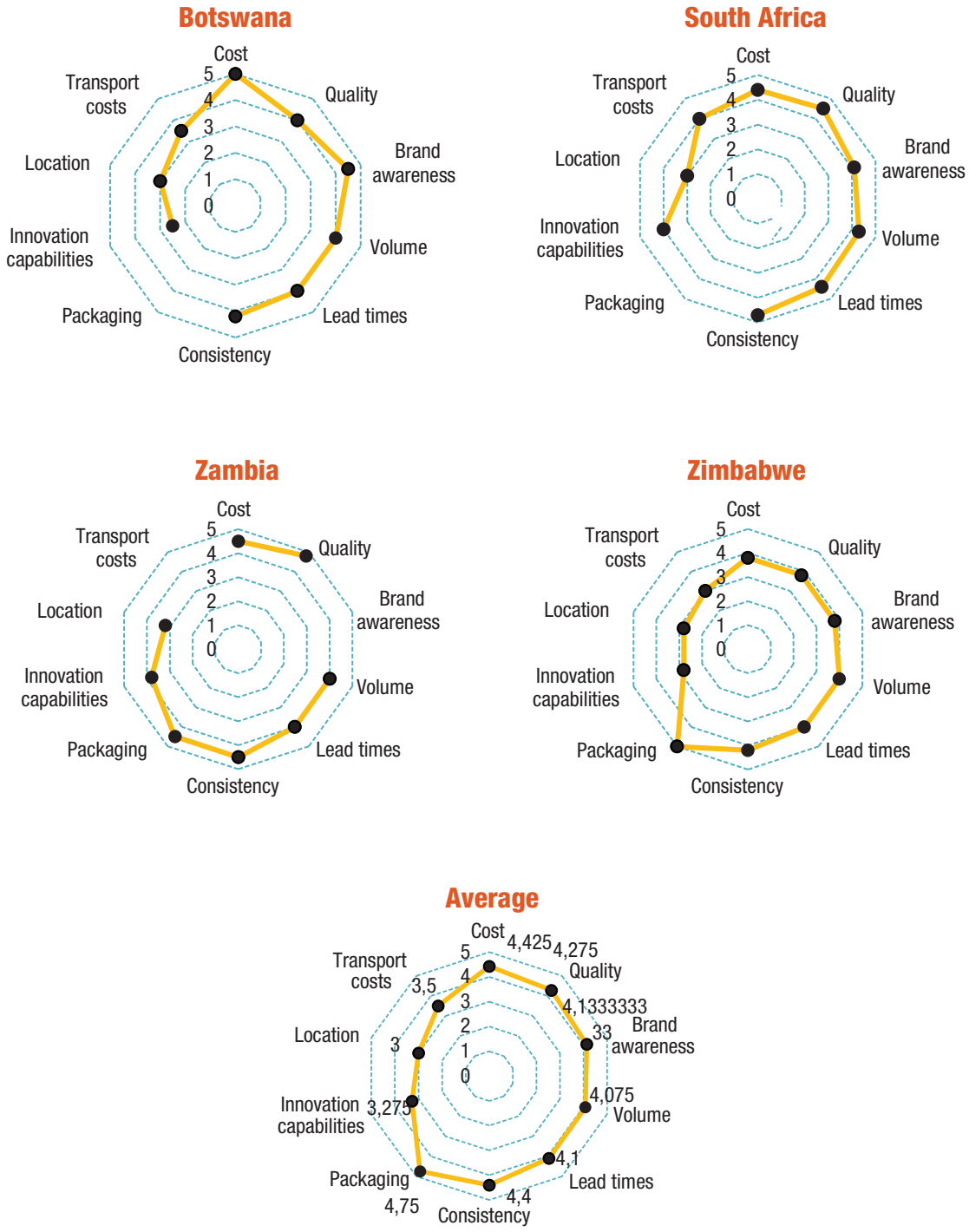
The interviews revealed the various requirements that suppliers have to adhere to in order to successfully supply supermarkets in Southern Africa. These can be understood as 'critical success factors' that need to be met to supply supermarkets. Supermarket chains are often the lead firms in food and other household consumable value chains and govern and shape requirements that suppliers need to adhere to.

In the UNU-WIDER studies, suppliers interviewed were asked to rank factors that were important requirements in supplying supermarkets on a Likert scale of 1 to 5 – with 1 being not important and 5 very important. Comparing these with what the supermarkets themselves consider to be important factors when they procure from suppliers helps in triangulating findings. Figure 4 shows the results in each country and on average across countries from the suppliers' perspectives and Figure 5 that follows shows results from the supermarket's perspectives.

[50] A range of different sized suppliers were interviewed to understand the respective challenges each group faced. Suppliers included fresh produce suppliers, millers, bakers, poultry producers, dairy producers, confectionery producers and light manufacturers of household consumable products (like soaps and detergents manufacturers).

[51] Das Nair, Nkhonjera and Ziba (2017), Bosiu, Chinanga, Das Nair and Mondliwa (2017) and Das Nair and Chisoro-Dube (2015b).

Figure 4: Critical success factors: Perspectives of suppliers



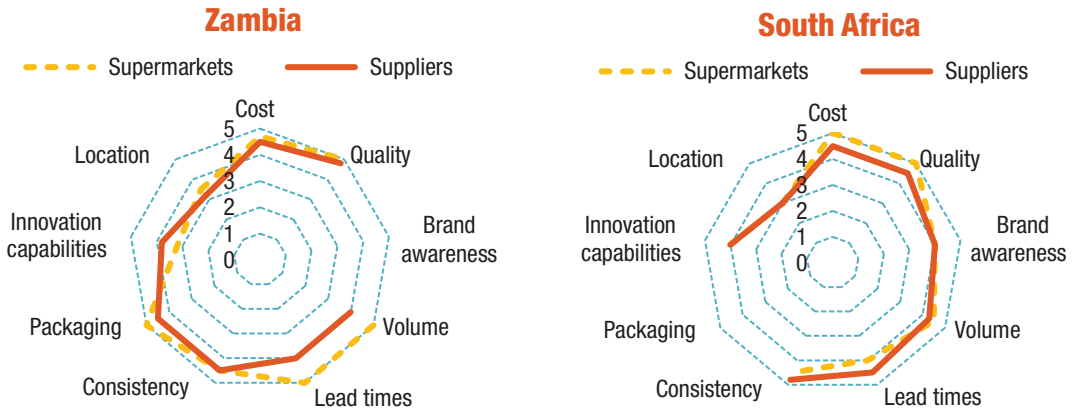
Source: Supplier interviews, 2015 and 2016. South Africa: N=11. Botswana: N=5. Zambia: N=48. Zimbabwe: N=15.

Note: Not all the suppliers provided answers to this question. In the case of Zambia, distance to supermarket is used as a proxy for location. The Zambian numbers include the survey.

Scale: 1 being not important and 5 very important.

Supermarkets on the other hand ranked most factors higher than suppliers did (on a 1 to 5 Likert scale) (see Figure 5 below). For Zambia and South Africa, the interviews collected comparable data from supermarkets. This data was however not consistently gathered from supermarkets in Botswana and Zimbabwe and results for these countries cannot be presented.

Figure 5: Critical success factors: Perspectives of supermarkets vs suppliers



Source: Supermarket and Supplier interviews, 2015 and 2016.

Note: Not all respondents provided answers to this question. In the case of Zambia, distance to supermarket is used as a proxy for location.

Scale: 1 being not important and 5 very important.

On average, the most important factors in supplying supermarkets from the perspective of suppliers was packaging, followed by costs, consistency and quality. From the supermarkets' perspective in South Africa however, cost and quality were ranked highest, and these factors were ranked higher than how suppliers ranked them. Lead times and consistency were ranked lower by supermarkets than by suppliers in South Africa, while the other factors were ranked similarly. In Zambia however, almost all the factors were ranked higher by supermarkets than by suppliers. Packaging, lead times, volume and quality were ranked highest by supermarkets. This suggests that there may be some information asymmetries between supermarkets and suppliers in Zambia, and that local suppliers might not be as in tune with what supermarkets are looking for or understand the importance of certain factors.

However, the average for packaging in Figure 4 (suppliers) is just for Zambia and Zimbabwe given that the suppliers in South Africa and Botswana spoke about packaging under innovation capabilities. This is because for these suppliers innovative solutions were found for problems in packaging. Given the larger sample size of suppliers interviewed including as part of the survey by Ziba and Phiri (2017) in Zambia, this result is important, and the significance of packaging was also emphasised by suppliers in Botswana and South Africa in their responses under investments in upgrading. Brand awareness, volume and lead times were also considered important. Innovation capabilities, transport costs and location were ranked as relatively less important.

Innovation in packaging was undertaken by a number of suppliers to continue to supply supermarkets. Supermarket chains are driving the need for local suppliers to invest in better packaging so that they can more effectively compete with imported products on shelves. Supermarkets, as part of their efforts to differentiate their offerings from their rivals, also drive packaging requirements. Investments in packaging are undertaken by suppliers across the spectrum – for high- and low-value products, high- and low-income targeting supermarket chains and by small and large suppliers. Packaging was also found to be a major constraint for suppliers of higher-value products

like soaps, cosmetics and detergents in South Africa and Zambia, especially for new entrants (Bosiu et al. 2017). It plays a very important role in shaping consumer preferences and driving sales in these markets given consumer loyalty. In product categories where there is a high level of brand loyalty especially from low-income consumers who have limited disposable income to test new brands, branding and packaging is critical. For new entrants in these product categories, substantial investment is needed to upgrade their branding and their packaging to gain loyalty for their product. Large players are also continuously upgrading their packaging capabilities to supply supermarkets.

Such investments in packaging build the capabilities of suppliers and improve their competitiveness even in global markets. It also builds linkages to third-party packaging firms if these capabilities are not developed in-house by suppliers. These and further linkages with suppliers of packaging materials, such as plastics, paper and glass, in turn develop industrial capabilities in upstream levels of value chains.

The ability to be cost competitive in the supply to supermarkets was also ranked highly as shown. The importance of cost is irrespective of the type of product supplied and whether supply is for a single store, nationally or regionally across multiple stores. Supermarkets place pressure on all suppliers to reduce their cost of supply. The cost to supply a product is dependent on many things, including the negotiation of trading terms, scale of production, costs of labour and raw materials, transport, and finance. Larger suppliers have an obvious cost advantage given scale economies. Supermarkets push suppliers to supply at the lowest price possible, yet they impose additional costs on suppliers making it difficult to achieve these lower prices (discussed under buyer power below). Being able to impose onerous trading terms highlights the power that large chains have in the value chain and how they can squeeze the margins of suppliers. Suppliers in the region have had to invest in various forms of upgrading to reduce costs and increase efficiencies to supply supermarket chains.

Quality and consistency of supply were also ranked relatively high by both supermarkets and suppliers. Supermarkets require suppliers who can supply consistently in terms of providing high-quality goods and in terms of being able to maintain consistent supply to all outlets. A concern in the countries in the region is that suppliers are not able to consistently supply stores in a chain, even if they are able to produce quality products. Erratic suppliers not only disadvantage customers who are loyal to the product but are costly in terms of the supermarket's reputation.

Basic quality standards are not set by supermarkets but by legislation. In terms of legal requirements, each country in the region has its own legal standards that suppliers have to adhere to. Some of these standards are enforced by the respective national bureaus of standards in each country such as the South African Bureau of Standards (SABS), Zambian Bureau of Standards, Botswana Bureau of Standards and Standards Association of Zimbabwe. Because the standards in the different countries are not harmonised across the region and with SABS, it is difficult for suppliers in the other countries to compete with South African suppliers for shelf space in South African supermarkets even in their own countries. Proving that their products are of equal standards to South African standards raises additional costs for suppliers in the region. This further creates barriers to intra-regional trade, skewing trade patterns from South Africa further. There is an even bigger gap between these local standards and international standards as discussed below, making participation in GVCs particularly hard.

There are also food safety, health and safety, environmental, packaging and labelling standards enforced through other regulatory bodies. In South Africa, these standards include legislation that governs the manufacture, sale and importation of foodstuffs, cosmetics and disinfectants with hygiene specifications. They deal with issues of hygiene at the point of production, general consumer protection and food safety. They also include the conditions under which food is stored, transported, maintained and consumed. Labelling and advertising of foodstuffs regulations were also introduced in March 2012 (Von Broembsen, 2016).

These are basic standards that serve to protect consumers and are essential for food safety. Whether suppliers supply supermarket chains or not, they have to adhere to these standards and therefore investments to meet these standards are not driven by supermarket chains alone. Suppliers to informal channels however sometimes flout these regulations.

Private standards however are set by supermarkets when they demand certain quality requirements that are over and above these basic legal standards. To adhere to these, suppliers have had to invest in processes, machinery and equipment, as well as safety and quality management systems. These can result in barriers to entry for suppliers.

