

Regional value chains and industrialisation: The southern African experience

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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 SADC¹ 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

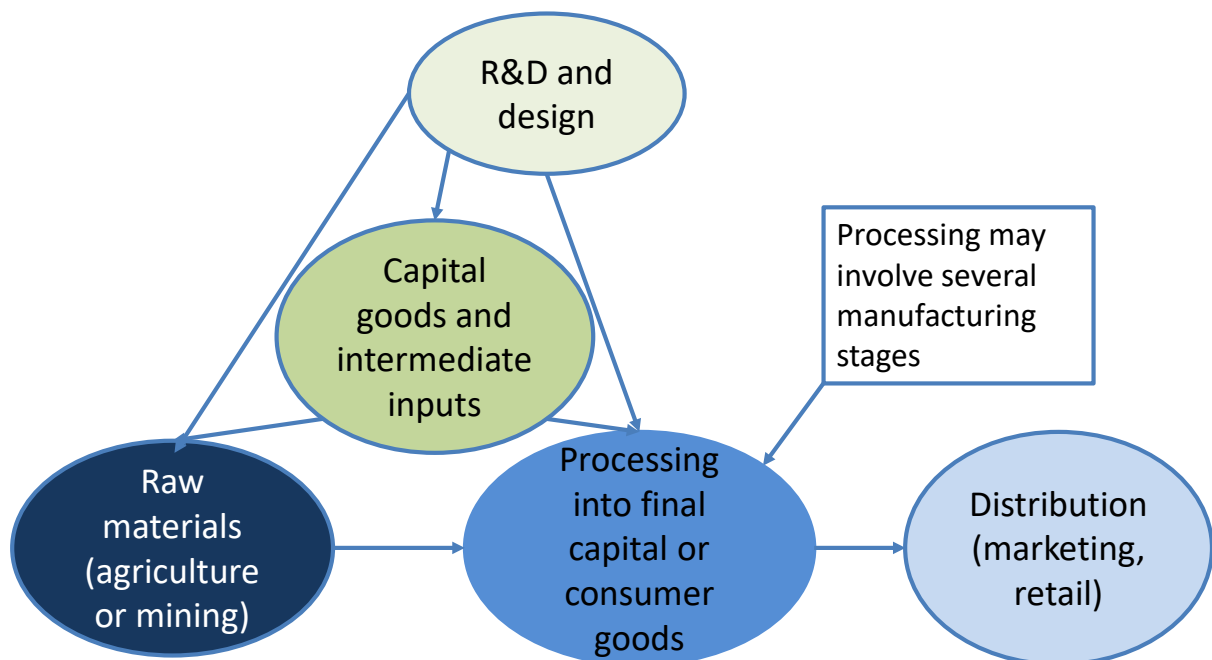
¹ The data here refer only to continental SADC, that is Angola, Botswana, the DRC, eSwatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe. It excludes the members that are islands - Mauritius, Madagascar and the Seychelles.

division of labour to promote regional industrialisation without excessive costs to South African producers.

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

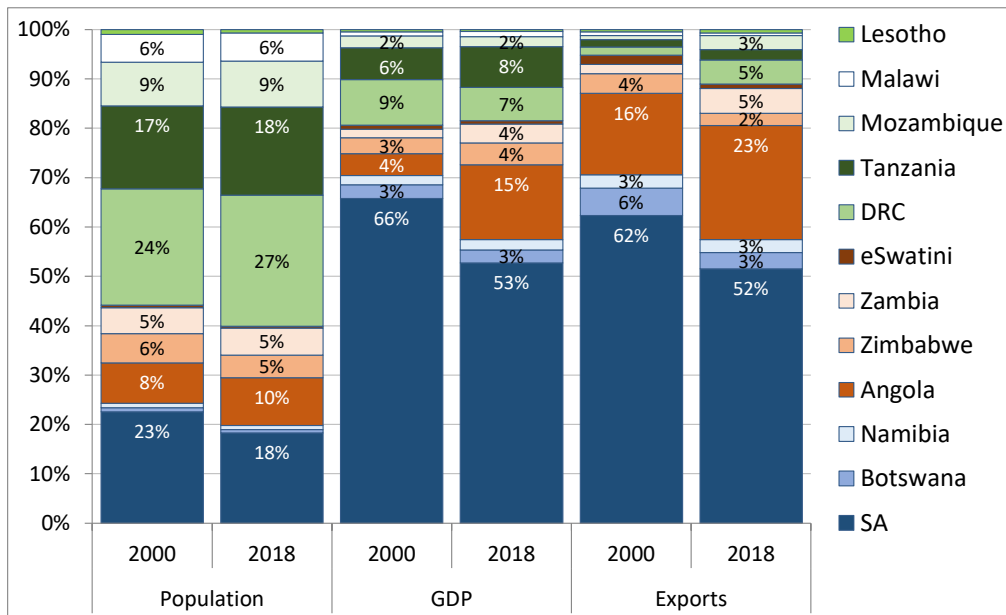
Regional value chains are particularly relevant for southern Africa because the economies in the region are small, deeply inequitable, and far from the major global markets. That makes it difficult to develop new industries without access to regional markets and resources.

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.

