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STRUCTURAL TRANSFORMATION IN SOUTH AFRICA: MOVING TOWARDS A SMART, OPEN ECONOMY FOR ALL¹

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Abstract

South Africa's post-apartheid economic transformation project has not generally delivered a "better life for all" as promised at the dawn of democracy. While most middle and upper-middle income countries have continued to see industry leading overall growth, with high investment levels, one of the most striking features of South Africa's economy is that it remains strongly oriented towards resource-based sectors. South Africa has in fact prematurely de-industrialised. While the financial sector has grown, investment levels in productive capacity and infrastructure have remained low. At the same time, concentration levels and profits have remained high. This has profound effects on the ability to generate jobs and support livelihoods.

This paper unpacks the factors that have led to poor outcomes, and puts forward ideas for a re-industrialisation agenda by drawing lessons from three industry studies, metals, machinery and equipment, the food and agro-processing sector and the automotive sector. In order to re-industrialise, investment in productive capacity is critical. It requires a new vision and programme for industrialisation under a political settlement which prioritises long-term investment in productive capacity, and rewards effort and creativity rather than incumbency. The vision proposed takes into account the political economy factors that shape outcomes, and puts forward priorities for a re-industrialisation agenda.

JEL classifications: D40; E22; O14; P16

Key words: structural transformation; competition; political economy; investment

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Executive Summary

It is evident that South Africa's post-apartheid economic transformation project has not generally delivered a "better life for all" as promised at the dawn of democracy. It is not generating prosperity and economic justice for the majority of the population and suffers from long-standing weaknesses which make it unfit to tackle the challenges of the 2020s. Unemployment remains stubbornly high. At the end of 2017, unemployment by the narrow definition stood at 26.7% and, by the broader definition, at 36.3%. Youth unemployment, narrowly defined, remained at an untenable level of 38.6%.² Instead of being empowered, South Africa's people are increasingly directly and indirectly reliant on various forms of social grants.

The social fabric is tearing, with a marked increase in service delivery protests - from an average of 900 a year between 1997 and 2013, to 2000 a year between 2014 and 2017.³ Moreover, the recent protests appear to have been driven by communities' exclusion from democracy in addition to discontent around the lack of delivery of basic services. The highest levels of income inequality in the world are combined with a large proportion of the South African population living below the poverty line – 30.4 million (55.5%) survive on less than R992 per person per month.⁴ Meanwhile, all the indications are of ongoing concentration of wealth.⁵

Any 'new deal' must chart a path to shared prosperity and meaningful economic participation. This can only be achieved by investing in the capabilities of individuals, firms and communities. Such investment will only happen if hard choices are made about the model of the market economy which has been adopted. Muddling along is not an option.

What are these choices? The main contribution of this study is to point out that shifts in the structure of the economy have been towards lower productivity and resource-based activities – which has taken the economy in the wrong direction. However, we can learn from our experience and recognise that only a focus on developing industrial capabilities across manufacturing and related services, in engineering and design, can sustainably generate higher incomes and wealth for all.

The political compromise in 1994 largely entrenched the economic status quo of years before. This can be understood within the context of the time. But, it does not explain the persistence of this approach through the 2000s. The market-friendly set of economic policies adopted by successive South African post-apartheid governments rested on a narrative that apartheid had undermined the productive potential of the economy through far-reaching interventions in markets and therefore liberalisation was essential. However, liberalisation has reinforced, rather than altered, the existing development trajectory. A concerted programme is required to alter the rules for markets, in order to incentivise broad-based investment in skills and productive capacity, if real economic transformation is to stand a chance.

Lack of structural transformation

Countries develop by changing the structure of the economy to move from sectors of low to high productivity and complexity (sectoral transitioning) and within sectors through upgrading to higher

² Quarterly Labour Force Survey QLFS Q3:2017

³ Runciman (2017).

⁴ Inequality in terms of the distribution of the nation's income across the population (Gini Index) stands at 63,38, where 0 represents complete equality and 100 is total inequality. The Palma index focuses on the differences between those in the top and bottom income brackets. The ratio takes the richest 10% of the population's share of gross national income (GNI) and divides it by the poorest 40% of the population's share. South Africa's Palma ratio is 7.1, where 0 represents complete equality and 100 is total inequality. <https://www.theguardian.com/inequality/datablog/2017/apr/26/inequality-index-where-are-the-worlds-most-unequal-countries> . Poverty is defined as below R992 per person per month.

⁵ 95% of assets in the country are in the hands of the richest 10% (Orthofer, 2016).

value-added activities (sectoral deepening).⁶ The shift to more advanced activities further raises the national income and taxation base, making deeper and more equitable provision of universal social services possible. Typically, sectoral transitioning has been about moving from mining and agriculture, to manufacturing, and then to advanced industries (combining high value services, research and development, and manufacturing). Manufacturing is central due to its interdependencies with agriculture and mining, on the one hand, and services like engineering and design on the other.⁷

South Africa has not made significant progress in transforming the structure of its economy and, by some measures, has in fact regressed. It has **prematurely deindustrialised**, with the contribution of manufacturing to GDP declining from 21% in 1994 to 13.3% in 2016.⁸ This matters for a developing economy as, throughout history, manufacturing has been regarded as the main source of productivity growth. Manufacturing has the ability to pull along growth through backward and forward linkages to the rest of the economy. For example, productivity increases in the agricultural sector have been made possible by the developments in manufacturing industries producing agricultural machinery, chemical fertilisers and, increasingly, genetic engineering. The manufacturing sector drives technology-driven productivity growth and has strong interdependencies with other high value activities, especially high value-added services.⁹ Consequently, the loss of manufacturing capabilities disadvantages economies in the long run.

Within manufacturing in South Africa there has been a **structural regression** as growth in value added has continued to be biased towards mineral and resource-based sectors.¹⁰ There has been a decrease in manufacturing employment across the board, but the largest losses have been borne by exactly those diversified manufacturing industries where strong growth would create jobs, directly and in related industries.¹¹

The lack of structural change is reflected in South Africa's **undiversified exports**. Mineral and resource-based sectors continue to dominate the export basket and together account for 60% of merchandise exports. South Africa is thus missing out on the gains from international integration from improved competitiveness and 'learning through exporting' in diversified manufacturing industries. Instead, there are 'islands' of export capabilities, such as in mining machinery, which have not been built upon. While the auto sector – which has been highly incentivised under successive industrial policies – stands out in terms of the value of exports, these have been limited to fully assembled vehicles and a narrow range of components.

In services too, the trend has been to lower value, **lower productivity services** overall, including those statistically classified as 'other business services' (such as security and cleaning services) and retail. There has been strong growth in communication services reflecting technological changes, but not employment growth. While financial services has also grown in value-added, it has not grown employment. Nor has its growth been associated with higher levels of savings and investment in the real economy. Thus, the increase in the contribution of services to GDP from 60% in 1994 to 68% by 2016 has not been part of a positive structural transformation of the economy.

⁶ Hidalgo, et al. (2007); Hidalgo and Hausmann (2009); Andreoni (2011); McMillan, et al. (2017).

⁷ Andreoni and Chang (2016b).

⁸ Statistics South Africa

⁹ Andreoni and Chang (2016b).

¹⁰ For example, value added in coke and refined petroleum products grew at an average rate (CAGR) of 6% over the period 1994-2016 while other diversified manufacturing only grew by 1% in the same period. Diversified manufacturing's share of total manufacturing value added *declined* by 12.5 percentage points between 1994 and 2016. Similarly, employment share declined by 5 percentage points between 1994 and 2016, equivalent to 243 417 people.

¹¹ Tregenna (2012); Black, et al. (2016).

The South African economy continues to be **highly concentrated**, with some data showing worsening concentration levels, even while ownership has changed with an increase in foreign and local institutional investors. At the same time, average rates of profit have remained high. Firms have been channelling funds towards mergers and acquisitions rather than in expanding and upgrading productive capacity. Monopolistic firms have less of an incentive to invest, since they can earn rents by protecting their market share rather than upgrading their product offering. Furthermore, **barriers to entry** for smaller firms inhibits investment and thus dynamism.

Capital account liberalisation has resulted in large portfolio inflows as well as outflows, resulting in a volatile exchange rate, while investment rates have remained much lower than in other middle-income countries.

South Africa's poor performance must be understood in the context of the evolving **political settlement**, that is, the compromises reached between powerful groups in society which sets the context for institutional arrangements and other policies.¹² The compromises reached in 1994 reflected the strength of established business groups. The government sought to discipline their rents by subjecting them to market competition, from imports, and through competition law enforcement.¹³ At the same time, macroeconomic policy emphasised 'stability' and cutting the fiscal deficit. Monetary policy was narrowly focused on reducing inflation, meaning higher interest rates and returns for those with positive net wealth. In the 2000s high real interest rates coupled with natural resource earnings led to a strong, over-valued Rand and hence a growing trade deficit exacerbated by burgeoning credit-fuelled consumer spending. The unsustainability of this path became glaringly obvious with the global financial crisis of 2007/8 and the end of the commodities boom shortly thereafter.

The political settlement has evolved since 1994 with the introduction of social grants for the poor; higher earnings for professionals, including for the growing number of public servants in a small middle class; and changing ownership patterns mainly towards a political elite and connected persons. Despite the rhetoric of 'economic transformation', the actual focus on a market-friendly, non-interventionist set of economic policies left little space, in practice, for manoeuvre in terms of redistribution.¹⁴

The lack of trickle-down benefits resulting from embarking on this development path meant growing pressure to accumulate wealth by leveraging state influence. From 2008 there has been vertical fragmentation of control within the African National Congress (ANC) as a result of competition for extractive rents from local to national levels of government and in state-owned corporations.¹⁵ In addition, a horizontal fracturing also occurred within the labour and business constituencies. Along with the rise of the Association of Mineworkers and Construction Union (AMCU), industrial unions split and left the Congress of South African Trade Unions (COSATU). For a time, public sector trade unions were kept onside by higher public wage settlements for government employees. But as the delivery of services by the state deteriorated, protests increased across the country.

The fragmentation of government is problematic for realising a coherent industrial policy. Industrial development requires co-ordination between policies on mining, energy, trade, development finance, competition, technology, sector industrial development and procurement. In fact, the **fragmentation of the state**, with its accompanying proliferation of departments, opened-up more space for successful lobbying by large international businesses and aided rent-seeking.

¹² Khan (2010).

¹³ Joffe, et al. (1995).

¹⁴ Ponte, et al. (2007).

¹⁵ Makhaya and Roberts, (2014); Bhorat, et al. (2017).

Inconsistent stances have been taken across government. The impact on industrial policy has been profound as it has made effective interventions across departments and the combination of policy instruments near impossible.

The result has been much poorer economic performance in South Africa compared with other upper-middle income countries. South African industry value-added grew at an average rate of just 1.6% over the period 1994 to 2016 while GDP grew at 2.9%. This contrast with the average for all the upper-middle income countries which recorded an average industry value-added growth of 5.5%, leading GDP growth of 5.0%. Investment levels have been much weaker in South Africa, and efforts to improve skills have had limited success. Between 1994 and 2014, the share of black African youth in skilled occupations *decreased*.¹⁶ Malaysia is a particularly useful comparison as in the 1980s and 1990s it had a strikingly similar economic structure to South Africa in terms of mining share of GDP, output per head and total factor productivity.¹⁷ Both South Africa and Malaysia were medium-sized economies with deep racial divides, where the ethnic majority had political power, but economic power lay with the ethnic minority. Over the last three decades, however, Malaysia continued to industrialise while South Africa went in the opposite direction. Malaysia recorded investment rates averaging 27% of GDP over 1994 to 2015¹⁸ compared to South Africa's 18%, and high technology manufacturing exports at 43% of the total compared to South Africa's 6%.

Key industry studies

Three in-depth industry studies were conducted in order to analyse the dynamics behind these aggregate trends. The industry groupings studied are: Metals, Machinery and Equipment; Automotive Vehicles and Components; and Agriculture and Agro-processing. These industries are important not only in their own right, but also because of the key linkages they exhibit and the broad range of policies of multiple government departments and institutions which impact on them. In each study, the extent of structural transformation is assessed, taking into account their linkages with sectors including agriculture, energy, mining and different groups of services. The studies analyse the impact of policies including, but not limited to, those traditionally identified as industrial and trade policies.

The **Metals, Machinery and Equipment** industries have seen a hollowing out of capabilities in the downstream, more diversified industries mainly as a result of failure to manage resource earnings during the commodity boom years to ensure the exchange rate was not over-valued, and to invest in downstream capabilities. Various forms of continued support for the upstream basic metals sectors has also contributed to this trend. The sector has witnessed increasing import penetration, particularly in the machinery and equipment industries, though there are pockets where South Africa remains competitive, notably in mining equipment.

The **Automotive Vehicles and Components** sector reflects a similar story, even though there has been sustained industrial policy support through the Motor Industry Development Programme (MIDP) and Automotive Production and Development Programme (APDP). The industry continues to run a significant trade deficit while local content remains low. As such, South Africa has not developed capabilities of more sophisticated auto hubs in countries such as Thailand and Mexico. The design of the system favours the multinational vehicle exporters by allowing import rebates and

¹⁶ StatsSA (2016).

¹⁷ Rodrik (2008).

¹⁸ Malaysia is not unusual in its levels of investment. The average for middle-income and upper-middle income countries are 27% and 28% respectively.

has resulted in significant downstream import penetration, with tier 2 and 3 producers increasingly isolated from vehicle manufacturers.

In the **Agriculture and Agro-processing** industries there have been widespread liberalisation of markets, except for sugar which continues to enjoy protection. The resultant restructuring brought huge job-losses. The fresh fruit sector has emerged as a strong export generator and has built considerable capabilities to export fruit into international markets. While downstream processing of sugar, dairy and fruit does present opportunities for industrialisation, value chain challenges remain. This includes, for instance, continued support for the sugar industry, raising the price of sugar for downstream producers. The dairy processing sector is concentrated, with the increasing presence of multinationals resulting in significant barriers for new entrants. The retail level of the value chain is also concentrated.

Economic development requires deliberate industrial policies, which are at the heart of countries' development. Industrial policy plays an important role in coordinating investment in interdependent activities, addressing underinvestment in capability development due to externalities, and dealing with the inherent discrepancies in the ability to deal with risk and uncertainties between individual producers.¹⁹ The lack of an overarching industrial policy in South Africa in the 1990s and early 2000s, and poor commitment across government following the introduction of the National Industrial Policy Framework in 2007, has undermined various industrial policy interventions and limited its impact on industries. Moreover, the failure to manage the commodities boom to ensure the exchange rate was not over-valued, and that revenues were saved and invested, exacerbated the hollowing out of industrial capabilities over the 2000s.

Key challenges for a new development path

The studies taken together highlight the following policy challenges.

Limited collaboration for 'learning' and building capabilities: The process of adopting and adapting technology requires learning and investment in capability-building in a number of related activities. Extensive company and industry-level analyses makes it clear that achieving competitiveness is about understanding value chains and building clusters to address collective challenges in productive capabilities at different levels of the chain.²⁰ In South Africa there have been very few cluster initiatives in the areas where structural transformation is required. For instance, strategies to build downstream capabilities in the Metals, Machinery and Equipment industries, where South Africa already has a significant industrial base, have not been effective. Furthermore, co-ordination with other areas, notably public procurement, has been lacking in design and especially in implementation.

Lack of coherence between technology and industrial policies: The lack of coherence between skills development policy and industrial policy means that firms often privatise the necessary training, which implies a bias against smaller firms. Furthermore, government's technology policy and industrial policy are fragmented and ineffective in working together towards industrialisation. While the fourth industrial revolution brings opportunities, there is a question around how to create an environment for smaller firms to participate in the changes, with the risk that technology advancements leave South African firms even further behind.

¹⁹ Andreoni and Chang (2016a).

²⁰ Sutton (2012).

Over-reliance on competition law enforcement for making markets work: Understanding competition issues through the value chain is critical for industrial policy, since industrial policy interventions at one point of the value chain may result in sub-optimal outcomes in another point of the value chain. For example, the study of agro-processing demonstrates the central role of supermarkets in routes to market for food producers. However, competition law enforcement does not create competition in the face of barriers to entry, as the competition authorities only address the conduct of existing businesses. The proposed amendments to the Competition Act, published in 2017, provide for market enquiries, which broadens the scope of the competition authorities to enable proactive interventions.

Design, co-ordination and implementation of policy instruments: In order for government incentives and other support measures to have a wider impact on the economy, it is necessary that incentive packages are designed with robust conditionalities. Incentives should be carefully designed, taking the roles of various government departments into account.

Poor co-ordination between macro policy and industrial policy: Managing the exchange rate to ensure exports are competitive has been a key pillar of the industrial policy of industrialising countries. South Africa's monetary policy of a flexible exchange rate and inflation targeting, however, has resulted in significant import penetration and destruction of industrial capabilities during periods of exchange rate overvaluation. The uncertainty around the exchange rate, as well as its level, has proved a major deterrent to investment in tradable goods and services. As far as fiscal policy is concerned, the focus has been to reduce the government deficit, with the underlying assumption that the private sector will invest if the role for government is reduced, but this has not happened. A growing public-sector wage bill has also had the effect of limiting the resources available for public sector investment.

Way Forward

We need an economy that is more dynamic, competitive and sustainable, where innovation and productivity lead to better jobs with high wages, and where entry is supported. In order to do this, there needs to be a new vision for reindustrialisation under a political settlement which prioritises long-term investment in productive capacity and rewards effort and creativity rather than incumbency. It requires a broad rethink rather than piecemeal initiatives, in order to place re-industrialisation and industrial policies at the centre of the country's development strategy.

It is important to acknowledge that in many areas there have been strategy documents, including the industrial policy framework and action plans, which have set out objectives and policy levers but these have been undermined by the fragmentation of the state and the failure of government departments to follow-through. This has no doubt partly been due to state capture, the full extent of which is becoming uncovered with each passing day. What is required, however, is to face up to the hard choices for the structural transformation required.

The elements of this vision and the main planks in addressing the structural transformation challenges are set out as follows.

a) Building a broad coalition for reindustrialisation

South Africa's course for reindustrialisation and inclusive growth needs to be based on a broad coalition which focuses on productive investment and widening economic participation. The narrow coalition of elites, buttressed by higher government salaries and social grants for important constituents has undermined investment and reinforced rather than changed the existing structure

of economic power. Reindustrialisation requires public investment to provide effective public transport and education for economic activity, alongside long-term private investment and entrepreneurship.

The levels of poverty and inequality are unsustainable, and the youth is bearing the brunt of the high unemployment rates. The creation of jobs and livelihoods are a priority for avoiding further unravelling of the social fabric. Newly elected president, Cyril Ramaphosa, is in the process of forging a “new social pact” between government, business and labour. The previous pact benefitted the insiders, with emphasis on wealth ‘trickling down’, but this did not drive industrial development. Though the current political settlement has accommodated the small black middle class to an extent including through public sector jobs, the burden of ‘black tax’ is a constant reminder that things need to change. Higher earnings for a small minority of the black population is not sustainable.

What is the new political settlement that can inform the new ‘social pact’ or new deal to ensure that it delivers real economic transformation? A new political settlement for industrialisation must speak to and mobilise key black constituencies, including industrial trade unions through effective skills upgrading and investment, and productive black entrepreneurs through opening-up economic opportunity. The settlement must speak to their aspirations, especially in urban areas where the majority now live and where industrial agglomerations are built. It must reach and sustain a shared and binding commitment which, through shared growth and investment, will lead to a reversal of the growing inequality in wealth. The settlement needs agreement around the expectations for large firms, rewarding long-term domestic fixed investment, innovation and dynamic competitive rivalry with effective government policies regarding infrastructure, procurement, skills development, technology and opening regional and international markets. It must be captured in a national agenda, which is designed and delivered locally, where people have a strong sense of identity, and a stake in the outcomes.

b) A commitment to structural transformation and the consolidation of fragmented government structures

The vision for industrialisation must be integrated with overall economic planning and be based on an understanding of sectoral dynamics and opportunities, taking land, water and energy into account. Successful industrial policy requires analysis of the challenges and opportunities, design, intervention and coherence. Experience from other countries highlights that this needs to be led politically from the apex of government and that lessons learnt along the way need to be incorporated in an iterative process of continuous improvement of policy design and implementation.

The vision includes a re-shaping of government departments bringing together those that relate to technology, industry, trade, development finance and regulating markets, and providing for clear leadership and coordination with areas including skills development, energy, minerals and agriculture. This needs to be accompanied by improving the institutional capacity and accountability of public institutions, rather than their number.

c) Understanding and pursuing opportunities

The importance of the region for South Africa’s growth needs to be factored into future industrial policies. The most important market for much of South Africa’s diversified products and services has become the wider southern African region, although South Africa is losing market share in a number of products. Partly this reflects the lack of commitment to a shared regional vision for industrial development across southern Africa. South Africa’s reindustrialisation must therefore be

in line with the Southern African Development Community's (SADC) regional industrial development strategy, which seeks to *jointly* uplift the economies in the region. We must import as well as export. Regional value chains are crucial, for instance, in the mining capital equipment sector. In agriculture, as South Africa moves to higher value products it needs to import more staple foodstuffs from the region. In the context of climate change, it is important to recognise that the great majority of water resources in SADC are not being used effectively and, with South Africa likely to more frequently experience drought conditions, it could take advantage of the ample rainfall in countries to the north by supporting the expansion of their agriculture, importing staple foods, and ensuring a more competitive regional agro-processing sector.

d) Incentivizing and investing in capabilities development

The fourth industrial revolution is bringing the role of technology into sharp focus in moving countries forward. While the apartheid government heavily supported innovation and industrial development in organizations related to its own objectives, post-apartheid governments have had more broad-based innovation strategies. Technology is, however, embodied in investment, and the low level of investment in the economy means poor progress in technological upgrading. A strategy for building capabilities must bring together technology policy, investment and industry incentives to present a coherent path for firms.

Incentives, technological change and development finance therefore all need to work together along with cluster initiatives at the local level. Incentive programmes should include conditionalities to ensure that there are wider benefits to the economy and care needs to be taken to avoid creating or entrenching firm dominance. Cluster initiatives have a key role to play in linking skills development, shared facilities for technological capabilities such as design, testing and prototyping, and in supporting firms to pool resources, creating economies of scale and developing supply markets. Understanding how collective action can be supported for private investment in capabilities by groups of firms is central to building dynamic industrial clusters, along with effective institutions of industrial policy. Local and provincial governments have played a leading role in the few cases where clusters have been successful given the geographical embeddedness of cluster initiatives.

e) Confronting concentration

Changing the profile of ownership and control is critical to public support for any economic agenda and this includes directly addressing the concentrated structure of the South African economy. Competition between firms is at the heart of an economy's dynamism. First, rivalry between firms promotes productivity improvements as firms invest in upgrading and improving production capabilities in order to win market share. Second, the competitive dynamics within a market determine the ability of new participants to bring new products, and in the South African context, this refers to the possibilities for accommodating black entrepreneurs.²¹ Third, the exertion of market power can contribute to inequality by facilitating a transfer from the poor to the wealthy in the form of management compensation, profits and shareholder dividends emanating from anticompetitive conduct.²²

Competition law enforcement under the Competition Act addresses the behaviour of firms and evaluates mergers but does not create competition in the face of barriers to entry. The South African economy requires a broader competition policy, as part of industrial policy, which facilitates the

²¹ Roberts (2017b).

²² Baker and Salop (2015).

entry and expansion of businesses, especially black entrepreneurs, and reduces barriers to entry. In addition to noting concentration, the industry studies point to the importance of understanding vertical integration in some value chains. Co-ordinated interventions are required at the different levels in order to support entry. The interventions need to be coupled with development finance to enable the investment in capabilities and learning necessary to grow efficient businesses. Specifically, there is a need for “patient capital” given the time required to build the scale and reach required to be competitive, and the appetite for risk in financing rivals taking on powerful incumbents. Development finance institutions need to be both aligned to industrial policy and make significant funds available for funding investments and supporting entry of businesses.

Effective regulation for competition and entry is an important aspect, especially in sectors where there are strong network effects such as telecommunications. Local government policies are also crucial for opening-up opportunities for rival businesses, such as the ways in which retail space is configured. The analysis of barriers to entry has further highlighted the importance of access to markets for rivals, for instance, a possible ‘supermarkets code’ where retailers commit to open-up shelf space to smaller businesses and engage in supplier development initiatives.

f) Reorientation of macroeconomic policy for industrialisation

A reorientation of macroeconomic policy is required to ensure the long-term management of natural resource earnings, consider the appropriate exchange rate, take into account the causes of inflation and dis-incentivise volatile capital flows. Fiscal policies need to prioritise longer-term investment.

1. Introduction

The past decade has seen a growing consensus re-emerging on the importance of industrialisation, as well as on the very poor performance of South Africa in this regard which has meant the country has failed to deliver the “better life for all” promised at the dawn of democracy. Studies have shown that changing the structure of production to more sophisticated and complex activities and integrating into the international economy through trade and technology relationships is key to economic development (Lall, 2004; Khan and Blankenburg, 2009; Hausmann, et al., 2014).

The process of industrialisation is the movement of factors of production to higher productivity and more complex activities (see, for example, McMillan et al. 2017). Changes in overall output per worker can be due to improvements *within* sectors and shifts in factors of production (labour and capital) *across* sectors, from lower productivity to higher productivity activities (McMillan & Rodrik, 2011). This is termed **structural transformation**.

Industrialisation is about building productive capabilities. Manufacturing is critical sector because of its generally more complex and higher productivity activities and needs to be understood along with its linkages to activities such as engineering and design services, although these have not been growing in African countries (Rodrik, 2016; Hoekman, 2017). Similarly, there are industrial capabilities in moving to higher value agricultural production – in improving yields, moving to higher quality products, as well as the co-ordination required with logistics and packaging (the “industrialization of freshness” as it is termed by Cramer and Sender, 2015).

South Africa has failed to achieve this structural transformation and changes have, in fact, broadly been growth-reducing rather than growth-enhancing. Resource-based sectors and related areas in the economy have continued to dominate, along with low-value services, and manufacturing performance has been poor. This is in stark contrast to other countries that have successfully industrialised. The strong and sustained growth in labour productivity in East Asia resulted from a major change in the sectoral composition of output in the economy in tradable goods *and* services, combined with within sector productivity growth. In South Africa, there has also been strong growth in financial services, but with little employment creation and not supporting higher levels of local investment.

In assessing the post-apartheid industrialisation outcomes, our analysis accounts for the fact that the structure of the economy is deeply rooted in historical legacies, including the impact of state support for specific industries in South Africa. South Africa’s structural transformation challenges are thus discussed in the context of the apartheid legacy and elements of continuity and change. This includes reflections on the continued importance of resource and energy-intensive sectors while, in the agriculture sector, there are important issues about the changes in policy and their impact on the mix of activities.

One of the central questions that the paper consider is why the levels of investment in the South African economy are so low. This is important, since industrialisation (moving to higher value activities and sectors) requires investment by firms. This question is considered from a variety of different angles, including concentration, internationalisation, and through insights from in-depth industry studies.

It is well-documented that concentration levels in the economy are high. A major concern of the paper is the implications of the very high levels of concentration in a small number of large firms, including the investment strategies of these firms on which the economy has been centred. These

firms have also internationalised as a result of the lifting of capital controls and the integration of South Africa into the global economy.

In looking at patterns of industrial performance and low investment, a political economy standpoint which considers the interplay of coalitions of interests and their influence over policies is essential. The paper considers the role of government policies in understanding industrialisation outcomes, including how those policies have been implemented. The shifting constellation of local interests and the ability of government to regulate effectively, given the lobbying and negotiating power vested in large and transnational firms, are key aspects.

The approach adopted in this paper is to examine the structural transformation, or lack thereof, in South Africa at two levels. First, a central objective of this paper in Section 2 is to examine the changes which underlie the aggregate variables in order to trace patterns within and across sectors. This examines data on output, value add, trade performance and investment. The description of structural transformation in the South African economy is further understood in terms of the changing nature of concentration, ownership and control, and internationalisation. This is important for the consideration of questions of market power, competition and investment, as well as broader questions of economic power.

Second, the core questions relating to the factors underlying the observed outcomes are assessed through in-depth analyses of three industry groupings, drawing on the separate studies done on each. Section 3 of this paper summarises the key findings of the industry papers and Section 4 draws more general insights from them.

The selection of the three industry groupings was made with the specific objective of assessing the linkages through different levels of processing as well as with agriculture, energy, mining and different groups of services, and to analyse the impact of policies across government on the industry performance. The three groupings are as follows:

- **Metals, Machinery and Equipment**, incorporating linkages to mining and energy. This industry grouping has undergone far-reaching restructuring and includes upstream basic metals, which received considerable support under apartheid, and machinery which requires sophisticated capabilities.
- **Agriculture and Agro-processing**. There was wholesale liberalisation of agricultural markets in the 1990s (except in sugar). There is potential for high value growth with upgrading of industrial capabilities in fruits, as well as downstream processing.
- The **Automotive Vehicles and Components sector**, which has been the subject of the most concerted, long-running and targeted post-apartheid industrial policy.

In each of these we consider what structural transformation means, taking into account linkages across the economy, and assess the performance of the industry groupings and the effects of the range of policies which impact on the industry. The role of powerful interests runs through these assessments. On the side of government, the fragmentation of policy across different departments is a key theme which emerges. Other cross-cutting issues dealt with in Section 4 include the role of technology, competition and concentration, and the influence of macroeconomic policy. Section 5 concludes.

2. Understanding Structural Transformation and Industrialisation

2.1. Structural transformation and industrialisation

In the wake of the liberalisation agenda pursued internationally in the 1980s and 1990s (and the efficient markets hypothesis on which it was purported to rest), the consensus points towards a failure to deliver meaningful transformations in developing and low- and middle-income countries. These include African countries. Countries such as China and Vietnam, which have transformed, cannot be characterised as following the orthodoxy. At the same time there has been a rise in transnational corporations (TNCs) around the world, and growing concentration of wealth.

Structural change involves shifting capital and labour to sectors and activities with higher productivity, including manufacturing (McMillan & Headey, 2014). Growing more sophisticated and complex activities, and integrating into the international economy through trade and technology relationships, is key to development (Lall, 2004; Khan and Blankenburg, 2009; Hausmann, et al., 2014). Thus, a more complex productive structure enables countries to engage in high-productivity activities that lead to faster development (Felipe, et al., 2012).

It is therefore important to understand the coalitions of interests within countries which support the design and implementation of the appropriate policies. The policies imply conditions being imposed on firms to ensure high levels of effort in learning and technological upgrading, to discipline the earning of rents from protection and subsidies (Khan, 2015). This means it is necessary to consider the political circumstances for the state to play such a developmental role in support of the growth of diversified manufacturing sectors with higher levels of productivity (Khan and Blankenburg, 2009; Andreoni, 2016). The South African experience highlights where powerful coalitions of interests in business and working through the state have undermined industrialisation.

Manufacturing is key because of its generally more sophisticated and higher value-adding activities. It is also likely to be related to more advanced activities in services and agriculture, such as design, engineering services, and the application of industrial techniques to agricultural production. The relationship between manufacturing and services is important in attempting to better understand the growth of productive capabilities, where services such as information technology (IT) and design tend to be highly productive and tradeable relative to others, and how it can play a key role as a growth driver (Rodrik, 2016; Hoekman, 2017). An important aspect of the debate on industrialisation therefore relates to the changing relationships of manufacturing with services, as well as with primary production such as agriculture and mining. Countries need to choose whether to be producers of the equipment in which advanced technologies are embodied, or simply importers.

Moving to more complex and higher value productive activities involves incorporating the application of design and engineering services (higher productivity services) as part of ongoing product development.²³ In this context, reindustrialisation necessitates the development of key sectors such as transport and logistics, finance, design and technology, which further contribute towards economic growth, employment and value addition (Roy, 2015). In contrast, countries in Africa have seen urbanisation being accompanied by growth of low-skilled services that do not

²³ For example, the rise of the importance of retail has also been linked with the importance of branding (see das Nair, 2018).

have growth-enhancing attributes for increasing productivity and innovation (Tregenna, 2016; Hoekman, 2017), and have weak linkages with the manufacturing sector.

Different approaches have been taken to measuring industrialisation in the literature. A number of people, such as McMillan and Rodrik (2011), and Tregenna (2013, 2016), examine sectoral changes, since development entails structural change, shifting capital and labour to sectors and activities with higher productivity, including manufacturing (McMillan & Headey, 2014). Looking at industry value-added and the composition of exports further allows us to assess changes in the complexity of production and diversification of exports (Felipe, et al., 2012). We use international country comparators to explore the issues of product diversification in South Africa.

The role of investment and technological capabilities²⁴

Cross-country research has emphasised the significance of investments to industrial development, economic growth and employment creation (Temple, 1999; Team, 2005; Beil, et al., 2005; Gylfason and Zoega, 2006). Evidence suggests that the high levels of growth in newly industrialising countries has been driven largely by high levels of investments in manufacturing, amongst other sectors (Jun, 2002). Increased labour productivity requires investment in physical capital, for both the *within* sector and *across* sector changes (Newman, et al., 2011). Investment is thus crucial to increase productive capacity and, because technology is to an important extent embodied in more advanced machinery and complex production systems, it is important to assess the patterns of investment.²⁵ The link between investment, output, and employment levels is typically positive and significant.

Investments are driven by a number of factors including expected returns and the cost and availability of finance. We note too that choices about investment are also impacted on by the transnational nature of corporations. Value chain research has brought to the fore international co-ordination by firms with power to govern production and value addition at different levels, as well as determine the division of returns.

There is a critical role for industrial policy in influencing expected returns, along with public investment in crowding-in private investment (Amsden, 1997). Industrial policies have played a key role in supporting the growth of diversified manufacturing sectors with higher levels of productivity (Khan and Blankenburg, 2009; Andreoni, 2016). There are also implications for monetary policy (through setting interest rates) as well as procurement and tax policies in influencing business decisions.

Investments made to adopt and adapt technologies for broad-based industrialisation require both access to international technologies and the capacity to absorb them. Technological capabilities are required at the firm level, and appropriate institutional capacity is necessary at national and local levels (such as in skills development, testing and certification, and financing for the necessary investments). Both are built over time in path-dependent and cumulative processes of learning-by-doing. This is why participating in the higher value-adding activities in value chains is so important

²⁴ Investment refers to transactions that increase the magnitude of real aggregate wealth. This mainly includes the purchase of new durable assets such as factories and machines. Economic theory identifies three types of investments namely fixed investment (in plant and equipment), inventory investment and residential investment in housing.

²⁵ Note that investment in financial assets and mergers and acquisitions are not considered as investments in this sense. The focus here is on fixed investment given its strong links with the enhancement of productive capacity and employment creation (du Toit & Moolman, 2004), rather than investments in the accounting sense, which includes mergers and acquisitions.

as it means being part of ongoing capabilities development rather than simply competing for tasks based on low costs.

Technological capabilities are also an important part in the explanation of why there is little, if any, empirical support for simple openness to international trade and capital flows being linked to economic development (Fagerberg & Srholec, 2008; Fagerberg et al, 2010). The point is that the growth in exports, and the benefits from importing, depend themselves on whether countries have developed capabilities. Similarly, foreign direct investment (FDI) and foreign ownership are not in themselves associated with sustained economic development, as countries require absorptive capacity in order to benefit from international technology relationships (Narula & Dunning, 2000).