Supermarket chains, particularly the South African chains, impose private standards on suppliers. In South Africa, supermarket chains often require that suppliers have HACCP (Hazard Analysis and Critical Control Point) accreditation, an internationally recognised system for reducing the risk of safety hazards in food. HACCP has been gazetted as part The Foodstuffs, Cosmetics and Disinfectants Act, but is not yet mandatory in South Africa. However, suppliers interviewed in South Africa are investing in HACCP to ensure that they can supply supermarkets that demand this. In Zambia, while HACCP is fully operational, it is voluntary and implemented only by large companies that can afford it, such as Trade Kings (Ziba and Phiri, 2017; Das Nair, Nkhonjera and Ziba, 2017). Such companies supply supermarket chains and have invested in HACCP because the benefits of complying enable their growth across the region. In Botswana, HACCP is on the list of standards although not compulsory. Again, certain suppliers in Botswana nonetheless have invested in it. In Zimbabwe, HACCP is compulsory, and like in Zambia, the costs of adhering to it are very high. In some cases, suppliers are taking it upon themselves to get higher accreditations such as FSSC 22000 (Food Safety System Certification), an international accreditation, to gain a competitive edge over local rivals and imports. Sizeable investments by a large confectionery producer in South Africa in the past ten years were made in improving quality standards, including investing in FSSC 22000 accreditation, and in new machinery and replacement capital. Estimates in 2016 in South Africa were that HACCP can cost as much as US$ 5,500 and FSSC 22000 can cost up to US$ 13,800 per annum, with additional US$ 6,900 annual fees for maintenance. Suppliers further have to consider investing in Local and Global GAP (Good Agricultural Practice) if they want to export to European supermarkets. In Southern African countries, a stepping-stone initiative, 'local GAP' is a more cost-effective solution for suppliers by providing an entry level to Global GAP certification.

For some supermarket chains, like Woolworths, even higher private requirements such as sustainable farming requirements under its 'Farming for the Future' initiative, are closely related to its niche positioning in the market and therefore are governed by its strategy. Some of these additional standards are demanded deliberately by supermarkets to differentiate them from rivals and is used as a competitive tool rather than to adhere to minimum regulations (Davis, Kaplinsky and Morris, 2018).

The costs of adhering to private standards imposed by supermarkets are mostly borne by the supplier, making it increasingly costly to supply formal supermarket chains, especially for small- and medium-sized suppliers. It is not always the case that suppliers are compensated for the additional costs in terms of higher prices and they still have to compete against cheaper imports. Independent retailers, on the other hand, often have lower, if any, private standards.

Some suppliers have nonetheless upgraded to meet growing supermarket quality standards in the region. This upgrading, as explained by Ponte and Ewert (2009), is not neatly captured in the traditional 'process' (producing more efficiently) or 'product' upgrading categories (moving into more sophisticated product lines) in the literature. Investing in accreditations involves improvements in production processes even when not necessarily producing higher-value products. The forms of product upgrading by suppliers that have served to reduce costs have also improved quality. Supermarkets' private standards on quality are driving these investments in value chains. This push over and above basic legal requirements allow suppliers to climb the ladder towards accessing export markets.

However, as interviews also revealed, most producers of food products in the countries assessed can only afford to adhere to their local/national minimum-required quality and food safety standards as the interviews revealed. Significant investments are required, and suppliers with scale are better able to spread the fixed costs of investments.

Another critical factor is being able to supply sufficient volumes across multiple stores in the networks of supermarket chains. Suppliers have to have sufficient scale to meet the demands of all stores in a chain. Needing to increase volumes of production is an important aspect that has been amplified by the spread of chains and by the changes in procurement practices of the main chains through DCs. These two features of modern supermarket chains– the requirement to supply all/most outlets of corporate supermarket chains to maintain consistency of offerings and the centralised procurement methods that support this – has put pressure on suppliers to grow volumes to supply a much larger regional store network. This makes it difficult for small suppliers and new entrants to start supplying supermarket chains as they often do not yet have sufficient scale to supply all outlets nationally.

Acceptable lead times, although scored relatively highly by supermarkets in Zambia, were scored lower on average by supermarkets in South Africa and by suppliers. Short and accurate lead times are important for forecasting and replenishing stock and is especially important for fresh products with short shelf lives (bread, fresh milk, fresh fruits, vegetables and poultry). A higher proportion of these types of products thus tends to be sourced locally rather than from other countries in the region. Past studies have found that supermarkets source majority of their fresh produce locally (Fessehaie et al, 2015b; Ziba and Phiri, 2017) and that supplying supermarkets has had a positive impact on the incomes of small-scale farmers in countries like Zambia (Emongor and Kirsten, 2009).

Linked to both lead times and costs to supply are issues of transport costs. Location of suppliers relative to supermarkets and transport costs were ranked as a relatively less important factor in supplying supermarkets or distribution centres. Yet, location of suppliers clearly affects logistics costs in the supply chain. The suppliers essentially have to absorb any transport cost disadvantages they may have relative to their competitors. Depending on supermarket requirements, suppliers either deliver directly to stores, DCs or third-party warehouses affiliated with transport companies. In some cases, large suppliers noted that they were forced to use the supermarket-nominated transport company. Other suppliers internalise transport cost by owning their transport fleet. Suppliers who supplied multiple store outlets highlighted that delivering to a DC saved them considerable transport costs by delivering to a single destination. It is the supermarket chain that ultimately dictates what the delivery requirement is, and suppliers bear all the costs of transporting or distributing the product, highlighting again the degree of power the supermarket has in supply chains.

Brand awareness was ranked by suppliers on average the same as ability to supply sufficient volumes and lead times but considered less important by supermarkets in South Africa. Brand awareness is important amongst lower-income customers in the region. Such customers have little disposable income and are less flexible to try new brands, preferring to stick with tried and tested brands. A Nielsen Global Premiumisation Survey of 2017 shows that consumers moving up the economic ladder are attracted to aspirational brands that signal that they have achieved a certain level of success. Branded products provide assurances of quality and are less risky in terms of money being wasting on new products that may not fulfil expectations. This is the case in South Africa not just for premium electronics and clothing, but for supermarket products like meat or seafood, coffee and tea and dairy as the survey found (Koigi, 2017). Suppliers therefore have to invest significantly in building brand awareness and loyalty through advertising, promotions, free sampling, point of sale material, merchandising and marketing material. Branding is also closely linked to packaging as discussed earlier.

Innovation capabilities were considered relatively less important by suppliers and supermarkets although there was a recognition that innovation, either in product range or packaging, was important to maintain competitiveness especially with deep-sea imports. Forms of innovation undertaken by

suppliers in the selected countries included investments in packaging, investments in the quality of existing products and introducing new, more sophisticated higher value-added products. In the GVC literature this is also classified as product upgrading. Such upgrading occurs regularly in the dairy industry, with new flavours of drinking milk, milkshakes and yoghurts being introduced as part of the suite of products sold through supermarket shelves. In the poultry sector, in addition to supplying whole and cut chicken, poultry producers in South Africa have invested in plants to produce value-added, processed crumbed chicken and chicken nuggets. Poultry producers in Botswana have also invested in producing free-range chicken to cater for the needs of Woolworths and meat producers have invested in capital equipment in slaughterhouses. In the sugar confectionery sector, new concept sweets are being developed, for instance, flavours and colour that merge upon chewing to produce a new and distinct flavour. Even in the most basic commodity-type staple product like maize meal, there has been some innovation to create differentiated products by medium-sized players, for instance, pre-cooked and flavoured maize meal. Sophisticated upgrading has also happened in the South African fresh fruit sector in the form of higher value, new cultivars and varieties of fruit. There is strong institutional support for industries like fruit in South Africa to upgrade to meet international standards through industry associations. Innovation is also seen in forms of inter-sectoral upgrading, with firms moving into new productive activities.

Suppliers have had to invest in upgrading their capabilities to meet all these requirements. This has allowed some of them to attain scale and produce higher-value products, and in certain cases, better equipped them to enter global markets. However, investments in upgrading to meet the various requirements of supermarkets is not easy for all classes of suppliers. It is often large, multinational suppliers that are able to invest in such upgrading, or suppliers like in the fruit industry that have strong, coordinated institutional support. Upgrading requires capital for investment, and access to finance in the region is expensive (Banda, Robb and Roberts, 2015; Chigumira et al. 2016; Ziba and Phiri, 2017). There is also a lack of technical capabilities and skills in the region as highlighted across interviews and past studies. This has the effect of increasing concentration at the supplier level, with large lead firms that have been able to upgrade and increase their exports through supermarket networks in the region. Small- and medium-sized suppliers are often excluded from supermarket value chains and are limited to supplying alternative routes to market.

Supermarket buyer power

Upgrading and developing capabilities do not automatically ensure access to supermarket shelves. The exertion of considerable buyer power by supermarkets can, and has, resulted in the exclusion of suppliers in the region, irrespective of investments made. The interviews revealed the various ways in which, through the unbalanced bargaining power of large supermarket chains, buyer power can be exerted through trading terms.

In Southern Africa, supermarket chains, through trading terms, impose a range of discounts and other components that are subtracted from a list price. This reduces the prices that suppliers can ultimately get for their products and, in this sense, imposes additional costs (over and above the costs of production) on them. The following are the main cost categories that supermarket chains in South Africa charge suppliers (Table 6). Certain of these costs are also imposed by chains in the region.

Table 6: Categories of discounts, rebates, fees and allowances charged to suppliers by supermarket chains

Basic rebates (fixed percentage or variable volume based)	Slotting allowances
Advertising allowances or rebates (newspapers, TV, radio, pamphlets)	Swell allowances
Listing/Support fees	Joint product promotion allowances
Settlement discounts	Fridge space fees
Growth Incentive discounts	Channel allowances
Trade discounts	Efficiency allowances
Data sharing allowances	Category management fees
Merchandising allowances	National/Theme promotion fees
New store opening allowances	Distribution/Warehousing allowances
Wastage allowance/returns/backhaul fees	Quality assurance allowances
Shrinkage fees	Ad hoc spend

Sources: Interviews with suppliers; Elite Star submission and testimony of Shoprite employees at the GRMI.

The charging of certain categories of costs, such as listing fees, slotting allowances, advertising and promotional charges, in addition to a range of other charges, may be exploitative, without justifications provided for the magnitude of the fees and their relation to costs. Cumulatively, the various fees can add up to 10-15% off the price of the product sold to supermarkets, placing considerable strain on supplier margins. Negotiations of these terms are often skewed towards supermarket chains and can result in the margins of smaller suppliers being squeezed and in their exclusion from supply chains. In the UK and Australia, regulation specifically protects suppliers against such potential abuses (das Nair, 2019).

Suppliers of private label or house brand products to supermarket chains in the region also expressed concerns of buyer power. Private labels are becoming successful fast-sellers in Southern Africa as they compete with branded alternatives on price, value and quality, particularly for cost-conscious customers. Every major supermarket chain has a wide and growing range of private brand products. However, the relationship between the supermarket chains and suppliers of private label or house brands represents more captive or hierarchical governance structures in which supermarkets completely control the production parameters and margins that the suppliers can make. Once committed to producing house brands, this capacity is captive to the supermarket chain, so the suppliers' outside options to sell to are reduced. This increases the bargaining position of supermarkets which allows them to extract greater surplus from suppliers (OECD, 2008).

Exertion of buyer power can hinder upgrading efforts into higher-value products or into global value chains. Small- and medium-sized suppliers are often excluded from supermarket value chains and are limited to supplying alternative routes to market. While buyer power can lead to lower end prices, these may not necessarily be passed on to consumers given the high concentration at the supermarket level. The long-term effects of buyer power can result in suppliers exiting the market, which ultimately could lead to higher prices for consumers. While larger, multinational suppliers may have countervailing power, small and medium-sized suppliers are often forced to take the terms imposed on them by large supermarket chains.

The Competition Commission's GRMI in its provisional report also identified concerns with the buyer power of supermarkets. This dovetails with the amendments to the Competition Act now in force which target buyer power as a specific competition concern. The Inquiry recommended a code of conduct and a regulatory framework to oversee the grocery retail sector. This would include the appointment

of an ombudsman to act as arbitrator in disputes and refer cases of abuse of buyer power to the Commission. These proposed interventions are similar to what has already been implemented in countries like the UK, Australia, Namibia and Kenya. The UK has a Groceries Code Adjudicator (that oversees a mandatory code of conduct) and Australia has a Food and Grocery Code of Conduct (voluntary code), both of which followed inquiries by competition authorities. The Namibian Retail Sector Charter of 2016 which has provisions on how supermarkets should treat local Namibian suppliers, has been spearheaded by the Namibian government.[52] These initiatives all aim to deal with the unequal power dynamics between supermarket chains and suppliers, which can lead to the exploitation and exclusion of suppliers. Such moves need to be complemented by supplier development initiatives such as private sector-led programmes undertaken by various supermarket chains that have the potential to be scaled up and replicated in the region. Few countries have combined both behavioural conditions in a code of conduct with building of supplier capabilities through supplier development programmes. In the Southern African region, Namibia is the first country to do this formally through its voluntary retail sector charter. The Namibian government signalled its commitment from the inception and understood that, from its side, it would have to address infrastructure backlogs and the cost of utilities to assist suppliers. In this regard, there are several complementary investments by government, for instance, developing local barcoding facilities. Having a 'custodian' for the charter through the Namibia Trade Forum as the institution which oversees the workings of the Charter further assists with compliance and more concrete outcomes and reduces the risk of capture.

