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Cars and clothes in South Africa's Covid experience: The contrasting fortunes of two manufacturing sectors in South Africa

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Institute for International Political Economy Berlin

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Cars and Clothes in South Africa's Covid Experience: The contrasting fortunes of two manufacturing sectors in South Africa

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Abstract: This paper uses the automobile industry and the clothing and textile industry as lenses to examine the impact of the Covid pandemic on globalization. We focus on the case of South Africa, where both sectors have a long history. In the early decades of neoliberal globalization the country's clothing and textile industry declined rapidly and the automobile industry expanded dramatically. The Covid crisis has had an overall negative effect on the economy of South Africa, but in certain respects the trends of these two key manufacturing sectors have reversed. The Automobile sector in the country is stagnating and both firms and government seem unable to take significant action to address the situation. The clothing and textiles industry has stabilized, and even begun to grow, after decades of decline from the 1980s to the 2000s. The pandemic period has seen renewed energy and engagement between firms and government. We analyze the background and Covid experiences of both industries to make sense of the explanation for and implications of this contrast.

Keywords: Covid-19; South Africa; Globalization; Automobile Industry; Clothing and Textile Industry

JEL Codes: L16; L52; O55

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1. Introduction

This working paper is part of a larger comparative project assessing the impact of the Covid pandemic on globalization and the structure of the world economy. Much of the research for this project has been conducted in the midst of the unfolding pandemic emergency. However, with the World Health Organization (WHO) declaring a formal end to the global health emergency in May 2023, it now seems possible to begin to analyze the pandemic in a sort of historical perspective, and to begin tracing the potential lasting effects that it has produced. While the fog of the present still shrouds our clear view of the last few years, the pandemic has been an event of such magnitude that the outlines of its lasting effects might already be visible through the mist.

That the pandemic will have lasting effects seems inevitable. The official recorded global death toll stands at nearly 7 million as of July 2023, but a UN study found that global excess deaths in 2020 and 2021 alone stood at 14.9 million (UN, n.d.) and the WHO general secretary estimated the true death toll as being at least 20 million by May of 2023 (Wise, 2023). The economic costs are difficult to measure, but immense (Reuters, 2022), and any account of the impacts must include a range of broader social and economic effects such as the persistently high worldwide inflation and increased nationalism and racial conflict (Bieber, 2022; Elias et al., 2021). Scholars interested in making some coherent assessment of the pandemic's effects are faced with a methodological challenge of how to approach an event that has touched nearly all aspects of social and economic life.

In this project we are interested in the way in which Covid may influence the structure of the global economy. In this approach, we engage with the debate, which has taken place in both popular media and academic literature, about whether and how the pandemic will reconfigure economic globalization (Cohen, 2023; Olivié and Gracia, 2020; Posen, 2022). In order to analyze this question we focus on two particular industries—the automobile sector and the clothing and textile sector—across four countries—Brazil, Germany, South Africa, and India. The sector level focus gives us a coherent unit of analysis, namely the actors along the value chains in these two sectors, including lead firms, subordinate firms, workers, unions, as well as governments.

This working paper is written by the South African research team, and its main goal is to give an overview of the two sectors in the country, including their backgrounds and experiences in the Covid period. We do not undertake a systematic comparison of the two sectors here. Still, it is worth reflecting on their characteristics briefly. Both sectors have been leading sectors of the world economy in the past, with clothing and textiles in the 18th and 19th centuries being one of the first sectors to industrialize and globalize, and automobiles being the leading sector of twentieth century industrial manufacturing (Silver, 2003). But while both have at times driven technological innovation in manufacturing historically, the clothing and textile industry today is regarded as a quintessential case of a labour-intensive sector with low capital requirements, while automobiles remain one of the most capital intensive areas of manufacturing. These differences make these two industries particularly interesting to consider in comparison, in order to assess the ways in which the pandemic crisis might have reshaped global value chains and the world economy as a whole.

Following this introduction, we begin sections two and three with a brief general account of the pandemic in South Africa, including the policy responses of the government. We then turn to the two sectors in sections four and five. For both sectors we give some background on their history in South Africa before turning to their experience during and since the Covid pandemic. We end with some brief

concluding thoughts about potential lessons to be drawn from this comparison, elaborating on the contrasting fortunes mentioned in our title.

2. The Trajectory of the Covid Pandemic in South Africa

South Africa experienced its first confirmed case of Covid-19 in early March 2020. The government instituted a national lockdown on the 26th of March, before any confirmed Covid deaths had occurred. The initial lockdown lasted five weeks and ranked high on the globally comparative Oxford Covid-19 Government Response Tracker (Hale et al., 2021; Mathieu et al., 2020). In addition to strict stay-at-home orders, the lockdown shut all but a defined list of essential businesses and even banned the sale of alcohol and cigarettes. While some restrictions were eventually relaxed, South Africa has been characterized as one of the "roller coaster" countries which experienced "successive waves of disease and [which] phased in and out of restrictive policies" (Hale 2021). Of particular importance was the discovery, by South African scientists in November of 2021, of the Omicron variant of Sars-CoV-2. While Omicron was first discovered in South Africa, it quickly became the dominant strain in the world and drove new waves of infections in many countries in late 2021 and early 2022.

By coincidence, South Africa held the Chairship of the African Union (AU) in 2020, a position which rotates on a yearly basis among countries across the continent. As AU Chair, South African president Cyril Ramaphosa drove both the national and the continental drive for vaccine access for countries in the global South. Upon ceding the Chairship at the beginning of 2021, Ramaphosa was appointed by the AU as the African Union Champion on Covid-19. Through this post he established the African Vaccine Acquisition Task Team (AVATT) and worked closely with the COVAX initiative, which was driven by a range of organizations including the WHO and UNICEF and aimed to promote global access to vaccines. However, despite the active engagement in these initiatives, South Africa only received access to vaccines months later than most rich countries. Some frontline workers were vaccinated in February of 2021, but the general public accessed vaccines in a phased process based on age prioritization, beginning with those over 60 years of age in May of 2021 and extended to everyone over the age of 18 in August of 2021. By the end of 2021 only about 30% of the population was vaccinated. The vaccination rate eventually plateaued at just over 40% by the end of 2022 (Mathieu et al., 2021).

