EFFECT OF FREE TRADE AGREEMENTS ON INTERNATIONAL TRADE AND EMPLOYMENT IN AGRO-PROCESSING INDUSTRY IN SOUTH AFRICA

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Declaration

I, Joshua Magomani, hereby declare that this thesis, which I hereby submit for the degree of Doctor of Philosophy in Agriculture at the University of South Africa, is my own work and has not been previously submitted by me for a degree at this or any other institution. I declare that the thesis does not contain any written work presented by other persons whether written, pictures, graphs or data or any other information without proper acknowledgement of the sources.

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Certificate

This is to certify that the work incorporated in this thesis titled “Effect of free trade agreements on international trade and employment in agro-processing industry in South Africa” submitted by Mr. Joshua Magomani (Student number: 63441586) to the UNISA, College of Agriculture and Environmental Sciences, for the award of the degree of Doctor of Philosophy in Agriculture is based on the results of investigations carried out by him under my direction and guidance. The contents of the thesis, in full or parts, has not been submitted to any other university or higher learning institute for the award of any degree or diploma.

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Abstract

Unemployment in South Africa has averaged above 20% over the past ten years. Trade liberalisation is linked to an increase or a decrease in trade and employment. Though, on the one hand, the positive aspects of trade liberalisation are desirable, on the other hand, the negative implications of an increase in imports and unemployment are concerns for policy makers. The aim of the study was to analyse the effect of free trade agreement (FTA) on agro-processing industry's exports, imports and employment in South Africa. Firstly, the study analyses the effect of free trade agreement on South African exports of subsectors of agro-processing industry. Secondly, it analyses the effect of the free trade agreement on South African imports of subsectors of agro-processing industry. Lastly, it assesses the implication of trade agreements on employment in the South Africa's subsectors of the agro-processing industry.

The study uses panel data, with exports and imports data sourced from United Nations Statistics Bureau, Commodity Trade Statistics (COMTRADE) and Global Trade Atlas databases. The real gross domestic product and population data were sourced from the International Monetary Fund and the World Bank. While the binary variables (landlocked, colony and common language) data and the data for area and distance were sourced from the CEPII database. The data for subsectors of the agro-processing industry was sourced from the Quantec EasyData database.

The study used a gravity model to analyse the effect of trade agreements on subsectors of agro-processing industry. The labour regression model was used to analyse the impact of trade on agro-processing employment. The gravity and labour model's results were juxtaposed to assess the link between trade agreement, exports, imports and employment. The results showed that the Southern African Development Community (SADC) (excluding Southern African Customs Union (SACU)) trade agreement increases South African exports of woods and woods products and rubber products by 0.65% and 0.52%, respectively. Moreover, the SADC (excluding SACU) trade agreement increases South African textiles imports by 1.36%. The Trade, Development and Cooperation Agreement (TDCA), on the other hand, increases South African exports of food and beverages by 0.45%. However, in terms of imports, the TDCA increases South African imports of wood and woods products, paper and paper products and furniture by 0.44%, 0.62% and 0.70%, respectively. The Southern African Customs Union-European Free

Trade Association (SACU-EFTA) agreement showed no evidence of increasing exports and imports of the agro-processing divisions except for tobacco and rubber. The SACU-EFTA increases South African tobacco and rubber exports by about 1.74% and 1.10%, respectively. Lastly, it increases South African tobacco imports by 2.22%. On employment nexus, the results show that the SADC (excluding SACU) trade agreement benefits employment in the wood and wood products division. The employment for wood and wood products increases as its exports increase. On the imports side, the SADC (excluding SACU) trade agreement negatively affects employment in the textiles division. The TDCA's exports increase employment in the wearing apparel division. The imports encouraged by the TDCA negatively affect employment in the furniture division. The exports influenced by the SACU-EFTA agreement positively affect tobacco division employment.

This study recommends that South Africa, firstly, needs to go beyond traditional markets (markets where South Africa trades under free trade agreements) and open trade negotiations for new markets. Secondly, to boost exports-induced employment, majors to facilitate an increase in trade with traditional markets need to be prioritise, including trade facilitations majors that ensure effective and efficient movement of goods and services. Lastly, South Africa needs to identify priority products that could be supported to mitigate an adversely negative impact on employment induced by imports.

Key Words: Trade agreements, exports, imports, employment, agro-processing industry

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Abbreviations and Acronyms

AGOA	African Growth and Opportunity Act
ANZER	Australia – New Zealand Closer Economic Relations
APAP	Agriculture Policy Action Plan
ASEAN	Association of Southeast Asian Nations
CEPII	Centre d'Études Prospectives et d'Informations Internationales
COMTRADE	Commodity Trade Statistics
CPI	Consumer Price Index
EFTA	European Free Trade Association
EPA	European Partnership Agreement
EU	European Union
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GDP	Gross domestic product
HS	Harmonised system
IPAP	Industrial Policy Action Plan
MERCOSUR	Mercado Comúndel Sur or Southern Common Market
MFN	Most favoured nation
NAFTA	North American Free Trade Agreement
NDP	National Development Plan
PTA	Preferential Trade Agreement
QSIC	Quantec Standard Industrial Classification
Rb	Rand Billion
Rm	Rand Million
RTA	Regional Trade Agreement
SACU	Southern African Customs Union
SADC	Southern African Development Community
SIC	Standard Industrial Classification
TDCA	Trade, Development and Cooperation Agreement
USA	United States of America
WTO	World Trade Organisation

1 CHAPTER 1: INTRODUCTION

1.1 Background of the study

The South African high unemployment rate coupled with low economic growth has underscored the role of the industry as a whole in job creation. This is seen in policies such as the National Development Plan (NDP), Industrial Policy Action Plan (IPAP) and Agriculture Policy Action Plan (APAP) (DAFF, 2016). However, in the era of globalisation, the success of an industry is dependent on its comparative advantage, among other factors.

The agro-processing industry is defined as a sub-set of manufacturing that processes raw materials and intermediate products derived from the agricultural sector (FAO, 1997). In accordance with the Standard Industrial Classification (SIC), the agro-processing industry is categorised into 11 divisions. The divisions are food products, beverages, paper and paper products, wood and wood products, textiles, wearing apparel, furniture, tobacco, rubber products, footwear, and leather and leather products (FAO, 1997).

According to the World Trade Organisation (2023), the Regional Trade Agreements (RTAs) have increased, as of 1 December 2022, they are about 355 RTAs (World Trade Organisation, 2023). South Africa as entered into multiple trade agreements since joining the WTO in 1994. This study, therefore, analyses the effect of free trade agreements on agro-processing industry's exports, imports, and employment in South Africa. Mahomedy (2013), in the analysis of international trade and labour demand elasticities for South Africa, observes that studies conveniently estimate manufacturing data at the sectoral level. This, as Mahomedy further alludes, might not indicate industry-specific idiosyncrasies.

1.2 South African trade policy and agreements

In the 1990s, the trade regime in South Africa was characterised by a massive reduction in tariffs. Prior to the liberalised trade regime era, South Africa utilised multiple measures such as quantitative restrictions, import surcharges and export subsidies to support domestic industries. In agriculture, for instance, various marketing boards existed to control the selling and buying of agricultural products. However, this changed when South Africa joined the

World Trade Organisation (WTO) in 1994, which resulted in the deregulation of marketing boards (Edwards, 2005).

Moreover, South Africa entered into multiple trade agreements after joining the WTO in 1994, with the Southern African Customs Union (SACU) being an exception. The agreements are the Southern African Development Community (SADC) joined 1996, the Southern African Customs Union and European Free Trade Association States free trade agreement (SACU-EFTA FTA) (2006), the Southern African Customs Union and Common Market of the South Preferential Trade Agreement (SACU-MERCOSUR PTA) (2004), and the Trade, Development and Cooperation Agreement (TDCA) (2000). This study analysed how these agreements have affected the agro-processing industry's trade and employment in South Africa, specifically focusing on the SADC, SACU-EFTA and TDCA.

The SADC is a regional economic community comprising 16 Member States: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe. The overall aim of the SADC is to achieve regional integration and eradicate poverty within the Southern African region (SADC, 2019). To achieve these goals, Member States must work together harmoniously to achieve effective results on common problems and issues (SADC, 2019).

Moreover, to achieve regional integration, several legal and institutional instruments have been put into place to guide and standardise the work of the SADC with the Member States. One of these instruments is the SADC Protocols, which enshrine the aims of the Community by providing codes of procedure and practice on various issues, as agreed by the Member States (SADC, 2019).

The EFTA-SACU is the free trade agreement between the EFTA and the SACU States. The EFTA Member States are the Republic of Iceland, the Principality of Liechtenstein, the Kingdom of Norway and the Swiss Confederation, while SACU members comprised of the Republic of Botswana, the Kingdom of Lesotho, the Republic of Namibia, the Republic of South Africa and the Kingdom of Swaziland (Eswatini) (SARS, 2017).

The TDCA is the agreement between the European Community and its Member States and the Republic of South Africa. The European Community consists of the Kingdoms of Belgium, Denmark, the Netherlands, Sweden and Spain, the Federal Republic of Germany, the Hellenic Republic, the French Republic, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Republic of Austria, the Portuguese Republic, the Republic of Finland, the United Kingdom of Great Britain, and Northern Ireland. The TDCA has established a free trade area that covers 90% of bilateral trade between the European Union (EU) and South Africa (SARS, 2017).

The MERCOSUR Member States are the Argentine Republic, the Federative Republic of Brazil, the Republic of Paraguay and the Oriental Republic of Uruguay. The PTA was concluded in 2004 between the Member States of the Common Market of the South and the Member States of the SACU (SARS, 2017).

The objectives of the SACU, as contained in Article 2 of the 2002 SACU Agreement, facilitate the cross-border movement of goods between the territories of the Member States so as:

1. To create effective, transparent, and democratic institutions which will ensure equitable trade benefits to Member States.
2. To promote conditions of fair competition in the Common Customs Area.
3. To substantially increase investment opportunities in the Common Customs Area.
4. To enhance the economic development, diversification, industrialisation and competitiveness of Member States.
5. To promote the integration of Member States into the global economy through enhanced trade and investment.
6. To facilitate the equitable sharing of revenue arising from customs, excise and additional duties levied by Member States.
7. To facilitate the development of common policies and strategies (SACU, 2019).

1.3 Problem statement

In the early 1990s, South Africa began its journey of integrating into the world economy after the signing of the General Agreement on Tariffs and Trade in the Uruguay Round. The signing of the General Agreement on Tariffs and Trade was subsequently followed by the accession to the WTO in 1994. Moreover, South Africa became a member of various trade agreements. The proponents (Winters and Martuscelli, 2014; Hoekman and Olarreaga, 2007; and Dollar and Kraay, 2004) of trade liberalisation argue that countries realise high economic growth, low levels of poverty and inequality due to trade liberalisation. However, others argue that trade liberalisation results in high poverty, inequality and unemployment (Goldberg and Pavcnik, 2007; Dowrick and Golley, 2004; and Le Goff and Singh, 2014).

The level of unemployment in South Africa has averaged above 20% over the past ten years (Stasts SA, 2021). In South Africa, trade liberalisation, among other factors, is linked to an increase or a decrease in trade and unemployment (Bhorat ,2000; Roberts and Thoburn ,2003; Westhuizen, 2007 and Bastos and Santos, 2022). Though, on the one hand, the positive aspects of trade liberalisation are desirable, on the other hand, the negative implications of increase in imports and unemployment are cause for concern.

Losers, specifically workers, because of an increase in imports, often find themselves displaced from their jobs with little prospects of finding alternative employment. Mahomedy (2008), in the study analysing free trade and labour demand elasticities, noted that in most instances where trade impacts employment negatively, unskilled labourers tend to be affected the most. This, as Mahomedy (2008) observed, is likely due to the ease of replacing unskilled workers with other factors of production.

Table 1.1 shows that South Africa has seen an overall employment gain in the period under review, except between 1996 to 2000, when about 208 643 jobs were shed, about 1.74%. Manufacturing employment and that of agro-processing industry exhibit similar pattern of job losses or gains in the period under review, with 2001-2005 being an exception. This is expected given that the agro-processing industry has an approximate 40% share in total manufacturing employment.

Before the 1990s, the agro-processing industry witnessed job losses only between 1958 and 1981. However, as Table 1.1 shows, during trade liberalisation, after the 1990s, the agro-processing industry suffered massive job losses. The agro-processing divisions with major job losses after the 1990s are food products, textiles, wearing apparel, leather and leather products, footwear, rubber products and furniture. The tobacco division has consistently shown gains and losses in employment before and after trade liberalisations. The beverages, wood and woods products and paper products divisions are dominated by periods of employment gains after trade liberalisation (Table 1.1).

Table 1.1: Employment gain and loss in the South Africa

	1970-1975	**1976-1980**	**1981-1985**	**1986-1990**	**1991-1995**	**1996-2000**	**2001-2005**	**2006-2010**	**2011-2015**
Food products	41339	13335	7031	16583	**-19738**	**-46942**	**-764**	**-10029**	11737
Beverages	12275	3356	4823	1476	**-6067**	**-3453**	820	7569	5761
Tobacco	**-401**	**-1835**	308	617	272	**-739**	50	**-795**	1603
Textiles	15952	**-509**	**-16364**	2222	**-19954**	**-20236**	**-7575**	**-4830**	**-3565**
Wearing apparel	19736	12195	1692	4851	24210	**-12246**	**-19627**	**-41216**	**-10523**
Leather and leather products	2363	**-120**	**-1328**	2138	**-2170**	2043	**-2212**	**-161**	**-1147**
Footwear	821	2635	**-2703**	1376	**-1376**	**-10022**	**-5193**	**-839**	2218
Wood and wood products	5036	3121	2689	4315	8605	18610	10410	**-28773**	**-838**
Paper and paper products	654	693	3257	5235	232	**-2788**	4303	4287	**-3743**
Rubber products	3166	1361	**-1739**	625	**-297**	**-4858**	**-851**	**-3067**	**-879**
Furniture	3272	4707	**-715**	6110	4965	**-4666**	**-6530**	**-10847**	**-3311**
Agro-processing	104213	38938	**-3049**	45548	**-11319**	**-85295**	**-27168**	**-88700**	**-2687**
Manufacturing	306069	101895	**-64283**	105707	**-47497**	**-236920**	8277	-192523	**-42455**
Total employment	1310101	547838	311799	635031	28806	**-208643**	1118176	372891	1744456

Source: Quantec, 2019a

In South Africa, there is differing evidence concerning the effect of international trade on employment changes. Erten *et al.* (2019), in analysing trade liberalisation and local market adjustment in South Africa, found evidence of a decline in manufacturing employment in districts facing a high level of trade liberalisation. They further allude that displaced workers, because of trade liberalisation, find it difficult to get absorbed by other economic sectors.

Similar evidence of employment loss linked to a drastic increase in imports was presented by Bonga-Bonga and Biyase (2019). They specifically looked at the South African textiles industry on how its employment is impacted by an increase in imports from China. They concluded that, indeed, total employment is negatively affected by imports from China. The results are in common with the findings of Edwards and Jenkins (2015), who noted a decline in employment as a result of increased imports from China, around eight per cent in 2010. This, they noted, was due to a decline in output in labour-intensive industries as imports increased.

The phenomenon of job loss as a result of increased imports is not unique to South Africa, but it has been observed in other countries. Nguyen *at el.* (2017) found that, in Vietnam, import competition led to a contraction in employment. Ha and Tran (2017) found similar evidence that international trade in Vietnam negatively impacts employment for firms in the low employment percentile. However, they further observed employment gains in firms in the high employment percentile linked to international trade.

Erlat (2000) analysed the impact of trade flows on employment in the Turkish manufacturing industry. The results showed that trade played a significant role in employment changes post-1980. Similar study in the manufacturing industry, Rai and Sen (2012) found no evidence in India of international trade positively affecting employment. Although there is some evidence of employment gain in other countries as a result of international trade, the manufacturing industry appears to suffer major employment losses as imports increase.

In summary, the empirical review showed that the impact of trade liberalisation on employment is analysed mainly at aggregated level. Therefore, little is known on trade and employment nexus in the sub-sectors of the agro-processing industry in South Africa. This study show how sub-sectors of the agro-processing industry are affected in respect to exports, imports and employment.

1.4 Research questions

What is the effect of South African free trade agreements on its agro-processing exports?
What is the effect of South African free trade agreements on its agro-processing imports?
How do trade agreements affect employment in the South African agro-processing industry?

1.5 The aim, objectives and hypotheses of the study

The aim of the study was to analyse the effect of free trade agreements on the agro-processing industry exports, imports and employment in South Africa.

The objectives of the study are:

To analyse the effect of free trade agreements on exports in subsectors of the agro-processing industry;
To analyse the effect of free trade agreements on imports in subsectors of the agro-processing industry;
To assess the implication of trade agreements on employment in the sub-sectors of the agro-processing industry;

Hypotheses of the study

The null hypotheses are:

H01: Free trade agreements have no statistically significant effect on exports in subsectors of the agro-processing industry.

H02: Free trade agreements have no statistically significant effect on imports in subsectors of the agro-processing industry.

H03: Exports have no statistically significant effect on employment in subsectors of the agro-processing industry.

H04: Imports have no statistically significant effect on employment in subsectors of the agro-processing industry.

1.6 Justification of the study

Analysing the impact of trade agreements on trade and employment in the South African agro-processing industry will contribute to the existing body of knowledge or literature on the nexus between trade agreements, employment and trade. This study, however, specifically singles out the agro-processing industry, which is the sub-set of manufacturing, given its deemed importance in South Africa in terms of its potential to create employment. In South Africa, trade agreements, comparative advantage and employment studies tend to be specific in nature (Valentine and Gena, 2000; Edwards and Stern, 2007; Nin-Pratt and Diao, 2014; Bahta and Willemse, 2016).

These studies can be categorised as analysis of the effect of trade agreements, analysis of trade liberalisation on employment and analysis of a country's comparative advantage. However, the current study combines these categories and draws inferences on the nexus between trade agreements and employment, specifically in the agro-processing industry.

Moreover, the importance of the agro-processing industry in the South African context has been indicated in the National Development Plan among other policies. The agro-processing industry is prioritised due to its potential to spur job creation in both upstream and downstream industries (DAFF, 2016). Furthermore, this study aims to enable policymakers to draft policies that respond to the challenges of unemployment and trade imbalances. In responding to negative employment performance due to free trade, Mahomedy (2008) alludes that government needs to identify how different sectors of the agro-processing industry perform to respond with policies that are appropriate to such industries. Hence, this study shows how different agro-processing industries perform with respect to trade agreements, trade and employment.

1.7 Limitation of the study

Finding the direct linkage between trade agreements, trade and employment was a limitation of the study. This is because the implementation of trade agreements did not happen in

isolation; other factors not accounted for by the gravity and labour models could impact trade and employment in the agro-processing industry. Moreover, using secondary data also meant that the inferences had to be made from the available data with no flexibility to add more variables.

1.8 Delimitation of the study

The main focus of the research was the following trade agreements: the SADC (excluding SACU), the TDCA and the SACU-EFTA agreement. The study used secondary data, with exports and imports data sourced from the United Nations Statistics Bureau, and the Commodity Trade Statistics (COMTRADE) and Global Trade Atlas databases. The real gross domestic product (GDP) and population data were sourced from the International Monetary Fund and the World Bank. The binary variables (landlocked, colony and common language) data and the area and distance data were sourced from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) database. The use of these sources is common in the international trade literature. The study used secondary data, not primarily, as it is more prevalent in trade studies. The secondary data was run using the Stata software.

1.9 The organisation of the study

The study is arranged as follows. Chapter one introduces the background of the study and South African trade policies and agreements. This is followed by the problem statement, justification of the study, research questions, and, lastly, the research aims and objectives. Chapter two details South Africa's macro-economic trends. This is followed by the analysis of trends in the South African agro-processing industry, concentrating on employment, real output, investment and trade patterns.

Chapter three begins by outlining the study's theoretical framework, followed by an empirical review of the impact of trade agreements and the interaction between labour and trade. It furthermore reviews literature on the use of the revealed comparative advantage, and, lastly, it illustrates the theory of regional integration.

Chapter four details the study's research methodology, briefly highlighting the gravity and labour models. Subsequently, the effect of trade agreements on exports, imports and

employment are respectively presented in chapters five and six. Lastly, chapter seven provides the study's summary, conclusion, and recommendations for future studies.

1.10 Chapter summary

Noting the challenges of high unemployment facing South Africa, the agro-processing industry has been prioritised due to its link with the downstream and upstream industries. This has been observed in policies such as the NDP, IPAP and APAP. South Africa has been involved extensively in trade liberalisation. This saw South Africa participate in multiple trade agreements, namely, the SADC, the SACU-EFTA and the TDCA.

This study analysed the implications of the trade agreements on trade and employment in the agro-processing industry. Therefore, the chapter showed**,** firstly, the background of the study, followed by South African trade policies and agreements. It further provided the problem statement, justification of the study, research questions, and, lastly, the research aims and objectives.

2 CHAPTER 2: SOUTH AFRICAN MACRO-ECONOMIC AND AGRO-PROCESSING STATISTICS TRENDS

2.1 Introduction

The chapter provides the patterns of selected South Africa's macro-economic and agro-processing statistics, mainly the GDP, population, GDP per capita, Gini index, consumer price index (CPI), exchange rate, trade patterns, foreign direct investment, employment, real output, investment and exports/imports of agro-processing products.

2.2 South African macro-economic trends

2.2.1 Trends in South African GDP

The World Bank (2023) defines the GDP as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products, while GDP growth is the annual percentage growth rate of GDP at market prices based on constant local currency. Figure 2.1 shows the South African GDP between 1970 and 2016. Over the past 20 years, 1996 to 2016, notable slow GDP growth rates are observed in 1998 (0.5%), 2009 (-1.6%) and 2016 (0.6%). Similarly, peaks in GDP growth rates were achieved in 1996 (4.3%), 2000 (4.2%), 2006 (5.6%) and 2011 (3.2%).

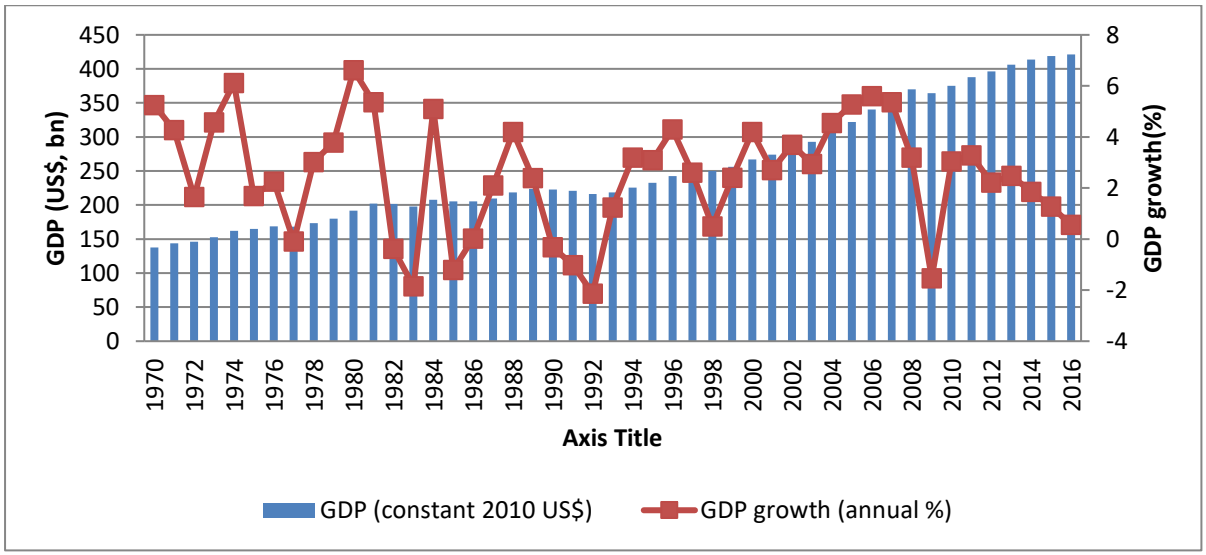

Figure 2.1: South Africa's gross domestic product, 1970 to 2016

Source: World Bank, 2019

2.2.2 Trends in South African population and GDP per capita

The GDP per capita is calculated by dividing the gross domestic product by the midyear population (World Bank, 2023). Figure 2.2 shows that the South African population continues to show a growth trend, increasing from about 42 million in 1996 to 56 million in 2016. However, the GDP per capita remains very flat at slightly above US$ 7000 over the period 2006 to 2016. This indicates that the population is growing at a faster rate than GDP.

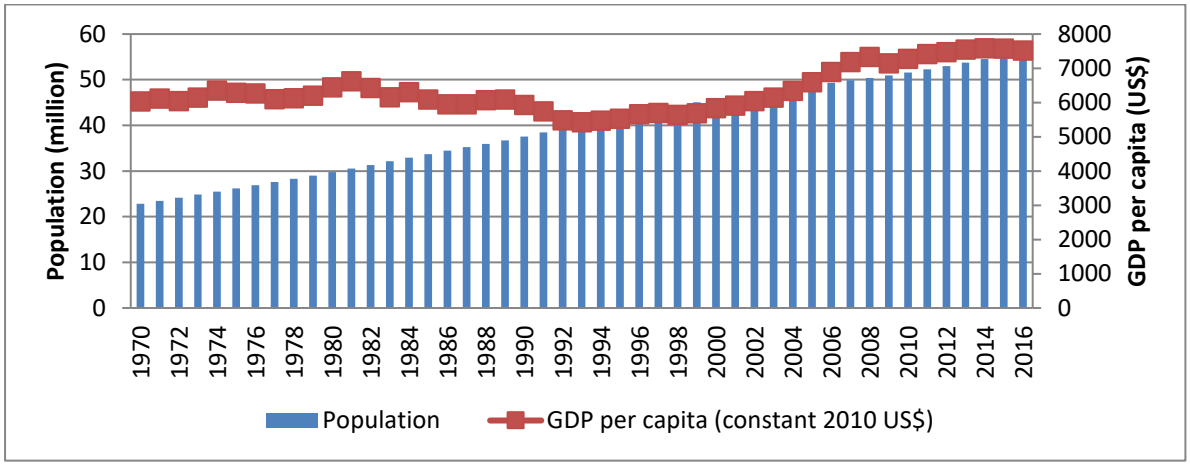

Figure 2.2: South Africa's population and GDP per capita, 1970 to 2016

Source: World Bank, 2019

2.2.3 Trends in South African Gini indices

Noting that GDP and GDP per capita are important economic indicators, the Gini index is equally important in showing the distribution of income. The Gini coefficient (Gini index or Gini ratio) is a statistical measure of economic inequality in a population (World Bank, 2023). Moreover, the coefficient measures the dispersion of income or distribution of wealth among the members of a population. The coefficient takes the value between 0 to 1 (or 0% to 100%), with 0 indicating perfect equality in distribution of income within a population, while 1 shows perfect inequality owing to one person in a population having all the wealth.

Additionally, a coefficient between 0–0.3 indicates relative equality, indicating that income or wealth is distributed quite equally. A coefficient between 0.3–0.4 shows that there is adequate equality, where income or wealth is distributed more suitable way, however, there's a space for equal distribution. A coefficient greater than 0.4 illustrates that unequal distribution. Lastly, a coefficient between 0.5–1 represents high inequality within an economy (World Bank, 2023). South Africa is regarded as a highly unequal society, with a Gini index of about 60.1% in 1996, which increased to about 63.0% in 2014 (Figure 2.3). This Gini index of 63% shows significant levels of income inequality in South Africa.

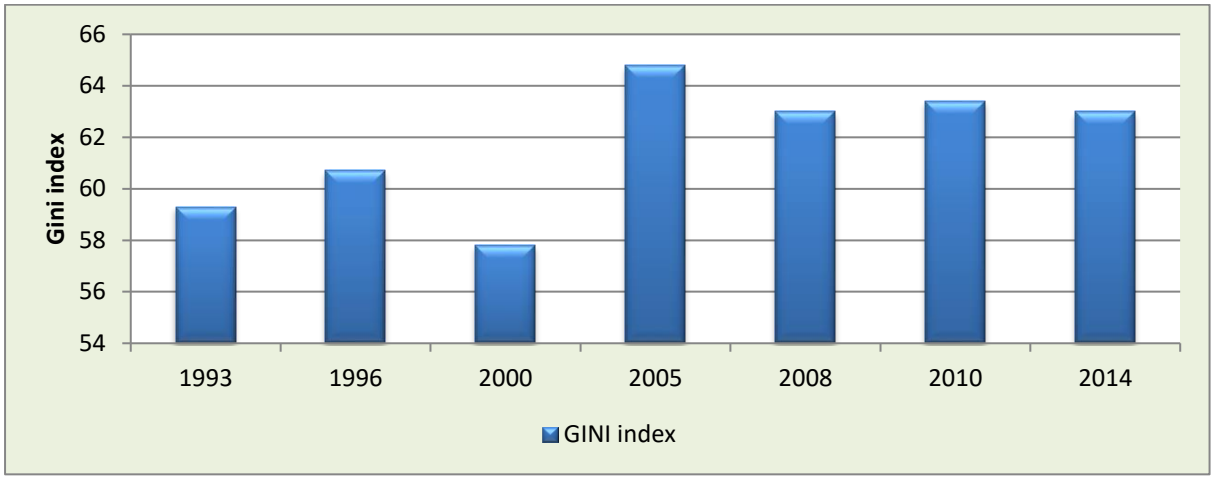

Figure 2.3: South Africa's Gini index, 1993 to 2014

Source: World Bank, 2019

2.2.4 Trends in the South African CPI and exchange rate

The Consumer price index, as defined by the World Bank (2023), reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Official exchange rate, on other hand, refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market(World Bank, 2023).

South Africa experienced a high CPI in the 1970s and 1980s, while at the same time, the rand was stable compared to the US dollar. Subsequent to 2000, both the CPI and the exchange rate moved in the same direction. However, the rand has experienced volatility over the past ten years, from 2006-2016 (Figure 2.4).