5. POLICY RECOMMENDATIONS

The growth of supermarket chains in the region creates opportunities for food processors and light manufacturers, providing great potential to stimulate and revive these industries. This is in line with objectives of the SADC Industrialisation Strategy and Roadmap (2015).[53] The trade patterns in selected food and household consumable products revealed the importance of supermarkets in driving inter-regional trade. Supermarkets can drive supplier development which can create mutually beneficial trade relationships in the SADC region, or indeed across the continent as envisioned under The African Continental Free Trade Agreement.

However, there are restrictions to such trade due to local content policies, import duties and import quotas that serve to protect national industries. Although local content initiatives have not always been strictly enforced and are at different stages of implementation in the different countries, they are not aligned with an agenda to develop suppliers to regional markets. If supermarkets are to become a key route to regional markets for suppliers, then the country-level policies and laws that currently exist need to be harmonised across the region with a wider view of developing regional value chains. Such policies could be specific to the supermarket industry, in which, for instance, governments and supermarkets jointly determine a proportion of space on supermarket shelves to be allocated to products manufactured within SADC. There are further benefits in harmonising standards across the region to create greater acceptance of products from outside South Africa.

Opening the region to trade alone is not sufficient to guarantee sustainable supply to supermarkets. Suppliers also need to continue to invest in building their capabilities to ensure they meet supermarket requirements. Successfully developing supplier initiatives requires a larger, long-term and commercially oriented approach by supermarkets in partnership with governments. Supermarkets must be intimately involved in designing, structuring and managing the programmes, as well as in identifying and developing the suppliers qualifying for the support. It cannot purely be financial support without any long-term capability development.

[52] For a study on the conceptualisation and impact of the Namibian Retail Sector Charter, see das Nair and Landani (forthcoming).

[53] Available at https://www.ilo.org/wcmsp5/groups/public/---africa/---ro-addis_ababa/---ilo-pretoria/documents/meetingdocument/wcms_391013.pdf, accessed in January 2018.

Public and private partnerships in investments in infrastructure developments, construction of distribution and warehouse facilities, and cold chains are also critical to support the initiatives of supermarkets. Suppliers selected as part of programmes need to make complementary investments to ensure that their products meet the requirements of supermarkets, with the goal of becoming self-sustainable beyond a certain size. Past research has suggested ways in which governments in the region can play a strong facilitating role in enabling investments. In the case of packaging for instance, which has been identified as a critical success factor, regional 'centres of excellence' for innovation in packaging material, prototyping and testing can be set up. Such facilities are critical particularly for suppliers to penetrate deep-sea export markets with stringent regulations on the testing of products (Bosiu et al., 2017).

Market failure in the provision of finance in the region is also a key barrier to entry for new players in grocery retail. The role of development finance institutions in providing this finance needs to be reviewed, in light of some of the structural and strategic barriers that new businesses face in the region.

The research further showed that supermarket chains in the region have significant buyer power, the exertion of which is seen in the negotiation of trading terms and the imposition of private standards. This results in additional costs for suppliers, thus squeezing their margins and limiting their participation in value chains. The international experience has shown that codes of conduct or a retail charter between suppliers and supermarkets are a useful way to control the exertion of buyer power and have been identified as an effective approach to level the playing field and reduce information asymmetries between suppliers and supermarkets. This has recently also been recommended by the Competition Commission of South Africa's Grocery Retail Market Inquiry. South Africa needs to adopt such a code of conduct for supermarkets, with an ombud to apply the code. This can build on existing codes, such as the Namibian Retail Charter, and extended to become a regional code to support regional suppliers given that it is largely the same retailers that operate in the different countries in the region.

Finally, municipalities, local government and the competition authorities also play important roles in actively fostering a competitive environment and opening up markets for a diversity of retail models. As shown in the research, a diversity of retail models and greater competition between and within formats, benefits both consumers and suppliers and reduces the risk of anticompetitive behaviour. Municipalities must ensure participation of independent retailers as part of rezoning processes. Local governments should encompass open and flexible retail space in planning to ensure a mix of formats. As it stands, there are limited or no policies or regulations specifically promoting inclusivity and growth of independent retailers although, in South Africa, the retail inquiry has raised awareness around these issues. Together with the long delays that are common in getting land rezoned for retail purposes by municipalities, the lack of clear policies to actively support independent players means that they are often excluded from the market.

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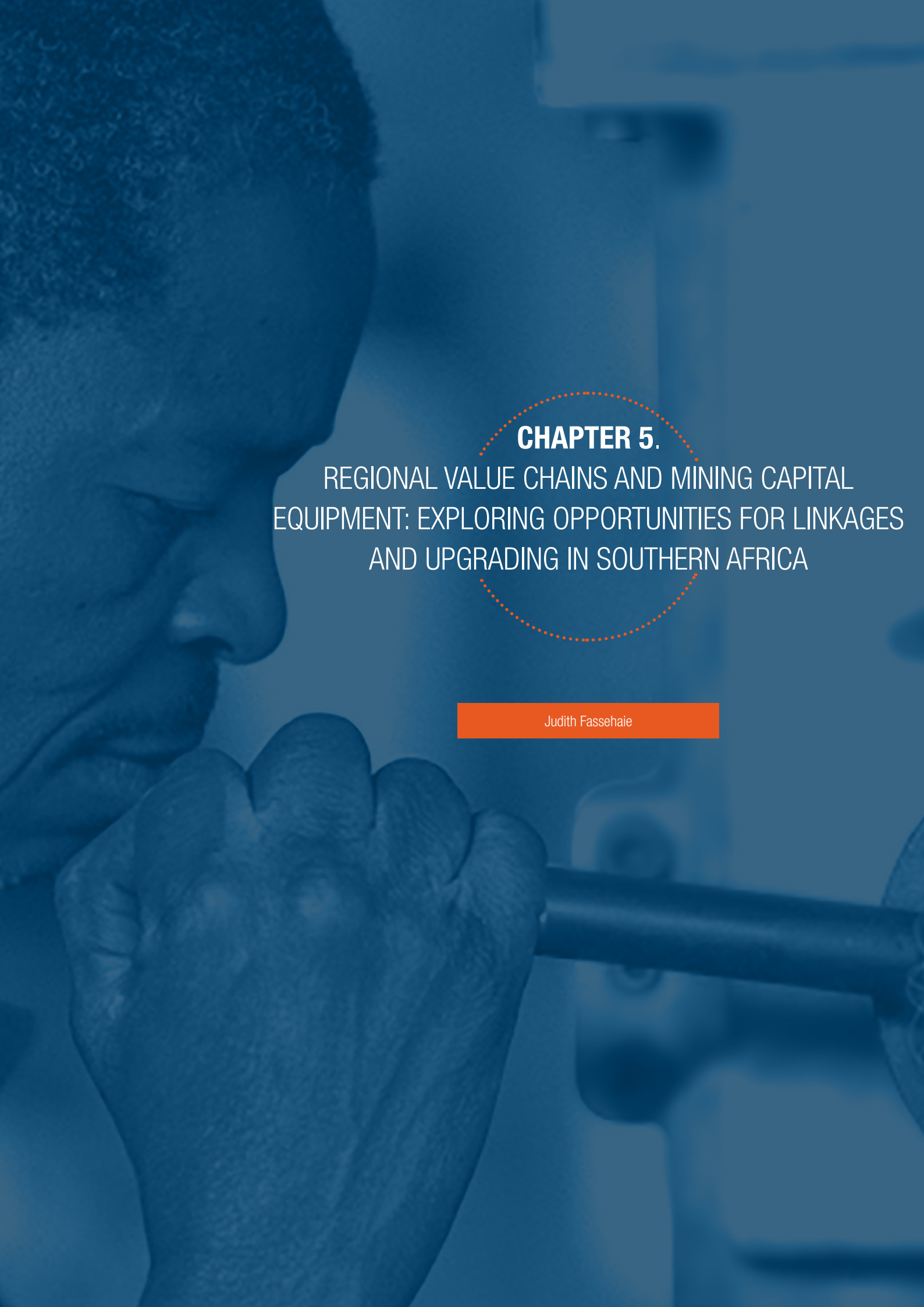


CHAPTER 5.
REGIONAL VALUE CHAINS AND MINING CAPITAL EQUIPMENT: EXPLORING OPPORTUNITIES FOR LINKAGES AND UPGRADING IN SOUTHERN AFRICA

Judith Fassehaie

1. INTRODUCTION

Global value chains (GVCs) underpin most of the world's production and international trade. GVCs encompass the different value-added links, composed of many activities, required to bring a product from conception and design to its delivery to the final consumer and, finally, to its disposal (Kaplinsky and Morris, 2001). Since the 1970s, the pace of geographical dispersion of these value-added links has accelerated, as lead firms have increasingly outsourced and offshored production across the globe. This fragmentation was made possible by technological advances in transport, communication, and production, as well as by trade and investment liberalisation.

Within this context, some developing countries have succeeded in participating and upgrading their roles in GVCs. The developing countries' share of global manufactures trade grew from 10% in 1980 to 45% in 2014. Most African countries however have been left behind and relegated to the bottom of GVCs (UNCTAD, 2016).

The last decade has witnessed important changes to organization and structure of GVCs (Gereffi, 2013). Industry concentration has increased, with many industries dominated by a handful of lead firms. Lead firms are also re-formulating their procurement strategies in favour of fewer larger and highly capable suppliers in large producer countries such as China, India, Brazil and Turkey. This change has increased consolidation on the supply side, with larger suppliers upgrading into pre-production services (design, R&D and purchasing) and post-production services (logistics, marketing, branding) (Appelbaum, 2008; Gereffi, 2013; Sturgeon and Kawakami, 2010). Industry concentration and tougher competition on the supply side make it even harder for African producers to participate in GVCs. More than ever, policy-makers have to design multifaceted strategies to promote industrialisation and job creation. This paper looks at the opportunities offered by regional value chains (RVCs), in particular the RVC for mining capital equipment in Southern Africa.

There are several reasons why policy-makers should consider the opportunities presented by the mining capital equipment industry. Since the late 1990s, FDI in Southern Africa's extractive industries have been significant, creating a large demand for engineering products and services. Several governments have adopted policies aimed at building domestic capacity in these areas. The mining capital equipment industry requires skills and productive supply chains which have the potential to deepen the value-addition and knowledge-intensification processes associated with mining investment. Moreover, these skills and productive capabilities can migrate laterally into other sectors. Finally, the Southern African Development Community (SADC) Industrialization Strategy and Roadmap has prioritised, among others, mining and the mining capital equipment industry. The African Mining Vision also envisages regional strategies to develop upstream linkages to the mining sector. This paper aims to analyse potential areas for regional cooperation, focusing on four SADC countries, namely Mozambique, Tanzania, South Africa and Zambia.

The paper is organised as follows: Section 2 discusses the reasons why African policy makers should pay attention to RVCs and the mining capital equipment industry. Section 3 presents key features of the global and regional value chain for mining capital equipment. Section 4 analyses productive capabilities, opportunities and challenges in the four countries, while the policy frameworks are discussed in Section 5. Finally, Section 6 concludes by discussing potential areas for regional cooperation.

2. REGIONAL VALUE CHAINS AND EXTRACTIVE INDUSTRIES

Opportunities in regional value chains

Regional value chains are characterised by a combination of intra-regional trade, regional investment and/or regional corporate ownership. RVCs entail two of more countries participating in different links of the value chain, which results in intra-regional trade in intermediate and final goods.

The regional dimension of GVCs is becoming increasingly important. In Asia, RVCs constitute competitive production platforms to supply global markets. For example, in the apparel and electronics GVCs, Taiwanese full-package suppliers to Northern buyers have outsourced labour intensive manufacturing to mainland China (Gereffi, 1999; Sturgeon and Kawakami, 2010). In Europe and America, respectively, Eastern and Central European firms have developed strong linkages to EU buyers, and Mexican firms to US buyers. In some industries, increasing production costs and longer lead times in China, and the need for closer relationship with suppliers, have led EU and US lead firms to favour regional sourcing (Bair, 2006; Ivarsson and Alvstam, 2010; Pickles *et al*., 2006). Finally, large emerging economies are increasingly focused on supplying regional markets in order to cope with the decline in demand from Northern markets, which had a disproportionately negative impact on producers of intermediate goods (Escaith, Lindenberg and Miroudot, 2010; Ferrantino and Taglioni, 2014; Gereffi, 2013).

RVCs are becoming strategically important for African policy-makers too. Traditional markets are no longer fast-growing, and are supplied by increasingly large, competitive and established suppliers. SSA's manufactured exports to developed economies fell from 5.1% of GDP in 2006 to 2.9% in 2013 (UNCTAD, 2016). Conversely, regional markets are important for value added exports. The bulk of Africa's exports consists of unprocessed commodities: 57% of total exports in 2014 (UNCTAD, 2016). Intra-regional exports however are composed of manufactures (43% of regional exports), and processed commodities (22%). Even if intra-regional exports are low (20% of total exports in 2014), they accounted for 42% of the manufactured exports growth in 2000-2014.