2.2. Assessing structural transformation in the South African economy

South Africa has performed poorly against its peer group of upper-middle income countries (Table 1). While overall, in upper-middle income countries (and middle-income countries) industry value-added has led GDP growth over the period 1994 to 2016, it is striking that for South Africa the opposite is the case. South Africa is not alone in this; Brazil has recorded a similar pattern with industry – and manufacturing as a sub-set of industry – growing slower than GDP. This contrasts with countries such as Malaysia, Thailand and Turkey.²⁶

	Brazil	Malaysia	South Africa	Thailand	Turkey	Middle-Income	Upper-middle Income
GDP (US\$ billion), 2016	2 248	344	420	406	1 119	26 914	20 535
GDP growth, 1994-2016	2.4%	4.9%	2.9%	3.4%	4.8%	5.1%	5.0%
GDP per capita, 2016 (US\$)	10 826	11 028	7 504	5 901	14 071	4 812	7 960
Industry value added growth, 1994-2015	1.7%	4.1%	1.6%	3.4%	5.9%	5.4%	5.5%
Manufacturing, value added growth, 1994-2015	0.4%	5.4%	2.3%	3.9%	5.7%		
Manufacturing, value added (% of GDP), 2015	11.8%	22.7%	13.4%	27.6%	19.0%	20.8%	19.9%
Manufacturing exports (% of merchandise exports), 2015	38%	67%	49%	78%	79%	66%	68%
Growth of exports of goods & services, 1994-2015	5.1%	5.1%	3.4%	6.4%	7.6%		
High-tech exports (as % of manuf exports), 2015	12%	43%	6%	21%	2%	19%	20%
Average Gross Fixed Capital Formation (% of GDP), 1994-2015	19%	27%	18%	27%	25%	27%	28%
Gross Fixed Capital Formation growth, 1994-2015	2.8%	3.6%	5.3%	0.2%	7.4%	7.1%	7.3%
Market capitalisation of listed domestic companies (% of GDP), 2016	42%	121%	322%	106%	20%	59%	60%

Source: World Bank, World Development Indicators

Note: Growth rates are all calculated as compound annual average growth rates

²⁶ These countries were selected because they have similar levels of per capita GDP to South Africa, are medium-sized in terms of population, and have pursued industrialisation strategies.

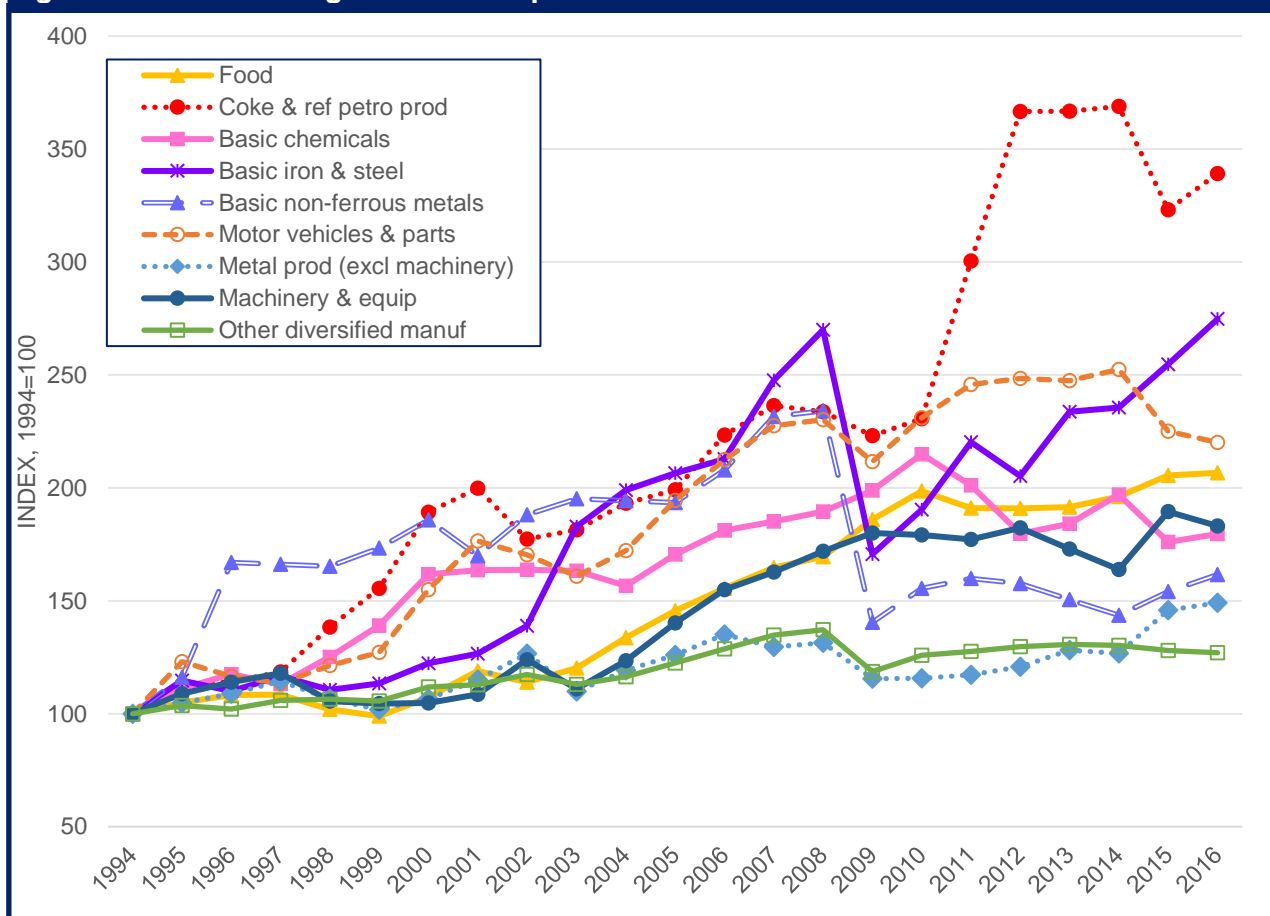
South Africa and Brazil both also have a relatively low share of manufactured exports (less than 50%) in total merchandise exports and have a low share of high-tech exports within these manufactured exports – less than 10%, compared with Thailand’s 20% and Malaysia’s 44%. Interestingly, the example of Turkey suggests that manufacturing exports need not be classified as hi-tech for positive effects on growth and investment. We return to understanding questions of technology and innovation as part of industrialisation in Section 4.

When looking at major industry groupings in South Africa, we find that three broad industry groups dominate manufacturing output: i) Petroleum Products, Chemicals, Rubber and Plastics (SIC 331-338); ii) Metals, Metal products, Machinery and Equipment (SIC 351-359); and iii) Food, Beverages and Tobacco (SIC 301-306) (see Appendix A1). In 1994 these products accounted for 62 percent of manufacturing output which increased to 65 percent in 2016, led by the resource-based sectors of basic metals and chemicals, indicative of strong path dependency effects.

A deeper look into the value-added²⁷ performance of disaggregated manufacturing sub-sectors reveals the overall stronger performance of upstream resource-based sectors led by Coke and Refined Petroleum products and Basic Iron and Steel (Figure 1). There has effectively been a regression over the past two and a half decades, away from more diversified and sophisticated manufacturing activities. Motor Vehicles, Food products, and Machinery and Equipment have all grown, but with serious weaknesses in terms of a broad base of capabilities, as analysed in detail in the industry papers reviewed in Section 3. The Motor Vehicle sector, in particular, grew value-added as a result of sustained support for the sector through the MIDP (1995-2012) and APDP (2013-2020), but local content declined in the latter period (Black et al., forthcoming, 2018). While Machinery and Equipment grew from 2003 to 2009 and created jobs on the back of local and regional demand, it became substantially less internationally competitive over the same period.

²⁷ Output measures the quantity of final goods produced within a time period, while value added refers to the addition of value on intermediate products by a firm. In this way, value added can be measured as the difference between the value of final product and intermediate products.

Figure 1: Manufacturing value-added performance: selected sectors²⁸



Source: Quantec, authors' calculations

There are also important differences between the resource-based sectors, especially from 2009, which reflects the extent to which they are vulnerable to international price volatility and local energy prices. Petroleum refineries (coke and refined petroleum products) have recorded the highest value-added growth over the whole period. Sasol, which dominates the value-added in this sub-sector, benefits from being vertically integrated back into coal and obtains natural gas at very low prices from Mozambique (Mondliwa & Roberts, 2017). Sasol also accounts for the majority of value added in basic chemicals²⁹ and the division of value added between refineries and basic chemicals is to a large extent an internal transfer pricing decision. The prices of inputs to basic chemicals production are largely set at a 'Fuel Alternative Value' (in line with non-discounted import parity prices of liquid fuels in South Africa) meaning that the value-added remains upstream in the refineries business.

Both Basic Iron and Steel and Non-Ferrous Metals face the challenges of volatile international prices in terms of both inputs and outputs and, since South Africa is a small open economy, it is vulnerable to huge price swings.³⁰ For Basic Iron and Steel the main inputs are iron ore and coal, while the sector is exposed to international steel price cycles on the output side. For Basic Non-Ferrous metals (largely aluminium) the main inputs are imported bauxite and local energy. A key question for industrial policy is how to manage the impact of large price swings on the local

²⁸ "Other Diversified Manufacturing" is inclusive of all other manufactured products not separated out in the chart.

²⁹ Basic chemicals include fertilizer and polymer chemicals which obtain their feedstock from refinery by-products and co-products.

³⁰ World prices are affected by commodity price cycles on which China's industrialisation has had a major impact.

economy including support for downstream sectors such as fabricated metal products which have performed very poorly.

Looking at employment data, we see a decline in employment across the board for manufacturing sectors, with the exception of Coke and Refined Petroleum products (which is highly capital-intensive and employs very few people) and Machinery and Equipment in which South Africa should be the workshop of Africa (Table 2). The large decline in employment for other diversified manufacturing, which accounts for half of all manufacturing jobs, is emblematic of the failure of the economy to transform.

Table 2: Manufacturing performance: selected sectors

	Total Employment			Value Added			Average Real Wage/Employee (1994-2016)	Labour Productivity Index (2016) (1994=100)
	Growth (1994-2016)	Share of Total		Growth (1994-2016)	Share of Total			
		1994	2016		1994	2016		
Food	-0,7%	14,3%	15,6%	3,5%	11,7%	14,9%	118 293	238,1
Coke and refined petroleum products	2,0%	0,9%	1,6%	6,0%	4,3%	9,0%	173 589	221,3
Basic chemicals	-2,0%	1,9%	1,5%	2,8%	3,4%	3,8%	262 365	292,2
Basic iron and steel	-2,8%	3,7%	2,6%	4,9%	3,8%	6,4%	242 272	489,3
Basic non-ferrous metals	-2,4%	1,8%	1,4%	2,3%	3,2%	3,2%	144 890	266,6
Metal products excluding machinery	-0,6%	8,3%	9,2%	1,9%	6,8%	6,3%	110 823	167,2
Machinery and equipment	0,9%	5,3%	8,2%	2,9%	5,2%	5,8%	126 259	151,1
Motor vehicles, parts and accessories	-1,0%	6,6%	6,8%	3,8%	4,3%	5,9%	129 707	262,7
Other Diversified Manufacturing	-1,4%	57,2%	53,1%	1,1%	57,1%	44,7%	103 222	
Total Manufacturing	-1,1%	100%	100%	2,3%	100%	100%	116 809	202,3

Source: Quantec, authors' calculations

Note: Employment figures include formal and informal employment.

Average real wage/employee is in constant 2010 Rands.

Growth rates are all calculated as compound annual average growth rates.

In the capital and resource-intensive Basic Chemicals and Basic Non-Ferrous Metals sectors, restructuring has led to loss of mainly low skilled jobs (and labour productivity growth along with higher average wages). Growth in these sectors would not be expected to create direct employment. However, in motor vehicles, the failure to improve local content including in components has seen a similar pattern being observed.

As discussed above, the relationship between manufacturing and services is important in attempting to better understand how to maximise growth (Rodrik, 2016), where services such as IT tend to be highly productive and tradeable relative to others, and can play a key role as a growth driver. While there have been studies assessing the links between growth of the services industries and manufacturing, services are very heterogeneous and the questions of causality are complex.³¹

³¹ For some industrialised economies, improved manufacturing has resulted in a decrease in manufacturing employment and growth in the services sector, perhaps as a result of outsourcing as well as other factors such as new technologies, competition and offshoring (Dey, et al, 2006). Other countries have increased productivity and employment through the rate of growth achieved as well as the areas in which they have specialized. The use of input-output analysis has allowed for a better understanding of the extent of linkages between the manufacturing and services industries. However, input-output analysis ignores the exogenous factors that may result in increased demand for services (Tregenna, 2010).

Some services such as IT, engineering, and design have a greater likelihood to develop more innovative production processes and improve quality management techniques, which aid in improving manufacturing's productivity (Dasgupta & Singh, 2005).

The growth of services exports in South Africa has been biased to traditional rather than advanced services (Bhorat et al, 2016). The data on disaggregated services is, however, relatively poor as it does not separately classify services such as engineering and design. Detailed firm and sector level analysis is required, as has been undertaken in the three industry studies.

In South Africa, at an aggregate level, the Communication, Finance and Insurance, Business Services, and Transport and Storage sectors have recorded particularly high growth in value added, above 4% per annum (Table 3 below and Appendix A6). However, this has not been accompanied by employment growth in Communication or Finance, in each of which high growth in average wages has resulted from a change in the skills mix. This contrasts with the growth in employment recorded in the Business Services segment (2.9%) which are low wage, low skill occupations including security guards.

Table 3: Services sector performance

	Total Employment			Value Added			Average Real Wage/Employee (1994-2016)	Labour Productivity Index (2016) (1994=100)
	Growth (1994-2016)	Share of Total		Growth (1994-2016)	Share of Total			
		1994	2016		1994	2016		
Wholesale & retail trade	3,7%	22,3%	28,5%	3,8%	20,1%	20,7%	50 933	102,7
Catering & accom services	0,0%	5,3%	3,2%	2,2%	1,7%	1,2%	30 369	142,3
Transport & storage	4,2%	4,2%	5,9%	4,1%	8,9%	9,8%	102 658	97,9
Communication	-0,5%	2,3%	1,2%	8,7%	1,3%	3,6%	114 671	629,8
Finance & insurance	-0,1%	6,3%	3,7%	6,0%	7,0%	11,3%	166 304	349,8
Business services	2,9%	16,3%	17,8%	4,1%	18,5%	20,5%	59 454	129,9
Community & personal services	2,0%	43,3%	39,6%	2,4%	42,5%	32,9%	109 228	107,0
Total Services	2,5%	100%	100%	3,6%	100%	100%	83 578	126,8

Source: Quantec, authors' calculations

Note: Employment figures include formal and informal employment.

Average real wage/employee is in constant 2010 Rands.

Growth rates are all calculated as compound annual average growth rates.

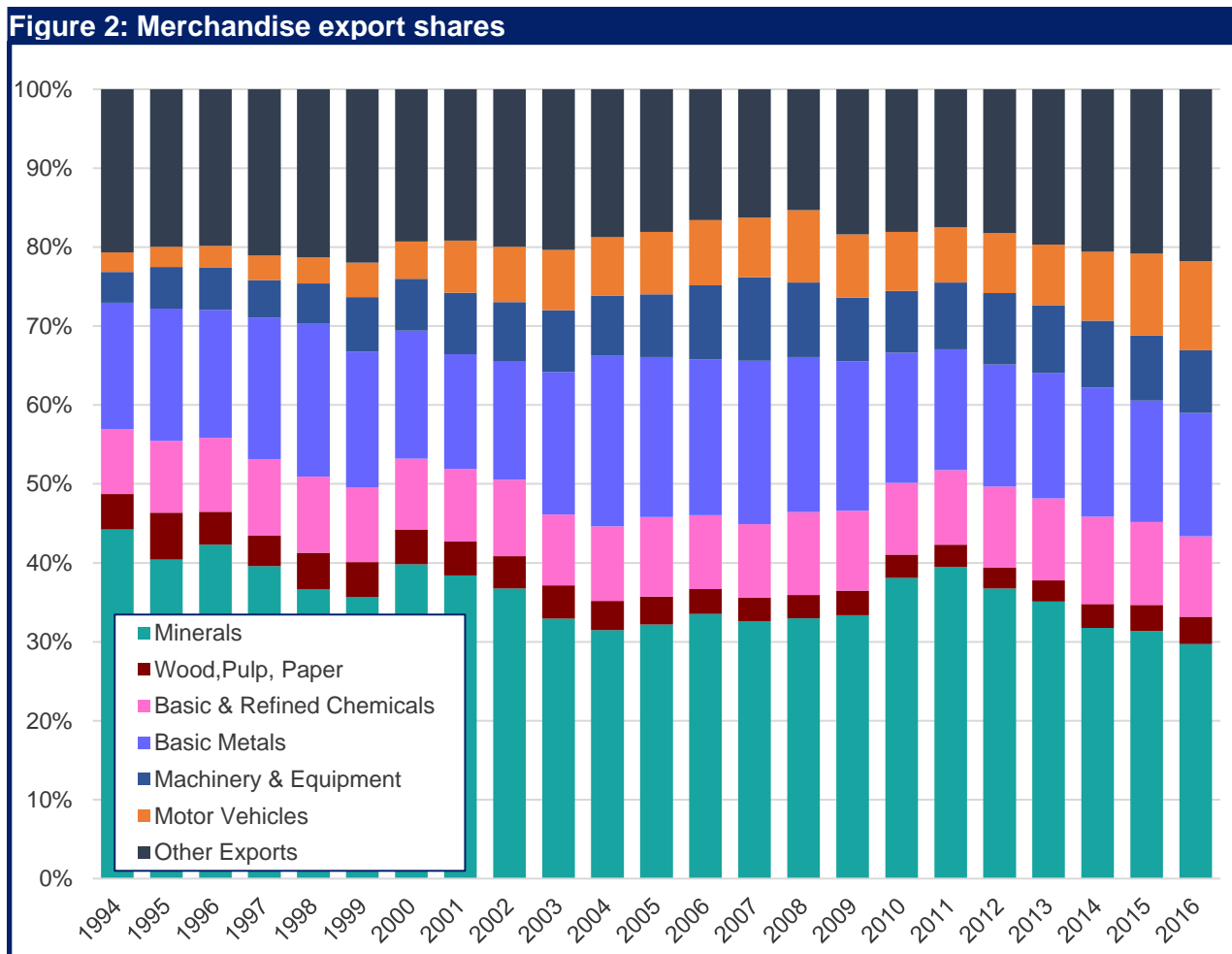
To assess patterns of continuity and change in the set of productive capabilities in more detail we assess disaggregated trade data.³² This failure to diversify is evident in South Africa's exports over time. Perhaps the most striking feature is the lack of any substantial change in South Africa's export profile over more than two decades (see Figure 2 below and Appendix A2). Minerals and the resource-based industries of Wood and Paper, Basic Chemicals and basic metals continued to account for close to 60% of total merchandise exports in 2016.

Exports of Motor Vehicles and of Machinery and Equipment are significant too, growing in importance in the first decade after 1994. Some motor vehicles components are included in other categories such that auto exports are in fact larger than reflected. For example, catalytic converters,

³² We note that the data on trade in services is not as good as for trade in goods, and the focus is on merchandise trade.

which are an auto component, are categorised under Machinery and Equipment.³³ The concerted industrial policy for the auto sector has strongly supported exports. An issue to which we return below is the extent to which these exports include local value-added and how they have related to growing local productive capabilities.

All other exports have remained with a share around 20%. This is consistent with the poor performance of South Africa in terms of summary measures of complexity and sophistication used by other analysts (Appendix A3 and A4).



Source: Quantec, authors' calculations

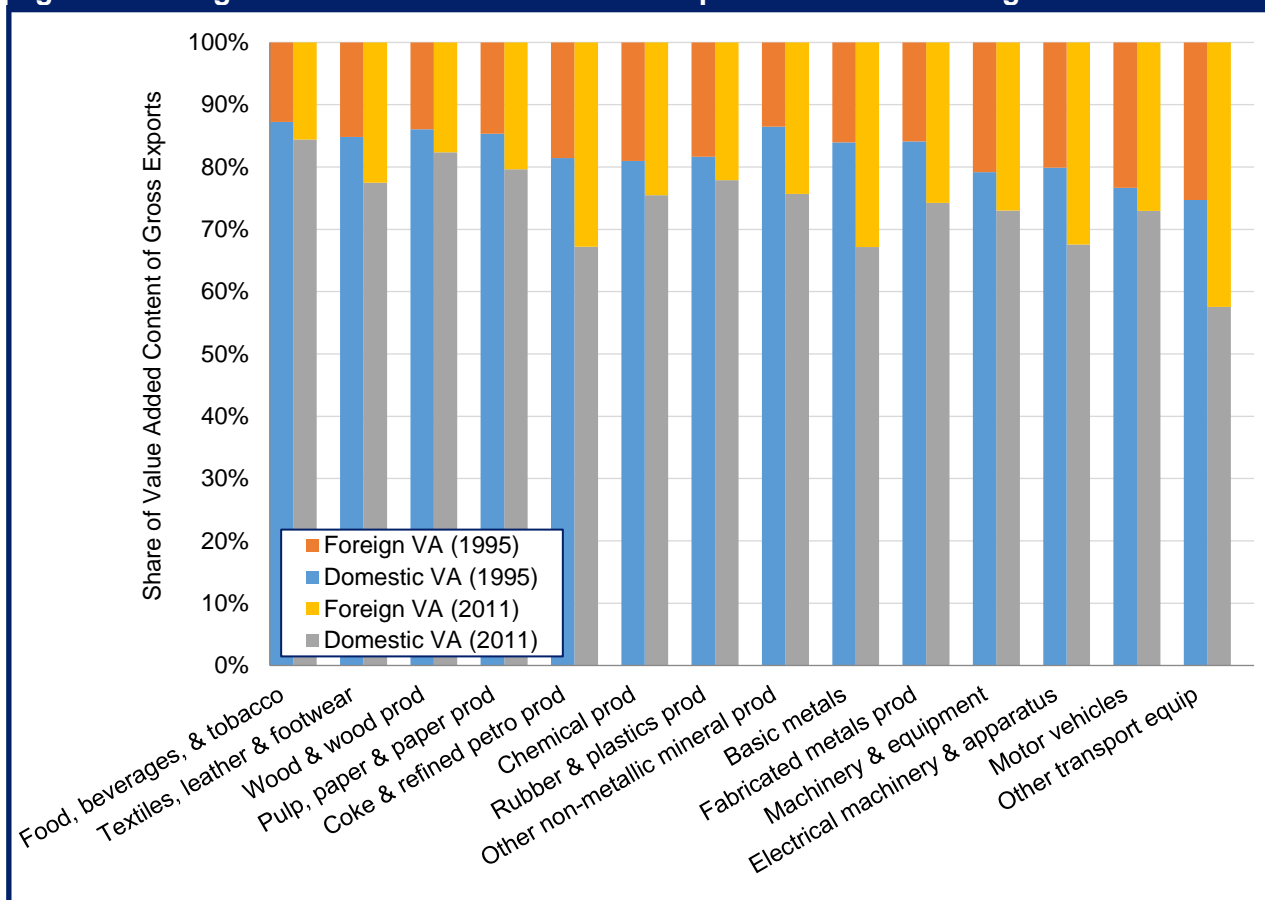
South Africa's poor performance in industrialisation is striking when considered against its peers. Instead of matching the growth in diversified manufacturing observed in middle-income countries which saw them increase their share of world manufacturing value added, South Africa has tracked the advanced G7 countries in deindustrialising (Andreoni & Tregenna, forthcoming, 2018).³⁴ This is evident when looking at trade in value-added data for South African manufacturing sectors in 1995 and 2011 (Figure 3). This indicates that the share of foreign value-added in exports increased across all manufacturing sectors implying increasing import penetration of intermediate inputs.³⁵

³³ Catalytic converters alone have accounted for as much as 3% of total merchandise exports in some years, or a very large proportion of the approximately 10% of exports recorded as machinery and equipment in most years from 2006 onwards.

³⁴ In Andreoni and Torreggiani (forthcoming, 2018), as presented at the public lecture *Challenges of industrial policy for middle income countries: new thinking and comparative insights for South Africa* by Professor Antonio Andreoni.

³⁵ Some have identified increased imports of intermediate inputs as associated with export success, but this fails to recognize the implications for local productive capabilities (See UNU-WIDER paper by Edwards et al., 2016).

Figure 3: Foreign and domestic value added in exports of manufacturing sectors



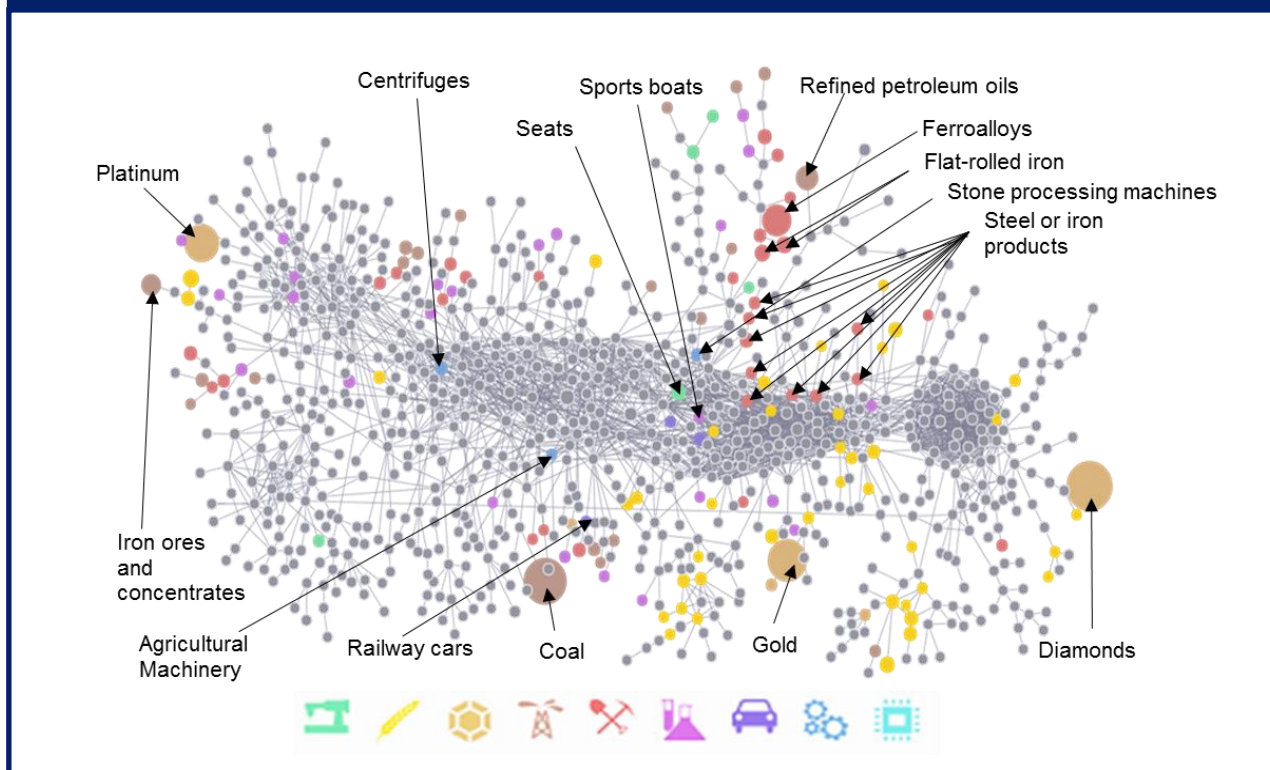
Source: OECD Trade in Value Added (TiVA)

To analyse the complexity and sophistication of exported products in greater detail we use the mapping of the product space (see Hidalgo, et al., 2007 and Felipe, et al., 2012 as two examples). The product space is premised on the idea that industrial development is path dependent and thus countries will grow by producing products that require similar capital requirements, knowledge, skills and institutions. A country's capabilities are embodied in the products exported and thus the evolution of the product space over time provides an indication of the ways in which countries have leveraged existing capabilities to produce new products and how capabilities have evolved (Hausmann, et al., 2007; Hidalgo, et al., 2007). A clustering of exports in space indicates the development of broad capabilities although, as the closeness in the mapping is generated from commonalities across countries, it is important to also understand the actual nature of linkages between products. Conversely, isolated dots of exports generally indicate a failure of capability development and idiosyncratic reasons for the exports.

We observe South Africa product space for exports for 1995 and 2016 (Figures 4 and 5 below) in comparison to other countries (see Appendix A5). South Africa's export basket in 1995 consisted of products with low complexity and did not have close linkages to other manufactured products. Exports of mineral (brown dots for coal and oil), stone and glass (gold dots for gold, diamonds, and platinum), vegetable and foodstuff (yellow dots), metal (red dots), and chemical (pink dots) products made up most of the export basket in both 1995 and 2016. In 2016, there was a slightly larger number of products being exported but not many of the linkages between various products were exploited. Instead export products appear as isolated points. For example, cars (purple dots) are evident in 2016, but not auto components (apart from catalytic converters which are classified under

centrifuges) and there are mining equipment exports, but not a broader clustering of machinery and equipment as characterises Malaysia and Thailand. This indicates a failure of South Africa to take advantage of the potential linkages. Moreover, products which are identified as being 'complex' generally turn out to be minerals-related or auto-related (although citrus also shows up). Overall, the assessment points to huge failures to realise potential higher growth in areas such as machinery and equipment where existing capabilities have not been built on.

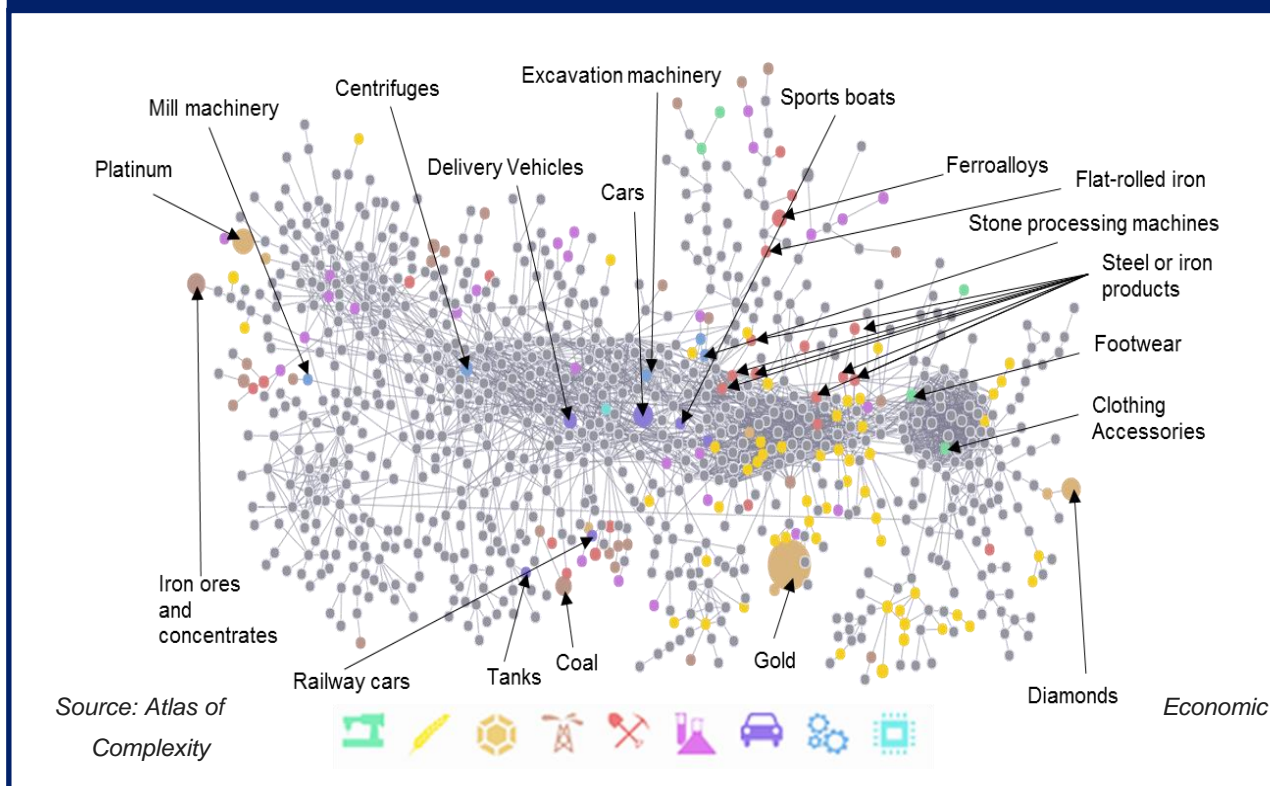
Figure 4: South Africa's export basket (1995)³⁶



Source: *Atlas of Economic Complexity*

³⁶ The coloured dots imply that the country has a revealed comparative advantage in that product greater than 1 meaning the country export share is more than that product's share in total world trade. The size of the dots represents the size of each good's export volume relative to the country's total share.