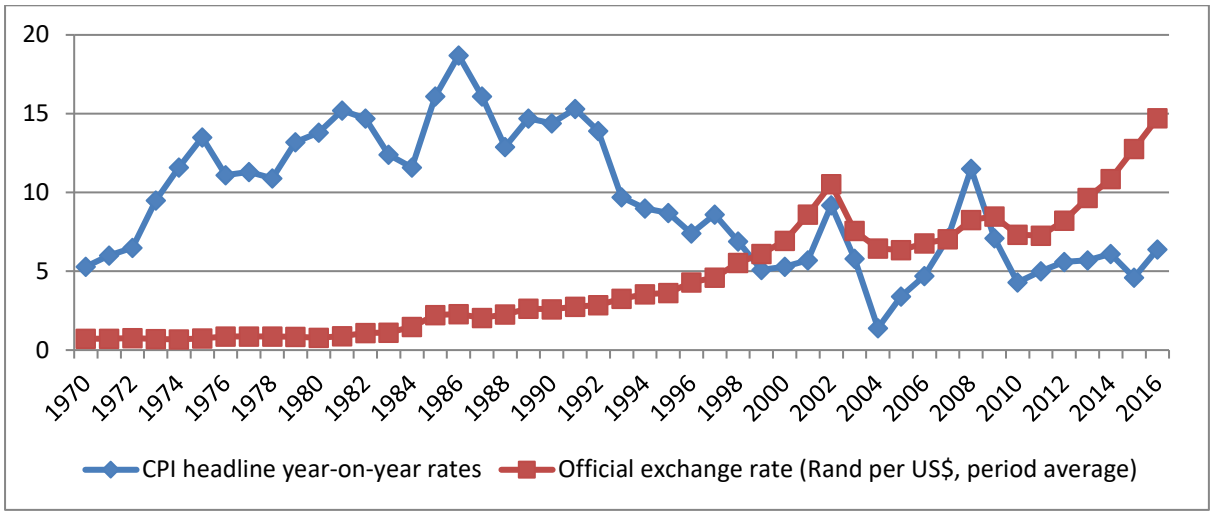

Figure 1.4: South Africa's CPI and official exchange rate, 1970 to 2016

Source: World Bank, 2019

2.2.5 South African exports, imports and trade balance

Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. Conversely, imports of goods and services represent the value of all goods and other market services received from the rest of the world (World Bank 2023). In 2016, South African total exports amounted to approximately R1 116.2 billion. South African exports are dominated by manufacturing and mining and quarrying. The manufacturing sector comprises about 60.83% of the country's total exports, followed by mining and quarrying with a share of 32.49%. However, agriculture, forestry and fishing have a share of 5.77% of the total exports, while electricity, gas and water contribute around a 0.92% share (Table 2.1).

In terms of total trade, South Africa had a positive trade balance in 2016. Similarly, South Africa had a positive trade balance in mining and quarrying; agriculture, forestry and fishing; and electricity, gas and water. However, South Africa had a negative trade balance in the manufacturing sector. South African total imports, as shown in Table 2.2, amounted to R1 099.99 billion, which is dominated by manufacturing with a share of 83.76%, while mining and quarrying had an import share of 13.18% (Table 2.1).

Table 2.1: South Africa's total trade with the world, 2016

Quantec SIC	Exports	Share	Imports	Share
	R bn	%	R bn	%
QUTT: Total: All industries	1,116.20	100	1 099.29	100
QUT03: Manufacturing [QSIC 3]	679.01	60.83	920.78	83.76
QUT02: Mining and quarrying [QSIC 2]	362.62	32.49	144.92	13.18
QUT01: Agriculture, forestry and fishing [QSIC 1]	64.36	5.77	30.95	2.82
QUT04: Electricity, gas and water [QSIC 4]	10.22	0.92	2.65	0.24

Source: Author's calculations based on data from Quantec, 2019b

South African total exports and imports by region are presented in Figure 2.5. In 2016, Asia accounted for 32% of South African total exports, followed by Africa with a share of 31%, while Europe, the Americas and Oceania account for shares of 26%, 10% and 1%, respectively. South African imports are mainly from Asia (44%) and Europe (33%). The Americas, Africa and Oceania account for 12%, 10% and 1%, respectively.

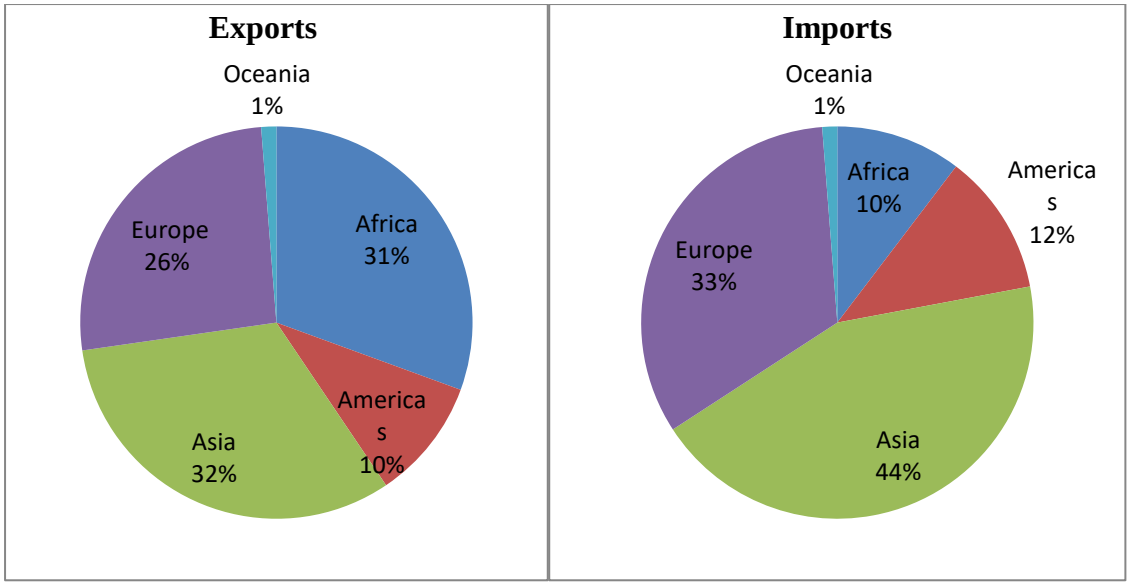

Figure 2.5: South Africa's total exports and imports by region, 2016

Source: Quantec, 2019b

Figure 2.6 shows the trends of leading export destinations for South Africa from 1996 to 2016. Prior to 2009, the leading markets for South African exports were Japan, the United States of America (USA), Germany and the United Kingdom. However, subsequent to 2009, there has been a substantial increase in exports to China, now the leading market for South African exports.

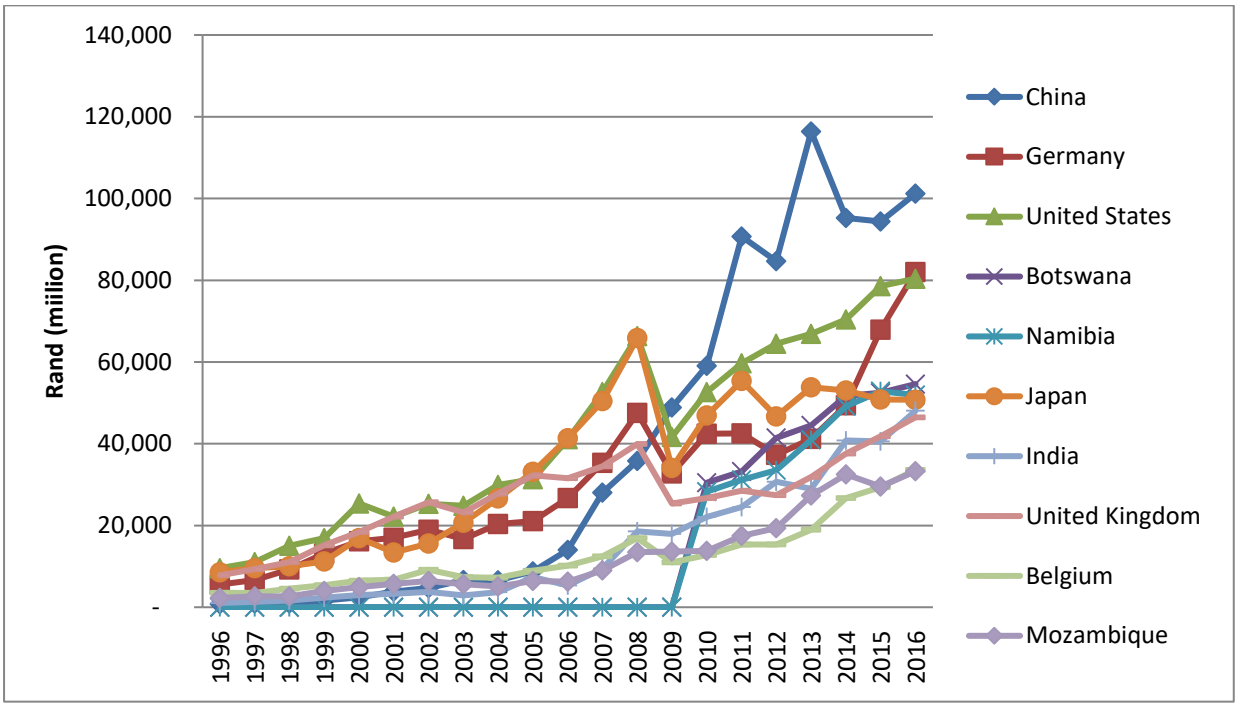

Figure 2.6: South Africa's top export destinations, 1996 to 2016

Source: Global Trade Atlas, 2019

Table 2.2 shows that in 2016 the leading export destinations for South Africa were China (9.2%), Germany (7.45%) and the USA (7.31%). Notable in Africa, Botswana (4.96%), Namibia (4.72%) and Mozambique (2.62%) were among the top ten destinations for South Africa's total exports. This, among other reasons, could be influenced by the SACU and SADC agreements and their proximity to South Africa.

Table 2.2: Top ten destinations for South Africa's total exports, 2016

Countries	Export value (Rm)	Share (%)	Trade regime
World	**1 100 311.18**	**100.00**	
China	101 173.74	9.20	MFN
Germany	82 027.90	7.45	MFN, TDCA and EPA
USA	80 392.35	7.31	MFN and AGOA
Botswana	54 596.76	4.96	SACU
Namibia	51 920.00	4.72	SACU
Japan	50 760.44	4.61	MFN
India	48 054.00	4.37	MFN
United Kingdom	46 480.77	4.22	MFN, TDCA and EPA
Mozambique	33 273.34	3.02	MFN and SADC
Netherlands	28 818.35	2.62	MFN, TDCA and EPA

Source: Author's calculations based on data from Global Trade Atlas, 2019

Table 2.3 shows South Africa's leading export products in 2016. The top leading exported Harmonized System (HS) chapters by South Africa are 71, 26, and 87. Chapter 71, which are natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin comprises of a share of 16%, which is followed by chapter 87 (vehicles) with a share of about 12.23% and chapter 26 with a 10.22% share.

Table 2.3: South Africa's leading exports products to the world in 2016

HS chapters	Description	Export value (Rm)	Share (%)
Total	**Total exports**	**1 100 311.18**	**100.00**
71	Nat Pearls Etc.; Prec Stones Etc.; Pr Met Etc.; Coin	182 558.82	16.59
87	Vehicles, Except Railway Or Tramway, And Parts Etc.	134 596.65	12.23
26	Ores, Slag And Ash	112 407.08	10.22
27	Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax	108 786.97	9.89
72	Iron And Steel	77 524.32	7.05
84	Nuclear Reactors, Boilers, Machinery Etc.; Parts	75 949.47	6.90
08	Edible Fruit and Nuts; Citrus Fruit Or Melon Peel	42 436.08	3.86
76	Aluminum And Articles Thereof	22 216.94	2.02
85	Electric Machinery Etc.; Sound Equip; TV Equip; Pts	26 902.15	2.44
39	Plastics And Articles Thereof	17 574.74	1.60

Source: Author's calculations based on data from Global Trade Atlas, 2019

Figure 2.7 and Table 2.4 show the sources of South African imports by country in 2016. Same as the export destinations for South African exports, the leading import sources are China, Germany, the USA, India and Saudi Arabia, with a share of 18.10%, 11.80%, 6.63%, 4.15% and 3.79%, respectively. China overtook Germany as South Africa's main source of imports subsequent to 2008. In Africa, Nigeria (likely due to oil imports) is the only country in the top ten, with a share of 2.77%. HS chapter 27 (mineral fuel, oil etc.) is the leading import for South Africa, followed by HS chapters 84 and 85 (see Table 2.7).

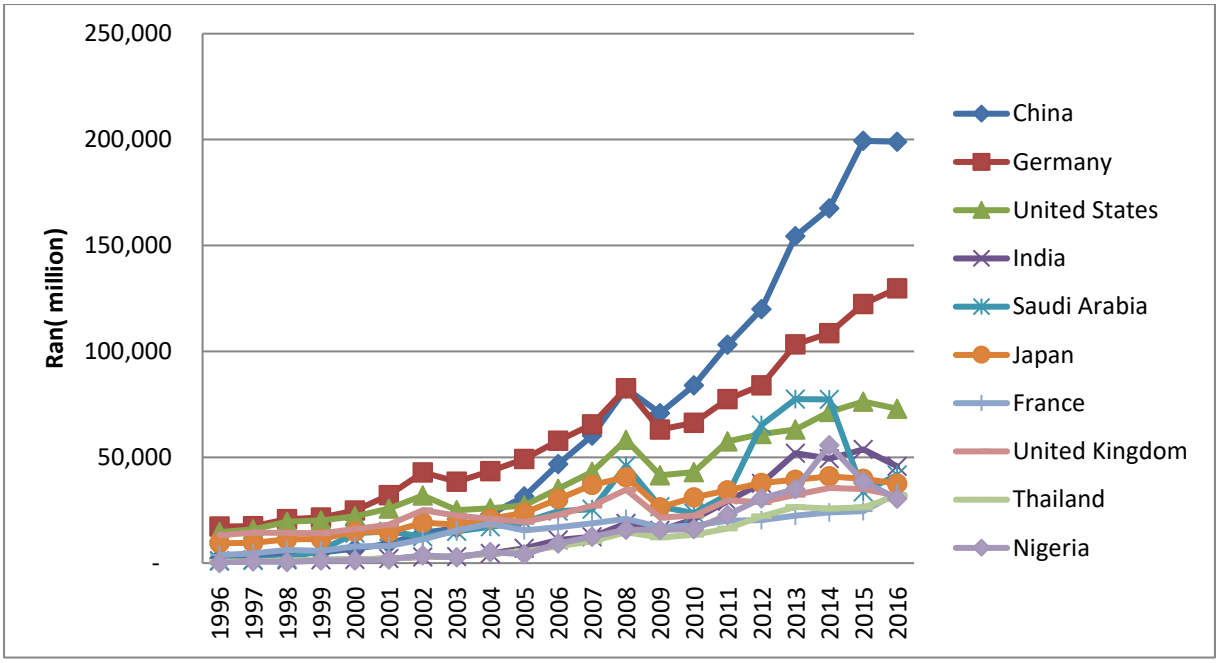

Figure 2.7: South Africa's imports by country, 1996 to 2016

Source: Global Trade Atlas, 2019

Table 2.4: Top ten leading import sources for South Africa, 2016

Country	Import value (Rm)	Share (%)	Trade regime
World	**1 099 292.18**	**100.00**	
China	198 990.68	18.10	MFN
Germany	129 682.90	11.80	MFN, TDCA and EPA
USA	72 902.26	6.63	MFN and AGOA
India	45 642.56	4.15	MFN
Saudi Arabia	41 691.62	3.79	MFN
Japan	37 528.94	3.41	MFN
United Kingdom	31 801.54	2.89	MFN, TDCA and EPA
Thailand	31 757.03	2.89	MFN
Nigeria	30 459.97	2.77	MFN
Italy	27 065.32	2.46	MFN, TDCA and EPA

Source: Author's calculations based on data from Global Trade Atlas, 2019

Table 2.5 shows South Africa's leading import products in 2016. The top leading imported HS chapters by South Africa are 84, 27 and 85. HS Chapter 84 (Nuclear Reactors, Boilers, Machinery Etc.; Parts) comprises a share of 13.71% of South Africa's total imports, which is

followed by chapter 27 (mineral fuel, oil) with a share of 13.45%, while chapter 85 has a share of around 10.81%.

Table 2.5: South Africa's leading imports products from the world, 2016

HS chapter	Description	Import value (Rm)	Share (%)
Total	All Commodities	1 099 292 178 770	100
84	Nuclear Reactors, Boilers, Machinery Etc.; Parts	150 749 569 916	13.71
27	Mineral Fuel, Oil Etc.; BituminSubst; Mineral Wax	147 811 867 090	13.45
85	Electric Machinery Etc; Sound Equip; Tv Equip; Pts	118 798 286 263	10.81
98	Special Classification Provisions, Nesoi	88 090 150 009	8.01
87	Vehicles, Except Railway Or Tramway, And Parts Etc	84 949 915 123	7.73
39	Plastics And Articles Thereof	33 140 499 268	3.01
90	Optic, Photo Etc, Medic or Surgical Instruments Etc	29 685 320 183	2.70
30	Pharmaceutical Products	27 768 215 045	2.53
38	Miscellaneous Chemical Products	20 267 744 304	1.84
29	Organic Chemicals	17 822 790 920	1.62

Source: Author's calculations based on data from Global Trade Atlas, 2019

Figure 2.8 shows the trade balance for South Africa over the period 1996 to 2016. The South African trade balance depicts a repetitive trend, with years of trade surplus succeeded by years of trade deficits. However, subsequent to 2004, years of trade surpluses are not as prevalent as years of trade deficits. Following successive quadruple deficits, from 2012 to 2015, South Africa achieved a trade surplus of approximately R16 911.11 billion in 2016.

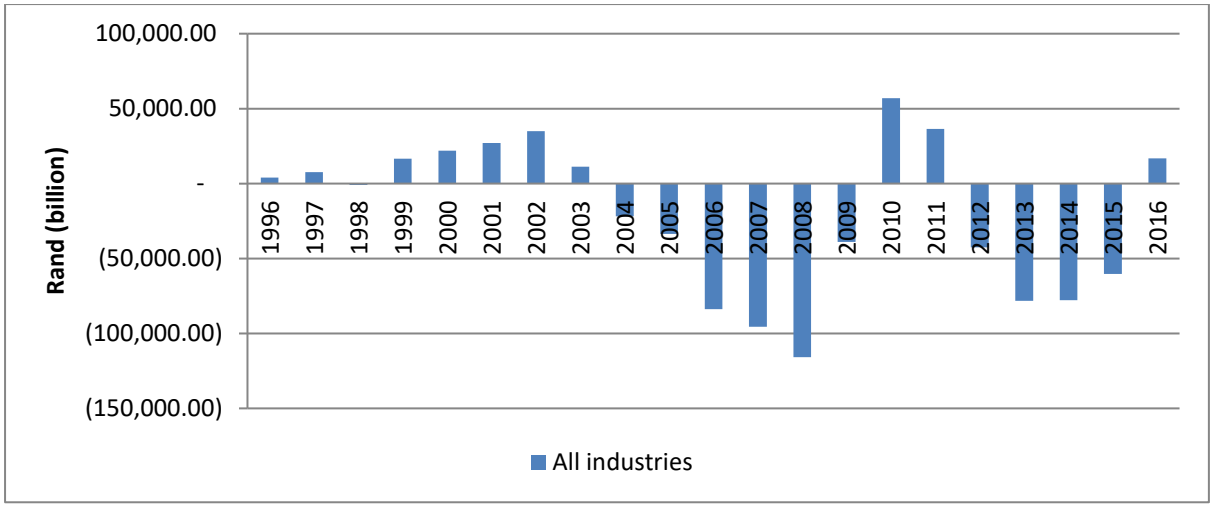

Figure 2.8: South Africa's trade balance of all industries, 1996 to 2016

Source: Author's calculations based on data from Quantec, 2019b

2.2.6 Trends of South African Foreign Direct Investment

FDI net inflows are the value of inward direct investment made by non-resident investors in the reporting economy. On contrary, FDI net outflows are the value of outward direct investment made by the residents of the reporting economy to external economies (World Bank, 2023) The foreign direct investment (FDI) net inflows and outflows for South Africa from 1970 to 2016 are presented in Figure 2.9. The 1970s and 1980s were characterised by low FDI, both for net inflows and outflows. However, following the opening of South Africa's economy in the early 1990s, both net inflows and outflows showed an increasing trend. The FDI net inflows reached their peak in 2008 at around US$9 885.00 billion. Between 2012 to 2016, the FDI net outflows increased substantially; this is the only period befell by high capital flight.

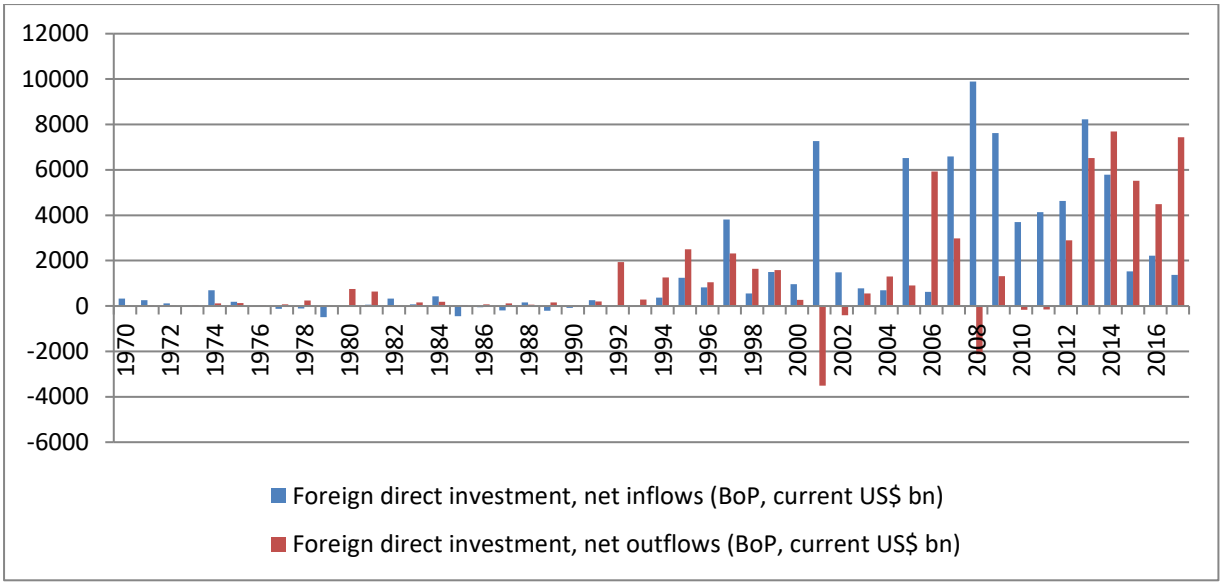

Figure 2.9: South Africa's foreign direct investment (net inflows and outflows), 1970 to 2016

Source: The World Bank, 2019

2.3 South African indicators of agro-processing industry performance

In 2016, as Figure 2.10 shows, South African employment peaked at about 15.8 million. This equates to approximately 3.6% share of the agro-processing industry in South African total employment in 2016. The share of agro-processing industry employment in South Africa's total employment appears to have been stable between 1970 and 2000. However, after 2000, albeit with a slight increase in South Africa's total employment, the share of the agro-processing industry exhibited a declining trend from 6.0% in 2000 to about 3.6% in 2016.

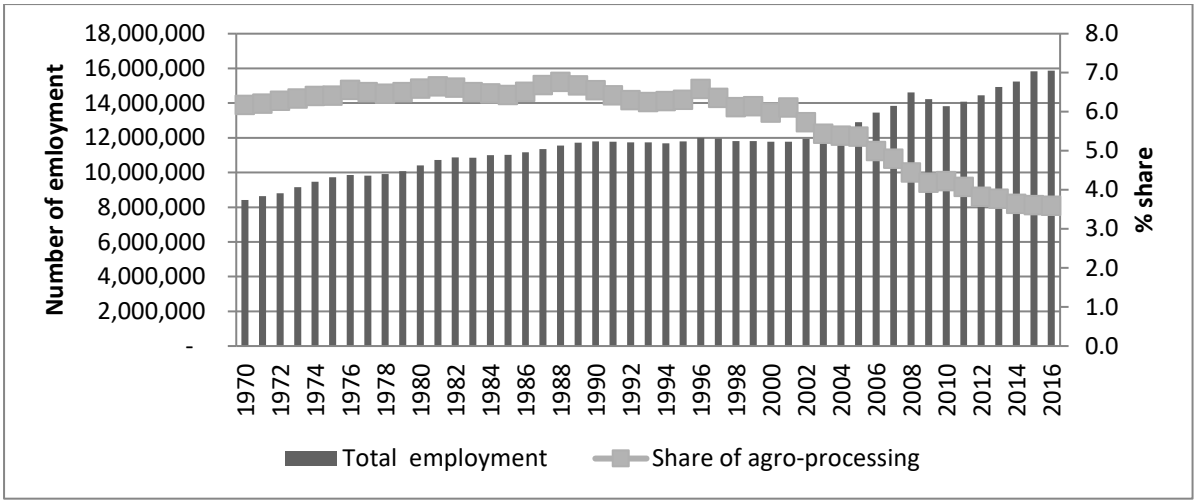

Figure 2.10: South Africa's total employment and share of the agro-processing industry, 1970 to 2016

Source: Author's calculations based on data from Quantec, 2019b

2.3.1 Trends in production and investment in South Africa's agro-processing industry

Figure 2.11 shows the real output and real gross domestic fixed investment of the food division; the primary vertical axis shows the real output value, and the secondary vertical axis indicates that of real gross domestic fixed investment. The real output for the food division has shown a substantial increase from about R61 047 million in 1970 to about R221 270 million in 2016. Over the period 2006 to 2016, it appears to have stabilised. However, investment in the food division, given their susceptibility to the macro-economic environment, exhibits highly volatile trends ranging between R2 221 million and R11 019 million over the period under review.

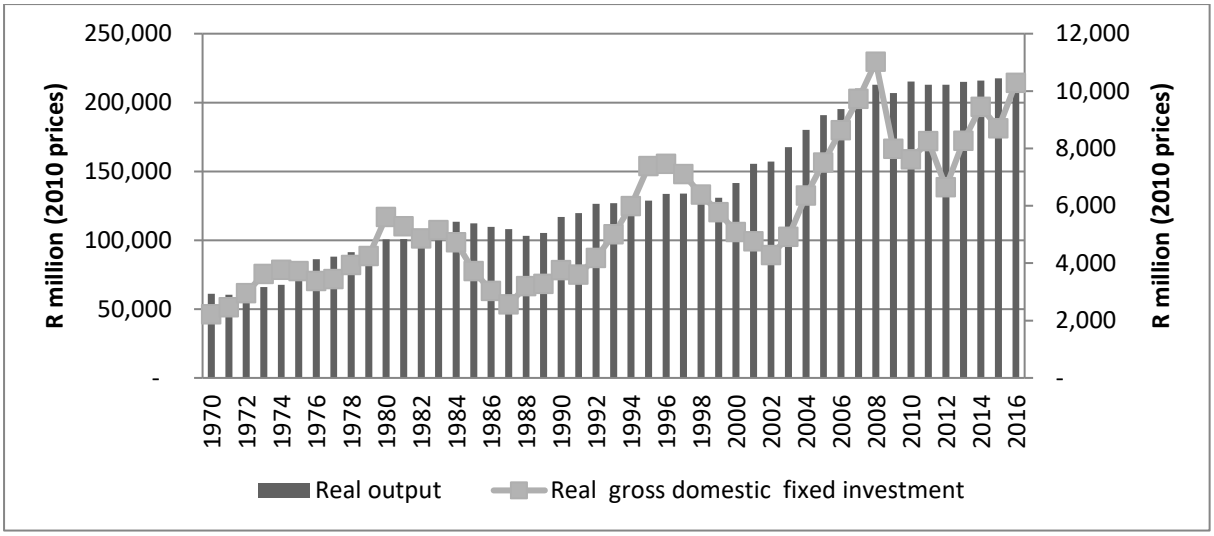

Figure 2.11: Real output and investment of the food division, 1970 to 2016

Source: Quantec, 2019b

Figure 2.12 shows the real output and investment of the beverages division over the period 1970 to 2016. In 2016, the real output and investment in the beverages division were approximately R62 449 million and R4 111 million, respectively. Unlike the stable variation relating to real output, the investment in the beverages division is characterised by high peaks, which, subsequently, are followed by a substantial decline. This, therefore, indicates that investment in the beverages division tends to be cyclical.

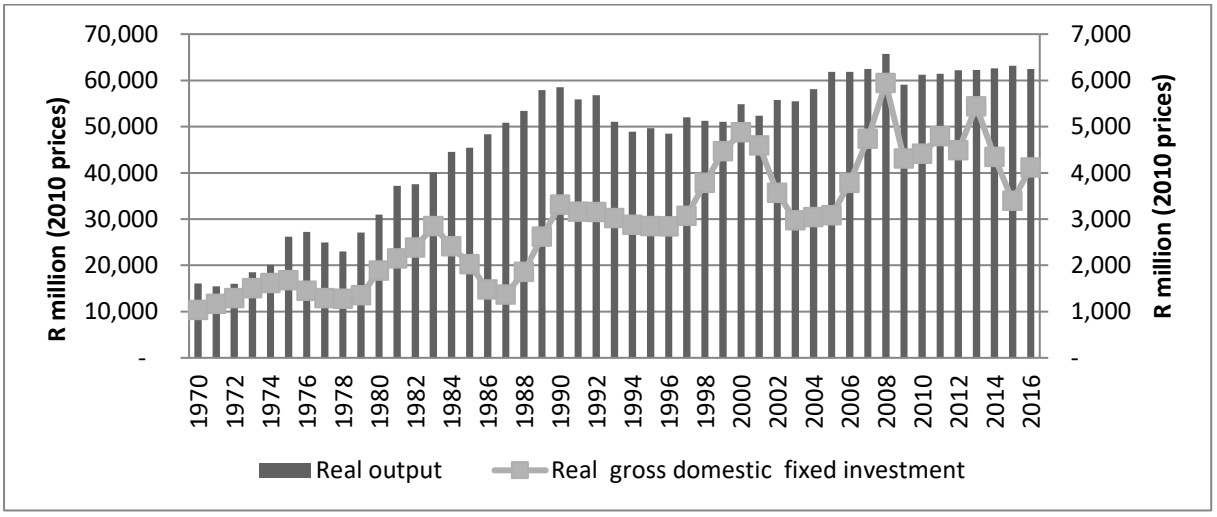

Figure 2.12: Real output and investment of the beverages division, 1970 to 2016

Source: Quantec, 2019b

The real output of the tobacco division increased at a fast rate between 1970 and 1990. However, between 1990 and 2016, it appears to have stabilised, peaking at around R65 695 million in 2008. Investment in the tobacco division peaked in the late 1970s and early 1980s. However, recently, it declined drastically from about R322 million in 2004 to about R56 million in 2016 (Figure 2.13).