Regional demand is growing. Africa's urbanisation and high economic growth are underpinning fast-growing demand for value-added goods and services. Africa's middle class is larger, younger, more urbanized, and more embedded in the private sector than even before (Handley, 2015). Africa's urban population growth is the world's highest, at 3.55% in 2010-2015 (World Urbanisation Prospects, 2016). In absolute terms, by 2030, an additional 300 million dwellers will join today's 470 million. Over a quarter of the 100 fastest-growing cities in the world are now in Africa (UN-Habitat, 2014). At the same time, more than 20 African countries have graduated to middle income status in recent years (Resnick, 2015).

The rise of the middle class has a distinctive impact on both demand growth and composition. For example, in Eastern and Southern Africa, a seven-fold increase in consumption of high-value processed foods is likely by 2040 (Tschirley, Haggblade and Reardon, 2013). Indeed, major international consultancies identify supply to the growing middle class as Africa's top investment opportunity for global businesses (The Boston Consulting Group, 2014; Deloitte and Touche, 2013; Euromonitor International, 2016; PricewaterhouseCoopers, 2015). In the SADC region, high growth demand has underpinned the development of RVCs driven by South Africa's apparel retail chains (Morris and Staritz, 2014; Morris, Staritz and Barnes, 2011), supermarkets (das Nair and Chisoro, 2015; Weatherspoon and Reardon, 2003), and agro-processing corporations (Ncube, Roberts and Zengeni, 2016).

For most African countries, domestic markets are too small to support significant industrial upgrading and scale economies. They need to tap into growing regional demand and continue building on existing efforts to integrate regional markets. Africa's RECs have established institutional frameworks

for trade and investment liberalization, infrastructure development and regional industrialisation. These provide an important platform to deepen cooperation in industrial policy.[54]

RVCs can be particularly conducive to African firms' upgrading and risk diversification strategies. In GVCs, firms from developing countries have struggled to move into the most knowledge-intensive and profitable activities such as product design, marketing, branding and distribution (Bair and Gereffi, 2001; Giuliani, Pietrobelli, and Rabellotti, 2005; Humphrey and Schmitz, 2000, 2002). Conversely, regional markets are less demanding and less standard-intensive, they require less sophisticated branding and marketing capabilities, consumer taste tends to be similar to domestic markets, and there are established distribution networks. Information on prices and costs in neighbouring markets is also more easily accessible. Hence, regional markets may be more conducive to firms moving up the value chain. This has been found to be the case in a number of important value chains in Latin America, Asia and Eastern Europe (Bazan and Navas-Alemán, 2003; Navas-Alemán, 2011; Pickles *et al*., 2006; Sturgeon and Kawakami, 2010). Supplying RVCs is also a risk-diversification strategy for firms affected by slow growth of demand in the EU and US markets. In Eastern and Southern Africa, food producers that traditionally serve the EU supermarket chains have started supplying regional supermarket chains because of less demanding requirements of buyers and lower price volatility (Barrientos *et al.*, 2016).

Opportunities in the mining capital equipment industry

The potential to industrialise leveraging natural resources is often viewed with scepticism. The Dutch Disease and rent-seeking by political elites have been identified as the main culpable for this *natural resource curse* (Auty 2001; Sachs and Warner 1997). Nevertheless, some resource-rich countries did manage to pursue industrialisation successfully, by progressively diversifying their economic structures but also by developing industries that lie upstream and downstream to their resource sector. Because of globalisation and technological innovations, geographical proximity to resources, which played an important role in the past, is less relevant today. However, history suggests that there are factors which can be pivotal in fostering resource-based industrialisation.

In this respect, the experiences of Scandinavian countries, Australia, Scotland and the US provide key lessons for Southern Africa (Andersen 2012; Blomström and Kokko, 2007; David and Wright 1997; Raines, Turok and Brown, 2001; Wright and Czelusta, 2007). All these economies invested in domestic technological capabilities, in particular in engineering and technical education, training, and R&D. Over time, national systems of innovations emerged with strong linkages between research institutes, universities, extractive companies, and supplier firms. In the early stages, inflows of foreign capital and skills enabled technology and knowledge transfer which was made possible by previous investment in domestic capabilities. In Norway, state ownership of natural resources was strategically important to catalyse investment in domestic innovation and production capabilities. With time, these countries developed sophisticated capabilities in capital equipment and specialised services, which have often migrated to other industries or the export market. The opportunities for the development of downstream and upstream industries, which hinge on technological innovation, advancement of skills, and capital accumulation, are however country- and sector-specific (Andersen 2012; Fessehaie, Rustomjee and Kaziboni, 2015; Morris, Kaplinsky and Kaplan, 2012).

[54] REC-level industrial policies and strategies include the West African Common Industrial Policy, the East Africa Community (EAC) Industrialisation Strategy, the Common Market for Eastern and Southern Africa (COMESA) regional value chain strategies, the Southern African Development Community (SADC) Industrial Development Policy Framework, the Africa Agro-business and Agro-industry Development Initiatives (3ADI) and the Accelerated Industrial Development of Africa (AIDA).

Mining capital equipment covers a broad array of equipment to explore, extract, and process minerals. The industry is important for several reasons. Firstly, although it is a capital-intensive sector, there are significant backward linkages to metal fabrication and component manufacturing which open opportunities for job creation in small and medium sized firms. Significant job creation and value addition also take place downstream, in the aftermarket services sector, as discussed in the next section. Moreover, mining capital equipment is linked to the development of engineering and technical skills and can spur important technological innovation and adaptation capabilities.

Lateral migration of technologies to non-resource sectors can promote further manufacturing growth, job creation and technological advancement. Country experiences suggest there are opportunities for lateral migration, for example, into the agriculture, forestry and transport sectors (Tordo *et al.*, 2013). For example, after the 2008 crisis, copper mining companies cut procurement spending or suspended operations altogether. In response, engineering companies in Zambia diversified away from mining (Table 1). Firms moved into the construction, forestry, and utilities sectors. Government in particular was seen as a low-risk market. Other suppliers targeted Lafarge (cement) and Zambia Sugar, two of the largest non-mining corporations in Zambia, as well as oil marketing companies and breweries.

In South Africa, a company developed composite packs that reduced underground mining fatalities caused by rockfalls and seismic activity and were later used for anti-terrorism policing (Walker and Minnitt, 2006). In South Africa, the Statscan (formerly Lodox) system, a low-radiation full body imaging device initially developed to control theft by workers from diamond mines was later adapted to the medical industry for emergency situation x-rays (Altman, 2007).

Table 1: Market diversification strategies for selected suppliers

Sector	New target markets
Compressors and other capital equipment distribution	Oil marketing companies, industrial sectors
Electric products	Transport, government procurement, corporate and exports
Electric products	Breweries, oil marketing companies
Engineering products	Corporate, farming
Electrical engineering	Corporate
Equipment supplier	Corporate
Fabrication	Agriculture, transport
Gas products	Corporate, households
Hydraulic equipment	Transport, industrial hydraulics, farming
Limestone and hydrated lime	Sugar refinery, households
OEM equipment	Construction, forestry
OEM pumps	Water utilities
Steel fabrication	Utilities, oil marketing companies, government procurement
Steel fabrication	Construction
Wire manufacturing	Corporate

Source: Fessehaie (2012).

3. THE VALUE CHAIN FOR MINING CAPITAL EQUIPMENT

Global dimension

Capital equipment requirements vary by type of mining operation (open cast, underground) and project phase (exploration, development, extraction, material handling, and mineral processing). This research focuses on the demand for capital equipment in the operational phase of a mining project, namely material-handling equipment (load-haul dumps, articulated dump trucks), and mineral-processing equipment (crushers, grinders, pumps, valves, conveyors). The operational phase of a mining project requires a broad range of machineries and services and supports entry by a large number of suppliers at different levels of capital and skills intensity. This offers opportunities for entry by developing countries' firms. Conversely, mining exploration relies heavily on knowledge- and skill-intensive inputs provided by specialised suppliers of geo-chemical and geo-physical services. Mining design, construction and refining plants are usually sub-contracted to specialised project design consultancy firms and large mine construction contractors from a restricted number of countries.

As a general trend, mining corporations have been under pressure to reduce costs and increase productivity. During the 1980s and 1990s, and later after the 2008 economic crisis, this was a response to depressed commodity prices. Supply chain strategies determined the profitability of mining operations. Developing organisational capabilities to manage complex financial and production networks became even more important in light of increased internationalisation of companies. Just-in-time, total quality management and total cost management are the cost-saving managerial practices used in purchasing and supply chain management. The focus on Total Cost of Ownership (TCO) means that procurement decisions aim to reduce long-term costs inclusive of capital, maintenance and operational expenses. Supplier selection is not only based on the initial purchasing price, but also on product quality and performance, availability of aftermarket services and innovative features (such as energy- or labour-saving technologies).

On the supply side, three important changes have taken place in the last two decades. First, the industry has become highly concentrated, because global Original Equipment Manufacturers (OEMs) have pursued mergers and acquisitions as an avenue to acquire new intellectual property and innovation capabilities, expand their range of products, access regional markets and reduce competition. Few players dominate several product markets at global level. For example, Sandvik, Atlas Copco, and Caterpillar dominate the market for Load Haul Dumps (LHDs), trucks, drills and bolters (RMG and Parker Bay, 2012).[55]

Second, global OEMs are increasingly outsourcing manufacturing operations. Whilst IP-intensive components are still manufactured in-house, OEMs are relying on global supply chains for heavy fabrication work and standard components. Third, OEMs are characterised by a process of *servicification of manufacturing*, which refers to an increasing share of services used as inputs into manufacturing, either produced in-house or bought from third parties, and sold as a bundle with the physical products (National Board of Trade, 2010). Table 2 shows the services acquired and sold by the Swedish OEM Sandvik, a key player in the mining equipment industry. The company sources approximately 40 types of services, either in-house or acquired from third parties, and sells approximately 15 types of services. In 2011, 40% of Atlas Copco's revenues came from the aftermarket and rental/leasing division (National Board of Trade, 2010).

[55] Other important global players in mining and processing equipment are Furukawa (underground and surface drilling equipment), Joy Global (open-pit mining equipment), Komatsu (mining extraction and haulage equipment), Boart Longyear (underground and exploration drilling equipment, rock drilling tools), Metso (grinding mills), Weir Minerals (pumps and liners), Outotec and FLSmidth (grinding mills).

Table 2: Composition of services acquired and offered by Sandvik Tooling

SERVICES ACQUIRED
Legal services; Accounting, book-keeping etc.; Taxation services; Placement of personnel
Computer services; Educational services; Environmental services; Banking services; Insurances
R&D; Design
Advertising; Market research
Services incidental to manufacturing; Maintenance and repair; Energy services
Packaging; Printing; Publishing; Photographic services; Audio-Visual services
Courier services; Logistic services; Postal services; Telecommunications; Hotels and restaurants; Travel agency services; Maritime transport – freight; Inland waterways – freight; Inland waterways – freight; Air transport – freight/passenger; Road transport – freight/passenger; Cargo-handling services; Storage and warehouse services; Freight transport agency services; Feeder services
Rental/Leasing; Security services; Building cleaning services; Medical services; Health related services
SERVICES OFFERED
R&D; Design; Computer services
Rental/leasing; Financial services
Management consulting; Technical testing and analysis services; Services incidental to manufacturing
Maintenance and repair
Environmental services; Logistics; Warehouse services

Source: National Board of Trade, 2010.

Two types of services are particularly important: R&D and aftermarket services. OEMs have internationalised their R&D activities across the globe, including in emerging economies, and have formed technology alliances with the mining companies. Equipment manufacturers have become the key source of innovation in the industry, mainly in the form of incremental product innovation. Global OEMs allocate very large budgets to R&D in order to reduce TCO for customers, and deliver improvements in energy efficiency, operational productivity, worker safety and health, and environmental impact. OEMs are also increasingly expected to provide 'full-package solutions', where they manage an entire segment of the supply chain on behalf of their customers.

Aftermarket services have taken on strategic importance. In light of commodity price volatility and significant year-on-year demand fluctuation, the market for spares, repair, and maintenance has become a profitable and stable revenue source. Table 3 provides an illustrative example of the size of the repair and maintenance market for mining and mineral processing equipment. The expenses on repair and maintenance (Stay in Business expenditures) over an average 30 years lifespan of a mine totalled up to 35 times the initial expenditure. Processing plants offer overall the highest aftermarket opportunities in particular for grinding mills, cyclones and pumps (because of large numbers of units installed) and crushing plants. In mining, LHDs and continuous mining machines have the largest aftermarket services. When markets are sufficiently large, OEMs invest in local subsidiaries to capture these revenue streams. This investment impacts positively on employment and upskilling of the workforce - especially when OEMs invest in training academies and overseas training.

