Revitalising SA's Manufacturing Sector

By: Pan-African Investment & Research Services (Pty) Ltd

A report prepared for

Proudly South African

CONTENTS

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Acronyms and Abbreviations

AMIESA	Association of Meat Importers & Exporters South Africa
APIs	Active Pharmaceutical Ingredients
ASU	Apparent Steel Use
BEE	Black Economic Empowerment
BOF	Basic Oxygen Furnace
CEO	Chief Executive Officer
CGE	Computable General Equilibrium
CPI	Consumer Price Index
DAFF	Department of Agriculture, Forestry and Fisheries
DARLRRD	Department of Agriculture, Land Reform and Rural Development
DTIC	Department of Trade, Industry and Competition
EAF	Electric Arc Furnace
EPA	(United States) Environmental Protection Agency
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization
FIMP	Furniture Industry Master Plan
GDP	Gross Domestic Product
GVA	Gross Value Added
HPL	Health Promotion Levy
IPASA	Innovative Pharmaceutical Association South Africa
ITAC	International Trade Administration Commission of South Africa
LLC	Law Library of Congress
MNC	Multinational Company
MVA	Manufacturing Value Added
MHT	Medium-and-High Technology
Nedlac	National Economic Development and Labour Council
NHI	National Health Insurance
NDP	National Development Plan
OEMs	Original equipment manufacturers
PAIRS	Pan-African Investment and Research Services
PPPFA	Preferential Procurement Policy Framework Act
PPI	Producer Price Index
Proudly SA	Proudly South African
R&D	Research and Development
SAAM	South African Automotive Master Plan
SACU	South African Customs Union
SAM	Social Accounting Model
SAFI	South African Furniture Initiative
SARB	South African Reserve Bank
SARS	South African Revenue Service
SIC	Standard Industrial Classification
SMMEs	Small, Medium and Micro Enterprises
Stats SA	Statistics South Africa
UNIDO	United Nations Industrial Development Organisation

Highlights

Revitalising SA's Manufacturing Sector Part 3

01 The Manufacturing Sector and the South African Economy

The **manufacturing** sector is in urgent need of a turnaround, in terms of its contribution to the economy and its export competitiveness.

Investment into manufacturing was at very low levels even in the pre-covid years, which is part of the problem when it comes to the sector's declining contribution to the economy.

A side effect of de-industrialisation is a falling **tax contribution** by the manufacturing sector: from 16.7% in 2017 to 13.2% in 2020, job losses is another key socio-economic impact.

The sector faces **supply chain constraints** as well as infrastructure, labour cost and skills constraints.

Demand side constraints include global inflation, disrupted international logistics networks, the repeated and uncertain lockdowns in China and the global consequences of war in Ukraine.

The manufacturing sector is also being forced to become more **environmentally-sensitive**, which imposes new costs and constraints.

02 Key Manufacturing Sub-Sectors

The **agro-processing sector** contributed 5% to value added in 2021 and holds potential for increased SMME involvement, export growth and employment, provided certain barriers to entry can be dealt with.

The **meat sector** was negatively impacted by Covid-19 but has begun to recover. Poultry is the largest component of the sector, at 40% and this sub-sector is currently the subject of an investment plan expected to create up to 4000 additional jobs.

The **sugar** sector has been under pressure since legislation was introduced to curb sugar intake for health reasons. The Ukraine war is expected to provide some relief as export demand for sugar rises.

The **furniture** sector is relatively labour-intensive and has the potential to contribute to job-creation, however both local and foreign demand have been muted.

The **automotive** sector is a successful exporter and contributes 4.3% to SA's GDP. It is more capital intensive than the other manufacturing sub-sectors but employs more than 100 000 people.

The **steel** sector is under pressure due to declining global steel demand and rising energy prices. This sector will benefit from the recovery in South Africa's construction, automotive and mining sectors, to which it is backward-linked.

03 Modelling the Manufacturing sector in the South African Economy

Projected medium-term **GDP** contribution of 13% as a result of a 10% increase in investment into the manufacturing sector.

13% GDP Contribution

Projected medium-term **employment creation:** 8% (unskilled jobs). Actual number of new jobs created (all skill levels): 75 300 in manufacturing, 11 500 in mining and 10 100 in agriculture.

8% Employment Creation

For a 10% increase in **investment** spending in manufacturing, the projected medium-term overall investment boost across the economy is 8.3%.

8.3% Overall investment boost

For a 10% increase in investment spending in manufacturing, the projected medium-term **fiscal revenue** boost is 9%.

9% Fiscal Revenue Boost

04 Policy Implications and the Way Forward

SA Industrial Revitalisation has two basic requirements

a

Transversal Requirements: The world over, these include:

1. Energy
2. Water
3. Skilled human resources
4. Transportation and export logistics network
5. Scientific capabilities for R&D
6. Supportive regulatory environment

b

Sector-Specific Requirements vary from sector/ industry to industry. Yet three megatrends are at play worldwide; these are:

- Technological disruptions
- Imperative of industrial greenification and sustainability
- Rising consumer activism pressing for ESG compliance

The success of SA's re-industrialisation rests on an effective partnership framework within which the public sector implements a well-coordinated, intergenerational infrastructure provision programme whilst the private sector in diverse industries focuses on industry-specific dynamics.

The Way Forward:

In each sub-sector or industry, there is need for an appropriate **institutional framework** for coordination and implementation review (or a 'Project Management System') of the public and private sector parallel action plans.

INTRODUCTION

01

a. Background

b. Objectives of the Study

a. Background

This report is the third in a series of research papers on the South African manufacturing sector that both highlight the sector's notable contribution to the South African economy and the need to effectively support the sector, so as to unlock the sector's potential and for it to meaningfully contribute to different aspects of the country's development. In addition, the reports make a case for the South African manufacturing sector, for the opportunities available for growth, and for its overall capacity to better compete in the global economy.

South Africa's manufacturing sector, similar to its global counter parts, is facing a host of new challenges on account of the implications of the ongoing Covid-19 pandemic – and this is over and above the pre-existing (i.e.: pre-pandemic) sectoral and macroeconomic policy handicaps the sector has to contend with. The growing concerns for environmental sustainability, the rising consumer awareness about the significance of reducing carbon footprint for all goods and services, and the escalation in the cost of energy in all its forms are but a few examples of the constraints within which global manufacturing needs to redefine its operations. In effect, a process of de-globalization is at play, in part driven by the recent and ongoing global supply chain disruptions highlighting the need for increased localization as a means of expansion, security and survival for certain industries. As a corollary, local procurement plays an important role in the local manufacturing sector, and done in the right manner, could help bolster the struggling sector in order for it to contribute more towards the country's sustainable growth.

To this end, it is critical that national and sectoral industrial strategies be based on two effective pillars. One is an appropriate competitiveness matrix – not simply price comparisons. Second, local procurement should be driven by an appropriate blend of value chain linkages, economics of agglomeration, and market-driven and efficient regulations. These themes will run through this report.

The previous two reports were entitled: **"MAPP: Revitalising SA's Manufacturing Sector" and "MAPP: Revitalising SA's Manufacturing Sector Part 2".** The first report underscored the changing structure of the South African economy as well as that of the manufacturing sector, the sector's export performance, contribution to employment, impact on government finances as well as the country's external accounts. It sought to quantify the importance of the sector in general, highlighting the multiplier effects that the sector has in the economy.

In the second report, the manufacturing sub-sectors of agro-processing and pharmaceuticals were identified by Proudly SA as some of the important drivers of sustainable growth, with high potential for expansion, given the right environment. Hence the study focused on the two sub-sectors and investigated their impact on the economy. Moreover, the work went further by looking at local procurement opportunities in the manufacturing sector as well as the two sub-sectors in particular. Similar to the first study, a Computable General Equilibrium (CGE) analysis of the manufacturing sector was carried out with the aim of investigating the multiplier effects that the sector has on the various economic variables deemed important to the country's socio-economic well-being.

b. Objectives of the Study

Serving as both an update and an extension to the work done in the previous two reports, the objective of this study is to analyse the South African manufacturing sector once again, and most importantly, quantify its contribution to the wider economy. The study investigates the multiplier effects manufacturing has on the country's growth, exports, job creation and fiscal revenue generation. It goes further in this by doing an analysis, including multiplier effects of the key industries of (i) agro-processing (ii) meat (iii) sugar (iv) furniture (v) automotive (vi) steel, and (vii) pharmaceuticals, on the country's macroeconomic variables. Finally, the study examines policies and other forms of sector support in manufacturing, including localization and local procurement, meant to assist the sector.

An investigation into the potential impact of injections into the manufacturing sector on the economy has increasingly become important given the deteriorating state of the economy, the structural nature of the country's labour force, wide-spread poverty and dire employment prospects. This is, moreover, in the context of the ongoing Covid-19 pandemic and the recent negative turn in the geopolitical sphere (i.e.: the Ukraine-Russian war). But as significant an impact these phenomena (particularly the pandemic) have had on manufacturing, the sector, like the rest of the South African economy, has been languishing under years of structural impediments that have stifled its optimal growth. It is hoped this, most recent analysis of South Africa's manufacturing sector and the respective sub-sectors will highlight the opportunities that provide real potential in boosting these industries to benefit the economy.

The study consists of a blend of descriptive statistical analysis and quantitative computations based primarily on both a social accounting model (SAM) and a computable general equilibrium (CGE) model of the South African economy. **Section II** provides an analysis of the Manufacturing sector within the context of the South African economy, reviewing the dominant trends in the sector. **Section III** critically examines the contemporary and current public policies and proposals aiming at the promotion of manufacturing activity in the country.

Section IV quantifies the technical and systemic linkages between the above mentioned seven key sub-sector industries and the broader economy. To this end, the manufacturing sector and sub-sectors' SAM and CGE model analysis are carried out with the aim of investigating the multiplier effects that the industry has on the country's growth, job creation, balance of payments and fiscal revenue generation. Such quantitative analyses help guide the relative impact that various policy options could entail. To the extent that the economic structure continues to change in response to the ongoing technological innovations and global business environment, such multipliers require regular updating as policies need technical review and impact analysis.

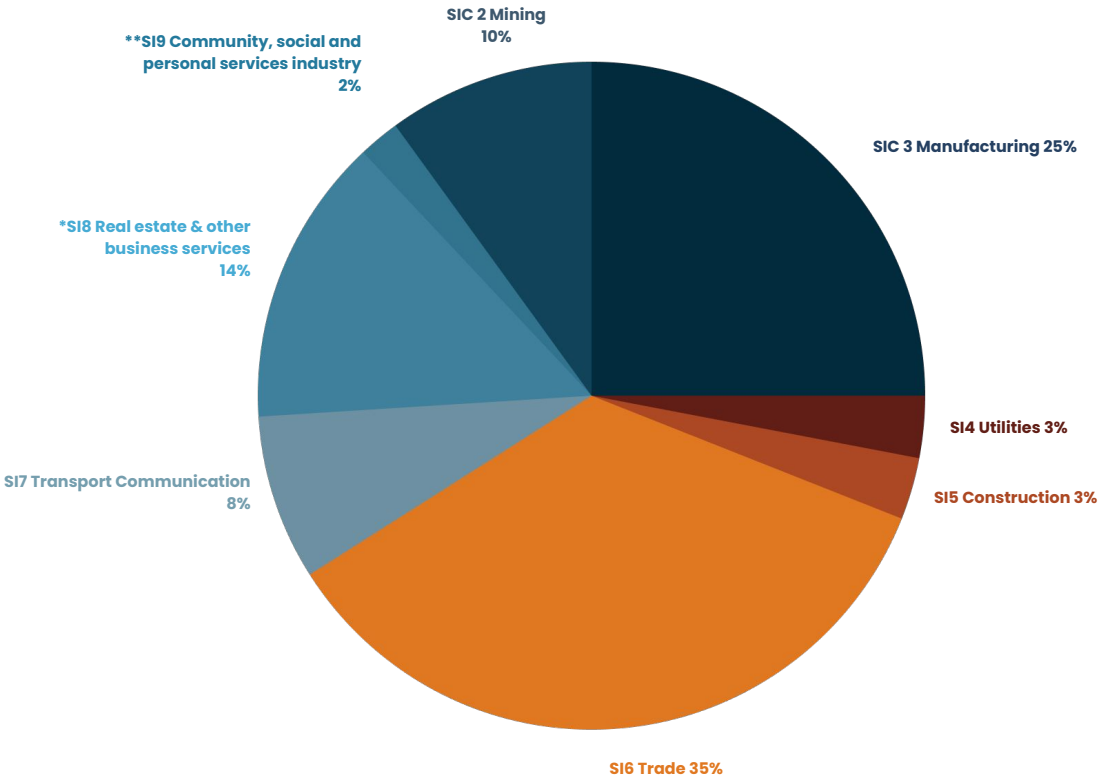
02 THE MANUFACTURING SECTOR AND THE SOUTH AFRICAN ECONOMY

a. The South African Manufacturing Sector

Manufacturing has historically been credited for being a key driver of higher value job creation and for the increase in living standards. The sector has indeed been vital to the South African economy and there are a myriad of reasons why it continues to be important. First and foremost, manufacturing contributes significantly towards the country's gross domestic product (GDP) – in 2021, the sector contributed 13%[1] towards GDP with a gross value added (GVA) of R523 billion. Additionally, the sector has one of the highest total turnovers by industry as depicted in Figure 1. The 2021 GVA, although an increase from 2020's low of R490 billion, was still significantly lower than the pre-pandemic GVA, i.e.: 2019's GVA of R559 billion. Relative to the performance of the sector in previous years, the 2021 manufacturing GVA was only closer to 2010's GVA of R525 billion. This, of course, mostly highlights the material impact, the Covid-19 induced economic crisis has had and continues to have on the manufacturing sector.

