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Stuck in the Middle: South Africa in the New Global Industrial Landscape

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Over the past two decades, the world economy has undergone profound structural transformations. Despite a number of catching-up economies having registered fast economic growth during this period, world industrial production has remained highly concentrated. Today, fewer than twenty countries control 80% of the world manufacturing value-addition activities. Many low- and middle-income countries are not part of this group of industrialised nations, and indeed many of those countries that have managed to reach middle-income status have shown signs of premature deindustrialisation. South Africa is one of these middle-income countries.

According to various indicators of industrial competitiveness, South Africa is stuck in the middle-income countries segment, and has shown signs of an ongoing process of premature deindustrialisation. Over several decades, the annual growth rate of the manufacturing sector has slowed down dramatically, thereby affecting the absolute manufacturing value addition produced in the country.

As a result of this premature deindustrialisation process, if we benchmark South Africa's export performances against that of other middle-income countries, we also find that gross export value has increased since 2000, but at a much slower pace than major comparator countries.

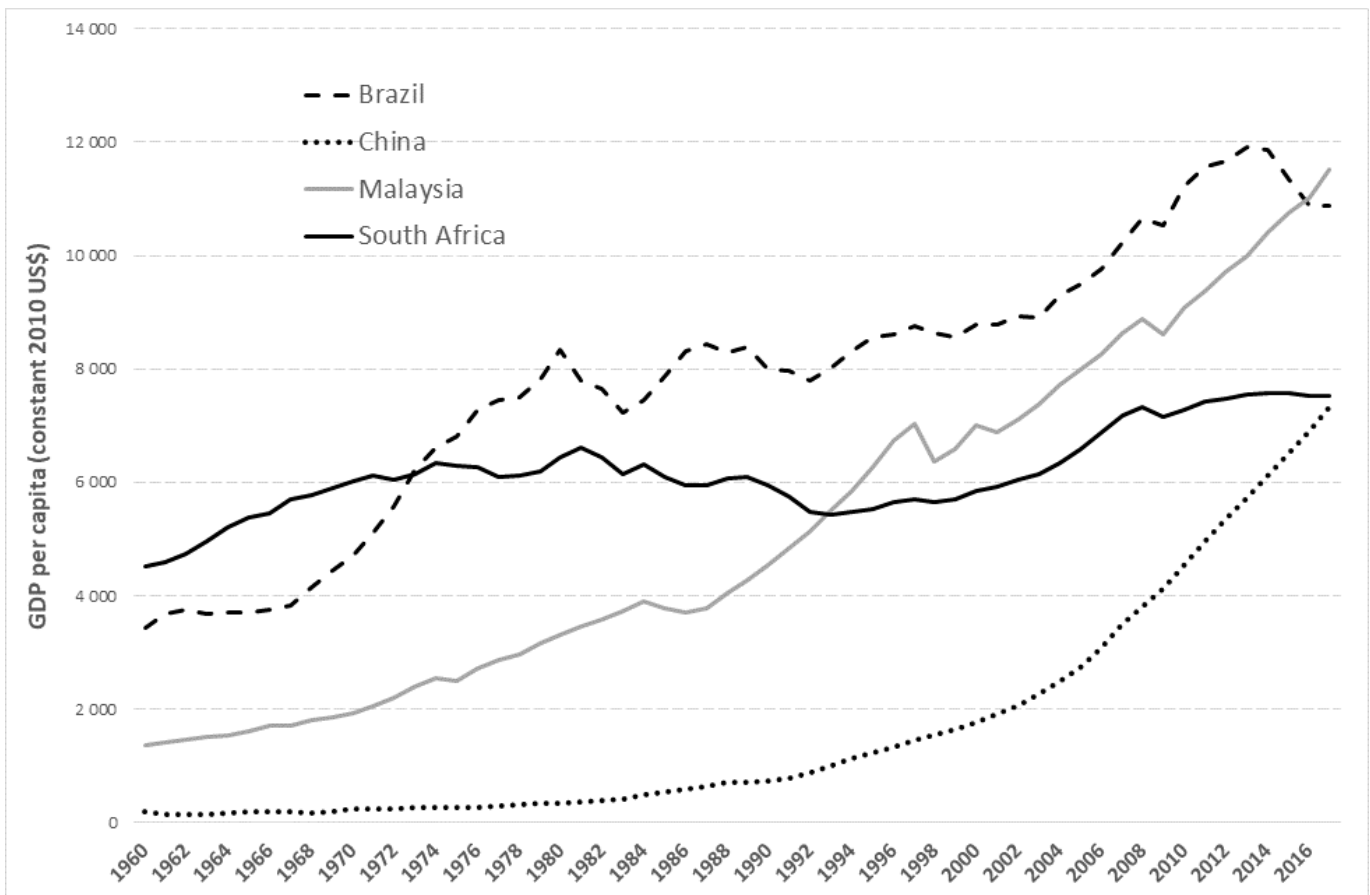
Moreover, trade relationships between South Africa and the new industrial giants have mainly reinforced the ongoing structural processes of premature deindustrialisation. Over the past decade, China and India have emerged as the top two destinations of South Africa's intermediate exports, while China became South Africa's largest supplier of imports in 2009. By 2011, imports from China were already above 12% of total imports and were overwhelmingly of manufactured goods, while South Africa's exports remained mainly composed by natural resources – i.e. mining and basic metals.