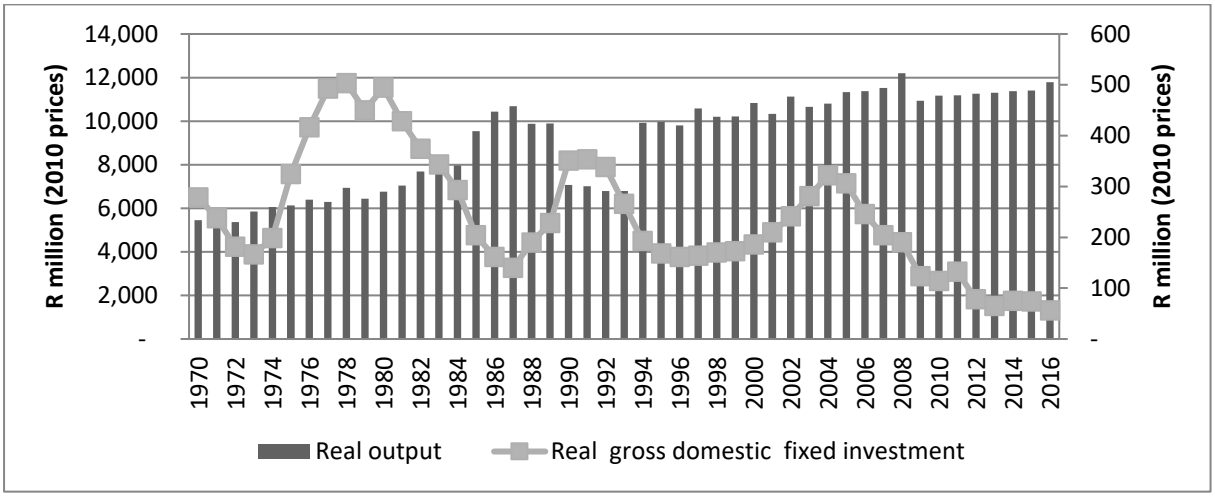

Figure 2.13: Real output and investment of the tobacco division, 1970 to 2016

Source: Quantec, 2019b

Like the tobacco division, textiles' output remained stable over the past ten years (2006 to 2016). However, as Figure 2.14 indicates, investment in the textiles division declined from about R1 335 million in 2004 to R633 million in 2016. The stable real output and declining investment likely indicate that the demand for textiles products is supplemented by textiles imports.

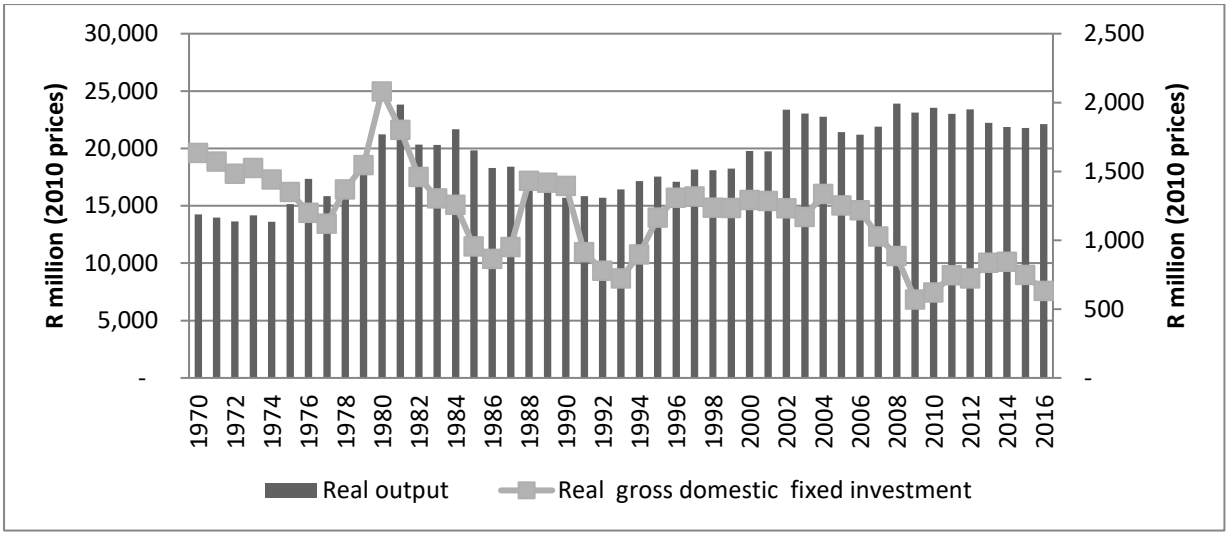

Figure 2.14: Real output and investment of the textiles division, 1970 to 2016

Source: Quantec, 2019b

Contrary to declining investment in the tobacco and textiles divisions over the last ten years of the review period, the investment in the footwear division records an increasing trend from about R49 million in 2004 to about R138 million in 2016 (Figure 2.15). There is a similar peak in footwear investment, as observed in divisions like tobacco, during the later 1970s and early 1980s. This is followed by a notable decline after 1994. This is likely impacted by a change in South Africa's trade policy after joining the WTO.

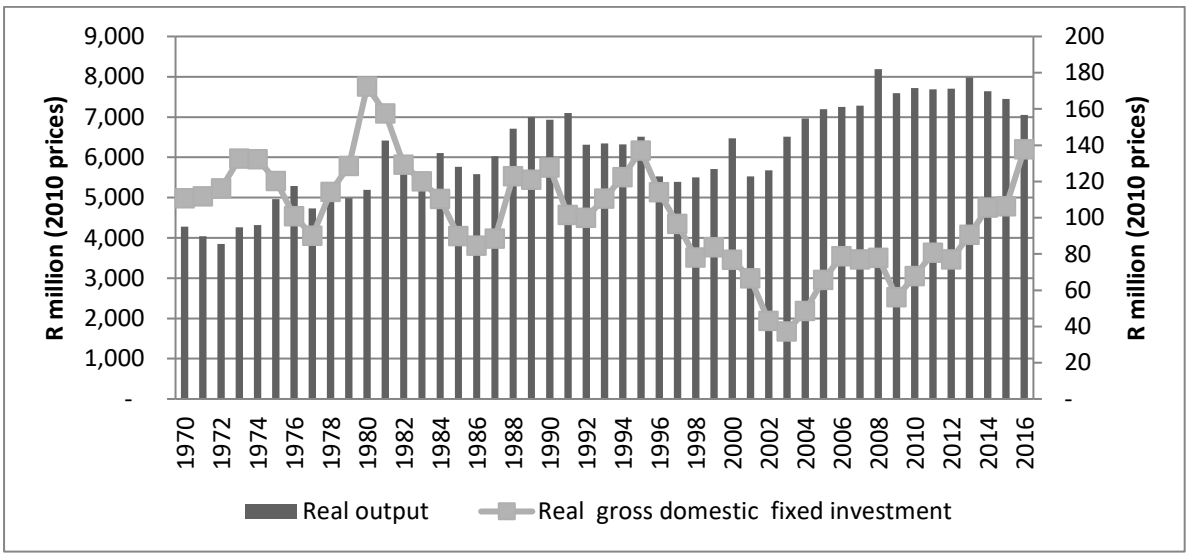

Figure 2.15: Real output and investment of the footwear division, 1970 to 2016

Source: Quantec, 2019b

The maintained level of real output in the wearing apparel division, as in other divisions, is also observed over the past ten years of the period under review, reaching about R17 784 million in 2016. However, the real investment in wearing apparel appears to have increased from 1994 to 2003. This is the period when South Africa acceded to the WTO. This level of growth was not maintained, with a notable decline in investment from about R526 million in 2003 to R358 million in 2016 (Figure 2.16).

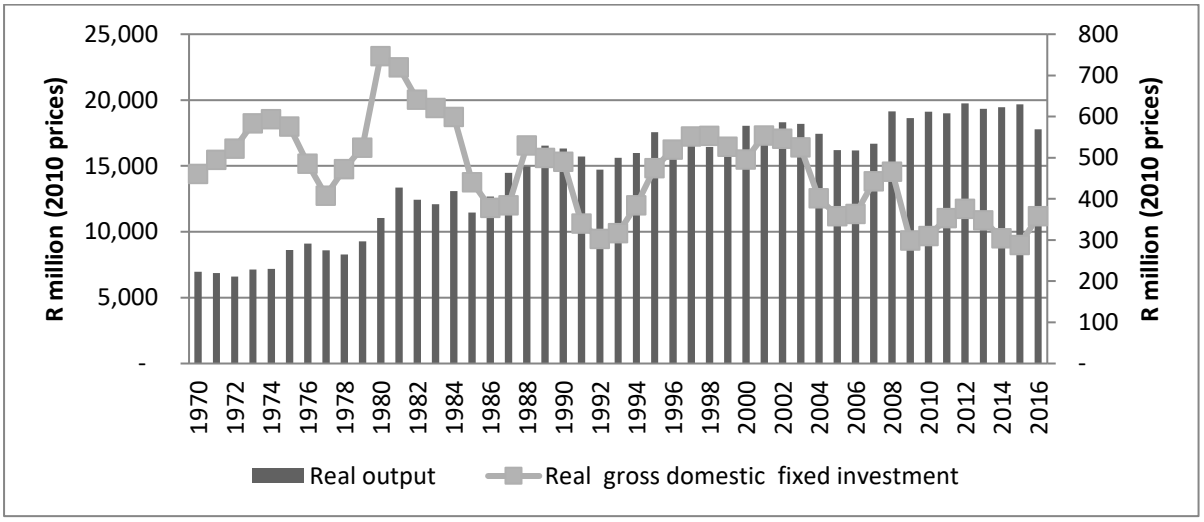

Figure 2.16: Real output and investment of the wearing apparel division, 1970 to 2016
Source: Quantec, 2019b

Before 1996, the real output and investment of the leather and leather products division exhibited similar trends of simultaneous increase and decrease. After 1996, the real output of leather and leather products doubled sharply from about R2 258 million in 1996 to R4 555 million in 2016. However, investment declined from about R154 million in 2001 to R48 million in 2016. Though investment increased from 1997 to 2001, this was not sustained in the subsequent years (Figure 2.17).

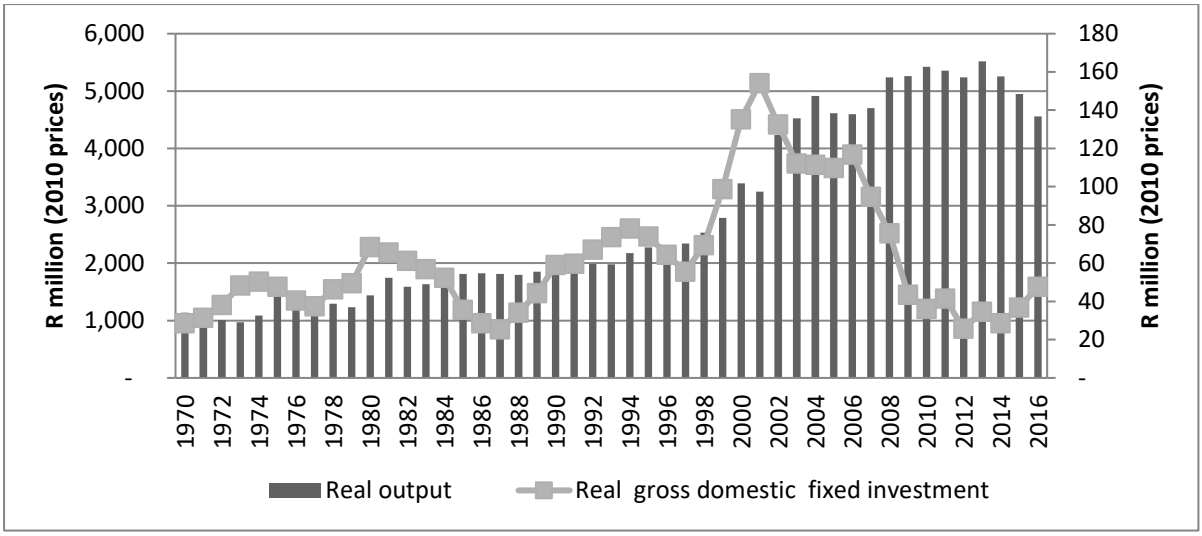

Figure 2.17: Real output and investment of the leather and leather products division, 1970 to 2016

Source: Quantec, 2019b

The real output and investment in the rubber products division depict an increasing trend, as shown in Figure 2.18. The real output and investment of the rubber products division were R14 020 million and R1 095 million, respectively, in 2016. The real output exhibits a stable trend over the past decade of the review period. However, investment is characterised by sharp fluctuations. The investment in rubber products declined from about R1 071 million in 2011 to R450 million in 2014, though a rebound was observed in 2016.

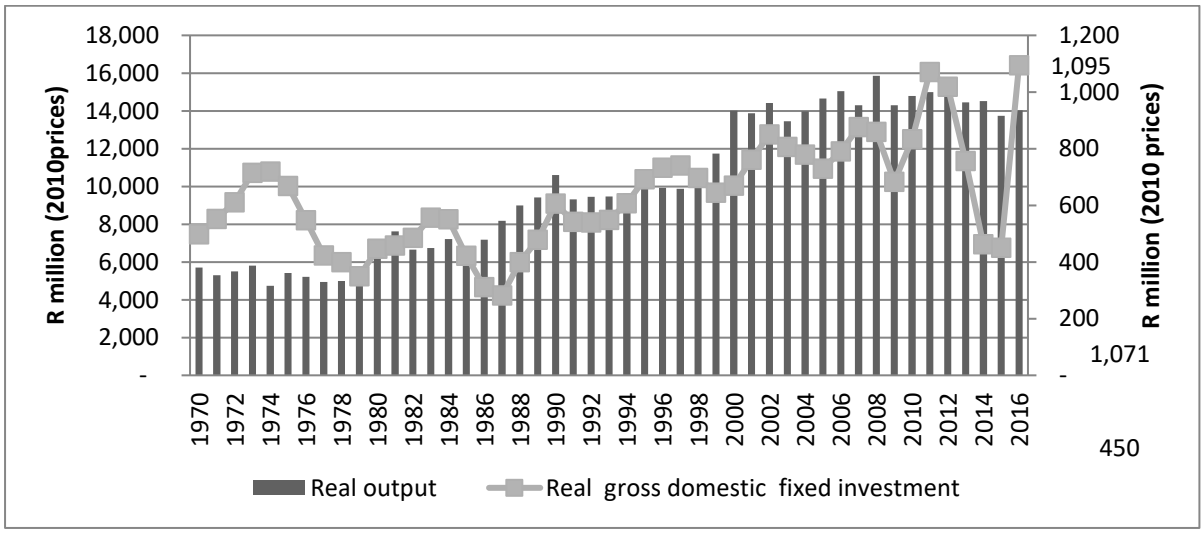

Figure 2.18: Real output and investment of the rubber products division, 1970 to 2016

Source: Quantec, 2019b

The real output and investment for the wood and wood products division are shown in Figure 2.19. The real output depicts an increasing trend, albeit slow, over the period under review. The real output increased from approximately R17 634 million in 1996, reaching about R38 823 million in 2016. However, investment in the wood and wood product division shows a relatively even trend, with a notable spike observed in 2008.

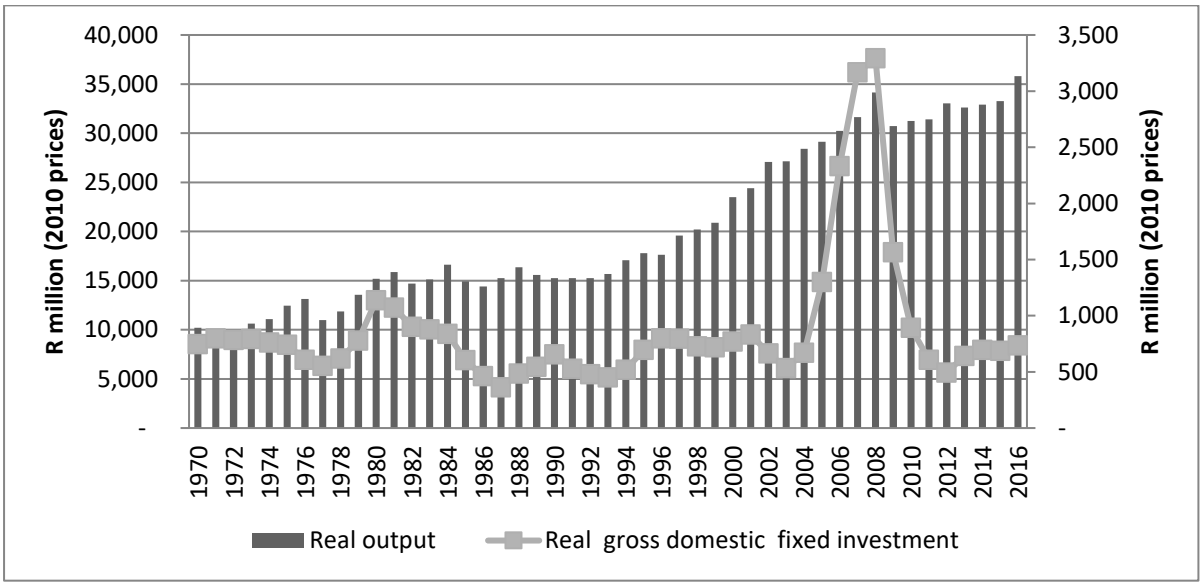

Figure 2.19: Real output and investment of the wood and wood products division, 1970 to 2016

Source: Quantec, 2019b

The real output of the furniture division, though slowing down over the last decade of the period under review, has continuously shown an increasing trend (Figure 2.20). The real output range is between R3 807 million and R19 952 million, with the former recorded in 1978 while the latter was in 2008. However, investment in the furniture division was characterised by cyclical patterns. This is likely influenced, among other factors, by the production nature of the furniture industry.

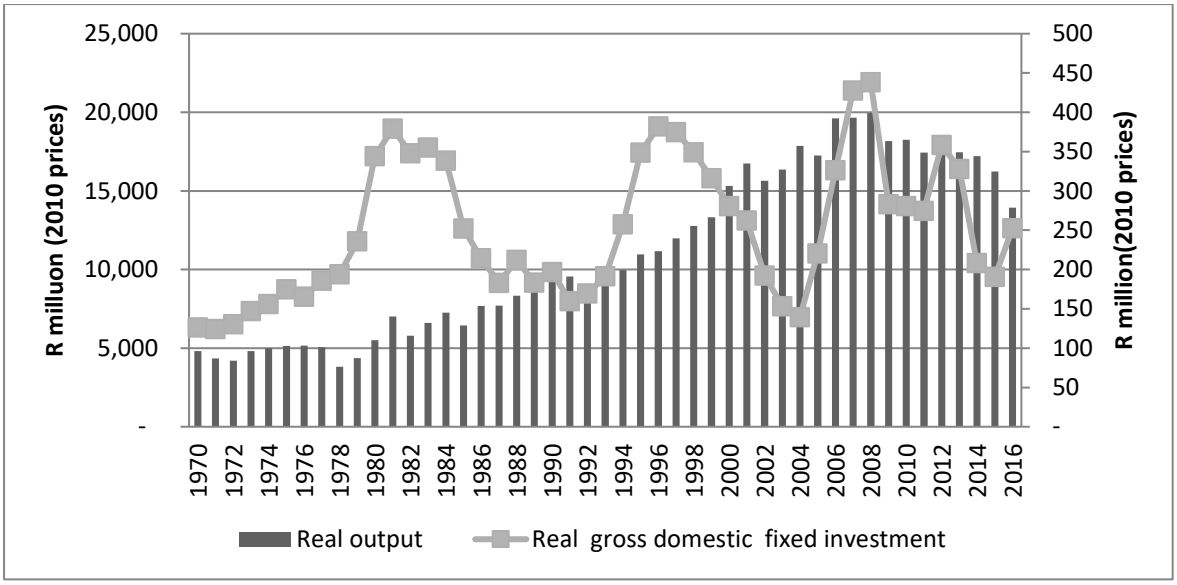

Figure 2.20: Real output and investment of the furniture division, 1970-2016

Source: Quantec, 2019b

Figure 2.21 depicts the real output and investment of the paper and paper products division from 1970 to 2016. The real output, after a peak of R67 788 million in 2008, has stabilised at approximately R60 000 million. Similarly, investment in the paper and paper products division reached its peak in 2008, which amounted to approximately R9 525 million, but it subsequently declined to about R3 532 million in 2016.

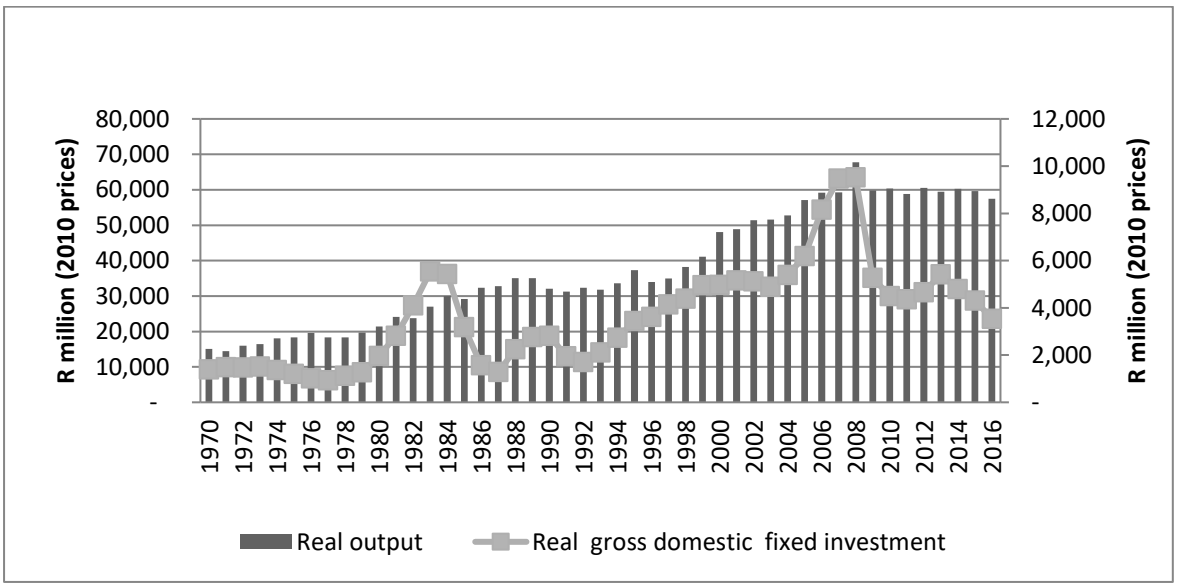

Figure 2.21: Real output and investment of the paper and paper products division, 1970 to 2016

Source: Quantec, 2019b

2.3.2 Trade and employment trends

Figure 2.22 presents South Africa's trade and employment trends in the food products division. South Africa, over the past four decades, has mainly been the net importer of food products. The exports and imports of food products before 1990 appear to be stable. This, however, changed after 1990, with around R11 449 million food exports recorded in 2000, which increased to approximately R39 370 million in 2016.

Similarly, the imports of food products increased from about R13 712 million in 2000 to R32 712 million in 2016. Employment in the food division reached its peak in the early 1990s, with a record employment of about 273 058 in 1999. Subsequent to the 1990s, the employment in the food division slight declined to about 189 866 in 2010.

Figure 2.22: Trade and employment of the food division, 1970 to 2016
Source: Quantec, 2019b

Table 2.6 shows South African exports of SIC 301, which is the production, processing and preservations of meat, fish, fruit, vegetables, oils and fats in 2016. Namibia, Zimbabwe and Botswana are destinations for South Africa's exports of meat, fish, fruit, vegetables, oils and fats with a share of 8.13%, 6.95% and 6.67%, respectively, in 2016. Outside of the African continent, the main destinations of South Africa's exports of these products are Italy (6.11%), China (4.89%), Spain (4.46%) and the Netherlands (3.23%).

Table 2.6: South Africa's exports of meat, fish, fruit, vegetables, oils and fats [SIC 301], 2016

Country	Export value, Rm	% share
World	**27 637.20**	**100.00**
Namibia	2 247.00	8.13
Zimbabwe	1 919.65	6.95
Botswana	1 842.52	6.67
Italy	1 687.91	6.11
Mozambique	1 672.32	6.05
China	1 351.49	4.89
Spain	1 233.54	4.46
Lesotho	1 229.27	4.45
Zambia	952.81	3.45
Netherlands	893.88	3.23

Source: Author's calculations based on data from Quantec, 2019b

Regarding South Africa's imports of meat, fish, fruit, vegetables, oils and fats, as presented in Table 2.7, in 2016, South Africa's total import value of production, processing and preservation of these products (SIC 301) was around R30 510.81 million. Argentina constituted about 16.00% of South Africa's total imports, while Indonesia, the Netherlands and Spain comprised about 10.55%, 8.89% and 7.57%, respectively. Namibia is also a major source of South Africa's imports of meat, fish, fruit, vegetables, oils and fats, contributing around 6.09%.

Table 2.7: South Africa's imports of meat, fish, fruit, vegetables, oils and fats [SIC 301], 2016

Country	Import value, Rm	% share
World	**30 510.81**	**100.00**
Argentina	4 881.85	16.00
Indonesia	3 218.31	10.55
Netherlands	2 711.21	8.89
Spain	2 309.59	7.57
Malaysia	1 989.32	6.52
Namibia	1 858.85	6.09
Brazil	1 770.41	5.80
China	1 754.94	5.75
Thailand	951.02	3.12
United Kingdom	750.83	2.46

Source: Author's calculations based on data from Quantec, 2019b

South Africa exported around R3 190.48 million of dairy products (SIC 302) in 2016. The leading destinations were Botswana, with a share of about 21.18%, followed by Namibia (18.10%) and Mozambique (12.56%). South Africa's export value of dairy products to the USA and Japan, the markets outside Africa appearing in the top ten, are R113.21 million and R82.65 million, with a share of around 3.55% and 2.83% of South Africa's total exports of dairy products, respectively, in 2016 (Table 2.8).

Table 2.8: South Africa's exports of dairy products [SIC 302], 2016

Country	Export value, Rm	% share
World	**3 190.48**	**100.00**
Botswana	682.25	21.38
Namibia	577.37	18.10
Mozambique	400.80	12.56
Lesotho	277.34	8.69
Swaziland	246.24	7.72
Angola	172.20	5.40
Zimbabwe	166.59	5.22
Zambia	134.84	4.23
USA	113.21	3.55
Japan	82.65	2.59

Source: Author's calculations based on data from Quantec, 2019b

Table 2.9 shows the leading suppliers of dairy products to South Africa in 2016. New Zealand is the main supplier of dairy products imported by South Africa with an import value of about R380.60 million, which equates to about 17.64% of South Africa's total dairy products imports. France, Germany and Ireland are important sources of South African imports, constituting a share of around 16.16%, 9.94% and 7.94%, respectively, in 2016.

Table 2.9: South Africa's imports of dairy products [SIC 302], 2016

Countries	Import value, Rm	% share
World	**2 157.97**	**100.00**
New Zealand	380.60	17.64
France	372.53	17.26
Germany	235.42	10.91
United Kingdom	211.14	9.78
Ireland	168.59	7.81
Poland	131.30	6.08
USA	101.92	4.72
Italy	97.68	4.53
Netherlands	91.15	4.22
Denmark	70.01	3.24

Source: Author's calculations based on data from Quantec, 2019b

Table 2.10 shows export destinations for South African grain mill products, starches and starch products and prepared animal feeds [SIC 303] in 2016. The leading export destinations are Zimbabwe, Botswana and Lesotho with a respective share of 17.44%, 13.92% and 13.79%. These are mainly the SACU and SADC Member States; however, outside these regions, South Africa exports to Australia with a share of about 2,32%. The total South African exports of grain mill products, starches and starch products and prepared animal feeds [SIC 303] amounted to about R7 463.98 million in 2016.

Table 2.10: South Africa's export of grain mill products, starches and starch products and prepared animal feeds [SIC 303], 2016

Countries	Export value, Rm	% share
World	**7 463.98**	**100.00**
Zimbabwe	1 301.53	17.44
Botswana	1 039.18	13.92
Lesotho	1 029.39	13.79
Namibia	795.09	10.65
Swaziland	656.18	8.79
Mozambique	617.81	8.28
Angola	539.50	7.23
Zambia	438.55	5.88
Australia	172.92	2.32
Malawi	84.22	1.13

Source: Author's calculations based on data from Quantec, 2019b

Regarding South Africa's imports of grain mill products, starches and starch products and prepared animal feeds, as presented in Table 2.11, Thailand constitutes a bulk share of approximately 33.21% of South Africa's total imports of grain mill products, which is around R11 144.93 million. India is a major source of South Africa's imports, constituting around 15.47%, which is around R1 723.97 million. In SACU, Swaziland and Lesotho are major suppliers of grain mill products, starches and starch products and prepared animal feeds to South Africa, accounting for about R416.28 million and R239.05 million, respectively, in 2016.

Table 2.11: South Africa's import of grain mill products, starches and starch products and prepared animal feeds [SIC 303], 2016

Country	Import value, Rm	% share
World	**11 144.93**	**100.00**
Thailand	3 701.04	33.21
India	1 723.97	15.47
Netherlands	531.47	4.77
Swaziland	416.28	3.74
France	382.23	3.43
USA	334.34	3.00
China	319.21	2.86
United Arab Emirates	250.20	2.24
Lesotho	239.05	2.14
United Kingdom	201.35	1.81

Source: Author's calculations based on data from Quantec, 2019b

South Africa's total exports of other food products to the world were about R12 357.19 million in 2016. Namibia is the leading market for South African exports of other food products, constituting approximately 17.72%, while Botswana, Mozambique and Zambia have a share of 14.93%, 11.70% and 7.70%, respectively, in 2016 (Table 2.12).