[1] *Own calculation from Stats SA data*

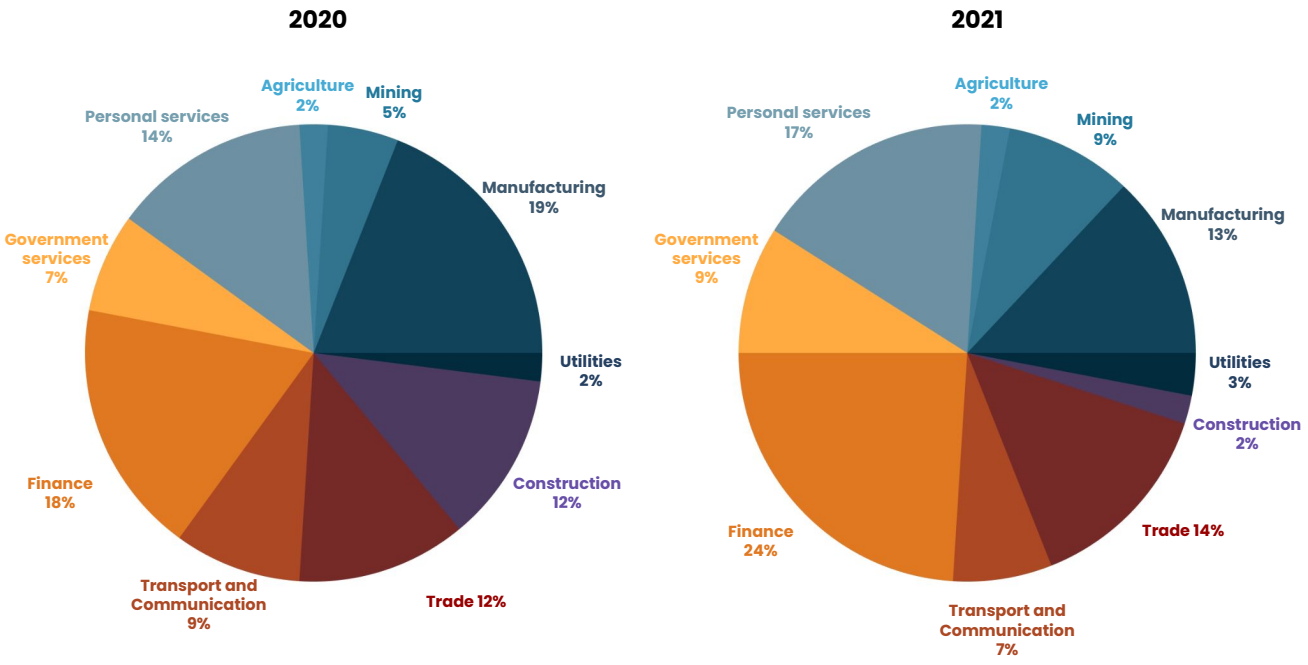
Figure 1: Percentage contribution to total turnover by sector, Q4-2021



Source: Stats SA data and PAIRS
Note: *excluding financial intermediation and insurance
** excluding government and educational institutions

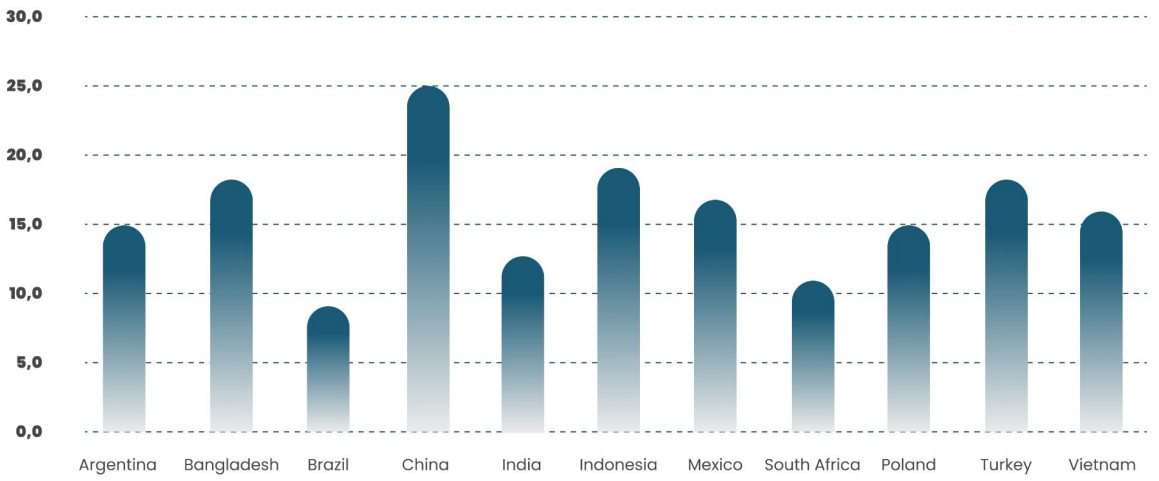
Recent exceptional dynamics brought on by the pandemic aside, South Africa's manufacturing sector as a share of the whole economy has declined significantly since its peak in the early 1980s, as discussed in the first report (2016). Empirical evidence demonstrates that as countries develop, the gradual decline of manufacturing sectors as a share of economies is the norm ('de-industrialisation'). However, the decline of the manufacturing sector in South Africa has been exceptionally accelerated, especially relative to its emerging market peers. Rodrik (2006) argues that the country's manufacturing has failed to keep up with those of other emerging countries such as China and Bangladesh. Figure 3 below provides manufacturing GVA as a share of GDP for a selected number of emerging market economies, and it indeed shows South Africa's GVA being relatively low compared to the other emerging market economies.

Figure 2: The Evolving Composition of the South African Economy, 2000 and 2021



Source: Own calculations, Stats SA (2022)

Figure 3: Manufacturing Value Added (% of GDP) for Selected Emerging Market Economies (2020)

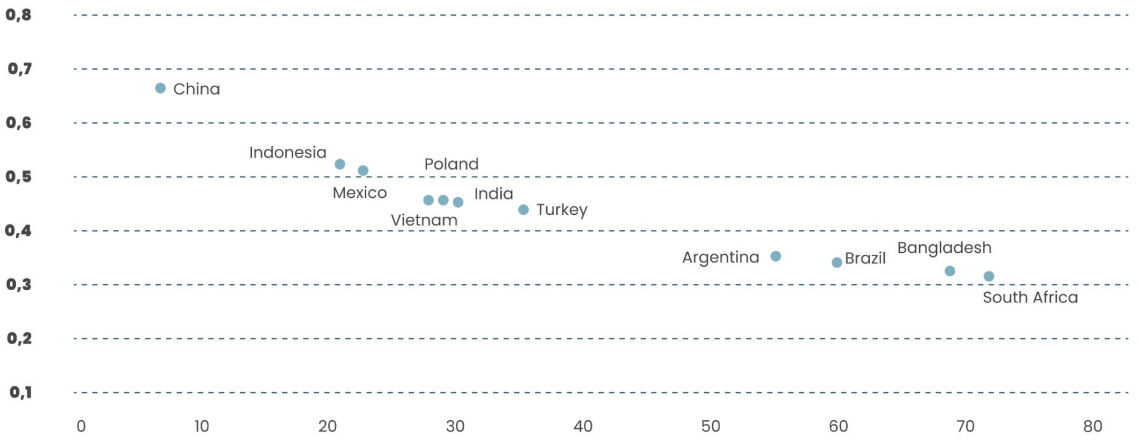


Source: World Bank data and PAIRS

Competitively, the South African manufacturing sector continues to lag those of its emerging market counterparts, hence its inability to 'keep up'. This is particularly demonstrated by the United Nations Industrial Development Organisation's (UNIDO) industrialisation intensity index as depicted in Figure 4 below.

The index is measured by taking the average of two measures: the share of manufacturing value added (MVA) in GDP and the share of medium-and-high-technology (MHT) activities in MVA. In turn, MVA (see Figure 3 above) captures the role of manufacturing in the economy, while MHT captures the technological complexity of manufacturing. South Africa had the lowest score[2] of the selected emerging market countries, causing it to rank lowest (72 out of a total of 152 countries) due to having both low MVA (Figure 3) and low technological complexity in manufacturing. It is a fact that manufacturing paradigms globally are rapidly evolving because of fast changing technologies, and the South African manufacturing sector needs to keep up in order to remain competitive.

Figure 4: Industrialisation Intensity Index for Selected Emerging Market Economies, 2020



Source: UNIDO data and PAIRS

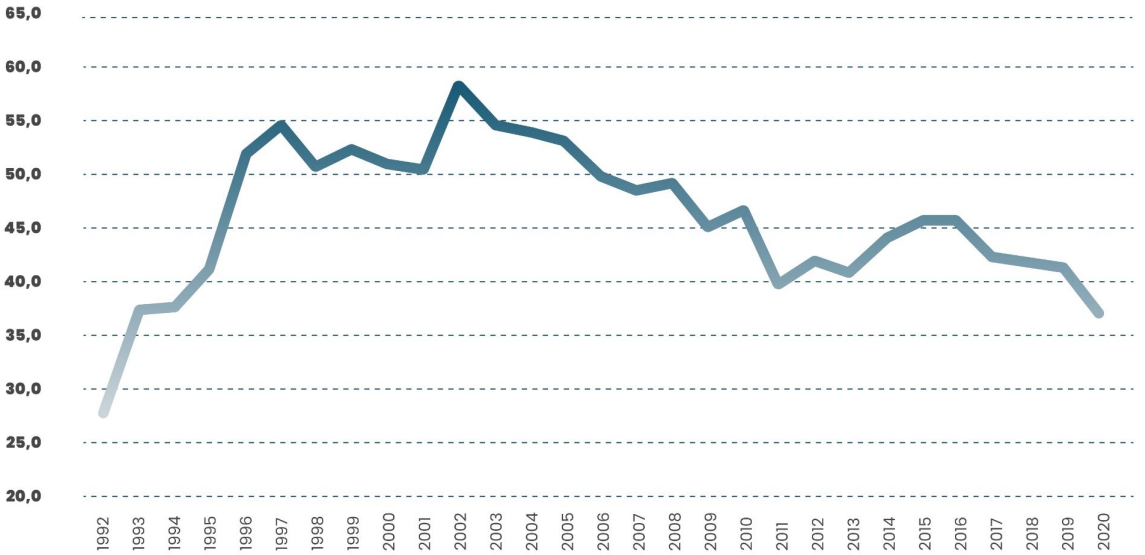
(i) Exports Competitiveness

Globally, manufacturing sector exports make up 70% of total merchandise exports as per 2020 data by the World Bank[3]. This value is even higher for key manufacturing economies such as China (94%) and averages 74% for upper-middle income countries of which South Africa is part of[4]. The latest available global exports data (2020) indicates that, of merchandise goods exported by South Africa, only 38% were manufactured goods. Since peaking two decades ago in 2002, the country's manufactured goods as a ratio of total merchandise exports have been on a downward trend as can be seen in Figure 5 below. In addition, South Africa's export values have generally been lagging those of the country's peers (see Figure 6 below), many of which have experienced impressive growth over the past two decades.

2 *2020 industrialisation intensity index*
3 *World Bank World Development Indicators, May 2022*
4 *Per World Bank classifications*

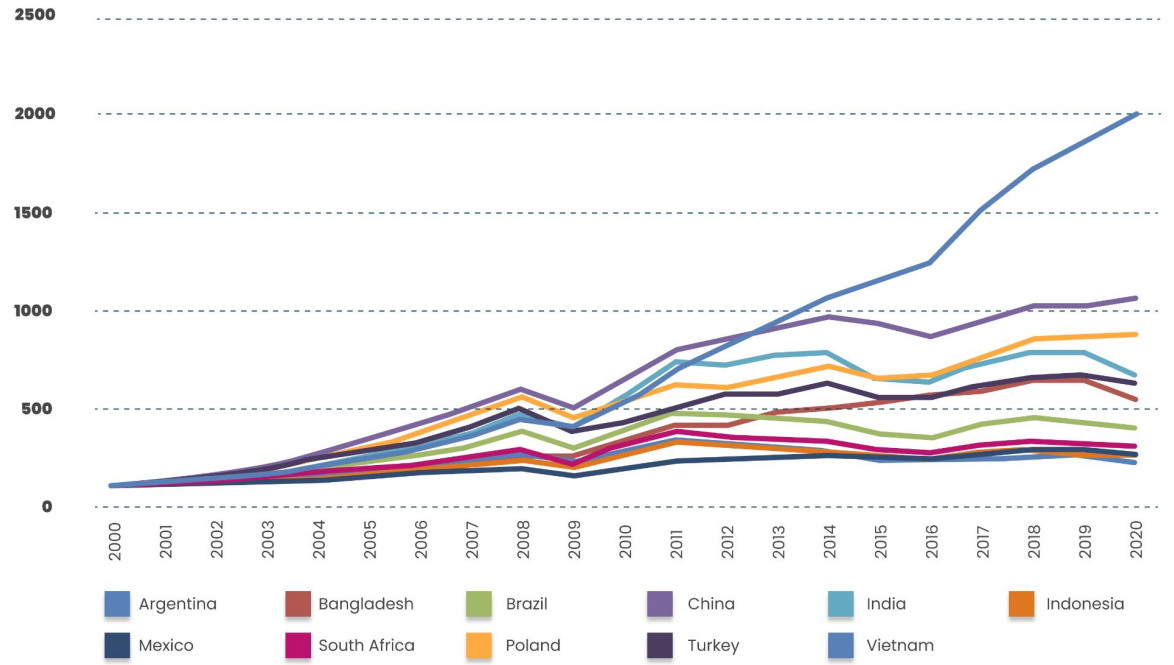
Again, this phenomenon can largely be ascribed to South Africa's lack of manufacturing competitiveness. Unlike its peers that have benefited from sound industrial policies and other forms of sector support, the country's domestic sector has largely been left unsupported. The exception in this case has mainly been the automotive industry (which is aided through the Automotive Production and Development Program, formerly the Motor Industry Development Program).

Figure 5: South African Manufactured Exports (% of Merchandise Exports)



Source: World Bank and PAIRS

Figure 6: Export Value Index (2000 = 100) for Selected Emerging Market Economies

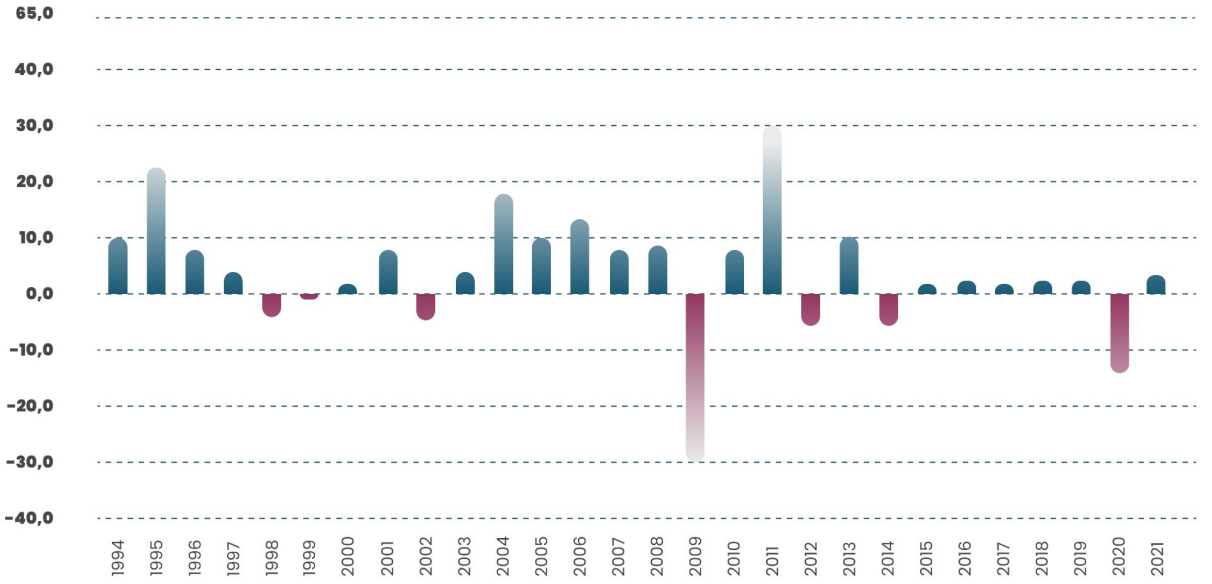


Source: World Bank and PAIRS

(ii) Investment in Manufacturing

Sufficient investment in any sector, including manufacturing, is a necessity for sustainable growth and development. Gross fixed capital formation has shown to be an important driver of economic growth in South Africa. By means of illustration, research by Perkins, Fedderke and Luiz (2005) finds there to be a long-run causal relationship running from investment in economic infrastructure, to stock of fixed capital to gross domestic product. South Africa's gross fixed capital formation in manufacturing totalled R87.7 billion in 2021, a slight recovery from its steep decline to R85.5 billion during 2020, but still significantly less than that of R98.7 billion registered in 2019. Overall, annual growth in manufacturing gross fixed capital formation averaged only 1.6 percent during the five years before the Covid-19 pandemic (see Figure 7 below). The low levels of gross fixed capital formation in manufacturing are hence leading to low levels of growth in manufacturing value added.