Table 3: Aftermarket sales for mining and mineral processing machinery

Mining equipment	Initial	Total SIB	Ratio SIB:initial	Processing equipment	Initial	Total SIB	Ratio SIB:initial
Underground loaders (LHDs)	1.9	27.0	14 :1	Grinding mill, rod & ball	5.5	197.6	35 :1
Shovels, hydraulic	15.9	179.3	11 :1	Cone crushers	4.0	65.0	16 :1
Continuous miners, u/ground	3.2	35.9	11 :1	Mobile crushing plants	1.2	17.7	15 :1
Roof bolters	1.4	16.5	11 :1	Gyratory crushers	13.0	170.0	13 :1
Tunnel boring machines	19.0	210.9	11 :1	Grinding mill, SAG	13.5	181.7	13 :1

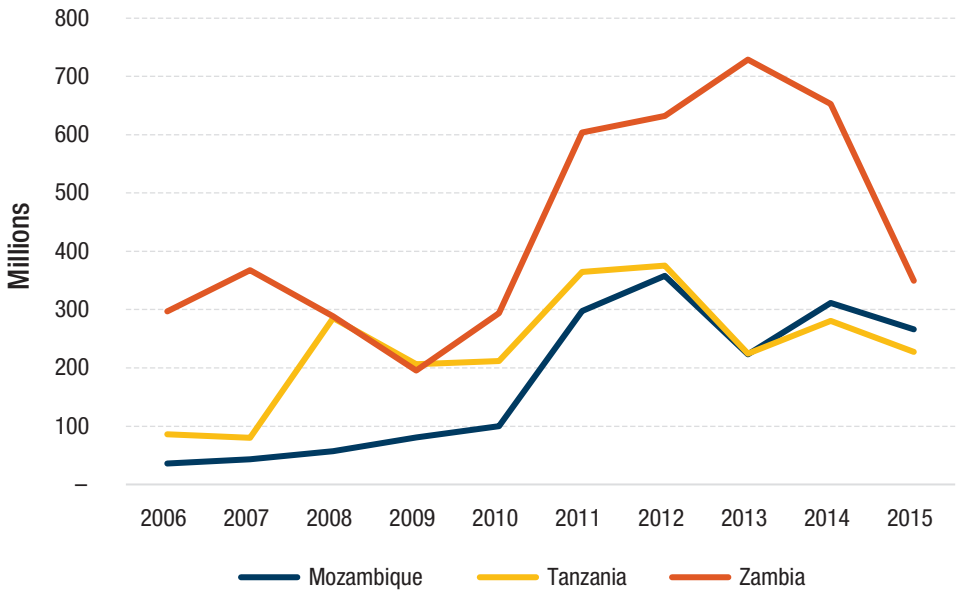
Source: Virgo, Armstrong and Alftan, 2013.

Regional dimension

In Southern Africa, the market for mining capital equipment is significant both in terms of production capabilities and demand growth. In terms of production capabilities, as discussed in the next section, South Africa has developed a world class manufacturing sector, mainly located in Gauteng. Levels of manufacturing capabilities vary across the rest of the region, with higher capabilities in Zambia than in Mozambique and Tanzania.

Regional demand has grown significantly on the back of FDI in the mining sector, recovering substantially after the 2008 crisis but declining again in 2014 following the closure of Chinese mining operations. Imports of mining capital equipment have been particularly high in Zambia, with more than US$ 600 million worth of imports annually between 2011 and 2014 (Figure 1). Cumulatively, over the past decade, imports totaled US$ 4.4 billion in Zambia, US$ 2.3 billion in Tanzania, and US$ 1.8 billion in Mozambique.

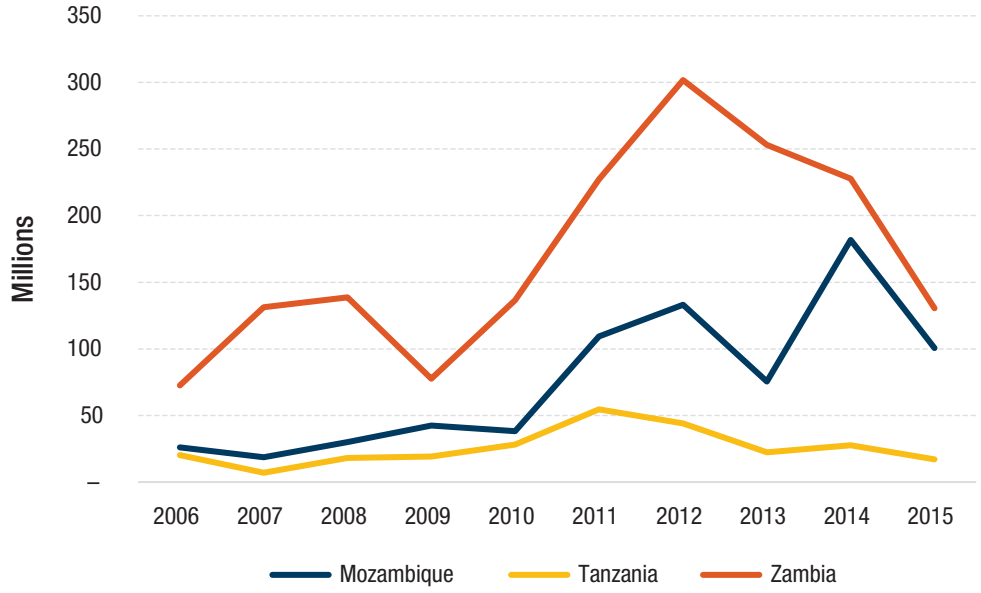
Figure 1: Imports of mining capital equipment



Source: COMTRADE Database, accessed from http://comtrade.un.org/ in June 2017.

In absolute terms, Zambia is a major destination for South African exports of mining capital equipment, peaking at US$ 300 million in 2012. To a lesser extent, so is Mozambique (Figure 2). In Tanzania, imports have been mostly below US$ 50 million per year during the past decade. Table 4 shows South Africa's market share in the three countries. South Africa is the key supplier of mining machinery to Mozambique, and to a lesser extent, Zambia. In both markets, it faces stiff competition from suppliers from the North (EU, US, Australia), Turkey and China, although Chinese imports into Zambia have declined following the closure of the Chinese-owned mines. Tanzania's main sources of mining machinery are China and India, with South Africa's market share relatively small, and in decline.

Figure 2: Imports of mining capital equipment from South Africa



Source: COMTRADE Database, accessed from http://comtrade.un.org/ in June 2017.

Table 4: Top sources of mining capital equipment imports, market shares and import growth 2011-2015

	Zambia			Tanzania			Mozambique	
	Share	Growth		Share	Growth		Share	Growth
World	1	-6	World	100	2	World	100	2
South Africa	36.8	-14	China	50.2	31	South Africa	57.6	3
China	20.5	-14	India	15.9	21	Portugal	9.9	19
UK	4.8	14	South Africa	9.5	-24	China	8.8	44
Australia	4.5	27	Indonesia	5.7	-3	Austria	7.4	23
Canada	4.5	73	France	3.4	14	Turkey	3.3	63
USA	3.6	42	USA	2	-16	India	2	-43
Turkey	3.6	170	Italy	1.7	-21	Italy	2	2
India	3.3	-13	Turkey	1.7	0	Spain	1.7	75
Finland	2.5	-2	UK	1.3	-2	UK	1.7	107
Germany	1.4	31	Germany	1.3	-10	France	1.1	61

Source: Trademap Database, accessed from http://intracen.org/ in June 2017.

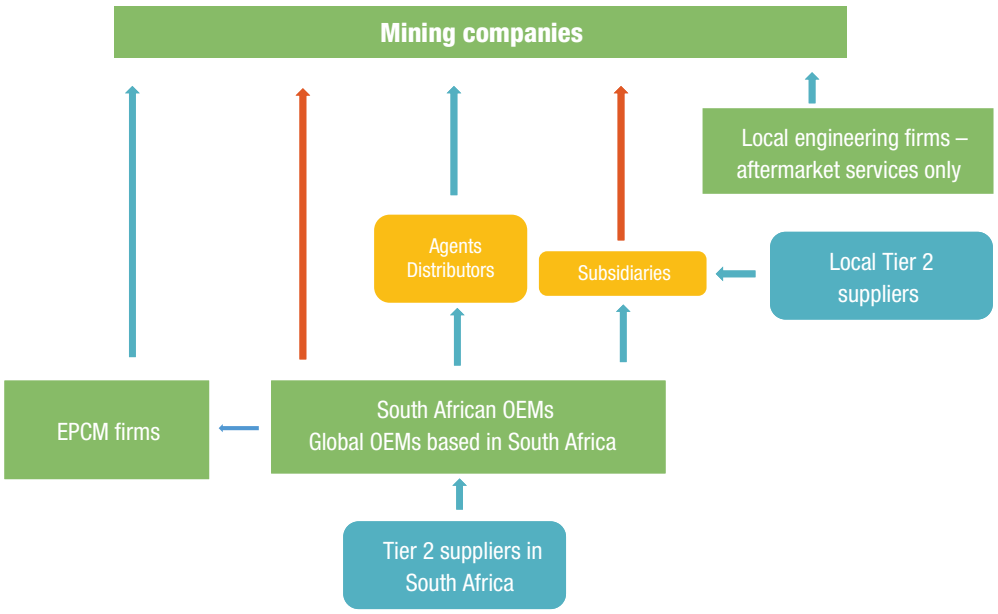
Figure 3 depicts the RVC for mining capital equipment. Mining companies in South Africa, Mozambique, Tanzania and Zambia source capital equipment in two ways: 1) directly from the OEMs or OEM subsidiaries; 2) indirectly from engineering, procurement, construction and management (EPCM) firms, agents and distributors.

i. Direct sourcing from OEMs

Mostly, OEMs are based in South Africa to supply the regional market and include both South African OEMs and global OEMs (EU, US, Australia). Some of the largest OEMs have subsidiaries across the region, sometimes in JVs with local firms. Two of the three global leaders in key mining equipment, Atlas Copco (Sweden) and Sandvik (Sweden), have subsidiaries in South Africa (where they offer the entire range of aftermarket services), Zambia, Tanzania, and Mozambique. Caterpillar uses local dealers, with Barloworld South Africa also serving Mozambique, and Mantrac Group providing services in Tanzania.

Given Zambia's large number of mines, and its proximity to mines in the Democratic Republic of Congo, the number of OEM subsidiaries is particularly high. Mining companies source directly from the OEMs based in South Africa or local subsidiaries (red arrows in Figure 3), through multi-year contracts inclusive of aftermarket services. The network of Tier 2 suppliers, i.e. suppliers of components and materials to OEMs, is relatively well-developed in South Africa, but weak or non-existent across the region.

Figure 3: Regional mining supply chain



Source: Author's fieldwork.

ii. Indirect sourcing from EPCM firms, agents and distributors

The mining companies can also source equipment indirectly (blue arrows in Figure 3). EPCM firms are sub-contracted by mining companies to develop greenfield and brownfield projects. Under these arrangements they are responsible for the procurement of capital equipment to be integrated into complete systems. Their decisions on system specifications at the plant design stage lock mining companies into long-term contracts with the OEMs. Many EPCM firms have regional offices in South Africa, where they have access to a skilled workforce, a sophisticated physical infrastructure, and specialised suppliers. Procurement from EPCM firms is common across the mining industry, but

the degree of local sourcing depends largely on the availability of competent suppliers and existing collaborations with specific technology providers. In Africa, local sourcing from EPCM firms has obviously been lower than in Australia and Russia.

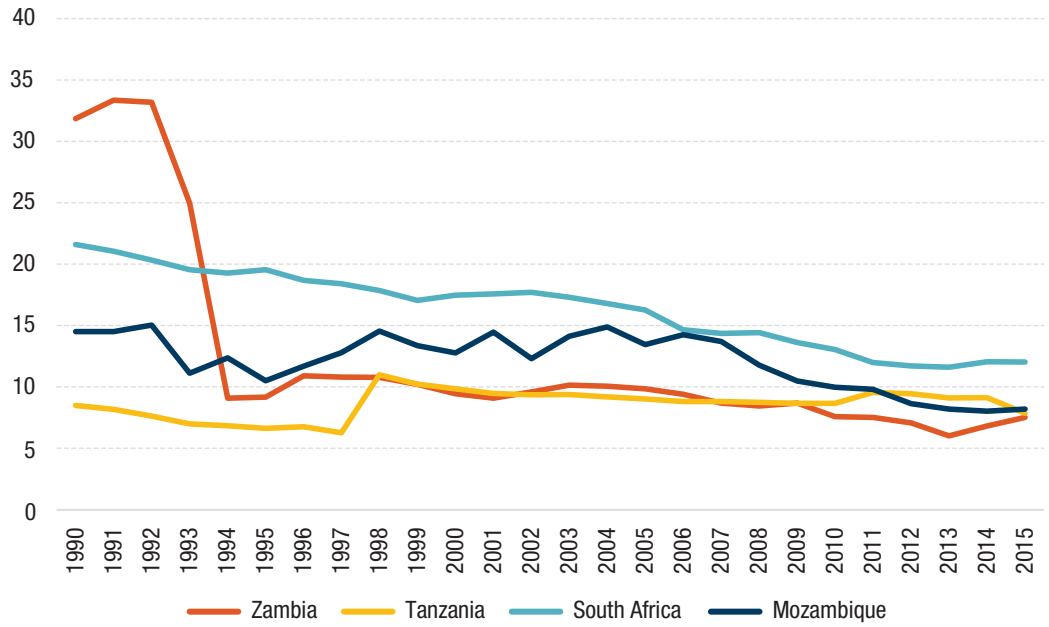
Indirect sourcing also takes place through large networks of local agents and distributors. Some of these firms have exclusive distributorship and/or equity relationships with the OEMs, receive substantial support from them, and engage in value-added services such as repair and maintenance. Other firms are small trading agents, involved in activities requiring minimal skills or knowledge. Political connections may give some of these firms an advantage in securing contracts, but these firms seldom improve the overall value change. In Zambia, there is also a network of long-established local engineering service providers specialised in aftermarket services only. They are fairly competitive because their proximity to the mines ensures short lead times.