Table 2.12: South Africa's exports of other food products [SIC 304], 2016

Country	Export value, Rm	% share
World	**12 357.19**	**100.00**
Namibia	2 190.21	17.72
Botswana	1 844.84	14.93
Mozambique	1 446.32	11.70
Zambia	951.61	7.70
Zimbabwe	860.55	6.96
Lesotho	553.41	4.48
Swaziland	430.87	3.49
USA	401.40	3.25
Angola	326.30	2.64
Malawi	299.24	2.42

Source: Author's calculations based on data from Quantec, 2019b

As depicted in Table 2.13, South African imports of other food products from the world were approximately R13 914.33 million in 2016. Swaziland, Germany and Italy are the leading sources of South Africa's imports of other food products accounting for a share of 23.44%, 7.15% and 5.57%, respectively, in 2016. African countries, except Swaziland, are not major players as suppliers of other food products to South Africa.

Table 2.13: South Africa's import of other food products [SIC 304], 2016

Country	Import value, Rm	% share
World	**13 914.33**	**100.00**
Swaziland	3 262.18	23.44
Germany	995.52	7.15
Italy	775.09	5.57
Netherlands	754.35	5.42
United Kingdom	682.55	4.91
Poland	624.81	4.49
USA	550.86	3.96
Brazil	524.08	3.77
Switzerland	523.20	3.76
France	442.77	3.18

Source: Author's calculations based on data from Quantec, 2019b

Before 1996, South Africa was a net importer of beverages products but became a net exporter after 2016. Beverages exports have shown a sharp increase from R2 126 million in 1996 to about R12 246 million in 2016, while imports increased modestly from R2 126 million in 2000 to R3 659 million in 2016. However, employment reached its peak around 1999 (about 63 641 employed), which subsequently declined to 45 462 in 2003 and, again, increased to its highest record of about 67 556 in 2016.

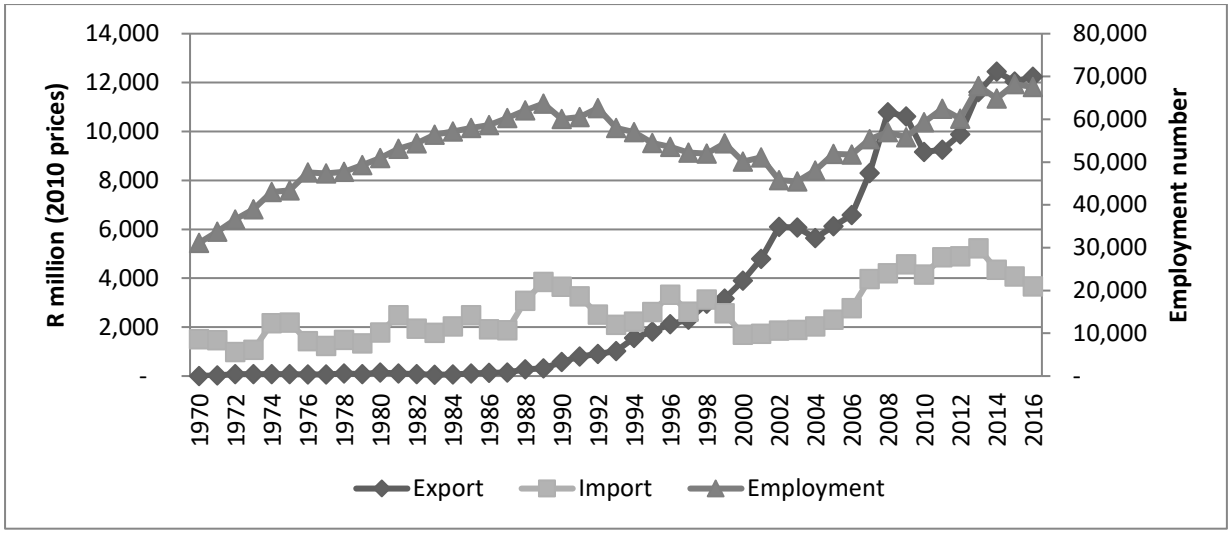

Figure 2.23: Trade and employment of the beverages division, 1970 to 2016

Source: Quantec, 2019b

Unlike other agro-processing products, where leading export markets tends to be mainly SADC countries, South African beverages exports are destined to the United Kingdom, which is about R1 643.73 million and comprising approximately 10.73% of South Africa's total beverages export. The significant export markets for South African beverages are Namibia (8.58%), Germany (8.44%), the Netherlands (5.10%) and the USA (4.80%). Moreover, Canada, China and Sweden are important markets for South Africa's beverages exports with a share of 4.12%, 3.67% and 3.43%, respectively (Table 2.14).

Table 2.14: South Africa's exports of beverages [SIC 305], 2016

Country	Export value, Rm	% share
World	**15 319.28**	**100.00**
United Kingdom	1 643.73	10.73
Namibia	1 313.97	8.58
Germany	1 292.64	8.44
Netherlands	781.66	5.10
USA	735.15	4.80
Mozambique	719.91	4.70
Canada	630.68	4.12
China	561.74	3.67
Sweden	525.20	3.43
Zambia	523.56	3.42

Source: Author's calculations based on data from Quantec, 2019b

Table 2.15 shows the sources of South Africa's imports of beverages in 2016. The total of South Africa's imports of beverages was around R5 849.47 million in 2016. The United Kingdom is the major supplier of beverages to South Africa, which amounted to about R2 171.70 million and accounted for about a 37.13% share. France and Namibia are important sources of South Africa's beverages imports with respective shares of 19.52% and 12.24% in 2016.

Table 2.15: South Africa's imports of beverages [SIC 305], 2016

Country	Import value, Rm	% share
World	**5 849.47**	**100.00**
United Kingdom	2 171.70	37.13
France	1 141.90	19.52
Namibia	716.23	12.24
Belgium	298.82	5.11
Ireland	226.42	3.87
USA	202.98	3.47
Mexico	193.79	3.31
Germany	177.45	3.03
Italy	110.17	1.88
Netherlands	101.60	1.74

Source: Author's calculations based on data from Quantec, 2019b

Similar to trade patterns observed in the beverages division, South Africa was a net importer of tobacco products prior to 1990; however, subsequent to 1990, South Africa became a net exporter of tobacco products. The value of South African exports and imports of tobacco products were about R313 million and R240 million, respectively, in 1990, which increased to R2 108 million and R671 million in 2016, respectively. The employment in South Africa's tobacco division exhibits a slightly declining trend over the period under review with recorded employment in 1970, 1990 and 2016 of about 6 892, 5 198 and 4 925, respectively (Figure 2.24).

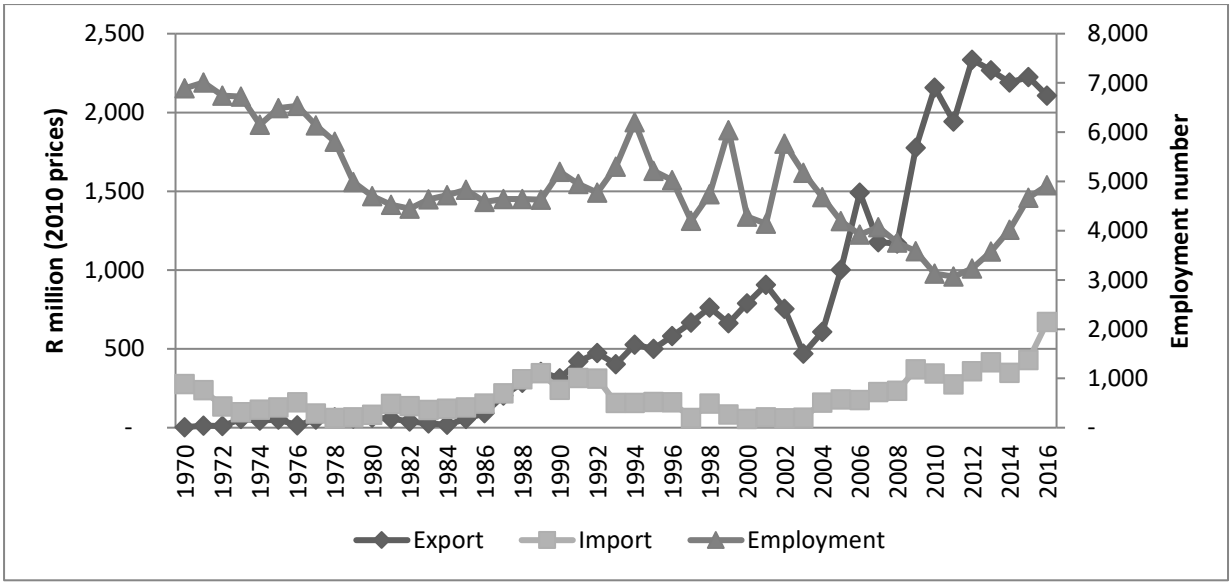

Figure 2.24: Trade and employment of the tobacco division, 1970 to 2016

Source: Quantec, 2019b

In 2016, South Africa's total exports of tobacco products amounted to around R2 426.16 million (Table 2.16). The major export markets for South Africa's tobacco products are Botswana, which constitutes 23.92%, followed by Namibia, Zambia and Lesotho, with each comprising 12.41%, 8.57% and 7.11%, respectively. Notably, outside the SADC region, South Africa exports tobacco products to the United Arab Emirates (5.6%) and the Netherlands (2.24).

Table 2.16: South Africa's exports of tobacco products [SIC 306], 2016

Country	Export value, Rm	% share
World	**2 426.16**	**100.00**
Botswana	580.41	23.92
Namibia	300.97	12.41
Zambia	207.94	8.57
Lesotho	172.39	7.11
Mozambique	166.33	6.86
Swaziland	156.62	6.46
United Arab Emirates	139.69	5.76
Equatorial Guinea	98.80	4.07
Zimbabwe	93.98	3.87
Netherlands	54.26	2.24

Source: Author's calculations based on data from Quantec, 2019b

The total value of South Africa's tobacco imports, as presented in Table 2.17, was approximately R1 205.94 million in 2016. The major source of South Africa's imports of tobacco is Austria with a share of 27.03%, followed by the Netherlands and the United Arab Emirates with a share of around 17.15% and 13.44%, respectively, in 2016. In addition, Switzerland, Taiwan and Germany are significant sources of South Africa's tobacco imports, accounting for a combined share of around 24.36%.

Table 2.17: South Africa's import of tobacco products [SIC 306], 2016

Country	Import value, Rm	% share
World	**1 205.94**	**100.00**
Austria	325.92	27.03
Netherlands	206.84	17.15
United Arab Emirates	162.11	13.44
Switzerland	151.77	12.59
Taiwan Province of China	75.95	6.30
Germany	54.21	4.49
Belgium	29.73	2.47
USA	27.58	2.29
Italy	25.98	2.15
GB: United Kingdom	17.36	1.44

Source: Author's calculations based on data from Quantec, 2019b

Figure 2.25 shows that South African exports of textiles slightly increased in the 1970s and 1980s; however, they reached their peak around the mid-1990s. In 1997, textiles exports were approximately R5 646 million, declining to about R3 944 million in 2016. Dissimilar to exports, imports of textiles fluctuated in the 1970s and 80s; however, after 1990, textiles imports depicted an increasing trend. The value of textiles imports increased from R5 089 million in 2000 to reach about R8 332 million in 2016. Employment in the textiles industry peaked in the 1970s and, subsequently, declined. In 1980, the employment was about 110 570, compared to 48 392 in 2016.

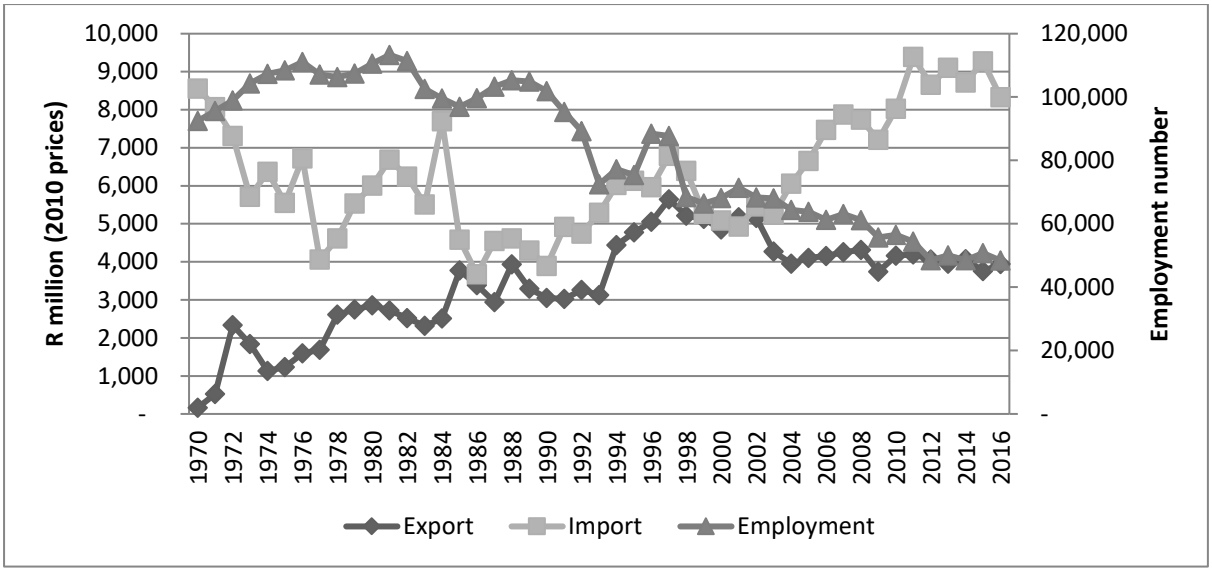

Figure 2.25: Trade and employment of the textiles division, 1970 to 2016

Source: Quantec, 2019b

In 2016, South Africa's exports of other textiles (SIC 312) to the world were approximately R3 870.12 million (Table 2.18). The main export destinations are Namibia (16.79%), Botswana (11,.6%), and Lesotho (7.18%). Outside the African continent, the markets with the prominent share of South Africa's exports of other textiles are the USA (4.37%), Australia (4.35%), Germany (3.95%) and the United Kingdom (3.89%).

Table 2.18: South Africa's exports of other textiles [SIC 312], 2016

Country	Export value, Rm	% share
World	**3 870.12**	**100.00**
Namibia	638.06	16.49
Botswana	431.79	11.16
Lesotho	277.97	7.18
Zambia	216.40	5.59
Zimbabwe	181.34	4.69
USA	169.20	4.37
Australia	168.41	4.35
Germany	153.03	3.95
United Kingdom	150.58	3.89

Source: Author's calculations based on data from Quantec, 2019b

South Africa's imports of other textiles, as Table 2.19 shows, are concentrated, with South Africa importing about R2 934.47 million from China, which equates to 37.82% of South Africa's total imports of other textiles. India, Germany and Pakistan are major sources of South Africa's imports of other textiles, comprising a share of 8.75%, 8,.9% and 5.82%, respectively, in 2016.

Table 2.19: South Africa's imports of other textiles [SIC 312], 2016

Country	Import value, Rm	% share
World	**7 759.32**	**100.00**
China	2 934.47	37.82
India	679.31	8.75
Germany	635.29	8.19
Pakistan	459.44	5.92
Swaziland	239.20	3.08
Turkey	234.62	3.02
Botswana	204.74	2.64
USA	197.45	2.54
Saudi Arabia	157.38	2.03
Italy	157.09	2.02

Source: Author's calculations based on data from Quantec, 2019b

Regarding spinning, weaving and finishing of textiles (SIC 311), South Africa's exports were about R5 213.10 million in 2016. Lesotho is the leading destination with an export value of around R699.84 million, which is approximately 13.42% of South Africa's total exports of spinning, weaving and finishing of textiles. This is followed by Namibia, Botswana and Italy, with a share of 11.48%, 8.27% and 7.66%, respectively, in 2016 (Table 2.20).

Table 2.20: South Africa's exports of spinning, weaving and finishing of textiles [SIC 311], 2016

Country	Export value, Rm	% share
World	**5 213.10**	**100.00**
Lesotho	699.84	13.42
Namibia	525.03	10.07
Botswana	497.28	9.54
Italy	338.49	6.49
Mali	328.51	6.30
China	314.46	6.03
Swaziland	304.75	5.85
Yemen	224.14	4.30
Mozambique	206.13	3.95
Angola	201.63	3.87

Source: Author's calculations based on data from Quantec, 2019b

South Africa's imports of spinning, weaving and finishing of textiles from the world were approximately R7 833.61 million in 2016. Imports are concentrated from China, accounting for approximately 37.47% of South Africa's total imports of spinning, weaving and finishing of textiles in 2016. However, as presented in Table 2.21, Switzerland, Pakistan and India are significant sources of South Africa's imports, comprising a share of 13.10%, 9.89% and 7.45%, respectively.

Table 2.21: South Africa's imports of spinning, weaving and finishing of textiles [SIC 311], 2016

Country	Import value, Rm	% share
World	**7 833.61**	**100.00**
China	2 935.15	37.47
Switzerland	1 025.96	13.10
Pakistan	774.98	9.89
India	583.85	7.45
Lesotho	576.56	7.36
Taiwan Province of China	191.58	2.45
Germany	154.45	1.97
USA	124.18	1.59
Turkey	120.89	1.54
Indonesia	112.22	1.43

Source: Author's calculations based on data from Quantec, 2019b

The wearing apparel division shows similar trends as that observed in the textiles division. South African exports of wearing apparel peaked in 2001 at around R4 976 million, declining to about R1 027 million in 2009. However, South African wearing apparel imports increased from around R2 763 million in 2000 to about R11 655 million in 2016. Employment in the wearing apparel division peaked in 2000 at around 153 342, thereafter, declining to 76 397 in 2016 (Figure 2.26).

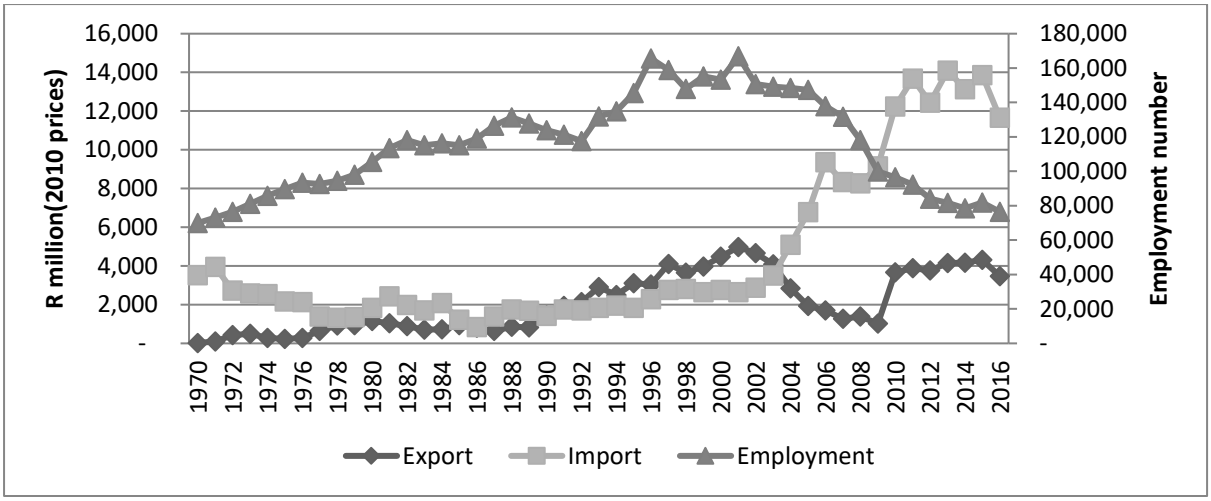

Figure 2.26 Trade and employment of the wearing apparel division, 1970 to 2016

Source: Quantec, 2019b

As Table 2.22 depicts, the SACU is an important market for South Africa's exports of wearing apparel (SIC 314), having a combined share of approximately 73.22% in 2016. There is a notable degree of high concentration of South Africa's exports of wearing apparel, with Namibia and Botswana having a combined share of about 52.65%. The SADC countries dominate the list of the top ten export markets for South Africa's wearing apparel exports, with an exception being the United Kingdom, which only had a 1.46% share in 2016.

Table 2.22: South Africa's exports of wearing apparel, except fur apparel [SIC 314], 2016

Country	Export value, Rm	% share
World	**4 789.50**	**100.00**
Namibia	1 628.92	34.01
Botswana	994.61	20.77
Lesotho	527.44	11.01
Swaziland	355.89	7.43
Zambia	304.28	6.35
Mozambique	167.98	3.51
United Kingdom	84.49	1.76
Kenya	73.95	1.54
Zimbabwe	65.93	1.38
Venezuela	47.45	0.99

Source: Author's calculations based on data from Quantec, 2019b

China's domination as South Africa's main supplier of textiles is similarly evident regarding wearing apparel. In 2016, South Africa's imports of wearing apparel from the world were around R19 567.30 million, with Chain accounting for about 54.04% share. Despite this dominance, Swaziland, Lesotho and Mauritius account for a share of 9.27%, 7.06% and 5.31% of wearing apparel exports, respectively (Table 2.23).

Table 2.23: South Africa's imports of wearing apparel, except fur apparel [SIC 314], 2016

Country	Import value, Rm	% share
World	**19 567.30**	**100.00**
China	10 573.82	54.04
Swaziland	1 813.37	9.27
Lesotho	1 381.68	7.06
Mauritius	1 038.97	5.31
Madagascar	900.74	4.60
India	782.95	4.00
Bangladesh	708.94	3.62
Vietnam	338.70	1.73
Turkey	245.83	1.26
Pakistan	202.10	1.03

Source: Author's calculations based on data from Quantec, 2019b

As Table 2.24 shows, the major markets for South Africa's exports of knitted and crocheted fabrics and articles (SIC 313) are Namibia (28.06%), Botswana (16.89%), Swaziland (12.52%), the USA (11.23%) and Lesotho (8.89%). The SACU and SADC members appear to be the main export destinations of knitted and crocheted fabrics and articles. However, countries outside the SADC markets are Australia (3.25%) and the United Kingdom (1.82%).

Table 2.24: South Africa's exports of knitted and crocheted fabrics and articles [SIC 313], 2016

Country	Export value, Rm	% share
World	**1 416.49**	**100.00**
Namibia	397.45	28.06
Botswana	239.18	16.89
Swaziland	177.33	12.52
USA	159.01	11.23
Lesotho	125.94	8.89
Zambia	55.31	3.91
Australia	46.05	3.25
United Kingdom	25.84	1.82
Mozambique	24.97	1.76
Kenya	21.35	1.51

Source: Author's calculations based on data from Quantec, 2019b

Similarly, as observed in other textiles, South Africa's imports of knitted and crocheted fabrics and articles are dominated by China, accounting for 53.23% (approximately R3 980.63 of R7 477.99 million) in 2016. This is followed by Mauritius, Swaziland, Madagascar and Lesotho, with shares of 9.12%, 7.79%, 5.98% and 4.11%, respectively (Table 2.25).

Table 2.25: South Africa's import of knitted and crocheted fabrics and articles [SIC 313], 2016

Country	Import value, Rm	% share
World	**7 477.99**	**100.00**
China	3 980.63	53.23
Mauritius	682.35	9.12
Swaziland	582.62	7.79
Madagascar	446.91	5.98
Lesotho	307.62	4.11
Bangladesh	269.03	3.60
India	254.70	3.41
Turkey	102.99	1.38
Taiwan Province of China	91.17	1.22
Italy	69.89	0.93

Source: Author's calculations based on data from Quantec, 2019b

The exports, imports and employment for the paper and paper products division have, as shown in Figure 2.27, slightly increased over the period under review. Prior to 1985, South Africa had a trade deficit in the paper and paper products division; however, subsequent to 1985, South Africa had a trade surplus, which continued to increase. In 1996, South African exports and imports of paper and paper products were R9 233 million and R6 066 million and reached approximately R18 296 million and R8 933 million in 2016, respectively. Similarly, employment in the sector in 1996 was about 34 269, while in 2016, it was around 37 274.

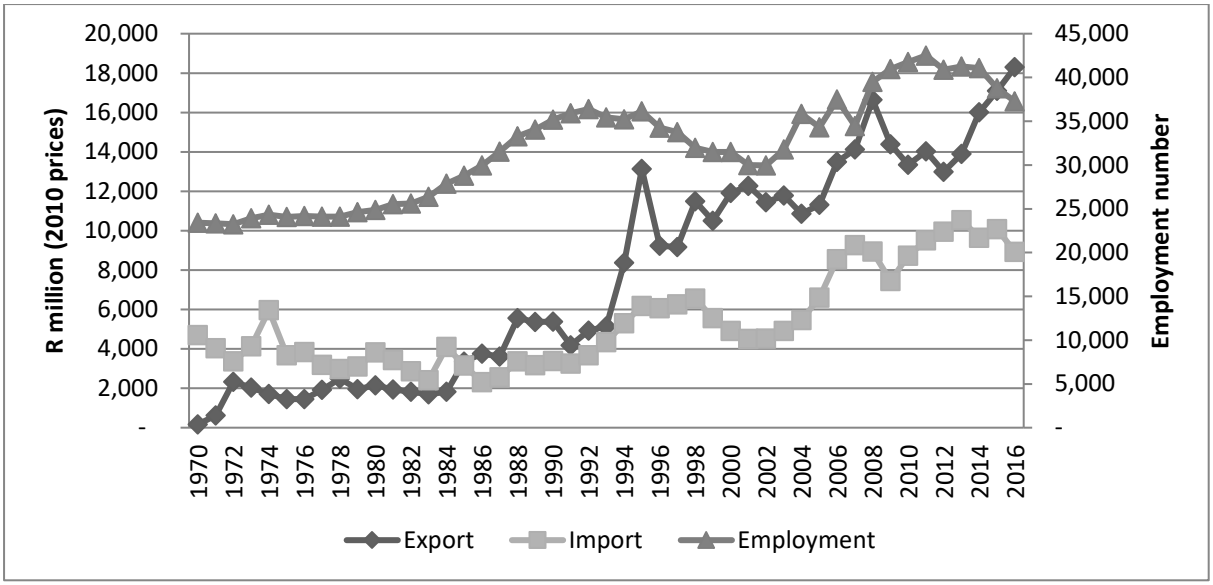

Figure 2.27: Trade and employment of the paper and paper products division, 1970 to 2016

Source: Quantec, 2019b

In 2016, South Africa's exports of paper and paper products (SIC 323) amounted to around R21 720.24 million. China comprised 19.52% of South Africa's total exports of paper and paper products, which is an export value of R4 238.80 million. Moreover, prominent markets for South Africa's paper and paper products are India, Indonesia and Namibia, with shares of 12.35%, 9.96% and 5.50%, respectively (Table 2.26).

Table 2.26: South Africa's exports of paper and paper products [SIC 323], 2016

Country	Export value, Rm	% share
World	**21 720.24**	**100.00**
China	4 238.80	19.52
India	2 683.41	12.35
Indonesia	2 162.81	9.96
Namibia	1 193.78	5.50
Zimbabwe	1 048.52	4.83
Thailand	1 010.74	4.65
Botswana	826.89	3.81
Zambia	793.27	3.65
United Kingdom	691.46	3.18
Belgium	681.26	3.14

Source: Author's calculations based on data from Quantec, 2019b

China, as indicated in Table 2.27, is the leading supplier of paper and paper products to South Africa. South Africa's imports of paper and paper products from China were around R2 084.69 million and constitute an import share of about 13.13%. Germany, Finland and the USA are also important sources of South Africa's imports of paper and paper products with an import value of R2 058.07 million, R1 257.52 million and R1 037.65 million, which constitute about 12.96%, 7.92%, and 6.54% share, respectively, during 2016.

Table 2.27: South Africa's imports of paper and paper products [SIC 323], 2016

Country	Import value, Rm	% share
World	**15 875.47**	**100.00**
China	2 084.69	13.13
Germany	2 058.07	12.96
Finland	1 257.52	7.92
USA	1 037.65	6.54
Sweden	1 035.50	6.52
Brazil	899.89	5.67
Poland	648.22	4.08
Austria	601.50	3.79
Italy	573.10	3.61
Republic of Korea	513.90	3.24

Source: Author's calculations based on data from Quantec, 2019b

As depicted in Figure 2.28, the South African exports and imports of wood and wood products show an increasing trend over the period under review. The exports of wood and wood products increased from R2 465 million in 1996 to R8 408 million in 2016, while imports, likewise, increased from R2 246 million in 1996 to R3 227 million in 2016. After 1996, South Africa's trade surplus for wood and wood product division expanded compared to the period 1978 to 1998. Employment in the wood and wood products division continued to increase in the 1970s, 80s and 1990s and reached its peak in 2006 at around 96 810, which subsequently declined to about 62 373 in 2016.

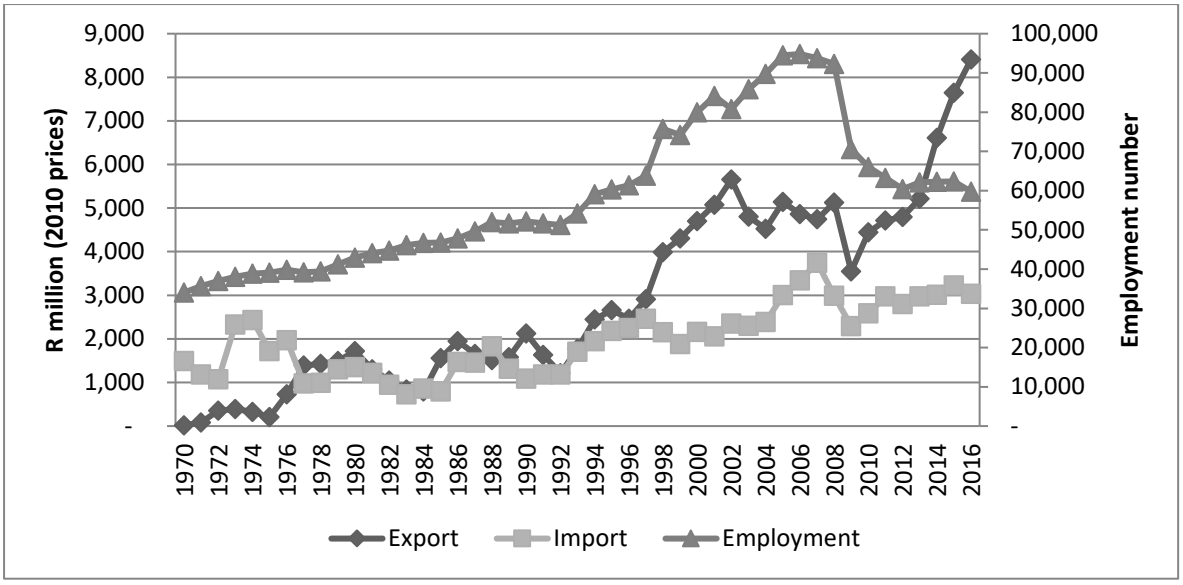

Figure 2.28: Trade and employment of the wood and wood products division, 1970 to 2016

Source: Quantec, 2019b

The total export value of South African sawmilling and planing of wood (SIC 321) amounted to about R4 126.61 million in 2016. There is a high level of concentration for South African export markets for sawmilling and planing of woods. Japan dominated exports, accounting for approximately 55.41%, followed by India (8.32%), Botswana (8.32%) and Namibia (6.81%), as shown in Table 2.28.