Figure 7: Real Annual Growth in Manufacturing Gross Fixed Capital Formation



Source: Stats SA data and PAIRS

(iii) Employment and the Manufacturing Sector

The National Development Plan (NDP) 2030 (the NDP was launched in 2012), a policy document with great ambitions on inclusive economic growth and job creation has so far fallen extremely short of its targets. It had plans of expanding manufacturing jobs by close to a million over a 20-year period. Manufacturing jobs, along with those in other sectors, have however, plummeted and the unemployment rate is currently at a staggering 34.3%[5]. As the share of manufacturing in the economy declines in the South African economy as already demonstrated in Figure 2, so too has the sector's overall contribution towards employment creation. Figure 8 below shows that, after peaking more than 3 decades ago, employment in manufacturing has been declining notably over the years. In addition, manufacturing shed a significant number of jobs on account of the Covid-19 pandemic. In 2019, i.e.: before the pandemic, an average of 1.8 million individuals were employed in the manufacturing sector, but this number had dwindled to an average of only 1.4 million in 2021.

The latest data from Statistics South Africa (Stats SA) shows that although manufacturing made up 13.5% of the economy in terms of sector share of nominal GDP during Q4-2021, manufacturing only contributed 9.1% towards total employment in the country. Figure 9 also demonstrates that even during those periods when manufacturing value added was

5 *For 2021*

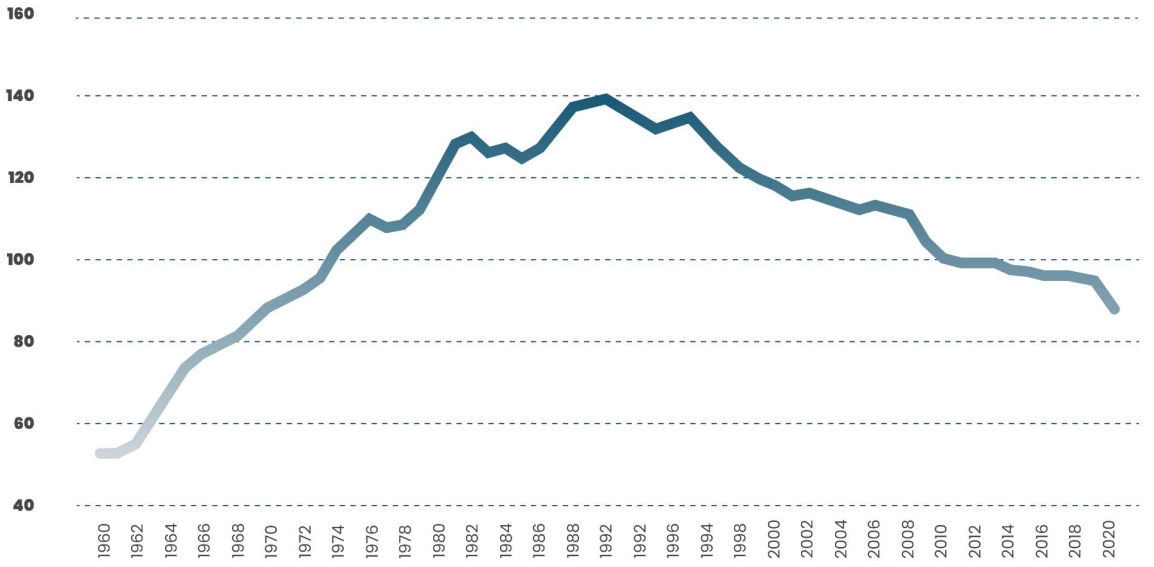
increasing, employment in manufacturing (as captured by the index of employment in manufacturing) was still deteriorating.

On the other hand, although the common argument is that South Africa's manufacturing sector is largely capital intensive as opposed to being labour intensive, evidence also signals to the country's manufacturing processes to be relatively lower in technology intensity. South Africa's share of medium-and-high-technology (MHT) activities in manufacturing value added is comparatively low and places the country at 68 out of 152 countries in the UNIDO 2020 Competitive Industrial Performance (CIP) report. This is much lower than emerging market peers such as India, China, Indonesia and Turkey, with MHT ranking of 28, 29, 44 and 50, respectively. These countries' manufacturing sectors still employ similar or more individuals as a ratio of total employment. As a share of total employment, the manufacturing sectors of India, China, Indonesia and Turkey employed 25%, 27%, 22%, 25% of workers respectively in 2019 according to World Bank data[6] relative to South Africa's 22%.

There are different means through which South Africa's manufacturing sector can contribute more towards employment creation depending on the type of manufacturing, i.e.: the level of capital and labour intensity. A study by Zalk (2014) points out that, for those sectors that are highly capital intensive, employment is largely created via the enablement of greater employment in other sectors. These other sectors are both medium and highly labour intensive through the provision of intermediate inputs at competitive prices. For those manufacturing sub-sectors in which capital and labour are complementary (e.g.: components for renewable energy sector), employment rises alongside capital investment. Lastly, for those manufacturing sub-sectors that are inherently labour intensive, there are ways to improve South Africa's competitiveness such as through the improvement of product quality and better industrial planning (e.g.: locating light industry closer to affordable housing). This then suggests that it is possible to improve different facets of the country's manufacturing sectors' abilities to better contribute towards employment by making use of the right policies and appropriate interventions.

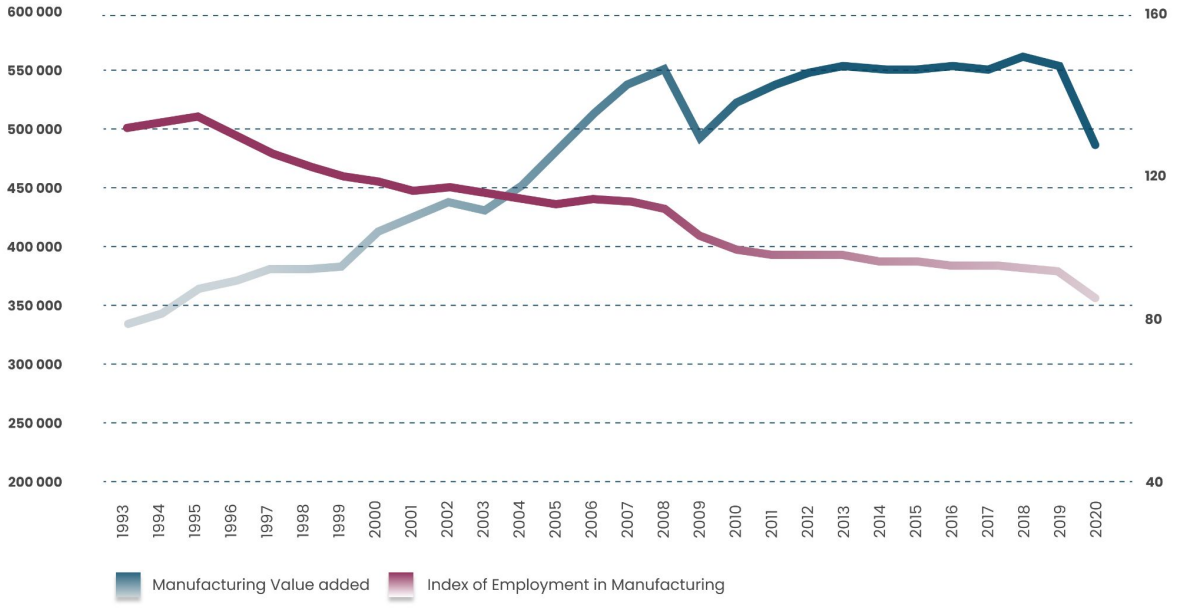
6 *World bank Indicators, May 2022*

Figure 8: Index of Employment in the Manufacturing Sector (2010 = 100)



Source: SARS and PAIRS

Figure 9: Manufacturing Value Added and Employment in Manufacturing, 1993 – 2020



Source: Stats SA, SARB and PAIRS
Note: MVA = constant 2015 prices
Manufacturing Employment Index, 2010 = 100

(iv) The Manufacturing Sector and the Fiscus

A critical impact of the ongoing de-industrialisation in South Africa is the rapidly declining number of taxpayers in the manufacturing sector, with negative implications for government revenue base. Table 1 illustrates the number of both taxpayers and tax assessed for the manufacturing sector from 2017 to 2020. It shows that although the number of tax payers in manufacturing had reached 71 304 in 2017, they declined by 3.6% as this number moderated to 68 760 in 2019 (i.e.: pre-pandemic), while the tax assessed also declined by 17.8% in nominal terms as it dropped from R35.3 billion to R29 billion during the period. The decline of both the number of taxpayers and tax assessed was steeper in 2020 on the back of the Covid-19 pandemic induced economic crisis. These trends do not bode well for the fiscus and economy as a whole and have grave negative macroeconomic consequences. The Covid-19 pandemic had a profoundly negative impact on the South African fiscus (a fiscus that was already weakened), and it is vital that the manufacturing sector's significant contribution towards government finances not only recovers but also expands.

Table 1: Manufacturing Sector Tax Assessed, 2017 – 2020

Tax Year	2017 (*100.2% assessed tax as % of provisional tax)*		2018 *(95.0% assessed tax as % of provisional tax)*		2019 *(93.4% assessed tax as % of provisional tax)*		2020 *(61.3% assessed tax as % of provisional tax)*	
Economic activity	Number of taxpayers	Tax assessed (R million)	Number of taxpayers	Tax assessed (R million)	Number of taxpayers	Tax assessed (R million)	Number of taxpayers	Tax assessed (R million)
Manufacturing*	71 403	35 325	68 369	33 203	68 760	28 990	61 559	16 487
% of total	7.3%	16.7%	7.6%	16%	8.5%	14.2%	8.7%	13.2%

Source: SARS data
Note: Includes the following SARS sectors – Bricks, ceramic, glass, cement and similar products; Chemicals and chemical, rubber and plastic products; Clothing and footwear; Coal and petroleum products; Food, drink and tobacco; Leather, leather goods and fur (excl. footwear & clothing); Machinery and related items; Metal (including metal products); Other manufacturing industries; Paper, printing and publishing; Scientific, optical and similar equipment; Textiles; Transport equipment; and Wood, wood products and furniture.

The rapid decline of South Africa's manufacturing sector is of particular concern then, as evidence from other fast growing emerging countries having been able to lift millions of people out of poverty in just a few decades (such as China) shows that they achieved this due to their robust manufacturing sectors. It is argued by Bhorat and Rooney (2017) that history shows those countries that transitioned from middle-income[7] to high-income did so on the

[7] *South Africa is an upper-middle income country according to World Bank classifications*

back of healthy manufacturing sectors. Zalk (2014) likewise highlights the work of the World Bank's Commission on Growth and Development (as captured in the 2008 report) in this regard. It shows 10 out of 13 countries (including Japan, Brazil, China, Indonesia and Malaysia) that were identified as having experienced 'episodes of high and sustained growth', i.e.: GDP per capita exceeding 7% per annum for 25 years and more, had growths that was led by their manufacturing sectors.

b. Challenges Facing the South African Manufacturing Sector

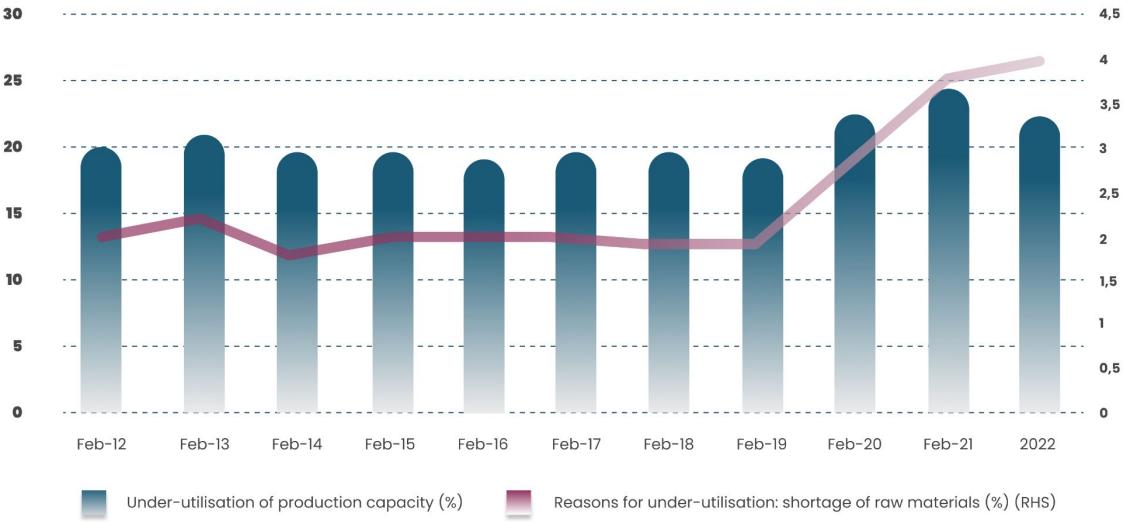
The South African manufacturing sector continues to be inhibited by a myriad of factors that prevent it from performing at its peak. Consequently, manufacturing's ability to contribute towards economic growth, employment, export and tax revenue is compromised. These elements include both supply and demand side factors, which were discussed extensively in the first two reports: "MAPP: Revitalising SA's Manufacturing Sector" and "MAPP: Revitalising SA's Manufacturing Sector Part 2". Both the supply-side and demand-side impediments faced by the country's manufacturers, including new emerging challenges, are highlighted below.

(i) Supply-Side Constraints

The Covid-19 pandemic triggered historic global supply chain disruptions that are still unfolding. These largely came on the back of lockdown restriction meant to curb the spread of the Covid-19 pandemic and the surge in demand as economies recovered from the Covid-19 induced recession, which then resulted in demand outpacing supply. The South African manufacturing sector too, continues to be adversely impacted by supply chain bottlenecks and shortages of raw material. For example, the ongoing shortage of microchips has had a negative impact on the domestic production of motor vehicles.

By means of illustration, not only has the South African manufacturing sector's utilisation of capacity been materially undermined since the beginning of the Covid-19 pandemic, but raw material shortages have also become increasingly prevalent. Figure 10 below provides the sector's ratio of under-utilisation of production capacity, together with the "shortage of raw materials" as the reason for the under-utilisation of capacity. Not only does the data show the under-utilisation of capacity increasing significantly since 2020, but there was a steep rise in "shortage of raw material" given as the reason for the under-utilisation.

Figure 10: Under-Utilisation of Production Capacity in South African Manufacturing



Source: Stats SA data and PAIRS
Note: Data is for the month of February

Other key supply-side constraints facing the South African Manufacturing Sector include:

a. inadequate infrastructure such as energy, water, transportation, and export logistics
b. high transport costs;
c. high unit labour costs that are also rising faster than labour productivity;
d. skills shortages;
e. high energy costs, especially the escalating electricity prices;
f. mismatch between South Africa's factor endowment and manufacturing output; and
g. the growing threat of cyber-attacks.

(ii) Demand-Side Constraints

Global demand, alongside overall global economic recovery from the Covid-19 pandemic induced recession, is currently under threat from three main factors. The first one is the heightened inflation rates globally. One of the leading complications brought on by the accelerating inflation rates has been the generally faster than initially anticipated monetary policy normalization, leading to tighter global financial conditions. At the same time, the higher inflation rates are having a detrimental impact on consumers. The sum total of these complex macroeconomic and financial variables is an overall contraction in economic activity, job creation and households' income. Meanwhile, rising Covid-19 cases in Asia, which have particularly induced harsh lockdowns in China, pose another risk to global growth and demand.