Figure 1 compares the evolution of South Africa's GDP per capita with that of the three comparator countries, namely Brazil, China and Malaysia. This throws South Africa's long-term structural problems into stark relief. In 1960, South Africa had by some distance the highest level of GDP per capita in the group. Brazil's GDP per capita was 76% that of South Africa, that of Malaysia was 29%, and that of China just 4% that of South Africa. South Africa retained its leading position until 1972, after which it was overtaken by Brazil. Malaysia overtook South Africa in 1993, and China will overtake South Africa this year.

It is true that virtually all countries would show up poorly when benchmarked against China's long-run growth miracle, especially the past three decades of unprecedented rapid and sustained growth in China. Yet South Africa performs poorly when compared not just against the comparator countries shown here, but against all relevant country groupings and aggregates. This underscores the long-term structural deficiencies of South Africa's economy and growth trajectory, and the extent to which it is stuck in its middle-income position and in fact falling down the global rankings in GDP per capita.

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Figure 1: Benchmarking South Africa



Source: World Bank World Development Indicators

Middle-income trap and premature deindustrialisation

An increasing number of studies have attempted to identify and measure the middle-income trap and its global structural dynamics (see Wade 2016 for a review). In particular, they have focused on providing different explanations for the underlying causes of this phenomenon. Among them, a number of specific industrialisation challenges faced by middle-income countries have been identified.

First, and in a relatively general sense, scholars have pointed to the challenges that middle-income countries face in sustaining labour productivity growth over a long period of time. For example, Justin Lin (2016:6) suggests that “[t]he middle-income trap is a result of a middle-income country’s failure to have a faster labor productivity growth through technological innovation and industrial upgrading than high-income countries”.

Second, other scholars (see for instance Lee, 2013) argue that a source of the middle-income trap is the difficulty of these countries competing with low-wage and large-scale exporters. At the same time, they cannot compete with technologically advanced economies because their industrial capabilities are not yet sufficiently developed to give them a competitive advantage.

Third, if we embrace the idea that manufacturing industries play a critical role in boosting productivity,

value addition and technological change, premature deindustrialisation could be another factor responsible for the phenomenon of the middle-income trap. Countries experience premature deindustrialisation when deindustrialisation has begun at a lower level of GDP per capita, and/or at a lower level of manufacturing as a share of total employment and GDP, than is typically the case internationally. Many of the cases of premature deindustrialisation are in sub-Saharan Africa, in some instances taking the form of ‘pre-industrial deindustrialisation’ (Tregenna, 2015).

The literature on the middle-income trap thus points to several industrialisation challenges that are intertwined, and that reinforce each other in different ways along different countries’ structural trajectories. These challenges also present potential opportunities for middle-income countries to industrialise and develop. Andreoni and Tregenna, (2018) identified three specific structural factors responsible for the middle-income trap: ‘global concentration’, ‘linking up’ ‘keeping pace’. Based on them, different ‘premature deindustrialisation trajectories’ can be identified. Indeed, capturing this set of factors, and how they unfold in different countries along different structural trajectories, is a key step towards designing appropriate industrial policy for middle-income countries.

Global concentration

Between 1995 and 2010, the G7 countries lost significant shares of value addition. In particular, their shares in world manufacturing value added (WMVA) registered a major decline. This means that fewer than ten nations controlled more than 70% of the world

manufacturing landscape in 1995. By 2011, less than 15 years later, all the G7 countries together accounted for only 40% of the WMVA, although their manufacturing value added in absolute terms kept increasing steadily until the 2007 financial crisis.