Table 2.28: South Africa's export of sawmilling and planing of wood [SIC 321], 2016

Country	Export value, Rm	% share
World	**4 126.61**	**100.00**
Japan	2 286.64	55.41
India	530.40	12.85
Botswana	343.42	8.32
Namibia	281.19	6.81
Mozambique	166.73	4.04
Lesotho	100.59	2.44
Zambia	91.99	2.23
China	74.88	1.81
Seychelles	52.03	1.26
Swaziland	31.28	0.76

Source: Author's calculations based on data from Quantec, 2019b

During 2016, South Africa's imports of sawmilling and planing of wood from the world, as shown in Table 2.29, amounted to R1 829.46 million. Swaziland is a leading supplier of sawmilling and planing of wood accounting for approximately 37.21% of South Africa's total imports. Malaysia, the USA and Indonesia are also prominent sources comprising 19.48%, 7.38% and 6.46% shares, respectively, in 2016.

Table 2.29: South Africa's import of sawmilling and planing of wood [SIC 321], 2016

Country	Import value, Rm	% share
World	**1 829.46**	**100.00**
Swaziland	680.68	37.21
Malaysia	356.46	19.48
USA	135.03	7.38
Indonesia	118.16	6.46
Brazil	97.94	5.35
Gabon	71.39	3.90
China	60.10	3.28
Uruguay	47.03	2.57
Zimbabwe	19.77	1.08
Singapore	17.71	0.97

Source: Author's calculations based on data from Quantec, 2019b

South Africa's exports of products of wood, cork, straw and plaiting materials (SIC 322) were around R2 335.10 million in 2016. These exports were mainly destined for Namibia, about 16.76%, followed by Botswana (15.16%), the United Kingdom (9.90%) and Zimbabwe (8.02%). The USA received a fair share of South Africa's exports of products of wood, cork, straw and plaiting materials of approximately R102.49 million, which is a share of around 4.95%.

Table 2.30: South Africa's exports of products of wood, cork, straw and plaiting materials [SIC 322], 2016

Country	Export value, Rm	% share
World	**2 335.10**	**100.00**
Namibia	391.40	16.76
Botswana	353.96	15.16
United Kingdom	231.25	9.90
Zimbabwe	187.38	8.02
Australia	160.76	6.88
Lesotho	160.76	6.88
Swaziland	115.47	4.95
Mozambique	111.92	4.79
Zambia	111.41	4.77
USA	102.49	4.39

Source: Author's calculations based on data from Quantec, 2019b

The total value of South Africa's imports of wood, cork, straw and plaiting materials amounted to around R2 861.29 million in 2016. The leading sources of these products are China (26.36%), Germany (10.09%) and France (9.59%). In Africa, South Africa imported approximately R82 million worth of products of wood, cork, straw and plaiting materials from Swaziland; this constitutes about 2.56% of South Africa's total imports of these products.

Table 2.31: South Africa's imports of products of wood, cork, straw and plaiting materials [SIC 322], 2016

Country	Import value, Rm	% share
World	**2 861.29**	**100.00**
China	754.19	26.36
Germany	288.73	10.09
France	274.37	9.59
Brazil	226.90	7.93
Portugal	151.87	5.31
USA	135.43	4.73
Indonesia	123.67	4.32
Malaysia	94.15	3.29
Swaziland	73.33	2.56
Spain	71.62	2.50

Source: Author's calculations based on data from Quantec, 2019b

Figure 2.29 shows the trends in trade and employment of the footwear division over the period 1970 to 2016. During the 1970s and 80s, the South African exports and imports of the footwear division were very flat. The 1970s and 80s saw employment in the footwear division peak. Employment in this division was approximately 37 047 in 1999 but declined rapidly, reaching about 10 105 in 2016. Though exports remained flat throughout the period under review, imports, however, increased from a mere R199 million in 1990 to about R2 901 million in 2016. The increase in imports of footwear coincided with a drastic decline in employment in the footwear division.

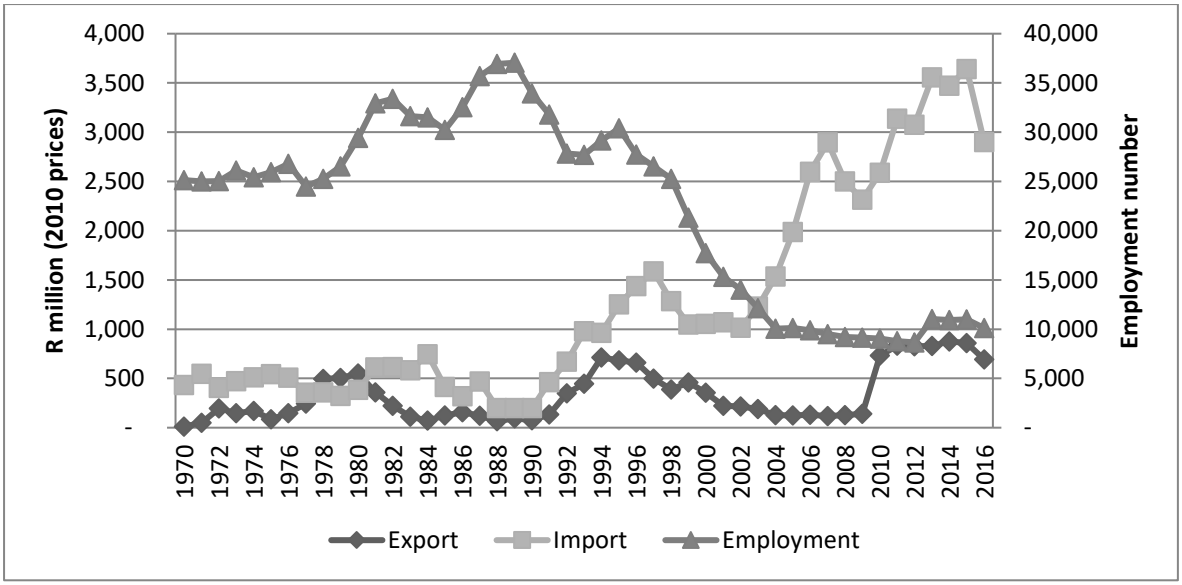

Figure 2.29: Trade and employment of the footwear division, 1970 to 2016

Source: Quantec, 2019b

South Africa's exports of footwear to the world were around R2 334.28 million in 2016, as presented in Table 2.32. Namibia accounted for a share of approximately 32.27%, followed by Botswana (22.19%), Lesotho (11.86%) and Swaziland (8.71%). It appears that the SACU and SADC agreements play a major role in terms of opening markets for the South African footwear industry, as is evident in other agro-processing industries whereby the SADC is the main destination of South African exports of agro-processing products.

Table 2.32: South Africa's exports of footwear [SIC 317], 2016

Country	Export value, Rm	% share
World	**2 334.28**	**100.00**
Namibia	753.38	32.27
Botswana	517.93	22.19
Lesotho	276.73	11.86
Swaziland	203.33	8.71
Zambia	175.84	7.53
Mozambique	96.34	4.13
Zimbabwe	87.26	3.74
Democratic Republic of the Congo	26.98	1.16
Kenya	19.60	0.84
Malawi	17.56	0.75

Source: Author's calculations based on data from Quantec, 2019b

China is a leading source of South Africa's imports of footwear (Table 2.33). In 2016, South Africa's import value of footwear globally was around R12 632.41 million, with China constituting a share of around 58.16%. Other notable sources of South Africa's imports of footwear are Vietnam, Indonesia and Italy, with shares of 19.93%, 5.96% and 4.70%, respectively, in 2016. However, in Africa, Lesotho is the prominent source of South Africa's imports of footwear, with a share of around 1.36%.

Table 2.33: South Africa's imports of footwear [SIC 317], 2016

Country	Import value, Rm	% share
World	**12 632.41**	**100.00**
China	7,346.76	58.16
Vietnam	2,517.41	19.93
Indonesia	753.40	5.96
Italy	594.32	4.70
India	404.96	3.21
Lesotho	171.60	1.36
Thailand	147.18	1.17
Cambodia	133.31	1.06
Brazil	116.92	0.93
Portugal	44.96	0.36

Source: Author's calculations based on data from Quantec, 2019b

The South African imports and exports in the rubber products division follow similar trends to the footwear division. Figure 2.30 shows that imports and exports increased from about R575 million and R2 101 million in 1990 to around R5 561 million and R12 589 million in 2016, respectively. South Africa is the net importer of rubber products, with a trade deficit continuing in the last decade (2006 to 2016). Although exports and imports of rubber products increased, employment, on the other hand, depicts a declining trend, from about 22 825 in 1990 to about 11 374 in 2016, this happens at the same period as the trade deficit continue to expand.

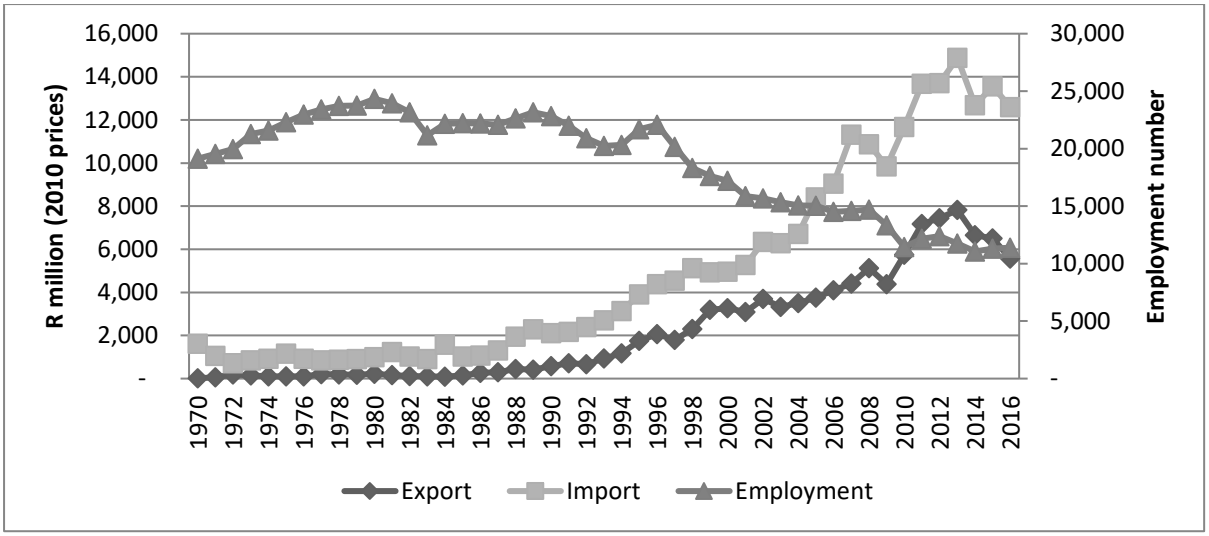

Figure 2.30: Trade and employment of the rubber products division, 1970 to 2016

Source: Quantec, 2019b

In 2016, the South African exports of rubber products were about R5 727.57 million. The leading export destination was Namibia, with an amount of R871.27 million, which is about 15.21% share of South Africa's total exports of rubber products. Exports to Botswana amounted to R806.73 million a share of 14.09%, while to Zambia was about R510.09 million, a share of 8.91%. Moreover, major export markets for South African rubber products outside Africa are Germany (4.47%) and the USA (3.61%), as presented in Table 2.34.

Table 2.34: South Africa's exports of rubber products [SIC 337], 2016

Country	Export value, Rm	% share
World	**5 727.57**	**100.00**
Namibia	871.27	15.21
Botswana	806.73	14.09
Zambia	510.09	8.91
Zimbabwe	465.95	8.14
Germany	423.34	7.39
Mozambique	255.78	4.47
USA	207.02	3.61
Democratic Republic of the Congo	203.09	3.55
Swaziland	195.30	3.41
Angola	183.32	3.20

Source: Author's calculations based on data from Quantec, 2019b

Likewise, as other agro-processing industries, China is a leading source of South Africa's imports of rubber products, amounting to around R3 304.37 million in 2016. This represents about 24.27% of South Africa's total imports of rubber products. Moreover, Japan, the USA and Germany are significant sources of rubber products for South Africa, with shares of 9.97%, 9.81% and 9.42%, respectively, in 2016 (Table 2.35).

Table 2.35: South Africa's imports of rubber products [SIC 337], 2016

Country	Import value, Rm	% share
World	**13 616.52**	**100.00**
China	3 304.37	24.27
Japan	1 357.12	9.97
USA	1 336.24	9.81
Germany	1 282.92	9.42
Thailand	826.40	6.07
Spain	635.53	4.67
Malaysia	511.31	3.76
India	463.28	3.40
Turkey	428.27	3.15
France	372.94	2.74

Source: Author's calculations based on data from Quantec, 2019b

The South African furniture division, as depicted in Figure 2.31, shows the same trend of flat exports and imports as the rubber products division prior to the 1990s. However, unlike the expanded trade deficit of the rubber division after the 1990s, the furniture division had an increasing trade surplus up until 2010. The South African furniture exports peaked in 2002 at around R6 935 million but dropped to about R2 509 in 2016. Contrary to declining exports, furniture imports as shown an increasing trend, with South Africa being a net importer of furniture products after 2012. Employment in the furniture division peaked in 2002, at the same time as exports, at about 59 053, but subsequently declined, reaching about 33 141 in 2016.

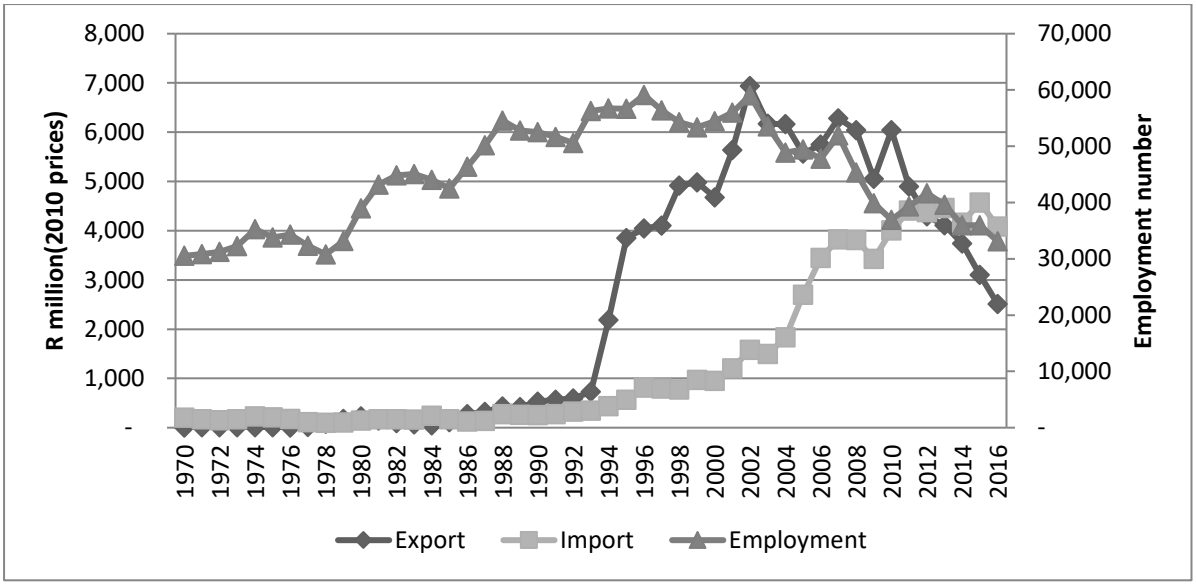

Figure 2.31: Trade and employment of the furniture division, 1970 to 2016

Source: Quantec, 2019b

South African furniture exports amounted to R3 939.89 million in 2016, with Namibia having a share of approximately 15.76%, followed by Botswana (13.43%) and Germany (12.16%). Similar to other agro-processing products, South Africa's furniture is exported to the SADC region; however, Poland and the USA have shares of 4.30% and 3.89%, respectively, in 2016 (Table 2.36).

Table 2.36: South Africa's exports of furniture [SIC 391], 2016

Country	Export value, Rm	% share
World	**3 939.89**	**100.00**
Namibia	620.93	15.76
Botswana	529.22	13.43
Germany	478.98	12.16
Zambia	337.03	8.55
Lesotho	218.78	5.55
Swaziland	195.12	4.95
Mozambique	189.10	4.80
Poland	169.43	4.30
USA	153.22	3.89
Angola	99.43	2.52

Source: Author's calculations based on data from Quantec, 2019b

South Africa's imports of furniture were approximately R6 816.29 million in 2016. China led the import market with a share of 44.41% (about R3 027.36 million). Despite this, Germany, Italy and Lesotho are also significant sources of South Africa's furniture imports, with shares of 5.63%, 4.62% and 4.44%, respectively, in 2016 (Table 2.37).

Table 2.37: South Africa's imports of furniture [SIC 391], 2016

Country	Import value, Rm	% share
World	**6 816.29**	**100.00**
China	3 027.36	44.41
Germany	545.32	8.00
Italy	383.44	5.63
Lesotho	314.84	4.62
Thailand	302.62	4.44
Czech Republic	208.90	3.06
Poland	200.90	2.95
Malaysia	178.60	2.62
Vietnam	144.91	2.13
United Kingdom	127.74	1.87

Source: Author's calculations based on data from Quantec, 2019b

Before 1990, the South African trade in leather and leather products was below R1000 million, and imports were greater than exports (Figure 2.32). However, after 1990, both imports and exports of leather and leather products increased sharply, with exports peaking at around R2 972 million in 2014, while imports peaked at R2 496 million in 2011. Despite these increases, employment declined significantly from a peak of 12 596 in 1990 to about 5 658 in 2016 (Figure 2.32).

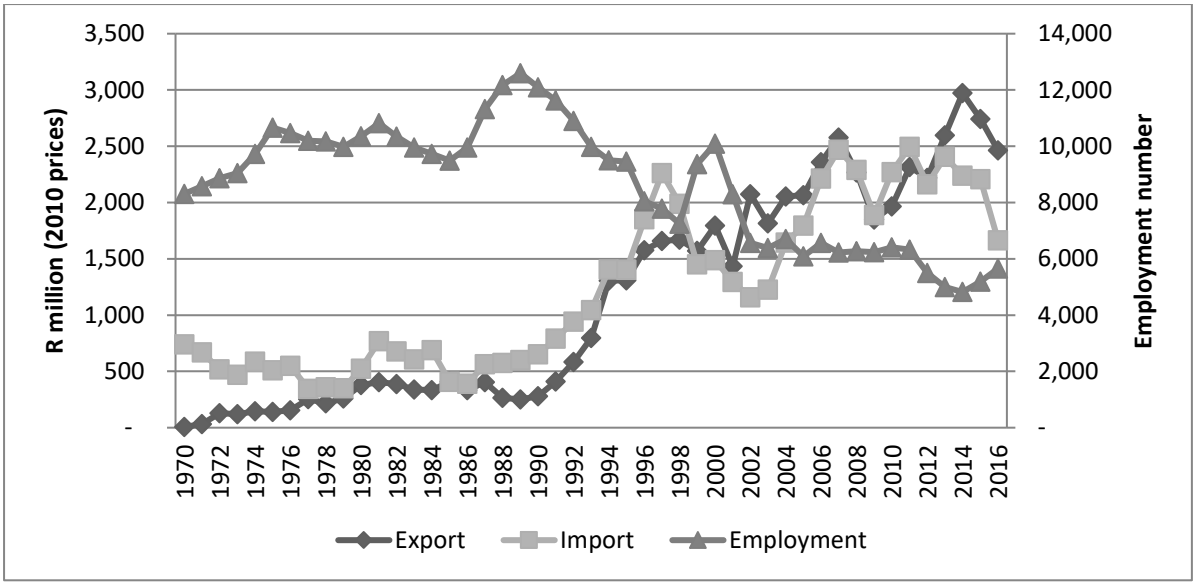

Figure 2.32: Trade and employment of the leather and leather products division, 1970 to 2016

Source: Quantec, 2019b

Unlike other divisions of the agro-processing industry, where South African exports are mainly to the SADC countries, the leading destinations for South African exports of tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness [SIC 316] products are Italy with a share of 11.34%, followed by China (7.36%), Poland (7,.8%) and Uruguay (6.78%) as shown in Table 2.38.

Table 2.38: South Africa's exports of tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness products [SIC 316], 2016

Country	Export value, Rm	% share
World	**3 451.82**	**100.00**
Italy	391.29	11.34
China	254.15	7.36
Poland	247.82	7.18
Uruguay	233.99	6.78
Lesotho	227.53	6.59
Mexico	227.37	6.59
Hungary	214.63	6.22
Germany	214.23	6.21
Namibia	202.21	5.86
USA	153.74	4.45

Source: Author's calculations based on data from Quantec, 2019b

In 2016, about 57.96% of South Africa's imports of tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness (SIC316) was accounted for by China, amounting to about R2 249.77 million. South Africa's imports from India were approximately R302.19 million; a share of around 7.79%. Meanwhile, Italy, Brazil and Pakistan accounted for shares of 5.49%, 4.25% and 3.50% of South Africa's total imports of tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness, respectively, in 2016 (Table 2.39).

Table 2.39: South Africa's imports of tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness products [SIC 316], 2016

Country	Import value, Rm	% share
World	**3 881.48**	**100.00**
China	2 249.77	57.96
India	302.19	7.79
Italy	212.90	5.49
Brazil	164.91	4.25
Pakistan	135.84	3.50
Lesotho	131.41	3.39
Namibia	100.17	2.58
Vietnam	91.84	2.37
France	91.15	2.35
Indonesia	68.16	1.76

Source: Author's calculations based on data from Quantec, 2019b

2.3.3 Trade patterns by trade agreements

2.3.3.1 Wearing apparel

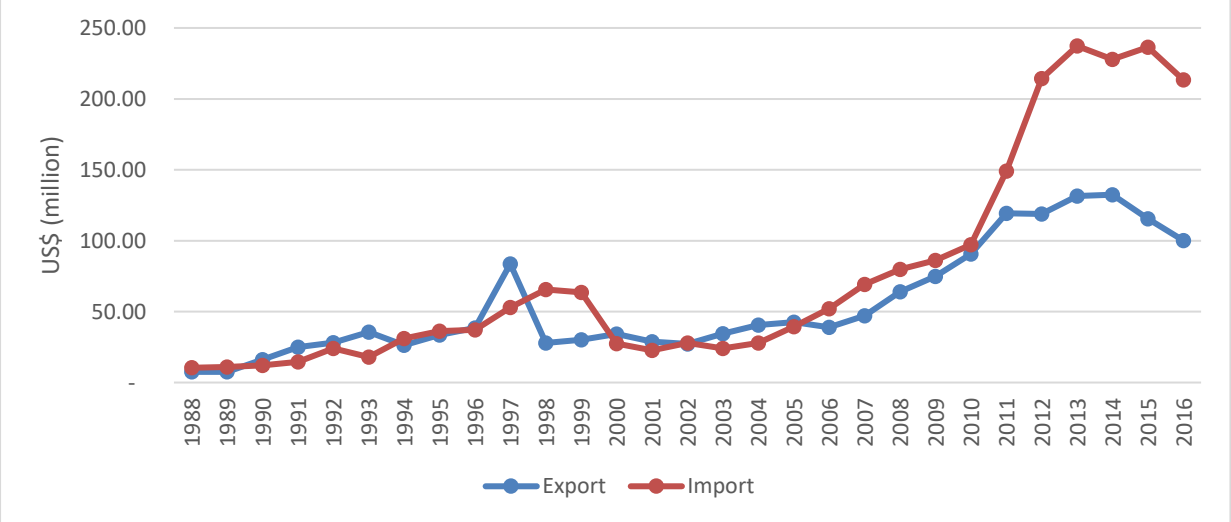

Figure 2.33: South Africa's trade of wearing apparel with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

Figure 2.33 shows that South Africa's trade with the SADC (excluding the SACU) from 1988 to 2016 increased in exports and imports of wearing apparel. In 2016, South Africa had a negative trade balance in wearing apparel of approximately US$ 113.23 million, which had widened significantly from 2010. The import value of wearing apparel increased rapidly from US$ 97.27 million in 2010 to US$ 213.48 million in 2016. Unlike imports, the export value increased modestly from US$ 90.77 million in 2010 to peak in 2014, followed by a slight decline to about US$ 100.25 million in 2016.

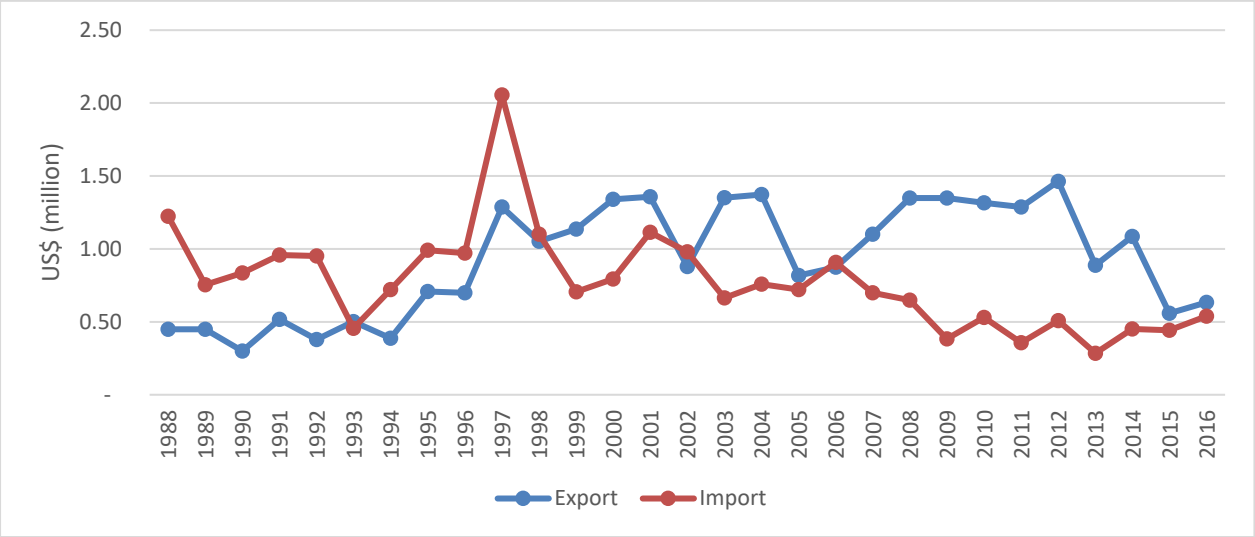

Figure 2.34: South Africa's trade of wearing apparel with the EFTA, 1988 to 2016
Source: Quantec, 2019b

South Africa's trade of wearing apparel with the EFTA, presented in Figure 2.34, depicts a slightly increasing trend for exports. However, South Africa's imports of wearing apparel from the EFTA appear to be on the decline. During the 1990s, South Africa predominately has a negative trade balance in wearing apparel. However, since 2006, South Africa has a positive trade balance. Trade between South Africa and the EFTA members is very meagre, ranging between US$0.50 to US$2.00 million.

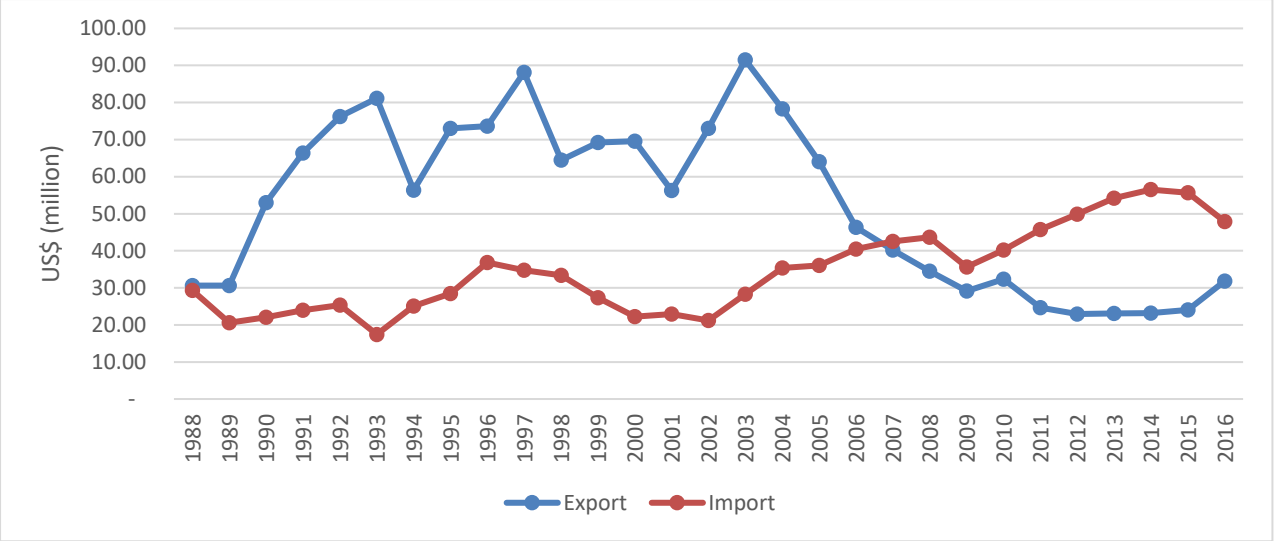

Figure 2.35: South Africa's trade in wearing apparel with the TDCA, 1988- 2016

Source: Quantec,2019

South Africa's trade in wearing apparel with the TDCA can be explained in two eras; the first is the era of positive trade balance during the 1990s up to 2008. The second is between 2008 and 2016, where imports (US$47.92 million) of wearing apparel were greater than exports (US$31.84 million). This resulted in a trade deficit of about US$16.08 million in 2016 (Figure 2.36).