Figure 5: South Africa's export basket (2016)



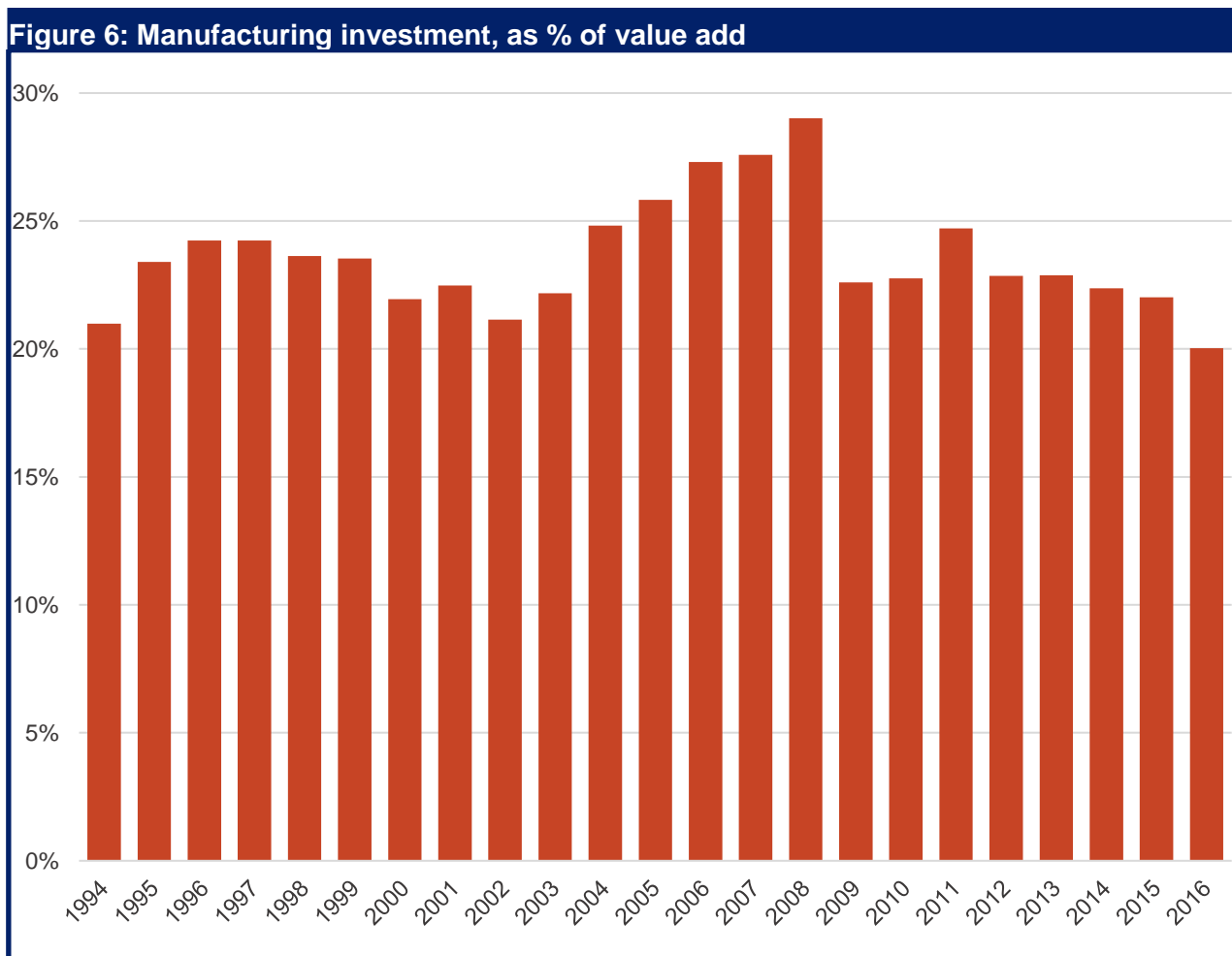
Thailand and Malaysia in 1995 are shown to have focused their export baskets on the production of machinery (blue dots) (see Appendix A5). Over time, these two countries have diversified towards industries with products with a greater level of sophistication. Malaysia's specialisation in the production of machinery (including electrical and electronic goods) is shown by the huge number of linkages which it has realised. When comparing 1995 and 2016, Malaysia has significantly increased the number of products it exports in the machinery and chemical product groupings over the 20-year period. On the other hand, Thailand's export basket shows a natural progression away from light manufacturing such as textiles, which have a low complexity, to chemical, plastics, and rubber products that typically have higher levels of complexity.

Turkey is similar with regard to diversification in the main clusters of exported goods. However, it differs from Malaysia and Thailand in that it has maintained exports in light manufacturing, including in textiles and various metal products, extending somewhat into more high-tech, sophisticated products such as motor vehicles and machinery products. Turkey has effectively taken advantage of its linkages and made use of its strong comparative advantage to increase the range of products exported in the metal products, machinery and transportation categories.

While the export data provides a richness at the product level, it fails to take into account the control over the value-adding activities, where intermediate products are traded several times through the production of a product, as well as the role of lead firms in determining the location of different production processes.

Investment

A key driver of growth in value-added is investment. Historically, South Africa's economic performance has been driven by investment in key sectors and industries such as mining, metals and machinery. Towards the end of the apartheid regime, investment levels declined sharply and, while investment recovered after 1994, the levels were still low relative to the levels required to restructure the economy (Figure 6). While the commodities boom, infrastructure spending and credit-driven local demand stimulated higher investment rates which peaked in 2008 at 30% of value added, these rested on a fragile base.

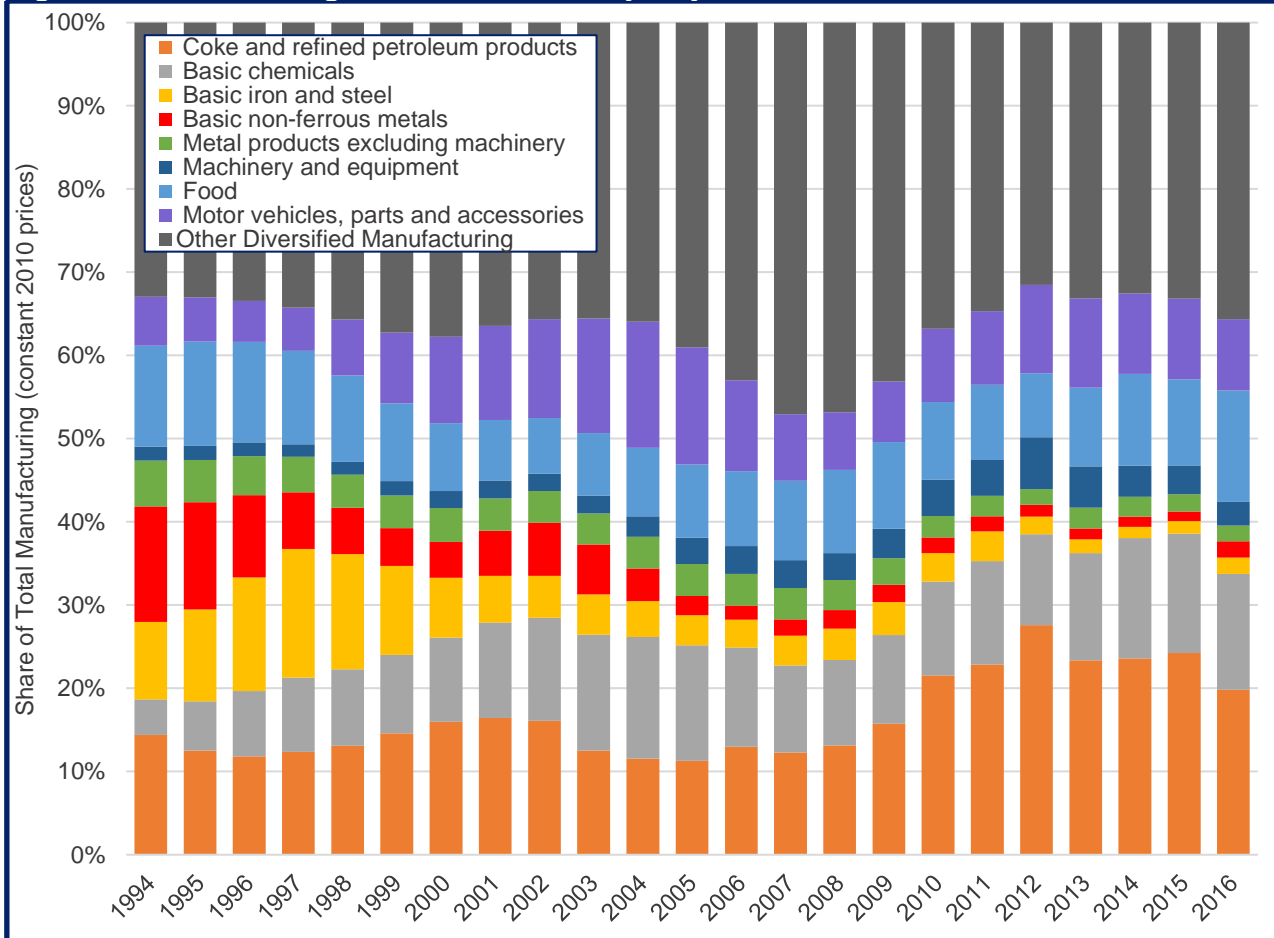


Source: Quantec, authors' calculations

The rates of investment also remained heavily skewed towards the capital-intensive industries of Coke and Refineries and Basic Chemicals (Figure 7). The basic chemicals and refined petroleum products sectors are essentially driven by Sasol whose capital expenditure generally constituted the majority of investments.³⁷ High rates of investment were recorded by the basic metals sectors in the 1990s which underpinned their growth in output at the time. The higher investment levels in downstream and diversified manufacturing, which would have seen higher overall investment and an increase in the significance of these sectors, has not happened. Evidence from other studies also show that in the later period firms have been spending on replacement capital expenditure rather than expansion (Nhundu, et al., 2017; Bosiu, et al., 2017).

³⁷ The Sasol investments were in polyethylene and polypropylene plants, which are linked to Project Turbo in which SASOL upgraded and built new capacity to meet government targets for introducing lead-free petrol and low-sulphur diesel.

Figure 7: Manufacturing investment, share by major sector

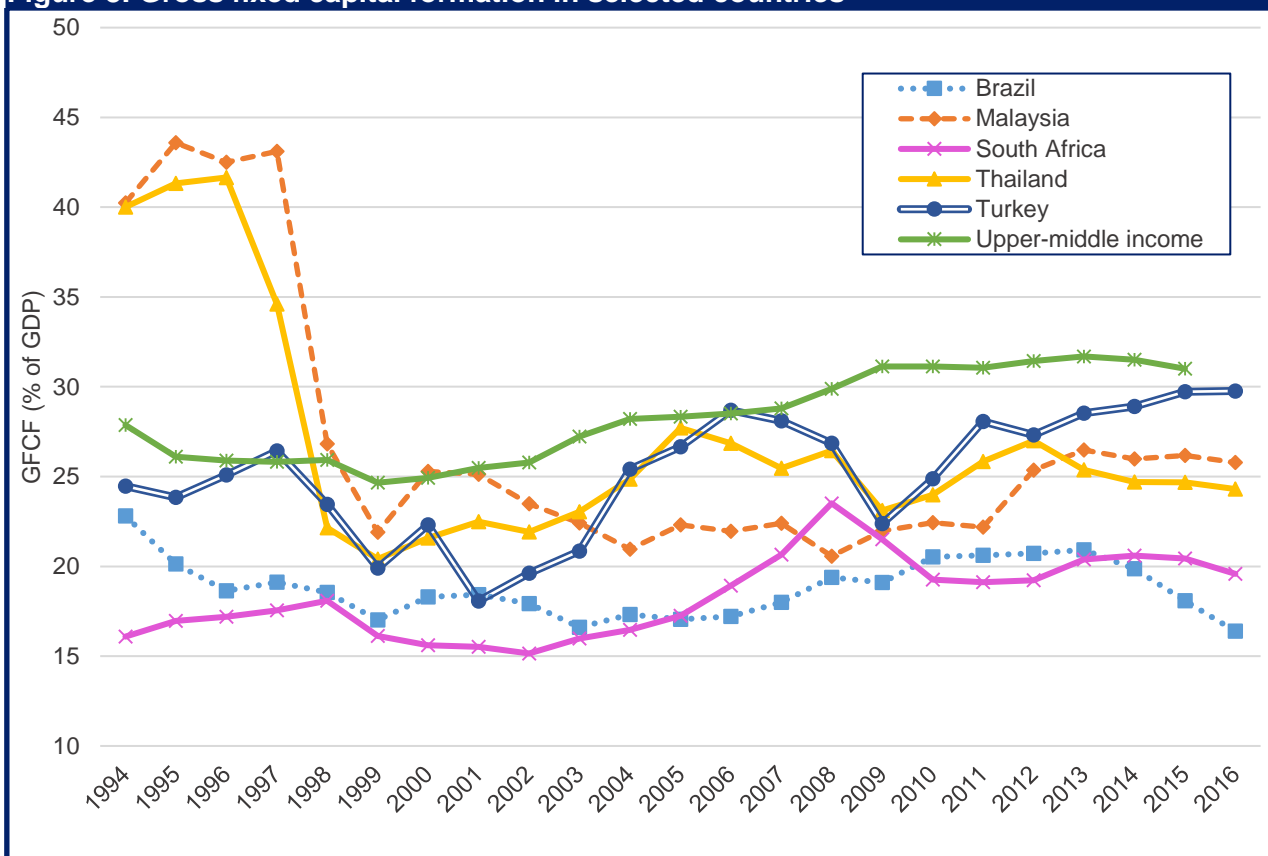


Source: Quantec, authors' calculations

South Africa's failure to diversify is thus evident in both the fact that traditional resource-based sectors are mainly responsible for output growth in the economy, and that levels of investment in the manufacturing sector have continued to be in these sectors rather than shifting to diversified manufacturing activities.

When compared with other countries, we see that over the period 1994-2016, South Africa's levels of total gross fixed capital formation (GFCF) have been persistently lower than those of comparator countries such as Malaysia, Turkey, and Thailand (Figure 8). This is despite South Africa maintaining strong corporate profits (Bosiu et al., 2017).

Figure 8: Gross fixed capital formation in selected countries



Source: World Bank Indicators

The challenge with boosting manufacturing in South Africa, and particularly with moving the economy into higher value products, was identified at the advent of democracy in the mid-1990s. A crisis in productivity was part of the characterisation of the South African economy motivating the Industrial Strategy Project (ISP) in the mid-1990s (Joffe, et al., 1995). In the case of the ISP this was viewed as a symptom of high levels of protection and the recommendation was liberalisation to drive efficiency improvements across the economy.³⁸ This was coupled with an assessment of concentration, low levels of domestic competition and the effects of apartheid on the skills base and workplace organisation.

The ISP analysis is relevant for our assessment here, as the liberalisation and competition law 'fixes' were implemented under the first democratic government, along with progressive labour legislation. The poor outcomes which subsequently resulted require a fundamental re-appraisal of the economic models of markets, competition and competitiveness which underpinned the ISP. There are also very important implications for the development of South Africa's manufacturing capabilities under the technology changes which are referred to as the fourth industrial revolution. The implications for science and technology policies for industrialisation are considered further in Section 4 below.

³⁸ South Africa was portrayed as a variant of Latin American style import substituting industrialisation (ISI) despite that fact the average levels of protection were not in fact so high by international comparison and were not focused on consumer goods industries as they are in ISI. Instead what characterised South African protection was its variability, protecting key strategic sectors for the apartheid regime, including those related to mining and, in agriculture, maize, sugar and forestry.

Political economy of industrial policy in South Africa

The compromises reached in 1994 meant that the economic structure was left intact, in effect, protecting white ownership of wealth and privileged employment positions for at least five years. This was premised on growth by established businesses, alongside improvements in labour rights. The major changes were liberalisation of trade and capital flows, deregulation of agricultural markets and moves towards privatisation. The compromises reflected the strength of big business interests.³⁹ The ANC-led government sought to discipline their rents through liberalisation and competition from imports. At the same time, macroeconomic policy emphasised 'stability' and cutting the fiscal deficit, with monetary policy attempting to target the money supply to control inflation.

There was somewhat of an economic recovery from 1994. This was unsurprising given the uncertainty of the political negotiations and violence leading up to 1994, however, it is now clear that it did not presage broader and sustained economic growth and employment generation. Indeed, the austerity under the Growth, Employment and Redistribution (GEAR) programme undermined longer-term structural transformation.

In the 2000s, under President Mbeki, there were strong elements of continuity. In effect, the political settlement reached in 1994 remained largely intact in terms of the balance of power and the institutional arrangements.⁴⁰ The benefits of liberalisation and open markets continued to be proclaimed along with the importance of macroeconomic stability. The emphasis on making markets work included competition law to referee anti-competitive mergers and prohibit cartels, and incentives under industrial policy to encourage 'knowledge-intensive' activities and advanced manufacturing technologies. Higher levels of investment were expected from business in response. However, there was no understanding of the relationship to the economic structure and the deindustrialisation taking place (Machaka & Roberts, 2003).

With the commodities boom driven by demand for China, coupled with domestic consumer credit extension and investment for the World Cup, the economy grew even while more diversified industries could not compete with cheap imports on the back of the strong Rand. At the same time, the need to bridge the gap between South Africa's 'two economies' meant social grants and government and parastatals spending on extending basic services. The approach to Black Economic Empowerment (BEE) reflected this attempt to straddle divergent realities as business committed to voluntary charters with weak monitoring and an absence of enforcement (Ponte, et al., 2007). In effect, white business interests offered ownership stakes, mainly to the political elite and connected persons. BEE therefore reinforced the existing economic structure and left black shareholders in debt to their white business partners and needing to ensure the flow of profits was maintained.

The balance of interests behind this policy platform included the large corporations which internationalised and the financial sector which grew rapidly. Earnings increased for professionals in these areas (such as lawyers and accountants) as well as high-skill occupations more generally. The impact of the commodities boom and strong currency meant that imported goods became cheaper and that salaries were higher in international currency terms, fuelling consumption but undermining companies' competitiveness.

³⁹ The first Minister of Finance under democracy was banker Chris Liebenberg, while Chris Stals was retained as governor of the Reserve Bank.

⁴⁰ See Khan (2010, 2017) and Behuria, et al. (2017) for a discussion of political settlements and industrial policy.

Much of semi- and unskilled labour, the informally employed and unemployed were progressively excluded. While popular protests grew, these were suppressed through policing, and social grants were substantially expanded to ameliorate the short-term effects of deindustrialisation (Runciman, 2017). While the global financial crisis revealed the true nature of finance, the pervasive reach of cartels demonstrated the problems with liberalised markets (Muzata et al. 2017). Economic power is evidently rooted in the historical control of wealth and resources, especially given the very limited productive transformation since apartheid, something South Africa shared with other post-colonial African states (see also Behuria et al. 2017).

The distance from popular sentiment of an increasingly authoritarian government was revealed when Jacob Zuma won the leadership of the ANC in 2007 and removed President Mbeki in 2008, with the support of COSATU and other groupings on the left inside the ANC. However, instead of a progressive economic policy agenda to engage with the country's development challenges, under President Zuma an increasingly clientilistic political settlement emerged. This included vertical fragmentation of control within the ANC as extractive rents were competed over from local to national levels of government and in state-owned corporations (Makhaya and Roberts, 2014; Public Protector, 2016; Bhorat et al., 2017). The message was that the market economy was rigged against the majority and so the only way to accumulate was through leveraging state influence. For a time, public sector trade unions were kept onside by higher public wage settlements for government employees while industrial unions fractured and ultimately left COSATU. As the delivery of services by the state deteriorated, protests continued to increase across the country (Runciman, 2017).

The impact on industrial policy was profound as conflictual stances were taken across government on a host of policy areas of central importance for industrialisation, such as energy, mining and procurement policies. Instead of a coalition in support of the growth of diversified manufacturing sectors with higher levels of productivity, levers such as local procurement were employed for short-term rent capture across government. A proliferation of departments made co-ordination of policy almost impossible in any event. It is important to recognise that, while apparently not aligned with the governing coalition, large businesses in finance and non-traded services continued to make high levels of profits and further internationalised.

2.3. Continuity and change: concentration and financialisation

While there have been strong elements of continuity in the growth of upstream, resource-based industries there have also been important changes. There has been extensive **financialisation** of the South African economy, which impacts on productivity and investment. Furthermore, high levels of **concentration** continue to persist in the South African economy. We discuss these below.

Financialisation of the South African economy

In the corporate sector, a significant proportion of financing for capital formation derives from retained profits. Traditionally, firms reinvested significant portions of profits to increase capital stock and the productive capacity of the firm. By contrast, financialisation sees an increase in firms' financial operations, with a push for increased income derived from financial assets, and a shorter time horizon associated with the interests of institutional investors. Thus, financialisation impacts

on the investment decisions of non-financial firms, as they tend to allocate an increasingly larger share of savings towards investments in financial assets.⁴¹

Globally, the positive relationship between profit and investment seems to have been strongest (a dynamic profit-investment nexus) for western economies when the manufacturing sector was expanding during industrialisation and post-war recoveries, and for East Asian countries undergoing rapid industrialisation from the 1950s. But the link between profit and investment is not spontaneous or direct because of competing claims on profit. This link has been weakening since the 1980s, most notably in developed countries where record profits have been coexisting with weakened investment rates (UNCTAD, 2016). The decoupling of profits and investment has coincided with changes in corporate governance, so that managerial decision-making is more closely tied to the interests of short-term portfolio shareholders at the expense of other stakeholders. Managerial performance and pay became increasingly linked to the short-term financial performance and share price of companies (Lazonick and O'Sullivan, 2000). This, in turn, focused decision-making in the short-term, weakening the commitment to longer term investment.

South Africa has witnessed a financialisation of its economy that began during apartheid and continued in the post-apartheid period (Newman, 2017). It has had a profound – though under-researched – impact on the real economy. Financial assets as a percentage of fixed capital stock in South Africa have been increasing since the 1980s, and there has been an increased preference for financial investments generating short-term returns by non-financial firms. The creation of a sophisticated financial system during apartheid and relaxing of capital controls post-apartheid resulted in a significant increase in short-term capital inflows (supported by high interest rates) and a boom in the stock market, especially in the 2000s (Figure 9). While the stock market capitalisation of countries like Brazil and Turkey were both below 60% of GDP in 2016, South Africa's market capitalisation stood at a staggering 322% of GDP (see Table 1).⁴²

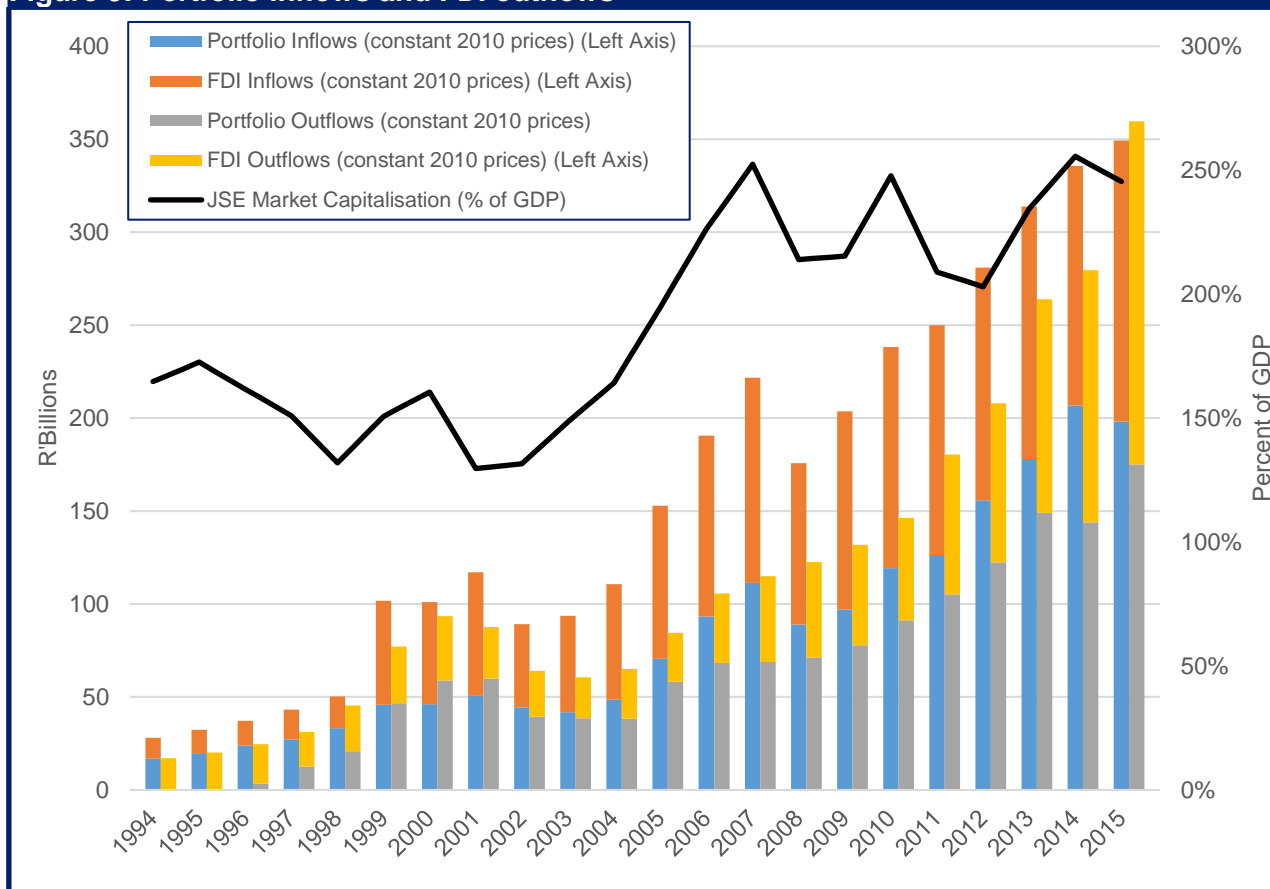
The massive growth in finance was de-linked from the real economy, as investment rates remained much lower than required for sustained growth. This reflects shorter planning horizons by industrial companies, even while mergers and acquisitions activity (including as FDI inflows and outflows) and trading in the stock exchange continued to grow. This is in line with international experience that shows that capital flows are highly unstable and are not associated with productive investment (UNCTAD, 2014). After the drop in portfolio and FDI inflows in 2008 with the global financial crisis, the growth resumed in the following year. Outflows continued to increase, consistent with the shifting emphasis by local firms to investing outside the country in response to domestic uncertainty, at the same time as international investors continued to acquire local companies (see Bell et al. 2017; Bosiu et al, 2017). Capital account liberalisation has also allowed South African corporations to move capital abroad on a grand scale, both legally and illegally (see Mohamed and Finnof, 2005; Chabane et al., 2006; Ashman et al. 2011).⁴³

⁴¹ Financialisation is a broad term that can encompass various characteristics such as the rise in the range and proliferation of financial services and instruments, an expansion of the range of financial activities in an economy, and the increasing importance of institutional investors (Newman, 2017).

⁴² This was a substantial increase from the ratio of around 250% from 2007 to 2015 because of the effect of the ABInBev acquisition of SAB-Miller.

⁴³ It is argued that the rapid and extensive liberalisation of exchange controls has regularized much of the illegal outflow of capital from the South African economy, which was estimated to be as much as 20% of GDP in 2007 (Ashman, et al., 2011).

Figure 9: Portfolio inflows and FDI outflows



Source: SARB

The rise in portfolio and FDI inflows has been matched by an increase in foreign ownership of the JSE. Foreign ownership, measured in terms of control of companies listed on the JSE, by their capitalisation, increased from 4.0% the late 1990s to 42.0% in 2016 (Table 4).⁴⁴ At the same time, the control by local institutional investors increased from 3.9% to 18.1% while the significance of black-controlled groups has declined sharply to negligible levels. The significance of TNCs in South Africa's economy is in line with global trends which have seen individual corporations controlling resources (at least in monetary terms) and having security, intelligence and public relations operations larger than many states, as well as huge lobbying ability including campaign donations (UNCTAD, 2017; Zingales, 2017).⁴⁵

⁴⁴ The largest South African conglomerates, led by Anglo-American and Richemont/Rembrandt (now Remgro) had always been internationalised even while being identified as South African, in part because of their origins and in part because of their response to sanctions. However, these were still family controlled conglomerate groups with a very substantial part of their business anchored in South Africa (Chabane et al., 2006). Remgro has remained family-controlled and Anglo-American has unbundled; the huge growth in foreign ownership was boosted by AB Inbev's acquisition of SABMiller (the biggest listed-company in recent years in terms of its market capitalisation).

⁴⁵ The significance of large global corporations is not new, as illustrated by the East India Company of the UK whose influence over politics saw a 15-year initial monopoly right to trade in a range of goods including tea lasting for 233 years (Zingales, 2017).

Table 4: Summary of control of JSE, by market capitalisation (%)

	1995 - 2000	2001 - 2005	2006 - 2011	2012	2013	2014	2015	2016
Anglo American Corp	25.1	21.2	15.4	8.9	6.8	5.5	1.6	3.3
Bidvest Group	1.0	1.0	0.9	0.9	0.9	0.9	1	1.1
Black Groups	7.1	5.1	5.5	3.9	1.5	1.3	0.6	0.5
Directors	11.1	7.3	8.2	9.2	7	7.1	11.3	12.4
Foreign	4.0	12.9	26.5	30.0	33.2	30.9	26.8	42.0
Institutions	3.9	10.1	14.1	19.4	22.1	23.7	17.6	18.1
Investec	2.0	1.4	0.9	0.7	0.7	0.9	1	0.8
Liberty Life/ STD Bank	8.3	4.9	3.5	1.1	2.5	2.5	2.1	
Naspers							7.7	6.9
Remgro (Rembrandt)	9.8	8.7	5.7	7.2	9.1	9.3	9.2	7.2
RMB/Firstrand	2.6	4.6	3.1	3.9	2.3	3	2.6	2.4
Old Mutual (SA Mutual)	10.6	7.7	3.6	3.3	2.8	2.7	2.8	2.1
SABMiller	2.8	4.1	6.2	9.2	9.1	9.4	12.5	0
Sanlam	11.9	4.9	1.4	1.4	1.4	1.7	1.3	1.2

Source: *Who Owns Whom (2017)*, adapted by the authors

The rise of institutional investors raises questions regarding the impact of common ownership across competing firms (Patel, 2017). Recent literature has raised the possibility of large institutional investors being able to use their influence and standing in these companies to discourage rivalry between competitors (Azar et al., 2015; Woodbury, 2017; Gramlich and Grundl, 2017). In South Africa there are also individual investors who hold shares across a number of JSE companies (the largest 12 of whom are listed in Appendix A7). Further research is required on how institutional and large individual investors in the South African economy may be impacting on competition and investment strategies of firms.

Concentration and profits

The patterns of ownership, concentration, competition and orientation of large firms are critical to understanding the poor levels of fixed investment, as well as access to the economy. In South Africa, during apartheid the conglomeration of capital in the economy under capital controls gave rise to concentration in several key sectors and created a system of accumulation that favoured a few, with a particularly prominent role played by mergers, acquisitions, interlocking and pyramid forms of ownership (Fine & Rustomjee, 1996). The market power of large firms has important implications for investment of large firms, entry of firms into sectors, and the ability of firms to set prices, thus disadvantaging consumers.

The extreme concentration of ownership and control within the South African economy, with a small number of large firms dominating most sectors, remains one of the country's greatest economic challenges.⁴⁶ Debates about whether or not these companies are 'hoarding cash' or business is on an 'investment strike' miss the point. The bottom line is that companies have market power and are using it to earn good profit margins, but investment remains weak. The opening-up of the economy to a diversity of participants has not happened and, if anything, concentration and vertical integration within sectors has increased since 1994, reinforced by high barriers to entry.

⁴⁶ See reviews by World Bank, OECD, IMF, as well as Mncube, et al. (2012) and Roberts (2013).

The claims by some that concentration reflects the efficiency of large firms is difficult to square with poor productivity performance and low investment in the economy as a whole. The prevalence of cartels in South Africa suggests that concentration and low levels of competition have gone together (Muzata et al, 2017). Large firms have also lobbied and strategised to undermine rivals, as would be expected. The reality that smaller participants are locked-out of markets further feeds the perception that the only way to gain access is by using state leverage to appropriate rents.

It should be no comfort to find that the world appears to be becoming more like South Africa, as concerns about corporate concentration grow in many countries.⁴⁷ The focus on state capture in South Africa should not ignore the need to apply the same scrutiny to large private businesses.

The persisting high levels of concentration have been highlighted by a Competition Commission study⁴⁸ of merger reports (which involve careful market definition) and data collated by Statistics South Africa. The Commission study found that unilateral dominance (where a single firm has a market share in excess of 45%) existed in a large number of markets. In the merger reports reviewed from 2009 to 2016, dominant firms were identified in 294 distinct product markets. Using the Hirschmann-Herfindahl Index (HHI), the study found the following broad sectors to be highly concentrated:⁴⁹ Communication Technologies; Energy; Financial Services; Food and agro-processing; Infrastructure and construction; Intermediate industrial products; Mining; Pharmaceuticals; Transport.

Intermediate industrial products include upstream sectors such as basic chemical products and basic metals, whose customers are labour-absorbing downstream industries. The concentration in food products is consistent with the extent of cartel conduct in that sector as well as high barriers to entry (Ncube et al. 2016; Muzata et al, 2017). Moreover, market concentration, by at least some measures, is getting worse. Statistics South Africa data on concentration levels within manufacturing indicates that the proportion of sub-sectors in which the biggest five firms held 70%+ market share has increased from 16 sub-sectors in 2008 to 22 of the 80 sub-sectors in 2014 (Figure 10).

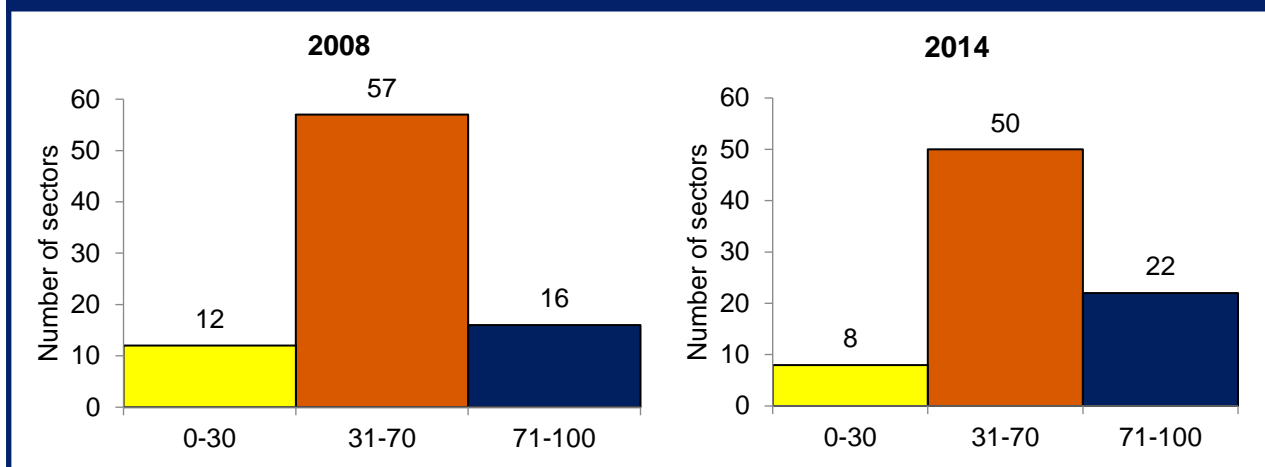
At the same time, average rates of profit have been high and fixed investment has been poor. For example, both the OECD (2013) and IMF (2017) have noted that South Africa has maintained among the highest levels of corporate profitability compared to other emerging market economies. Of course, there are important differences by sector and between firms. Downstream firms subject to the exertion of market power from dominant market participants and cartels find their profit margins and ability to invest are undermined through high input prices.

⁴⁷ Such as in the USA, see De Loecker and Eeckhout (2017).

⁴⁸ Cited in Government Gazette No. 41294, 1 December 2017.

⁴⁹ This is calculated as the sum of the squares of the market shares. A score or more than 2500 is taken to indicate the sector is highly concentrated.