Finally, the ongoing Ukraine-Russia war presents another major threat to the global economy and therefore on demand for South African exports, while at the same time exacerbating the upward pressures on inflation mainly on account of its impact on commodity prices, especially oil and food prices.

Other key demand-side constraints facing the SA manufacturing sector are:

a. unfavourable public policy and lack of assistance for the majority of the country's industries, especially relative to South Africa's peer countries;
b. volatile exchange rate;
c. exports not being the main business focus of the majority of South African manufacturers;
d. relatively low total factor productivity (TFP); and
e. deteriorating competitiveness due to, inter alia, infrastructure and logistical bottlenecks.

(iii) Environmental Factors

Finally, as the world in which the manufacturing sector evolves, manufacturers and policy makers must adjust the way the sector operates in order to not only keep up with global trends but also to thrive amid the changes. A case in point is the increasing movement towards more environmentally sustainable practices in business including that of manufacturing. This is because, as put in a report by McKinsey (2020) on the need to reimagine industrial operations, even though the industrial revolution and large-scale operations have raised the standards of living globally, one of its major unintended consequences has been wide scale pollution.

At the same time, it has become advantageous for companies to adapt their operations in becoming more environmentally sustainable as they appreciate the substantial financial and environmental benefits associated with sustainable business practices. Therefore, several environmental "megaforces" will be central for the evolution in business practices in the coming years (EPA, 2022 and KPMG International, 2012). As climate change and other effects of pollution intensify, the implications for manufacturing will become vast, especially if it results in the diversion of resources. Consequently, manufacturers will need to invest in the development of particularly efficient processes and products, while at the same time managing for potentially unpredictable risks to supply chains (Foresight, 2013). Box 1 below provides some of the motives for companies to pursue sustainability as provided by the US Environmental Protection Agency (EPA, 2022), and these are amongst the numerous reasons, the South African manufacturing sector needs to adapt their operations.

Box 1: Reasons Companies Pursue Sustainability
i. To increase operational efficiency by reducing costs and waste
ii. To respond to or reach new customers and increase competitive advantage
iii. To protect and strengthen brand and reputation and build public trust
iv. To build long-term business viability and success
v. To respond to regulatory constraints and opportunities

Source: US EPA, https://www.epa.gov/sustainability/sustainable-manufacturing

c. Key Manufacturing Sub-Sectors

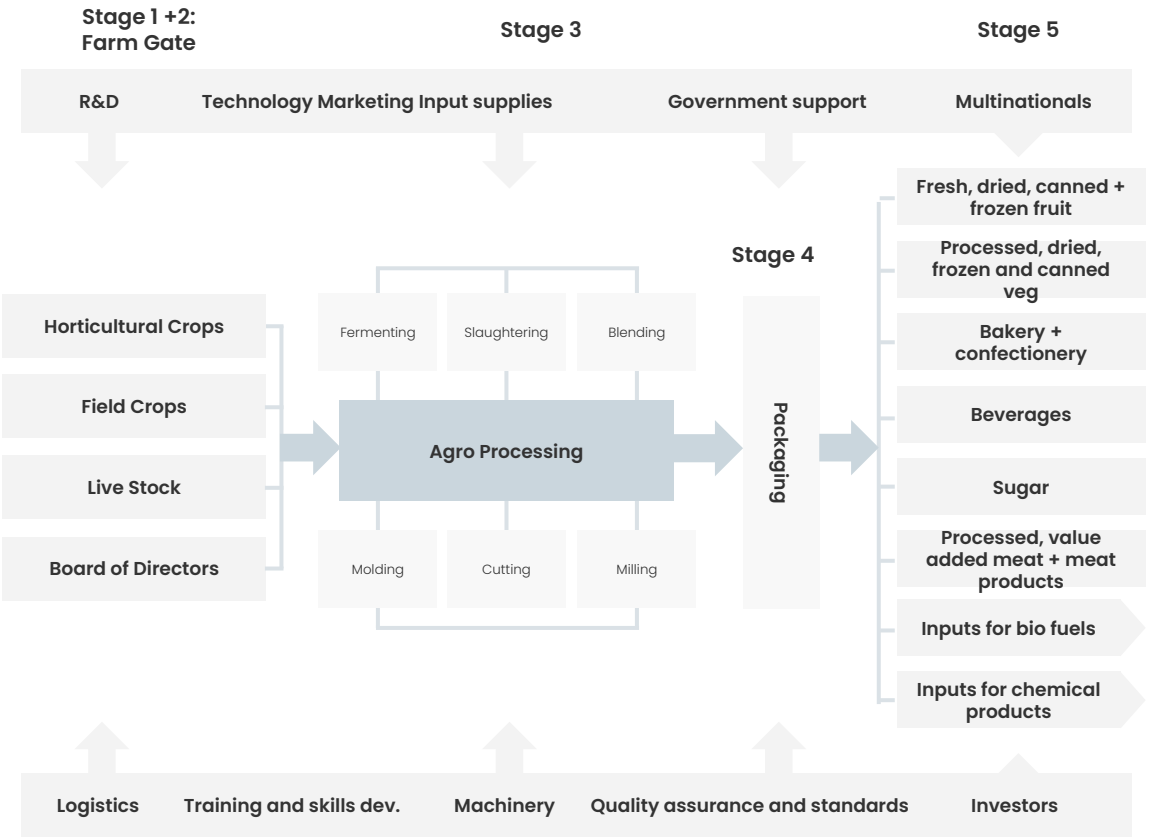
(i) Agro-Processing

Agro-processing has been identified as one of the crucial economic sectors that can lead to a transformation in the economy through sustainable employment creation, business investment opportunities, and growing the country's export base. This sub-sector of manufacturing beneficiates primary materials and intermediate goods from the agricultural, fisheries and forestry-based sectors. In other words, the sector has a firm backward linkage with the primary sectors and forward linkages with the secondary as well as tertiary sectors of the economy. As such, to drive aggregate growth, the best development path lies in selecting those activities where expansion will induce further progress in other industries[8]. In addition, this sub-sector consists of industries[9] that are believed to have the potential to make a significant contribution to the economic and social transformation of the country, as they are relatively labour intensive. This is undeniably an important factor for job creation and therefore makes the sector a possible vehicle for potential job creation.

[8] *FAO. (1997). The state of food and agriculture. FAO Agriculture Series No. 30. cited in Owoo, N.S, (2022). The Agro-Processing Industry and its Potential for Structural Transformation of the Ghanaian Economy. DOI:10.1093/oso/9780198821885.003.0010.*

[9] *Agro processing is a widely diverse sub-sector and is vital to the production of food products as well as the processing of wood for furniture and paper products.*

Figure 11: Agro-processing Value Chain



Source: Um Jwali Market Research

Figure 11 above suggests agro-processing has a huge potential for integrating SMMEs to operate[10] through all the stages of the value chain. However, there are numerous barriers to entry that constrain the penetration and participation of SMMEs agro-processors in the mainstream economy. To remedy this, the Department of Agriculture, Land Reform and Rural Development (DALRRD) has developed policies, strategies, and programmes to improve SMMEs participation. Additionally, the Agriculture and Agro-Processing Master Plan, which was ratified in early May 2022, has identified areas of focus within the sub-sector to enhance inclusive growth and boost employment opportunities in rural South Africa for the agriculture sector. This indeed is a welcomed affirmation for both the sectors as vital in the South African economy and should in the long run contribute to food security, poverty alleviation and job creation.

[10] *SMMEs can be setup in phase 1 and 2 as suppliers of inputs, tools and fertilisers to the primary sector. In phase 3 for actual processing/manufacturing of raw materials, in phase 4 for the packaging of processed products. Finally, SMMEs in the manufacturing sector could also be consumers of the processed products as inputs into other manufacturing activities such as Bakery use of flour, sugar, milk etc.*

In terms of performance, the agro-processing industry had a share of approximately 5% in total gross value added in 2021. Additionally, the "food, beverages and tobacco" division contributed the most towards the agro-processing industry (just over 40%), followed by the "wood and wood products" division (just over 15%). However, in relation to employment in the manufacturing sector, about 38.1% is attributed to the agro-processing industry (Statistics South Africa, 2021). Furthermore, examination of the trade balance of the agro-processing industry shows that the sector was a net importer between 2015-2021, with imports recording a value of R566 billion compared to the export value of R365 billion in 2021. Despite this, the sector was a net exporter of two divisions in 2021 ("food, beverages, and tobacco products" and "furniture and other items n.e.c and recycling").

Around R400 million of the committed R1 billion grants to the Agri-Industrial Fund[11] has been transferred and similarly, around nine projects to date that are black owned and operated (four of these being owned by women) have been funded. In addition, there are 31 transactions still in the pipeline that are expected to create around 1 371 new permanent jobs. However, factors such as trade, logistics & supply disruptions as well as rising production costs, pose a risk for the agro-processing sector that is intertwined with the agricultural sector.

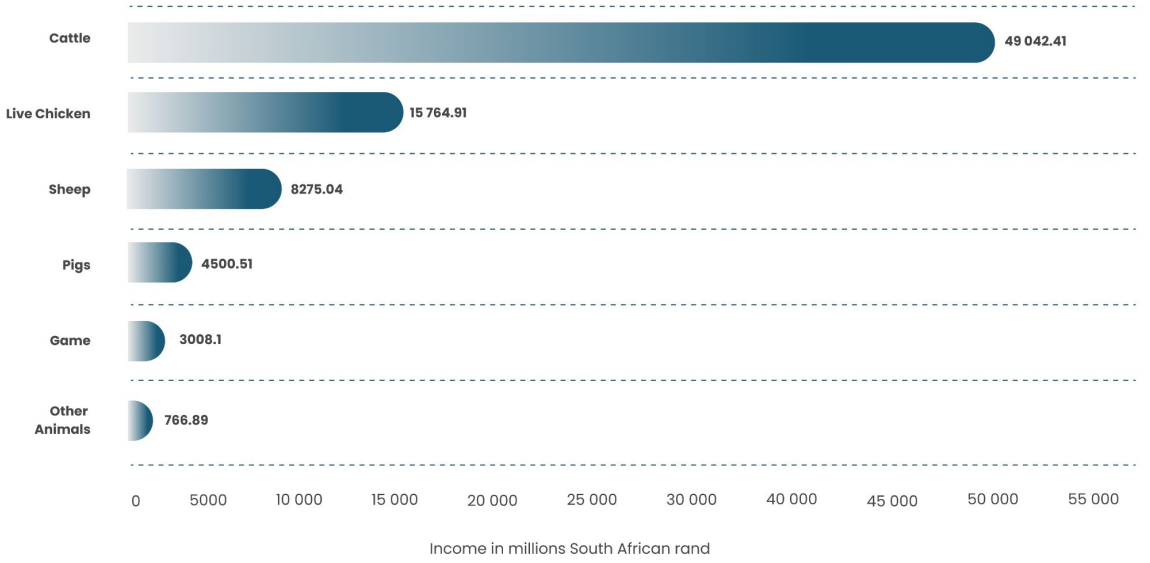
(ii) Meat

Since its outbreak, the Covid-19 pandemic has put a strain across the food manufacturing sector as a whole. The sector, when disaggregated, consists of six divisions with "meat and meat products" making up one of the largest sub-sectors in terms of output. Hence the direct and indirect negative impact on overall meat production was anticipated, as some meat plants were shut down. This led to not only a decline in production, but also in processing, distribution, and marketing potential. The volume of production of the "meat, fish, fruit, etc." division has remained positive since the beginning of 2022 (2% year-on-year, 4.6% year-on-year and 1.7% year-on-year in January, February and March 2022, respectively). That same category employed around 60 000 people with gross earnings of approximately R2.3 billion in the fourth quarter of 2021.

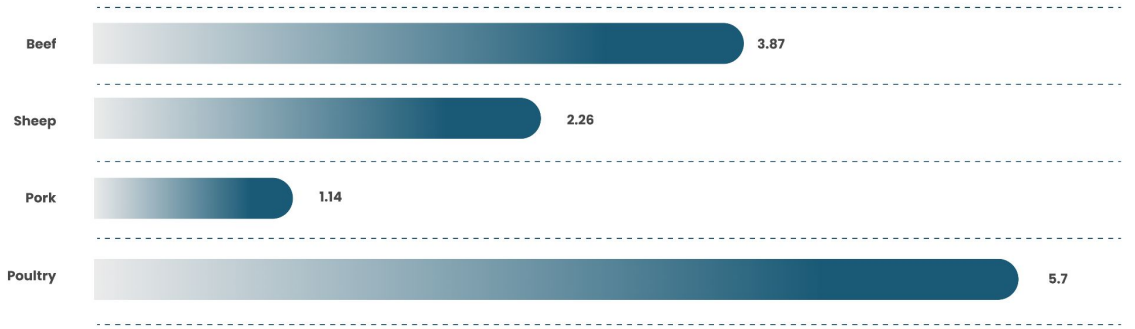
[11] *The Industrial Development Corporation (IDC) in partnership with the Department of Agriculture, Land Reform & Rural Development (DALRRD) have established the AGRI-INDUSTRIAL FUND, to support a wide range of economically viable activities in agro-processing (food and non-food) sectors. The aim is to develop a competitive industry in the food, beverage, fibre, forestry, and agro-derivative industries that utilises and develops local and regional resources to supply domestic demand and increase participation in international trade.*

Figure 12: Total Income (sales) from animals and Average per capita consumption of processed meat, 2020 (by type)

Total income from animals in the agriculture and related services industry in South Africa in 2020, by type (million SA rand)



Average per capita consumption of meat in South Africa 2020 (kilograms)



Source: Stats SA and OECD, FAO (in Mordor Intelligence)

In South Africa, poultry is the most preferred type of processed meat. Figure 12 above shows that poultry[12] was the most consumed meat (per person) in 2020, with sales of live chicken totalling R15.8 billion in that same year. Additionally, processed poultry accounts for around 40% of market share, making poultry the largest segment in the processed meat industry. Looking at chickens raised for meat production (broilers), a small group of large firms dominate in the country. This is because of the high degree of vertical integration and the high capital requirements needed to achieve sufficient economies of scale to compete successfully in the market for a highly tradable generic good.

[12] *Chicken meat is widely consumed and accounts for 65% of the market share, South Africa Processed Meat Market – Growth, Trends, Covid-19 Impact, and Forecasts (2022 – 2027)*

The poultry industry provides around 65 percent of locally produced animal protein consumed in the country (excluding milk), therefore dominating the animal products sector. Regarding exporting and importing of the commodity, the sector has recorded trade surpluses from 2017 to 2019, with a trade deficit recorded in 2020 when exports came in lower than imports. It is interesting to note that while South Africa generally has a surplus of chickens, Europe usually has a shortage of the product, which means South Africa can capitalize on this shortage and grow its exports as Europe is willing to pay for them. At the same time, South Africa has a duty-free status in the European Union (EU), meaning South African products don't attract duties when sold in the EU. However, the South African Association of Meat Importers and Exporters (AMEISA)[13] points out that because the country does not meet the health and safety standards required by trade blocs such as the EU, it will miss this great opportunity.

The recently ratified Poultry Master Plan aims to identify and address cross-cutting bottlenecks, industrial financing, export promotion, standards (including sanitary and phytosanitary requirements), innovation and technology, packaging, and skills. Additionally, there is also a potential to expand the industry across the value chain[14] if a substantial export market can be developed. The expansion would lead to increases in fixed investment, employment, and the value of output. Chicken producers committed to R1.5 billion in fresh funding within the next four years towards the investment drive. This is expected to result in nearly 4 000 additional jobs in the production of chicken. Moreover, barriers to entry into the poultry industry are reasonably low, which allows emerging farmers and small-scale participants and local economies to easily supplement industrial scale activity.