Graph 1. Share of continental SADC members in regional GDP (a), population and exports in 2000 and 2018, by World Bank income level

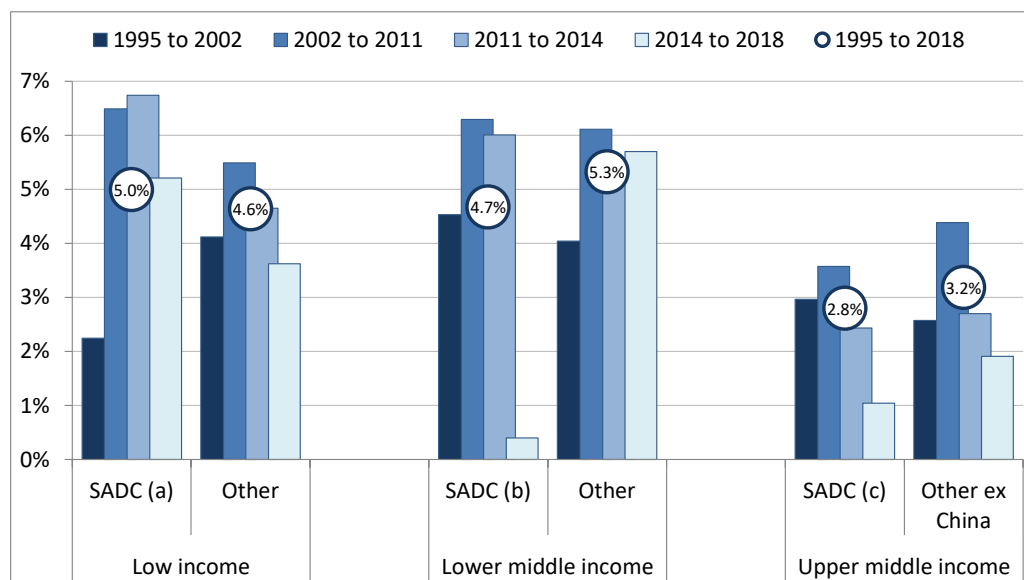


Note: (a) In current U.S. dollars (b) Botswana, South Africa and Namibia: Upper middle income (blue shades); eSwatini, Angola, Zimbabwe, Zambia and Lesotho: Lower middle income (brown shades); Tanzania, DRC, Mozambique and Malawi: Lower income (green shades) *Source:* Calculated from World Bank. World 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 Graph 2 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.

Graph 2. 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.

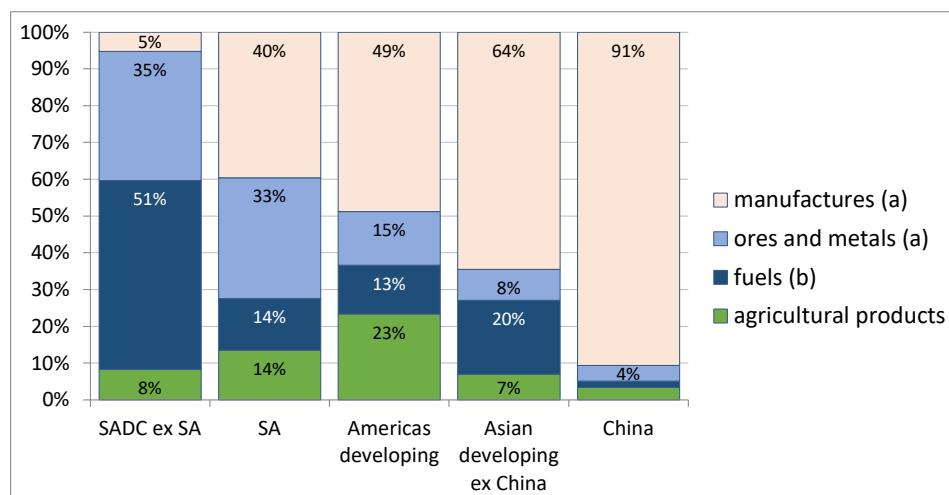
The slow growth in the SADC region compared to peer economies can be explained in large part by its high degree of dependence on commodity exports, especially minerals and fuels, combined with unusually deep inequalities.

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 Graph 3 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 products² 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.

Graph 3. Exports from continental SADC compared to exports from China and from other developing economies by region, 2018

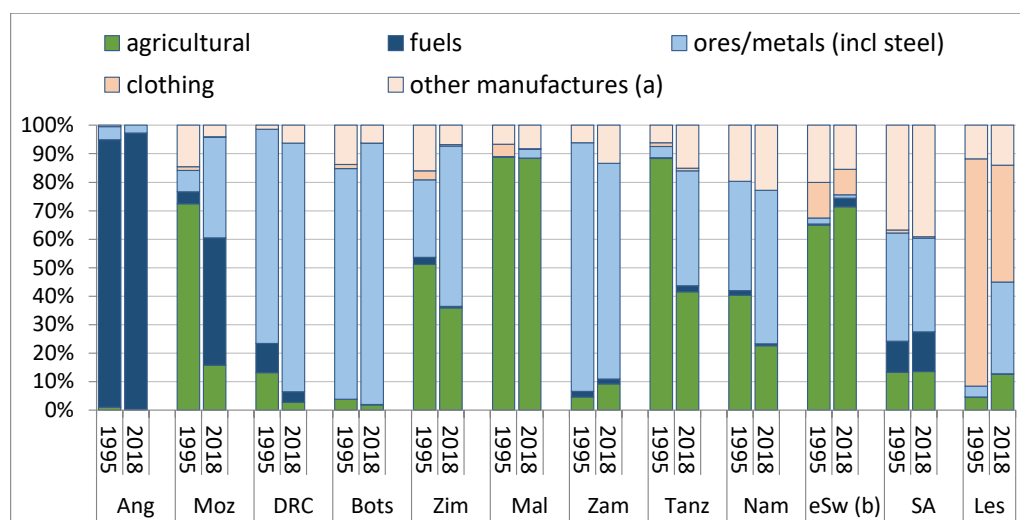


Notes: (a) Manufacturing excludes basic foodstuffs, which are included under agriculture, and iron and steel products, which are included in ores and metals. (b) Mostly oil and gas outside of South Africa, and coal for South Africa. *Source:* Calculated from UNCTAD. UNCTADSTAT. Interactive database.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