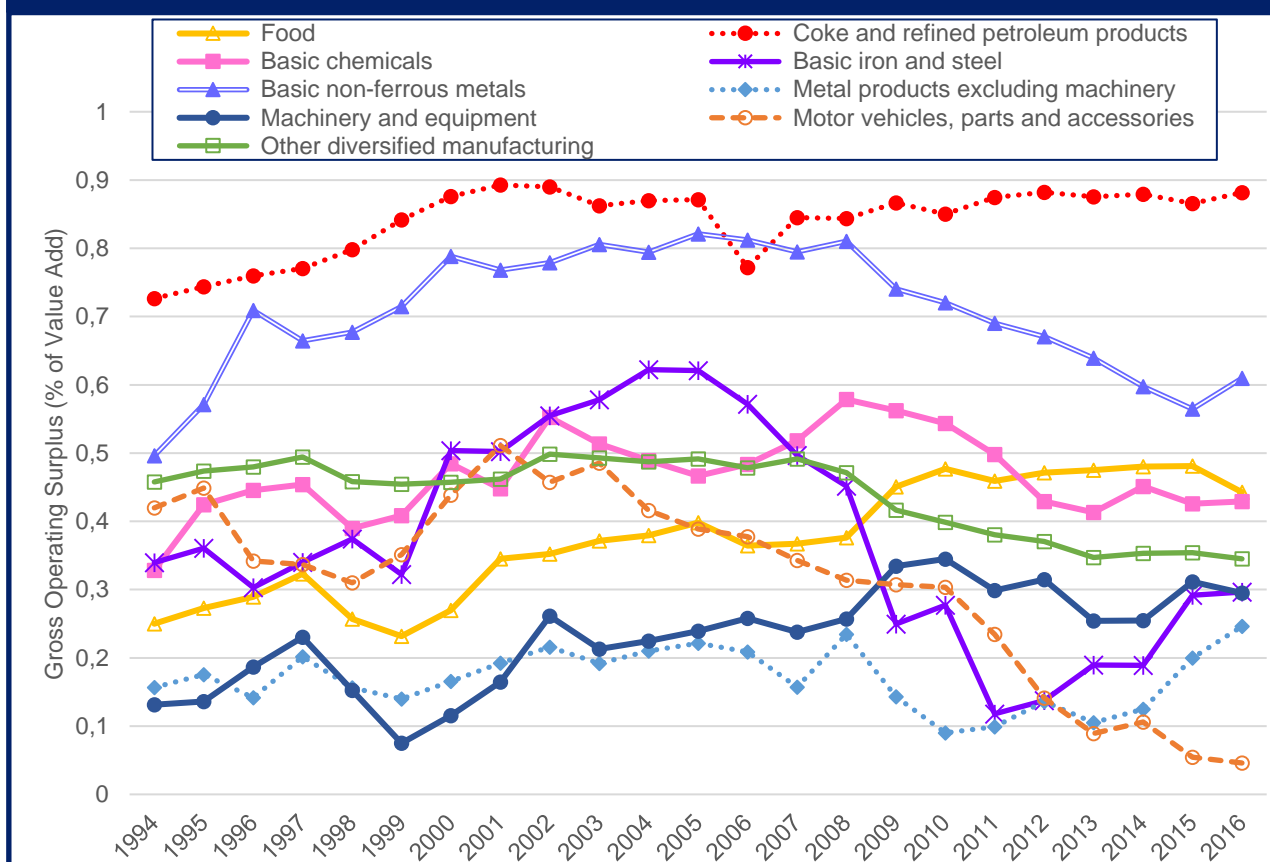
Figure 10: Number of disaggregated manufacturing sectors by different levels of concentration (measured by CR5)



Source: Statistics South Africa

In light of high levels of concentration in the manufacturing sector, we consider profit rates as indicated by the gross operating surplus (GOS) as a percentage of value-added (Figure 11).⁵⁰ While higher profit rates are expected in more capital-intensive sectors, the trends reveal that companies in coke and refineries, basic chemicals and food processing have been able to sustain profit rates.

Figure 11: Manufacturing sub-sector gross operating surplus, as % of value add



Source: Quantec, authors' calculations

⁵⁰ It would be expected that more capital-intensive sectors have higher rates of GOS to reward the capital invested.

Given the high levels of concentration in South Africa, the orientation and strategies of the large firms is obviously very important. So, what have they been doing? Studies of the top 50 listed firms and of listed firms in key sectors including metals and food found relatively strong profitability, significantly high reserves accumulated, and low investments in expanding productive capacity.⁵¹ Firms in the top 50 on the JSE have instead been increasingly channeling funds towards mergers and acquisitions in South Africa and externally, between 2011 and 2016 (Bosiu et al, 2017).⁵² Within this overall picture, there are important differences between sectors with, for example, mining companies performing particularly poorly over the period.

The study of listed companies in food production and processing found that the 13 listed food processing firms, which account for a very large proportion of activity in the sector, are mainly controlled by institutional investors. The focus on growth through acquisition by these firms is concerning given the already high levels of concentration, significant barriers to entry and a range of competition issues which have been identified by the Competition Commission. In addition, concentration at the supermarket level means that routes to market for producers are governed by three main chains who have a huge influence on the potential for smaller producers to reach consumers. There is a clear trend of expansion of operations and interests by South African firms to other sub-Saharan Africa countries.

In metals, machinery and engineering a substantial proportion of investment spend of the 25 listed companies has also gone on mergers and acquisitions, bringing further consolidation in the sector. At the same time, some firms have effectively become distribution entities with a hollowing out of local manufacturing capacity in the face of low investment spending, weak demand (including a decline in government infrastructure investment), lack of implementation of local procurement policies, and a challenging cost environment made worse by energy and mining policies. In the last decade and a half there has been huge import penetration in the machinery and equipment sector. However, there are some 'pockets of excellence' where firms are investing in developing capabilities and technologies that can drive industrialisation.

While large firms may claim to be better placed to innovate and make investments to upgrade capabilities, monopolists also have incentives to focus on maintaining their position by lobbying and raising barriers to entry in order to continue to earn returns from exertion of their market power. Competitive markets and policies which lower barriers to entry are therefore important to stimulate innovation and open-up opportunities to entrants with new business models and products. Competitive markets further incentivise firms to reduce costs and raise productivity within sectors, investing in expanded productive capabilities (Cohen and Levin, 2010; Shapiro, 2012; Nübler, 2014). This is borne out by a range of studies on barriers to entry in South Africa, which have found that investment levels are higher when there is greater rivalry due to effective challenger firms pushing incumbents to up their game.⁵³

The high entry barriers and arrangements which weaken small and medium firms therefore undermine economy-wide investment. Barriers to entry entrench the positions of incumbents as

⁵¹ Bosiu et al. (2017); Nhundu et al. (2017); Bell et al. (2017); das Nair and Chisoro-Dube (2017). The Intellidex study (*The Myth of Corporate Cash Holding*) and accompanying op-ed suggested that conclusions cannot be drawn from 'trends in nominal cash holdings' and that 'a lot of their cash is held in hard currency', with reference to the largest three cash holders of BHP Billiton, Anglo American and Richemont. We note the CCRED study corrected for inflation and *excluded* eight firms because of their mainly foreign operations BAT, SAB Miller, Anglo American plc, Glencore plc, BHP Billiton, Richemont, Naspers and South32.

⁵² These results also hold when financial corporations are excluded from the top 50.

⁵³ See das Nair and Chisoro-Dube (2015), Makhaya and Nhundu (2015), Matumba and Mondliwa (2015), Hawthorne et al (2016), Ncube et al (2016), Paelo and Vilakazi (2016).

potential competitors are restricted from entering and competing (Roberts, 2017a). These can come in the form of natural barriers such as high start-up costs related to the purchase of machinery in a capital-intensive industry, or other obstacles such as patents, customer loyalty, and the high costs associated with switching brands. Substantial entry barriers also imply that investment and productivity will be dependent on the decisions of incumbents. If barriers to entry are removed or their extent lessened, it can incentivise firms to produce better quality products and offer low prices to consumers (Banda, et al., 2015).

In the chemicals sector, Sasol is able to extract supernormal profits as it faces no real competition, both because of the high barriers to entry into the market due to the enormous costs involved as well as because of the capital-intensive nature of the industry. However, Sasol's high profitability is seemingly harming the manufacturing industry as Sasol's output is an input into production processes of many firms (Mondliwa, forthcoming, 2018).

3. Insights from Industry Studies

Three industry studies assessed structural transformation in depth, considering the performance at different levels of the value chains, the changing linkages between the activities and the economic policies impacting on the industries. A brief overview of the studies is given here before cross-cutting insights are drawn from them in Section 4.

3.1. Metals, Machinery, and Equipment (MME)⁵⁴

Structural transformation

The broad industry grouping of Basic Iron and Steel, Basic Non-Ferrous Metals; Metal Products (excluding machinery); and Machinery and Equipment brings into focus the challenges facing South Africa in changing the industrial structure and moving the economy to a different development trajectory. The grouping includes upstream heavy industries which benefitted from development finance and favourable energy prices, along with downstream diversified manufacturing activities in fabrication and machinery and equipment.

Machinery and equipment is especially important in structural transformation to move to more sophisticated products, given the production technologies embodied in machinery. The development of capabilities in manufacture of machinery therefore means participating in ongoing processes of upgrading. The application of capabilities to a diverse range of products within the broad set of machinery is reflected in the range of exports observed in Thailand and Malaysia (Appendix A5). Competitiveness depends on clusters of activities and components brought together by Original Equipment Manufacturers (OEMs) and incremental improvements and customisation to meet particular buyers' needs. There are also links with high value services such as engineering and design services. Moreover, the South African record indicates that growth in machinery production has the potential to create significant direct and indirect employment.

In 1994 South Africa had a base of productive capabilities in machinery and equipment, most notably associated with manufacturing equipment required for mining and mineral processing. South Africa also had major investments in upstream basic metals industries supported by apartheid industrial policy. Structural transformation should have seen a change in the composition of activities to a much greater proportion being in diversified downstream products of higher value, led by machinery and equipment. In broad terms, this has not occurred and the balance of activities is much the same in 2016 as in the mid-1990s, despite restructuring and much greater openness to international trade.

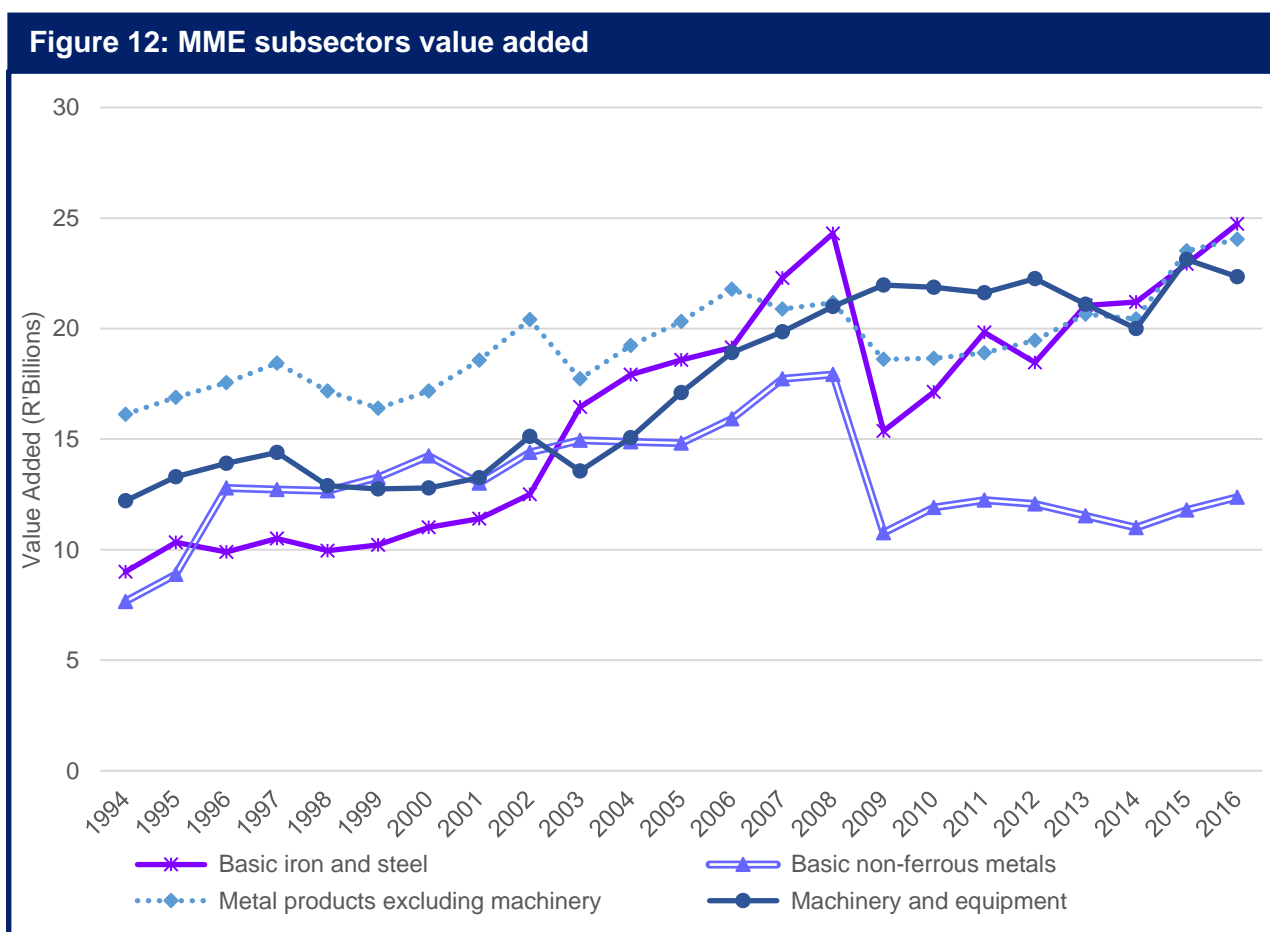
Indeed, the strongest growth in value added over the period 1994 to 2016 was recorded by the upstream Basic Iron and Steel sector (Figure 12). The restructuring of basic iron and steel producers undertaken in the 1990s under liberalisation did mean very large employment losses even while production increased. These industries involve large-scale, energy-intensive production, dominated by the former Iscor, now ArcelorMittal South Africa (AMSA). The relatively better performance of this upstream resource-based sector in terms of value-added, compared to downstream more diversified activities including in fabricated metal products, epitomises the

⁵⁴ This draws on the IDTT study on the Metals, Machinery, and Equipment sector by Lauralyn Kaziboni, Zavareh Rustomjee, and Ian Steuart: Structural transformation along metals, machinery and equipment value chain – developing capabilities in the metals and machinery segments.

negative trajectory in South African industry, with a regression rather than positive structural transformation.

Basic Iron and Steel, along with Basic Non-Ferrous Metals, experienced a fall in the value of production in 2009 with the global financial crisis and falling commodity prices. However, Basic Iron and Steel, with strong backward linkages to iron ore, coal, energy and scrap, recovered while Non-Ferrous Metals which has weak local linkages and was reliant primarily on unsustainably low energy prices did not.

Foundries making cast metal components are at an intermediate level in the value chain. Scrap metal and electricity are the main inputs. Design and quality are also very important for competitiveness, as the castings are manufactured for a range of downstream industries. There is also a diverse range of fabricated metal products. The performance of this grouping has been relatively poor overall. While machinery and equipment has grown value added, the pace of growth was relatively low (although even this growth has generated increases in employment) and, as assessed below, occurred with a deteriorating trade balance.



Source: Rustomjee et al., forthcoming, 2018
 Note: All prices in constant 2010 Rands.

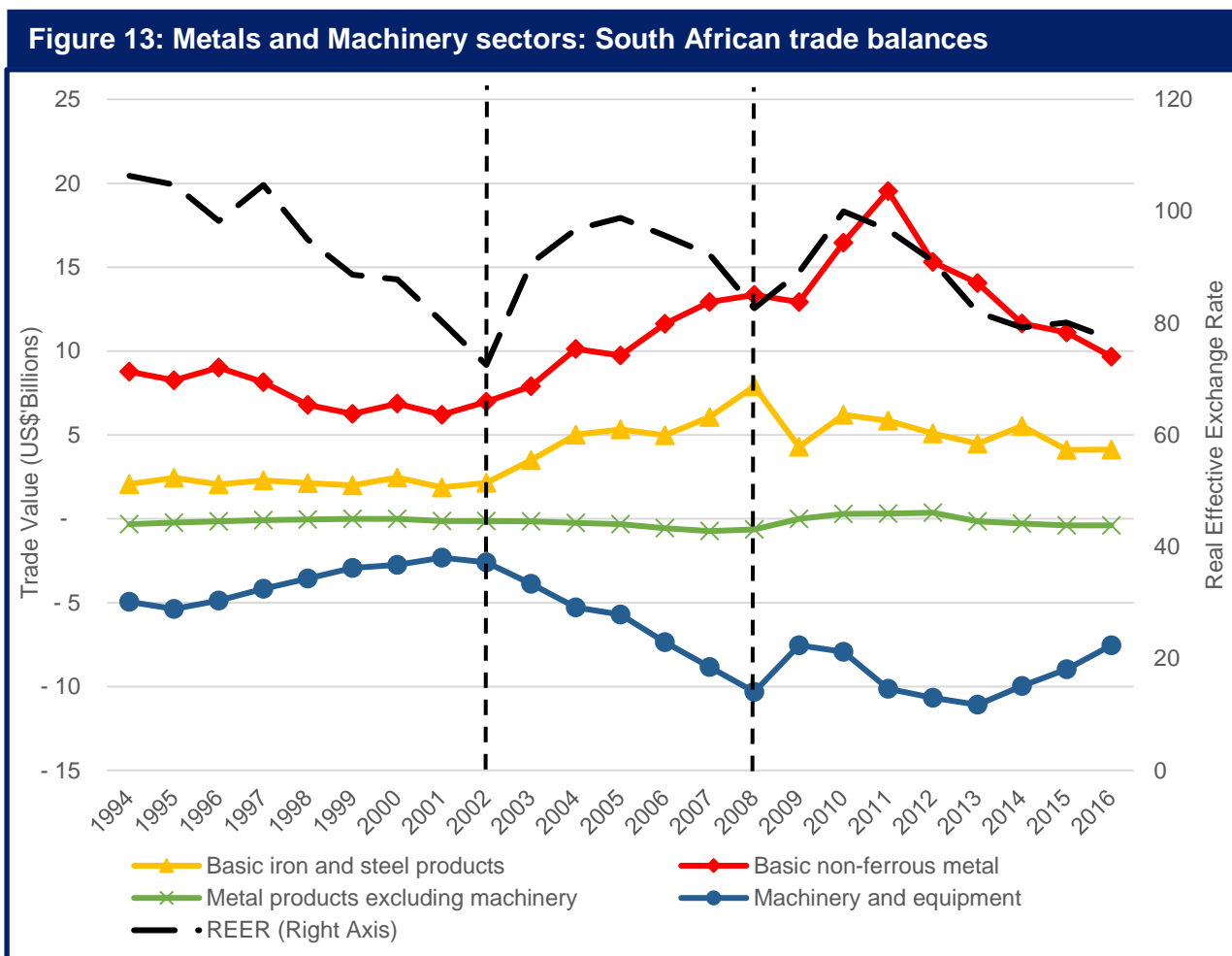
Trade performance

The lack of transformation is evident in the trade patterns as South Africa remains a substantial exporter of basic metals, and a growing net importer of machinery and equipment (Figure 13). Scale economies and historic investments coupled with the country's resource endowment means that

flat steel production exceeds local demand and there are large net exports, with local monopolies in steel plate (Highveld), hot rolled and cold rolled coil steel (AMSA) and stainless steel (Columbus/Acerinox). Long steel products are produced from scrap metal by a small number of producers in an oligopolistic market structure.

In the period of trade liberalisation during the 1990s, the trade performance of machinery and equipment did in fact improve, assisted by a depreciation in the real exchange rate. However, from 2002, even while value added in machinery and equipment grew with strong domestic demand, the trade balance worsened substantially due to increased import penetration reflecting a loss in competitiveness in higher value, more complex activities, as the real exchange rate appreciated.

The exchange rate appreciation was partly due to the commodity boom which saw earnings from exports of steel and aluminium increase substantially in US Dollar terms. Alongside the higher commodity prices, the inflation targeting framework meant higher real interest rates attracting portfolio capital inflows and the country running a trade deficit. This exacerbated the hollowing out of diversified, higher value manufacturing through increased import penetration.



Source: Rustomjee et al., forthcoming, 2018

The openness of the machinery sector to international trade is evidenced in the fact that, for machinery, imports grew to be more than 90% of domestic demand.⁵⁵ At the same time, local output was growing, with strong investment spending in South Africa and the region associated with the minerals boom, infrastructure spending and energy investments, even while a larger share of the

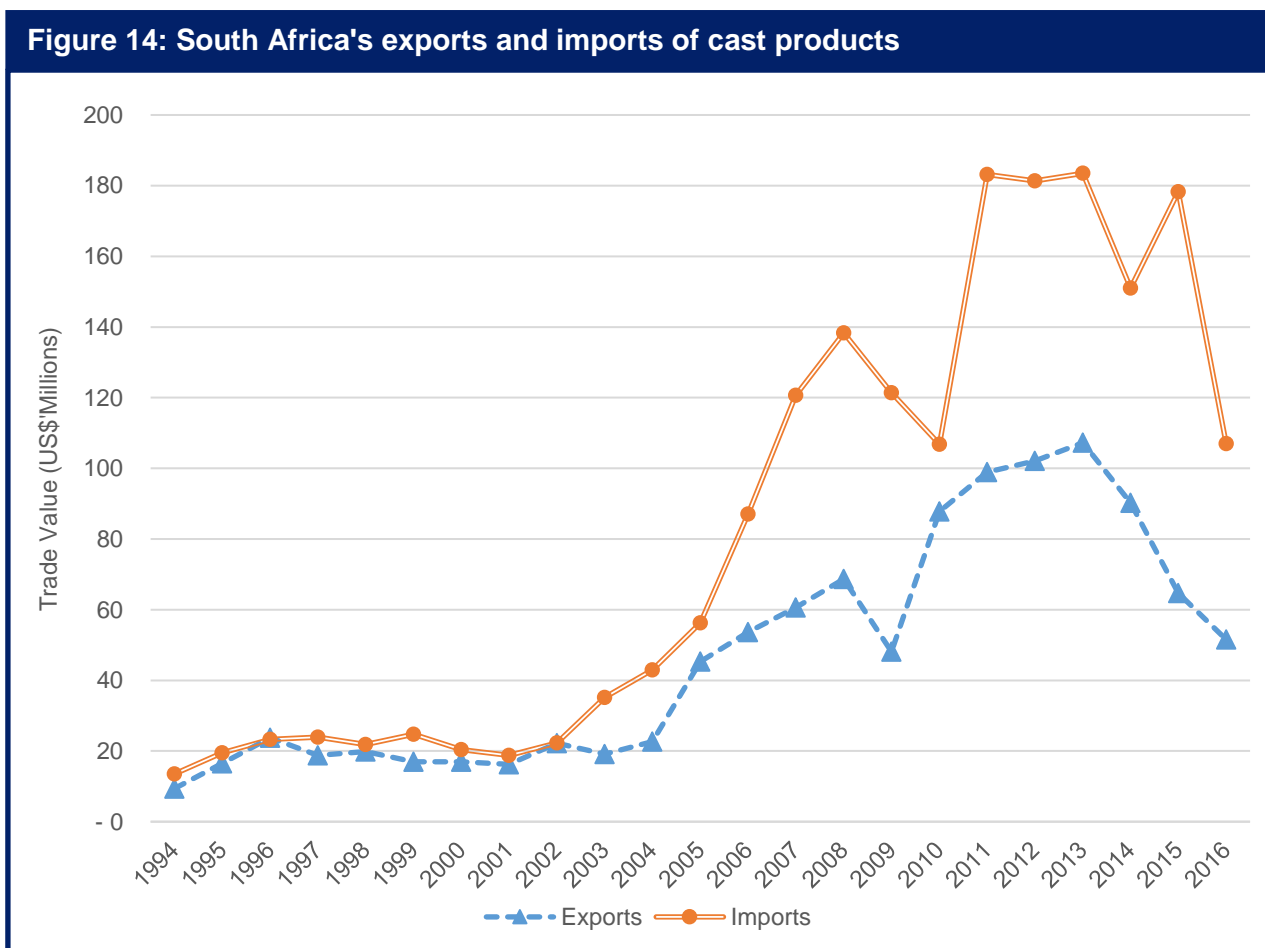
⁵⁵ It may also reflect some mis-recording of imports for trans-shipment.

local spending was being met by imports reflecting the loss of competitiveness. The impact became evident after the global financial crisis in 2008 as investment and consumer spending weakened.

In effect, the reverse of structural transformation in this industry grouping reflects a failure to manage resource earnings. Instead of saving the revenues in the global commodity boom, building up foreign exchange reserves, and maintaining a lower value of the currency, South Africa did the reverse.

An even worse picture was evident in metal castings (a segment within metal products) (Figure 14). As imports grew substantially to 2007, and again in 2010, the result was that by 2013, the tonnes being cast were 25% lower than in 2003. The performance of foundries is a bellwether for industrial capabilities as these firms bring together design (of moulds and dies), metallurgy (of improved alloys), with cost competitive production and quality to meet the needs of downstream industry. The foundry sector has failed to invest in upgrading capabilities required to meet the needs of customers, however, the incentives to do so were weak given poor cost-competitiveness against countries such as China.

Figure 14: South Africa's exports and imports of cast products



Source: Rustomjee et al., forthcoming, 2018

The main costs for foundries are scrap metal, energy and labour. Intervention in scrap metal pricing has been mooted since the mid-2000s with a series of studies indicating that the pricing is a key issue for foundries and a possible way in which the industry could be supported. The uncovering of cartels in scrap metal around 2010, involving the large steel mills as buyers along with the scrap metal merchants, further suggests that while the steel mills were getting favourable prices, other buyers (the foundries) were being charged cartel mark-ups. The intervention in 2015 to require an

export permit to be obtained by scrap exporters on condition the scrap metal has first been offered to local buyers on a discounted basis, termed the Price Preference System (PPS), has not proved effective. It is administratively burdensome and is widely believed to be by-passed by scrap dealers who have no incentive to forego export sales for discounted local sales. A far simpler mechanism would be an export tax which would directly reduce the attractiveness of exporting.

Energy costs are important across the industries. However, while the investments in upstream production of basic metals have been supported by cheap energy agreements made in the 1990s, downstream industries are generally purchasing electricity from municipalities at costs estimated (for foundries) to be between 19-29% higher than if they were supplied direct by Eskom. In the case of AMSA, in addition to cheap energy from coal, when the mining operations were unbundled AMSA was guaranteed iron ore supplied at cost plus a 3% management fee, for 25 years.

Economic policies

Three main issues emerge related to economic policies. First, the policies have failed to ensure that the historical support for upstream industries has served as the foundation for stronger local linkages to grow downstream businesses such as products fabricated from flat steel, as the flat steel has been priced at import parity levels. Second, there has not been a coordinated set of policies to build clusters in machinery and equipment. Given the fragmentation of government, this requires effective cross-department co-ordination which has not occurred. Third, policies which have been put in place to support local industrialisation, notably with regard to procurement, have been actively by-passed and undermined through unproductive rent-seeking.

The upstream steel industry in South Africa is subject to the volatility of international prices given the openness of South Africa to international markets. The cyclicity in international prices has been exacerbated by support provided by other countries to their industries. With the benefits of backward integration having been undermined,⁵⁶ government has turned to protection to support the upstream industry. There are two problems with the approach. First, the protection directly raises the costs to downstream sectors and reinforces the current industrial structure. Second, there is a danger that the support continues for longer than required, especially given industry lobbying. The record since the acquisition of control by Mittal has been for engagement to be ineffective. On making the acquisition Mittal committed to a 'developmental steel price', without it being defined. In any event, in the Competition Tribunal hearing on the excessive pricing case brought by Harmony Gold it was admitted that the benchmarking proposed by Mittal to the Department of Trade and Industry (DTI) in long-running negotiations had not yielded any different pricing from the import parity prices that the company had continued following. Similarly, attempts to link electricity pricing in a 'developmental electricity pricing policy' had no effect.

The support provided in the steel pricing dip in the early 1990s thus set up high returns over the following high price years of the cycle without credible conditionalities. This is at risk of being repeated following the very low prices in 2016 and the reintroduction of protection on flat steel products. The settlement with the Competition Commission and related conditions, reached in 2017, seeks to cap the potential for excessive rents to be made in good years. It is yet to be seen how effective this will be. The settlement while involving a large penalty in Rand terms is favourable to Mittal given the settlement of the cartel conduct and the low size of the penalty as a percentage of turnover. By comparison, China has, at times, imposed export duties on basic steel and

⁵⁶ The benefits of favourable iron ore prices have been lost as the mining rights were contested, while coal prices have also increased to international price levels.

aluminium products to ensure that support for local producers is translated into low local product prices.

The competitiveness of machinery and equipment depends much less on basic metal prices than is the case for fabricated metal products. The main machinery groupings in which South Africa is competitive are related to mineral processing, pumps & valves and earth moving equipment in all of which capabilities have been developed to supply the local mining industry. This has formed a platform for being internationally competitive, especially in regional export markets. The industries have internationalised with global OEMs integrating components and being involved in ongoing incremental improvements to meet the needs of users.

As companies move to provide solutions to mining companies with Engineering, Procurement, Construction, and Management (EPCM) or turnkey contracts, the relationship between mining, manufacturing and services is critical (Fessehaie, et al., 2016). Linkages to high value added and productivity enhancing services such as various engineering services are integral to competing. Mining and mining-related manufacturing activities further require complex services related to, among others, finance, transport, logistics and quality assurance. The above-mentioned services are important for the industrialisation trajectory of South Africa because they are amongst the highest value-added segments of the mining supply chain, can catalyse investment in skills development and technology transfer and, once domestic capabilities are established, these services can support growth in other sectors of the economy, including manufacturing.

South Africa has the opportunity to be the workshop of Africa through building strong regional value chains and production hubs, but the country has not realised this opportunity and has lost ground even in the focused areas of capital equipment in which it was competitive in regional export markets. There has not been the migration of capabilities to build a more diversified industry, with deeper linkages to components suppliers. Instead these mining machinery manufacturers remain 'islands' in the product space. As observed in Section 2, the failure to develop denser networks of productive capabilities across product categories distinguishes South Africa from other upper-middle income countries which have continued to industrialise.

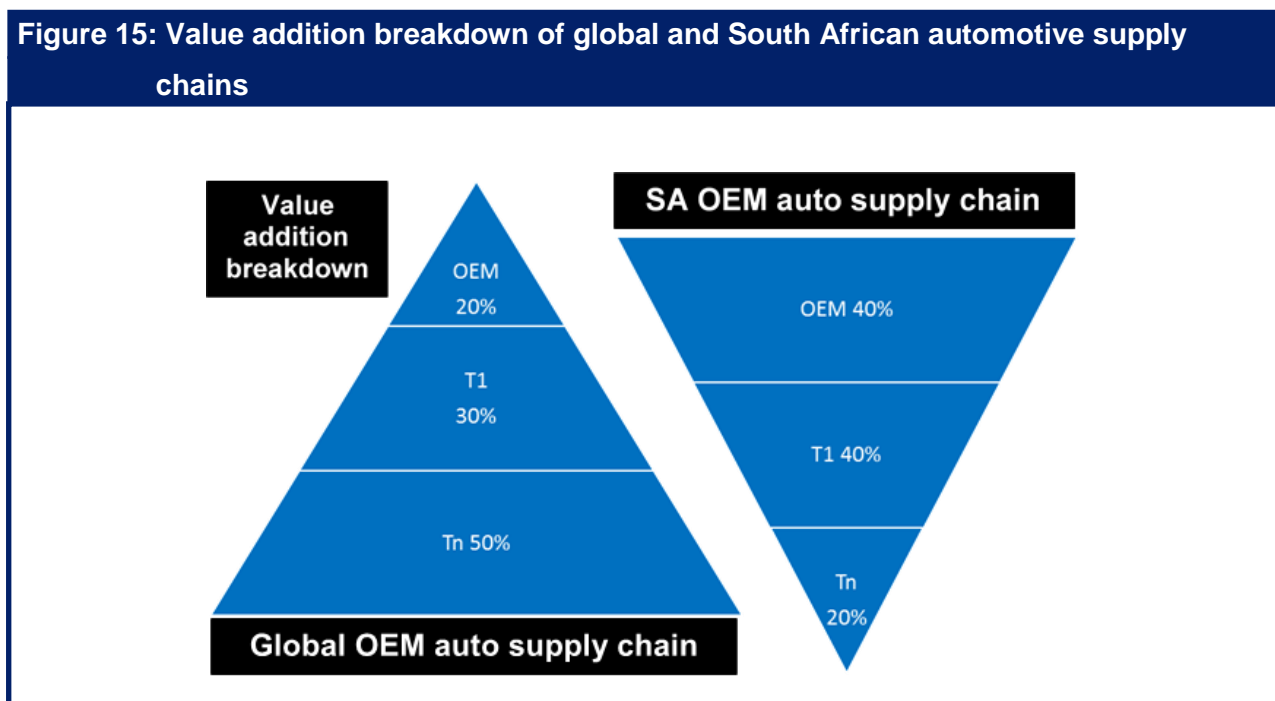
The record highlights the costs of the fragmentation of government. Mining, energy, trade, development finance, competition, technology, and industrial policies are the responsibilities of five different ministers and departments. Addressing the challenges requires a consistent and coordinated policy for the industry as a whole. This also needs to include a basket of measures to support agglomerations and clusters of activities at local level, as has been emphasised by a large number of studies. These clusters require research and testing facilities, institutions for skills development and training, along with development finance and appropriate trade policies. Such a coordinated package of measures has been sorely lacking. It would require collective action across departments, as well as a range of public institutions, state owned companies, and with the involvement of local government. In addition, local procurement policies are an important platform to stimulate investment by international businesses in local capabilities. Here, as well, studies have highlighted the lack of implementation of the strategies which do exist, leaving aside a more ambitious programme. Instead it has been evident that unproductive rent capture, associated with imports, has been the order of the day.

3.2. Automotive Vehicles and Components⁵⁷

Structural Transformation

The auto industry in South Africa has received state support and protection for more than a century and has been the focus of successive industrial development programmes since 1994. These programmes have used a range of incentives and policy levers aimed at restructuring the industry to achieve scale economies in production, international competitiveness and local investment in capabilities. The results have been mixed. While the sector is a major exporter, imports are also very significant. Most important, strong linkages have not been developed in components manufacture to grow diversified local capabilities. The industry continues to run a significant trade deficit while local content remains low. As such, South Africa has not developed the characteristics of a real auto hub such as Thailand or Mexico.

Structural transformation has therefore been limited at best, with the automotive value chain in South Africa underdeveloped relative to leading international competitors. It is heavily biased to OEM assembly rather than successive tiers of components suppliers (Figure 15). There are low and deteriorating levels of local content on South African assembled vehicles (only 38.7% local content in South African assembled vehicles in 2015), with a substantial level of automotive components imported into the industry. As a result, while South Africa has increased the value of its vehicle assembly activities significantly between 2012 and 2015 (from R75 billion in manufacturing sales to R137 billion), this increase was accompanied by a R44 billion surge in automotive component imports over the same period (Table 5).



Source: Black et al., forthcoming, 2018

⁵⁷ This draws on the IDTT study on the Automotive Vehicles and Components sector by Anthony Black, Justin Barnes and Lorenza Monaco: Structural Transformation in the Auto Sector: Industrial Policy, State-Business Bargaining and Supply Chain Development.