South Africa has recorded around 100,000 deaths from Covid or about 172 deaths per 100,000 members of the population as of March 2023 ("Johns Hopkins Coronavirus Resource Center," n.d.). However, as at the global level, there is strong evidence that this is an under-counting of the overall toll. Bradshaw et al. (2022) found that excess deaths stood at 295,135 in January of 2022, and they estimated that 85%-95% of these deaths were associated with the pandemic.

3. Economic Effects of the Pandemic and Policy Responses

As the previous section has shown, the Covid pandemic was a profound crisis of health and mortality. However, what made the period such a dramatically disruptive crisis is the way in which both the pandemic itself and policy responses meant to contain it had devastating economic impacts. In the South African case, these negative impacts were exacerbated by the fact that the country was already in a deep economic malaise even before the pandemic arrived. This economic background is covered extensively in another IPE Working Paper published from this project (Scully 2023). However, we will provide a brief summary here.

South Africa had been negatively affected by the global economic crises in 2008 and the end to the long period of elevated commodity prices which had driven growth from the late 1990s until 2008. The country also experienced significant economic and political challenges during the presidency of Jacob Zuma, which was marked by widespread corruption and a severe decline in state capacity, especially in many key areas for overall economic performance such as electricity generation and rail freight transportation (Bowman, 2020; Von Holdt, 2019).

As Figure 1 shows, South Africa's unemployment rate had already been at persistently high levels even before the pandemic. It is worth taking a moment to explain the two versions of the unemployment rate which are reported in South Africa's official statistics. The narrow unemployment rate excludes what are often called "discouraged work seekers", that is, individuals who report that they want work, but who have not actively sought work in the 4 weeks prior to the survey date. In the South African context there is extensive evidence that the expanded unemployment rate, which includes discouraged work seekers, is a more accurate reflection of the rate of unemployment since a number of structural barriers, including the extremely limited availability of jobs in many geographic locations, limit active searching among significant sections of the unemployed.

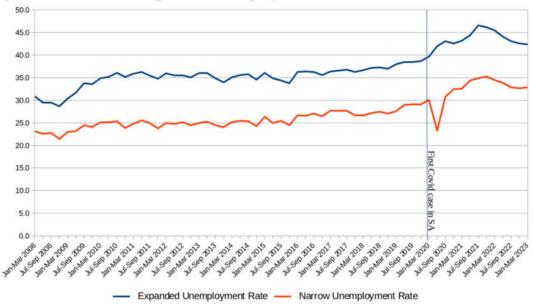


Figure 1: Narrow and Expanded Unemployment Rates, 2008-2023

Source: Authors' calculations from StatsSA Quarterly Labour Force Survey

High unemployment not only pre-dates the pandemic but has been a long term structural feature of the South African labour market. The already high level of unemployment rose further in the wake of the 2008 financial crisis, and these levels persisted throughout the years of Zuma's presidency. In the final years of the 2010s unemployment had begun to climb again with the narrow rate reaching 29.1% and the expanded rate sitting at 39.7% in the last quarter of 2019, just before the pandemic struck (StatsSA, 2020).

This had also been a period where rolling blackouts resulting from the electricity generation shortfall had intensified. As figure two shows, the total days in which blackouts occurred increased dramatically in 2022 and 2023. What these numbers do not show is that the blackouts have also been at higher "stages", which means more hours out for each blackout, so the overall increase of hours without electricity is much higher than the simple count of days in this chart demonstrates.

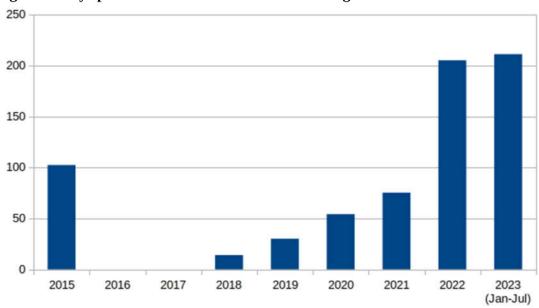


Figure 2: Days per Year with Scheduled Power Outages

Source: Data from loadshed.theoutlier.co.za

Further dimming the economic outlook was the downgrading to "junk status" of the country's sovereign credit rating, by two of the three major rating agencies, Fitch and S&P, in 2017. The government had made a priority to avoid downgrading by the third agency, Moody's, in the months ahead of the pandemic, however Moody's followed the other two rating agencies and confirmed its downgrading days into the country's first Covid lockdown in March of 2020.

This summary shows the negative economic environment which prevailed when the pandemic arrived in South Africa. Given this situation, it is noteworthy that South Africa did respond to the pandemic crisis with a programme of counter-cyclical spending. In April of 2020 President Cyril Ramaphosa announced a Covid Stimulus package worth R500 billion (~\$26 billion), or 10% of the country's GDP. Relative to GDP this made South Africa's package among the highest in the developing world and "notably larger than several high-income countries, including South Korea and Canada" (Bhorat and Köhler, 2020). However, the real value of spending was far lower than the announced package. The largest component of the package, R200 billion or 40% of the total value, was supposed to come from a credit scheme in which the government would guarantee loans provided by private banks to businesses in distress due to the pandemic. However, by the time the scheme ended in mid-2021 only R18.4 billion worth of loans had been provided (Buthelezi, 2022).

Despite the lower than advertised cost, the excess Covid spending did put pressure on the national fiscus and required the Government to seek financial support from a range of sources including the

IMF and the World Bank. This funding was framed as supporting not only the emergency stimulus package, but also the Government's Economic Reconstruction and Recovery Plan, a policy document which was announced in October of 2020 and which has guided South Africa's longer term strategy for addressing the economic effects of the pandemic crisis (Government of South Africa, 2020)¹.