Without disregarding all efforts made in the poultry industry, rising imports of cheaper products will continue to present a challenge for poultry producers. At the end of 2021, government imposed provisional anti-dumping duties against bone-in chicken meat imports from Brazil and several EU countries to curb detrimental imports. This was however not enough. Investigations showed that dumping by Germany, the Netherlands and the UK continued. The International Trade Administration Commission of South Africa (Itac) therefore, recommended a five-year extension of existing anti-dumping duties on bone-in imports from these countries. This renewal should benefit the South African poultry industry, thus encouraging economic growth and job creation in the country.

13 *AMIE CEO, Paul Matthew, during the AMIESA media briefing, 26 May 2022.*

14 *The industry can be expanded by increasing capacity at all stages of the value chain: manufacturing of feed, farming of chickens and processing of poultry product.*

(iii) Sugar

The South African sugar industry is a combination of agricultural activities of sugar cane cultivation with the manufacture of raw and refined sugar, syrups and specialised sugars, as well as a range of by-products. In terms of contribution to the national GDP, the industry has been on the decline since the introduction of the sugar tax[15] in 2018 according to a Nedlac (2021)[16] report. According to this report, the industry contributed R12.5 billion to GDP in the 2019/20 period, down from R13.1 billion and R13.7 billion recorded in the 2018/19 and 2017/18 periods, respectively. Meanwhile, inflation (of both consumer and producer prices) has been rising rapidly since the beginning of 2022[17]. The rising prices will put pressure on the demand for sugar.

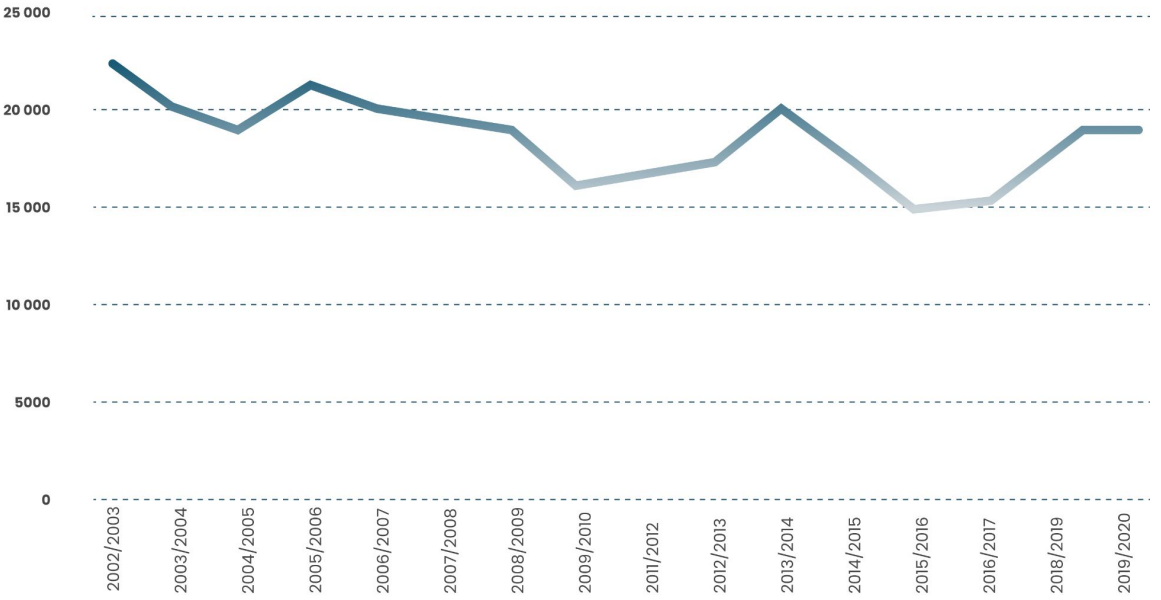
As it is, the sugar tax (also known as a Health Promotion Levy), had a detrimental impact on the demand for sugar, with demand dropping from 1.65 million tons to 1.25 million tons per year. This has forced South Africa to increase its exports to the global market, where prices are below the cost of production. This increase in exports has led to losses of approximately R2 billion each year. Nonetheless, South African sugar exports are to be expected to benefit from the likely notable increase in international sugar prices in the short to medium term. This has come about because of the overall increase in food prices following the Ukraine-Russian war, while at the same time, major sugar exporting countries such as India have started limiting sugar exports in efforts to curb rising prices at home.

15 *A Health Promotion Levy, known as the sugar tax which was introduced in 2018 on sugary drinks with more than four grams of sugar per 100 ml. The tax is charged on non-alcoholic sugary beverages, except fruit juices.*

16 *The National Economic Development and Labour Council (Nedlac) published a report titled, 'Economic Impact of the Health Promotion Levy on the Sugar Market Industry' in June 2021.*

17 *CPI for sugar registered 3.5% y/y in April 2022, while PPI for sugar hurried to 9.3% y/y in the same month.*

Figure 13: Production of sugar cane in South Africa from 2000 to 2020



Source: Stats SA

South Africa's sugar industry is driven by sugarcane farming and sugar milling. The former is made up of 21 500 registered sugarcane growers, of which 1300 are large scale growers and 20 200 small scale growers. In the sugar milling sector, sugar is manufactured by six milling companies with 12 sugar mills (initially there were 14 mills, but one closed and one more was suspended) operating in the cane growing regions of Kwa-Zulu Natal and Mpumalanga. Moreover, there are approximately 85 000 people who are directly in cane production and processing, with a further estimated 270 000 jobs supported through upstream and downstream multipliers. Jobs created in the sugar industry sustain about one million livelihoods, the majority of which are situated in South Africa's rural areas. Additionally, the country's sugar industry generates an annual estimated average direct income of R14 billion through sugar sales in the South African Customs Union (SACU) region and world market exports.

In November 2020, the South African Sugarcane Value Chain Master Plan (Sugar Master Plan) was ratified. It aims to stabilise the industry, protect jobs and introduce reform in restructuring the industry. Through the Master Plan, the sugar industry has managed to provide R225 million to over 12,000 small-scale sugar cane growers as part of a R1 billion commitment to support black farmers. President Ramaphosa announced in his 2022 State of the Nation Address that the government will be expanding the provision of input vouchers and calling on other sectors to join this effort, in order to reach up to 250,000 small-scale farmers. Despite efforts being made to transform and reignite the industry, the fact that the Minister of Finance, Mr. Godongwana, confirmed an increase in sugar tax as of the 1st of April 2022 is concerning due

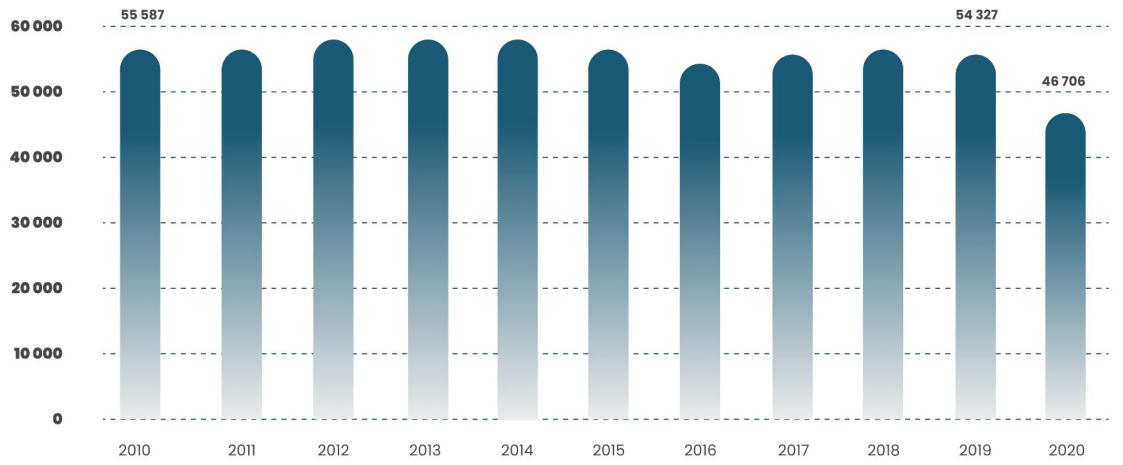
to its likely adverse impact on the industry. This is not only expected to stifle employment, but also dampen production in the already constrained industry. This, coupled with the impact of the Covid-19 pandemic, global prices that are below South Africa's cost of production, increasing volumes of low-priced tariff-free exports from eSwatini into the SACU market, as well as the recent catastrophic floods in the Kwazulu Natal (KZN) region, will be a major blow for the industry.

(iv) Furniture

In 2020, "Furniture and other manufacturing value added" amounted to R46.7 billion, down from R54.3 billion in 2019. This sub-sector which is considered a division of agro-processing made up 9.5% of the total manufacturing industry in 2020 (but contributed less than 1% to GDP). The sub-sector recorded the largest year-on-year decline during 2020 (-14%) in the past 10 years, as the effects of the Covid-19 pandemic continued to put pressure not only on demand in the industry, but also on the availability of raw materials. In addition, the civil unrest in some parts of the country during July 2021, that included the looting and destruction of property and infrastructure, had a negative impact on the sub-sector.

Overall, the performance of the furniture sub-sector of manufacturing remains constrained. Although output edged higher in March 2022 (5.5% month-on-month), it was weak in the first two months of 2022 (-16.1% month-on-month and -7.5% month-on-month in February and January 2022, consecutively). Consequently, furniture sales followed the same pattern, rising in March 2022 (10.7% month-on-month) after declining in February (-8.8% month-on-month) and January (-7.7% month-on-month) of 2022. The utilisation of production capacity rate by large furniture manufacturers was at 81% in February 2022, with the 19% under-utilisation due mostly to insufficient demand in the sector. For the sector to operate at a maximum, the supply of raw materials as well as the upscaling of both skilled and non-skilled labour needs to improve.

Figure 14: Furniture and other manufacturing, Industry Value added (R millions, constant 2015 prices), 2010- 2020



Source: Stats SA

Due to its labour-intensive nature, the furniture industry has the potential to reduce unemployment by absorbing some of the low-skilled labour that makes up the largest portion of South Africa's unemployed. In addition, the sector can play a more significant role in the economy through its contribution to the development of small, medium, and micro enterprises (SMMEs) and total exports. Furthermore, since furniture products can be developed in rural areas with minimal investment, the industry can contribute to the geographical spread of economic activity. However, in terms of international trade, the sub-sector's performance has been lacklustre.

Looking at trade data, South Africa has been steadily losing its share in global furniture manufacturing. The rising supply of cheap Asian exports, accompanied by the declining investment in skills development and a lack of technological innovation resulting from low research & development funding over the last five years, has led to a decline in the levels of competitiveness for the industry internationally. The value of both exports and imports of furniture declined in 2020 (exports: -32.7% and imports: -32.1%). Close to 82 percent of the country's furniture exports are to other African countries, with Botswana being the highest furniture export destination at 17.6 percent.

According to the South African Furniture Initiative (SAFI)[18], most companies in this sector are small companies, many of which are family owned. Additionally, 61 percent of all entities listed with the furniture bargaining councils employ fewer than 10 people.

18 *annual report 2021*

Statistics South Africa shows that the number of those employed in this sector increased marginally in the fourth quarter of 2021 (25 841 vs. 25 798 in Q3-2021) with gross earnings increasing by 13.3% in Q4-2021 (versus a 4.9% increase in Q3-2021). A noteworthy feature of the industry is its low barriers to entry, which makes it possible to start small entry level companies that require minimum capital and human resources. These small companies might, in the long run be able to compete against the larger companies for market share.

Figure 15: Furniture, Employment Survey (No. of employees vs. Gross Earnings), Q1 2019 – Q4 2021

Source: Stats SA

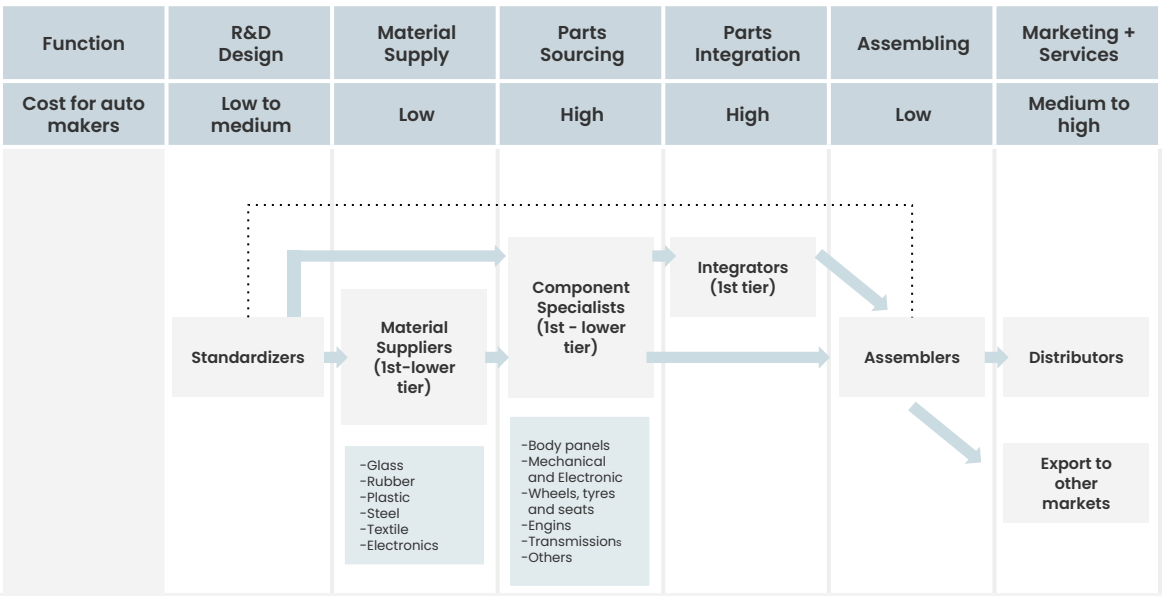
To help alleviate challenges in this sector, the Furniture Industry Master Plan (FIMP) was established and adopted in late 2021. The Master Plan sets clear guidelines and targets for the furniture manufacturing industry, and it guides public sector procurement as part of the government's efforts to support and stimulate the industry. Moreover, the South African Revenue Services (SARS) partnered with industry members in 2019 to form the SARS Furniture Forum that was aimed at addressing the industry's challenges. The forum seeks to provide support to inform trade and industrial policy directed at decreasing imports of furniture into South Africa, and to develop and implement a plan aimed at preventing illegal import practices to curb the spread of illegal and poor-quality imports which flood the local furniture market. All these efforts made in the industry are expected to regenerate and expand the sector, while contributing positively to the nation's economic growth and employment, especially labour-intensive opportunities.

(v) Automotive

The automotive value chain can be characterised as an automaker-driven network, as many automobile production systems are to a great extent controlled by automakers according to the Economic and Social Commission for Asia and the Pacific (ESCAP) (2009). The value chain comprises a complex mixture of firms of different sizes, types, and geographic scope, that produce large quantities of a variety of products from simple parts to technologically complex systems.