During the same period, between 1995 and 2010, emerging economies increased their total value addition from 13% to 27%, and their joint WMVA shares from 18% to 36%. This process of convergence has been driven by the rise of the new industrial superpower – China – and a group of fast catching-up economies. China moved from contributing less than 5% of WMVA in 1995 to 10% in 2005, and more than 20% in 2011, to reach a peak of almost 23% in 2014. As a result, China's share in world value-added exports surged to 17% in 2014, seven percentage points ahead of the second world-leading exporter – Germany – and more than double that of the United States.

Against this persistent concentration in the global industrial landscape, South Africa has faced a fundamental challenge in increasing its domestic value addition (DVA) in manufacturing industries and exported products. DVA in manufacturing products captures the extent to which a country is able to add value to its produce. The value addition can be the result of several types of activity, including extracting and processing raw materials; designing a product; producing components; integrating or assembling product systems; and adding services to products downstream in the value chain.

To capture the extent to which a country has engaged in value addition activities, it is critical to measure only the net value addition, thus excluding the value that results from buying goods and services from abroad. In South Africa, the net DVA declined among all major manufacturing subsectors between 1995 and 2008 (see Andreoni and Tregenna, 2018). Some recovery was registered after 2008, for example in the machinery and equipment industries. Direct exports by the mining industry generated the greatest source of domestic value added in 2011, accounting for 24.6% of the total value added of exports. The next three most important industries were wholesale, retail & hotels (10.2%), basic metals (9.3%), and transport & telecommunications (5.4%).

Linking up: Challenges in global value chains integration

Domestic value-added performances reflect the extent to which countries have been able to build up their industrial capabilities and take advantage of the opportunities offered by forward integration into global value chains (GVCs). Between 1990 and 2010, African countries experienced limited gains from GVC integration and declining forward integration (and domestic value addition) in international trade.

Middle-income countries like South Africa face the difficulty of moving into more technologically sophisticated segments of GVCs, often remaining stuck in the middle-income trap. By middle-income countries

joining RVCs or GVCs, focusing on the production of low-value added parts and components, might risk 'de-linking domestically' and hollowing out of the domestic manufacturing sector. Under these conditions, a combination of weak productivity growth and rising labour costs, or the emergence of alternative lower-cost locations, might lead to declining profitability, disengagement by the lead firm and a further weakening of domestic productive capacity.

In contrast, by linking up local producers and local supply chains to international companies and system integrators – *local production system development* – domestic companies can capture international demand and learn from exporting (Andreoni, 2018). South Korea and Taiwan, between 1970 and 1990, and China in the 1980s and 1990s, all started their industrialisation by linking (backwards) to global supply chains and adding value (forwards) in electronics and other industries, starting in particular from those characterised by short-technology cycles. With the expansion of the local production system through downstream (forward) integration, more opportunities for backward integration also open up, as domestic companies will start importing more intermediate goods while diversifying their export baskets.

Keeping pace: Challenges of technological change and preconditions

Technological change at the innovation frontier – the so-called *Industry 4.0* – has increasingly been recognised by lower- and middle-income countries as a critical competitive factor for global value chain upgrading and a leapfrogging opportunity. Sectoral value chains are based on different technology platforms integrating various types of technologies and technology systems.

The identification (and development) of *key technology systems* can follow different criteria (and policies) associated with different technology properties:

- i. their being 'transversal', that is, the extent to which they are deployed in multiple sectoral supply chains
- ii. their degree of 'embeddedness', that is, the extent to which they play a critical role within integrated technology systems
- iii. their 'quality-enhancing potential', that is, the extent to which they allow increasing quality products and their functionalities
- iv. their 'productivity-enhancing potential', that is, the extent to which they affect production processes' productivity
- v. their being 'strategic', in terms of facing major social and economic future challenges or markets

Starting from 2010, the European Union (EU) technology and industrial policy has identified and focused its interventions on a set of key technologies and technology systems characterised by more than one of the properties highlighted above. These are: Advanced materials; Advanced manufacturing systems;

Industrial biotechnology; Photonics; Micro- and nano-electronics; and Nanotechnology.

Middle-income countries like South Africa run the risk of undermining the 'technological preconditions' that have to be met in order to capture value opportunities from these key technology systems. For example, to make investments in ICT and digital solutions valuable, investments in the production capacity and hardware and organisational capabilities must be in place. In particular, the integration of digital technologies and networks with robotics and autonomous systems requires investments in key technology sub-systems and components, including automation and m2m technologies, embedded software, sensors and human interfaces, and augmented reality. These emerging technologies are expected to reshape the industrial plant of the future, making processes faster and more responsive, while reshaping the nature of jobs and skills.