One other major component of the stimulus package which is important for the topic of this paper is the wage support scheme called the Temporary Employer-Employee Relief Scheme (TERS). TERS provided wage support to workers at formal businesses who were unable to cover their wage bill due to the pandemic and the lockdown policies and other restrictions which the government had put in place. As of April of 2022 the TERS had paid out R64 billion (~\$4.4 billion) to 5.7 million workers (Nxesi, 2022). This scheme was essential for both firms and workers in the formal sector. However, with South Africa's high levels of unemployment and a significant minority of employed workers in the informal sector, the TERS alone was not sufficient to protect the populace from economic destitution during the pandemic.

To address this the government also introduced a new social grant, the Covid-19 Social Relief of Distress Grant (popularly called the "Covid grant"). The Covid grant had a value of R350 (~\$19) per month. The low amount meant that for informal workers, including many domestic workers, who were unable to access TERS because their employers had not formally registered them, the grant constituted a major reduction in income. However, despite its small amount, the grant was important for protecting many informally employed and unemployed South Africans from absolute destitution (Jain et al., 2020).

This section has provided a general overview of the effects of the pandemic in South Africa. In the following sections we turn to the two sectors which served as the case studies in this comparative project, namely the Clothing and Textile sector and the Automobile sector.

4. The Clothing and Textile Sector and the Covid-19 Pandemic

4.1. The Decline of the Clothing and Textile Sector in post-Apartheid South Africa

The clothing and textile sector is widely regarded as one of the most important industries for driving industrialization and development. As mentioned in the introductory section, clothing and textiles were at the center of the industrial revolution in 18th century England which was foundational to the history of the capitalist world economy. In the years since, this sector has often been a key to processes of industrialization around the world. In addition to its low barrier to entry it has the added benefit of being labour-intensive, and therefore having the potential to absorb significant populations of low-skill workers which are often a prominent feature of developing countries (Morris and Barnes, 2008).

Clothing and Textiles has a long history in South Africa. During Apartheid the apparel producers had been instrumental in developing the policies that governed the sector. They had successfully pushed for protectionist regulations and government aid to boost regional business. As a result the sector was a highly protected industry under Apartheid and was one of the sectors used to drive the Apartheid state's import substitution industrialization strategies.

¹ The ERRP is discussed extensively in another working paper which is a part of this project (Scully, 2023)

Being a labour-intensive industry, clothing and textiles was also important for the history of trade unionism. The National Union of Textile Workers was one of the many independent, non-racial unions to emerge in the wake of the Durban Strike wave of 1973 which is often regarded as the birth of the modern labour movement in South Africa. After various amalgamations and renamings the union was a founding affiliate of the Congress of South African Trade Unions (COSATU) in 1985 and became the South African Clothing and Textile Workers Union (Sactwu) which remains the largest union in the sector today.

However, in the post-Apartheid era, the industry has faced major challenges. South Africa had the misfortune of achieving democracy at the time when Washington Consensus-era free market ideology was at its zenith, especially with regards to trade and industrial policy. South Africa joining the World Trade Organization (WTO) in 1995 subjected them to pressure for less protectionism and more liberal economic policies in the nation. In the space of clothing and textiles there were domestic actors who supported this push. Both importers and retailers argued that protectionism in clothing and textiles drove up the price of imported goods and harmed consumers.

The Growth, Employment, and Redistribution (Gear) policy framework implemented in 1996 largely sided with retailers and against clothing manufacturers. Industrial policy in this period focused on "international competitiveness as a central theme". It accepted that some re-adjustment would take place with some sectors declining. Although it included some "support for non-mineral based subsectors and higher value added activities it was understood that mineral based manufacturing would remain important and should be supported by further beneficiation" (Black and Roberts, 2009). In this environment, low value added labour-intensive sectors like clothing received little support.

The predictable result was a severe crisis in the sector. Vlok (2006, p. 229) points out that while the retail sales grew dramatically between 1999 and 2003 (50% for men's clothing, 40% for women's clothing, and 38% for footwear) overall output of the South African producers in the sector was stagnant. Even more dire, employment in the sector declined by 37%, from 228,053 in March of 1996 to 142,863 in March of 2005 (ibid). However, even in the wake of this decline, the sector remained an important employer, especially of women (ibid).

4.2. Attempts at Revitalization

Although the Clothing and Textile sector can be considered one of the biggest losers of the post-1994 trade liberalization, it has also been a major focus of state industrial policy throughout the democratic period. One feature that industrial policy has often aimed to overcome is the domestic orientation of the industry. The idea behind liberalization was that uncompetitive producers who had grown up under the protectionist policies of the Apartheid state, often with a focus on the domestic market, would be replaced with internationally competitive producers who could shift into the export market. The promotion of such international competitiveness has therefore been a focus of state support. In the mid-2000s a number of concrete initiatives emerged. First, the government increased tariffs in the sector to the maximum 45% allowed under current WTO agreements. It also introduced a flagship industrial policy for the sector, the Clothing and Textile Competitiveness Programme (CTCP)².

² The name has recently been changed to the Clothing, Textiles, Footwear and Leather Growth Programme.

The CTCP primarily supports technological upgrading in production technology and skills. This is important because, although textiles and especially clothing are generally considered low-technology manufacturing sectors, the past few decades have seen important shifts. Whereas the industry was once one in which large buyers procured from a wide range of low-capital producers, there is now a trend of consolidation among producers, the largest of whom have upgraded skills and technology and captured significant market share (Kumar, 2020). In this emerging situation, investment and skills development are important components of any development strategy for the industry.

These changes have also informed the further development of industrial policy in the sector. As Kumar (ibid.) notes, the rise of larger producers in the sector has shifted the balance of power between buyers (brands and retailers) and producers. Whereas buyers once held a dominant position, there is increasingly an interdependence between large global brands and retailers and large producers. In the South African context, this new situation has prompted the introduction of a new industrial policy, the Retail, Clothing, Textiles, Footwear, and Leather Master Plan (hereafter "the RCTFL Master Plan").

The inclusion of retail in the master plan signals this important shift. It reflects an attempt to link industrial development in clothing and textile production to local retailers. The idea is that local retailers can gain a market advantage through a closer integration with local producers. This reflects the fact that speed and flexibility of supply chains has become an important point of competition in the clothing retail sector. Retailers often order small runs of a wide range of items in order to test the most popular styles, which they can subsequently expand orders of to meet demand. This strategy depends on a close link between flexible suppliers and retailers³.