Table 5: South African OEM manufacturing sales and associated import and local content values (all Rand billions)

Year	Vehicles	Local content	Imported content	Local content (%)
2012	75,3	35,2	40,1	46,6%
2013	92,5	37,9	54,6	40,9%
2014	113,5	47,1	66,4	41,5%
2015	136,7	52,9	83,8	38,7%
2012-15 (% change)	81,5%	50,3%	109%	-16,9%

Source: Black et al., forthcoming, 2018

Motor vehicles (cars) therefore show up strongly in South Africa's export product space illustrated in Section 2, but not related auto components. Rather than operating as a bedrock for broader industrialisation within the South African economy, the present profile of the automotive supply chain suggests it is increasingly becoming an island, with only a narrow isthmus connecting OEM and Tier 1 activity to the balance of the economy. The second and third tiers are weak, and have contracted under competitive pressure. Unsurprisingly then, the expansion in investment in the component sector has also been modest in spite of the fact that South Africa's automotive policy has offered significant incentives for such investment.

Automotive Policy

The major international firms have played a vocal and influential role in the development of policy. A key dynamic, therefore, is that of the bargaining between firms and government. The auto industry in South Africa has been a recipient of large-scale state support. The MIDP was introduced in 1995, and entrenched the principle of import-export complementation. It provided export, production and investment support, notably strongly incentivising CBU and component exports. It also aggressively reduced component import duties, thus exposing firms to international competition.

Total imports of vehicles and components, however, grew at a more rapid rate than policy makers expected. The nominal tariff on light vehicles, at 25 percent, was still reasonably high and does not on its own explain the rapid increase in automotive imports; the key factor was that the MIDP enabled firms to rebate import duties by exporting. In addition, the very strong supply response to changes in the policy regime are also partly attributable to the nature of the automotive industry value chain. Since 1994 there was a process of investment or reinvestment by multinational corporations (MNCs) and all seven light vehicle producers⁵⁸ are now 100% foreign owned. At least one of the factors driving the takeover of domestically owned plants was the need to upgrade the South African plants in the face of growing competition. To achieve scale, exports were essential and this was unlikely to happen from licensed, as opposed to, wholly owned plants.

The multinational OEMs were able to rapidly facilitate exports either from their own South African operations or from South African-based suppliers to their international operations. This enabled them in turn not only to expand their own exports but to offset import duties on cars and parts. This led to erosion of the high levels of local content in South African vehicles in the mid-1990s (estimated at around 60%) and large South African-owned automotive component manufacturers were displaced. The MIDP thus had a strong export (rather than local productive capability) bias, which had resulted in major production distortions through the early 2000s (most notably in the form

⁵⁸ These are Toyota, Nissan, VW, Mercedes, BMW, Ford and GM. The latter has recently sold its plant to Isuzu.

of catalytic converter exports) that limited the need for local content in South African assembled vehicles.

The conversion of the MIDP to the APDP in 2013 heralded a major change in government policy, but the outcomes have been poorer in terms of local content. The APDP reoriented the sector from explicit export support to production support irrespective of market focus by moving to a Volume Assembly Allowance (VAA) for OEMs and a Production Incentive for OEMs and component manufacturers. The belief of the policy development team was that OEMs would balance their production between domestic market supply and exports under the APDP, while simultaneously balancing their CBU import programmes with local production for the South African market. However, OEMs have preferred to grow both exports and imports into South Africa for strategic reasons and because of the level of rebates earned per unit of local production. The OEMs identified the opportunity to increase their CBU export programmes under the APDP as an alternative to deepening their local content. As the VAA is based on the sales value of CBU production, as opposed to local value addition, OEMs realised they could earn substantial rebates by exporting high value CBUs comprising predominantly imported components.

Policy has not had the intended consequences but has realised outcomes oriented to the priorities of the OEMs, specifically in the level of effective export assistance which has been far too high, especially at the start of the MIDP, but also under the APDP. This reflects the intense lobbying by leading multi-national firms. The structure of support has led to the expansion in exports of peripheral components and the growth of a component export sector which is not integrated with the low volume, low local content assembly industry. Furthermore, it has led to firms using exports as a way of rebating imports, which has impacted on the component sector.

One of the major reasons for the industry's comparative lack of cost competitiveness is that South Africa remains a marginal producer of models within global multinational families which means that South Africa's contribution to global production for any locally produced model is low. This means that South Africa struggles to secure the local content needed to support its competitiveness development.

The manner in which incentives are determined needs to be reconsidered. Two issues stand out. First, larger firms retain the services of government officers whose sole job it is to ensure continued public-sector support for their operations. For instance, the technical team recommended a level of VAA support that was deemed sufficiently generous (with this supported by rigorous modelling work and expert input), and yet the VAA level that was finally introduced was substantially higher (33% more) than the recommended level, as a result of political intrusion in the technical process. This needs to be addressed to ensure that policy works for the sector rather than catering for the needs of big and powerful companies.

Second, incentives should be carefully designed, taking the roles of various government departments into account. One example is the way the South African tax authorities administer the ad valorem tax on imported vehicles. Where an imported vehicle has had its duty rebated by using APDP rebates, the ad valorem tax on the imported vehicle is based on the rebated value. The dutiable portion of the imported vehicle is discounted – thereby reducing the ad valorem tax payment; and the base value of the import is reduced by 25% - thereby changing the base ad valorem tax calculation, and further reducing the ad valorem tax payment on imports. These two impacts fundamentally reduce the amount of ad valorem taxation that is paid on imported CBUs, and by implication the ad valorem tax paid on imported CBUs relative to their locally produced

equivalents. By reducing the ad valorem tax burden, CBU imports have a potential cost advantage over their locally made equivalents.

In order to deepen the supply chain, there needs to be more effective industry co-ordination and programmatic interventions including locally embedded support for institutions of industrial development in areas such as research and testing. The South African automotive industry, working in partnership with national government, has established the Automotive Supply Chain Competitiveness Initiative (ASCCI) for identifying and responding to localisation opportunities, and it is critical that the industry and government collaborate on specific agreed-upon opportunities, especially where local materials availability provides the scope for substantially improving local content through South African automotive supply chains, and establishing potential areas of specialisation for the domestic industry within complex Global Value Chains (GVCs).

3.3. Agriculture and Agro-processing⁵⁹

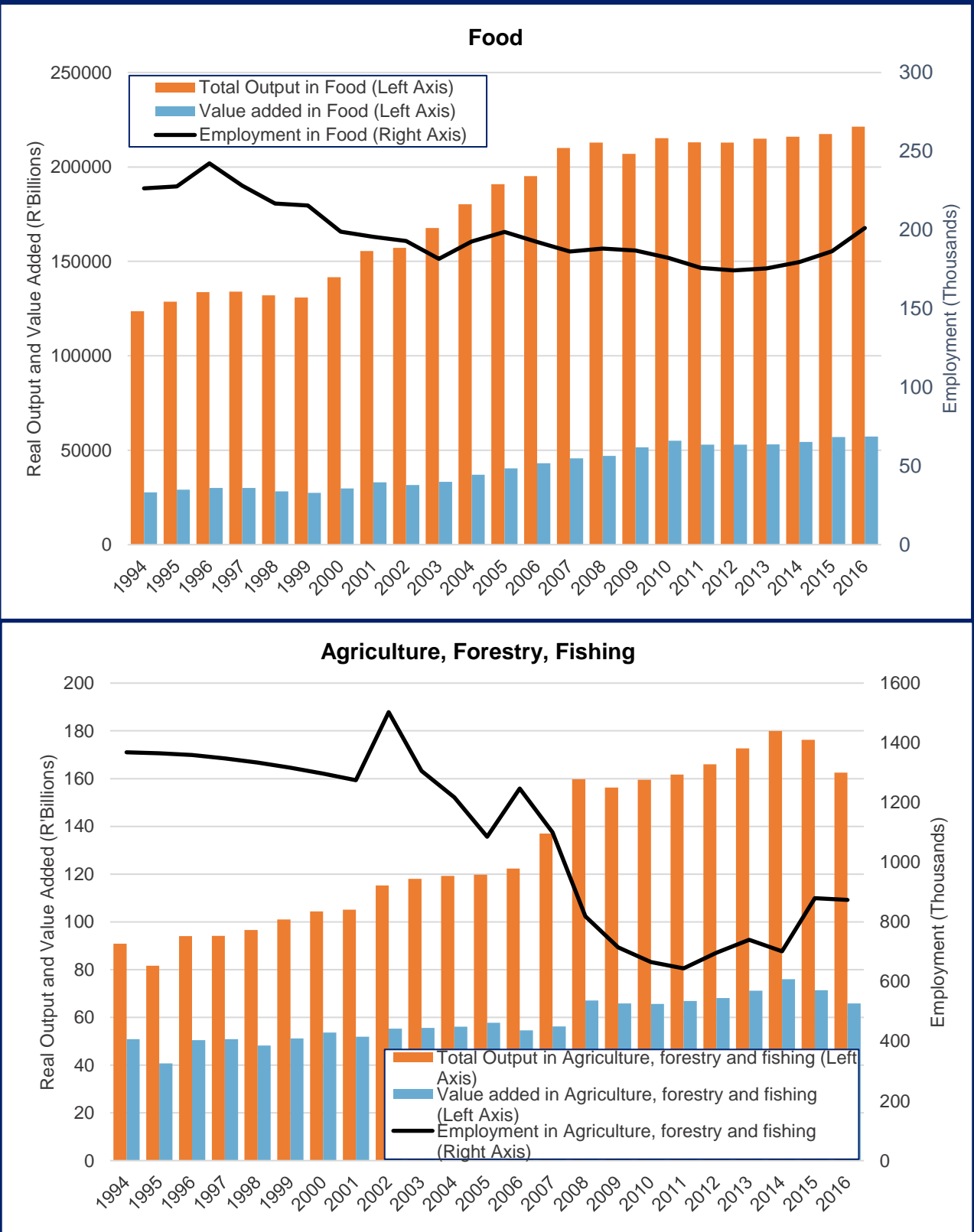
Structural Transformation

Structural transformation within agriculture involves the application of industrial processes to move production to higher value agricultural products, as well as to build capabilities in processing. This includes the logistics required for delivery of fresh goods to supermarket shelves around the world (the 'industrialisation of freshness').

South Africa has made notable strides in moving production to higher value fruits, creating employment and earning higher returns. However, this is in the context of the far-reaching restructuring which took place in agriculture and food products following the liberalisation of agricultural markets in the 1990s. This saw increased output overall, but large reductions in employment, especially in agriculture (Figure 16). The decline has been attributed to farm mechanisation and consolidation of farms into larger units resulting in lower employment per hectare cultivated (BFAP, 2011). We note however that there are challenges with measuring employment in the agricultural sector and that some apparent shifts are due to measurement issues (see Wittenberg, 2014). There are notable signs of improvements in employment since 2011, reflecting the greater employment intensity of fruits and nuts, and some vegetables, as well as employment in manufactured food products.

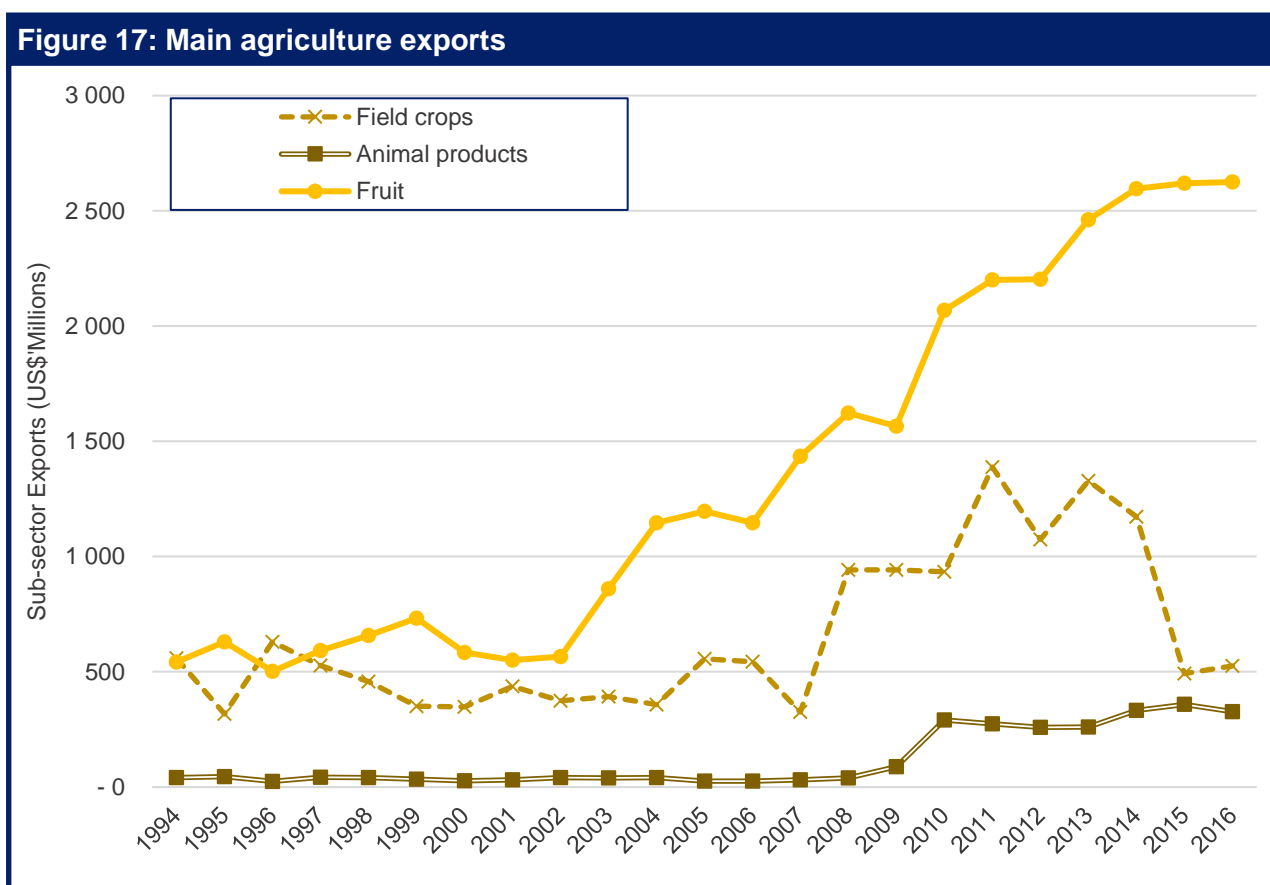
⁵⁹ This draws on the IDTT study on the Agriculture and Agro-processing industry by Shingie Chisoro-Dube, Reena das Nair, Maria Nkhonjera and Ndiadivha Tempia: Structural transformation in agriculture and agro-processing value chains.

Figure 16: Agriculture and food output, value add and employment



Source: Chisoro-Dube et al., forthcoming, 2018

The progress made by South Africa in higher value crops has largely occurred in the absence of an effective strategy, indicating the potential for structural transformation in the industry with the appropriate support. The growth in high value fruits has been based on supplying export markets (Figure 17). This is consistent with growth in high value added agricultural exports achieved by India and comparable countries such as Brazil and China (Cramer & Sender, 2015). It is also notable that the drought in 2015/16 in South Africa did not lead to a reduction in the value of fruit and nut exports although it meant a sharp fall in field crops (mainly maize).



Source: Chisoro-Dube et al., forthcoming, 2018

To understand the performance of the agriculture and food value chains, including the linkages and the role of policies, three areas were examined in detail, namely, fruit, sugar and dairy. The three sub-sectors are quite different in nature and have been subject to different types of policies and programmes, post-apartheid. Fruit received little support under apartheid and until recently was not the focus of industrial policy, however, its performance demonstrates the potential for structural transformation as well as the role of industrial capabilities for it to be internationally competitive. The sugar industry had substantial support under apartheid and is the only sizable agricultural sub-sector to maintain a system of protection and regulation. Value-adding activities are in downstream processing in which competitiveness depends in part on the price of sugar, meaning there is a tension between upstream support for sugar production and the growth of food products using sugar. The dairy sub-sector, by comparison, was liberalised in 1996 and has undergone consolidation with much fewer farms and higher levels of productivity. There has been investment in downstream agro-processing activities in dairy products. As such, the three sub-sector experiences provide useful comparative insights.

Industrial capabilities in fresh fruit, sugar and dairy

In fruit the high value market is for fresh products rather than processed (such as in fruit juices). While fruit processing involves the acquisition of manufacturing capabilities, it generates lower returns.

Over 70% of total South African fruit production is sold in export and local fresh markets. There has been a move in land-use, from low value field crops towards high value fruits, as well as shifts in land-use from apples and pears towards higher value fruits such as cherries, plums, dessert peaches and nectarines, and to higher value lemons and limes within citrus. Production for the fresh export market is dominated by large producers and marketing companies because production of fresh fruit for international markets generally requires competitive technologies, large-scale operations and compliance with private standards (of retailers) and international sanitary and phytosanitary standards. It is challenging for smaller-scale farmers to be part of large international marketing and distribution operations.

Production and packing of fresh fruit into ready-to-eat products that are prewashed, chopped and bagged constitute innovative, new prepared products that attract high prices on the market. Gaining access into high value markets in developed countries requires compliance with standards, which, in turn, requires traceability to the farming level with regard to the use of pesticides and quality of water. Other capabilities required include good post-harvest practices to maintain the quality of the fruit, packing capabilities which require investment in equipment to attain high standards of hygiene, storage and cold chain facilities, and transportation capabilities. Cross border movement of product is a key challenge to growing regional markets in southern Africa due to hold-ups and delays at the borders leading to loss of fruits.

The 'reject' fruit or fruit above the export quota is sent to processing facilities to manufacture fruit juices, dried fruit, canned and bottled fruit products. Capabilities required for fruit processing include the following: a) security of fruit supply; b) fruit processing plants located close to production areas, leading to a degree of vertical co-ordination to ensure supply and quick processing; c) working capital as the product must be processed at harvest time and stored at the processors' cost for delivery to retailers throughout the year; and d) compliance with standards and therefore traceability right down to the farming level in order to access large markets. Due to the nature of capabilities required in the industry, fruit processing is relatively concentrated with the largest five firms accounting for slightly under 50% of total revenue in the industry, and no entry of new processors but rather a trend towards consolidation with large processors taking over smaller processors.

In contrast, field crops such as maize and sugar, although they are key export-revenue products, present limited opportunities for future growth.⁶⁰ Structural transformation requires growing downstream processed goods, however, this requires low priced inputs. As far as sugar is concerned continued support for the sugar industry has resulted in high sugar prices in a globally protected sugar industry.

Sugar is the only agricultural commodity that was not subjected to the post-apartheid deregulation process and has therefore remained a highly protected sector through various pieces of legislation. Upstream, the Sugar Act of 1978 and Sugar Industry Agreement of 2000 provide for the setting of

⁶⁰ For instance, in the case of maize, exports may decline in future, following South Africa's main export destinations in the region increasingly becoming self-sufficient (BFAP, 2011) as well as climate change challenges.

the sugarcane price to protect growers from low global sugar prices and the buying power of millers. Furthermore, the sugar industry is afforded tariff protection on sugar imports when the world sugar price drops below a pre-determined dollar-based reference price, and local and export quotas have the effect of controlling local volumes available (and local prices) as well as controlling what is available for export.

Cane crushing capacity has been on a downward trend since the 2013/14 season following drought conditions, and there is evidence of a rapid and continuous decline of small-scale production (Dubb, 2016).⁶¹ Even though there have been decreases in the number of growers, area under cane cultivation and cane production, sugar production levels have been stable and South Africa has continued to be a net exporter of raw sugar products. Sugar imports have, however, also increased significantly, particularly since 2009, and there are concerns about the medium-term competitiveness of South African sugar producers.

Given water availability and climate change, there is greater potential for growth in sugar production in other countries in the region such as Zambia and Mozambique, which can ensure low priced sugar for downstream processing in sugar confectionery. There is evidence of firms developing capabilities to produce sugar containing products with the sweets subsector experiencing strong growth in both production and sales. However, the confectionery industry and small confectionery producers, in particular, face constraints primarily related to the price of input sugar.

While the sugar industry in many countries is heavily subsidised, the protection of the sugar industry in South Africa impacts on the price of sugar as a key input to downstream sugar confectionary producers (Barnes, et al., 2015).⁶² Furthermore, it reduces competition between millers and ultimately creates an environment conducive to coordinated pricing of sugar by the millers. Investments in the milling industry have mainly been by large millers, in spite of drought conditions and increasing imports.

The retail level of the value chain is also concentrated, and buying power gives retailers the ability to extract margins at the expense of suppliers through trading terms. In addition, onerous requirements make penetrating the retail market (the key distribution channel for sugar confectionery products) challenging, particularly for small to medium sized producers.

Dairy is the largest export revenue earning animal product in absolute values, however, it has recorded low growth and milk has been experiencing a worsening trade balance. As far as processed dairy products are concerned, there is a favourable trade balance for high value added products, specifically concentrated dairy products, with SADC accounting for the largest proportion of exports. This is likely due to the growing trend of expansion of South African retail chains into southern Africa and points to the potential for food product exports by South Africa to the region.

Restructuring saw increasing levels of consolidation over the past 16 years at both farming and processing. There are fewer commercial farms with larger herds and increased productivity. This is linked to the increasing power of processors and retail buyers of milk and milk products, forcing small-medium milk producers to become price-takers (WWF, 2016). Raw milk producers (commercial farmers) are now paid on the basis of the composition and hygienic quality of milk,

⁶¹ The relationship between growers and millers is governed by cane supply agreements, which creates space for buyer control, locking cane growers into contracts with a single buyer, creating a monopsony procurement situation, in addition to potentially excluding small farmers from securing contracts simply because it is in a miller's interest to deal with the most efficient (larger) producers (Saitone & Sexton, 2017).

⁶² Barnes, et al. (2015) further identified the relevance of better classification of different grades of sugar in order for the import tariff to be more targeted in its application.

volume of milk produced and proximity to the milk buyer's depot in a comparative base-pricing purchasing system administered by milk buyers (the large processors).

The dairy sector is concentrated at the processing level with only a few players led by Clover, Lactalis, the maker of popular Parmalat brand, and Dairybelle. There has been increasing levels of consolidation in the sector, with at least six mergers taking place in the sector between 2011 and 2016, the majority of which involved Clover, the largest dairy processor in South Africa. The retail level is also concentrated with retailers in a strong bargaining position relative to smaller milk processors.

Dairy has significant opportunities for further industrialisation given the linkages to downstream processing of dairy products (such as yoghurt, flavoured milks and cheese) and the growth of supermarkets in the region. There are however substantial barriers for small-scale producers as the industry is capital-intensive, and significant scale economies and logistics are required to be profitable. In addition, packaging contributes significantly to costs, with packaging and labelling of processed products representing approximately 17% of the cost of the finished products.

Policy implications

The developments in agro-processing present some sharp contrasts. The upgrading of the fruit industry highlighted the potential for positive structural transformation, even while receiving little support. It is labour-intensive and can use advanced water management to mitigate the effects of climate change. By comparison, the protection of sugar reflects the lobbying power of entrenched interests and has undermined the competitiveness of downstream manufacturing of confectionary products. The dairy sector also represents potential for growth in downstream processing, especially to supply growing regional demand in southern Africa.

In all three sectors there are substantial levels concentration, as well as at the retail level (Greenberg, 2017) and effective industrial policies need to engage with the power and decisions of large businesses, which are increasingly internationalised. The role of smaller producers is an important concern. In the dairy sector, for instance, the increasing consolidation of processors as well as the power of supermarket chains impacts both on the ability of smaller black processors to enter the processing segment, as well as on the profitability of smaller milk producers.

The analysis indicates that policies have been poorly targeted and there has been a lack of co-ordination along value chains from land and water use, through agricultural production, extension services, testing and certification, logistics and retail. An industrial strategy for high value agricultural products is imperative and the inclusion in the Industrial Policy Action Plan (IPAP) is to be welcomed, however, the policy requirements cut across a number of departments and institutions. Possible areas for future intervention can focus on identifying niche fruits with high growth potential and developing capabilities required to sell into fresh fruit markets. These could include strawberries and other berries, and macadamia nuts, with strong demand in export markets. Bananas also present a possible area for intervention given the high global demand.

Strategies need to recognise the growing power of supermarkets which has led to the creation of buyer-driven food value chains. This has important implications for primary and secondary producers. Special attention thus needs to be given to the impact of concentrated retailing sectors and competition from large multinational producers. Given that supermarkets are a key route to market for producers, the development of focused supplier development programmes, particularly for small brands are essential, as well as codes of conduct. Both these initiatives have been introduced in IPAP 2017/2018.

4. Lesson on Structural Transformation from Industry Studies

We draw on the industry studies for insights into the factors underlying structural transformation in South Africa. In Section 4.2 we then assess the relationship between macroeconomic policies and structural transformation. Central to this relationship is the impact on investment.

4.1. Structural transformation, industrialisation and economic power

The industry studies provide insight into the relationships which underlie the overall trends and specifically how capabilities have (and have not) shifted to the higher value activities which are at the heart of the desired structural transformation. The studies also reveal the interests and economic power of large firms and their influence over the changes that have taken place.

Understanding structural transformation in South Africa

The industry studies emphasise the strong continuities in the patterns of industrial development. In metals and machinery, the upstream basic metals sectors continue to be substantial net exporters while the downstream more diversified and sophisticated machinery and equipment sector has recorded substantial import penetration and growing trade deficits. In the auto sector, there has largely been a failure to develop the components industry and policies have been oriented to the large international OEMs who continue to produce a range of models at scales far below the operations in countries such as Thailand and Turkey. In food and agro-processing, far-reaching liberalisation of agricultural markets led to consolidation into larger farms in the main crops, with massive reductions in employment.

In agricultural production there have also been important positive changes, most notably the growth in high value fruit exports. This illustrates that more sophisticated industrial capabilities are not necessarily about more processing but instead may be about moving to different niches with the application of a range of services to produce the specifications required. The export success in fruit has involved being able to grow and deliver the preferred varieties of citrus, deciduous fruits and berries fresh to consumers in far-away export markets.

In machinery and equipment, different customer segments increasingly look to the industry to deliver a total solution, for example, in the mining and processing of ore. This requires integrating design through to management of operations, and involves the application of high-value engineering services and digital technologies. The costs of repair and maintaining businesses are also generally many times greater than the cost of the original equipment.

While South Africa has niches of excellence in machinery, such as in some areas of mining equipment, the overall picture has, however, been a hollowing out of capabilities and weakening of value chain linkages. Instead of clusters of competitive production reflected in the export basket, there are isolated 'islands' on the export map. The loss of capabilities happened particularly from 2002.

The turning point around 2002 is significant for a number of reasons.

First, firms largely did manage to restructure to maintain their competitiveness in response to the trade liberalisation during the 1990s. For example, there was relatively little import penetration in metal castings and in machinery and equipment over this period. In the restructuring process, firms

shed labour and improved efficiencies. Investment rates remained relatively low outside of the upstream minerals and energy intensive sectors, however, until early in the 2000s there was not a hollowing out of diversified capabilities.

The management of the natural resources boom of the 2000s meant that this changed from around 2002. South Africa ran a growing balance of payments deficit even while export earnings increased from higher resource prices. This was the result of sharply increased import penetration on the back of a strong currency. The sustainability of running a growing balance of payments deficit on top of export earnings from high commodities prices was questioned at the time by the so-called 'Harvard team' of economists in 2007 who recommended managing the exchange rate (Draper & Freytag, 2008).⁶³ It points to inconsistencies between macroeconomic policy and the real economy which we assess below.

Second, economic growth appeared robust during the 2000s but it was driven by a credit-fuelled consumer spending boom along with rising house prices. At the same time, infrastructure investment (for the World Cup and to address chronic backlogs) supported construction services and industry inputs. The higher investment rates were not to be sustained and were largely a belated response to the backlogs which impacted on the existing energy-intensive economy, rather than signalling a longer-term move to higher investment rates to change the economy structure.

Third, there was a weakening rather than strengthening of value chain linkages. The upstream sectors such as basic iron and steel and basic chemicals faced high international prices (linked to high resource prices) which balanced the effects of the strong Rand on their export earnings. Their sunk capacity meant they sustained production levels while being able to exert their market power over local buyers to effectively cross-subsidise exports while undermining the competitiveness of downstream industries.

The exceptions indicate the potential impact of policies and the possibilities for diversification. In the automotive sector, the revised MIDP incentivised greater local content, evident in value added performance to 2008, before the next policy iteration was too generous to the OEMs and effectively weakened local content requirements. In agro-processing, the potential for shifting to high value products has been demonstrated in the growth of fruits and nuts, increasing employment.

Fourth, the far-reaching internationalisation accelerated after 2002, with implications which need to be better appreciated, along with the policies to maximise the benefits while ameliorating the risks. This is a global debate, however, South Africa represents an extreme case. It raises fundamental questions about whether the regulatory institutions for the global economy are fit for purpose (they clearly are not) and how they should be reformed. South Africa cannot wait for this to play out. The internationalisation of business places an even greater premium on coordinated policies to build local capabilities.

The poor South African recovery from the global financial crisis revealed the underlying economic weaknesses, and was accompanied by a muddling along, and a fight over the existing rents through state institutions. At the same time, more and more evidence of the control of the insiders over profits through cartels has come to light. Not surprisingly, all sides have retreated into defensive positions rather than the honest re-appraisal required. The question is whether the lessons can be learned and applied. This is in the context of major global challenges including climate change and technological upheaval under the banner of the fourth industrial revolution. A key starting point is

⁶³ See also Recommendation 4 in Hausmann (2008).

to recognise the fragility of the growth path in the 2000s as part of moving to a far-reaching and pragmatic agenda for shaping a different future.

Capabilities, technology, skills and employment

Innovation, the attempt to try out new or improved products, processes or ways to do things, is part of most economic activities (Fagerberg, et al., 2010). It is also a critical part of industrial development and structural change. Although there was a time when it was widely believed that new and improved technologies would diffuse to developing countries through markets with 'hands-off' economic policies, the record of the past three decades and more has made clear this is wrong. Countries adopting the Washington Consensus policy package have not performed well, while those rapidly playing catch-up, led by countries in East Asia, have done so under far-reaching interventions to shape incentives and regulate markets.

Large firms are important for the development of technological capabilities, in being able to make the investments necessary, and to realise the economies of scale and scope (Chandler, et al., 1997). The issue is how the markets and value chains are governed and regulated by large firms with substantial economic power as well as by public institutions. Is the power of large firms consistent with learning, interaction and adaptation that enhances the 'creative functions' (Arndt, 1988) of markets? Or is power exercised to exclude rivals, undermine different business models and entrench rents?

Internationalisation of production and local capabilities

The industry studies indicate substantial failures in managing the integration of the South African economy with the global economy, as well as failures in developing coherent policies for local and national institutions for technological capabilities.

The rapid opening-up of the South African economy, which began in the late 1980s, meant exposure to international markets and prices. The challenges involved are exemplified by the metals and machinery industries in which basic metals prices have fluctuated wildly with global demand and supply, exacerbated by industrial policies in large economies led by China and the USA. The importance of exports to local basic metals producers mean they are highly exposed, going from boom to bust. In periods of high international prices, the basic metals producers make substantial profit margins while in low price periods they lobby for government protection to save jobs. The policy agenda has been preoccupied by the interests of upstream firms, rather than by downstream businesses which account for much more employment, but which are fragmented.

Basic metals production has undergone global consolidation and, in South Africa, become dominated by TNCs. The government's strategy in the early 2000s in iron and steel was to identify an international company with the technological capabilities to turn around the former state-owned Iscor. Iscor became part of the largest steel company in the world Arcelor-Mittal which restructured the business, but failed to make the promised investments (Zalk, 2017). As a result, profits in the boom years were taken out of the business while, following the collapse of prices from 2011, the industry has required support. The initial agreement when the then Iscor was separated into steel-making and mining businesses guaranteed access to iron ore at cost-plus prices and thereby cushioned the steel producer somewhat. However, the iron ore dispensation was ended by short-term gaming over the mineral rents by Kumba, Imperial Crown Trading (reportedly associated with the Gupta family), and ArcelorMittal SA (AMSA) itself. The package of energy, mining, industrial policies and procurement which is required for upstream sustainability in the interests of downstream steel-using industry capabilities has been conspicuous by its absence.

A similar picture appears in basic chemicals to downstream plastics production except here the main upstream producer has remained vertically integrated into resource inputs, meaning it has remained profitable, yet has not been subject to effective policies to build broader industry capabilities (Mondliwa, forthcoming, 2018).

In the automotive sector a similar failure to effectively engage with TNCs has been in evidence. Local technological capabilities require ensuring transfer of know-how to local components businesses. Instead, the revisions to the MIDP in the mid-2000s overly favoured the interests of the TNC auto-assemblers while not requiring the kinds of investments to realise scale production and stronger local linkages. This compares with countries such as Thailand where strong locally-embedded auto hubs have been built around international OEMs.

By comparison, in agro-processing, local producers' capabilities and investments have underpinned the shift to high-value products such as citrus and berries for global exports.

Clusters and capabilities

The international experience emphasises that technological capabilities are locally embedded in firms and institutions. There are extensive positive externalities in skills development and capabilities which underpin agglomeration economies and mean individual firms will under-invest.

One of the most striking insights from the industry studies is the lack of effective cluster initiatives in the areas where structural transformation implies they are most required. In machinery and equipment where South Africa has historical capabilities and where growth has been accompanied by employment generation, the lack of a well-resourced, high impact, strategy is striking. The industry has export councils which assist with marketing but do not address the cross-cutting challenges of building local technological capabilities. In recent years, there is a clustering policy in place with the practical impact yet to be seen.

Initiatives in related industries such as the National Foundry Technology Network appear not to have been responsive to the upgrading requirements of businesses themselves. Appropriate initiatives need to be part of concrete firm-level transformations. As noted in auto, the initiatives have also been weak in terms of promoting locally-embedded clusters.

The experiences point to the importance of considering industrial policy and structural transformation in geographic, as well as sectoral, terms. Metros and provinces can link up the spatial investments required along with local institutions. However, as with other policy areas, the practical actions are lacking notwithstanding policy statements. Firms continue to report a wide-range of basic challenges which have gone unaddressed (see, for example, Kaziboni, 2017).

Co-ordination with other important policy areas, notably public procurement, has also been lacking. Here as well the policies are in place but, in the context of the fragmentation of government and contestation over rents, the implementation has been absent (Crompton, et al., 2017). The result is that government at different levels from national to local now lacks credibility.

Skills, employment and productivity

The area of employment and productivity has been highly contested. While much of the policy debate focused on labour market flexibility and nominal wage rates, it now appears clear that wages have not outstripped productivity growth. Moreover, higher average wages have been driven by

wage increases at the top end of the distribution and real median wages of employees have remained stagnant (Wittenberg, 2014, 2017a).⁶⁴

It is trite to observe that unit labour costs (the labour cost for a unit of production) are impacted by the productivity of the labour involved, along with the wage rate. That is, the capabilities of firms (including the capital stock) in which the workers are employed are critical to the labour costs of production. Much of the debates around labour simply ignore the dynamic challenges relating to building capabilities. It is clear that firms are very heterogeneous in this regard. Larger firms have been more productive (Kreuser & Newman, 2016), as well as firms which are more integrated into international markets (Matthee, et al., 2016). Large firms have also been found to be more important in net job creation casting doubt on a narrow focus on small firms for employment generation (Kerr et al, 2014).⁶⁵ But firms are also very heterogeneous and the results beg questions as to how firms build the capabilities, and the ways in which firms engage in international value chains, which require understanding at sector and industry level.