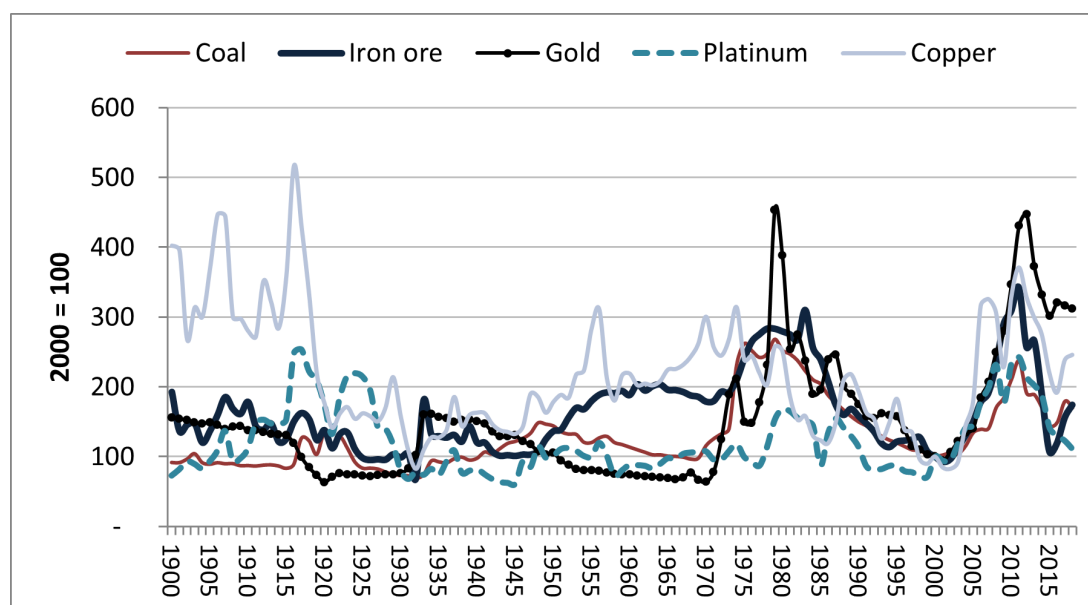
Graph 4. Structure of exports by continental southern African economies, 2000 and 2018



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.

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.

Graph 5. Index of prices of major mining commodities in constant U.S. dollars, 1900 to 2018 (2000 = 100)



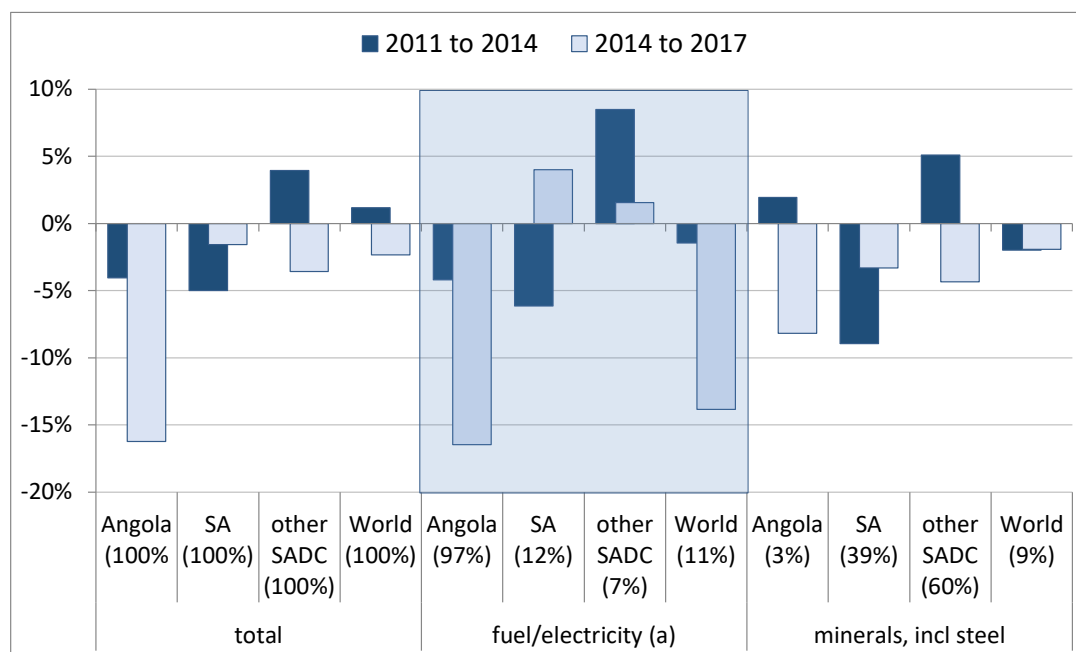
Source: For 1920 to 2015, calculated from Jacks, D.S. 2016. Chart book for “From Boom to Bust.” February. Downloaded from www.sfu.jacks.ca in June 2016. Update of David S. Jacks. 2013. “From Boom to Bust: A Typology of Real Commodity Prices in the Long Run,” NBER Working Paper 18874. For 2016 to 2018, 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 Graph 6 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.

Graph 6. 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)