In addition to reflecting a general trend in the clothing retail sector, the new focus on linking retail and production in South Africa also stems from the entry of large global retailers such as H&M, Inditex (Zara), and Shein into the South African market for the first time over the past decade. These globally leading brands have pioneered the new methods of tightly integrated retail and production value chains, through partnerships with some of the leading producers in the world.

The RCTLF Master Plan also reflects a shift in the relationship between clothing and textiles, which have long been seen as having somewhat competing interests. For a variety of reasons the South African textile production sector declined much more dramatically than the clothing sector after liberalization. There are some fabrics which are important in contemporary fast fashion, especially woven fabrics, which are not produced in significant quantities or at high quality in the country. However, in previous iterations of industrial policy the country's remaining textile producers retained influence. Regulations, including tariff structures, often promoted for the use of locally produced textiles in clothing. However, this often limited fabric choices or drove up costs (for fabric that had to be imported), thereby undermining the competitiveness of the clothing sector. The Master Plan includes a new tariff rebate mechanism which represents a compromise between the competing interests of textile and clothing producers. Through the rebate, producers who make certain commitments to purchase locally produced fabrics are also free to import woven fabrics without paying tariffs.

Another aspect of the Master Plan is an increased focus on customs enforcement. This is an issue on which both unions and retailers pressured government. There was a widespread view that customs

³ This and the next few paragraphs are based on discussions with government officials working on the master plan and trade unions in the sector.

enforcement had been lax and that this had allowed the proliferation of ultra-low-cost items which violated existing tariff protections. There have been a number of high profile cases, including an investigation of Shein, which are evidence of this new focus (Davis, 2022; Wexler, 2023).

The ultimate goal of the Master Plan is to increase local production. One target that the plan sets to drive this increase is the portion of locally produced clothes sold by local retailers to 65% by 2030 (from a baseline of 44% in 2016). The focus on local retailers and the local market is unusual in comparison to the majority of post-1994 industrial policy in South Africa. Previous industrial policy has prioritized export orientation. However, the RCTLF Master Plan focuses first on strengthening local producers by supplying local retailers. But importantly, many local retailers have a strong presence in other African countries. In this way, the South African retailers could become a vehicle for increasing exports to regional and continental markets.

4.3. Clothing and Textile and the Covid Pandemic

By coincidence the Master Plan was being put into place just as the Covid pandemic struck. While the Plan was formally launched in late 2019, one of the key mechanisms of the plan was regular coordinating meetings of issue focused task teams that included a range of stakeholders including representatives from the Department of Trade, Industry, and Competition, from retailers, producers, and unions. The first meeting of the RCTLF task teams took place in March of 2020, the same month when South Africa experienced its first Covid cases and when the initial lockdown began. This was obviously a major disruption to the Master plan process, and a number of timelines and processes had to be readjusted. However, the intensity of the Covid emergency seems to have had positive effects on the spirit of cooperation in the task teams⁴.

It should also be noted that one overarching goals of the Master Plans as a whole (in addition to the RCTLF plan there are 6 other Master Plans covering various industries) was to reestablish trust and a working relationship between business and the state in light of the severe breakdown that had taken place during the Zuma presidency. This is a further reason that the intensity of the Covid emergency could have had some positive effects. Intense close coordination between business and the state was unavoidable.

One important outcome of these emergency consultations was around the issue of fabric masks. South Africa was one of the first countries in the world to issue guidelines recommending the wearing of fabric masks, even before the WHO had made this recommendation. The South African guidelines were developed by a task team within the RCTLF Master Plan process, which, in addition to government, business, and labour had brought on board a medical doctor and a scientist with expertise in textiles. Regulations were established which allowed textile and clothing producers to register as mask producers and reopen production. There was also a procurement system established whereby government institutions which needed to buy masks could place orders with local producers. Registered producers included both large factories and SMMEs. In fact, one SMME fashion brand owner we spoke to reported that her business expanded dramatically during Covid as the steady supply of mask orders from government departments were more reliable and more lucrative than the low-cost clothing products she had been producing before⁵.

⁴ Interview with DTIC official

⁵ Interview with an SMME owner in the Western Cape

The intensity of work during the emergency period was not unique to participants in the Master Plan process. One other institution that shifted into emergency mode was the National Bargaining Council for the Clothing Manufacturing Industry (NBC). The NBC invoked a clause of the existing collective agreement which allowed changes to the agreement under emergency circumstances. Through this clause it was agreed that factories could apply to the council to be registered as PPE producers which would allow them to re-open under national Covid regulations. The NBC also has a long established Health Care Fund which operates primary care clinics which are free for workers in the clothing sector.

The Health Care Fund played a major role in the health care response to the crisis. It drove a vaccination campaign for workers in the industry beginning in July 2021. The vaccination campaign was so successful that the clinics had quickly vaccinated an overwhelming majority of workers in the industry, after which the clinics opened up to the general public and helped contribute to the general national vaccination programme. The health care fund also played a major role in testing. This use of industry associated health care facilities for testing is also something we observed in Automobiles, and we will discuss it more in the section of Autos below.

The Covid period has continued to pose major economic challenges to the industry, and not only because of the direct effects of the pandemic. As mentioned above, rolling blackouts have intensified. It is now not possible to run a manufacturing business such as clothing production without a back-up power supply. This has driven up costs for larger producers and driven many smaller producers out of business. In addition to power outages the country experienced a highly destructive wave of public violence in July of 2021. This unrest was triggered by the imprisonment of former President Jacob Zuma after his conviction for failing to make a legally mandated appearance before a national judicial commission investigating corruption. The unrest included widespread looting and vandalism. While it was mostly concentrated in two provinces, KwaZulu-Natal and Gauteng, these are both areas where clothing retail and manufacturing activities are located. It is reported that over 994 clothing and footwear retail stores were ransacked - resulting in the cancellation of manufacturing orders - and 56 CTFL factories were damaged, leaving some completely beyond repair. In response the Industrial Development Corporation, a government economic development agency, introduced a Rapid Response Fund worth R450 million to offer Working Capital Grants and/or Capital Equipment Grants for up to R10 million per applicant; the fund has since disbursed R457 million to 53 companies affected (IDC, 2022).