The faster growth of wage rates at the upper end of the distribution in South Africa is in the context of the *already* extremely unequal distribution inherited from apartheid. Moreover, recent research (Wittenberg, 2017b and c) indicates that the earnings distribution is even more unequal than had previously been thought. While there are multiple and compounding factors which underlie this inequality, skills and education are one important dimension (Bhorat, et al., 2016). In terms of the profile of the workforce, the issues of skills and education relate more to the quality and reach of technical and vocational education than to university degrees.

In the area of skills development, it is therefore essential that national industrial strategies for capabilities are designed with input from industry associations, and that there is alignment with government departments responsible. Firm-level assessments have indicated that firms have increasingly privatised training in the face of poor public institutions for Technical and Vocational Education and Training (TVET) (Kaziboni, 2017). This means wasteful duplication across firms and implies a further bias against smaller firms which cannot realise the economies of scale in the provision of in-house training. For all firms, their training investment decisions will be relative to the expectations as to how long employees are likely to stay with the business and, as such, they will under-invest relative to the returns to the economy as a whole.

As highlighted in the metals industry study, there is a crisis in terms of the lack of suitably skilled artisans. The need to address artisan training programmes has been recognised. There is however a “need for a clearly co-ordinated effort in policy formulation that involves all relevant government policy clusters, the employing sectors and education providers to better align skills supply and demand” (HSRC, 2014). The fragmentation of government over the past decade and the ineffectiveness of cluster initiatives has undermined efforts to date.

*Interface of technology and industrial policies*⁶⁶

Under apartheid, South Africa’s institutional environment related to innovation and industrial development was driven by national objectives related to military dominance in the region, food

⁶⁴ Mean real earnings of manufacturing workers have also remained flat (Wittenberg, 2014: 16) implying that if the same economy-wide pattern of higher wage increases at top end have also been observed in manufacturing then median manufacturing wages may in fact have declined.

⁶⁵ Rates of job destruction and creation in South Africa are also similar to those internationally implying there is correspondingly ‘little evidence that labour legislation creates rigidities that prevent firms from hiring or firing workers’ (Kerr, et al. 2014).

⁶⁶ This section was drafted by Erika Kramer-Mbula.

security, energy self-sufficiency, as well as mining industry interests. Support for science, technology and innovation competencies was heavily oriented towards parastatal organisations that served such national objectives.

From 1994, the country's agenda for modernisation and socio-economic progress has recognised the importance of research, technology and innovation as key areas of policy for international competitiveness. The creation of a Department of Arts, Culture, Science and Technology (DACST) by the new government in 1994 was the first step to oversee and coordinate the entire South African science, technology and innovation (ST&I) system. The redefinition of priorities and governance was set out in the White Paper on Science and Technology of 1996 which adopted a 'national system of innovation' approach, calling for greater co-ordination among a range of relevant government departments and stakeholders.

Since then, South Africa's ST&I system has expanded rapidly and is populated by a growing number of public institutions, advisory bodies and funding agencies, guided by multiple strategies and policies that steer research and development (R&D) and innovation activities. The Department of Science and Technology (DST) has overall responsibility for public ST&I institutions. However, other ministries such as the DTI and the Department of Higher Education and Training (DHET) are also key players regarding policies and programmes that affect technology development and innovation. The Council on Higher Education and the National Advisory Council on Innovation (NACI) are further mandated to advise government on policy issues that pertain to innovation. The public funding function is mainly executed by the National Research Foundation (NRF), the Medical Research Council (MRC) and the Technology Innovation Agency (TIA) established in 2009. The objectives have not, however, been reflected in the overall economic outcomes described here.

The broad overarching strategy is the Ten-Year Innovation Plan (TYIP), launched in 2008 to guide transition toward a knowledge-based economy. This is echoed in the National Development Plan (NDP) which recognises the fast pace of technological change and innovation, and the move towards a knowledge-based economy. However, while the TYIP explicitly supports the DTI's National Industrial Policy Framework (NIPF), the evidence on the ground is of poor co-ordination and little real impact. Programmes and interventions have been developed within the domains of innovation and industrial development without much alignment.

Despite the poor coherence and co-ordination at the implementation between innovation and industrial policy, there are examples of innovation policy interventions. These include the Support Programme for Industrial Innovation (SPII) and Technology and Human Resources for Industry Programme (THRIP) which assists industry investment in technology development together with supporting links with universities. The Sector-Specific Innovation Fund (SIF) established in 2013 under the government's Economic Competitive Support Package also incentivises the private sector to invest more into research and development. It has involved partnerships with the private sector, including in citrus, forestry and waste management.

Digital technologies, automation, and the fourth industrial revolution

The various digital technologies which are being applied to the design, production and delivery of goods and services are bringing far-reaching economic changes around the world. While these have been perceived as a threat to developing countries with lower skills and technological capabilities they also may lower barriers to entry into different activities as countries can access international technological capabilities more easily. The technologies in design also enable much greater customisation and short production runs responding to changing consumer preferences.

This lowers the costs of producers identifying and responding to market trends in international markets. It also potentially opens up routes to consumers which by-pass traditional retail channels, such as supermarkets.

Networks and platforms become much more important, as exemplified by Google and Amazon in search and on-line retail. There are similarly dramatic implications for finance and communications in which the importance of fixed infrastructure is diminishing rapidly. With appropriate regulatory frameworks this can aid in the extension of financial services to previously excluded populations. In energy, the changes mean more dispersed generation and transmission can meet needs with smart metering enabling better price signals. However, poor regulation will undermine the gains and potentially allow markets to be cornered by powerful interests.

It is evident that the impact on countries of the technological changes grouped under the 'fourth industrial revolution' will depend on how the countries respond. A capable state and effective public institutions become even more important and will likely mean even greater divergence in outcomes across countries. In each industry, incumbents will lobby to hold back the changes which threaten their existing business models. South Africa has not performed well in this regard with incumbents in finance, telecommunications, energy, transport, and media all successfully blocking regulations which would have opened up markets. There is a premium on market data and the responsiveness of policies and regulations to evolution. The question is how to make sure that smaller local firms can access market data and build local and international collaborations to effectively participate.

The role of industrial financing

Companies use both retained profits and external financing to finance investments. Development finance institutions have acted as catalysts for accelerated industrialisation and economic growth in developed countries, while developmental states such as China, Turkey, India and Brazil show that development finance can play a crucial role in transforming the economy. Successful development finance institutions provide game-changing interventions that alter the growth trajectory of their countries (Gumede, et al., 2011). In South Africa, financing entry and expansion of businesses is critical in the context of significant barriers to entry. In particular, there is a need for "patient capital" given the time required to build the scale and reach required to be competitive, and the appetite for risk in financing rivals taking on powerful incumbents (Roberts, 2016).

The industry studies indicate both that state industrial financing continues to be channelled to larger firms while there is a need for 'patient finance' for smaller rivals. In the metals and machinery value chain, the bulk of state industrial financing has been absorbed in more capital and energy-intensive projects in the ferrous and non-ferrous metals sectors. This reflects a continuity from the historic support by the Industrial Development Corporation (IDC) for the development of the mining, steel, aluminum and chemicals industries (Mondi and Roberts, 2005; Fine and Rustomjee, 1996). In the post-apartheid period, the IDC continued to be oriented towards large, capital-intensive and resource-based industries tending to perpetuate the bias to capital-intensive manufacturing (Edwards, 2001; Roberts, 2004; Hirsch, 2005; Burton, 2011).

Downstream sector funding seems small compared to investments upstream. The IDC has worked to increase financing to more employment-intensive sectors and to small, medium and micro-enterprises. However, for the firms to be profitable, development finance needs to be aligned more closely with industrialisation policies.

Concentration and economic power

The economic power of large firms includes being able to govern the value chains in which they are located, as gatekeepers to opportunities upstream and downstream through their control of key inputs or routes to market. In addition, concentration and rents inevitably means extensive political lobbying to protect the firms' positions and returns. To an important extent, the success of an industrial policy depends on whether it takes on the vested interests and mobilises a broader coalition around addressing economic power. The industry studies highlight the inability to do this and the costs to an inclusive agenda.

Market power and governance of value chains

In food products extensive cartel conduct has demonstrated the ability of insiders to raise prices while keeping out rivals (Makhaya and Roberts, 2014; Ncube et al., 2016). The sweeping liberalisation of markets undertaken in 1996 did not achieve the outcomes which proponents had claimed. In the very few places where controls were retained, notably in sugar, outcomes have not necessarily been better as the regulatory regime continued to favour the main producers over other interests.

The potential benefits of an alternative agenda, where incumbents do not influence policy to stifle rivals, is indicated by segments such as fruits. In this area, which was not the target of extensive support under apartheid and does not have major entrenched interests, investment has gone hand-in-hand with exports, upgrading of capabilities and employment. It shows what can be done.

On the other hand, in the metals industries the result of the ongoing tussle between powerful interests has been the failure to chart an inclusive growth agenda. Policies, such as on procurement, have been captured by one or other of the interests. Levers which can be used, such as mining and energy policies, have not been employed because of the fragmentation in government.

What can be termed 'market fundamentalism' led to competition law being viewed as the way to address the market power of upstream producers in basic metals, such as Iscor. The idea was that 'imperfect' competition can somehow be 'corrected' by discrete decisions to punish contraventions of the law. Put another way, in the absence of such aberrant contraventions it was assumed that markets would be efficient instead of recognising that so-called 'market failures' are intrinsic features. Market power is likewise an ever-present reality, the question is to what degree, how it is exercised, and what are the rules which constrain its abuse.

The failure of the excessive pricing cases in steel and basic chemicals (brought against Sasol) illustrate the challenges of using competition law instruments to regulate what are quasi monopolies whose position derives from prior state ownership and support (Mondliwa and das Nair, 2017).⁶⁷ Imagining a 'long run competitive equilibrium', as the Competition Appeal Court has indicated, abstracts from real world value judgements that need to be made if the power of these companies is to be effectively regulated. The competition cases have also risked distracting attention from other more direct regulatory measures which could have been taken.

Competition law enforcement does not create competition in the face of barriers to the entry and expansion of smaller rivals. The industry studies further point to the importance of understanding

⁶⁷ Two of the authors, Simon Roberts and Pamela Mondliwa, were involved in the excessive pricing cases in steel and polymer chemicals as expert economists for the parties bringing the cases.

vertical co-ordination to govern different levels of value chains, as well as concentration at a given level.

The study of agro-processing demonstrates the important role of supermarkets in the routes to market for food producers. In international exports of high value fruits, logistics is crucial, along with ensuring international standards are met.⁶⁸

In the auto sector, the OEMs play the key role in governing international value chains. Industrial policies influence the ways in which they do this and the impact on components producers and local value added in different countries. The comparison in the study between South Africa and countries such as Thailand indicate that, while South Africa has maintained the presence of OEMs, it has failed to leverage this into stronger backward linkages to local components. Instead, the incentives have been overly generous to the OEMs and weak in terms of the conditionalities imposed on them. While this reflects the bargaining power of the OEMs it also brings into question the ability of the government to assess the interests and incentives of the firms subject to the policies.

Economic power and political economy

The studies all point to the need to understand different dimensions of economic power and the interests at play if we are to have a better understanding of why different policy choices have been made. The market power of companies allows them to extract profits which are not related to the investments, effort and innovation being made. The deeper question is why the companies are able to continue to do this if it is harming the long-term economic development of the country. The answer lies in the power of coalitions of interests.

In the case of the upstream basic steel producers, the change of ownership of the main companies, such that the South African operations became small parts of transnational corporations, reduced the transparency of the businesses and weakened the power of the national government. The change was meant to bring transfer of technology and know-how but in practice it appears as if a short-term view was adopted with extraction of profits in the good years but relatively little investment. The TNC ownership also potentially makes transfer pricing easier, portraying a misleading picture of the profitability of the local operations. At the same time, the downstream businesses using steel as an input are diverse and less able to represent their interests to government.

The levers which could have been used by the South African government, including energy and minerals policies, were undermined by the fragmentation of the state. The division of responsibilities into many different departments under different ministers meant that corporate interests could lobby them separately and make a coordinated approach unlikely. It is difficult otherwise to understand why the provisions in the standard mining rights which stipulate that there should not be discrimination against local buyers compared to export customers, for the minerals and products manufactured from them, have not been enforced. Similarly, the very advantageous energy pricing arrangements were not used as a basis for conditions to prevent harm to local businesses through exploitation of market power. The separation of development finance, competition and trade from industrial policy further increased the co-ordination requirements across government. Procurement

⁶⁸ The market inquiry being undertaken by the Competition Commission into supermarkets is tackling key issues, however, the appropriate policy responses potentially go far beyond competition enforcement.

as an industrial policy lever has also foundered on lack of commitment to implementation. Instead, as widely documented, there has been rent capture.

An important question is why so little attention has been paid to the more sophisticated and diversified machinery and equipment sector in comparison with basic iron and steel, and indeed also by comparison with the auto sector. Economic power relates not only to the relative influence of different interests in decisions on a specific issue but also to which issues are prioritised and get onto the policy agenda in the first place. The influence of the automotive OEMs have ensured their interests have been high on the agenda. As noted above, machinery and equipment requires local as well as national interventions to change the development path and build diversified capabilities.

In the agro-processing sector there was a turn away from the historically-favoured constituency of white grain farmers. Reform in agriculture (outside sugar) brought a harsh restructuring, as marginal maize farmers went under, with consequent employment loss. The main failure has been to craft a constructive framework for growing alternative agricultural value chains, for high value crops and for greater processing. The successes which have been realised in citrus and nuts have not been as a result of concerted policy support and demonstrate what could have been attained, earlier and on larger scale.

In the agenda and actions of the state, the interests of workers and businesses in diversified industry have not been given importance while the lobbying of the industries which prospered under apartheid have meant they have been able to continue to hold sway. Contests have largely been over the existing rents rather than how to create new rents. This has been true of the framing of BEE in terms of ownership in existing businesses. The issues of 'state capture' have also focused on existing rents. Without crafting a new political settlement, in which the interests of longer-term investment in capabilities have a prime position, it is difficult to see a different path being taken. Breaking-down barriers to entry and growth is one side of such a settlement, forums for new investment is the other side of this new coin.

4.2. Macroeconomic policies and structural transformation

The scope of this paper means that the broader relationships between macroeconomic policies and structural transformation cannot be addressed in detail here. We focus on the issues of managing natural resource earnings, the related question of exchange rate policy as part of monetary policy, and the record of fiscal policy.

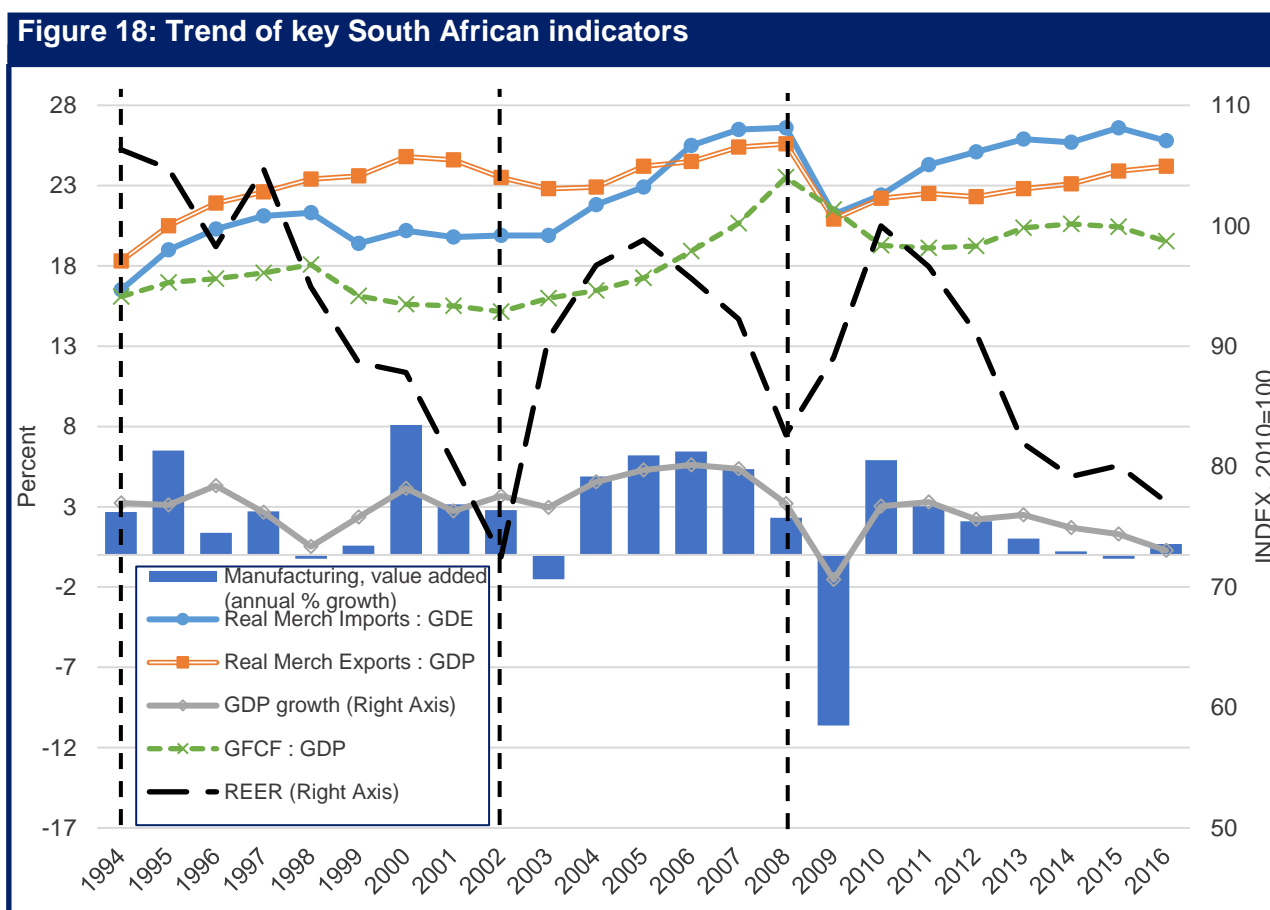
Managing natural resource earnings

The continued reliance of South Africa on natural resource earnings (including resource-intensive industrial products), especially for foreign exchange, is one of the key features of the past two and half decades. It implies that the exchange rate is influenced by the country's resource endowment rather than by the skills, capabilities and accumulation of productive capital of the country. This is in an environment in which resource earnings have fluctuated massively due to international commodity prices, driven to a large extent by industrialisation and demand from China. From 2002 to 2008 the prices of commodities increased dramatically in real terms, with base metals prices more than doubling and iron ore almost quadrupling. Despite a reduction in 2009 the prices rebounded to remain very strong through to 2011. Export earnings from these goods therefore increased through no underlying improvement in the economy's competitiveness.

How macroeconomic policy responds to such a big shock has a major impact on the economy. If the natural resource earnings are treated as a short-term windfall then the most appropriate

response is to save the earnings to invest over time, smoothing the impact. Saving the earnings implies building up foreign exchange reserves.⁶⁹ Capturing a share of the rents implies an appropriate tax regime, saving such as in a sovereign wealth fund, and channelling the earnings into long-term investments to improve the future productive capacity of the economy.

Unfortunately, in South Africa the resource-earnings were treated as if they reflected a sustained improvement in competitive capabilities. Basic metals exports were further underpinned by unsustainably low electricity prices which effectively acted as an export subsidy. The real exchange rate was allowed to strengthen to 2005 and again to 2010 (as the 2009 decline in commodity prices was treated as a blip) (Figure 18). And, instead of building up foreign exchange reserves through running a surplus on the balance of trade, the economy moved into deficit in the middle of the resource boom.



Source: SARB, Quantec and World Bank Indicators

By comparison, over the earlier period of trade liberalisation the exchange rate had weakened, as was appropriate. While import penetration increased so did the ratio of merchandise exports to GDP, from 18% in 1994 to 25% in 2000, opening-up a trade surplus. However, from 2002 the strengthening exchange rate underpinned by the focus on inflation targeting meant imports increased strongly, to reach 27% of GDE in 2008. As reflected in the industry studies, these increased imports were of diversified manufactured products and undermined local producers who

⁶⁹ In the words of the Commission on Growth and Development, resource rich states 'will improve on this sorry historical record only if they capture an appropriate share of the resource rents; save a judicious amount overseas; and set clear, growth-oriented priorities for absorbing the remainder at home) (Commission on Growth and Development, 2008: 9)

could not compete with cheap imports. The increase in imports in fact exceeded the higher earnings from the boom in commodities earnings. Not only did South Africa spend all of the windfall but attracted portfolio capital inflows on top of this to finance imports. While the imports included capital goods for investment spending, much of the imports were for consumption on the back of credit extension and growing household indebtedness.

As a result, the structural transformation of the economy regressed to a state of greater dependence on resource and energy intensive activities. Put in another way, the relatively strong GDP growth from 2002 to 2008 was not shared and was also fragile, as revealed by the end of the commodity boom. The failure of a shared growth vision to deliver to the majority was the under-pinning for state capture for elite wealth accumulation through the state by other means.

We now consider the role that monetary and fiscal policy played in these challenging times.

Monetary and exchange rate policies

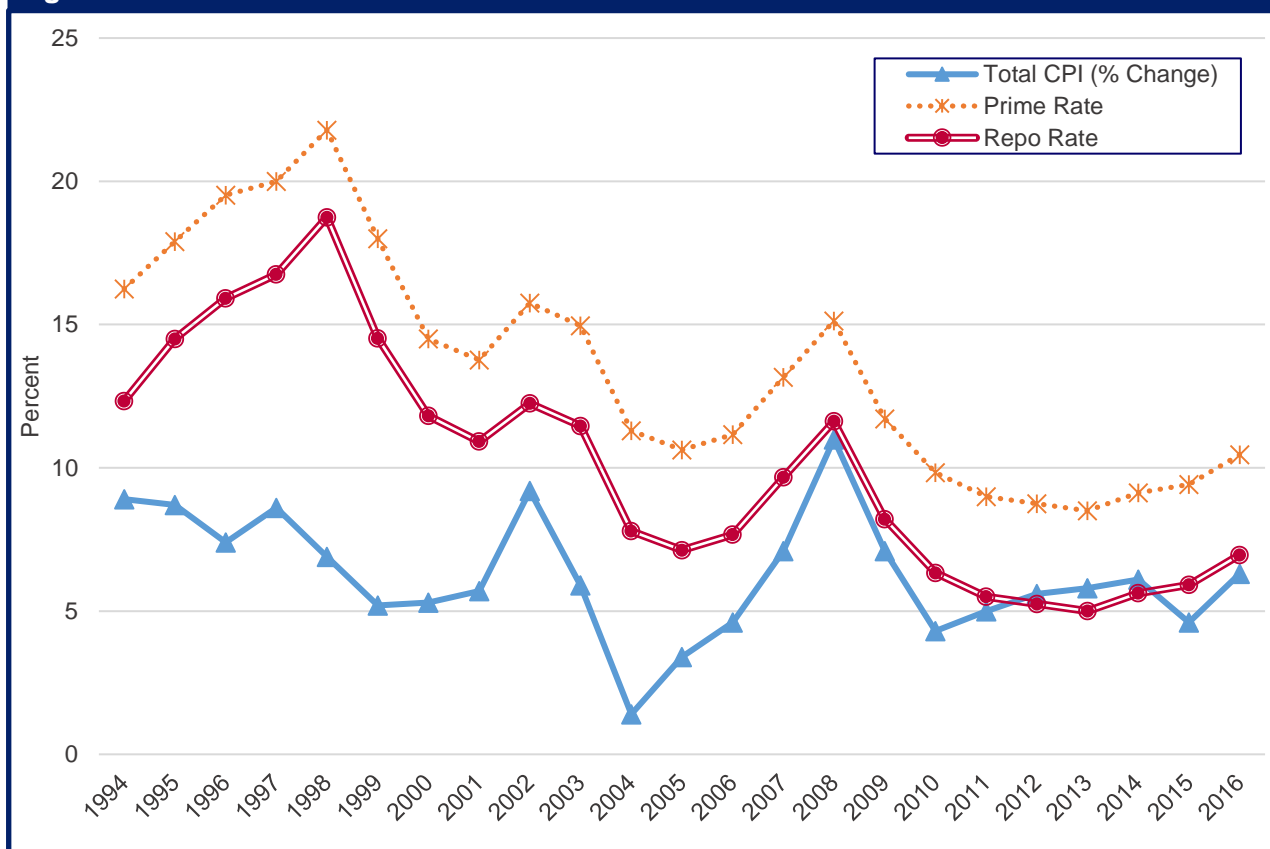
Monetary policy has been characterised by an over-riding focus on inflation. This has had fundamental implications for the structure of the economy through the impact on the exchange rate. To understand this, it is necessary to remember that the exchange rate is the price of tradable to non-tradable goods and services. A strong exchange rate, as we saw when the Rand was around R6-7 to US\$1 in 2004 to 2007 and again in 2010, meant that tradable goods and services were cheap to South African consumers and unattractive to investors in local production. The prices of imported motor vehicles, consumer goods and overseas holidays were relatively low in Rand terms. By comparison, non-traded services such as private healthcare and education were more expensive and attractive to investors.

Was R6 to US\$1 a fair reflection of the strength of the South African economy? In hindsight, the answer is obvious. This exchange rate reflected the luck of the country's natural resource endowment and the cheap electricity subsidy to basic metals exporters. Without the benefit of high resource prices, it became evident that the education system, infrastructure and capital base warranted an exchange rate in the order of R12 to US\$1.

Monetary policy exacerbated the over-valuation of the currency through the narrow focus on inflation, including the adoption of inflation targeting in 2000 (Aron & Muellbauer, 2007). In effect, this was premised on lower inflation being the main route to improved international competitiveness. By depressing aggregate demand through higher interest rates, and putting the local manufacturers under pressure through lowering the price of imports under a strong currency, businesses are meant to become more efficient and labour pressured to accept lower real wages. The problem is that firms do not invest and, without investment, productive capabilities do not improve, in a vicious cycle.

Targeting inflation using monetary policy means using only one instrument, the interest rate, and assumes that inflation is due to excess demand rather than recognising it is an average of price changes affected by many different factors on the supply and demand side. The interest rate was used to dampen inflation in the late 1990s and into the 2000s (Figure 19). In the early 2000s it is evident that, while administered prices and food were increasing at close to 15% in 2002, consumer prices excluding these items were increasing at much lower rates. Indeed, by 2004 these consumer prices recorded negative rates of increase as the impact of the strong Rand took its toll.

Figure 19: Inflation and interest rates



Source: Quantec

Lower inflation from 2003 to 2006 was seen as a success of the inflation targeting approach but it was based on an unsustainable exchange rate appreciation (to below R6 to the US\$1). As the trade deficit increased, when commodity prices fell in 2008 and the currency depreciated, inflation rose once again. Despite weak economic conditions, interest rates were increased once more further depressing the economy. Higher interest rates also attract short term portfolio inflows, raising the value of the currency and exerting downward pressure on the price of tradables but at the same time undermining the competitiveness of local producers and South Africa's recovery from the global financial crisis.

In considering the exchange rate it is furthermore misleading to think that the real effective exchange rate should tend back towards the same level over time. The real effective exchange rate represented in Figure 18 above is an index calculated from the weighted average exchange rates with South Africa's main trading partners and taking inflation into account.⁷⁰ In considering the trends over time it is important to take into account a number of things. First, the initial level of the exchange rate may have been inappropriate if it was supported by high levels of protection and by resource earnings – both of which was the case at the end of apartheid. Second, over time, if the development of productive capabilities in South Africa is weaker than in other countries then the real effective exchange rate should be depreciating. This is an important missing part of the picture. The legacy of apartheid on the education system as well as in other ways such as the inefficiency

⁷⁰ It can be illustrated with a brief thought experiment. A wage of R100 per day in 2005 was equivalent to US\$17 (at an exchange rate around R6:US\$1). Ten years later in 2015 a wage of R100 per day was equivalent to US\$8 (at an exchange rate of around R13:US\$1) and South Africa appeared a much lower cost place to hire labour than it had been ten years earlier. However, in the interim what had happened to the nominal wages in Rand terms? If we assume annual increases of 6% per annum then the wage would have increased to almost R180 per day, which would be equivalent to US\$14 in 2015, still less than the US\$17 in 2005 but not by nearly as big a margin.

of cities for the organisation of production mean large sections of the economy have extremely low levels of productive capabilities and these capabilities have been improving only slowly, with implications for the appropriate exchange rate.

Managing the exchange rate and undervaluing it to reflect the economic challenges of building diversified productive capabilities in tradable goods and services has been a key pillar of the economic strategies of all industrialising countries. Moreover, liberalising trade protection, as South Africa did in the 1990s, implies the real exchange rate should depreciate, as occurred to 2002. It is notable that imports as a percentage of gross domestic expenditure (GDE) increased relatively little over 1994 to 2002 despite the reduction in protection, as local producers could compete with imports given the weaker exchange rate. However, after 2002 the change was reversed as the Rand appreciated with the commodity boom and imports increased.

To manage the exchange rate implies building up foreign exchange reserves if the currency is to be undervalued. In the context of resource earnings, these reserves are the same as the country saving a proportion of the earnings. The objection to such a strategy is that there is a cost in doing so. Interest must be paid by the Reserve Bank on bonds offered to soak up the foreign exchange earnings from exports. Many resource endowed countries have decided the cost is worthwhile in order to promote structural change, but South Africa has not done so. Accumulation of reserves can also dampen exchange rate volatility, which impacts directly on the decision-making of exporters.

In addition, if monetary policy is tailored more closely to the causes of inflation then it will adapt to shocks such as the increase in electricity prices by around 150% in a matter of a few years from 2008. This shock had a big impact on the overall average price increases, however, it was a necessary adjustment to the unsustainably low prices which had skewed the industrial structure to energy-intensive activities. As the effect of electricity price increases worked through the economy it required a range of adjustments including new investments in less energy-intensive businesses. Accommodative monetary policy would have assisted the adjustment, while tight monetary policy made borrowing for this investment more expensive. Similarly, with regard to credit extension, if direct levers had been employed to address excessive consumer credit (such as higher and differential reserve requirements) then this could have meant lower interest rates.

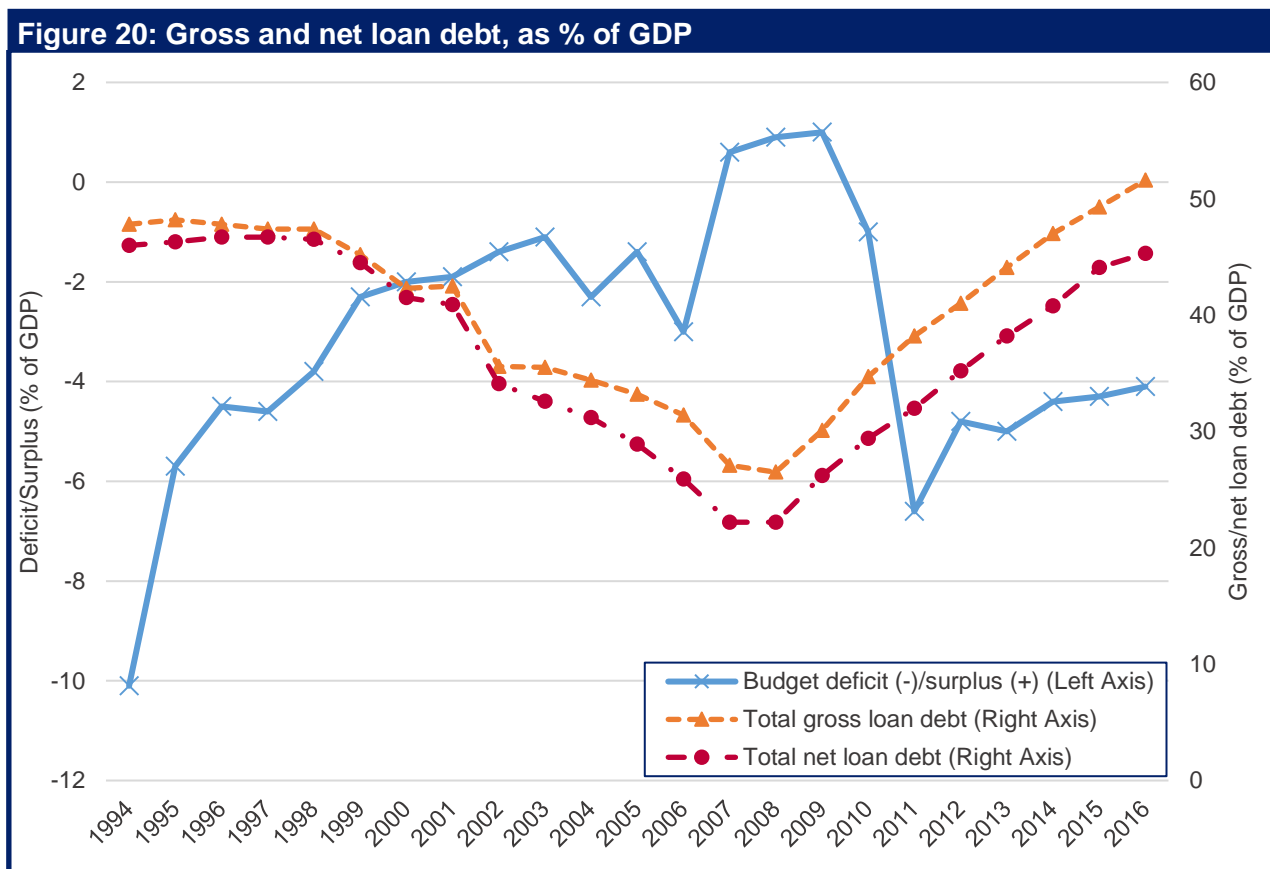
These are not options which have been taken in South Africa. The result has been a monetary and exchange rate policy which undermined the adjustments required for a more diversified economy, especially since the beginning of the resources boom in 2002 and in accommodating the need to stimulate the economy after the financial crisis of 2008.

Fiscal policy, infrastructure investment and the role of SOCs

Extensive international literature highlights the importance of infrastructure investment for shaping private investment. There are important positive externalities (spill-overs) from publicly funded infrastructure. Moreover, these effects are even more important for South Africa in the context of the infrastructure backlog after apartheid, especially for geographic regions and groups of businesses which were not prioritised. For example, in agriculture, while grain farmers had silos and railway sidings, citrus farmers have had little support for the infrastructure which they required and, as a result, incur high transport costs (Baloyi, 2017).

The focus of fiscal policy has largely been on reducing the government deficit and the stock of government debt (Figure 20) even although South Africa's debt levels have been low by

international comparison.⁷¹ The rationale for reducing the deficit was that it would increase business confidence and spur private sector investment. The underlying assumptions that the private sector will lead if the role for government is reduced over time have, however, not been born out and effectively ignored the importance of the state in altering the profile of the economy.