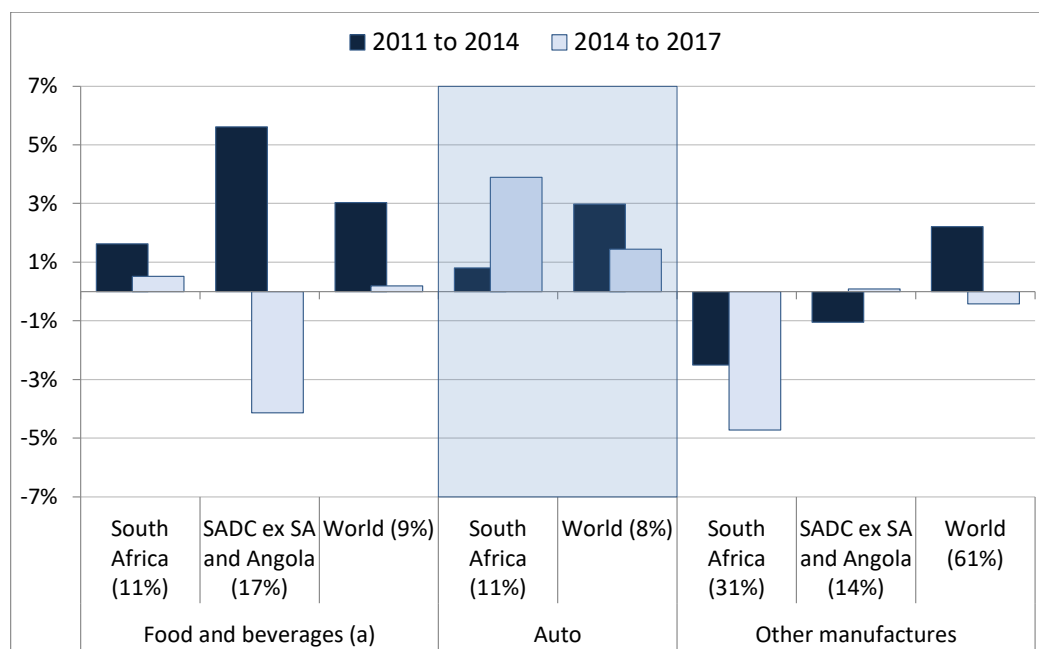


Note: (a) Includes iron and steel. South Africa exports electricity to the regional grid, and Mozambique exports it to South Africa. *Source:* Calculated from UNCTAD. UNCTADSTAT. Interactive dataset. Merchandise trade matrix – product groups, exports in thousands of United States dollars, annual. Downloaded 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.

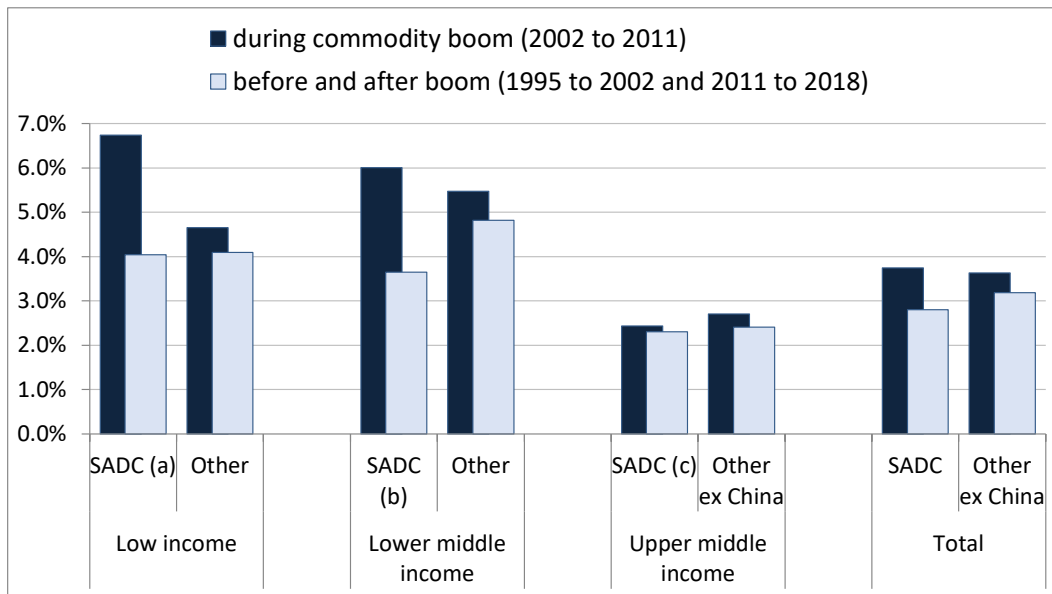
Graph 7. Growth rates for exports of food and beverages, autos and other manufactured products by South Africa and other continental SADC countries compared to the rest of the world, 2011 to 2017, in current U.S. dollars (figures in brackets are share of product in total exports)



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.

Graph 8. 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

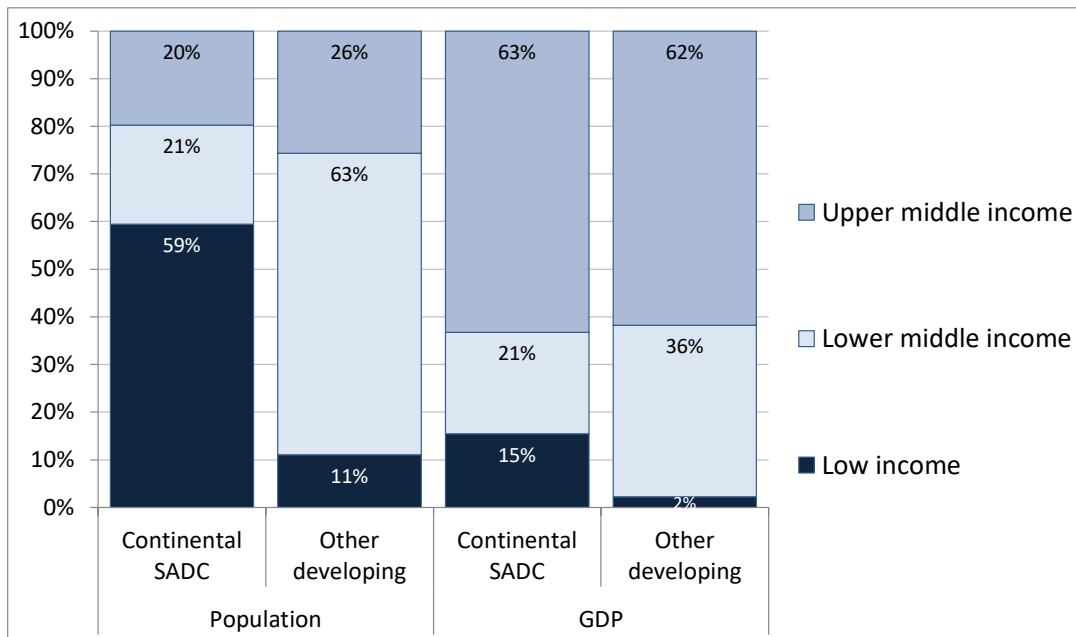


Notes: (a) Tanzania, DRC, Mozambique and Malawi. (b) eSwatini, Angola, Zimbabwe, Zambia and Lesotho. (c) Botswana, South Africa and Namibia. South Africa accounted for over 90% of value added in this group. *Source:* Calculated from World Bank. World Development Indicators. Interactive dataset. Downloaded from www.worldbank.org in October 2019.