These various challenges led to significant disruptions in the sector. Employment was down 7.8% from the last quarter of 2019 to the last quarter of 2020 and output collapsed dramatically in the middle of the same year with seasonally adjusted manufacturing sales in April 2020 standing at only 35% of the level achieved in December 2019 (see Figure 3). However, the recovery of the sector has been rather robust. In 2023 manufacturing sales were almost 20% higher than at the end of 2019. While it is difficult to assess what has driven the recovery, it seems likely that the pandemic disruptions have served to reinforce many of the factors that have driven localization and the emergence of the Master Plan. In addition to the need for more tightly coordinated value chains, retailers also choose local production to avoid supply chain disruptions and price volatility owing to exchange rate fluctuation (Crotty, 2022). Both of these problems have been magnified by the pandemic and its aftermath.



Figure 3: Seasonally Adjusted Manufacturing Sales for Textile, Clothing, Leather, and Footwear sectors, in R millions

Authors' calculation from StatsSA's Manufacturing: Production and Sales reports

5. The Automobile Sector and the Covid-19 Pandemic

5.1. Background of the Automobile Sector in South Africa

While the story of clothing and textiles is a relatively optimistic one, the trajectory of automobiles is more complex. Much of the increased energy towards industrial policy and national development can also be found in the auto sector, but global trends in the industry are creating more challenges rather than more opportunities for South African producers.

Auto production has a long history in South Africa, dating back to the establishment of assembly plants by Ford and GM in the 1920s (Black, 2001). In the 1940s the government set limits on auto imports in an effort to improve its balance of payments. This prompted the expansion of local assembly through the entry of new OEMs. When import controls were briefly loosened in the late 1950s there was a rapid expansion of the market, which reinvigorated efforts to boost local production to avoid balance of payment issues (Duncan and Payne, 1993). Starting in the 1960s the government introduced local content requirements based on weight, with the local percentage being gradually increased until 66% of finished cars by weight had to be locally produced from 1977. Both the number of OEMs and the size of the local component production sector grew dramatically through the 1980s, when political crisis and economic pressures drove a reorganization. One major marker of this reorganization was disinvestment by Ford and GM. A result was that by the 1980s, in contrast to the situation today, most production in the country was done by companies that were either wholly or primarily owned by South African capital, even if they produced through licensing arrangements with global auto brands (Masondo, 2018).

By the end of the 1980s the prospects for the industry looked bleak. It was almost entirely focused on the small local market, and by international standards productivity levels were low and wages were high (Black, 2009). Already in 1989 the Apartheid government introduced new measures to attempt to expose the industry to competition and promote exports. This policy direction was accelerated by the post-Apartheid state with the introduction of the Motor Industry Development Programme (MIDP) in 1995.

The MIDP, following on from a change that occurred in the last years before democracy, shifted the incentive structure of industrial policy in the auto sector. Rather than simply promoting the use of local content in finished automobiles, the MIDP promoted exports by allowing automakers to count exported vehicles or components towards local content. Essentially, automakers could earn credits by exporting which gave them more flexibility in decisions about the production for the local market. Tariffs on vehicles were also progressively lowered.

In this same period, previously nationally owned firms producing on license were reabsorbed by the global OEMs. By 2010 auto production was entirely foreign owned (Masondo, 2018). These two changes were related as incorporation into global networks allowed companies to strategically shift production in ways that maximized the benefit of the export incentives. For example, a firm could produce vehicles or even components for export in South Africa and thereby earn the credits to import completely foreign-produced vehicles for sale in the local market.

The MIDP, along with the Automobile Production Development Programme which replaced it in 2013, has had a number of successes. Both overall volumes and especially exports have grown dramatically. In 1995 only 4% of vehicles produced in South Africa were exported and vehicle exports accounted for 4% of total exports. As of 2021 63% of vehicles are exported and these account for 13% of total exports (Lamprecht, 2022). However, there remain major challenges. With the shift from local content requirements to export incentives, local content as a proportion of completed vehicles in South Africa has declined rather than increased, employment in the industry has stagnated. As domestic producers have increasingly oriented towards export they have lost domestic market share. By 2015 only 18.3% of the new cars sold in the country were produced domestically. As a result of these dynamics the industry as a whole runs at a trade deficit (Barnes et al., 2018).

The poor performance of the South African economy since the 2008 financial crisis has exacerbated these problems. New vehicle sales in South Africa peaked in 2006 at 714,315 units. Even on the eve of the Covid pandemic in 2019 sales (536,612 units) were roughly 25% below the 2006 peak.

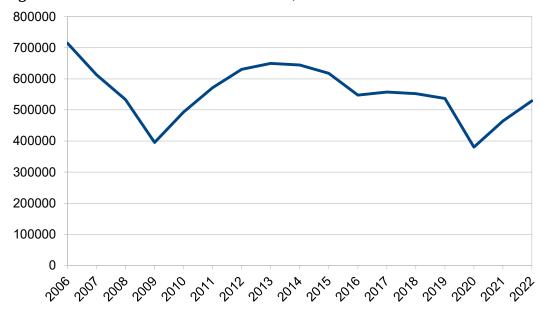


Figure 4: New Vehicle Sales in South Africa, 2007-2022

Source: Naamsa New Vehicle Sales reports

In short, South Africa has become increasingly reliant on exports and, in the context of a stagnating domestic market, strategic engagement with government incentives is the major driver of investment and production strategies of global producers. Already before the pandemic this was seen as a vulnerable situation, in part because of the anticipated shift of the markets to which South Africa exports towards electric vehicles. This was the context in which the Automobile Master Plan was conceptualized. As with Clothing and Textiles, the fact that the Master Plan was launched in the midst of the Pandemic (or technically, in the case of Autos, just before the pandemic) had important implications for the way the pandemic affected the industry. We turn to this period in the next section.