2.3.3.2 Food and beverages

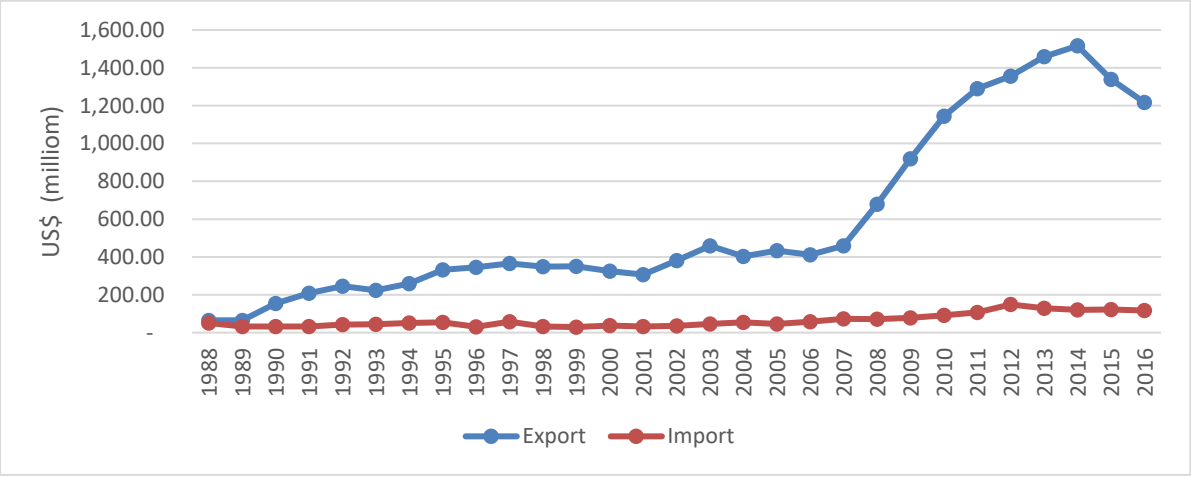

Figure 2.36: South Africa's trade of food and beverages with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

South Africa's exports of food and beverages to the SADC (excluding the SACU) significantly increased subsequent to 2007, from US$458.34 million in 2007 to US$1 516.13 million in 2014. However, exports declined to about US$ 1 217.61 million in 2016. On the other hand, South African imports of food and beverages showed a less significant increase, from about US$72.21 million in 2007 to a peak in 2012 of around US$148.64 million, which subsequently declined to around US$116.23 million in 2016.

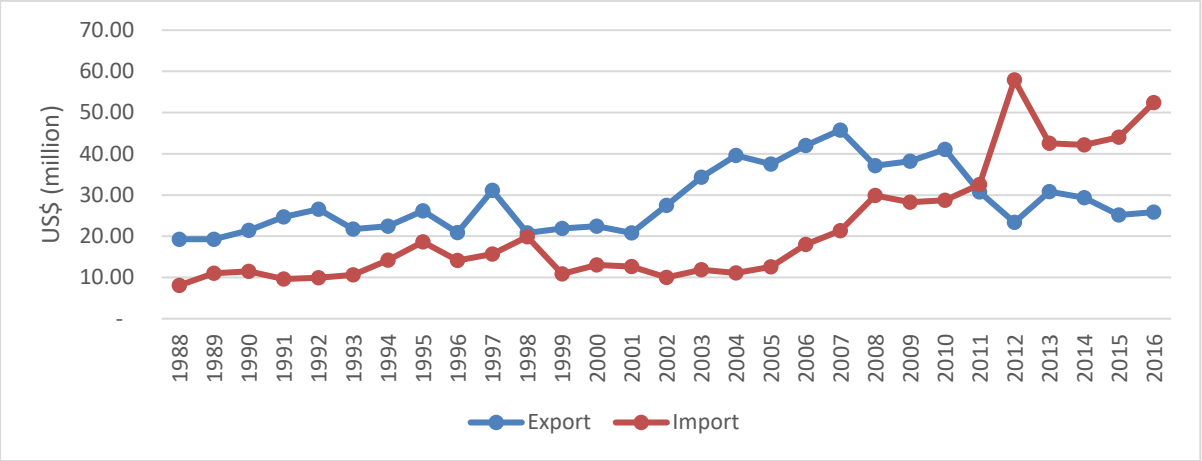

Figure 2.37: South Africa's trade of food and beverages with the EFTA, 1988 to 2016
Source: Quantec, 2019b

South African imports of food and beverages to the EFTA members, as depicted in Figure 2.37, have seen a greater increase than exports. In 2016, the export value of food and beverages was approximately US$25.87 million, while import value stood at about US$52.44 million. This translates to a trade deficit of US$26.87 million in 2016. South Africa likely realised an increase in imports from the EFTA members as a result of the SACU-EFTA agreement.

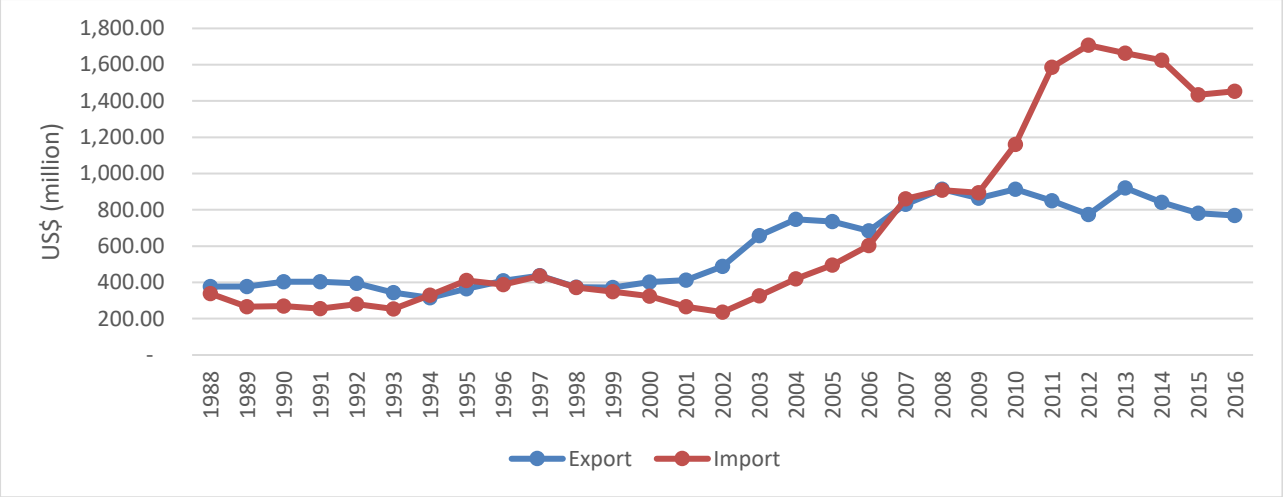

Figure 2.38: South Africa's trade of food and beverages with the TDCA, 1988 to 2016

Source: Quantec, 2019b

The trade balance with the TDCA in the food and beverages industry was negative in 2016, having widened from 2009 (Figure 2.38). The South African imports of food and beverages from the TDCA members increased from US$ 894.42 million in 2009 to approximately US$ 1 453.23 million in 2016. Meanwhile, South African exports of food and beverages witnessed a slight decline from US$863.46 million in 2009 to about US$768.53 million in 2016. It appears that the TDCA increased imports of food and beverages for South Africa.

2.3.3.3 Tobacco

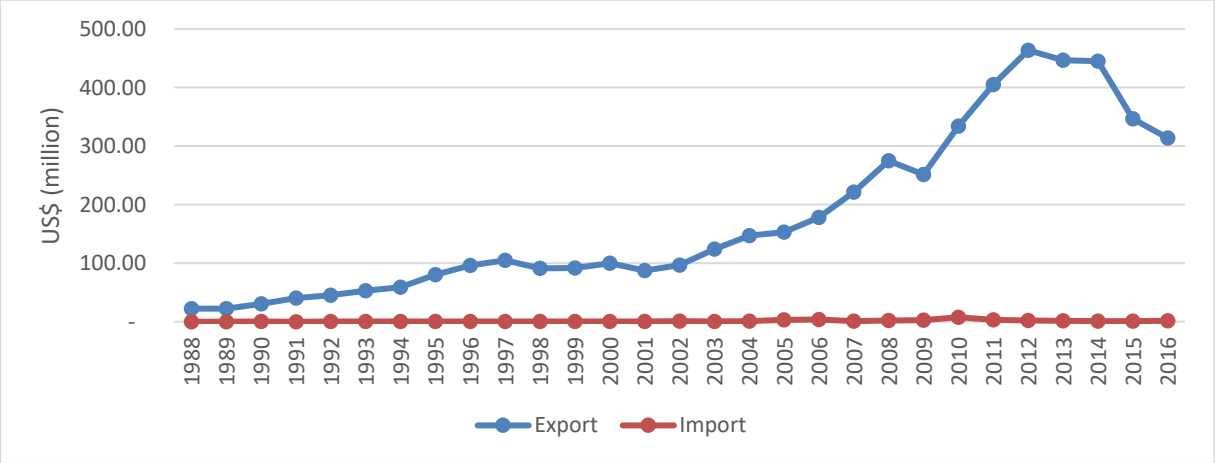

Figure 2.39: South Africa's trade of tobacco with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

Figure 2.39 shows a widening trade surplus in South Africa's trade in tobacco products with the SADC (excluding the SACU). In 2012, South African exports of tobacco peaked at around US$ 463.88 million, declining to about US$313.70 million in 2016. Similarly, South African tobacco imports peaked at approximately US$7.59 million in 2010 but subsequently declined to US$ 1.59 million in 2016.

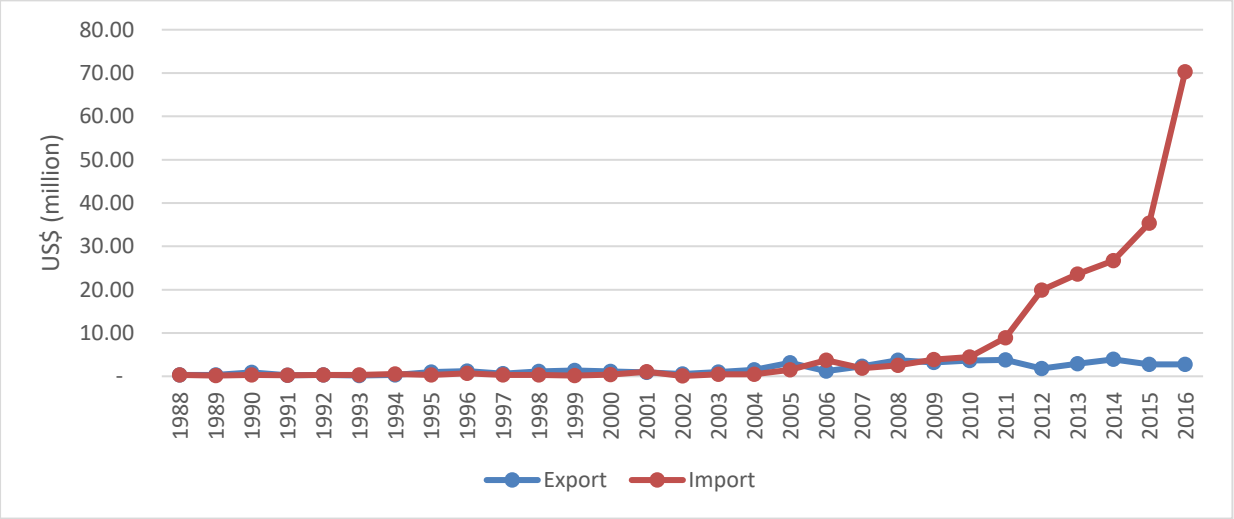

Figure 2.40: South Africa's trade of tobacco with the EFTA, 1988 to 2016

Source: Quantec, 2019b

As Figure 2.40 shows, South Africa has a widening trade deficit with the EFTA subsequent to 2010. Tobacco imports to EFTA members increased in 2010 from US$ 4.49 million to US$ 70.28 million in 2016. However, South African tobacco exports declined from US$3.65 million in 2010 to approximately US$ 2.77 million in 2016.

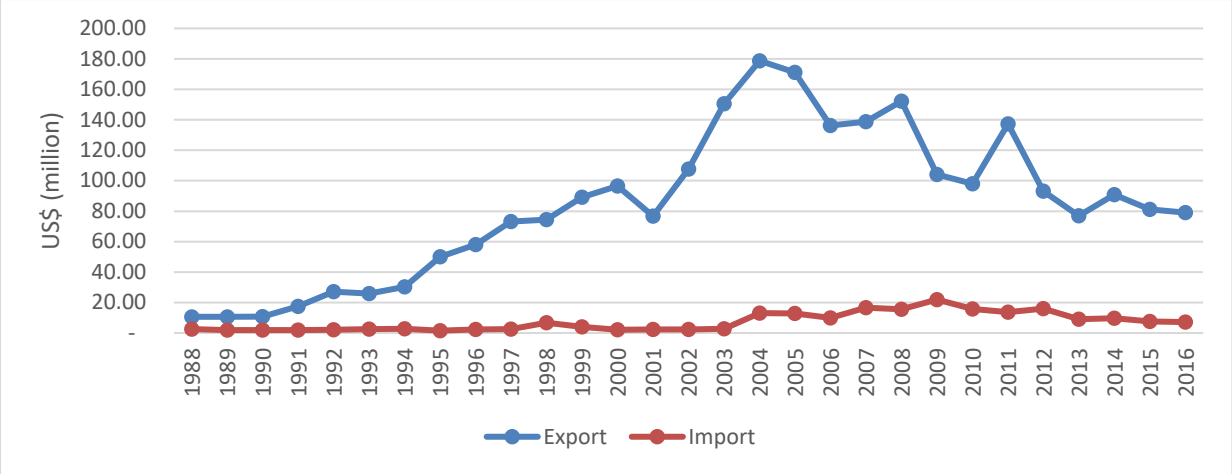

Figure 2.41: South Africa's trade of tobacco with the TDCA, 1988 to 2016

Source: Quantec, 2019b

As Figure 2.41 shows, exports of tobacco to the TDCA member countries peaked in 2004 at around US$ 178.75 million. Subsequent to 2004, South African tobacco exports have been declining, reaching about US$ 79.00 million in 2016. The South African imports of tobacco were flat prior to 2003, increasing from US$2.73 million in 2003 to peak at around US$ 21.96 million in 2009 but declined to about US$7.27 million in 2016.

2.3.3.4 Textiles

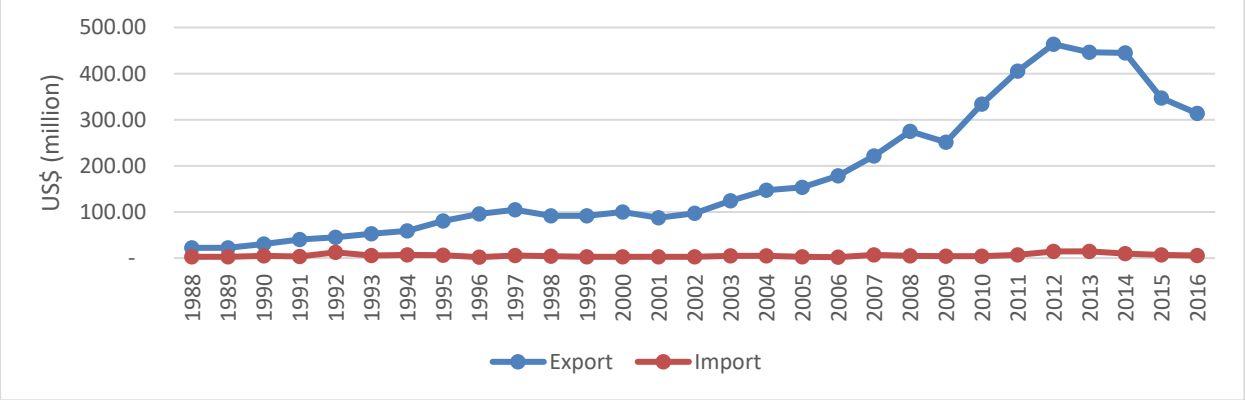

Figure 2.42: South Africa's trade of textiles with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

South African exports of textiles to the SADC (excluding the SACU) have shown a steady growth from about US$96.82 million in 2002 to US$463.88 million in 2012 (Figure 2.42).

However, after 2012, exports declined to approximately US$313.70 million in 2016. South Africa's imports of textiles from the SADC (excluding the SACU) have shown a similar trend but less overall change, to that of exports, increasing from US$ 2.57 million in 2002 to about US$14.41million in 2012, which declined to US$ 5.79 million in 2016.

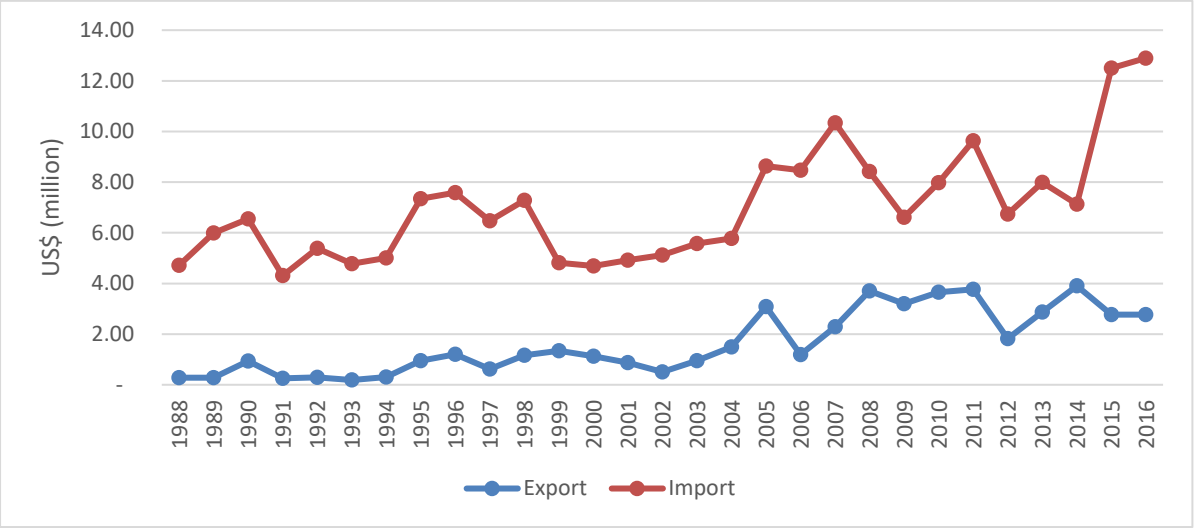

Figure 2.43: South Africa's trade of textiles with EFTA, 1988 to 2016

Source: Quantec, 2019b

Unlike South Africa's trade with the SADC (excluding the SACU), South Africa has a negative trade balance with the EFTA members in textiles. South African imports of textiles to the EFTA amounted to approximately US$12.90 million, while exports were US$2.77 million in 2016. This translates to a trade deficit of around US$10.13 million in 2016 (Figure 2.43).

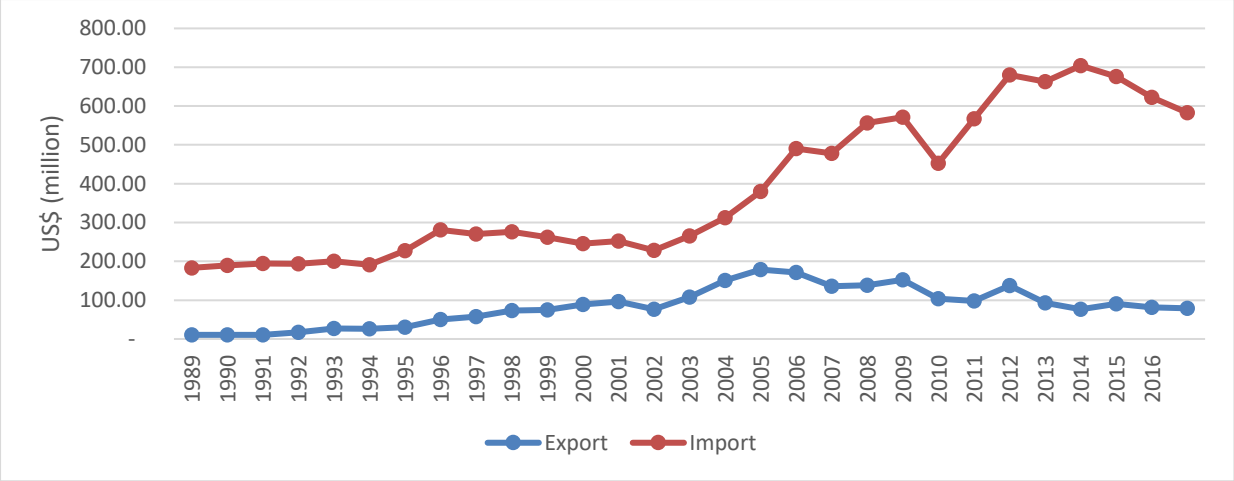

Figure 2.44: South Africa's trade of textiles with the TDCA, 1988 to 2016

Source: Quantec, 2019b

Figure 2.44 indicates that South Africa has a negative trade balance with the TDCA in textiles, with a deficit of US$503.80 million in 2016. Exports declined from about US$ 171.12 million in 2006 to approximately US$79.00 million in 2016. In contrast, South African textiles imports from TDCA member countries increased from around US$490.42 million in 2006 to US$582.80 million in 2016.

2.3.3.5 Leather and leather products and footwear

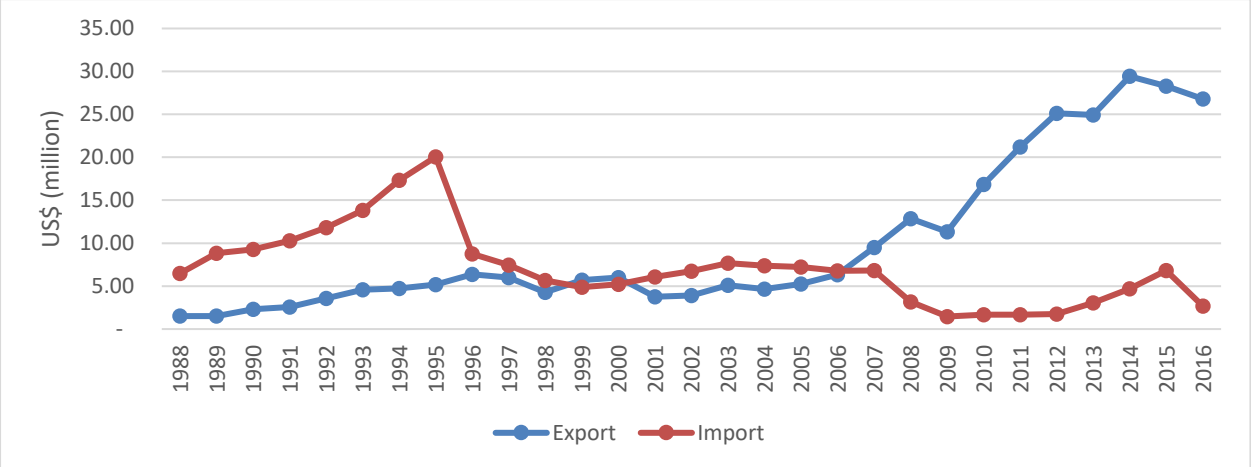

Figure 2.45: South Africa's trade in leather and leather products and footwear with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

South Africa's exports of leather and leather products and footwear to the SADC (excluding the SACU) increased from US$6.33 million in 2006 to about US$26.79 million in 2016. Compared to exports, imports increased from approximately US$6.77 million in 2006 to US$6.81 million, subsequently declining to US$2.68 million in 2016. South Africa had a favourable trade balance of around US$24.11 million in 2016 (Figure 2.45).

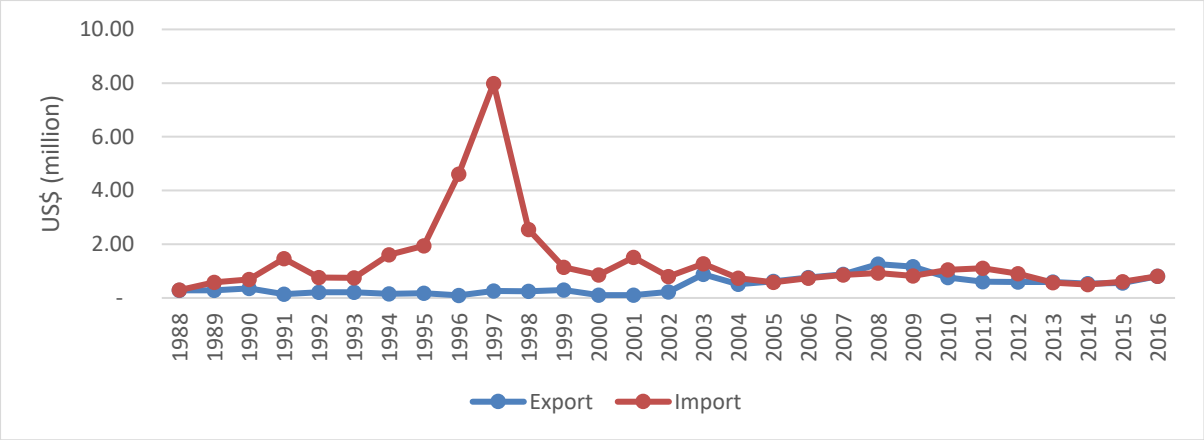

Figure 2.46: South Africa's trade in leather and leather products and footwear with the EFTA, 1988 to 2016

Source: Quantec, 2019b

South African exports of leather and leather products and footwear to the EFTA peaked in 2008 at around US$1.26 million, which dropped to about US$ 0.81 million in 2016. However, imports peaked in 1997 at about US$7.99 million. This substantially declined to about US$0.81 million in 2016 (Figure 2.46).

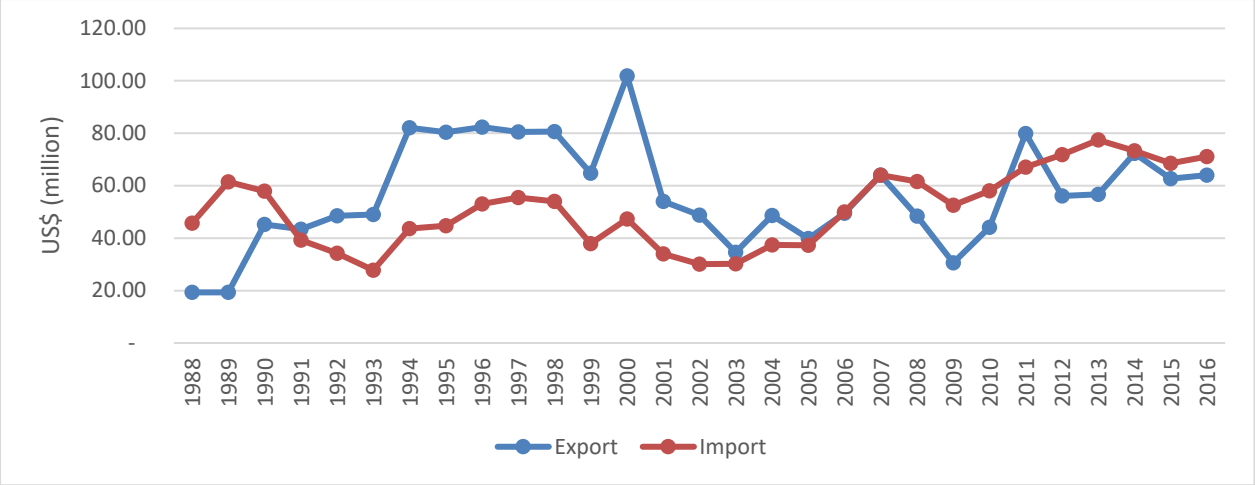

Figure 2.47: South Africa's trade in leather and leather products and footwear with TDCA, 1988 to 2016

Source: Quantec, 2019b

South Africa's trade of leather and leather products and footwear with the TDCA shows periods of positive and negative trade balance. Both in the 1990s and early 2000, South Africa had a positive trade balance with the TDCA. This is the period where South Africa's exports of leather and leather products and footwear were at their highest, peaking at around US$101.85 million in 2000 (Figure 2.47).

Similarly, after 2005, with the exception of 2011, South Africa had a trade deficit with the TDCA. During this time, imports of leather and leather products and footwear peaked at approximately US$77.43 million in 2013.

2.3.3.6 Wood and wood products

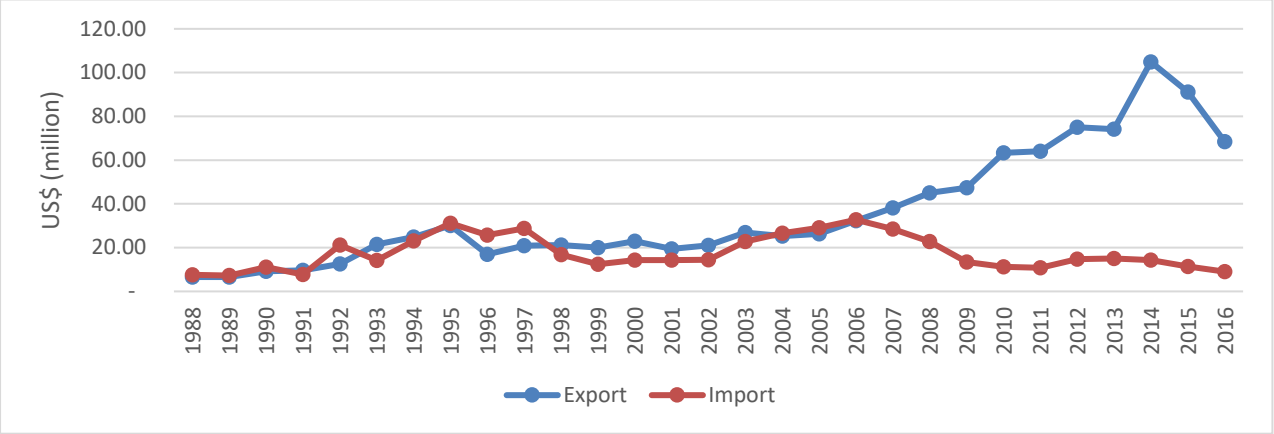

Figure 2.48: South Africa's trade of wood and wood products with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

South Africa's exports of wood and wood products to the SADC countries (excluding the SACU) have shown an upward trajectory since 2005, from US$26.26 million in 2005 to about US$ 104.92 million in 2014. However, the export value decreased to about US$68.50 in 2016. Unlike exports, wood and wood products imports from the SADC (excluding the SACU) declined steadily from US$ 32.73 million in 2000 to about US$9.03 million in 2016 (Figure 2.48).