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.

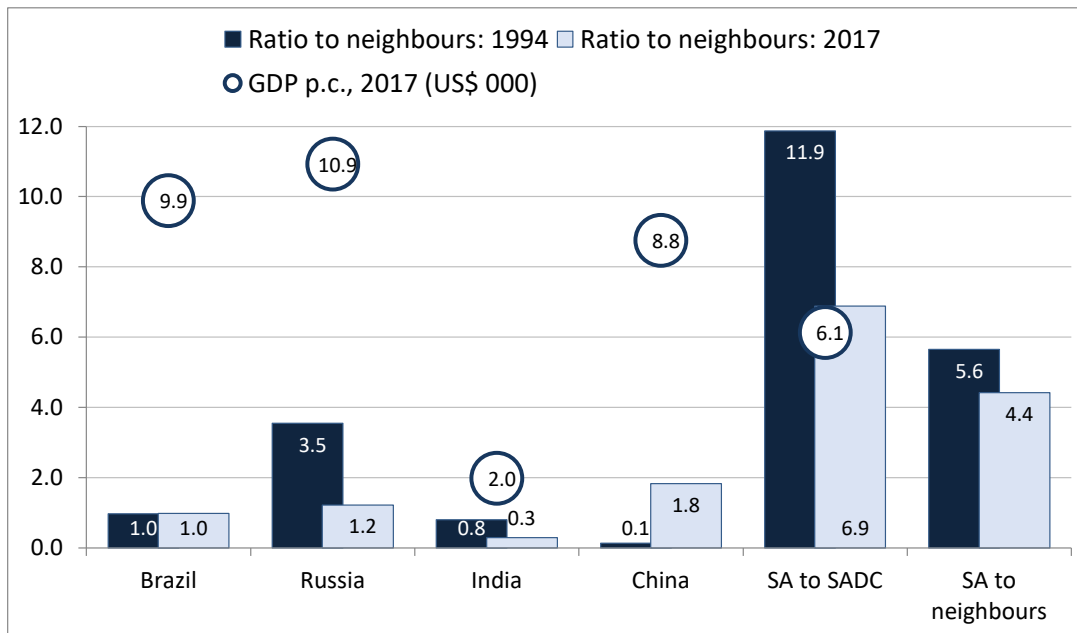
Graph 9. Share of population and GDP by income level in SADC compared to other developing countries, 2018



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.

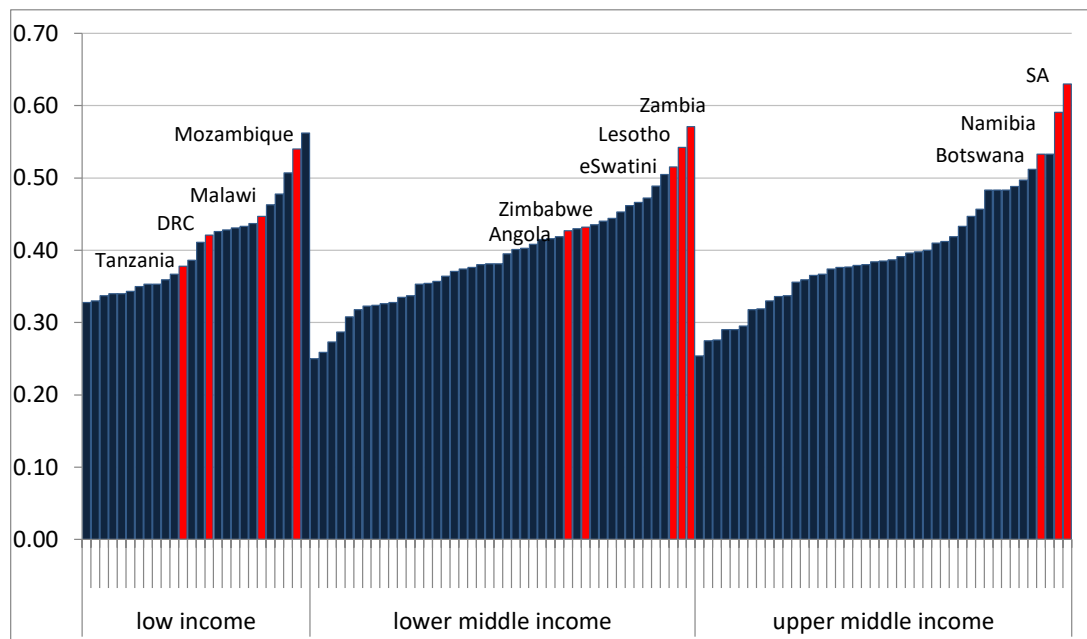
Graph 10. Ratio of GDP per capita for BRICS members to neighbours, 1994 and 2017, and GDP per capita in current U.S. dollars in 2017



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.