5.2. The Automobile Master Plan and the Covid Pandemic

The Automobile Master Plan represents a departure from previous industrial policy in the sector in many regards. One example of this is the plan's emphasis on the local and regional market as opposed to the traditionally dominant export markets in the global North. The small share of the domestic market supplied by local producers is seen as a potential area to drive growth. The same applies to the regional market where new car sales are negligible as most demand is met through imported used cars from Japan and North America. The plan discusses a number of different methods for increasing the market share of local production, including using policy levers to limit both the number of OEMs in the market as well as the number of models each produces in order to allow the development of economies of scale which would increase the competitiveness of local production.

Expansion into the regional market is a complex proposition. A shift of the market from imported used cars to locally produced new cars would necessarily entail higher costs for consumers and would have to be driven by tariffs or other barriers to importing. The plan recognizes that it would therefore be necessary to incentivize regional governments to shift in this direction by shifting some production activities into neighboring countries and building a regional auto production network. An interview

with an expert involved in crafting the Automobile Master Plan noted that, despite its inclusion in the plan, this idea of expanding production into neighboring countries remains controversial and is seen by some in government as a potential source of competition for the South African industry rather than as an avenue for the growth of the sector⁶.

The other aspects of the plan—localization, technological and skills upgrading, infrastructure development, and transformation⁷—are less novel and have long been features of policy in the sector, although, it should be noted that the inclusion of transformation as a pillar of the Master Plan could be seen as constituting an increased emphasis, since previously the industry was subject to the general policy promoting transformation in the country rather than sector-specific strategies. It is the orientation of this general sectoral development towards the local and regional market which marks a shift.

The pandemic has altered both the global landscape and local context of the sector, but as with the clothing and textile sector, the changes can be best summarized as accelerations of ongoing trends rather than ruptures with what came before. The immediate effects on the industry in South Africa were similar to what was experienced around the world. There was a sudden shock to the market in 2020 as the lockdown was implemented. As mentioned above, the preceding decade had already been an extended sluggish period of sales, so the market has taken longer to recover than it did in some other countries.

Perhaps more important than the domestic effects have been global shifts in the automobile sector and in particular in government policy towards the sector in wealthy countries. The pandemic period has seen the rise of what have been dubbed "subsidy wars" (Ingaki et al. 2023) between the leading economies of the world. The Inflation Reduction Act in the US, the Green Deal in the EU, and long standing policies in China all have given significant support to promote the respective domestic electric vehicle (EV) sector, including incentivizing domestic demand and production of EVs. The EU policies, which plan to end the sale of non-electric vehicles by 2035, are particularly important for South Africa as the EU is by far the leading destination for South African manufactured vehicles, accounting for 77.1% of light vehicle exports in 2022 (Lamprecht 2022). At present South African production of new energy vehicles is extremely limited with both Toyota producing one plug-in hybrid model and Mercedes-Benz producing two.

South Africa's automakers have complained that domestic policy promoting EVs has been severely lagging⁸. The DTIC published a green paper—a preparatory policy document—on new energy vehicles in 2021 and committed to publishing the full policy white paper later in the year. However as of July 2023 the white paper has not been released. Of course, one of priorities of local producers is to pressure government to jump into the "subsidy wars" and support the purchasing and/or manufacturing of EVs. However, even if subsidies are not on the table there are many issues that are important to clarify in policy, such as standards for charging infrastructure, in order to facilitate the growth of the EV market.

⁶ Interview with industry expert

[&]quot;Transformation" in the South African context refers to the process of increasing representative of previously disadvantaged groups, including black people, women, and disabled people. Transformation policy in the auto industry focuses on multiple levels, from regular employees, to management, to owners, to suppliers.

⁸ This was reflected in our interviews with OEMs and with the business organization Naamsa and is also a frequent refrain in media and public statements from OEMs.

The pandemic has served to exacerbate this moment of flux and uncertainty. It is our impression that many actors in the industry are taking a wait-and-see approach to their long terms strategic plans. Mercedes-Benz South Africa has indicated publicly that recent upgrades to its production facilities in South Africa mean it would be able to produce more EVs in South Africa, if the market and policy environment allowed, even though it has no immediate plans (Venter 2023). Another major OEM we spoke to said they had no plans to shift to EVs in South Africa and could make up for declining exports to the EU through increasing exports of the internal combustion engine vehicles to the African market.

Perhaps reflecting this flux and uncertainty there are ongoing shifts among the OEMs in South Africa. A number of new OEMs have recently begun or soon plan to begin production in South Africa. Between 1973—when BMW began production in South Africa—and 2018 only one new manufacturing OEM of light vehicles (Isuzu in 2002) entered the market. In 2018 Mahindra opened an assembly plant in Durban. The Chinese brand BAIC has just completed a new production facility in Gqebera 2023, and Stellantis⁹ has announced a new facility set to begin production in 2025. This growth is surprising in that it has taken place in a period in which the local market has been relatively stagnant.

Another example of the changes taken place in the industry is Volkswagen's expansion on the continent beyond South Africa. Volkswagen opened assembly plants in Nigeria in 2015, Kenya in 2016, Rwanda in 2017, and Ghana in 2020. In 2017 the global Volkswagen Group created a new Sub-Saharan Africa region which is managed by Volkswagen South Africa. This strategy of expansion seems to be heavily influenced by government incentives offered by African countries, which could be interpreted as the knock on effect of the subsidy wars taking place between rich economies.

It is noteworthy that despite the major shifts taking place in the sector, data on employment levels in the sector reported by the business association of OEMs show that direct employment in vehicle manufacturing has remained relatively stable. Over the last eight years employment has been around 30,000 employees, with only minor fluctuation, even during the height of the pandemic and lockdowns in 2020. This confirms what both unions and employers we spoke to reported, namely that direct employees of OEMs did not lose their jobs during the pandemic nor did they lose pay. However, some manufacturers did use a system in which workers had to make up hours for which they were paid but did not work during lock-down, either because plants were shut or because they had to operate with fewer workers as per Covid regulations.