Figure 16 below illustrates that costs remain low to medium for those companies in the research and development (R&D) and design, material supply and assembling stages, while costs are medium to high for those in the parts-sourcing, parts-integration, and marketing and services phases. At the same time, an effective supply chain management that can succeed in reducing costs can lead to an improvement in the competitiveness of automakers. This could then result in the expansion of automotive value chains to low-cost neighbouring countries.

Figure 16: A simplified global automotive value chain



Source: UNESCAP

This capital and technology intensive industry, contributes 4.3 percent[19] to South Africa's GDP, contributes 0.7 percent to the global automotive manufacturing industry value, and is expected to trend upwards in the future.

19 *In 2021*

The South African Automotive Master Plan (SAAM) 2021 – 2035 could lead to a growth in vehicle production, with an increase from 600,000 to 1.4 million vehicles per annum. It is therefore imperative to increase the percentage of parts and total cost of new motor vehicles assembled or manufactured domestically. This would have the benefit of not only transforming the automotive sector, but also facilitating the entry of Black Economic Empowerment (BEE) participants to the supply chain. As such, the original equipment manufacturers (OEMs), have committed to funding a Transformation Fund, which will partly assist in facilitating the entry of BEE participants in the supply chain.

According to the Automotive Industry Export Council's 2022 Automotive Export Manual, the value of new-vehicle and automotive component exports from South Africa increased by R31.8 billion to a record R207.5 billion in 2021, up from R175.7 billion in 2020. This translates to an 18.1% increase. Despite continued challenges in the supply chain, such as global semiconductor shortages, the sector managed to recover strongly from the weak levels seen in 2020 when the Covid-19 pandemic's impact on economies was the greatest. Across the vehicle and component manufacturers, just over 113 000 people were employed in the fourth quarter of 2021 (with gross earnings totalling R9.9 billion), compared with 109 000 people in the fourth quarter of 2020 (gross earnings equalling R9.6 billion). SAAM has communicated plans to increase the number of people working in the automotive industry to 224 000 from the 113 000. It is estimated that the sector has an indirect impact on 1.5 million people. With the country's automotive industry's export destinations increasing (152 countries in 2021 vs. 147 in 2020), it is no surprise that South Africa's seven major vehicle manufacturers invested R8.8 billion in 2021, the second-highest yearly figure on record (R9.2 billion in 2020).

The sector's utilisation of production capacity edged higher in February 2022 (81%) after recording 80.1% in 2021. The improvement in demand and shortage of raw materials assisted in moderating total capacity under-utilisation (22% in February 2022 vs. 22.7% in 2021).

The ongoing collaboration between the automotive industry and the government, which is improving automotive policies in the country, is encouraging as it could spur the sector to not only invest in production facilities and local plants, but also to develop efficient technology expertise. Additionally, the increasing demand for alternative mobility concepts could motivate manufacturers to further adapt and innovate, and in turn bolster expectations for employment opportunities to be created across the automotive value chain.

(vi) Steel

South Africa remains one of the largest steel producers in Africa, and according to the World Steel Association, it ranked 35th place in 2020 in terms of crude steel producing countries in the world from 28th place in 2019. The bulk of steel production in South Africa is done via the Basic Oxygen Furnace method (BOF)[20] (52.6%, while 47.4% is done through the Electric Arc Furnace method (EAF))[21] and this suggests that large-scale steel firms are likely to vertically integrate the production process backward into coal and iron ore mining to reduce costs.

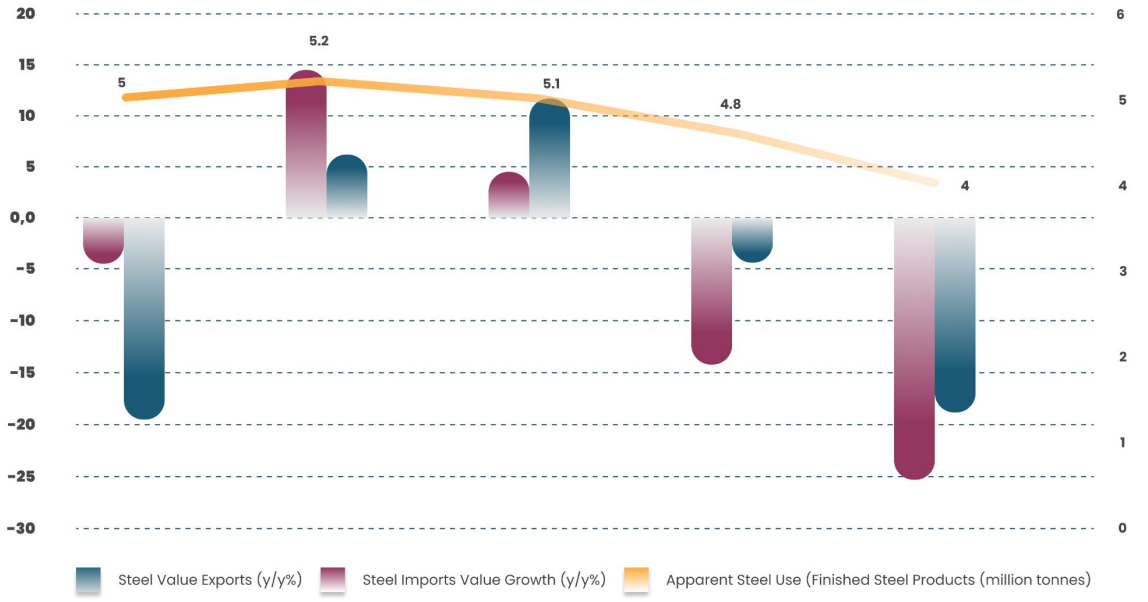
Locally, this sector remains under pressure as costs skyrocket (largely fuelled by the recent increase in energy prices that resulted in increasing costs of extracting and refining steel), subdued global steel prices, and the rise in cheap imports. The demand for steel (measured by the apparent steel use, ASU[22]) that has been on a downward trend since 2018 (5.1 million tonnes in 2018, 4.8 million tonnes in 2019 and 4 million tonnes in 2020) is consistent with the steep decline in steel exports, which recorded a negative growth of 25.6 percent in 2020 (from -14.7% in 2019). As such, the insufficient demand in steel, coupled with the increase in the shortage of raw materials and semi-skilled (to unskilled) labour led to the sector's total capacity under-utilisation rate rising in February 2022 (23.5% from 21.5% in November 2021). However, the fact that the shortage of skilled labour declined marginally is welcomed. For this sector's revival, the expansion of industrial activity and infrastructure development will be needed. Indirectly, the steel industry remains the facilitator of South Africa's construction, automotive and mining sectors.

[20] *Firms, producing steel requires sourcing a variety of raw material namely iron, coal and limestone.*

[21] *EAF doesn't involve iron making. This route reuses mainly existing steel (scrap). It uses some direct reduced iron (DRI) and pig iron for chemical balance.*

[22] *Apparent steel use (ASU) is defined as production plus net imports minus net exports.*

Figure 17: Apparent Steel Use (Finished Steel Products), Steel Exports Growth and Steel Imports Growth, 2016- 2020



Source: World Steel Association & Trend Economy Data

In May 2022, the Mainstreaming the Steel Master Plan Conference was held, with the conference giving clear action plans that the industry must collaboratively undertake to ensure the successful implementation of the steel industry master plan (the Steel Master Plan was ratified in June 2021). In addition, the conference also revealed the need for enhanced labour participation in workstreams and for the private sector to also increase its participation in this role. This could lead to an increase in job opportunities. As of the fourth quarter of 2021, the 'basic iron & steel' sector employed just over 22 000 people and had gross earnings of approximately R2.3 billion. Despite great plans being tabled to increase the viability of the industry, red tape will continue to weigh down the sector if it is not urgently addressed and it will prevent the sector from growing and creating much-needed jobs.

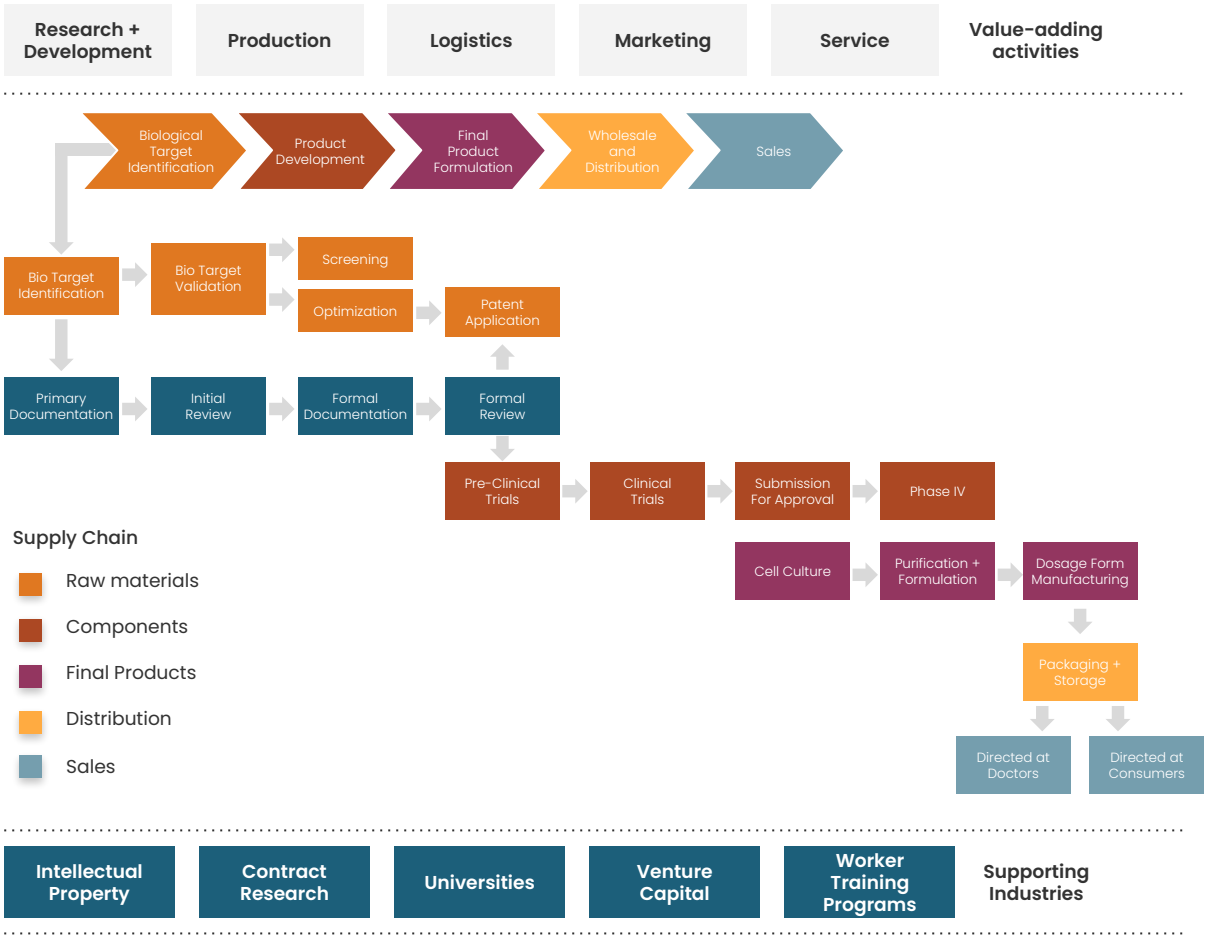
(vii) Pharmaceuticals

The South African pharmaceutical sector is worth approximately R20 billion annually as indicated in a report by Gauteng Business[23]. The sector is dominated by multinational pharmaceutical companies (MNCs), with over 90 percent of the MNCs listing South Africa as

[23] *2019/20 edition*

their regional headquarters (IPASA CEO[24], 2022). Therefore, because the sector is high-value-adding, the socio-economic benefits of South Africa being the preferred regional location remains an advantage. Figure 18 below shows three dimensions that work together to produce final products and services for the market, with "research & development, design, production, logistics, marketing and services" being the most important value-adding activities for the pharmaceutical sector.

Figure 18: Pharmaceutical Value Chain (value adding activities, supply chain and supporting industries)



Source: Global Economy (North Carolina)

In South Africa, the public health sector consumes the largest volume of pharmaceuticals, while a greater variety of products is available in the private sector. In essence, the private sector accounts for 80 percent of pharmaceutical industry sales by value and 20% by volume, while the public sector accounts for 80% by volume and 20% by sales. Retail trade sales rose sharply on a month-on-month basis in March 2022 (9.7%), after remaining sluggish in the first

[24] *Bada Pharasi, CEO for IPASA (The Innovative Pharmaceutical Association South Africa) stated this earlier in January 2022.*

two months of 2022 (-6.3% m/m in January and -9% in February). According to Invest SA's Fact Sheet (published by the Department of Trade & Industry), the South African pharmaceutical industry is expected to record sales of R73 billion by 2025, a substantial increase, compared to the R51 billion expected in 2022. However, in 2020, the sector's total expenditure amounted to R45.8 billion, while total income amounted to only R44.1 billion, which led to a loss in profit for the year. The industry spent most on 'purchases' and 'employment cost'.

Although close to 70 percent of the pharmaceutical products that are used are locally produced, numerous active pharmaceutical ingredients (API) and finished products are imported. With the Covid-19 pandemic adversely impacting demand for pharmaceutical products, total exports declined steeply in 2020 (-9.2%) while imports declined only marginally (-0.04%) in that period. However, in February 2022, the increase in the shortage of raw materials, together with the increase in shortage of skilled labour, were offset by the improvement in low levels of demand, leading to total utilisation of production capacity increasing to 83.9%, from 83.7% recorded in November 2021 and an 83.4 percent aggregate in 2021.

Since the sector is highly regulated and the development, production, marketing, and sale of pharmaceuticals are strictly controlled, it has become increasingly difficult for new companies to enter this competitive market. Additionally, high costs, the substantial dependence on imported APIs and finished pharmaceutical products as well as skills shortage (and the cost of specialised skills) are some of the challenges that continue to weigh heavily on the sector.

South Africa has completed the development of government's planned National Health Insurance (NHI)[25] scheme which is striving for universal healthcare (the intention is to create a single fund that will buy services on behalf of all South Africans). In July 2019, Cabinet approved the NHI Bill which is scheduled to be presented to the president for promulgation soon. The full implementation of the NHI is envisaged by 2026. Should the NHI materialise, a rising demand for prescription generic drugs, improved healthcare infrastructure and access, as well as increased local pharmaceutical production of generics are expected. What should also be noted is that the industry's contribution is not only through the fields of innovation, research, and development, but also through direct and indirect employment and a commitment to growing local capabilities.

25 *National Health Insurance (NHI) is a health financing system that is designed to pool funds to provide access to quality affordable personal health services for all South Africans based on their health needs, irrespective of their socio-economic status. NHI is intended to ensure that the use of health services does not result in financial hardship for individuals and their families. NHI is being implemented in phases over a 14-year period that started in 2012. It will be established through the creation of a single fund that will buy services on behalf of the entire population, The funding for NHI will be through a combination of various mandatory pre-payment sources, primarily based on general taxes.*

03 LOCALISATION AND GOVERNMENT PROCUREMENT

Against the backdrop of the evolving manufacturing environment, current elevated risks as well as potential opportunities for the sector, it is of paramount importance that government policy plays an important role in supporting South African manufacturing. One of the proposals made by the NDP 2030 regarding the stimulation of the country's manufacturing sector is "leveraging public and private procurement to promote localisation and industrial diversification".