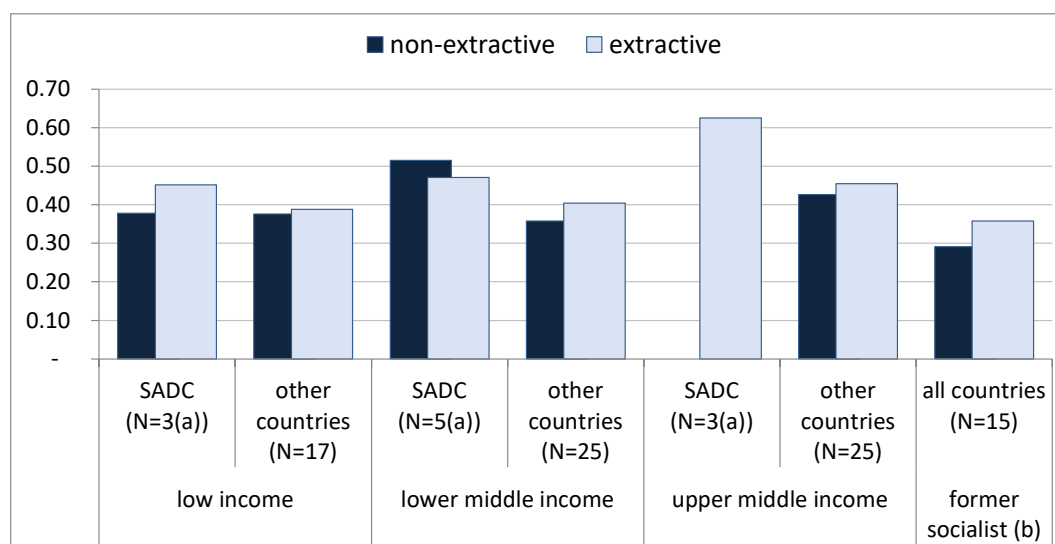
Graph 11. Gini coefficients in continental SADC compared to other countries by income level (latest available figure from 2007 to 2017)



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 graph 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.

Graph 12. 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.

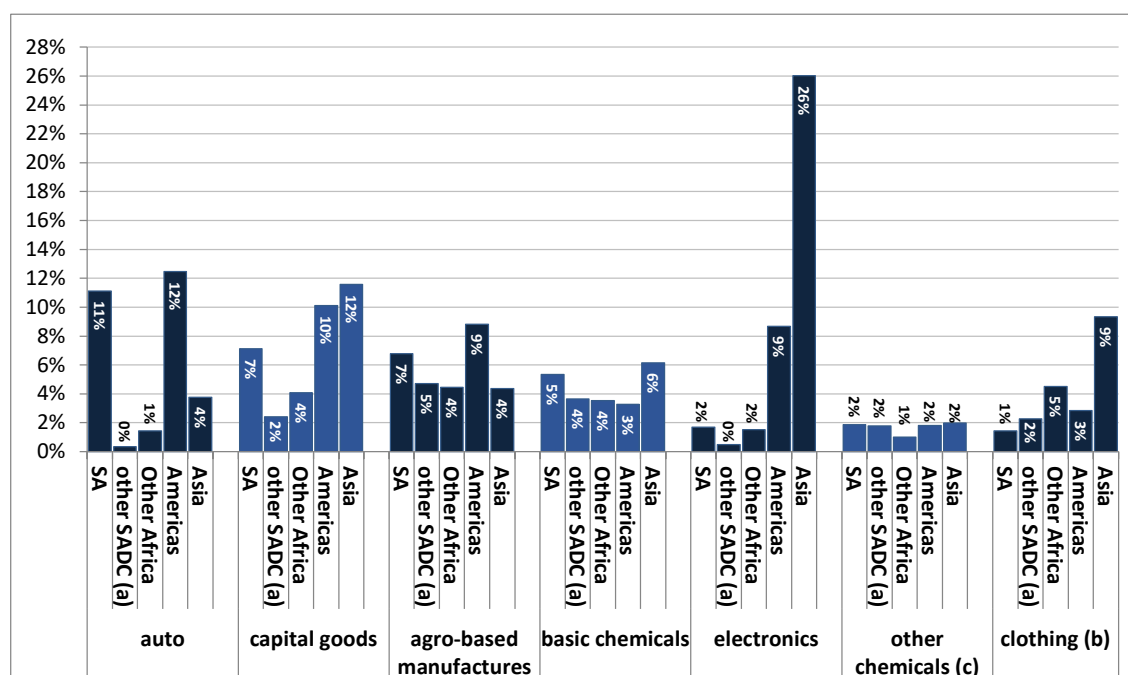
- They led to stronger policy contestation, notably around land and mine ownership as well as labour rights, which slowed investment and fuelled fierce political conflict.
- Rivalry for mineral rents often led to corruption, typically related to access to mining rights and mine ownership, procurement 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 benefited 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.

Graph 13. 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.

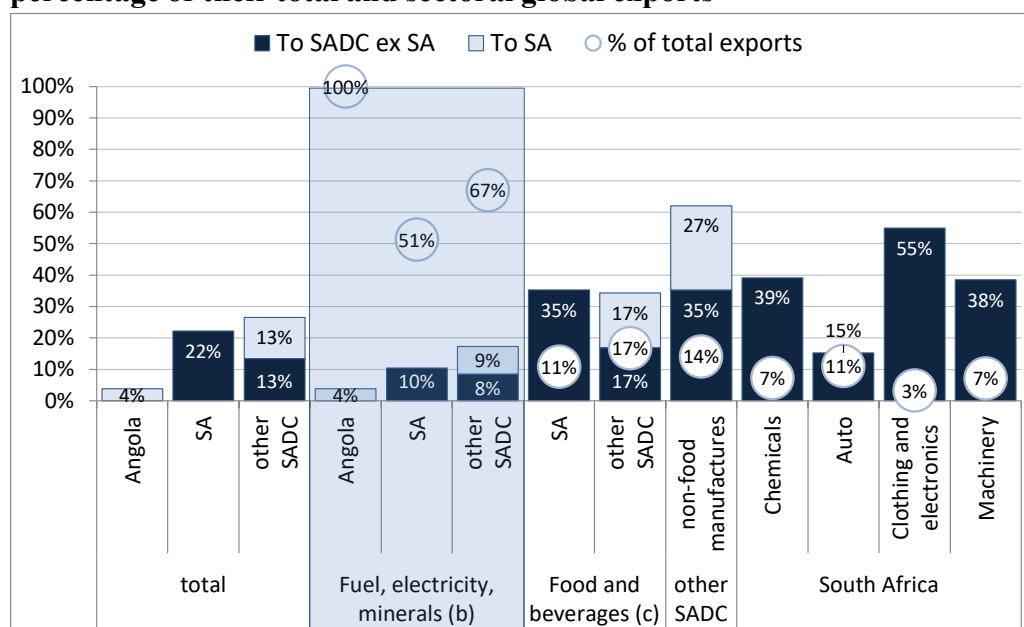
4 Regional value chains in SADC: Experiences and challenges

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.