Premature deindustrialisation: South Africa in international comparative perspective

Andreoni and Tregenna (2018) empirically analyse deindustrialisation trends across countries. This explores the patterns and dynamics of deindustrialisation internationally, in particular premature deindustrialisation, and locates South Africa in the context of these trends.

Countries are categorised based on two dimensions. Firstly, whether their actual share of manufacturing in total employment in 2015 was higher or lower than would be 'predicted' based on their level of GDP per capita in 2015 (and the estimated coefficients from the regression). This dimension gives a sense of which countries may be 'under-industrialised' given their level of GDP per capita. Secondly, whether they experienced an increase or decrease in the share of manufacturing in their total employment between 2005 and 2015. This second dimension indicates which countries can be considered (simply on the basis of sectoral employment shares) to have deindustrialised during this period.

Taken together, these two dimensions allow us to tentatively classify countries into four broad categories, depicted schematically in the four quadrants of Figure 2. Quadrant 1 (Q1) includes countries in which the share of manufacturing employment is higher than expected in 2015, and in which this share has grown between 2005 and 2015. Based on this analysis, these countries do not raise a concern in terms of deindustrialisation.

Amongst the countries in the first quadrant (Q1) are low- and low-middle-income, fast-industrialising, fast-growing Asian countries such as Cambodia, Indonesia, India, Bangladesh and Myanmar. Countries in Quadrant 4 are also growing their share of manufacturing in total employment, which in 2015 remains below their 'expected' values. Thus, even though these countries might be regarded as 'under-industrialised', they show evidence of industrialising during this decade.

Countries falling in quadrants 2 and 3 can be characterised as possible deindustrialisers, in that their share of manufacturing in total employment fell between 2005 and 2015. Yet, in the case of Quadrant 2 countries, their manufacturing employment share in 2015 still remains above their 'expected' level.

From the standpoint of structural change and concerns around the impact of deindustrialisation on growth, it is the countries falling in Quadrant III that potentially raise more significant concerns. In these countries, the share of manufacturing in employment is lower than would be expected, and they have been *further* deindustrialising over the past decade. Rather than catching up to their 'expected' level of industrialisation, this group of countries has been falling further behind. Furthermore, some of these countries had a higher than expected level of industrialisation in 2005, but fell below the curve by 2015.

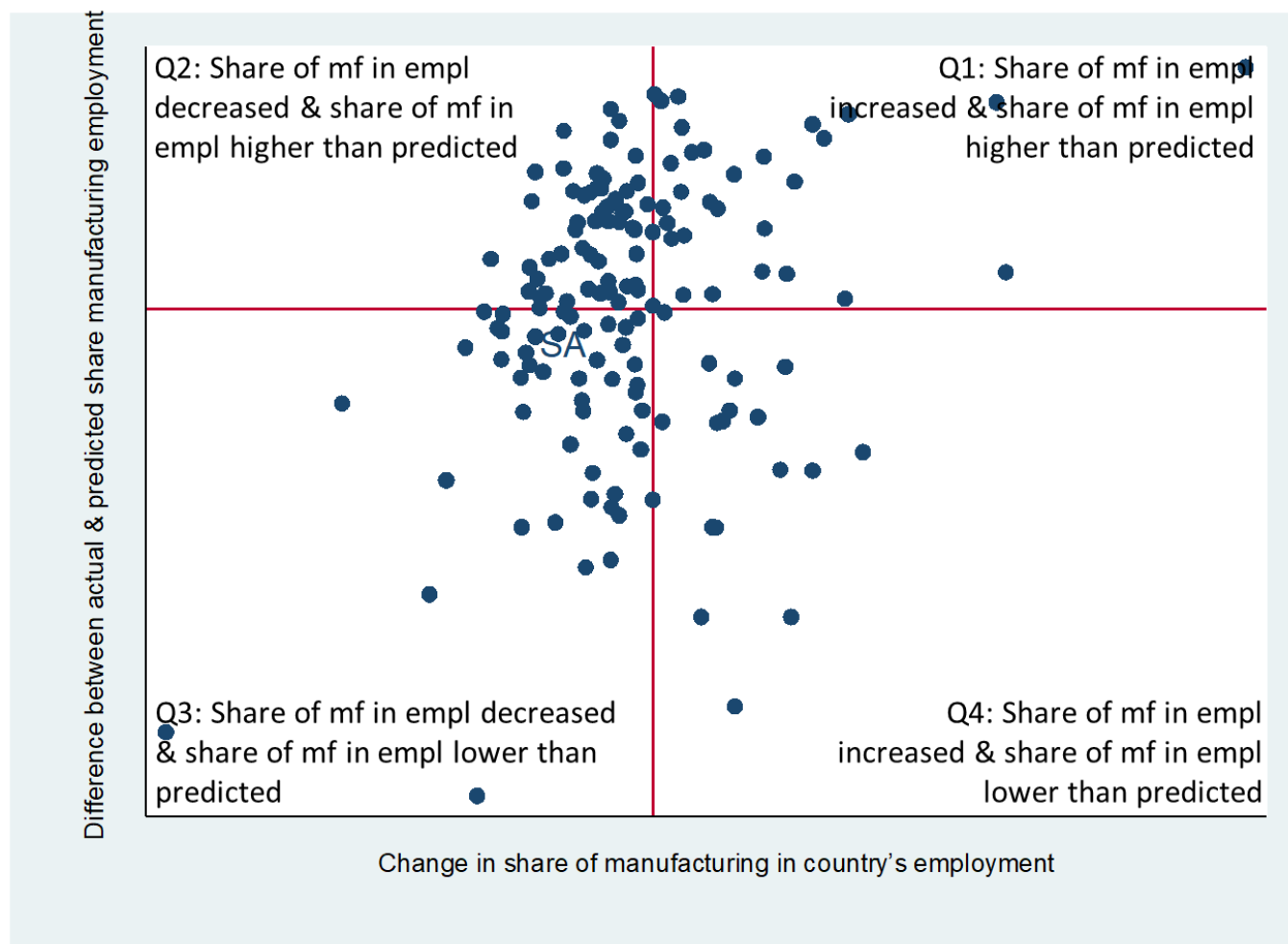
South Africa falls in Quadrant 3 – the category of greatest potential concern in terms of deindustrialisation. Between 2005 and 2015, the share of manufacturing in South Africa's total employment fell from 13.9% to 11.2% (based on the ILOSTAT data). Worth noting is that this is in fact only slightly below the expected value for 2015 based on South Africa's GDP per capita and international patterns of widespread deindustrialisation, that is, South Africa's share is actually close to its predicted value.