4. CAPABILITIES IN CAPITAL EQUIPMENT AND METAL FABRICATION

Technological capabilities in capital equipment and metal fabrication

Production and technological capabilities in the mining capital equipment industry vary considerably across the region. However, across all countries, this industry's performance needs to be contextualized within the broader process of de-industrialisation. Manufacturing value added (MVA) contribution to GDP in South Africa and Zambia has been characterised by a consistent decline, particularly in Zambia (from 36.1% in 1990 to 7.9% in 2015) (Figure 4). In Mozambique, MVA contribution to GDP has been stagnant, until the entry of the aluminum smelter MOZAL, which was estimated to contribute up to half MVA in the 2000s (Castel-Branco and Goldin, 2003). MVA contribution to GDP has since the 2000s been in decline. In Tanzania, MVA contribution to GDP rose in the late 1990s and early 2000s but stagnated during the rest of the 2000s. In the past five years, it declined significantly (from 8.1% in 2011 to 5.6% in 2015).

Figure 4: Manufacturing Value Added as % of GDP



Source: World Development Indicators, retrieved from http://databank.worldbank.org/

In Mozambique, Tanzania and Zambia, the machinery and metal fabrication sector has been characterised by declining output and shrinking technological capabilities (Fessehaie, 2012; Msami and Wangwe, 2016; Sousa Cruz *et al.,* 2016). Industrial production is increasingly concentrated in few, large firms, and a multitude of small-scale, informal businesses (Msami and Wangwe, 2016; Sutton, 2014; Sutton and Langmead, 2013; Warren-Rodríguez, 2008b). The three countries share challenges related to lack of management and technical skills; poor access to credit, technology, and business development services; weak national quality assurance systems; uncompetitive upstream industries; and costly and unreliable infrastructure. Stakeholder interviews confirm that costly and unreliable utilities and lack of finance are the most serious constraints to growth in the sector.

In Mozambique and Tanzania, there are further constraints related to burdensome regulatory and administrative environment (ODI, 2016; Wangwe *et al.*, 2014; Warren-Rodríguez, 2008b). Interviews confirm for example that South African OEMs operating in Mozambique struggle with understanding laws, excise and customs regulations (Langa et al., 2017). Moreover, inefficient bureaucratic procedures at the Mozambique-South Africa border increase logistics costs. In Tanzania, port clearance and administration fees and charges amount to 1.6% CIF value of imports, increasing inputs costs for local manufacturers.

There can be dramatic differences in technological capabilities between local manufacturing firms and OEMs. Local manufacturers in Mozambique, Tanzania and Zambia are mostly involved in metal casting and fabrication. Over time, their capabilities and competitiveness have declined. On the other hand, OEMs have invested to expand their distribution network, with subsidiaries or agreements with dealers. The largest ones employ few hundred workers, a relatively large number compared to local firms. In Zambia and Tanzania, most technical positions are filled by nationals; Mozambique has a higher presence of foreign staff in OEM operations. Workers are semi-skilled and skilled. The subsidiaries or their large distributors, such as Mantrac and Barloworld, invest significantly in-house and external training. For example, OEM subsidiaries in Zambia's Copperbelt invest heavily in training, unlike other types of firms (agents, independent manufacturers) (Table 5). Training is done in-house and in South Africa, less often in the home country of the parent company. Support to local TEVT institutes and universities is not common. Other illustrative examples as far as Tanzania is concerned include Mantrac providing management, technical, product-related, and competency-based training, as well as safety training to its engineers; and Atlas Copco providing mechanical, electromechanical, and mining engineering applied training.

Table 5: Supply firms investment in skills development in Zambia, 2014

	Invest in skills development	In-house	In South Africa	Abroad	Support to local institutes
OEM Subsidiaries	100%	100%	100%	50%	17%
Others	17%	17%	0%	0%	0%

N= 34 firms.

Source: Fessehaie, 2015

Though OEM subsidiaries do not assemble locally, some, such as Mantrac Tanzania and Sandvik Zambia, are involved in machine re-conditioning. A large segment of OEM business is repair and maintenance, which is often provided under warranty. This area has generated significant employment and skills development opportunities. According to interviews, contracts with two mega-projects in Mozambique allowed one large foreign firms to diversify into parts manufacturing, which now represents 40% of the turnover (Langa et al., 2017). OEMs rely on engineers and technicians from abroad for the most complex repair tasks. This is especially the case in Mozambique and Zambia, where proximity to South Africa may have discouraged additional investment in skills and equipment to provide all repair services from local resources.

Local sub-contracting is very limited across Tanzania, Mozambique and Zambia. Most parts and components are procured by the head office through a global network of suppliers. For example, one of the OEMs interviewed reported that parts and components are purchased by suppliers across 32 countries. Only in South Africa are local manufacturers competitive in supplying OEMs with specialized, higher-tech components which are less price-sensitive. According to the interviews, key bottlenecks in local supplier capabilities relate to price competitiveness, product design, and certification.

Contextualizing capabilities within broader developments in the mining sector

The structure of the mining capital equipment industry in the four countries stems from the history of their mining sectors. In South Africa and Zambia, large-scale mining dates back at least a century: gold, diamond, coal, chrome, and platinum mining in South Africa, and copper mining in Zambia. Protectionist policies in apartheid-era South Africa and post-independence in Zambia leveraged the mining sector to develop local engineering manufacturing industries. These policies were accompanied by significant investment in education and, in South Africa, R&D.

South Africa's innovation efforts were driven by the private sector-funded Chamber of Mines Research Organisation (COMRO) and supported by a very dynamic national system of linkages between mining companies, suppliers, research centres, universities and technical and artisanal schools. Over time, the capital equipment industry became particularly innovative in the areas of mineral processing and deep mining (Walker and Minnitt, 2006). However, since the 1990s, a combination of lower funding from the private and public sectors to domestic R&D, internationalisation of mining and supplier companies, and reduced investment in skills development, has led to a considerable reduction in innovation capabilities and a shift from long-term, 'blue sky' R&D to short-term product development (Walker and Minnitt, 2006). While South Africa retains a comparative advantage in mining-related innovation, the decline of its national system of innovation is eroding its capacity to sustain such competitiveness in the future (Kaplan, 2012). The industry has also witnessed increased levels of import penetration, because global OEMs have established subsidiaries to serve the region, but with little investment in R&D or manufacturing, and because standard components are increasingly imported from low cost countries.

In Zambia, government support for a domestic capital equipment industry in the 1970s and 1980s never led to the level of competitiveness achieved by South Africa. However, it did create a relatively large and diversified manufacturing basis, with access to skilled workforce (Fessehaie, 2012). The trade liberalization and privatization process in the 1990s largely coincided with the erosion of manufacturing capabilities in Lusaka and the Copperbelt. In terms of capital equipment, most OEMs re-organised their value chains by moving away from manufacturing and investing in marketing, distribution, and aftermarket services. This was done either by establishing subsidiaries in Zambia, or in South Africa to serve Zambia; or through a large network of agents and distributors. Engineering capabilities can be found in the local fabrication, repair, and maintenance services. There are also manufacturing firms supplying fabrication work, components, and mill balls.

The trajectory of the mining capital equipment industry has been very different in Mozambique and Tanzania. In both countries, large-scale mining is relatively new. In Tanzania, before the late 1990s the sector was dominated by small-scale gold mining, which does not offer the same opportunities for upstream industry linkages, R&D, and skills development as large-scale mining. Since the late 1990s, large mining conglomerates invested in Tanzania's gold, diamond, nickel, uranium, coal, iron, and natural gas sectors. In Mozambique, large investment in mega-projects since the late 1990s included MOZAL (aluminum smelting), SASOL (gas deposits), and Companhia Vale do Rio Doce (coal deposits).[56] Future investments in liquefied natural gas are expected to turn the country into one of the world's largest producers.

[56] MOZAL is owned by BHP-Billiton (66%), the South African Industrial Development Corporation (20%), Mitsubishi and the Government of Mozambique. Apart from the aluminum smelter, the project also invested in infrastructure development (roads, telecommunications, electricity,

In Tanzania, there has been a recent revival of the metal fabrication industry (Gray and McMillan, 2016). Output growth has been significant for machinery and equipment (60% in 2010-2012), basic metals (47% in 2010-2012), and fabricated metals (32% in 2010-2012) (Wangwe *et al.*, 2014). Metal fabrication is dominated by six large domestic firms and a large number of SMEs (Gray and McMillan, 2016). Their main activities include steel/aluminum making from scrap; fabrication and body building and; making wires, structures, and other inputs into the construction industry. However, the industry is relying mostly on imported intermediate products (Wangwe *et al.*, 2014). It has also established the Steel Manufacturers Association of Tanzania.[57]

Linkages between the industry and the mining sector are very weak (Gray and McMillan, 2016; Mjimba, 2011; Perkins and Robbins, 2011). This is due to low supplier capabilities but also the geographical remoteness of the mining companies, which increases cost of supply, and reduces agglomeration economies (Perkins and Robbins, 2011). The mining companies import machinery directly or indirectly through OEM subsidiaries (Mjimba, 2011). South Africa is a key supplier of mineral processing machinery and systems.

Mozambique's manufacturing performance after the late 1980s reforms has improved compared to the previous period of centralized economic planning. However, this improvement has coincided greater concentration of manufacturing into a small number of firms and industries without generating significant employment (Sousa Cruz *et al.,* 2016; Warren-Rodríguez, 2008b). While growing rapidly since 2000s, total industrial production has been driven by mega-projects in the aluminum processing, extractive industries, and agro-processing (sugar, forestry) (CCRED, 2017). The metalworking industry generates the largest contribution to manufacturing value added (43%) but has been in decline since the late 1970s (Sousa Cruz *et al.,* 2016; Warren-Rodríguez, 2008b). Currently a small number of metal fabricators mostly based in Maputo province supply metal parts, galvanized steel, and repair and maintenance services (Warren-Rodríguez, 2008b). Overall, the decades after privatization have been characterised by a loss of technological capabilities. New entrants, mostly foreign-owned, have engaged in packaging and assembly of imported intermediate products, while long established firms have moved away from manufacturing into more remunerative specialized engineering services for large clients such as MOZAL (Warren-Rodríguez, 2008b).

Linkages between the local manufacturing engineering sector and mega-projects have been very weak. The most significant linkages built around very large projects have been the result of the MOZAL programme for SMEs undertaken by Centro de Promoção de Investimentos (CPI), under the Ministry of Planning and Development. In 2005, the programme resulted in the establishment of the 660-hectare Beluluane Industrial Park adjacent to the MOZAL smelter. Overall, the programme resulted in firm upgrading and linkage development (Krause and Kaufmann, 2011). In the metalworking (metallurgical) sector, subcontracting to MOZAL resulted in skills and technological upgrading of the SMEs, and a number of joint ventures with specialised foreign suppliers, which contributed to further technological learning, and for three firms even opened access to new markets (Robbins, Lebani and Rogans, 2008; Warren-Rodriguez, 2008a). Nevertheless, recent research shows that the impact of MOZAL on broader industrial development has been limited (Castel-Branco, 2004; Langa and Mandlate, 2015; Robbins et al., 2008). First, linkages have been very limited in scope and number of firms involved because suppliers lack the scale and capabilities required, face high entry barriers, and operate in a difficult business environment. Companies involved in the engineering sector are positioned in low value-added lines of business (supply of simple products, welding, maintenance). MOZAL and its suppliers also failed to invest the resources required to build more complex technological capabilities. Instead, firms diversified into services with low barriers to entry, minimal risks, and/or speculative/rent activities. The sustainability of linkages has also been questioned (Langa and Mandlate, 2015). Local firms that

water and sewers, and harbours).

57 Whilst the Morogoro Engineering Cluster was established in 2005 with 60 registered metal companies, stakeholder interviews revealed very little knowledge of this initiative.

undertook large investment to meet buyer's requirements on quality, management and safety, have struggled to deploy their new capabilities into traditional markets or with other mega-projects.