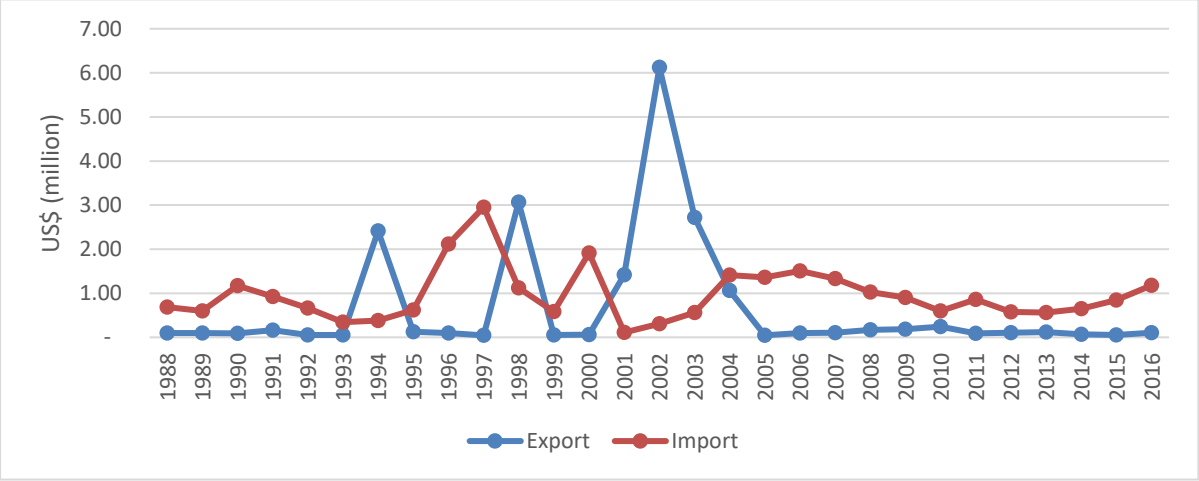

Figure 2.49: South Africa's trade of wood and wood products with the EFTA, 1988 to 2016

Source: Quantec, 2019b

Figure 2.49 shows that South Africa has a negative trade balance with the EFTA in wood and wood products. Both exports and imports of wood and wood products were volatile in the 1990s and early 2000s but stabilised after 2004. In 2016, South African exports of wood and wood products were approximately US$0.10 million, while imports amounted to US$1.18 million. This translates to a trade deficit of about US$1.08 million in 2016.

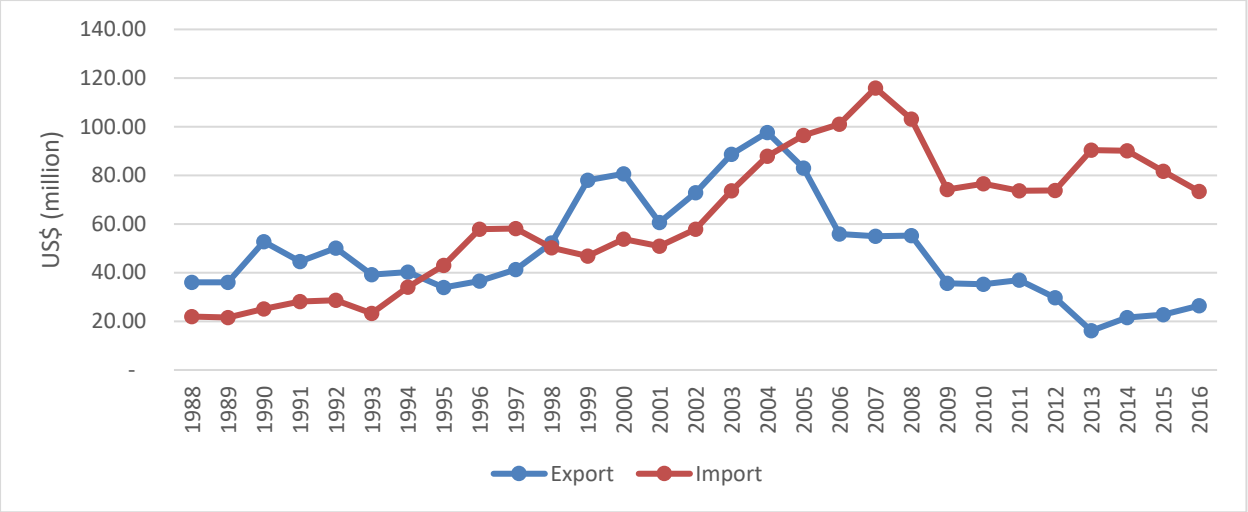

Figure 2.50: South Africa's trade of wood and wood products with the TDCA, 1988 to 2016

Source: Quantec, 2019b

Like South Africa's trade with the EFTA in wood and wood products, the country has a favourable trade balance with the TDCA members subsequent to 2003 (Figure 2.50). South African exports of wood and wood products peaked in 2004 at around US$97.66 million. This declined sharply to about US$26.41 million in 2016. Likewise, imports of wood and wood products peaked in 2007 at around US$115.91 million, then declined, albeit at a slower pace, to around US$73.47 million in 2016.

2.3.3.7 Paper and paper products

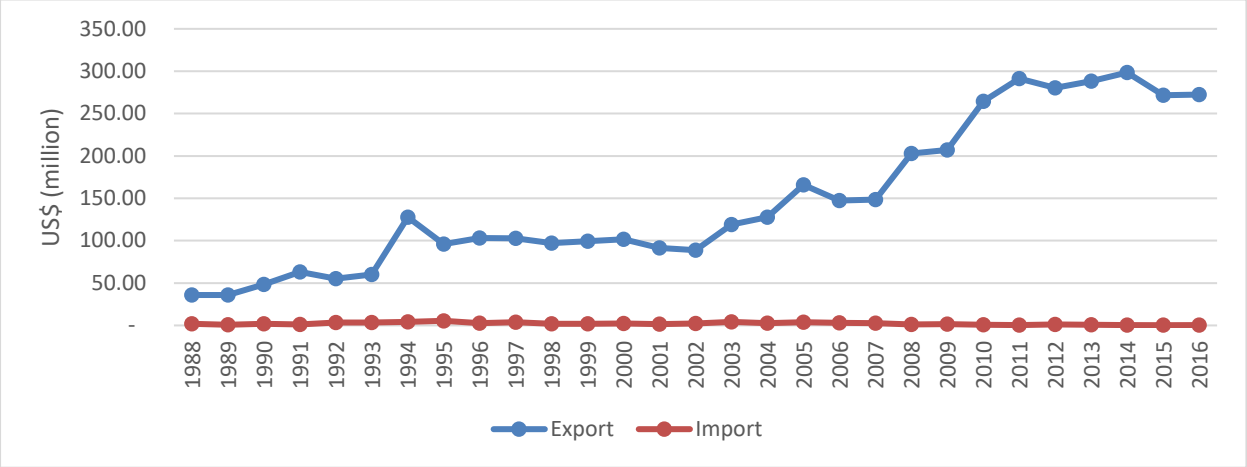

Figure 2.51: South Africa's trade of paper and paper products with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

The SADC's protocol on trade came into effect in the early 2000s. As a result, South Africa's exports of paper and paper products increased significantly from about US$88.89 million in 2002 to about US$ 272.58 million in 2016. South African imports of paper and paper products, on the other hand, declined marginally from around US$2.33 million in 2002 to approximately US$0.58 million in 2016. Figure 2.51 shows South Africa has a positive trade balance with the SADC (excluding the SACU) in paper and paper products.

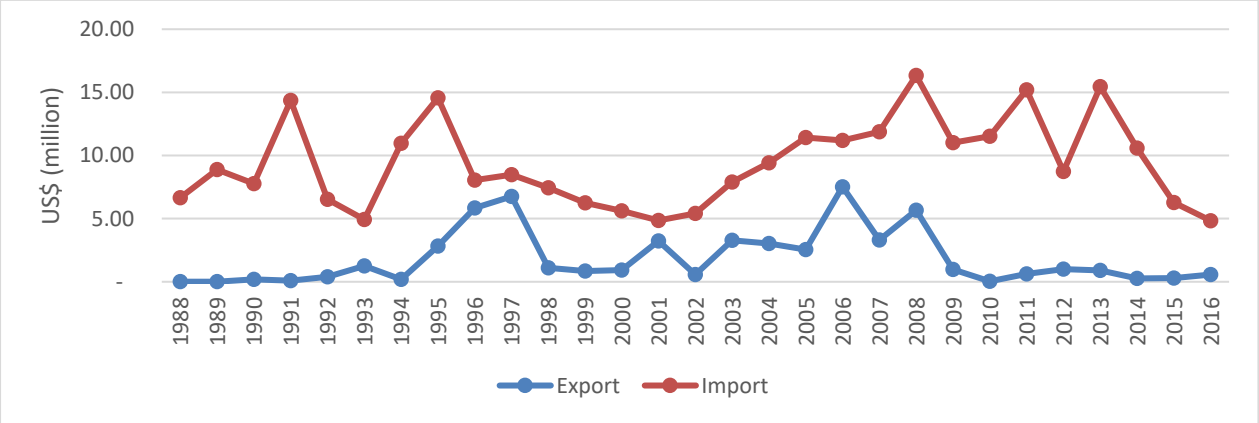

Figure 2.52: South Africa's trade of paper and paper products with the EFTA, 1988 to 2016

Source: Quantec, 2019b

South Africa's exports and imports of paper and paper products appear to follow similar trends. South Africa's exports of paper and paper products to EFTA member countries peaked in 2006 at around US$7.53 million, which eventually declined to around US$0.58 million in 2016. South Africa's imports of paper and paper products from the EFTA peaked in 2008 at around US$16.33 million but decreased to approximately US$4.84 million in 2016. Therefore, as Figure 2.52 shows, South Africa has a negative trade balance with the EFTA in paper and paper products.

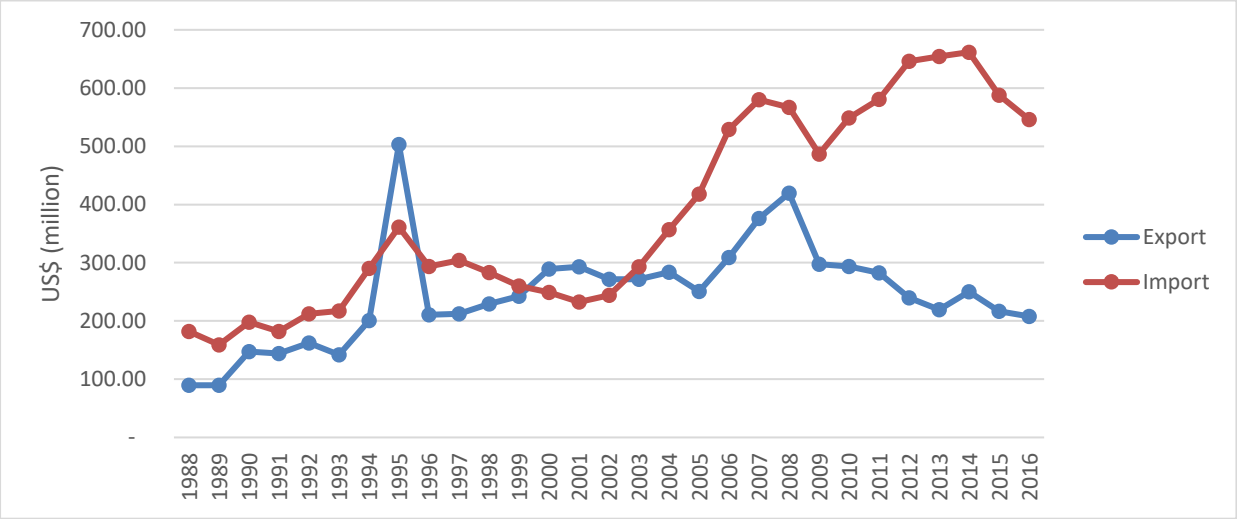

Figure 2.53: South Africa's trade of paper and paper products with the TDCA, 1988 to 2016

Source: Quantec, 2019b

As Figure 2.53 depicts, subsequent to 2002, South Africa has a negative trade balance with the TDCA. In 2002, South Africa's export value of paper and paper products was around US$271.89 million. However, it declined to around US$208.14 million in 2016. Unlike exports, South Africa's imports of paper and paper products to TDCA members increased from US$244.36 million in 2002 to about US$545.95 million in 2016. The trade deficit appears to be widening, reaching about US$337.81 million in 2016 compared to a trade surplus of about US$27.53 million in 2002.

2.3.3.8 Rubber products

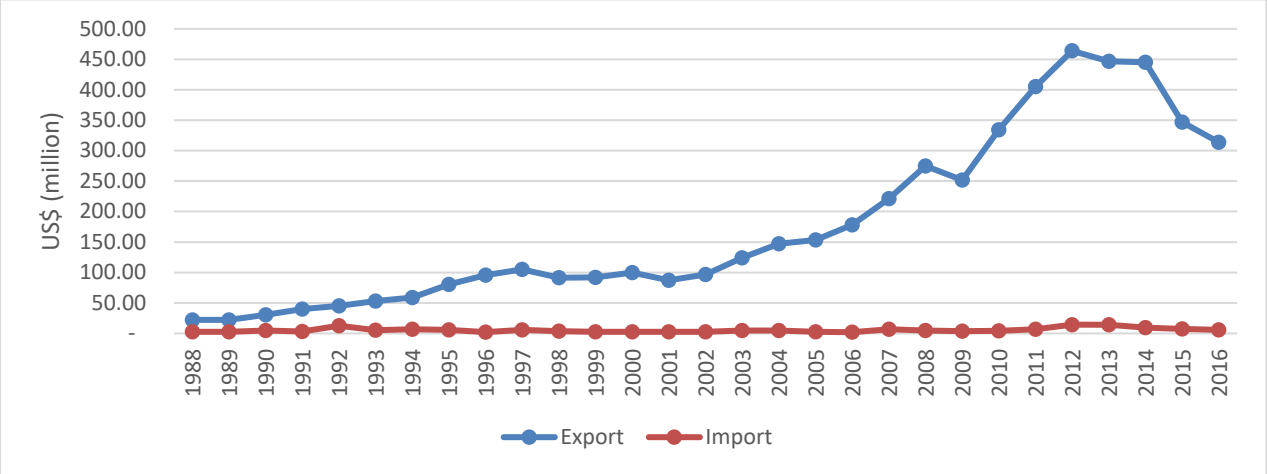

Figure 2.54: South Africa's trade of rubber products with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

In 2002, South Africa's exports of rubber products amounted to around US$96.82 million, which substantially increased to about US$463.88 million in 2012. It, however, declined to about US$313.70 million in 2016 (Figure 2.54). Similarly, South Africa's imports of rubber products from the SADC (excluding the SACU) were approximately US$2.57 million in 2002, which increased rapidly to US$14.41 million in 2012 but declined to US$5.79 million in 2016.

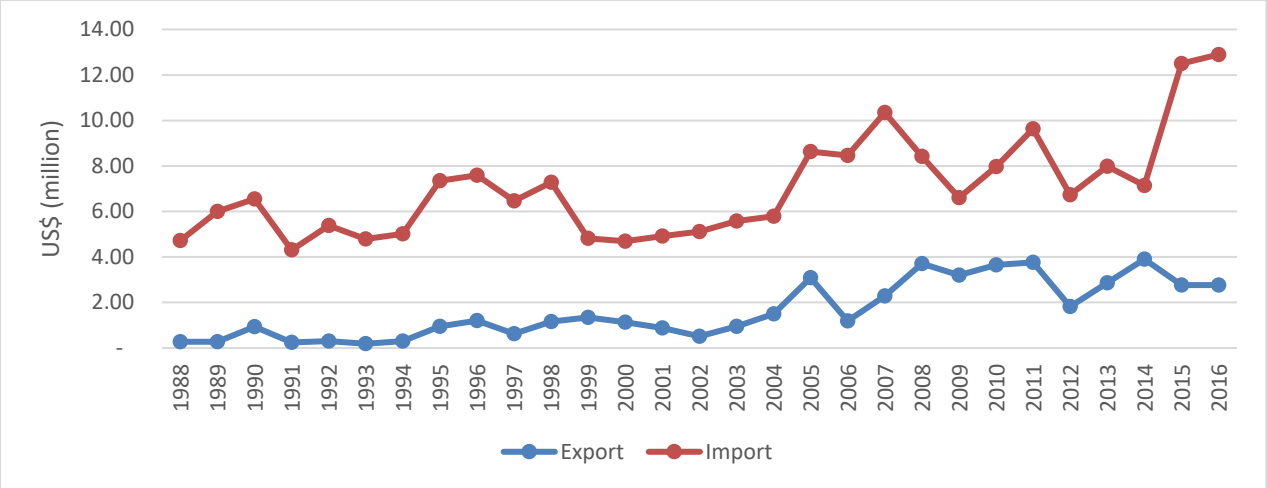

Figure 2.55: South Africa's trade of rubber products with the EFTA, 1988 to 2016

Source: Quantec, 2019b

Unlike the trade in rubber products with the SADC (excluding the SACU), South Africa has a negative trade balance with the EFTA in rubber products. Both South African exports and imports, as Figure 2.55 shows, depict an increasing trend, albeit at a slower pace. South Africa's exports of rubber products to the EFTA increased from US$1.19 million in 2006 to about US$2.77 million in 2016. Similarly, imports increased from about US$8.47 million in 2006 to approximately US$12.90 million in 2016.

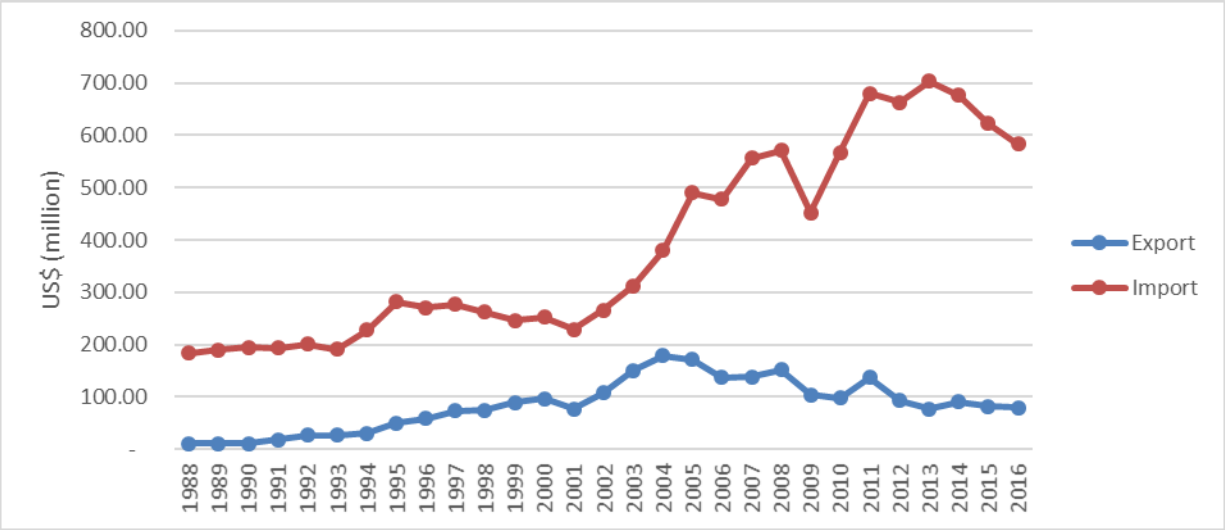

Figure 2.56: South Africa's trade of rubber products with the TDCA, 1988 to 2016
Source: Quantec, 2019b

Figure 2.56 shows that South Africa has a negative trade balance with the TDCA in rubber products. In 2006, South African exports of rubber products to the TDCA were at approximately US$136.29 million. However, it declined to about US$79.00 million in 2016. South African imports, on the other hand, increased from US$478.07 million in 2006 to around US$582.80 million in 2016.

2.3.3.9 Furniture

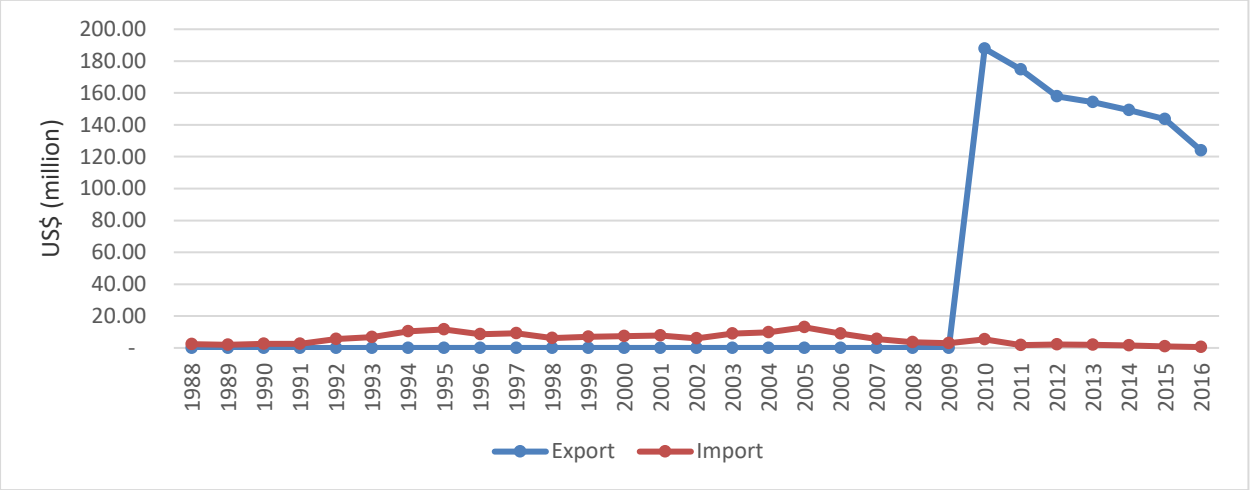

Figure 2.57: South Africa's trade of furniture with the SADC (excluding the SACU) FTA, 1988 to 2016

Source: Quantec, 2019b

Subsequent to 2009, South Africa had a positive trade balance with the SADC (excluding the SACU) in furniture. South African exports of furniture spiked to US$187.81 million in 2010. This eventually declined to about US$124.00 million in 2016. However, South African imports of furniture declined from US$3.03 million in 2009 to about US$0.54 million in 2016 (Figure 2.57).

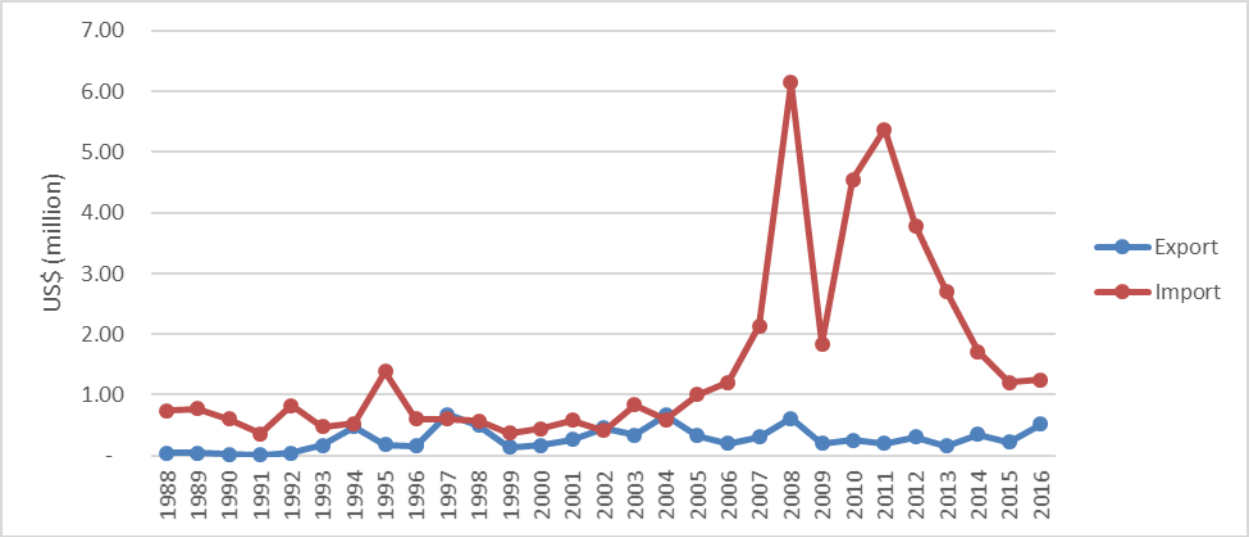

Figure 2.58: South Africa's trade of furniture with the EFTA, 1988 to 2016

Source: Quantec, 2019b

For the period 2004 to 2016, South Africa had a trade deficit with the EFTA in furniture. In this period of trade deficit, South Africa's export of furniture slightly declined from US$0.67 million in 2004 to about US$0.52 million in 2016. However, South African imports of furniture increased from US$0.59 million in 2004 to about US$6.14 million in 2008. Moreover, after a substantial decline in imports in 2009, to about US$1.84 million, it increased to approximately US$5.37 million in 2011. In 2016, South Africa's imports of furniture were at around US$1.24 million (Figure 2.58).

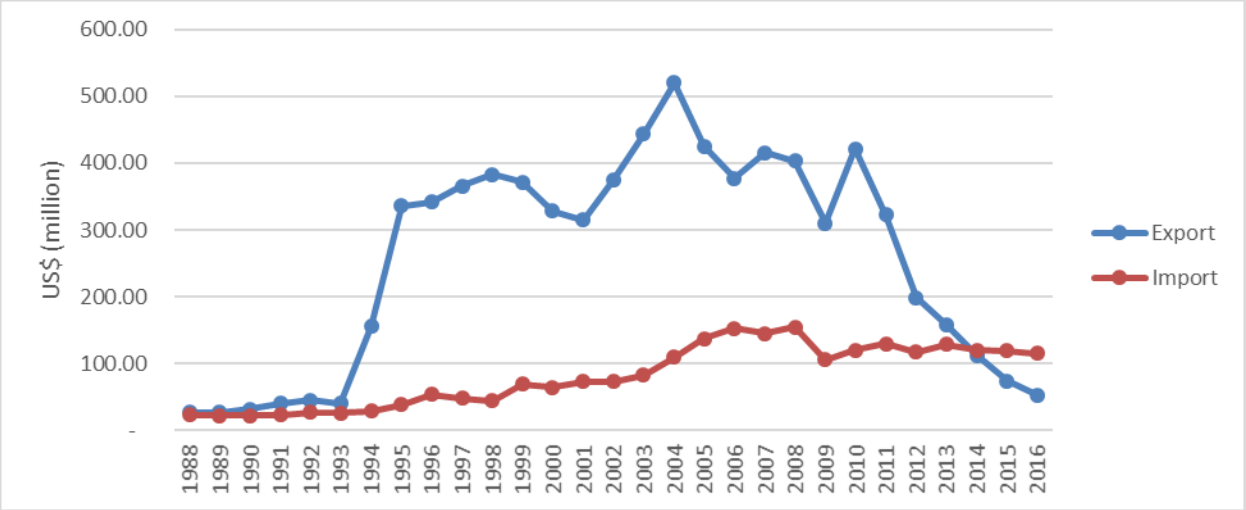

Figure 2.59: South Africa's trade of furniture with the TDCA, 1988 to 2016

Source: Quantec, 2019b

South Africa's trade with the TDCA in furniture depicts a significantly different trend from that with the EFTA. South Africa has recorded a widening trade surplus with the TDCA in furniture. However, after 2013, South Africa has a trade deficit with the TDCA, as Figure 2.59 shows. South Africa's furniture exports to the TDCA reached their peak in 2004 at around US$520.92 million, which declined to about US$52.60 million in 2016. Similarly, South Africa's furniture imports peaked at around US$154.23 million in 2008 but declined to about US$114.50 million in 2016.

2.4 Chapter summary

The chapter highlights the performance of the South African economy relating to the GDP, population, GDP per capita, Gini index, CPI, exchange rate, trade patterns and FDI. In addition,

it further shows how the agro-processing industry has performed over the period 1970 to 2016. The analysis of the agro-processing industry looked at the following variables: employment, real output, investment and trade patterns.

The analysis shows that the South African GDP has been increasing at a slower pace. Similarly, the per capita GDP has remained flat, with minor increments witnessed. However, the population growth has increased significantly; therefore, the population growth has been at a faster rate than the GDP. Amid an increasing population, inequality has also increased, with the Gini index increasing from about 60.1% in 1996 to 63.0% in 2014. This is an increase of about 2.9 percentage points.

However, in terms of prices, the CPI appears to be stable, while the rand has shown high volatility, particularly over the period 2006 to 2016. The investment illustrates a cyclical trend, with periods of net inflows followed by periods of net outflows. However, in the recent period, 2012 to 2016, there has been a substantial increase in FDI net outflows.

In terms of trade, South Africa's leading trading partners are China, Germany and the USA. The leading exports are natural or cultured pearls, precious or semi-precious stones; ores, slag and ash; and vehicles other than railway or tramway rolling stock, while the leading imports are machinery, mechanical appliances, nuclear reactors, boilers; electrical machinery and equipment; and mineral fuels, mineral oils and products of their distillation.

The South African agro-processing trade depicts the following trends: most South African exports of agro-processing divisions are largely destined for the SADC countries; however, the sources of imports are mainly China, India, Germany and France. Lastly, employment in South Africa appears to be increasing, though slowly. However, the share of agro-processing industry's employment in South Africa's total employment shows a declining trend over the period 2000 to 2016.

3 CHAPTER 3: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

3.1 Introduction

This section provides a theoretical framework for the study, followed by the conceptual framework that underpins the study. Secondly, it provides an empirical review of the impact of free trade agreements. Thirdly, it reviews studies on the interaction between labour and trade. Fourthly, it analyses literature on the use of the revealed comparative advantage. Lastly, it shows the theory of regional integration and the summary of the study.