Already globally, procurement by governments accounts for a significant share of economic activity, with public procurement amounting to 15 to 20 percent of GDP on average in developed countries (Anderson et al (2011), Lamy (2009) and Rickard and Kono (2013)). Similarly in South Africa, government is the country's largest buyer of goods and services, including construction work, according to the National Treasury (2015). Most recently, government introduced the "Economic Reconstruction and Recovery Plan" in 2020 amid the Covid-19 pandemic as a means of stimulating the South African economy, and the Plan has 'industrialisation and local procurement' as one of its key priority areas.

In South Africa, government procurement reforms began following the onset of the country's first democratic government after 1994. Along with promoting good governance, the reforms were aimed at addressing certain socioeconomic objectives through a preference system. These reforms were further supported by legislative measures including the Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFA). Section 2 of the PPPFA states that an organ of the state must determine its preferential procurement policy and implement it within a given framework, following a preference point system. The Revised Preferential Procurement Regulations aimed at strengthening localisation came into effect in 2011.

Recently, government[26] has introduced a strategy for the manufacturing sector that has a focus on the development of competitive industries. Part of the strategy has been the development of plans under key manufacturing sub-sectors known as Sector Master Plans, which are aimed at improving performance, job creation, competitiveness and efficiency, as well as economic inclusion. Six Master Plans have thus been developed and being implemented in the sub-sectors of automotives, clothing, textile, footwear and leather, poultry, sugar, steel and metal fabrication, and furniture (DTIC, 2021).

[26] *Under the Ramaphosa administration*

Under the aforementioned Economic Reconstruction and Recovery Plan (2020), plans to promote manufacturing through localisation will be pursued through the following strategic objectives:

i. reducing the proportion of imported intermediate and finished goods;
ii. improving the efficiency of local producers; and
iii. developing export competitive sectors that can expand the sales of South African made products on the continent and beyond.

The Plan further highlights that "Priority will be placed on key value chains such as in construction; agro-processing; healthcare; basic consumer goods; capital goods including equipment and industrial inputs used in infrastructure projects; and transport rolling stock focusing on automobile and rail assembly component production" (Republic of South Africa, 2021 p.12). Ultimately, and based on the objectives of the Economic Reconstruction and Recovery Plan, and under the "localization initiative", the Nedlac partners have agreed to work together to bring down the country's "non-oil" import bill by 20 percent in the next five years (DTIC, 2021).

South Africa is not alone in pursuing localisation and making use of government procurement to boost its manufacturing sector. Globally, countries have adopted procurement policies that are aimed at enhancing national interests, and these include local procurement policies intended to promote local industry. For example, the economic stimulus package contained in the United States' American Recovery and Reinvestment Act (ARRA)[27] largely required that manufactured goods including steel and iron used in the construction of public works projects that were funded by the Act be made in the country. The Buy American provisions of the ARRA were issued during April 2009. In Brazil, domestic sourcing of goods and services is justified under the Constitutional principles, determining that procurement by government be carried out via public tenders regulated by federal law in which preferential treatment is given to small companies. In addition, during public tender processes, cases where there is a tie between bidders under same conditions, preference is then given to goods and services produced or rendered by Brazilian companies of national capital, produced in Brazil, and produced or provided by companies that invest in research and technology in Brazil. Finally, in China, government procurement also favours goods and services or projects from Chinese sources. Under China's Government Procurement Law (GPL) (promulgated in June 2009), government procurements are required to be derived from domestic sources, with prescribed exemptions, (LLC, 2010).

27 *The ARRA was a part of the fiscal stimulus package by the U.S. in response to the Great Recession of 2008.*

In light of the South African government's renewed drive for localisation, the DTIC (2021) argues that the strategy is not a departure from an engagement in global markets, but rather more about changing South Africa's terms of engaging in global markets to ensure the country is no longer mainly just exporting raw materials. Hence, it is based on the mission to build the local industrial capacity for both the domestic market as well as for export markets. It is important to note from the analysis in section II "The Manufacturing Sector and the South African Economy" above that of South Africa's total exports, only 38 percent were manufactured in 2020. This indicates that the bulk of the country's exports have not had much value added to them, hence putting South Africa at a disadvantage in terms of lost opportunity, i.e.: those opportunities that come with expanding its industrial capacity as outlined throughout this report.

04 MODELLING THE MANUFACTURING SECTOR IN THE SOUTH AFRICAN ECONOMY

In this section we present a simulation of several investment scenarios for the South African economy. The purpose of a simulation exercise is to better understand, in advance, the consequences of policy or other actions that impact on the broader economy. The results of the exercise depend on multiple factors and are not cast in stone but represent a 'best approximation' of the outcome should no other major economic shocks occur in the interim.

a. The mechanics of the investment simulation exercise

The model of the South African economy that is used is a CGE model, calibrated to a 2015 SAM[28], combined with a SAM multiplier analysis. This approach allows a distinction to be drawn between short term and medium term results. The fundamental nature of investment is that it is an inter-temporal process whereby a sacrifice (investment) is made today for future expected benefit. Therefore, the immediate or short term response of the economy may not reflect the boosts to output, consumption and incomes that would be expected from investment. As time passes, however, investment expenditures work their way through the economy to yield higher output, consumption and incomes in the medium to longer term.

28 *This is the latest publicly-available SAM but, due to the impacts of the Covid-19 pandemic, almost certainly better reflects the size of the South African economy in 2022 than in 2019.*

The process by which this happens is complex. The initial round of investment expenditure is used to purchase 'investment goods' – plant, machinery, vehicles, buildings (whether existing or newly constructed), office equipment and consumables – as well as to hire staff. This expenditure round places pressure on prices and leads to a rise in the price and wage level (the latter depending on the relative shortage of the particular skill level). These demand and price pressures cause the initial crowding out of the other two main components of domestic absorption – consumption and government expenditure. On the other hand, imports usually initially rise relative to other expenditure components and relative to exports. This is because of the important import component in investment goods for many manufacturing sectors. The automotive industry, for example, requires equipment that is not produced domestically and is only available imported from the rest of the world. The same is true for many, if not most of the manufacturing sectors. This decline in net exports causes an initial real depreciation of the currency, which suppresses non-investment import expenditures.

Due to this demand, price and exchange rate pressures initially suppress non-investment domestic expenditure and can lead to very modest or even mildly negative short term impacts on the level of domestic GDP. As time passes, however, these effects are dissipated and reversed. The initial round of investment spending works its way through the economy and profits, leading to a rise in incomes and wages. In turn, these contribute to increased tax revenues and higher consumption and government expenditures. As real activity increases, the pressure on prices is relieved and inflation declines toward a steady-state level.

The improved production capacity – both as a result of gross capacity improvements and technology-driven gains – as a result of the investment round, makes exports more competitive in international markets. The volume of exports increases as foreign buyers substitute into cheaper South African exports, and export values rise. This reverses the downward pressure on the real exchange rate, prompting the exchange rate to appreciate back towards its original level. This appreciation also helps to sustain import demand driven by other components of domestic expenditure.

If all goes well, meaning provided there are no other economic or policy shocks in the interim, the investment into manufacturing will yield higher GDP, higher incomes, higher expenditure, greater employment, positive technology transfer, an expanded capital stock and higher fiscal revenue, without any significant impacts to longer run inflation or exchange rate levels. It is this process that is simulated for the following scenarios.

(i) 10% increase in investment in the entire manufacturing sector

The results of a simulation of a 10% increase in investment in the entire manufacturing sector are presented in Figure 19 below. As is evident, the effect of investing into the entire manufacturing sector – some 24% of the entire productive capacity of the South African economy – is strongly positive for GDP growth, employment (especially for lower skilled), wages (especially for higher skilled), household consumption, total investment and government revenue.

In the short term, some negative impacts are experienced due to the crowding-out of private consumption and the inflationary pressure on prices and downward pressure on the real exchange rate, but these are reversed in the medium term.

Figure 19: Results of 10% increase in manufacturing investment in all sub-sectors

Source: PAIRS

It is important to note that the full impacts on the economy are felt not just in the manufacturing sector but across the board in other sectors – primary and tertiary as well. This means that the agriculture, mining and services sectors also benefit. In fact, services such as construction, finance, communications and business services all benefit in that they are generally forward-linked to the value chain of manufacturing industries. Other services such as distribution/trade and transport are backward-linked to the value chain of manufacturing and therefore also benefit[29].

(ii) 10% increase in investment into specific sub-sectors or industries

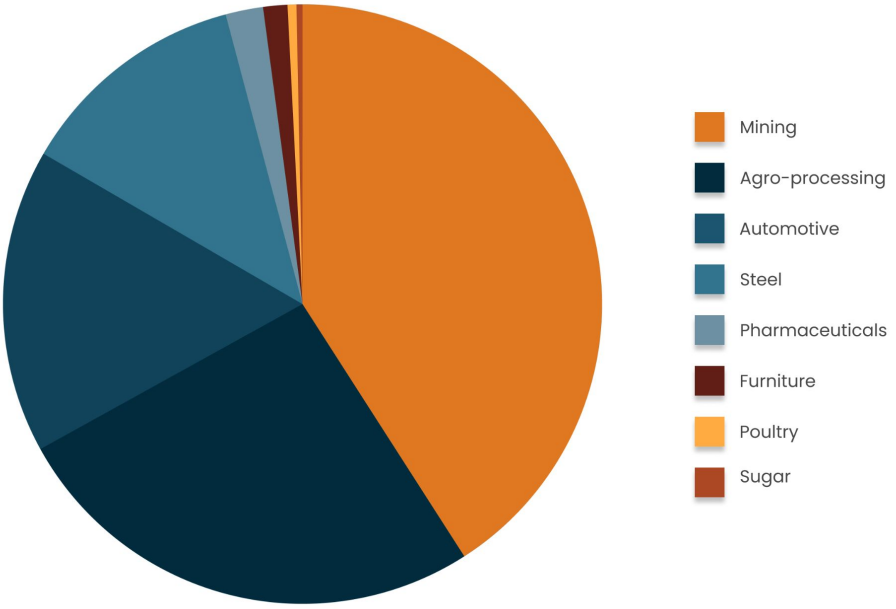
Similar simulations were undertaken for a 10% increase in investment into the following sectors:

i. Agro-processing
ii. Automotive
iii. Furniture
iv. Mining (not a manufacturing sector)
v. Pharmaceuticals
vi. Poultry
vii. Steel
viii. Sugar

Impacts on GDP for all the above sectors' 10% investment boosts are presented in the pie chart Figure 20, which ranks the sectors clockwise from greatest to the smallest impact on GDP.

[29] Backward-linked' value flows are those that are inputs into the production of a sector, in turn its outputs could be inputs into another sector's outputs, in which case it is 'forward-linked' to that sector. The flow of value starts with raw materials and ends, after multiple links in the value chain, with services related to marketing and customer services.

Figure 20: 10% increase in investment into specific sub-sectors: ranked impacts on GDP



Source: PAIRS

Results are presented below for the two leading manufacturing sub-sectors – agro-processing and automotive, as well as those of the mining sector – the other sub-sectors' results are given in the Annexes. The results for the mining sector are visualised in a chart, Figure 21.

Table 2: Results of a 10% increase in investment into the agro-processing manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	-0.3%	2.92%
Employment - low skill	0.8%	2.44%
Employment - medium skill	0.4%	1.32%
Employment - high skill	0.1%	0.39%
Real wages - low skill	0.2%	0.5%
Real wages - medium skill	0.4%	1.08%
Real wages - high skill	0.5%	1.58%
Household Consumption	-1.5%	2.16%
Consumer inflation	-0.3%	0.0%
Investment	0.6%	2.35%
Exports*	0.4%	1.8%
Imports	1.4%	2.87%
Fiscal revenue	-0.4%	2.83%
Real exchange rate*	-0.9%	0.0%

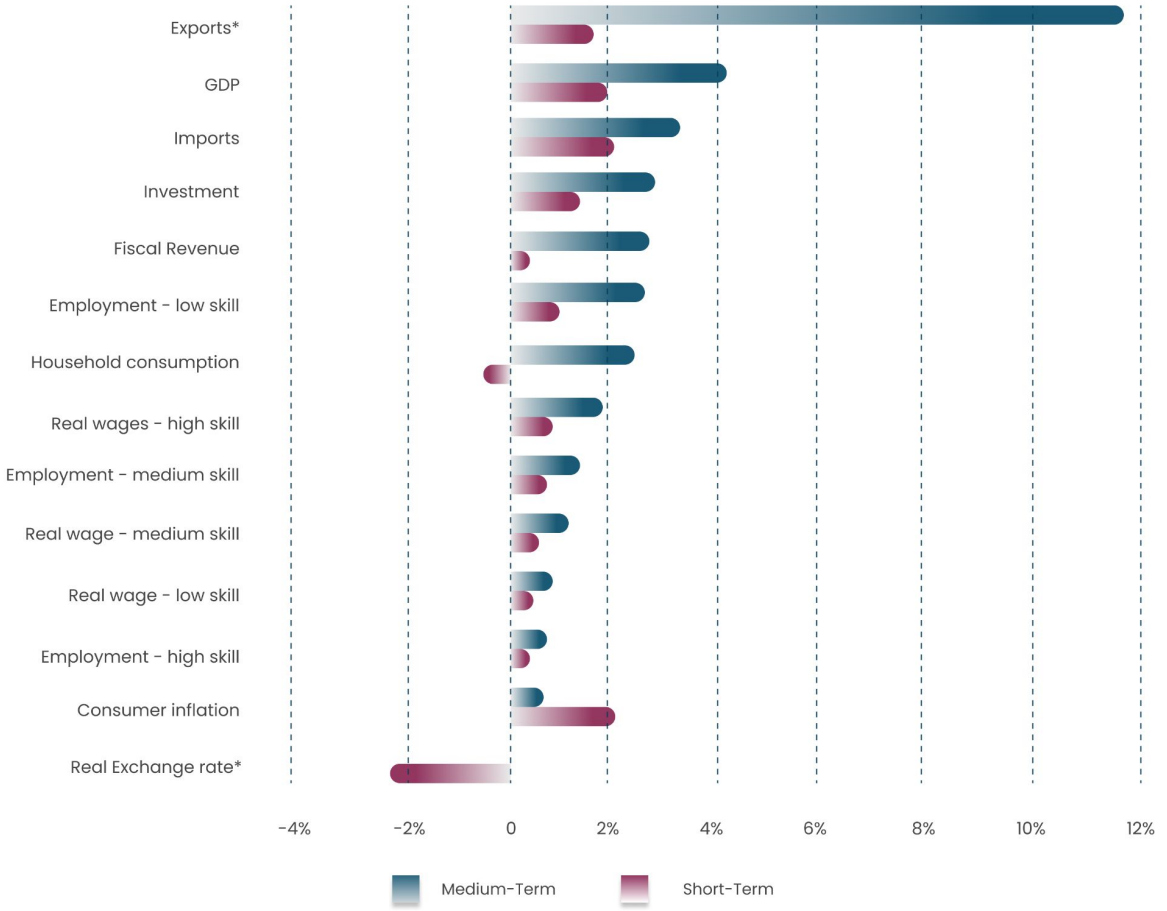
Source: PAIRS

Table 3: Results of a 10% increase in investment into the automotive manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	0.2%	1.56%
Employment - low skill	0.3%	0.98%
Employment - medium skill	0.2%	0.55%
Employment - high skill	0.1%	0.17%
Real wages - low skill	0.1%	0.2%
Real wages - medium skill	0.1%	0.45%
Real wages - high skill	0.2%	0.70%
Household Consumption	0.0%	0.91%
Consumer inflation	0.2%	0.0%
Investment	0.4%	1.11%
Exports*	0.2%	1.7%
Imports	1.2%	1.76%
Fiscal revenue	0.1%	1.15%
Real exchange rate*	-0.5%	0.0%