5. POLICY FRAMEWORKS IN SOUTHERN AFRICA

National policy frameworks

In the 1990s, as part of their structural adjustment programmes, Zambia and Tanzania adopted policies to privatize mining assets and incentivize FDI in the mining sector.[58] These were successful in restructuring the industry by promoting the entry of large mining conglomerates which invested significant resources to re-capitalise the mines or undertake greenfield projects. Since the 2000s, governments have been under pressure to deal with the tax regime and labour conditions prevalent, and increasingly, to open procurement opportunities for local businesses. In both countries, this led to a revision of mining policy frameworks, with new legislation adopted in the late 2000s.[59] Among other provisions, these policies encourage mining companies to increase local sourcing, but do not establish mandatory obligations, specific targets, or monitoring mechanisms. Overall, there has been very limited impact on local machinery and metal fabrication industries (Fessehaie, 2012; Hansen *et al.*, 2014; Mjimba, 2011).

Local content policy in Tanzania is controversial (Kinyondo and Villanger, 2017). The experience with mining has shaped the approach of local content in the oil and gas industry. The 2017 Mining Act and 2015 Petroleum Act include local content provisions. The mining local content (40% local content target) provisions refers to local procurement rather than local ownership or local value addition (Lange and Kinyondo, 2016). Respondents highlighted that the mining local content policy had increased opportunities for the private sector, but not necessarily for manufacturers. Conversely, the 2015 Petroleum Act, and recently approved local content legislation (July 2017), define obligations in terms of ownership and use of domestic human and material resources and services.[60] Government is in the process of finalizing regulations which will set concrete targets, as well as implementing and monitoring mechanisms.

From the mid-1990s, Tanzania's government brought industrial development back onto its agenda with the 25-year Sustainable Industrial Development Policy (SIDP2020) which seeks to promote economic transformation (Wangwe *et al.,* 2014). Similar to the mining legislation, the industrial policy reflects the objective of increasing upstream linkages to the resource sector.[61] The planned interventions include the development of the Mtwara special economic zone (SEZ), an oil and gas corridor. Metal fabrication has been encouraged by measures such as an export ban on scrap metal and import protection on metal bars (Gray and McMillan, 2016). Government is also engaging with foreign investors in practical ways: foreign investors are encouraged to share information on the standards of procured inputs with Tanzania Bureau of Standards, the Engineering Board and potential local suppliers. However, there are concerns over inadequate leadership, resources and institutional capabilities to address structural competitiveness bottlenecks and ensure policy implementation (ODI, 2016; Wangwe *et al.,* 2014).

58 In Zambia, this was done through the 1995 Mines and Minerals Development Act; in Tanzania through the 1997 Mining Act and the 1998 Mineral Policy.

59 Zambia 2008 Mines and Minerals Development Act; Tanzania 2010 Mining Act and 2009 Mineral Policy.

60 Under the Petroleum Act, the National Oil Company and the newly established, Petroleum Upstream Regulatory Authority (PURA), have the mandate to promote local content (Kinyondo and Villanger, 2017). The licensee's procurement plans and local content plans should be submitted to PURA, along with a detailed local supplier development program.

61 Both Tanzania's Five Year Development Plan (FYDP) and Integrated Industrial Development Strategy (IIDS) 2025 target the iron and steel industry. One of the key policy issues identified by the IIDS under resource-based industrialization is to link the mining sector development with the rest of the economy, and increase participation by local businesses and citizens.

In Zambia, the link between industrial policy and local content has been weaker than Tanzania. Recent industrial policies, such as the 2012 Strategy for Industrialisation and Job Creation, and the 2012 Engineering Products Industrial Strategy, do not explicitly target the development of engineering manufacturing capabilities to supply the mining sector. However, in 2013, the private sector took a leadership role, as the Chamber of Mines of Zambia and the Zambia Association of Manufacturers, working closely with government, mining companies, and other key stakeholders, established the Zambian Mining Local Content Initiative (ZMLCI). The ZMLCI mainly focuses on a business-to-business platform and providing technical support to local firms.

In Mozambique, investment and industrial policies have no local content provisions (Robbins, Legani and Rogan, 2008). The MOZAL linkage development programme was successful because it was supported by large corporations and international financial institutions. However, less well-defined interventions tend to be poorly implemented (Castel-Branco, 2004). Mozambique's experience with MOZAL has resulted in a certain degree of institutional capacity building in SME development. This has been enshrined in the 2007 Strategy for the Development of SMEs in Mozambique and a state-owned SME institute, the Instituto para a Promoção das Pequenas e Médias Empresas (IPEME), founded in 2008 to implement the strategy.

Mozambique's overall industrial policy remains weak (Robbins *et al.*, 2008; Warren-Rodriguez, 2008a). Except for MOZAL, Mozambique does not have a clear strategy to develop linkages to mega-projects (Krause and Kaufmann, 2011). Since its structural adjustment programme in the late 1980s, industrial policy has focused on horizontal measures such as general FDI promotion and business environment reforms (Krause and Kaufmann, 2011). There has been no selective policy to foster specific technological capabilities or to create agglomeration economies (Krause and Kaufmann, 2011; Warren-Rodríguez, 2008b). The 2007 Industrial Policy and Strategy focuses on improving the business environment, SME promotion and FDI promotion (Sousa Cruz *et al.,* 2016). Poor policy implementation, low resources, and lack of coordination between interventions of various institutions and NGOs are a problem (Warren-Rodríguez, 2008b).

South Africa's key local content provisions are found in the Mining Charter. The 2002 Minerals and Petroleum Resources Development Act (MPRDA) provided for a Mining Charter to be developed by government and industry stakeholders with the objective of addressing past inequalities in terms of ownership, employment, and business opportunities. The first Mining Charter (2004) required the mining companies to increase opportunities for Historically Disadvantaged South Africans' (HDSA) suppliers. Implementation however was unsatisfactory, and a new Charter was established in 2010, the Broad-based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry. This Charter sets specific targets in terms of local procurement from Broad-Based Black Economic Empowerment (BBBEE) companies, which for capital goods was 40% of total procurement by 2014.

The 2015 review of the Mining Charter found significant progress,[62] however this has not resulted in increased levels of local value addition. Global OEMs and large suppliers have been able to meet the Mining Charter requirements mostly by supplying via BBBEE importing agents, rather than local manufacturers. Recently, the government has initiated a consultation process with stakeholders to address the impact of mining procurement practices on the local industry, and there is a growing consensus on the need to increase sourcing from and cooperation with the local equipment manufacturing industry. Government is also targeting the mining equipment sector with national and local initiatives such as cluster development, development finance and export promotion.

[62] 81.6% of mining right holders met the 2014 target of spending 40% for capital goods (Department of Mineral Resources, 2015). Mining right holders have been weighted by mine size, using employment figures.

Cross-cutting themes

The analysis of policy frameworks in the region highlights some cross-cutting themes.

Policy inconsistency

Across countries, there is a level of internal policy inconsistency. All governments granted the mining companies tax incentives on capital equipment imports. For example, Zambia grants investors duty-free import and value-added tax (VAT) deferment for five years for machinery and equipment. Because these exemptions do not apply to supply firms, the mining companies are discouraged from procuring locally. In theory, the policy permits withdrawal of duty-free incentives once there is local production, however this is seldom implemented (Fessehaie, Rustomjee and Kaziboni, 2015). Moreover, importers pay duties on shipments of spares and components attract. This tariff structure discourages investment in local assembly operations and is an issue of concern for the industry. Similarly, in Tanzania, the mining companies receive a VAT refund on imported equipment, and they report that apply for the same incentive for domestic purchases is more time-consuming (Lange and Kinyondo, 2016). Moreover, import of machinery and spares is duty-free, but import duties apply to inputs into fabrication (Gray and McMillan, 2016). In Mozambique, some firms face duties for inputs when the import tariff for the fully assembled equipment is zero-rated, which makes local assembly less profitable.

Across the region, government pressure to increase local content has often, explicitly or implicitly, been framed in terms of local ownership or local registration. In South Africa, this has been framed in terms of Broad Based Black Economic Empowerment (BBBEE) aimed at redressing past racially discriminatory practices of the apartheid era. In 2010, the amendment of the Broad-based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry set the following targets in terms of mining procurement from previously disadvantaged groups:

- Procure a minimum of 40% of capital goods from BBEEE entities by 2014
- Ensure that multinational suppliers of capital goods annually contribute a minimum of 0.5% of annual income generated from local mining companies towards socio-economic development of local communities into a social development fund from 2010
- Procure 70% of services and 50% of consumer goods from BBBEE entities by 2014

The 2015 review of the Mining Charter found that the large mining companies were meeting their BBBEE targets, especially for procurement of services. However, the impact of the preferential procurement scheme on industrialisation has been cause for concern. The Mining Charter procurement rules are developed around BEE ownership, defined as 25%+1 BEE. To comply, the mining companies' procurement strategies have focused on the ownership profile of their suppliers rather than job creation and local value addition (Hansen et al., 2014; Fessehaie, Rustomjee and Kaziboni, 2015). In fact, they are incentivised to switch from direct imports to indirect imports through BBBEE-compliant agents. Relying on agents also has the advantage of saving buyers the time and costs involved in complying with import procedures. Agents and distributors are not obliged to disclose their local content. Since 2016, government and manufacturers associations have engaged the mining companies to re-focus their procurement strategies towards local technology development and manufacturing, with some success.

Lead firms

Lead firms can play an important role in promoting local manufacturing upgrading. As far as the mining companies are concerned, the experience with mining supplier development programmes varied. In Tanzania, they have been rare and discontinued quickly (Lange and Kinyondo, 2016). In Zambia, five large mining companies undertook a joint programme, and some have individual supplier development plans, but these have been limited in duration and scope (Fessehaie, 2012). In Mozambique, this experience has been limited to a MOZAL linkage development programme, which

has had a positive impact on local technological upgrading, but only on a few firms. The mining companies in South Africa have been relatively more ambitious and consistent in terms of supplier development programmes, facilitated by higher supplier capabilities. For example, an Anglo American enterprise development initiative, Zimele, provided funding to 2300 businesses as of 2017 and established 23 business development centres around the country (Anglo American, 2017). However, such efforts do not necessarily engage local manufacturing or innovative firms, or contribute to re-building the national system of innovation that worked well in the past.

The role of private-sector associations will be critical in designing and implementing industrial policies for the capital equipment sector. In South Africa, the South African Capital Equipment Council is a well-established export promotion body for the industry, which has recently been involved in cluster-type initiatives in the areas of technological upgrading, skills development, and engagement with policy-makers and mining companies, among others. In Mozambique, the Confederação das Associações Económicas de Moçambique (CTA) is the private sector's principal and almost 'official' government interlocutor, with good technical and organisational capacity (Krause and Kaufmann, 2011). In Tanzania, the Tanzania Private Sector Foundation and Confederation of Tanzanian Industries represent the private sector, but more recently the Association of Tanzanian Steel Manufacturers has been established and will represent a key interlocutor in terms of capital equipment value chain development. In Zambia, the Zambia Association of Manufacturers is playing a critical role in promoting local content and is championing a local content policy geared towards local manufacturers rather than trading companies. Across the region, the Chambers of Mines tend to be well organised, and in South Africa, well-resourced as well.

Human capital

Human capital investment is critical to support local capabilities in the capital equipment value chain because it provides skills for productivity growth, technological adoption, and R&D capabilities. South Africa has a well-established tertiary education system in the engineering field, though the South African Chamber of Mines reports shortages of mechanical and electrical engineers (Fessehaie *et al.*, 2015). Similarly, the University of Dar es Salaam has received financial and technical support from the mining companies for mining engineering courses, but not for mechanical or industrial engineering. There has been no support from the OEMs. As a result, the skills required to support competitive manufacturing sectors are lacking. Across the Southern African region, engineering education at the tertiary level suffers because resources are lacking for infrastructure, apprenticeship programmes, and teaching and academic staff. Declining investment Science, Technology, Engineering, and Math (STEM) education at secondary level also pulls down the overall skill level of the workforce.[63] Respondents have consistently highlighted the weakness of practical skills of students entering the job market, due to weak relationships between training institutes and business, and poor facilities to train engineers and technicians. In Zambia and Tanzania, the weakness of STEM at the secondary level hurts the quality of students entering into tertiary education.

The SADC tertiary education systems struggle to produce the quality and quantity of graduates required by the economy. Table 6 shows mobility rates for in the four countries in 2011. Although not specific to engineering, the table shows that a relatively large proportion of students from Zambia (14.7%), Mozambique (10.6%), and Tanzania (9.1%) study outside their home country. The interview with University of Dar es Salaam confirms that fewer than 10% of engineers are trained outside the country. South Africa is a major destination country for Zambian students, the second most important in Mozambique, but only a marginal one for Tanzania. Consistently with trade patterns, the table shows that Tanzania is not as integrated as Zambia and Mozambique in the Southern Africa RVC. Many Zambian students tend to remain in South Africa and contribute to its private-sector growth in the domestic and regional market, as well as to that country's teaching and research institutes.

[63] These include the College of Engineering and Technology, University of Dar es Salaam (UDSM); schools of mines and engineering from the University of Zambia (UNZA) and the Copperbelt University (CBU)

On the contrary, in Tanzania the 'brain drain' is reversing, according to interviews. Tanzanian engineers used to work in Botswana, Namibia, Swaziland and South Africa. However, many are returning back to Tanzania thanks to good job prospects.