Source: National Budget Review Statistical Tables and SARB

Efforts to reduce the budget deficit and corporatisation of State Owned Companies (SOCs) in the 1990s did lead to reductions in capital expenditure by government and SOCs to 2001 (Figure 21). While investment by government and SOCs picked up somewhat thereafter, it was in the context of massive infrastructure backlogs, and power outages due to under-investment in generation and transmission, and the required investment in the run up to the 2010 World Cup. Most of the funds have gone toward expanding the power-generating capacity, upgrading and expanding the transportation network, and improving sanitation and water services. However, these quasi-monopolies have constrained wider economic participation,⁷² enabled rent-seeking through the major procurement power these organisations have,⁷³ and undermined the use of procurement for industrial policy goals in sectors such as machinery.⁷⁴

While the investment which was made in infrastructure by SOCs in the 2000s represented a substantial increase, this was not leading economic development but reactive, reflecting the *failure* to anticipate the growth trajectory and plan accordingly, such that in electricity there were widespread power cuts and rationing and in transport there is still a failure to address the spatial

⁷¹ See, for example, the regular comparisons made by The Economist.

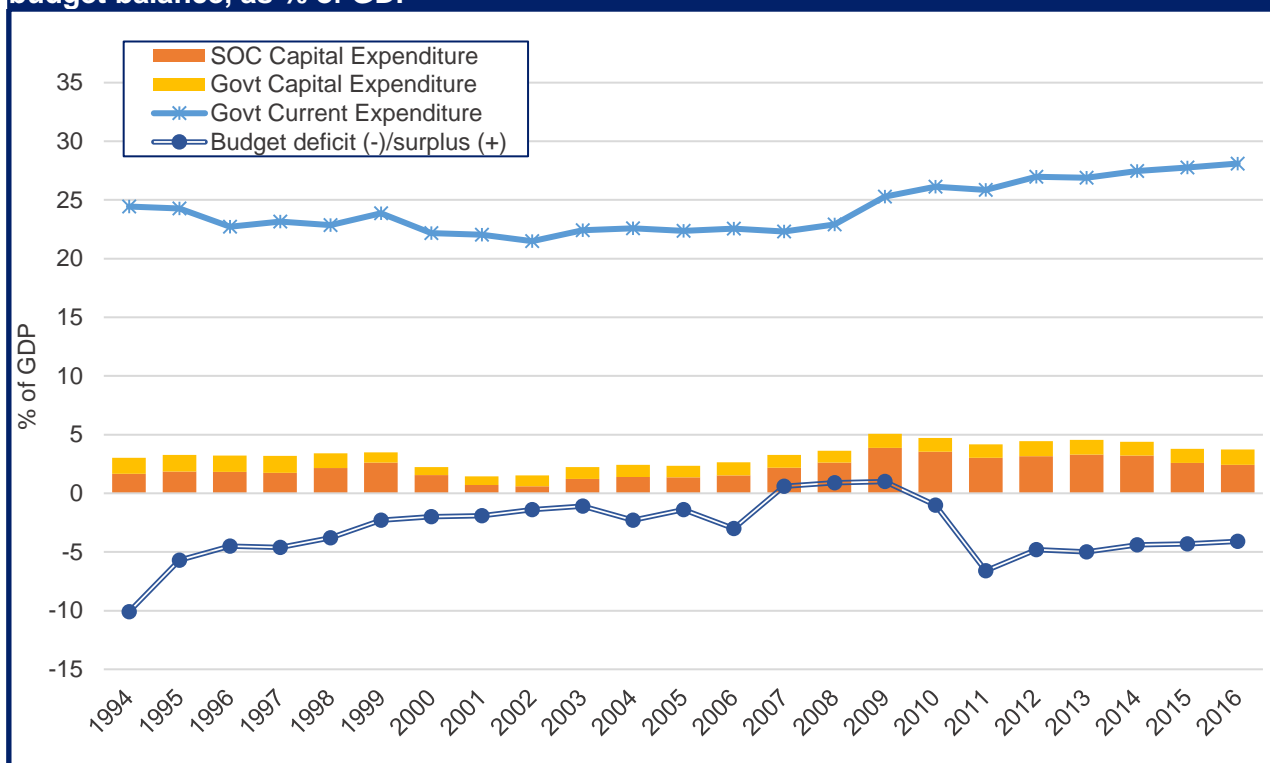
⁷² The potential for a regulatory state to open-up opportunities to wider participation is exemplified by the renewable energy independent power producers programme (REIPPP), although this has been undermined by Eskom (Montmasson-Clair, 2017).

⁷³ As reflected in the metals industry study as well as Borat, et al. (2017).

⁷⁴ See Crompton, et al. (2017).

legacy of apartheid through improved public transport. The industry studies and studies of local economic development (Kaziboni, 2017) have continued to highlight the costs that poor public transport place on firms, with firms internalising the cost in order to operate for longer hours.

Figure 21: Government current expenditure, capital expenditure, SOC investment, and budget balance, as % of GDP



Source: National Budget Review Statistical Tables and SARB, authors' calculations

On the other hand, while current government expenditure was constrained until 2008, it then increased strongly with the lack of shared growth building pressure for higher wages for public servants, and growing transfers including social grants. The growth in government spending has been driven by substantial increases in compensation to employees, which grew at a compounded rate of 5.7 percent in real terms from 2008-2016, and is referred to as a public-sector premium (see Kerr and Wittenberg, 2017). The public sector's level of employment as a share of total jobs has also increased from 14.5% in 2008 to around 17.5% in 2014, partly due to the poor private sector employment record following the financial crisis. While social grants have undoubtedly played a critical role in countering poverty and have improved the enrolment of children in school among poorer households (Scott, 2009), their importance ultimately reflects a failure, rather than a success of government's economic policies.

5. Towards a smart, open economy for all

It is evident that South Africa's economic development trajectory has not delivered a 'better life for all' over the past 24 years. It is not generating prosperity and economic justice for the majority of the population, with unemployment remaining stubbornly high alongside persisting poverty and extreme inequality. Our analysis demonstrates that this is due to the failure to transform the structure of the economy. Moreover, the structural weaknesses make the economy unfit to tackle the challenges of the fourth industrial revolution.

South Africa is at a critical inflection point. The sustainability of a market economy is at risk from its failure to deliver better outcomes under widespread liberalisation. It is incumbency rather than effort and creativity which is being rewarded. Those with resources can bring innovations to market while the majority are excluded. The economy is not open and is deeply unfair. These realities have to be faced, with hard choices to be made. It requires a broad rethink rather than piecemeal initiatives, in order to place re-industrialisation and industrial policies at the centre of the country's development strategy.

Charting a new path means rethinking the political compromise reached in 1994. This evolved, with BEE and substantial extensions of services and social grants, but has left the economic structure unchanged to a very significant extent. However, far-reaching frustration with the failure to deliver inclusive development means the state has instead been viewed as a means to directly capture rents. There has also been growth in the number and real wages of public sector employees, as part of a small middle class, even while state performance has worsened in many areas. A by-product has been the fragmentation of the state, and this has emerged as an over-arching theme from the study. This is especially concerning given the coordination and leadership challenges posed by rapid technological change and the digital economy.

While there have been changes, the most striking feature of the last 24 years has been the strong continuity in the structure of the economy. Almost a quarter of a century since the end of apartheid and the legacy of support for capital-intensive and resource-based industry lives on. Indeed, the economy has regressed in many ways rather than structurally transformed through moving into more diversified, complex and higher productivity areas. The failure to diversify is evident in the trade data, with a lack of substantial change in the export profile over more than two decades. This is in stark comparison with many other upper-middle income countries which have upgraded within sectors and moved productive resources to more dynamic and sophisticated industries and related services. In South Africa the industrial investment which has occurred has been oriented largely towards resource-based industries rather than diversifying away from these areas.

As South Africa has prematurely deindustrialised, services have grown rapidly in importance. But, here also the trajectory is fragile. Much of the growth has been in low-value traditional services. Financial services and information communication technologies (ICT) have grown in value-added terms but not in employment. Nor has growth of financial services and much higher international financial flows been accompanied by higher levels of investment. The processes of industrialisation which are urgently required include services such as in engineering and design.

Manufacturing is critical to driving growth through forward and backward linkages to other sectors in the economy. In the agriculture sector, for instance, productivity improvements in the sector have been on the back of developments in the manufacturing sector, including production of agricultural machinery and chemical fertilisers. Conversely, the loss of manufacturing capabilities has a knock-

on effect on other parts of the economy too, since the manufacturing sector drives technology investments and has a symbiotic relationship with high-value services (Andreoni & Chang, 2016b).

There has also been a strong element of continuity in the persisting high levels of concentration within industries and markets, even while ownership structures have altered. Large and increasingly internationalised firms have maintained high profits although not investing, while substantial barriers to entry mean levels of competition continue to be weak notwithstanding vigorous competition enforcement against cartels. While large firms have a key role to play in realising scale economies and making investments in new technologies, dynamic competitive rivalry is crucial for productivity improvements (Roberts, 2010). In the absence of competitive rivalry, firms can continue to capture rents without investing, while keeping competitors out of the market. The result is a more closed and less dynamic and competitive economy, with knock-on effects on employment and skills.

High levels of concentration have been maintained alongside rapidly growing international portfolio capital and direct investment flows and the increasing importance of institutional investors. In practice, these have worked against long-term investment with a greater emphasis on short-term financial performance. In a vicious circle, weak domestic economic growth has further led to firms directing profits towards expansion through mergers and acquisitions rather than making greenfield and brownfield expansions. This has included acquisitions across and outside Africa (and, making funds available for investment in other countries but also increasing concentration at a regional level.

The three separate studies into structural transformation in large and important industries analysed the patterns in metal and machinery, automotive, and the agriculture and agro-processing industries. The studies assessed the deindustrialisation in more detail along with the role of linkages and key interests. They also indicated the ways in which poor policy choices and implementation have been responsible. In important regards, policies such as favourable energy pricing reinforced the position of traditional minerals and energy-intensive industries for a considerable period. Monetary and exchange rate policies did not properly take into account the effects of the commodities boom, allowing the exchange rate to appreciate substantially undermining non-commodity diversified tradable goods and services.

The Metals and Machinery industries illustrate the hollowing out of capabilities during the 2000s as import penetration increased substantially and a trade deficit grew in diversified downstream activities in fabricated metals and machinery. At the same time, the exposure of upstream basic metals to volatile international prices has not been taken into account in broader policies, with weakening linkages with mineral inputs and calls for protection when international prices turn down. The single most important grouping of machinery and equipment has not seen effective cluster initiatives to build capabilities through addressing inter-related challenges of skills, technology and achieving higher productivity. Procurement policies aiming at building local industrial capabilities have been undermined by non-compliance through capture by narrow interests of state-owned enterprises.

The Automotive industry has had a sustained set of industrial policies and has achieved higher levels of exports of motor vehicles. However, the industry study highlights how the export focus and the lobbying influence of multinational OEMs has meant the support provided has undermined stronger capabilities in local components manufacture. This contrasts with countries such as Thailand where the industrial policies incentivised assembly of fewer models but at much larger scales than in South Africa in order to have a base for local components manufacture.

In the Agriculture and Agro-processing industries there has been widespread liberalization of markets, except for sugar which continued to enjoy effective protection. The growth in high-value fruit exports illustrates the linkages between agricultural production, and advisory and logistics services through to local and international retail. It has occurred in the absence of concerted support and suggests much greater potential for positive structural transformation than has been realised. By comparison, value chains in processed foods highlight the challenges of increased concentration and the role of multinationals with regards to smaller local participants. Until recently, policy has also largely neglected the critical role of retailers.

The industry studies highlight the costs of failing to coordinate policies across departments and raise the question of how policies have been determined, implemented and who they have benefitted. They point to the central challenge of engaging with multinational businesses and the ability of larger players to lobby government to protect their rents. These considerations extend beyond narrow industrial policy boundaries.

Structural transformation requires deliberate industrial policies coordinating investment in interdependent activities to build capabilities. In the words of Alice Amsden (1997, p478), in late industrialising economies “[g]overnments’ role has been one of joining with the private sector to socially construct competitive assets (resources, capabilities and organisations) rather than to create perfect markets”. The coordination needs to work across policies on mining, energy, trade, development finance, competition, technology, sector industrial development and procurement. While government has espoused value chain policies, in practice they have largely failed to address the coordination challenges and discipline more powerful interests, as illustrated in the metals and machinery study. Instead the fragmentation of the state, with its accompanying proliferation of departments, has opened-up more space for successful lobbying by large international businesses and aided rent-seeking. Inconsistent stances have been taken across government. The impact on industrial policy has been profound as it has made effective interventions across departments and the combination of policy instruments near impossible.

In the absence of an effective and coordinated industrial policy, technological change will likely worsen the economic divide rather than bridge it. The isolated examples of what is possible through upgrading, such as in fruits, demonstrate what can be achieved.

The studies highlight the need to understand the dominant coalition of interests. The compromises reached in 1994 meant that the economic structure of the South African economy was left intact, reflecting the lobbying power of big business. The political settlement was premised on growth by established business, attracting international capital investment through fiscal stability, and improved labour rights to accommodate the interests of organised labour. The framework did not set the conditions to ensure high levels of effort in learning and technological upgrading nor did it open-up markets to wider participation and discipline the rents of incumbents. The international commodities boom hid the overall trajectory. While the economy grew, there was a hollowing out of capabilities of downstream diversified manufacturing sectors. At the same time, the divide between South Africa’s ‘two economies’ resulted in an expanded social grant system and expansion of services. BEE was the main tool through which black people could benefit from the existing economic structure, but the BEE deals could only ever benefit a very few and reinforced rather than changed the distribution of economic power and wealth, notwithstanding the incorporation of ‘broad-based’ in BEE.

The effective economic exclusion of large parts of the population led to clamour for a change in approach. However, what emerged under Zuma administrations was an increasing clientilistic

political settlement, with a fragmentation of control within the ANC as rents were competed over from national to local levels of government. Higher wage settlements in the public sector kept public sector workers on-board, but industrial unions fractured. The impact of patronage politics on industrial policy was profound with, for example, energy, mining and procurement policies in conflict, and land reform separated from agricultural development and water affairs.

Way Forward

We need an economy that is more dynamic, competitive and sustainable, where innovation and productivity lead to better jobs with high wages, and where entry is supported. In order to do this, there needs to be a new vision for reindustrialisation under a political settlement which prioritises long-term investment in productive capacity and rewards effort and creativity rather than incumbency. It requires a broad rethink rather than piecemeal initiatives, in order to place re-industrialisation and industrial policies at the centre of the country's development strategy.

It is important to acknowledge that in many areas there have been strategy documents, including the industrial policy framework and action plans, which have set out objectives and policy levers but these have been undermined by the fragmentation of the state and the failure of government departments to follow-through. This has no doubt partly been due to state capture, the full extent of which is becoming uncovered with each passing day. What is required, however, is to face up to the hard choices for the structural transformation required.

The elements of this vision and the main planks in addressing the structural transformation challenges are set out as follows.

a) Building a broad coalition for reindustrialisation

South Africa's course for reindustrialisation and inclusive growth needs to be based on a broad coalition which focuses on productive investment and widening economic participation. The narrow coalition of elites, buttressed by higher government salaries and social grants for important constituents has undermined investment and reinforced rather than changed the existing structure of economic power. Reindustrialisation requires public investment to provide effective public transport and education for economic activity, alongside long-term private investment and entrepreneurship.

The levels of poverty and inequality are unsustainable, and the youth is bearing the brunt of the high unemployment rates. The creation of jobs and livelihoods are a priority for avoiding further unravelling of the social fabric. Newly elected president, Cyril Ramaphosa is in the process of forging a "new social pact" between government, business and labour. The previous pact benefitted the insiders, with emphasis on wealth 'trickling down', but this did not drive industrial development. Though the current political settlement has accommodated the small black middle class to an extent including through public sector jobs, the burden of 'black tax' is a constant reminder that things need to change. Higher earnings for a small minority of the black population is not sustainable.

What is the new political settlement that informs the new 'social pact' or new deal to ensure that it delivers real economic transformation? A new political settlement for industrialisation must speak to and mobilise key black constituencies, including industrial trade unions through effective skills upgrading and investment, and productive black entrepreneurs through opening up economic opportunity. The settlement must speak to their aspirations, especially in urban areas where the majority now live and where industrial agglomerations are built. It must reach and sustain a shared

and binding commitment which, through shared growth and investment, will lead to a reversal of the growing inequality in wealth. The settlement needs agreement around the expectations for large firms, rewarding long-term domestic fixed investment, innovation and dynamic competitive rivalry with effective government policies regarding infrastructure, procurement, skills development, technology and opening regional and international markets. It must be captured in a national agenda, which is designed and delivered locally, where people have a strong sense of identity, and a stake in the outcomes.

b) A commitment to structural transformation and the consolidation of fragmented government structures

The vision for industrialisation must be integrated with overall economic planning and be based on an understanding of sectoral dynamics and opportunities, taking land, water and energy into account. Successful industrial policy requires analysis of the challenges and opportunities, design, intervention and coherence. Experience from other countries highlights that this needs to be led politically from the apex of government and that lessons learnt along the way need to be incorporated in an iterative process of continuous improvement of policy design and implementation.

The vision includes a re-shaping of government departments bringing together those that relate to technology, industry, trade, development finance and regulating markets, and providing for clear leadership and coordination with areas including skills development, energy, minerals and agriculture. This needs to be accompanied by improving the institutional capacity and accountability of public institutions, rather than their number.

c) Understanding and pursuing opportunities

The importance of the region for South Africa's growth needs to be factored into future industrial policies. The most important market for much of South Africa's diversified products and services has become the wider southern African region, although it is losing market share in a number of products. Partly this reflects the lack of commitment to a shared regional vision for industrial development across southern Africa. South Africa's reindustrialisation must therefore be in line with the Southern African Development Community's (SADC) regional industrial development strategy, which seeks to *jointly* uplift the economies in the region. South Africa must import as well as export. Regional value chains are crucial, for instance, in the mining capital equipment sector. In agriculture, as South Africa moves to higher value products it needs to import more staple foodstuffs from the region. In the context of climate change, it is important to recognise that the great majority of water resources in SADC are not being used effectively and, in periods when South Africa is experiencing drought conditions, it could take advantage of the ample rainfall in countries to the north by supporting the expansion of their agriculture, importing staple foods, and ensuring a more competitive regional agro-processing sector.

d) Incentivising and investing in capabilities development

The fourth industrial revolution is bringing the role of technology into sharp focus in moving countries forward. While the apartheid government heavily supported innovation and industrial development in organizations related to its own objectives, post-apartheid governments have had more broad-based innovation strategies. Technology is, however, embodied in investment, and the low level of investment in the economy means poor progress in technological upgrading. A strategy for building capabilities must bring together technology policy, investment and industry incentives to present a coherent path for firms.

Incentives, technological change and development finance therefore all need to work together along with cluster initiatives at the local level. Incentive programmes should include conditionalities to ensure that there are wider benefits to the economy and care needs to be taken to avoid creating or entrenching firm dominance. Cluster initiatives have a key role to play in linking skills development, shared facilities for technological capabilities such as design, testing and prototyping, and in supporting firms to pool resources, creating economies of scale and developing supply markets. Understanding how collective action can be supported for private investment in capabilities by groups of firms is central to building dynamic industrial clusters, along with effective institutions of industrial policy. Local and provincial governments have played a leading role in the few cases where clusters have been successful given the geographical embeddedness of cluster initiatives.

e) Confronting concentration

Changing the profile of ownership and control is critical to public support for any economic agenda and this includes directly addressing the concentrated structure of the South African economy. Competition between firms is at the heart of an economy's dynamism. First, rivalry between firms promotes productivity improvements as firms invest in upgrading and improving production capabilities in order to win market share. Second, the competitive dynamics within a market determine the ability of new participants to bring new products, and in the South African context, this refers to the possibilities for accommodating black entrepreneurs (Roberts, 2017b). Third, the exertion of market power can contribute to inequality by facilitating a transfer from the poor to the wealthy in the form of profits and shareholder dividends emanating from anticompetitive conduct (Baker and Salop, 2015).

Competition law enforcement under the Competition Act addresses the behaviour of firms and evaluates mergers but does not create competition in the face of barriers to entry. The South African economy requires a broader competition policy, as part of industrial policy, which facilitates the entry and expansion of businesses, especially black entrepreneurs, and reduces barriers to entry. In addition to noting concentration, the industry studies point to the importance of understanding vertical integration in some value chains. Co-ordinated interventions are required at the different levels in order to support entry. The interventions need to be coupled with development finance to enable the investment in capabilities and learning necessary to grow efficient businesses. Specifically, there is a need for "patient capital" given the time required to build the scale and reach required to be competitive, and the appetite for risk in financing rivals taking on powerful incumbents. Development finance institutions need to be both aligned to industrial policy and make significant funds available for funding investments and supporting entry of businesses.

Effective regulation for competition and entry is an important aspect, especially in sectors where there are strong network effects such as telecommunications. Local government policies are also crucial for opening-up opportunities for rival businesses, such as the ways in which retail space is configured. The analysis of barriers to entry has further highlighted the importance of access to markets for rivals, for instance, a possible 'supermarkets code' where retailers commit to open-up shelf space to smaller businesses and engage in supplier development initiatives.

f) Reorientation of macroeconomic policy for industrialisation

A reorientation of macroeconomic policy is required to ensure the long-term management of natural resource earnings, consider the appropriate exchange rate, take into account the causes of inflation and dis-incentivise volatile capital flows. Fiscal policies need to prioritise longer-term investment.

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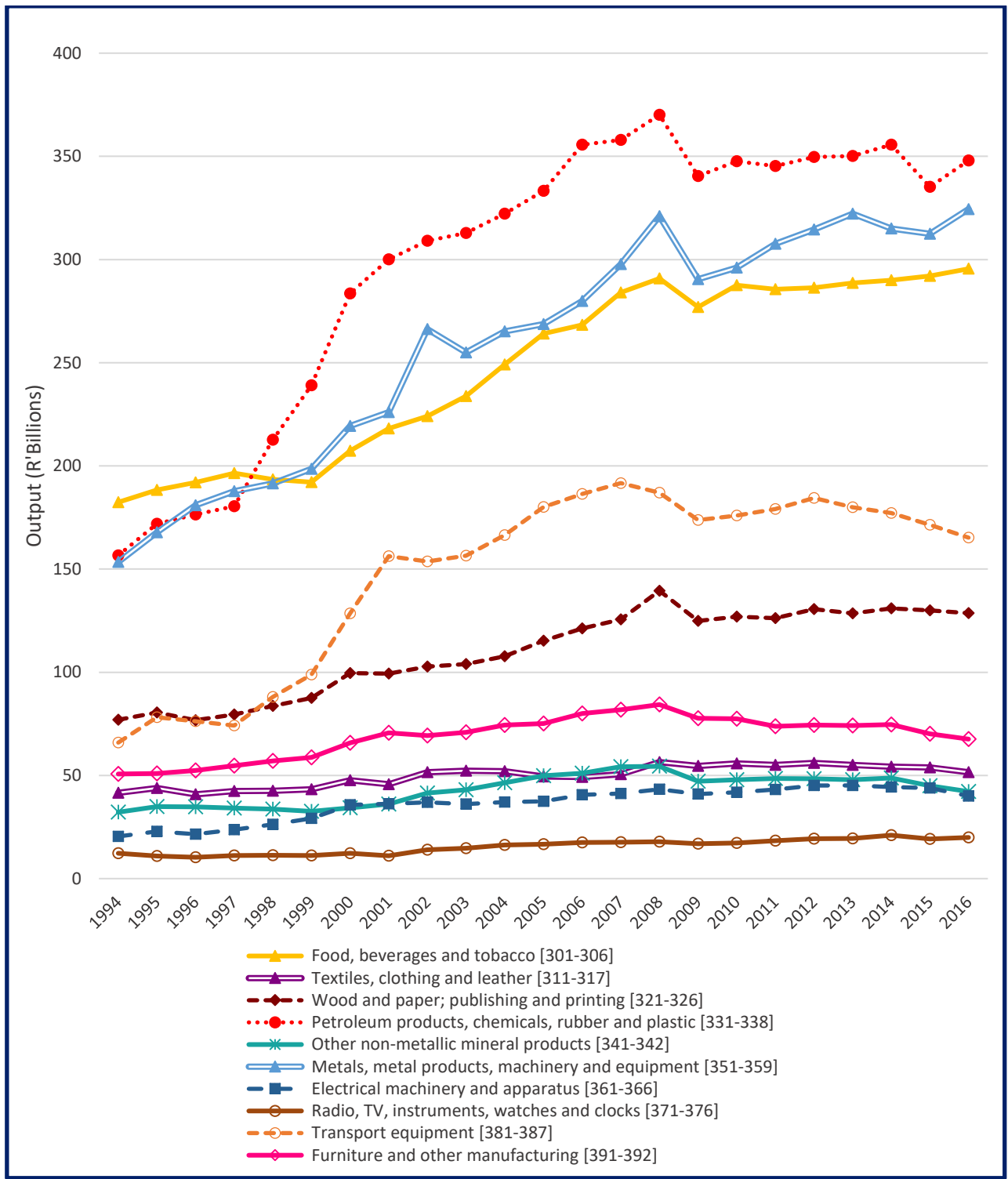
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7. Appendix

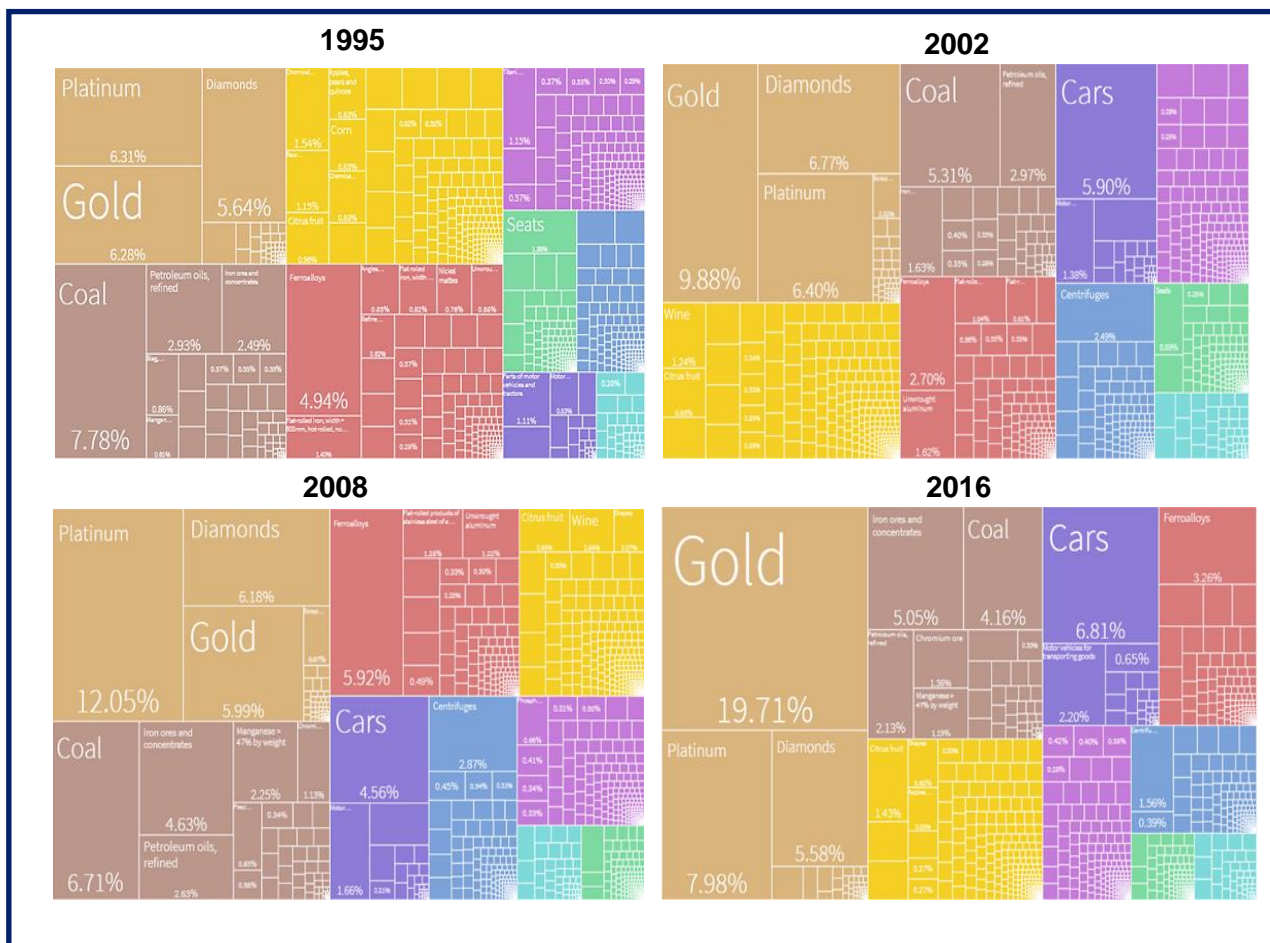
Appendix A1: Real manufacturing output



Source: Quantec

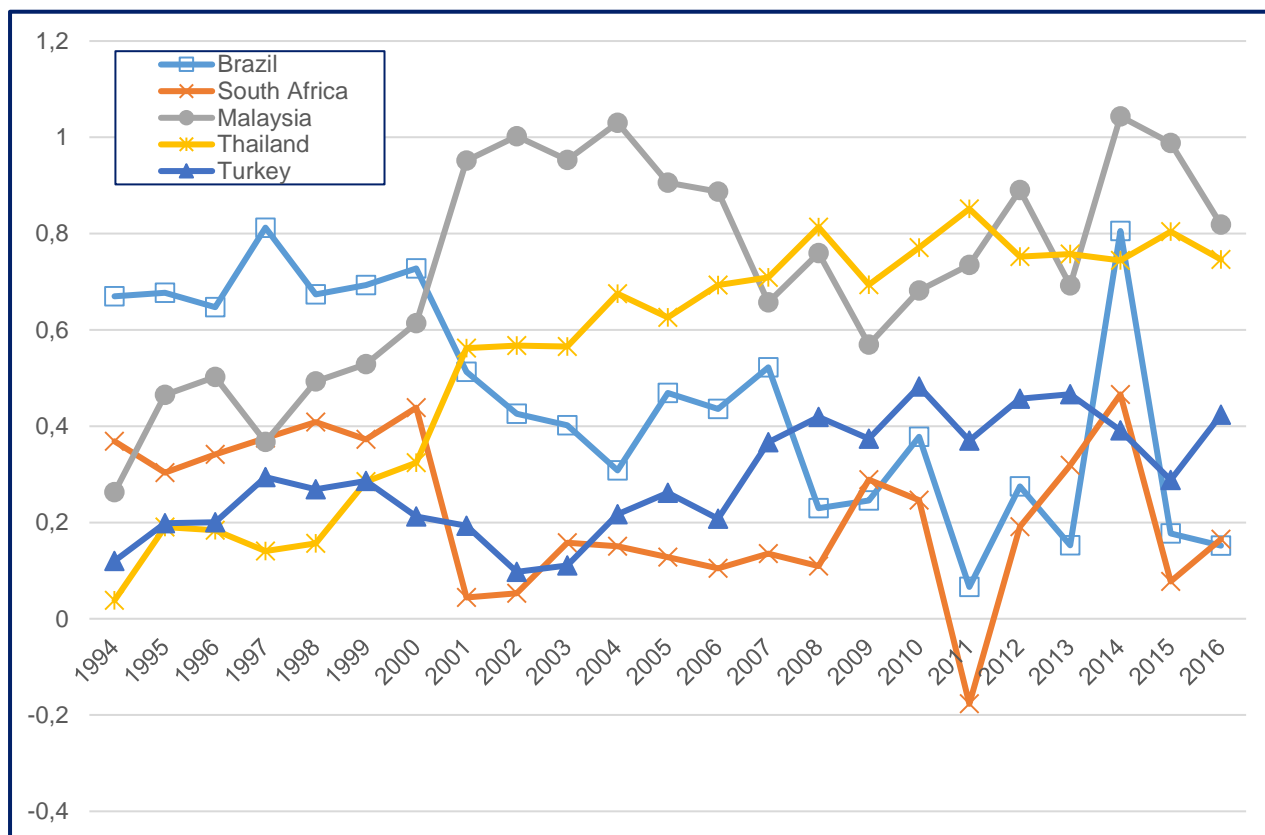
Note: All figures are in constant 2010 Rands

Appendix A2: Composition of South Africa's export basket



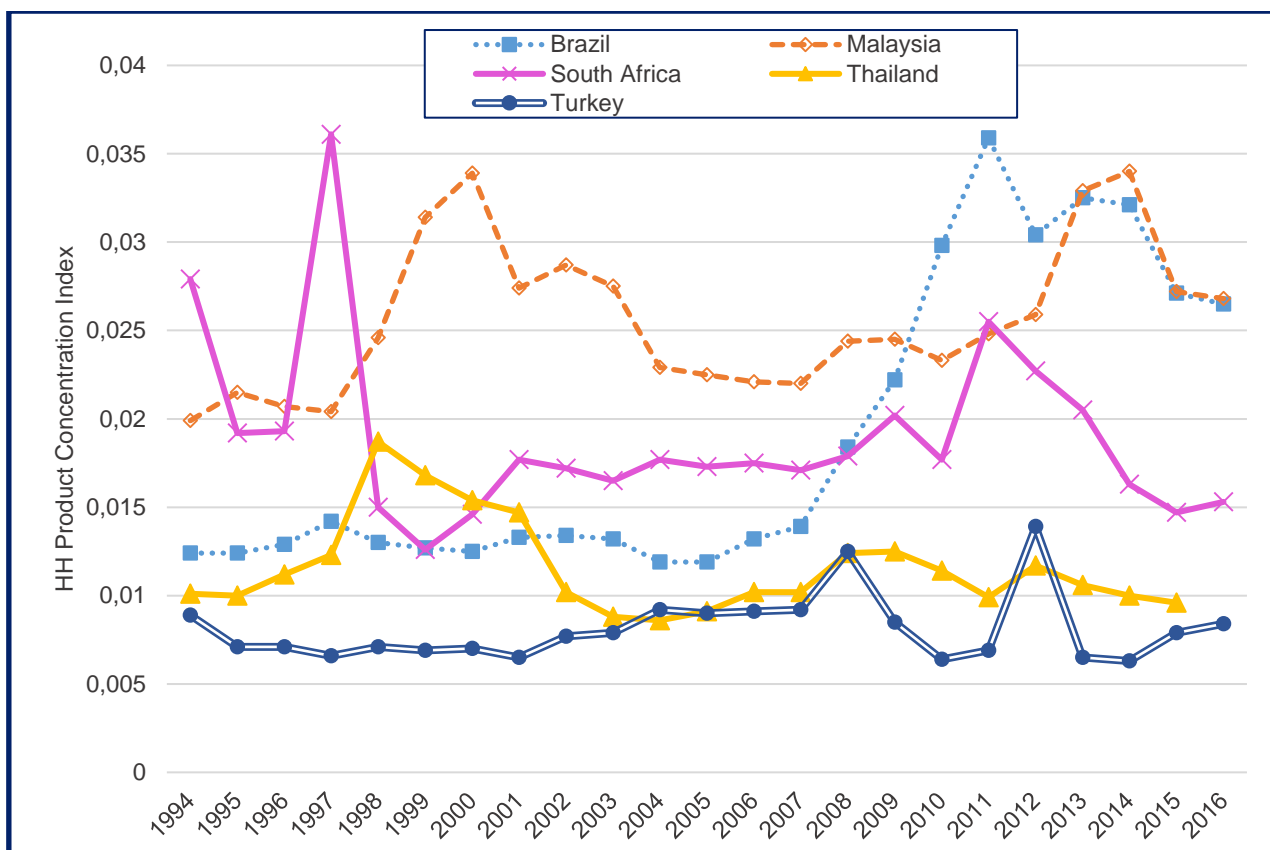
Source: Atlas of Economic Complexity

Appendix A3: Economic complexity of South Africa versus middle-income countries



Source: Atlas of Economic Complexity

Appendix A4: Herfindahl-Hirschman product concentration index of South Africa versus middle-income countries⁷⁵



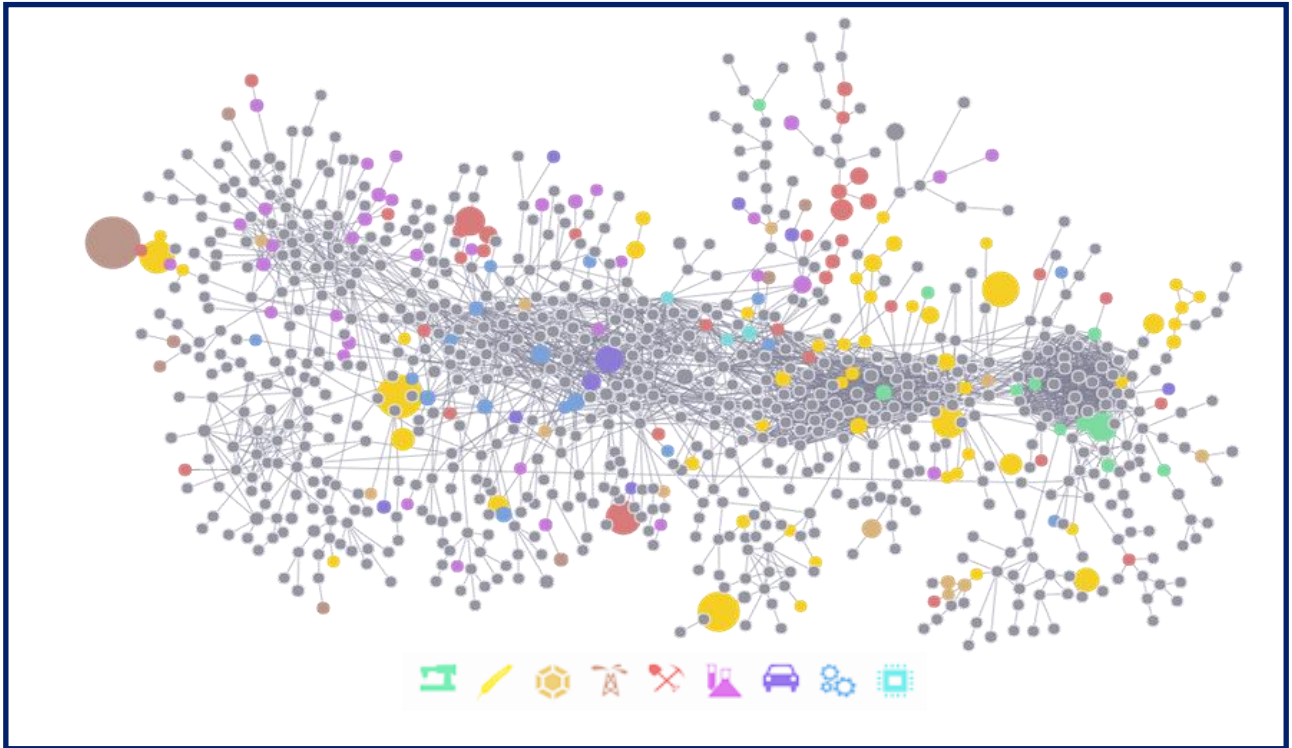
Source: World Integrated Trade Solution

⁷⁵ High concentration of exports means an index value very close to 1, while a country that exports a larger, diversified set of products will have an HHPCI value closer to 0.