4.1 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. (Graph 14)

Graph 14. Share of regional sales by South Africa and other SADC countries (a) as a percentage of their total and sectoral global exports



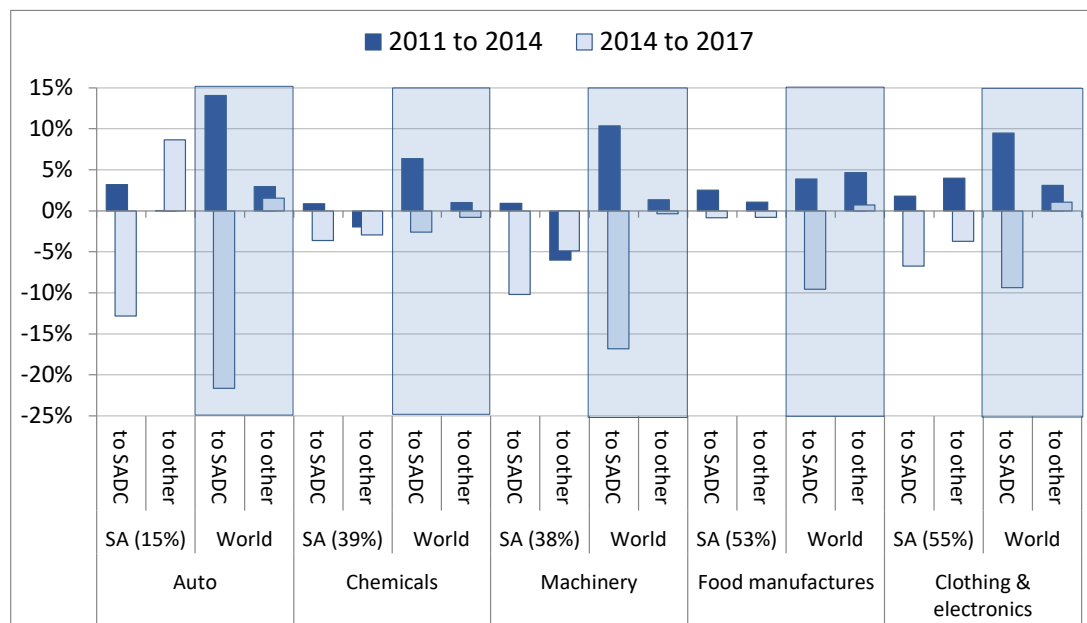
Note: (a) The source does not publish data for Angolan exports other than fuels and minerals. (b) Includes substantial exports of electricity from SA to SADC and from Mozambique to SA; also copper ore from the DRC for refining in Zambia. (c) Both processed and unprocessed products. *Source:* Calculated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

Graph 15. 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 merged 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)

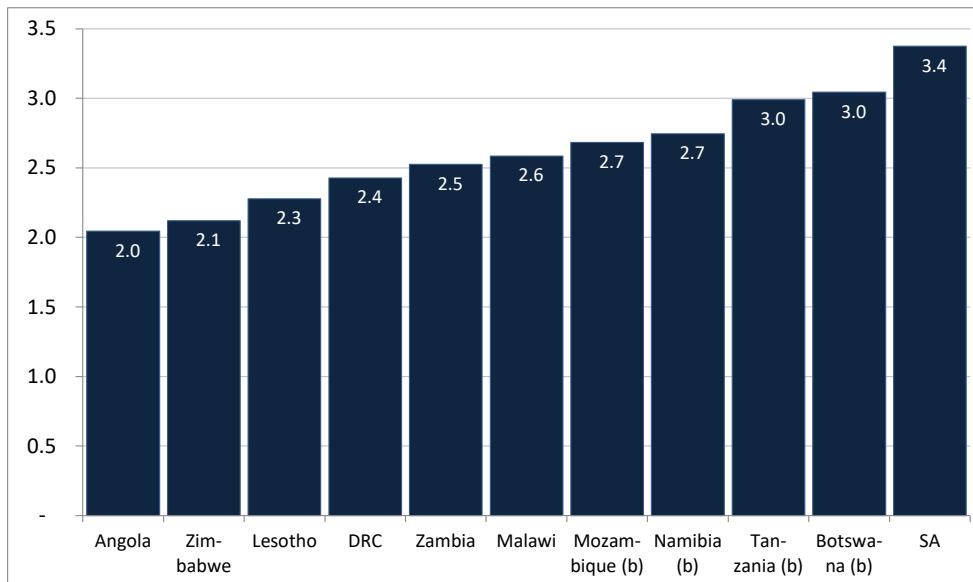
4.2 Freight transport

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.