Source: PAIRS

Figure 21: Results of 10% increase into the mining sector



Source: PAIRS

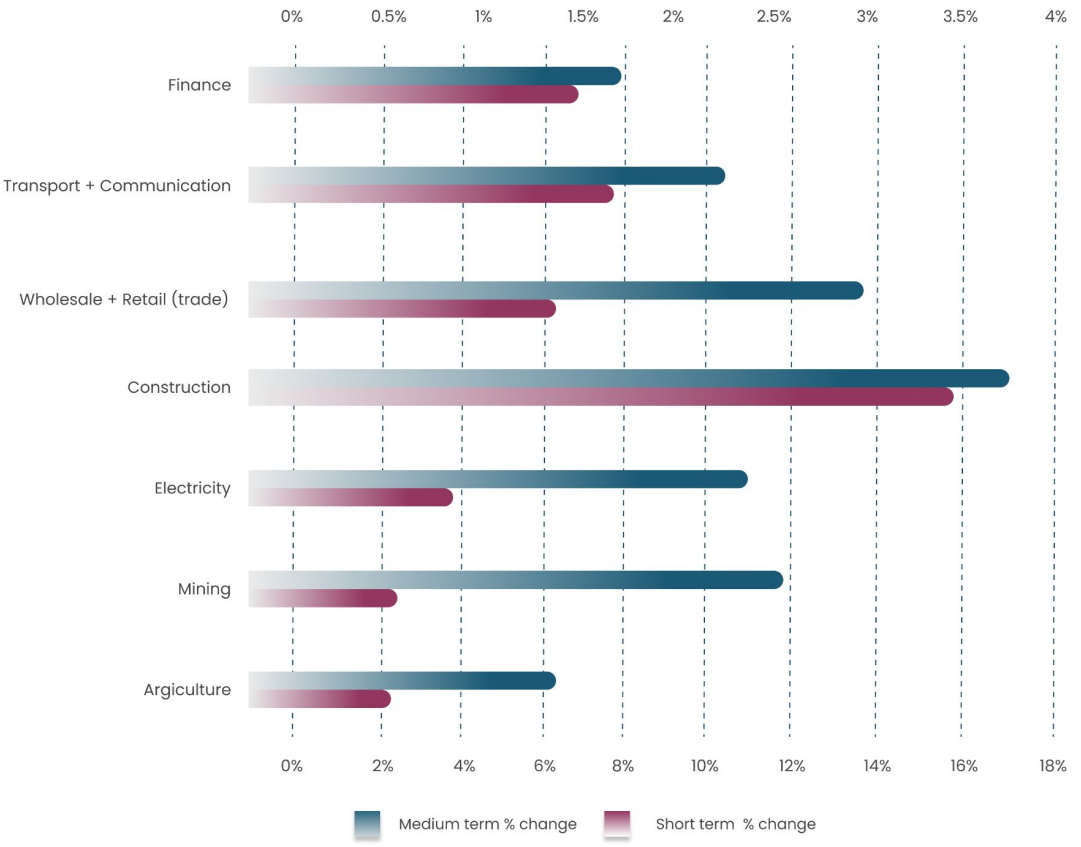
The agro-processing sector makes up about a third of the manufacturing sector and about 8% of all productive economic activity. This compares with the mining sector at about 7% of all productive economic activity and the automotive sector at just over a tenth of the manufacturing sector and about 2.6% of all productive economic activity. Of these sectors, mining and the automotive sector are a bit more 'dynamic' in their ability to translate a given value of investment into GDP, employment, household consumption and fiscal revenue. However, the agro-processing sector surpasses the other two in its ability to create low and medium-skilled jobs, which are desperately needed in South Africa.

(iii) 10% increase in manufacturing investment in specific sectors on other sector's outputs

Due to the circular flow, each investment scenario has repercussions not just for its own sector but all other sectors, even those to which it is not directly linked. This is because every sector is ultimately linked, sometimes indirectly via its links to intermediate sectors.

In order to gauge the distributed impacts of the investment boosts, a set of results looking at the output impacts of the previous simulations on a group of seven sectors is given in Table 4. The top section of the table presents the output impacts on the seven sectors of the main simulation, i.e.: an investment increase for the whole of the manufacturing sector by 10%. This same data is also visualised in the bar chart in Figure 22. The table data also contains a row for the base output levels of each sector (in Rm). The short and medium term percentage increases are given below, and thereafter for each of the other investment boost simulations.

Figure 22: Results of 10% increase in manufacturing investment on other sectors' outputs



Source: PAIRS

Table 4: Results of a 10% increase in manufacturing investment in specific sub-sectors on other sectors' outputs

Short and medium term results Rm and percentage change							
1. 10% Increase in investment in manufacturing - whole manufacturing sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Base	218 790	533 557	177 695	409 535	612 707	701 206	615 865
Short term % change	0.54%	0.57%	0.85%	3.50%	1.39%	1.74%	1.55%
Medium term % change	6.52%	11.75%	10.85%	17.07%	13.38%	10.51%	8.54%
2. 10% Increase in investment in manufacturing - agro-processing sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	1.22%	0.28%	0.69%	1.04%	0.41%	0.66%	0.57%
Medium term % change	12.28%	2.64%	2.81%	4.91%	3.94%	3.04%	2.49%
3. 10% Increase in investment in manufacturing - automotive sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.05%	0.07%	0.12%	0.21%	0.15%	0.16%	0.12%
Medium term % change	0.63%	1.51%	1.27%	2.25%	1.74%	1.35%	1.10%
4. 10% Increase in investment in manufacturing - furniture sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.0197%	0.0068%	0.0090%	0.0186%	0.0131%	0.0241%	0.0230%
Medium term % change	0.21%	0.12%	0.12%	0.21%	0.17%	0.14%	0.11%
5. 10% Increase in investment in the mining sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.18%	2.07%	0.46%	0.68%	0.35%	0.44%	0.39%
Medium term % change	1.37%	10.89%	3.95%	5.62%	2.84%	3.47%	2.87%

6. 10% Increase in investment in manufacturing - pharmaceutical sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.01%	0.03%	0.03%	0.04%	0.04%	0.02%	0.02%
Medium term % change	0.14%	0.22%	0.23%	0.33%	0.26%	0.21%	0.17%

7. 10% Increase in investment in manufacturing - poultry sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Base	179 959	480 941	138 238	319 113	494 669	384 270	485 953
Short term % change	0.04%	0.02%	0.02%	0.03%	0.02%	0.03%	0.03%
Medium term % change	0.46%	0.14%	0.15%	0.27%	0.21%	0.17%	0.14%

8. 10% Increase in investment in manufacturing - steel sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.07%	0.15%	0.12%	0.17%	0.12%	0.13%	0.15%
Medium term % change	0.50%	1.30%	1.26%	1.50%	1.26%	1.01%	0.77%

9. 10% Increase in investment in manufacturing - sugar sector							
	Agriculture	Mining	Electricity	Construction	Wholesale & Retail (trade)	Transport & communications	Finance
Short term % change	0.021%	0.006%	0.005%	0.011%	0.009%	0.010%	0.052%
Medium term % change	0.165%	0.049%	0.054%	0.096%	0.077%	0.059%	0.048%

Source PAIRS

A pattern that is prevalent across the simulations is the strong impact of the investment boost on the services, construction, trade, transport, communications and finance. Therefore, although this investment is directly into manufacturing sectors, forward and backward-linked services sectors also benefit substantially due to the multiplier effects of the circular flow. A similar pattern holds for the mining sector, which is not part of the manufacturing group. However, there are some differences, the 10% increase in investment into the mining sector differs from the balance of the simulations, having a proportionately greater impact on electricity output[30] and a lower proportional impact on trade services.

30 Note that strictly-speaking, the electricity sector should have been modelled as output-constrained. Unless the national electricity supplier, Eskom, can solve its supply issues in the medium term, these simulations will reflect more of an optimistic than a 'middle of the road' scenario.

Figure 23: Results of a 10% in manufacturing investment on mining and agriculture sectors on specific variables

Source: PAIRS

(iv) 10% increase in manufacturing investment on mining and agriculture sectors on specific variables

The final set of results (visualised in Figure 23) focuses on the impacts of the whole-sector investment boost on the levels of employment, fiscal revenue and exports in South Africa's two primary production sectors - mining and agriculture. The employment impacts are stronger across the board for the mining sector, a reflection of the relatively increasing level of technology uptake, automation and rising capital intensity in the agriculture sector. Fiscal revenue results reflect the greater impact on incomes of the mining investment, due to its effects on employment and consequently income taxes.

For export demand, which is exogenous to a small open country such as South Africa, certain assumptions were made. Firstly, as with the other simulations, the initial real depreciation is assumed to be reversed in the medium term. However, a smaller export boost for mining is shown, reflecting our projection of a slowing commodity cycle into the mid 2020s. Since the commodity cycle affects minerals more strongly than agricultural products, the exports growth is assumed to be smaller than that for agricultural products.

b. Summary of results of simulations

This section presented results of a set of CGE simulations of various investment boosts to the manufacturing sector of the South African economy. Due to supply constraints in the short term, the full benefits of the investment increases are only felt in the medium term but are considerable. Specifically, the simulations show a medium term boost to GDP of 13%, unskilled employment creation of 8%, an overall boost to investment across the economy of 8.3% and an additional 9% increase in tax revenues.

Ex-post calculations of actual numbers of jobs created (across all skill levels), using best available estimates of current employment, show medium term gains of 75 300 new jobs in manufacturing, 11 500 new jobs in mining and 10 100 new jobs in agriculture.

There were some caveats noted, among them the need for the national energy policy, and hence energy availability, to overcome its supply constraint and also the assumption that export demand is not constrained but follows a long term growth trend. The latter is of course dependent on global economic events that are not within the control or influence of South African policy makers and investors.

05 Policy Implications and The Way forward

The preceding analysis and the CGE model projections illustrate the rich potential that the manufacturing sector in South Africa has. The policy review of the selected industries and sub-sectors have furthermore highlighted the shift in the right direction of developing "master plans" for specific industries. This policy move is critical insofar as it recognizes the fact that each sector, sub-sector and industry has specific conditions and limitations that require specific considerations. More often than not, there is a critical need for the existing industry role players and policy makers to jointly assess the existing circumstances, operational parameters and unlock the potentials accordingly.

In the context of the "industrialisation master plans", the pre-requisites for success may be divided into two separate categories as follows:

a. Transversal Requirements set up the infrastructural platform which enables industrialisation and its sustainability over time. The world over, these include, energy, water, skilled human resources, transportation and export logistics network, scientific capabilities for R&D, and supportive regulatory environment. Hence the "investability" of the industrial enterprises demands ongoing and special socio-political attention.

b. Industry-specific requirements relate to the complementary inputs that are unique to a given industry/sub-sector in a given period of time. Such requirements may be technical and/or organisational or institutional in nature. Critically, the requirements vary depending on the structure of the industry at a given point in time, its maturity and the loci of activities along the value chain. A salient aspect of these industry-specific requirements relates to the nature of the product. The requirements of intra-industry products are far more complex than final (consumer) items. To this end, three mega trends are at play; these are:

i. Technological disruptions;
ii. Environmental sustainability imperatives; and,
iii. Consumer activism underpinned by global connectivity and real time communication via diverse digital platforms.

The upshot of these forces leads to an effective need for policy and business strategy. Resilience and robustness are the emerging requirements of industrial/commercial success.

In this context, the success of SA's re-industrialisation, or the revival of the national industrialisation drive, rests on an effective partnership framework within which the public sector implements a well-coordinated, intergenerational infrastructure provision programme whilst the private sector in diverse industries focuses on industry-specific dynamics. In each sub-sector or industry, there is need for an appropriate institutional framework for coordination and implementation review (or a 'Project Management System') of these parallel action plans.

Last but not least is to have an open and public discourse about the policies, the reviews and the learning so that all the major stakeholders can contribute to, and assess the outcome of, the action plans at play.

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7. Annexes

Figure 24: Results of 10% increase in investment into the furniture manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	0.005%	0.16%
Employment - low skill	0.041%	0.12%
Employment - medium skill	0.022%	0.07%
Employment - high skill	0.005%	0.02%
Real wages - low skill	0.008%	0.03%
Real wages - medium skill	0.018%	0.05%
Real wages - high skill	0.022%	0.06%
Household Consumption	-0.015%	0.09%
Consumer inflation	0.003%	0.0%
Investment	0.042%	0.10%
Exports*	0.010%	0.1%
Imports	0.080%	0.13%
Fiscal revenue	0.005%	0.11%
Exchange rate*	Negligible	0.0%

Source: PAIRS

Figure 25: Results of 10% in investment into the pharmaceuticals manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	0.011%	0.238%
Employment - low skill	0.013%	0.148%
Employment - medium skill	0.008%	0.086%
Employment - high skill	0.002%	0.027%
Real wages - low skill	0.003%	0.030%
Real wages - medium skill	0.006%	0.070%
Real wages - high skill	0.010%	0.110%
Household Consumption	-0.026%	0.141%
Consumer inflation	0.010%	-0.001%
Investment	0.053%	0.161%
Exports*	0.024%	0.209%
Imports	0.049%	0.232%
Fiscal revenue	-0.001%	0.167%
Exchange rate*	-0.054%	0.000%

Source: PAIRS

Figure 26 Results of 10% increase in investment in the poultry manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	-0.023%	0.04%
Employment - low skill	0.005%	0.13%
Employment - medium skill	0.003%	0.07%
Employment - high skill	0.001%	0.02%
Real wages - low skill	0.001%	0.03%
Real wages - medium skill	0.002%	0.06%
Real wages - high skill	0.003%	0.08%
Household Consumption	-0.089%	0.11%
Consumer inflation	-0.014%	0.0%
Investment	0.047%	0.12%
Exports*	0.023%	0.2%
Imports	-0.008%	0.14%
Fiscal revenue	-0.054%	0.13%
Exchange rate*	-0.048%	0.0%

Source: PAIRS

Figure 27: Results of 10% increase into the steel manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	0.88%	1.13%
Employment - low skill	0.26%	0.79%
Employment - medium skill	0.14%	0.41%
Employment - high skill	0.04%	0.12%
Real wages - low skill	0.05%	0.16%
Real wages - medium skill	0.11%	0.34%
Real wages - high skill	0.16%	0.47%
Household Consumption	-0.04%	0.66%
Consumer inflation	1.01%	0.1%
Investment	0.59%	0.72%
Exports*	0.69%	5.8%
Imports	0.63%	0.94%
Fiscal revenue	0.08%	0.76%
Exchange rate*	-0.9%	0.0%

Source: PAIRS

Figure 28: Results of 10% increase in investment into the sugar manufacturing sub-sector

Short and medium term results		
Percentage increase over base year value		
	Short Term	**Medium Term**
GDP	-0.008%	0.01%
Employment - low skill	0.001%	0.04%
Employment - medium skill	0.000%	0.02%
Employment - high skill	0.000%	0.01%
Real wages - low skill	0.000%	0.01%
Real wages - medium skill	0.000%	0.02%
Real wages - high skill	0.000%	0.03%
Household Consumption	-0.030%	0.04%
Consumer inflation	-0.005%	0.0%
Investment	0.016%	0.04%
Exports*	0.008%	0.1%
Imports	-0.003%	0.05%
Fiscal revenue	-0.018%	0.04%
Exchange rate*	-0.016%	0.0%

Source: PAIRS

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