OEM's also played a significant part in the direct healthcare response to the crisis. As in the clothing industry, some OEMs used their own in-house clinics to manage testing rather than relying on government or private sector hospitals. This allowed for workers who contracted Covid to quarantine and return to work more quickly.

However, the employment and health benefits that full-time workers of OEMs received does not reflect the experience of all workers in the sector. Even at the OEMs, a portion of the workforce works on a casualized basis. One OEM explained a process whereby previous employees are kept on a standby system to be brought in during periods of higher demand. Most of these non-contracted employees

⁹ Stellantis was formed in 2021 through a merger of Fiat-Chrysler and the French PSA Group which manufactures Puegot, Citroen, and Opel.

were not working during the pandemic period or for a long period after until demand recovered and supply chain bottlenecks were resolved.

On the basis of our interviews it seems that workers at suppliers were also not as protected, with loss of shifts and full loss of employment more widespread. However, workers did benefit from the government's wage subsidy programme, the TERS, so complete loss of income was not common. Yet even if workers in the sector generally weathered the immediate storm of the Covid pandemic. The uncertainty that hangs over the industry at the moment makes longer term prospects less clear.

6. Conclusion

In the 1990s and early 2000s the clothing and textile industry was the exemplar of the negative effects of liberalization on the economy (Mosoetsa 2010). The sector experienced massive job loss, informalization, and a collapse in investment to the point that it was widely perceived as a "sunset industry" (Barnes 2005:11). While the negative effects of liberalization were particularly bad for clothing and textiles, manufacturing in general declined in this period, with the exception of the auto industry, which was seen as a "notable success" (Altman and Mayer, 75) of post-1994 industrial policy. Auto production went from being small, protected, and entirely inward focused to being export-oriented and fully integrated into the global production networks of leading OEMs. What stands out from the comparison of the two industries in the Covid period is the stark reversal of their fortunes.

We should note that in neither case is it correct to say that there has been a complete reversal. The auto industry remains the leading manufacturing industry in the country, but its recent performance and future prospects are far from a notable success. Production and employment have stagnated and there seems to be little clarity on how the sector will adapt to the coming changes brought on by the shift to new energy vehicles. The emergence of new OEMs and restructuring of existing ones seems more oriented to benefiting from governmental support programmes than any real growth in productivity or markets.

Similarly the clothing sector cannot be seen as having completely turned things around. In fact, one impetus for the new energy in industrial policy is the intense competition from leading international brands like H&M, Zara, and Shein who have recently entered the local market. However, where the auto sector seems in flux and lacking a clear direction, the clothing and textile sector seems to have a renewed energy.

In trying to understand why there has been such an unexpected shift it is important to recognize that in both sectors the changes are driven not by the Covid pandemic itself, but by ongoing trends at the level of the global industry leaders. One commonality that effects both sectors is the increased space for direct state support for and protection of domestic industries.

It is perhaps important that the leading economies of the world are all involved in automobile production, whereas clothing and textile production is not a major industry in rich countries. Similarly in South Africa auto production is dominated by foreign capital, whereas domestic firms remain important players in clothing, and especially clothing retail. This perhaps partially explains why there seems to be more possibilities for the clothing sector than the auto sector.

In the auto sector, whatever increased policy space is available is ultimately only providing the "freedom" to attempt to out-compete the leading global firms and the state support they are receiving in the US, China, the EU, and elsewhere. The high levels of state support in the global North and the international nature of capital in the auto sector mean that firms are under little pressure to work with the South African government and to find solutions to problems they face within the South African market. Firms strongest relationships are with their "home" countries, and in any decisions about reorganizing their global production networks, they face a "sellers' market" in which governments are competing to attract them. By contrast, in the clothing sector, there is a strong incentive for local firms to work with the South African government to try to protect and expand domestic and ultimately global market share.

But even if these trends were identifiable before Covid, it seems clear that the pandemic has accelerated them. In South Africa the disruption of the pandemic seems to have further muddled the already unclear situation facing the auto industry. In the clothing sector the intensity of the emergency responses to the pandemic has contributed to the renewed energy and policy developments.

References

- Altman, M., Mayer, M., 2003. Overview of industrial policy, in: Human Resources Development Review: Education, Employment and Skills in South Africa. HSRC Press, Cape Town, pp. 64–85.
- Barnes, J., 2005. A strategic assessment of the South African clothing sector [WWW document]. Nedlac. https://tips.org.za/files/barnes_nedlac_clothing.pdf (accessed 7.30.23).
- Barnes, J., Black, A., Monaco, L., 2018. State—business bargaining, localisation and supply chain development in the South African auto industry. Presented at the 4th Annual Competition and Economic Development (ACER) Conference, Johannesburg, South Africa.
- Bhorat, H., Köhler, T., 2020. Lockdown economics in South Africa: Social assistance and the Ramaphosa stimulus package. Africa In Focus. URL https://www.brookings.edu/blog/africa-infocus/2020/11/20/lockdown-economics-in-south-africa-social-assistance-and-the-ramaphosa-stimulus-package/ (accessed 2.21.21).
- Bieber, F., 2022. Global nationalism in times of the COVID-19 pandemic. Nationalities Papers 50, 13–25.
- Black, A., 2009. Location, Automotive Policy, and Multinational Strategy: The Position of South Africa in the Global Industry since 1995. Growth and Change 40, 483–512. https://doi.org/10.1111/j.1468-2257.2009.00491.x
- Black, A., 2001. Globalization and restructuring in the South African automotive industry. Journal of International Development 13, 779–796.
- Black, A., Roberts, S., 2009. The evolution and impact of industrial and competition policies, in: Aron, J., Khan, B., Kingdon, G. (Eds.), South African Economic Policy Under Democracy. Oxford University Press, Oxford, pp. 211–243.
- Bowman, A., 2020. Parastatals and economic transformation in South Africa: The political economy of the Eskom crisis | African Affairs | Oxford Academic. African Affairs 119, 395–431.
- Bradshaw, D., Dorrington, R., Laubscher, R., Groenewald, P., Moultrie, T., 2022. COVID-19 and all-cause mortality in South Africa the hidden deaths in the first four waves. South African Journal of Science 118. https://doi.org/10.17159/sajs.2022/13300
- Buthelezi, L., 2022. "They wouldn't budge": Mboweni blames banks for failure of the Loan Guarantee Scheme. News24.com.
- Cohen, P., 2023. Why It Seems Everything We Knew About the Global Economy Is No Longer True. The New York Times.
- Crotty, A., 2022. SA's textile sector is staging a comeback. Financial Mail.
- Davis, D., 2022. Here be dragons: Sars win on underpriced clothing affirms the integrity of the tax system. Business Day.
- Duncan, D., Payne, B., 1993. Just in time South Africa: Japanese production systems in the South African motor industry. Capital & Class 17, 11–23.
- Elias, A., Ben, J., Mansouri, F., Paradies, Y., 2021. Racism and nationalism during and beyond the COVID-19 pandemic. Ethnic and Racial Studies 44, 783–793.
- Government of South Africa, 2020. The South African Economic Reconstruction and Recovery Plan.
- Hale, T., 2021. What we learned from tracking every COVID policy in the world. The Conversation. URL http://theconversation.com/what-we-learned-from-tracking-every-covid-policy-in-the-world-157721 (accessed 7.3.23).
- Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., Tatlow, H., 2021. A global panel database of pandemic policies