Table 6: Intra-SADC student flow

Country	Students from a given country studying abroad		Top five destinations for outbound mobile students	Number of students from abroad studying in given country
	Total	Outbound mobility rate (%)		
Mozambique	2366	10.6	Portugal (1,066), South Africa (815), USA (93), UK (71), Australia (67)	n/a
South Africa	5619	0.8	USA (1,971), UK (1408), Australia (643), Cuba (340), Germany (196)	49979
Tanzania	3907	9.1	USA (1,471), UK (1,053), South Africa (283), Australia (119), Germany (115)	275
Zambia	3610	14.7	South Africa (1,363), USA (859), UK (541), Australia (317), Namibia (228)	n/a

Source: CREST (2011).

Technical and vocational skills are a challenge across the region, including South Africa. In South Africa, the mining houses have their own, long-established individual training centres, which are well-equipped and able to offer accredited certifications. Industry however suffers from skills shortages; capital equipment manufacturers report skills gaps for machinists and artisans (electricians, fitters, boilermakers and technical instrumentation). In the rest of the region, skills bottlenecks are even more severe. In Zambia and Tanzania, structured collaborative processes are currently underway between the technical and vocational authorities and the mining companies. In Zambia, the authority, the Chamber of Mines, and individual mining firms are integrating company-specific qualifications into a national qualification framework. The programme seeks to recognize, retrospectively, prior company-specific training, with an initial focus on entry-level skills (heavy equipment operators, crane operators, excavator operators, smelter process controllers, locomotive operators, etc.). In Tanzania, two large gold mining companies have collaborated with the Tanzanian Chamber of Minerals and Energy (TCME) and the authority (the Chamber of Mines) to establish the Integrated Mining Technical Training (IMTT), specifically designed to train artisans (tradesmen). Some respondents reported that the initiative was useful but was too limited to low skill levels (certificate holders and undergraduate trainees). Most respondents however were not aware of this initiative, which suggests that it has had a limited impact so far.

6. REGIONAL COOPERATION

Deepening regional value chains will require the development of integrated productive capabilities across the region, which will help spark growth in intra-regional flows of intermediate goods, skills, knowledge, capital and services. Cooperation should aim at enhancing capabilities to participate and upgrade in the mining capital equipment regional value chain both in South Africa, where deepest technological capabilities and knowledge are found, and in Mozambique, Tanzania and Zambia, where capabilities are low. In other words, this process has to result in a win-win outcome, rather than reinforcing existing patterns of development. Before discussing potential areas for cooperation to develop and deepen the regional value chain, we consider the opportunities and the challenges ahead for regional cooperation.

Opportunities

1. *Significant demand*

The world market for mining capital equipment was worth US$100 billion in 2016 and estimate suggest it will grow to US$107.3 billion by the end of 2017 (Research and Markets, 2017). The market will grow by a Compound Annual Growth Rate (CAGR) of 7.9% between 2017 and 2022, totaling US$150 billion in 2022. The greatest share of this market is accounted for by surface mining machinery, followed by parts and components, and underground mining machinery. Africa, in particular Southern Africa, is one of the most dynamic markets for machineries required for metals, coal, and minerals mining.

Cumulatively, during the decade 2006-2015, Mozambique has imported US$ 1.8 billion worth of mining capital equipment, Tanzania US$ 2.3 billion, and Zambia US$ 4.4 billion. Though commodity price fluctuations have caused some projects to be temporarily or permanently suspended, the market tends to pick up shortly after economic downturns. Moreover, aftermarket opportunities remain very large (see Table 7).

Table 7: Equipment with large markets for repair and maintenance services and spares

	Equipment with large aftermarket services
Mining equipment	Underground loaders (LHDs) Shovels, hydraulic Continuous miners, u/ground Roof bolters Tunnel boring machines Rotary blasthole drill rigs Continuous miners, surface Backhoes, hydraulic Bucketwheel excavators Wheel loaders Shovels, cable Underground ore & coal haulers
Processing equipment	Grinding mill, rod & ball Cone crushers Mobile crushing plants Gyratory crushers Grinding mill, SAG Stackers, conveyor Mill drives, gearless Cyclones Slurry pumps Electric motors Screens

2. *Scale of aftermarket services opportunities*

Aftermarket services are strategically important for a number of reasons. First, they are a sizeable market, with expenditures on spares, maintenance and repair totaling up to 35 times the initial expense, depending on the machinery. Second, they are a relatively stable source of revenues, because even during economic downturns, mining companies tend to invest to optimize installed equipment utilization. Third, because of aftermarket services, global OEMs tend to invest in facilities in close proximity to the mining companies, and invest in skills development. Governments should leverage this opportunity to attract FDI in local engineering and technical capabilities.

3. *Locational advantages*

Suppliers located in proximity to the mining companies have several advantages: they can offer short lead times, cooperate closely with customers to address technical problems, and benefit from intense knowledge flows and agglomeration effects. The mining companies have increasingly shifted to the two-fold strategy of outsourcing and *nearsourcing*, preferring to procure from local suppliers a vast range of goods and services, *if supplier capabilities are sufficiently high.*

4. *Existing capabilities*

South Africa has well established manufacturing and services competences in the mining capital equipment industry. Zambia has lost considerable manufacturing capabilities over the last three decades, but some engineering companies are successfully supplying goods and services to the mining sector. Mozambique and Tanzania have low capabilities. However, in Tanzania there has been investment in skills development and there is a revival of the metal sector. Mozambique has a few firms which have upgraded and provide a range of products and services to MOZAL.

5. *Renewed government interest in industrial policy and local content*

Industrial policy is back on the development agenda, and governments across the region are increasingly looking at different approaches to local content policies. In Tanzania, Zambia and Mozambique, the approach to local content has been on a voluntary basis, and in the latter two cases, governments nudged mining companies to undertake supplier development programme or favour local SMEs. In Tanzania, however, more recent policy and legislative developments suggest a mandatory approach, complemented by stricter licensing and monitoring provisions.

6. *SADC Industrialisation Strategy and Roadmap*

SADC provides the regional economic integration framework which enables intra-regional trade and investment, cooperation on trade facilitation, harmonized standards setting and compliance procedures, and so forth. More recently, SADC has also embarked on a regional Industrialisation Strategy and Roadmap which provides an important forum to discuss potential programmes to develop upstream linkages in the mining sector. Moreover, the Africa Mining Vision envisages cooperation in this area.

Challenges

1. *High barriers to market entry*

Barriers to entry. These include experience, economies of scale, capital requirements, R&D capabilities, access to distribution channels and global supply chains, international standards compliance, and adoption of world-class manufacturing practices. Local firms across the region struggle to overcome these barriers.

2. *Very different levels of capabilities across the region*

The region is characterised by a significant disparity in capabilities and competitiveness between South Africa on the one hand, and Mozambique, Tanzania, and Zambia on the other. This dilemma calls for interventions that are jointly designed and developed after extensive stakeholder consultations to deal with potential mistrust. Well-designed and properly resourced interventions should ensure shared benefits from regional cooperation.

3. Capability migration to the gas industry

Mozambique and Tanzania are increasingly looking at local content in the gas industry. Gas and oil however utilize different machinery than the mining industry. This strategy will require bilateral cooperation in particular between these two countries given their shared interest in developing capabilities in this area. The potential for South Africa to migrate some its competencies to gas is also worth exploring.

4. Price volatility

All countries are heavily exposed to commodity price volatility, which in the past few years in particular has hurt mining companies' operations and investment, as well as their suppliers. In Mozambique, a combination of falling commodity prices and macroeconomic crisis are leading many foreign and domestic firms to suspend or close down operations. Others are shrinking (Langa et al., 2017). Firms supplying repair and maintenance functions to mega-projects had to retrench 50 to 80% of their workforce.

5. Internal and regional inconsistency of local content policies

In some countries, there is inconsistency between local content, investment and industrial policies. For example, local content policies may focus on local ownership and not on value addition. Investment incentives may discourage local assembly and local sourcing, while industrial policies are not leveraging the buying power of the extractive industries.

Moreover, each country has framed its local content policy at domestic level, with no consideration for the potential to tap into regional value chains and regional cooperation. Yet, Zambia and Mozambique, for example, there are very clear regional dynamics with South Africa that could potentially be leveraged to support value addition and knowledge transfer processes.

Potential areas for cooperation

Stakeholders highlight that the most binding constraints to the development of manufacturing capabilities relate to domestic policies. These include competitive access to infrastructure, development finance, skills, and inputs. There is general agreement that stakeholder cooperation needs to be strengthened and that the local content policies, in principle, offer an important opportunity for local manufacturers. However, specific recommendations on other areas vary. Some advocate for protectionist policies, others for better integration into global supply chains of the OEMs.

In light of the opportunities and challenges discussed in the previous section, however, it is clear that there is a role for regional cooperation and potential for win-win outcomes. In the short-term, it is unlikely that global or South African OEMs could sub-contract component manufacturing across the region to a significant scale. Equally, the ability of each individual country, except for South Africa, to develop internationally competitive mining R&D capabilities will require long-term investment. Aftermarket services and locational advantages are important opportunities to localize engineering capabilities which nevertheless require additional investment in skills development.

POLICY RECOMMENDATIONS

Recommendation	Description	Objectives
Support South African firms in investing in subsidiaries across the continent	South African firms, especially OEMs and engineering firms, should be encouraged and supported in investing in subsidiaries in Africa. Such support should include market intelligence, investment facilitation, and access to capital. Trade Invest Africa (South African Dept. Trade and Industry) has a specific mandate in this regard, and should cooperate with Tanzania, Mozambique and Zambia in order to target the mining capital equipment industry. In order to maximise impact on local value addition, the OEM subsidiaries should invest in capabilities to provide aftermarket services. This approach could be a stepping stone towards re-machining and assembly operations. Aftermarket services are skills-intensive, hence there is need for coordination and strategic partnerships.	In Tanzania, Mozambique, and Zambia, OEM subsidiaries contribute to job creation and skills development. In South Africa, OEMs and engineering firms need to expand into Africa for growth and risk diversification
Prioritize the internal processes required to accede to the Washington, Sydney, and Dublin Accords	Accession to these Accords will require improvement of the quality of tertiary and vocational training systems and the associated national accreditation and quality management systems. This process will also contribute towards the SADC Regional Qualification Framework.	Skills development for manufacturing competitiveness
Develop bilateral, multi-stakeholder initiatives for skills development	Bilateral, multi-stakeholder initiatives focused on skills development should leverage the investments of South African firms in Tanzania, Mozambique and Zambia. In each country, South African OEM subsidiaries, TVET authorities, and local TVET institutes in the Copperbelt and Northwest Provinces (Zambia), Tete Province (Mozambique) and Shinyanga region (Tanzania) should cooperate in the area of curriculum development, training, and apprenticeship.	Skills development for manufacturing competitiveness
Finalise the SADC RQF and prioritise TVET and Engineering qualifications	Progress on the SADC RQF hinders Member States from finalising the establishment of NQFs and NQAs. Recognition and development of minimum standards in TVET and engineering -related qualifications should be a priority.	Facilitate regional flows of skills which are critical for manufacturing. Allow skilled workers to gain experience across the region. Upgrade the NQF in each country.
Promote standards compliance through SADC	SADC has a well-established Standardisation, Quality Assurance, Accreditation, and Metrology Programme, with specialised institutions such as SADCAS. SADC should develop a programme on standard compliance targeting metal fabricators, engineering manufacturers, and service providers in the region. This should be a component of the broader industrial upgrading programme suggested below, because most firms will have to make significant investment in process and product upgrading.	Upgrade productive capabilities in the region
Develop a knowledge sharing platform on local content policies under the SADC Industrialisation Strategy and RoadMap	Setting up regular dialogues to facilitate knowledge-sharing on local content policies, under the umbrella of activities undertaken by SADC. Activity II.2.1. "Creation of a business-friendly and conducive environment for competitiveness" of the Costed Action Plan for SADC Industrialisation Strategy and RoadMap foresees activities related to knowledge sharing. Local content policies are currently being designed or implemented in the mining, oil, gas, and engineering services sectors, and, in South Africa, some manufacturing sub-sectors. Policy-makers need to learn from each other's successes and mistakes in a neutral platform with countries at similar levels of development.	Enhance institutional capabilities in designing, implementing and monitoring local content policies
Promote sub-contracting from OEMs	Mapping local supplier capabilities for parts and components in Zambia, Tanzania and Mozambique, with the objective of developing a supplier upgrading programme. It is important to stress that manufacturing firms need to access the entire SADC market to achieve scale. Products with high potential for local sourcing include electrical cables, electrical panels, fixtures and metal fabricated products, bearings, and tires.	Enhance linkages to local manufacturers
Expand cooperation between universities on training and R&D	MoUs between faculties of engineering in South Africa, Tanzania, Mozambique, and Zambia should encourage, among others, post-graduate training opportunities, research fellowships, and R&D projects. This programme should prioritise training. However, there may be specific opportunities for joint R&D projects, including with Mintek or OEMs.	Enhance human capital and research capacity within universities

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ISBN: 978-92-1-113007-2

Printed at United Nations, Geneva
2102906 **(E)** – October 2021 – 913

UNCTAD/GDS/ECIDC/2021/1

United Nations publication
Sales No E.20.II.D.38