With a focus on Quadrant 3 countries, we can also distinguish those advanced economies that are deindustrialising from those countries experiencing (potential) premature deindustrialisation. Amongst the 33 'possible premature deindustrialisers', eight can be classified as low income, seven as lower-middle income, 15 as upper-middle income, and three as high income. In terms of regional distribution, almost half (14) are in sub-Saharan Africa. This is consistent with what Tregenna (2016) has described as a phenomenon of 'pre-industrialisation deindustrialisation' in some (especially low-income) sub-Saharan African countries. Another nine are from Latin America and the Caribbean, six from Europe and Central Asia, two from the Middle East and North Africa, one from Southern Asia, and one is from East Asia and the Pacific. As discussed earlier, South Africa is amongst this Quadrant 3 group of possible premature deindustrialisers.

Concluding remarks

'Stuck in the middle', South Africa – alongside a number of middle-income countries – has been unable to break out of its middle-income status. To the contrary, South Africa has been falling down global GDP rankings over a long period of time. Having previously had the highest income per capita of the group of comparator countries analysed here, South Africa has since been overtaken by Brazil and Malaysia, and China is set to overtake South Africa in 2018. Far from catching up with advanced economies, South Africa is itself being caught up with by other countries, including those that were previously of low-income status.

Figure: Premature deindustrialisation: South Africa in a global context



Source: Andreoni and Tregenna, 2018

This poor growth performance is concomitant with South Africa's failure to take forward its industrialisation and to upgrade the structure of its economy. To the contrary, the country has experienced premature deindustrialisation. The analysis of the global evidence on premature deindustrialisation benchmarks South Africa's structural position and trajectory in the global context. The share of manufacturing in total employment in South Africa in 2015 is shown to be (a bit) below the share that would be predicted based on international patterns. Moreover, this share is falling further in South Africa, taking the country further below its predicted share.

Adding to the concern about the quantitative share is the composition of South Africa's manufacturing sector and exports. With some exceptions, the profile of South African manufacturing production and exports does not show the desirable patterns of structural transformation, which would include growth in domestic value added, movement up the value chain, and increasing focus on products that show potential for cumulative productivity increases and are demand-dynamic. South Africa is also lagging in terms of innovation and in the development and application of KETs that would enable the country to become competitive in the manufacture

of complex products and to gain from the opportunities associated with *Industry 4.0*.

Over the last years, South Africa has relied on several ambitious rounds of industrial policy, including sectoral targeting as in the case of the automotive industry. Reversing premature deindustrialisation in South Africa will depend on the coordination of a feasible set of interventions reinforcing each other in a coordinated manner.

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