- (Oxford COVID-19 Government Response Tracker). Nat Hum Behav 5, 529–538. https://doi.org/10.1038/s41562-021-01079-8
- IDC, 2022. Integrated Report 2022. Industrial Devlopment Corporation.
- Inagaki, K., Chazan, G., Fleming, S., 2023. A global subsidy war? Keeping up with the Americans [WWW Document]. Financial Times. https://www.ft.com/content/4bc03d4b-6984-4b24-935d-6181253ee1e0 (accessed 7.30.23)
- Jain, R., Bassier, I., Budlender, J., Zizzamia, R., 2020. The labour market and poverty impacts of COVID-19 in South Africa: An update with NIDS-CRAM Wave 2 (No. 272), Saldru Working Papers. SALDRU, UCT, Cape Town.
- Johns Hopkins Coronavirus Resource Center [WWW Document], n.d. URL https://coronavirus.jhu.edu/data/mortality (accessed 7.3.23).
- Kumar, A., 2020. Monopsony capitalism: Power and production in the twilight of the sweatshop age. Cambridge University Press.
- Lamprecht, N., 2022. Automotive Export Manual: 2022. Automotive Industry Export Council, Pretoria. Masondo, D., 2018. South African business nanny state: the case of the automotive industrial policy
- post-apartheid, 1995–2010. Review of African Political Economy 45, 203–222.
- Mathieu, E., Ritchie, H., Ortiz-Ospina, E., Roser, M., Hasell, J., Appel, C., Giattino, C., Rodés-Guirao, L., 2021. A global database of COVID-19 vaccinations. Nature Human Behaviour 5, 947–953. https://doi.org/10.1038/s41562-021-01122-8
- Mathieu, E., Ritchie, H., Rodés-Guirao, L., Appel, C., Giattino, C., Hasell, J., Macdonald, B., Dattani, S., Beltekian, D., Ortiz-Ospina, E., Roser, M., 2020. Coronavirus Pandemic (COVID-19) [WWW Document]. Our World in Data. URL https://ourworldindata.org/covid-stringency-index (accessed 7.3.23).
- Morris, M., Barnes, J., 2008. Globalization, the changed global dynamics of the clothing and textile value chains and the impact on Sub-Saharan Africa (No. 10), UNIDO Research and Statistics Branch Working Paper. University of Cape Town, Vienna.
- Mosoetsa, S., 2011. Eating from One Pot: The Dynamics of Survival in Poor South African Households. Wits University Press, Johannesburg.
- Nxesi, T., 2022. Two-year anniversary of the UIF's Covid-19 TERS. Department of Employment and Labour.
- Olivié, I., Gracia, M., 2020. The end of globalisation? A reflection on the effects of the COVID-19 crisis using the Elcano Global Presence Index. International Journal for Physical and Engineering Sciences.
- Posen, A.S., 2022. The End of Globalization? Foreign Affairs.
- Reuters, 2022. IMF sees cost of COVID pandemic rising beyond \$12.5 trillion estimate | Reuters. Reuters.
- Scully, B., 2023. South Africa's response to the Covid-19 Pandemic: The crisis in the context of the history of South African Capitalism (No. 200/2023), IPE Working Paper Series. Institute for International Political Economy Berlin, HWR Berlin.
- Silver, B.J., 2003. Forces of labor: workers' movements and globalization since 1870. Cambridge University Press.
- StatsSA, 2020. Quarterly Labour Force Survey (No. Statistical Release P0211). Pretoria.
- UN, n.d. 14.9 million excess deaths associated with the COVID-19 pandemic in 2020 and 2021 [WWW Document]. United Nations. URL https://www.un.org/en/desa/149-million-excess-deaths-associated-covid-19-pandemic-2020-and-2021 (accessed 7.3.23).
- Venter, I., 2023 Mercedes-Benz to make second hybrid in SA, but competitiveness concerns mount.

- Engineering News [WWW Document]. URL https://www.engineeringnews.co.za/article/mercedes-benz-to-make-second-hybrid-in-sa-but-competitiveness-concerns-mount-2023-01-20-1 (accessed 7.31.23).
- Vlok, E., 2006. The Textile and Clothing Industry in South Africa, in: Jauch, H., Traub-Merz, R. (Eds.), The Future of the Textile and Clothing Industry in Sub-Saharan Africa. Friedrich Ebert Stiftung, Bonn, pp. 226–246.
- Von Holdt, K., 2019. The Political Economy of Corruption: Elite-formation, factions, and violence (Working Paper No. 10), Society Work and Development Institute (SWOP). University of the Witwatersrand.
- Wexler, A., 2023. Fast-Fashion Giant Shein Faces South Africa Probe Over Import Practices. Wall Street Journal.
- Wise, J., 2023. Covid-19: WHO declares end of global health emergency. BMJ 381, p1041. https://doi.org/10.1136/bmj.p1041

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