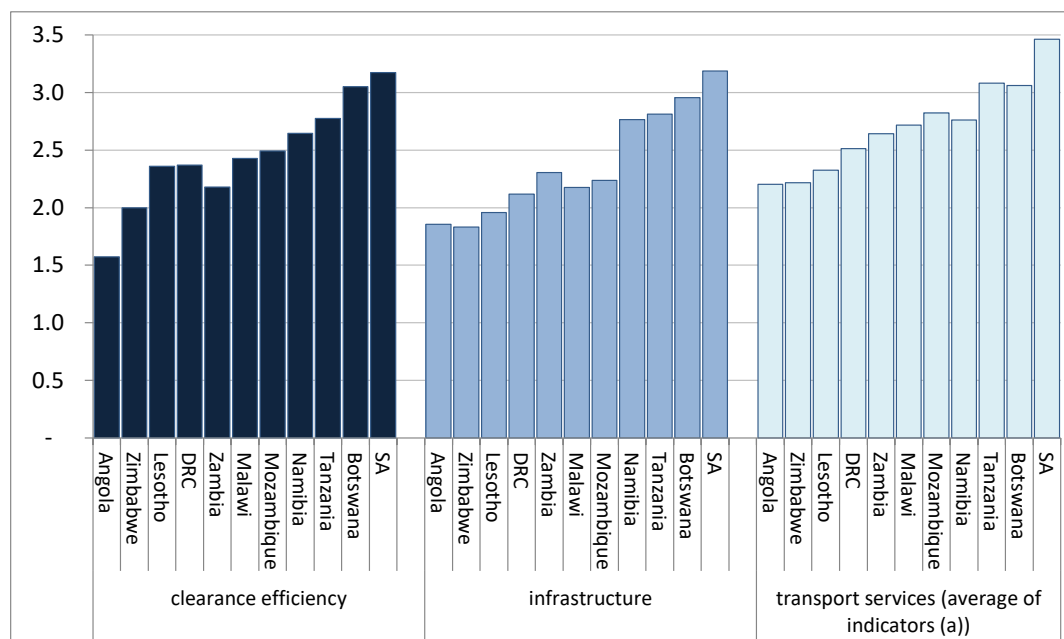
Graph 16. Scores in the World Bank Logistics Performance Index for continental SADC countries (a), 2018



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.

Graph 17. 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.

4.3 A case study: The copper value chain³

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

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

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.

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.

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

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)

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 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.

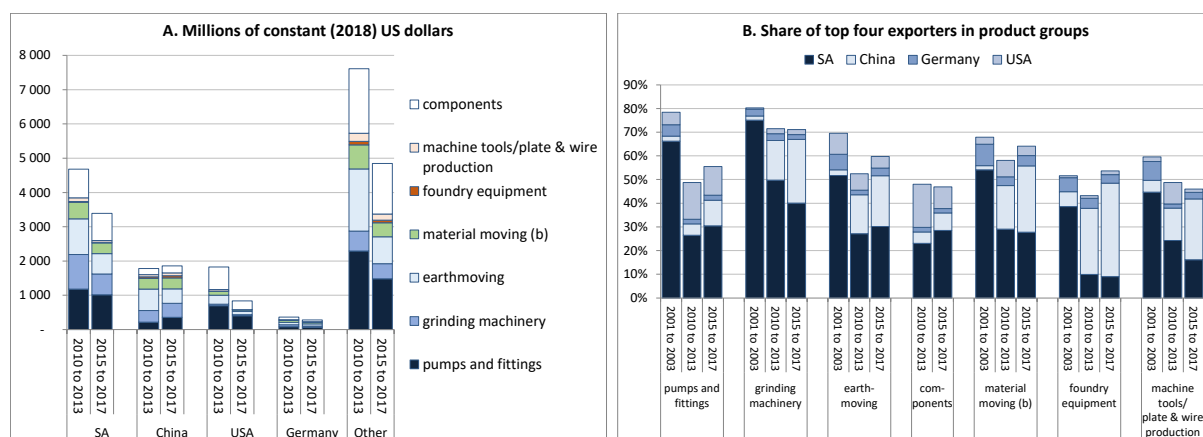
In 2018, the South African capital goods industry had around 5000 companies with 75 000 to 80 000 employees. (Calculated from SARS 2019, sheet A3.4.1 and Statistics South Africa 2018) Like the rest of South African manufacturing, the industry was fairly concentrated, with a few companies employing over 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.

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.

Graph 18. 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.

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.

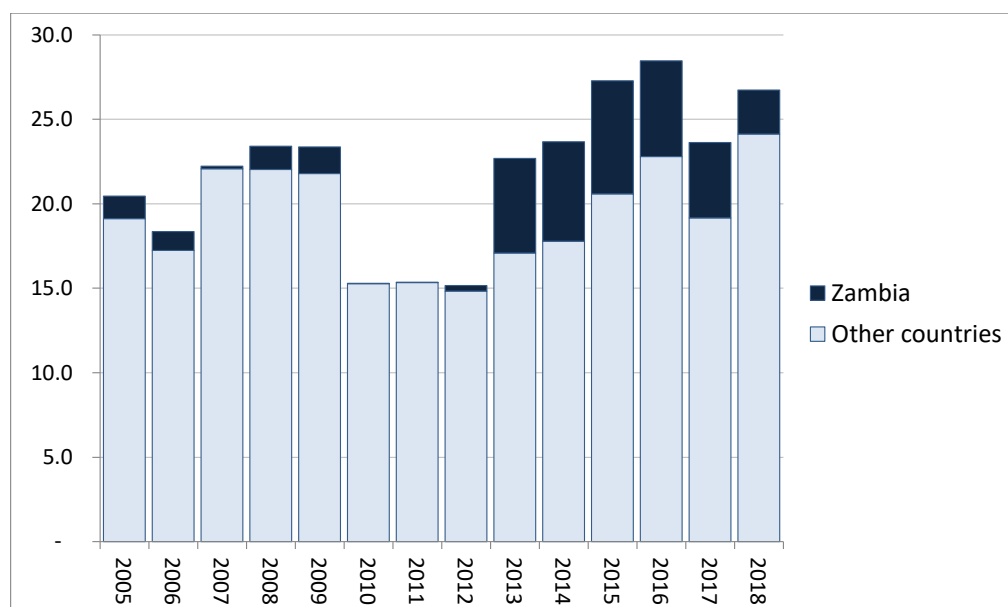
Table 1. Export credit insurance extended to Zambia, FDI stock and other foreign equity and debt, in millions of U.S. dollars, 2016

	exposure by export credit agency	FDI in Zambia	other foreign equity and debt
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.

Graph 19. 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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