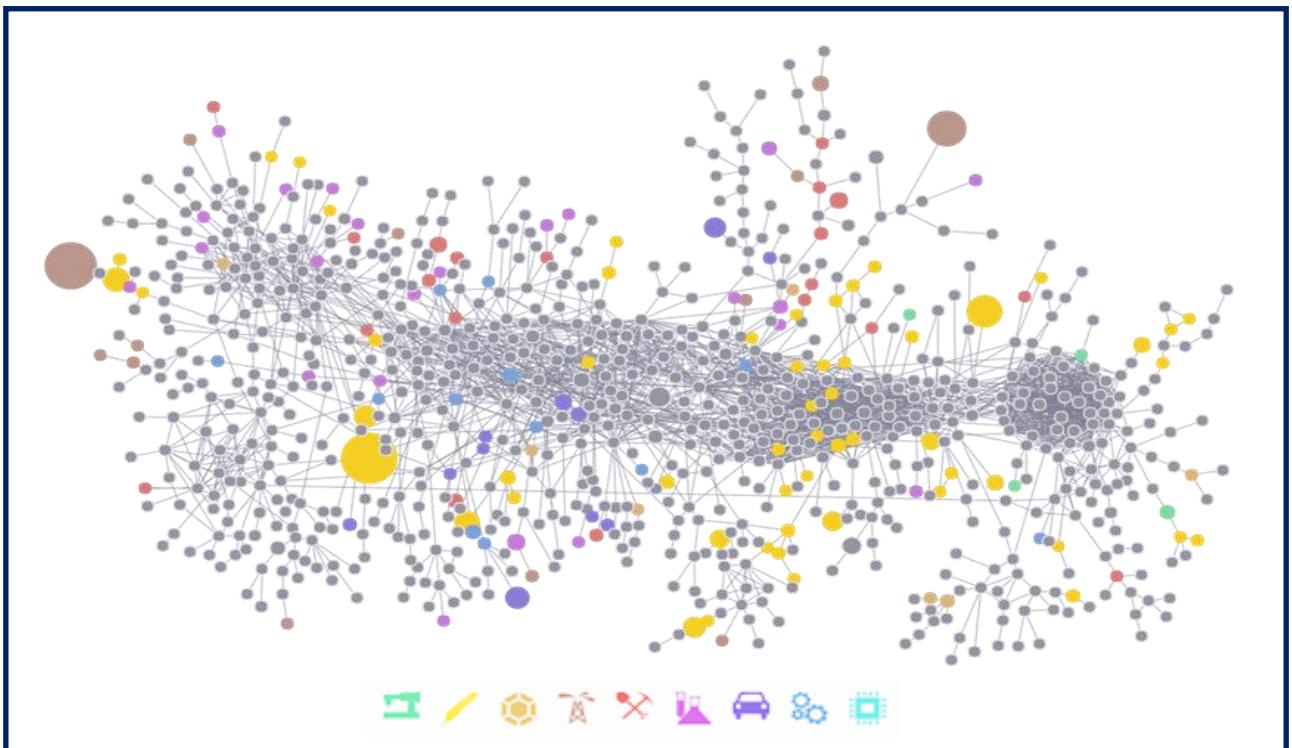
Appendix A5: Product linkages for selected countries (1995 and 2016)

Brazil

1995

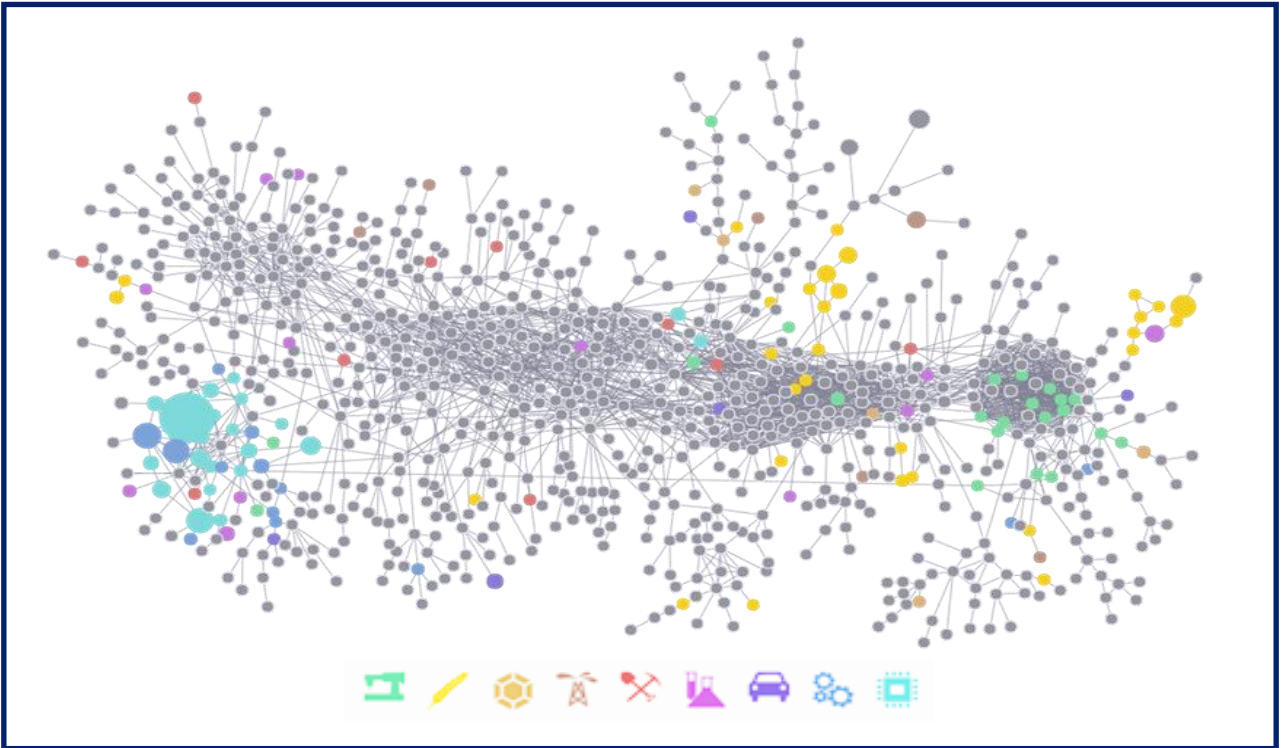


2016

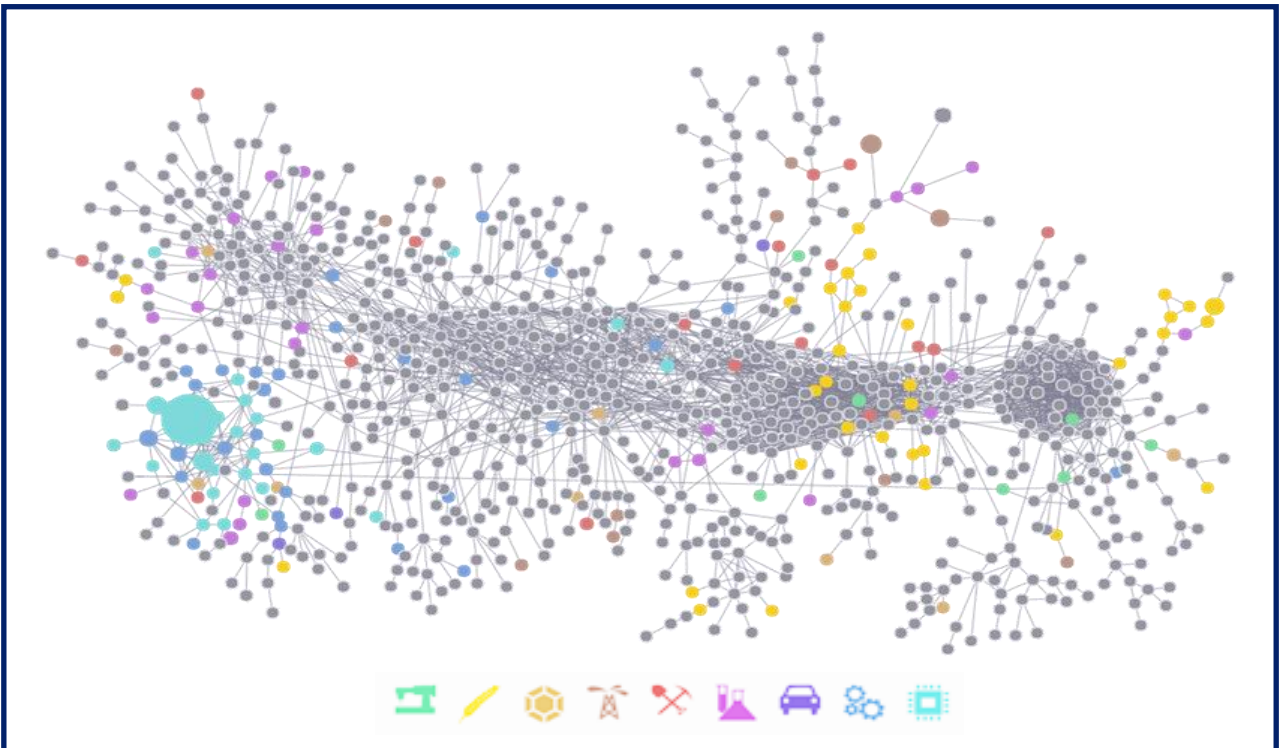


Malaysia

1995

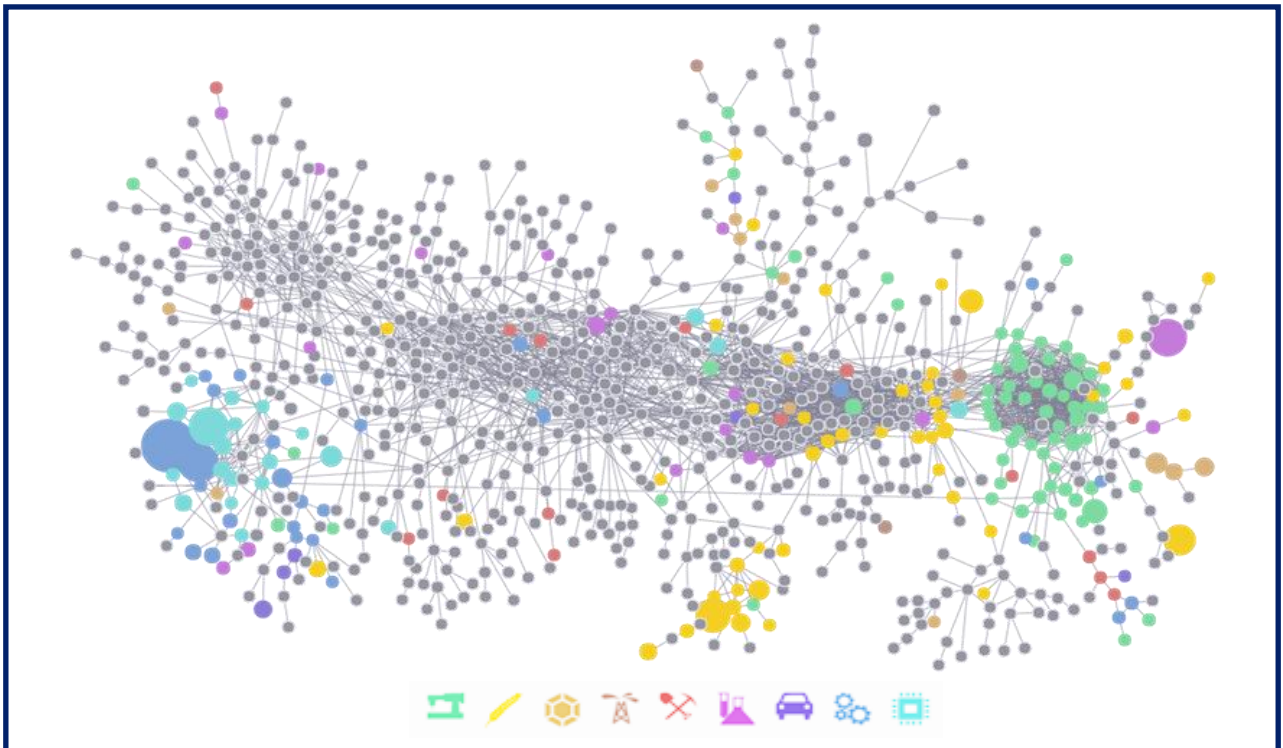


2016

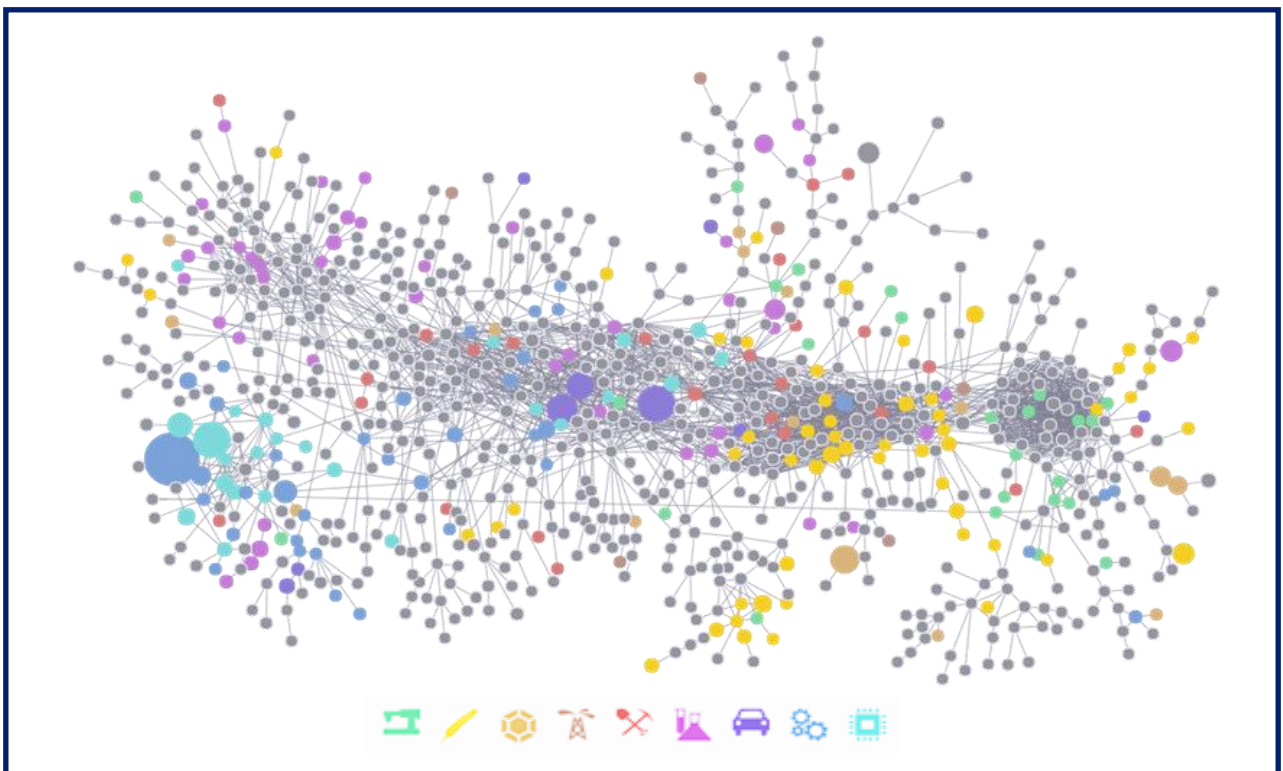


Thailand

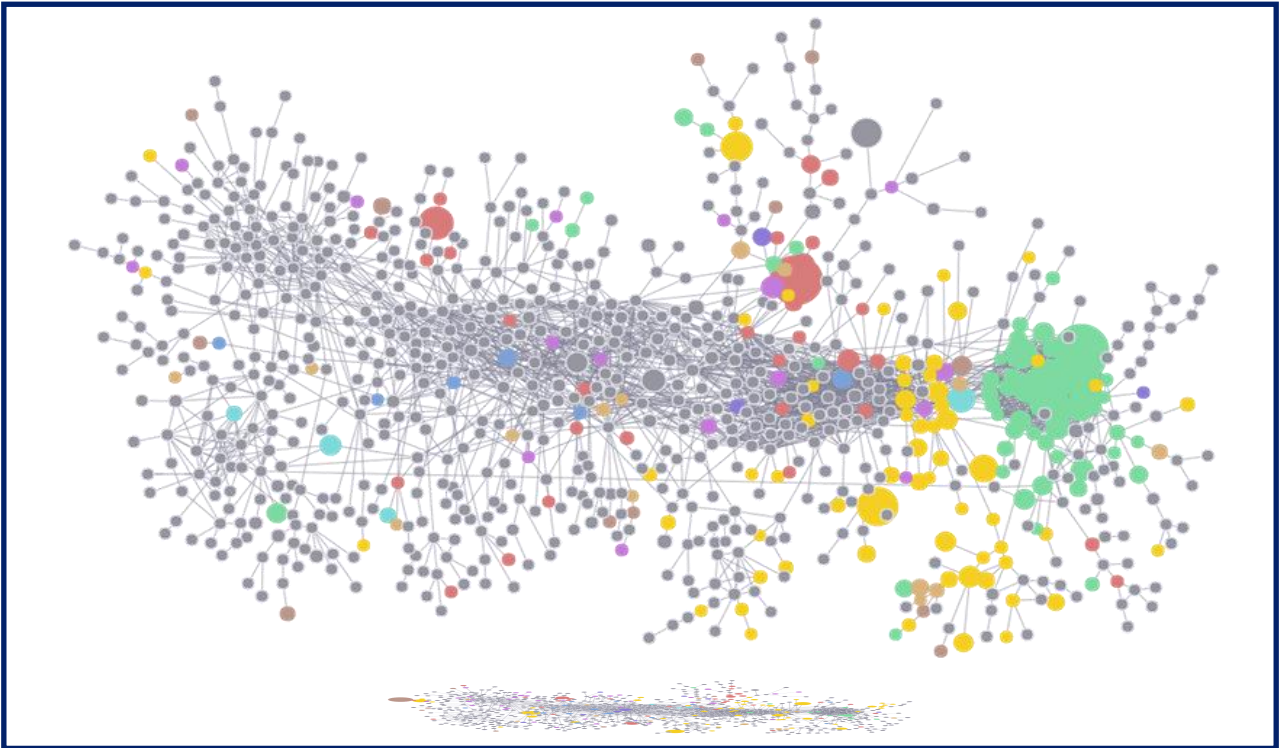
1995



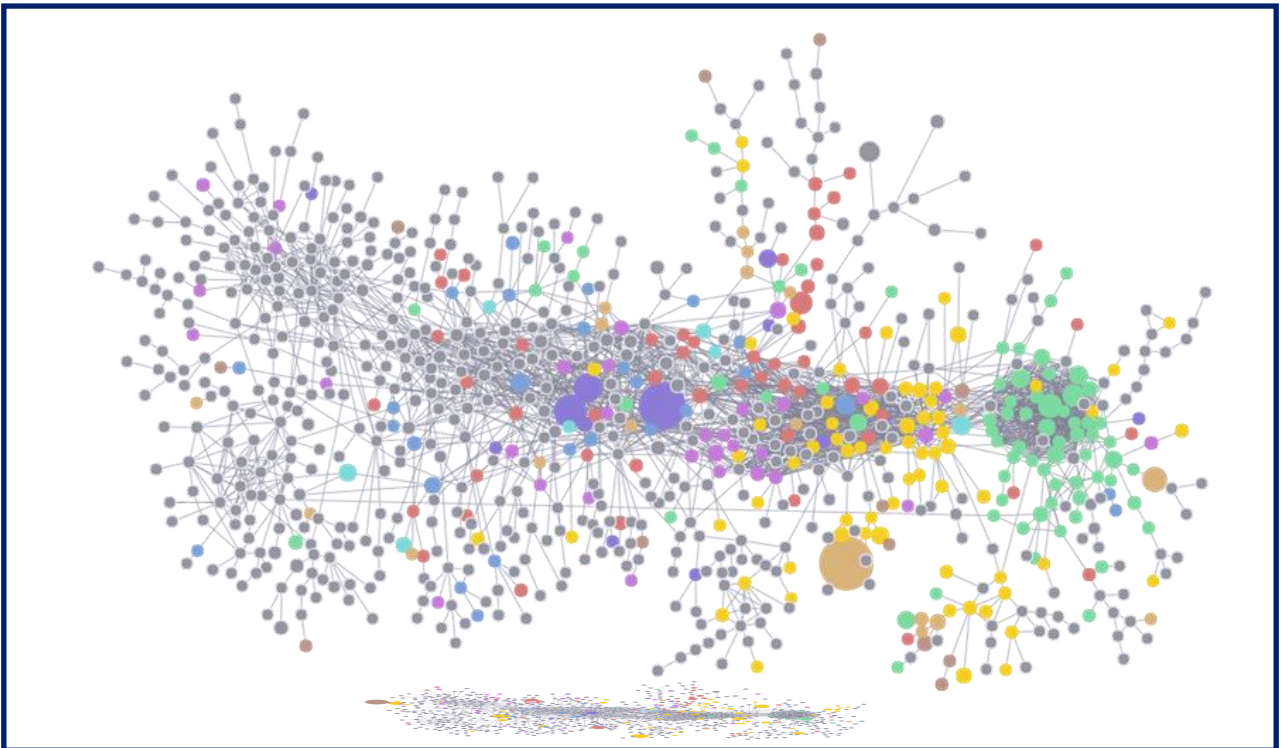
2016



Turkey
1995

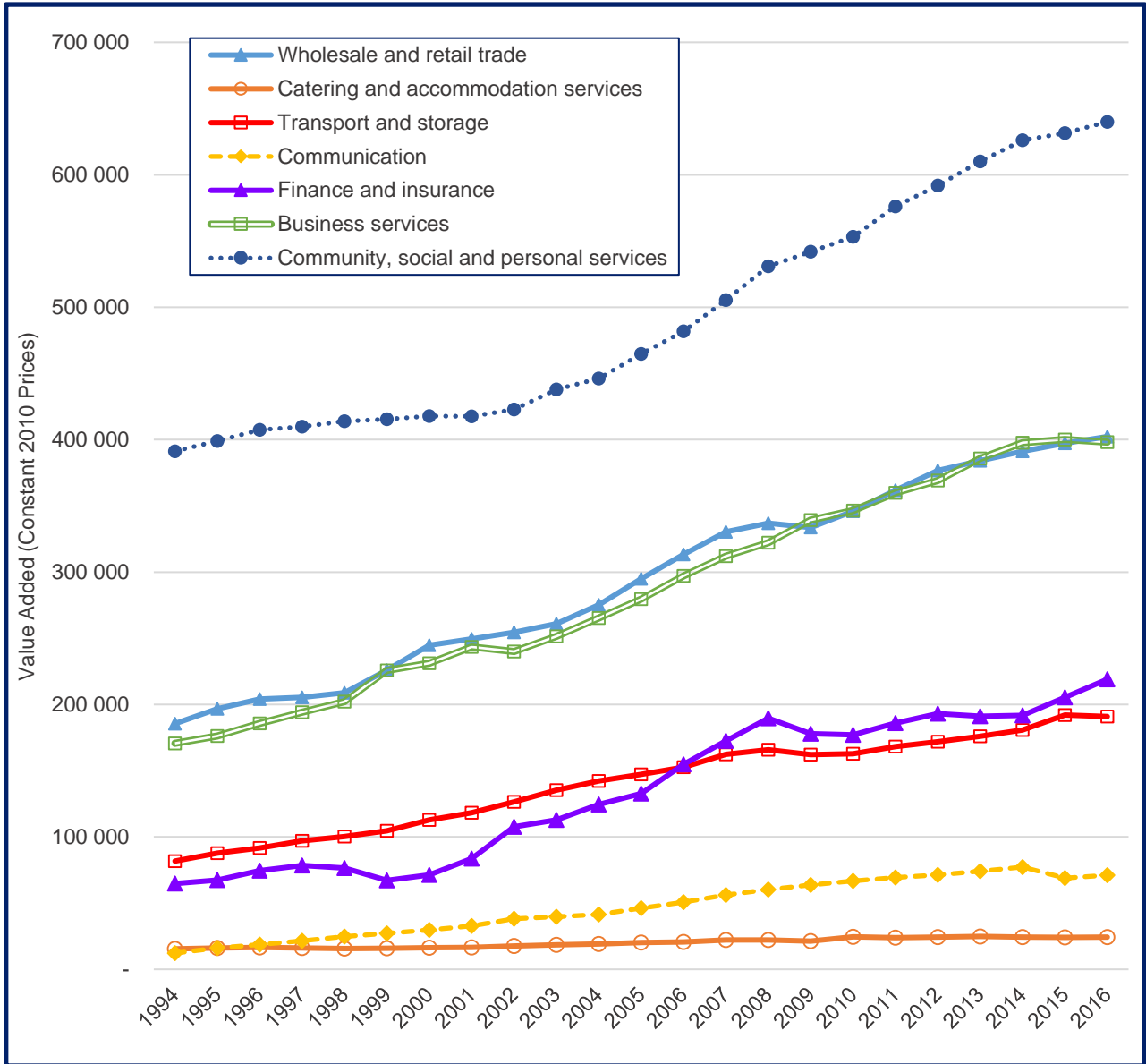


2016



Source: *Atlas of Economic Complexity*

Appendix A6: Services value add



Source: Quantec

Appendix A7: Most Common Investors on the JSE

Investor Name:	Companies:	Industry Description:
Christopher Seabrooke	Brait SE	Financial Intermediation, Except Insurance & Pension Funding
	Datatec Ltd	Computer & Related Activities
	Massmart Holdings Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Metrofile Holdings Ltd	Computer & Related Activities
	Net 1 UEPS Technologies Inc	Computer & Related Activities
	Rolfes Holdings Ltd	Manufacture : Coke, Refined Petroleum Products & Chemicals
	Sabvest Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Torre Industries Ltd	Construction
	Transaction Capital Ltd	Financial Intermediation, Except Insurance & Pension Funding
Jan Durand	Capevin Holdings Ltd	Manufacture : Food Products & Beverages
	Distell Group Ltd	Manufacture : Food Products & Beverages
	FirstRand Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Mediclinic International Plc	Health & Social Work
	Rand Merchant Investment Holdings	Insurance And Pension Funding, Except Compulsory Social Security
	RCL Foods Ltd	Manufacture : Food Products & Beverages
	Remgro Ltd	Financial Intermediation, Except Insurance & Pension Funding
	RMB Holdings Ltd	Financial Intermediation, Except Insurance & Pension Funding
Jacob Wiese	Fairvest Property Holdings Ltd	Real Estate Activities
	Invicta Holdings Ltd	Manufacture : Transportation Equipment
	Shoprite Holdings Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Steinhoff International Holdings NV	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Texton Property Fund Ltd	Real Estate Activities
	Tradehold Ltd	Real Estate Activities
John Copelyn	Deneb Investments Ltd	Wholesale & Commission Trade, Except Of Motor Vehicle And Motor Cycles
	E Media Holdings Ltd	Recreational & Sporting Activities
	Hosken Consolidated Investments Ltd	Recreational & Sporting Activities
	Hospitality Property Fund Ltd	Real Estate Activities
	Montauk Holdings Ltd	Electricity, Gas, Steam & Hot Water Supply
	Niveus Investments Ltd	Recreational & Sporting Activities
	Tsogo Sun Holdings Ltd	Hotels & Restaurants
Ralph Patmore	Accentuate Ltd	Manufacture : Coke, Refined Petroleum Products & Chemicals
	ARB Holdings Ltd	Manufacture : Electrical Machinery & Apparatus
	Calgro M3 Holdings Ltd	Real Estate Activities
	Mustek Ltd	Computer & Related Activities
	Sentula Mining Ltd	Mining of Coal & Lignite
	Trellidor Holdings Ltd	Manufacture : Basic Metals, Fabricated Metal

Hester Hickey	African Dawn Capital Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Barloworld Ltd	Sale, Maintenance & Repair Of Motor Vehicles And Motor Cycles; Retail Trade In Automotive Fuel
	Cashbuild Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Northam Platinum Ltd	Mining of Metals Ores, Except Gold & Uranium
	Omnia Holdings Ltd	Manufacture : Coke, Refined Petroleum Products & Chemicals
	Pan African Resources Plc	Mining of Gold & Uranium Ore
Mpho Makwana	AdBEE (RF) Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Adcock Ingram Holdings Ltd	Manufacture : Coke, Refined Petroleum Products & Chemicals
	ArcelorMittal South Africa Ltd	Manufacture : Basic Metals, Fabricated Metal
	enX Group Ltd	Manufacture : Electrical Machinery & Apparatus
	Nedbank Group Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Sephaku Holdings Ltd	Manufacture : Other Non-Metallic Mineral Products
Nigel Payne	Bid Corporation Ltd	Business Activities
	Bidvest Group Ltd (The)	Wholesale & Commission Trade, Except Of Motor Vehicle And Motor Cycles
	BSi Steel Ltd	Manufacture : Basic Metals, Fabricated Metal
	JSE Ltd	Activities Auxiliary To Financial Intermediation
	Mr Price Group Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Vukile Property Fund Ltd	Real Estate Activities
Christoffel Wiese	Brait SE	Financial Intermediation, Except Insurance & Pension Funding
	Invicta Holdings Ltd	Manufacture : Transportation Equipment
	Pallinghurst Resources Ltd	Mining of Metals Ores, Except Gold & Uranium
	Shoprite Holdings Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Steinhoff International Holdings NV	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	Tradehold Ltd	Real Estate Activities
Petrus Mouton	Capitec Bank Holdings Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Curro Holdings Ltd	Education
	Pioneer Food Group Ltd	Manufacture : Food Products & Beverages
	PSG Group Ltd	Activities Auxiliary To Financial Intermediation
	PSG Konsult Ltd	Insurance And Pension Funding, Except Compulsory Social Security
	Zeder Investments Ltd	Agriculture, Hunting & Related Services
Zarina Bassa	Investec Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Investec Plc	Financial Intermediation, Except Insurance & Pension Funding
	Oceana Group Ltd	Fishing, Operation of Fish Hatcheries and Fish Farms
	Sun International Ltd	Hotels & Restaurants
	Woolworths Holdings Ltd	Retail Trade, Except Of Motor Vehicles And Motor Cycles; Repair Of Personal Household Goods
	YeboYethu (RF) Ltd	Financial Intermediation, Except Insurance & Pension Funding
Chris Otto	Capevin Holdings Ltd	Manufacture : Food Products & Beverages
	Capitec Bank Holdings Ltd	Financial Intermediation, Except Insurance & Pension Funding
	Distell Group Ltd	Manufacture : Food Products & Beverages
	Kaap Agri Ltd	Wholesale & Commission Trade, Except Of Motor Vehicle And Motor Cycles
	PSG Group Ltd	Activities Auxiliary To Financial Intermediation
	Zeder Investments Ltd	Agriculture, Hunting & Related Services

Source: Who Owns Whom