3.2 Theoretical framework

The gravity model, which is widely used in the analysis of bilateral trade flows, is the basis for the study. Before the 1970s, the use of the gravity model in analysing trade flows, irrespective of its lack of theoretical foundation, was at first observed in the study of Tinbergen (1962) and subsequently in Poyhonen (1963). However, the breakthrough in providing a theoretical basis for the gravity model began with the seminal work of Anderson (1979).

The argument put forth by Anderson (1979) was that the gravity model explicitly explains bilateral trade between regional or national borders. However, at that time, caution was made with respect to the model's lack of theoretical basis for the inclusion of variables like border taxes. Despite this expressed caution, the gravity model has been used widely in the analysis of trade. This seminal work by Anderson led to subsequent studies in understanding the gravity model in the 1980s by various authors (Bergstrand,1985; McCallum, 1995).

Likewise, Bergstrand (1985), building on Anderson's (1979) foundation, agreed with the findings on the usefulness of the gravity model in studying trade flows. Further emphasis was made regarding the insufficient theoretical basis for some variables included in the gravity model. Unlike the theoretical analysis conducted by Anderson (1979), the inferences of Bergstrand (1985), indicating that the gravity equation had a problem of omitted variables, were based on empirical evidence.

During the 1990s, as the use of the gravity model intensified, McCallum (1995) concluded that the border significantly impacted trade flows between Canada and the USA. However, the improvement in trade flows was happening at the height of a move towards trade liberalisation, particularly in developed countries. McCallum noted the impact of removing trade barriers in influencing trade flows.

In addition to studying the implication of a border, Engel and Roger (1996) emphasised the importance of distance and border in highlighting the failure of a common price in a segmented market. They showed that as the distance between countries increases, countries are likely to trade less with each other. The variable distance is essential to the gravity equation; it is used as a proxy for transportation cost.

Building on the breakthrough with respect to including the border and distance variables in the gravity equation, similar work was conducted in different cities (see Engel, 2000 and Engel and Roger, 2001). It further confirmed that prices of goods would differ due to geographical differences. This bolstered the inclusion of variables such as area and distance in the gravity model to explain trade flows.

Parsley and Wei (2001) found that the variable distance is significant in explaining trade flows. Despite these earlier concerns raised in the 1990s, there is a consensus that the gravity equation better explains trade flows. However, the shortcomings of the gravity model inspired the development of an improved gravity model.

Anderson and van Wincoop (2003), recognising the gravity model's omitted variables problem, developed the improved gravity model that is said to be free from omitted variable bias. However, despite these improvements, the results of the gravity model remained the same, showing that the border significantly impacts trade. These studies have the provision of a theoretical foundation for the gravity model in common. The equation below shows the initial specification of the model.

$$T_{ijt} = \gamma_0 \frac{Y_{it}Y_{jt}}{D_{ij}} \text{.....(1)}$$

Where T_{ijt} represents bilateral trade between exporting country i and importing country j in period t, Y_{it}, is the national income of the importing county i in period t, Y_{jt}, is the national income of the exporting country j in period t, and D_{ij}, is the distance between importing country i and exporting country j. The model indicates that bilateral trade is proportional to the national income and inversely proportional to the distance between the countries. However, over the years, the model has been improved.

The standard gravity models explain bilateral import demand (X_{ij}) with a variety of explanatory variables, e.g., the income of the importing country (Y_i), the income of the exporting country (Y_j), per capita income of the importing country (N_i), per capita income of exporting country (N_j), a variable that accounts for the distance between the importing and exporting countries (D_{ij}), and a vector of additional variables that may be employed if thought to be relevant (V_i) (Plummer *et al.*, 2010). Expressed in logarithmic form, a characteristic gravity model of bilateral trade is:

$$\ln X_{ij} = A + \delta_1 \ln(Y_i * Y_j) + \delta_2 \ln(N_i * N_j) + \delta_3 \ln D_{ij} + \delta_z \ln V_z + \ln e_{ij} \quad \text{.....(2)}$$

Where: i= importing country; j= exporting country; A= intercept; δ= coefficients of the explanatory variables; ln e_{ij}= lognormal error term

However, in running the model, the national income is replaced by the GDP. This is because the GDP is the measure of the market size of the economy. Lastly, the widespread use of gravity models in trade analysis is due to their high explanatory power of real-world data (Plummer *et al.*, 2010). Table 3.1 lists other variables that are also added to the model.

Table 3.1: The gravity model's variables and expected signs

Variables	Expected signs
GDP of importing country	+
Per capita GDP of importing country	+/-
GDP of the exporting country	+
Per capita GDP of exporting country	+/-
Distance	-
Free trade agreement	+
Area of importing country	+
Area of exporting country	+
Common language	+
Colony	+
Landlocked	-

The labour model, the overall level of manufacturing employment in an economy is by definition equal to the level of manufacturing output times the weighted average employment coefficient for the manufacturing sector.

$$L = Q.\Sigma w\ i\ (L/Q)i \ldots\ldots (3)$$

Where L is total manufacturing employment, Q is total manufacturing output, w i = Q_i/Q, and i refers to branches of manufacturing. The impact of trade on manufacturing employment, as shown in Equation (3) can be described as follows: firstly, it may have an impact on the total output of the manufacturing sector (Q). Increased exports have a positive effect on the level of output, resulting in an increase employment, while greater import penetration decreases output and displaces labour. Secondly, trade influences the shares of different industries in overall manufacturing output (w i), increasing the output of exportable and reducing output of import competing industries. Finally, trade can have an impact on employment by changing labour coefficients within industries $(L/Q)_i$ (Jenkins and Sen (2006).

3.3 Conceptual framework

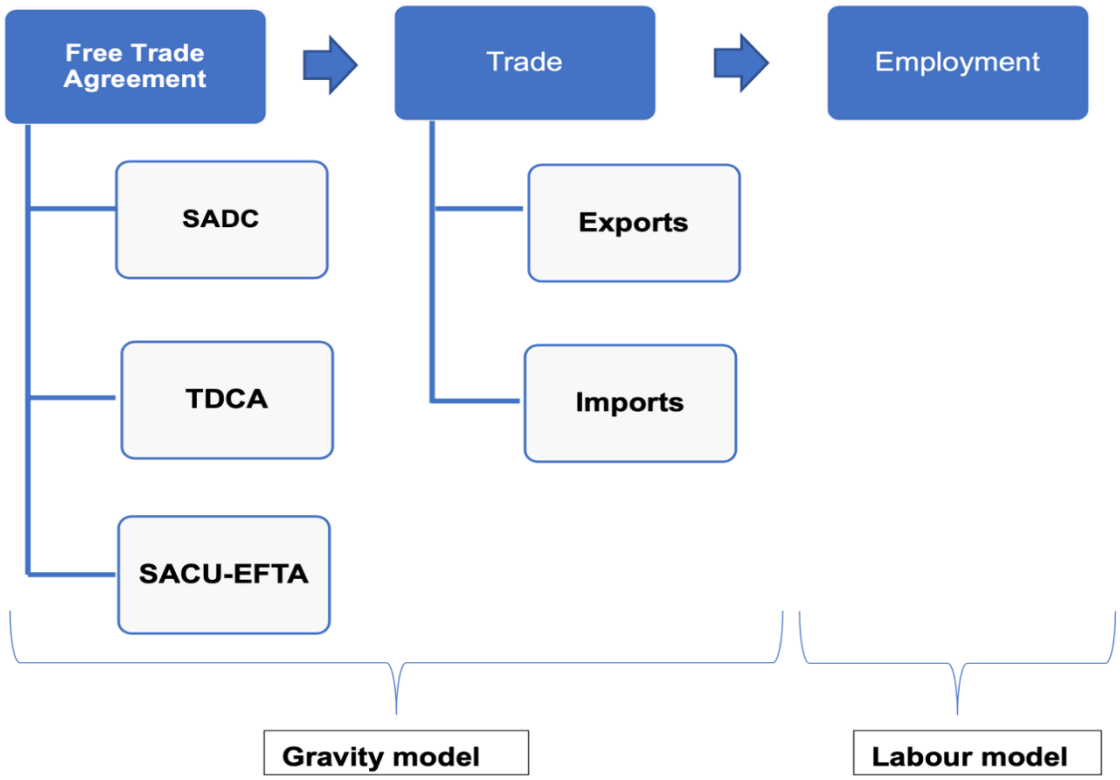

Figure 3.1: Conceptual framework of the study

The study sought to analyse the effect of free trade agreements on international trade and employment in South Africa's agro-processing industry using the framework that is illustrated in Figure 3.1. Firstly, the gravity model was used to analyse the impact of FTAs on exports and imports of the agro-processing industry. Traditionally, the gravity model points out that trade depends on variables such as the GDP, GDP per capita, population, area, distance, common language and landlocked. However, several variables are added to the basic gravity model depending on the intended outcome of the study (Plummer *et al.*, 2010).

The GDP is a proxy of the country's income; however, together with the population, they serve as a market size guide. Additionally, the GDP per capita indicates a country's income per capita, which is an indicator of potential demand, while the distance, area, common language and landlocked are proxies for the transactional costs. The gravity model is estimated using secondary data for the GDP, GDP per capita, population, area and distance, while FTAs, common language and landlocked are binary variables.

Secondly, as in Figure 3.1, is the estimation of the labour model. The labour model was used to indicate the impact of exports and imports on employment in the agro-processing industry. The labour model assumes that an increase in wages and import-domestic demand ratio negatively affects employment, while an increase in output and export-output ratio positively affects employment.

Lastly, the gravity model's results were juxtaposed with the results of the labour model to draw inference on the link between FTAs, international trade and employment in South Africa's agro-processing industry.

3.4 Empirical review of the impact of trade agreements

Several studies have analysed the implication of trade agreements, mainly in identifying if they result in trade creation or trade diversion. Clausing (2001) observed that the FTA between Canada and the USA had created trade. However, it was further noted that there was little evidence indicating trade diversion.

Similar interest in trade creation and diversion effects as a result of regional trade arrangement is seen in Tang (2005). Who analysed the North American Free Trade Agreement (NAFTA), and the Australia – New Zealand Closer Economic Relations (ANZCER) and the Association of Southeast Asian Nations (ASEAN) trade agreements using the modified gravity model. Tang (2005) concluded that these trade agreements enhanced trade. However, the ANZCER agreement showed evidence of decreased trade with non-members, which was not the case for the NAFTA. Furthermore, the ASEAN trade agreement was associated with increased trade with non-members.

Furthermore, Jayasinghe and Sarker (2008), using disaggregated data of agri-food products, noted the substantial increase in intra-regional trade between the NAFTA members. This increase was a consequence of the displacement of imports from the rest of the world. Moreover, the NAFTA is seen as less open compared to the rest of the world.

The MERCOSUR trade agreement, as shown in the *ex-post* study of García *et al.* (2013), has positive effects on trade, albeit moderate compared with other regional trade agreements

(RTAs). This moderate improvement in trade could be enhanced by deepening trade relations with existing members or by adding new members (García *et al*., 2013).

In South Asia, Islam *et al*. (2014) use the gravity model to investigate changes in trade patterns of the South Asian economies as a result of joining the South Asian FTA. There is no evidence of trade creation among the members of the South Asian FTA. However, it was found that the members' exports to the rest of the world significantly increased.

Martin-Mayoral *et al.* (2016) looked at the effects of trade agreements in the western hemisphere. This involved the MERCOSUR, Andean Community, Central American Common Market and NAFTA. The conclusion in the study was that the evidence of trade creation was observed in the MERCOSUR, Andean Community, Central American Common Market. However, trade diversion was also seen in NAFTA member countries and MERCOSUR countries.

Similarly, trade creation for agricultural products among members of FTAs was shown in the ASEAN agreement, the People's Republic of China PTA, EU-15, EU-25, and SADC (Sun and Reed, 2010). Nin-Pratt and Diao (2014) highlighted that the SADC members indeed realised an increase in agricultural imports. However, they alluded those imports are from inefficient producers in the SADC region, consequently resulting in negative welfare.

Unlike Sun and Reed (2010) merely noting evidence of trade creation in the SADC, Nin-Pratt and Diao (2014) further indicated the importance of common policies in areas of investment, productivity and product diversification for the SADC members to achieve positive welfare gains. This has recently been seen, and the emphasis has moved to integrate the African continent through the continental FTA.

Theoretically, the FTAs are expected to impact trade positively. Martnez-Zarzoso and Nowak-Lehmann (2003), in applying the gravity model on MERCOSUR-EU trade, noted that trade flows are determined by variables such as infrastructure, income differences and exchange rates. Likewise, Kahouli and Maktouf (2013), using the gravity model to study the implication of RTAs in the Mediterranean region, concluded that the FTAs impact trade flow positively.

In a similar study concerning the EU, Caporale *et al*. (2012) observed that the European FTAs positively impacted four new EU members from central and eastern Europe, referred to as the CEEC-4. Imports were impacted more than exports, suggesting trade asymmetry.

In a recent study applying the gravity model, Alawadhi *et al.* (2021) looked at the effect of the EU and the Gulf Cooperation Council agreement on the margins of trade and found evidence of a slight increase in the extensive margin of trade. Studies of this nature applying the gravity model to determine trade margins are not common, but this shows the usefulness of the gravity model to new trade areas.

Moreover, in a recent FTA analysis, using the gravity model, albeit at differing variations of the model, Choi and Minondo (2019) looked at the effects of the Central European Free Trade Agreement on Albania's trade. The evidence based on the gravity model's equation showed a positive impact on Albania's exports.

Khurana and Nauriyal (2017) evaluated the effects of the ASEAN-India FTA and concluded that the gravity model's variables, namely, GDP, distance, common language and border were significant with their expected signs. Timsina and Culas (2020) looked at Australia's FTAs with respect to whether they are trade creating and export diverting. They concluded that the FTAs that Australia participates in showed evidence of trade creation, which was higher than export diversion.

Ngepah and Udeagha (2018) analysed the effect of RTAs in Africa using the gravity model, which was estimated by Eicker–White robust covariance Poisson pseudo-maximum-likelihood method. This method, as Ngepah and Udeagha (2018) argued, is superior compared to non-linear least square estimators. Overall, the results showed that RTAs in Africa have indeed increased trade.

Further, the positive impact of RTAs in Africa was identified by Kagochi and Durmaz (2018). They observed the positive benefits of increased trade brought about by RTAs in sub-Saharan Africa. This has been true for the Common Market for Eastern and Southern Africa, the Economic Community of West African States and the SADC agreements.

Therefore, the use of the gravity model in analysing trade, albeit variations of the model, continues to dominate *ex-post* studies. Irrespective of the variations in how the gravity model is estimated, the conclusions have remained predominately common, with arguments indicating that trade agreements lead to trade creation or trade diversion.

3.5 Empirical review of the link between employment and trade liberalisation

The empirical analysis on the impact of trade liberalisation on employment has been ongoing for years and intensified in the 1990s, with recent impetus due to, among other reasons, high levels of unemployment in developed and developing countries alike. There are two main viewpoints on trade and employment relations. One view is that the changes in employment are largely explained by technological changes (Acemoglu, 2002), while others, such as Wood (1995) and Leamer (1998), link changes in employment to international trade.

Some studies have found support for welfare improvement resulting from opening to trade. Another view is that aggregated unemployment declines as countries open to trade (Altenburg and Brenken, 2008). Greenaway *et al.* (1999), in their assessment of the impact of trade on employment in the United Kingdom, concluded that an increase in trade leads to a reduction in the level of derived labour demand.

Moreover, as argued by Greenaway *et al*. (1999), this implies that a country's openness to trade increases its efficiency due to increased competition and consequently reduces derived labour demand. However, dissecting the causal impact is cumbersome, exacerbated by the complex nature of trade and employment interactions.

Theron *et al*. (2007) highlighted that there is the likelihood that changes in employment within sectors could be linked to technological changes, while employment between sectors could be likely explained by trade liberalisation. Furthermore, Theron *et al.* noted support in favour of technological change as argued by Edwards (2001) and Edwards and Behar (2006).

Gozgor (2016) examines the effect of international trade on manufacturing employment in Denmark, France, the Netherlands, Sweden, the United Kingdom and the USA. The results show that there is a negative relationship between trade and employment. This, as Gozgor

argues, is mainly due to the export orientation policy in Denmark and the import penetration in France and the United Kingdom.

Erlat (2000), looking at Turkey, investigated the impact of exports and imports on employment changes in the manufacturing industry. Erlat noted trade-induced employment changes post-1980. Further observed that this is correct for net exporting and noncompeting products rather than import-competing products. This shows that irrespective of the direction of changes in employment, trade flows induced the change.

In developing countries, notable studies of the interaction between trade and employment are seen in India and Vietnam. Das *at el.* (2014) looked at the impact of trade and labour demand in Indian manufacturing from 1991 to 2010. Among other findings, they concluded that exports have a positive impact on aggregate employment. However, they further observed that changes in employment induced by trade vary across industries.

In Vietnam, Nguyen *et al.* (2017) posed a question on whether competition from imports has a negative impact on employment. They specifically looked at the period around the 2000s in Vietnam. Nguyen *et al.* concluded that import competition had led to a contraction in employment. This was mainly observed in firms operating in industries that are more open to international competition.

Trade and employment nexus studies are also observed in Africa. In Kenya, for instance, Were (2011) studied the link between casual employment and the export orientation of Kenyan manufacturing firms and found no evidence to support that exports impact casual workers employed by these firms. Therefore, the rise in casual employment in export-orientated firms could be explained by other variables other than exports.

Babatunde *et al.* (2012) explored the relationship between trade, employment and poverty reduction in Nigeria. Babatunde *et al.* (2012) noted that oil exports contribute significantly to economic growth; however, this does not translate into job creation. Agricultural exports, on the other hand, as Babatunde *et al.* (2012) further allude, are capable of creating jobs.

Trade and employment linkages have been widely studied in South Africa. In the 1990s for South Africa, the net effect of trade flows on employment demand is claimed to have been

close to zero, with the argument that the employment created through export growth closely matched employment lost through import penetration (Edwards and Stern, 2007).

Petersson (2002) analysed intra-industry trade adjustment in the SACU after 1994, particularly the link between trade liberalisation and employment. Petersson found that inter-industry trade, together with export and import expansions, are positively related to employment gain.

Moreover, on South African trade and employment linkages, Edwards and Jenkins (2015) evaluated the impact of Chinese import penetration on the South African manufacturing sector. Edwards and Jenkins observed that due to an increase in import penetration from China, South African manufacturing output declined by approximately 5%. Furthermore, total employment in manufacturing declined by about 8%. However, they noted that this might be due to a decline in output of labour-intensive industries coupled with increased productivity as imports increased.

Similarly, on the impact of China on South Africa's trade and employment, Bonga-Bonga and Biyase (2019) assessed the implication on the textiles industry. They concluded that total employment in the textile industry is negatively impacted by imports of textiles from China. This is the same observation as Edwards and Jenkins (2015) that indeed imports from China resulted in a decline in total manufacturing employment.

In the impact of trade and structural changes on sectoral employment in South Africa study, Bhorat (2000) estimated the impact of trade flows on labour demand and observed positive correlation between international trade and employment. Employment of all workers increased as exports and imports in the economy grew between 1970 and 1995 (Bhorat, 2000).

Mukherjee (2014), in studying liberalisation and jobless growth in developing countries, found support for the notion that as a consequence of different trade reform policies, domestic sectors face increasing competition from foreign markets, resulting in the retrenchment of relatively less productive workers. This reinforced the argument that liberalisation results in jobless growth (Mukherjee, 2014). This resonates with what South Africa witnessed during high economic growth, which is argued to have contributed less to curbing the scourge of unemployment.

In a study on deindustrialisation, Kim and Lee (2014) concluded that the expansion of bilateral trade with China with developing countries could be a source of deindustrialisation. This observation, particularly for South Africa, is likely to hold in some sub-sets of the agro-processing industry, given its increasing trade with China.

Roberts and Thoburn (2003) in adjusting to trade liberalisation: the case of firms in the South African textile sector study noted an increase in exports, however, at the same time employment declined. Similar findings on clothing industry showed that that import penetration in South African clothing industry led to industry decline and employment loss (Westhuizen, 2007).

Mulangu (2015) evaluated the impacts of AGOA and its apparel provisions on African firms and concluded that the impact on employment is weak, however, noted an increase in firm productivity (Mulangu, 2015). Recentely, Bastos and Santos (2022) estimated the medium to long-run effects of trade liberalisation on local labour markets. They found that employment growth tended to be lower in industry that experienced mass tariff cuts (Bastos and Santos, 2022).

3.6 Empirical review of the revealed comparative advantage

The Balassa index, predominately known as the revealed comparative advantage, despite being criticised by Greenaway and Milner (1993), is widely used in international trade analysis, specifically in identifying the products in which a country has a comparative advantage. The revealed comparative index was initiated by Liesner (1958), with Balassa (1965) incorporating some improvements. The revealed comparative advantage continues to be applied to analyse a country's comparative advantage. French (2017), in determining the uses of revealed comparative advantage indices, observed that these indices could show patterns in countries' comparative advantage, effects of changes due to trade barriers and competitors in different markets.

Maqbool *et al*. (2018) examined the competitiveness of Pakistan's leather and leather products industry using the revealed comparative advantage and revealed competitive advantage indices. They found that the industry showed a high degree of comparative advantage. Despite

the use of different indices, as seen in French (2017) and Maqboolet al. (2018), the inferences reached tend not to be different.

Similar studies that used the revealed comparative advantage to determine the competitiveness of a country's products are that of Serin and Civan (2008) and De Paula *et al*. (2017). Serin and Civan (2008), in a Turkish case study, observed that in the EU, the comparative advantage for Turkey was in fruit juice and olive oil products. However, this is not the case for products such as tomatoes. On the other hand, De Paula *et al*. (2017) assessed Brazil's competitiveness for natural honey. The revealed comparative advantage index shows that Brazil is competitive in natural honey. Other studies, such as Fertő and Hubbard (2003), Seyoum (2007), and Bojnec (2001), also assessed a country's competitiveness at an industry or sectoral level.

Using the revealed comparative advantage to analyse the competitiveness of a sector or product is well established in Africa. Valentine and Gena (2000), in studying sectors in the SADC countries, established that agricultural and mining products have high revealed comparative advantage ratios. However, Weiner *et al.* (2008), in identifying sectors in which South Africa has a comparative advantage, noted that South Africa's comparative advantage is attributed to products servicing producers and those with high capital intensity.

Visser *et al.* (2015) examined the comparative advantage of products at a provincial level in South Africa's Mpumalanga province using the revealed comparative advantage index. A revealed comparative advantage study at a provincial level is rare; however, the study showed that products with a comparative advantage in Mpumalanga are manganese products, salted meat (beef), frozen fish, chewing gum, tomatoes, soups and broths.

The soybean industry in South Africa, as shown in Bahta and Willemse (2016), showed a trend of revealed comparative disadvantage over the period 1996 to 2011. These studies show the reliance on revealed comparative advantage to identify products in which a country has a comparative advantage or disadvantage. Similar studies using revealed comparative advantage are that of Bezić *et al*. (2011) and Singh and Singla (2012), with the former looking at changes in Croatia's manufacturing industry, while the latter analysed India's revealed comparative advantage.

3.7 Trade theories and impact of regional integration

The seminal work by Smith (1904) in an inquiry into the nature and causes of nations' wealth laid the foundation for trade theory. Smith indicated that countries trade due to their ability to produce goods relative to other countries. This is known as having an absolute advantage. However, in an attempt to better highlight the premise of trade, Ricardo (1821) introduced the theory of comparative advantage. Ricardo argued that the opportunity cost of producing a good is key in determining why countries trade.

The Heckscher-Ohlin trade theory, with inspiration from David Ricardo's theory, states that countries export goods that are produced using relatively abundant factors while, similarly, import goods produced with scarce factors. Stolper and Samuelson (1941), on the premise of Heckscher-Ohlin's theory, pointed out that there are winners and losers when a country moves from autarky to trade. In the context of South Africa, given its abundance of low-skilled workers, the Stolper-Samuelson trade theory could imply that low-skilled workers could benefit from trade.

In addition to endowments in resources or technology as an explanatory variable as to why countries engage in trade, Helpman and Krugman (1987) showed that the will to achieve economies of scale is a major influential variable. Different from comparative advantage theory, as reflected above, based on constant returns to scale and perfect competition assumptions, Helpman and Krugman's theory adds the concept of increasing returns to scale as a determinant to trade.

The breakthrough in analysing the implication of trade agreements on participating and non-participating members was captured in the work of Viner (1950), which introduced the concept of trade creation and diversion. Trade creation is when consumers switch from domestic suppliers to a cheaper supplier from a trade agreement member. Trade diversion is when consumers switch from an efficient foreign supplier to buying from partners in the trade agreement. This is explicitly illustrated by Hoekman and Kostecki (2001) in Figure 3.2.

As depicted in Figure 3.2, the regional integration assumes that country N trades with two countries, B and G, with D_m and S_m representing domestic demand and supply, respectively. The assumption is that all three countries, country N with two partners, B and G, produce the

same product, X. Moreover, country G is a low-cost producer of product X, while country N imposes a non-discriminatory tariff on imports of product X. As it is depicted in Figure 3.2, the import tariff is the vertical distance between S_G and S_{G+T}.

Before the introduction of a Customs Union, country G is the low-cost producer of product X; thus, country N only imports Q_2Q_3 from country G, while domestic production is $0Q_2$. Assuming that countries N and B create a Customs Union. After a Customs Union, country G still faces a tariff while it is eliminated for country B because of the Customs Union. Therefore, country N imports from country B, as country G loses its export to country N.

Since country B is an inefficient producer compared to country G, the efficiency loss is depicted by rectangle *e*. However, consumption increases from $0Q_3$ to $0Q_4$ as the domestic price of product X declines from P_n to P_b. Similarly, imports increase from Q_2Q_3 to Q_1Q_4. Country N's net welfare gain is equal to area *b* and *d* minus area *e*. Consumer surplus expands by area *a* and *e*, with the latter a loss in producer surplus, while the former is a loss in tariff revenue.

Producers of product X in country N face a decline in output as consumers switch to cheaper imports, which is trade creation. Trade creation improves consumer surplus. However, as country N ceases to import from country G and starts to import from country B (a Customs Union partner), a trade diversion is set up. Whether country N experiences welfare loss or gain is dependent on the extent of trade diversion compared to trade creation.

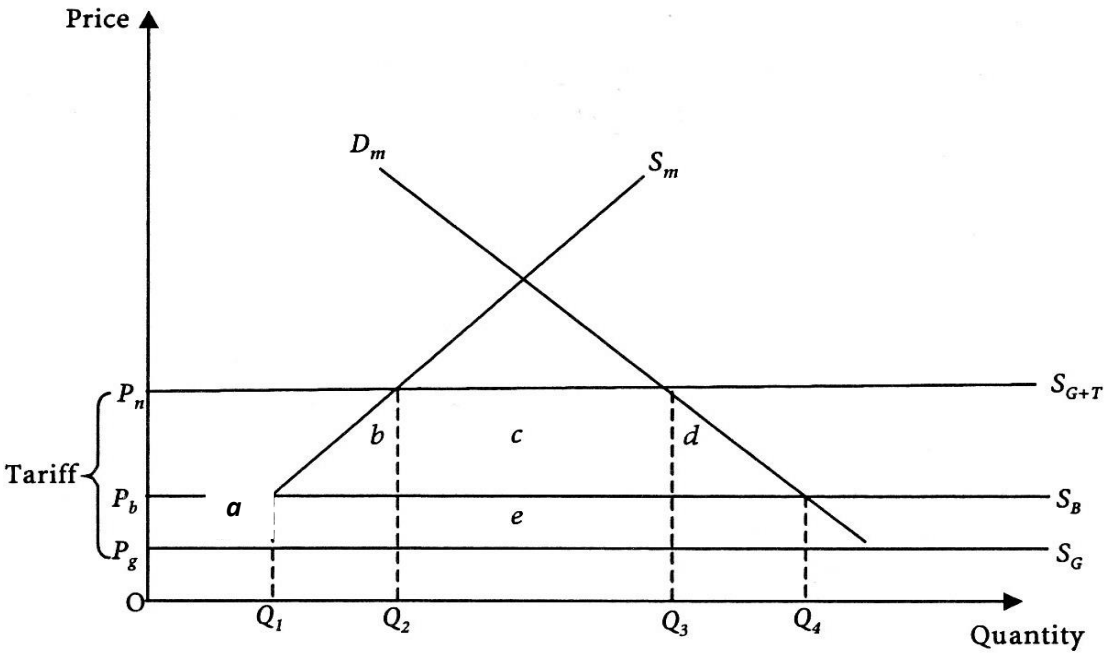

Figure 3.2: Regional integration model

Source: Hoekman and Kostecki (2001:496)

Empirically, Matthee and Gallego (2017) investigated determinants of South Africa's extensive and intensive trade margins using a gravity model. They concluded that the gross domestic product and population play a significant role in a firm's export decision. Moreover, the cultural or language fit, presence of South African embassy abroad, and free trade agreement with SADC have a positive effect on exports expansion, respectively. However, distance and trade regulations and costs have negative impact on exports (Matthee and Gallego, 2017).

Guei (2019) measure the effect of the regional trade agreements in South Africa. The results showed that the SADC and EU FTA increased trade with less efficient partners by approximately 4% and 6%, respectively (Guei, 2019). This, therefore, shows that the regional trade agreement gas diverted trade from non-members of the FTA.

3.8 Chapter summary

The chapter highlighted the theoretical basis for the gravity model. It showed how the gravity model was used initial without its foundation in economic theory and how this changed when attempts were made to improve it. The chapter further showed how this study is carried out through the conceptual framework.

Moreover, the chapter provided a review of the literature on how trade agreements influence the direction of trade, as well as trade and employment interactions and revealed comparative advantages. The impact of trade agreements mainly concluded whether there is trade creation or trade diversion. However, on trade and employment links, the literature review revealed various debates. On the one hand, there is an argument that employment changes are linked to technological changes, while, on the other hand, it is linked to international trade.

Lastly, the chapter explained trade theories and illustrated the regional integration model. The trade theories provide reasons for why countries engage in trade. However, the regional integration model highlights that trade creation occurs when consumers switch from domestic suppliers to a cheaper supplier from a member of a trade agreement, while trade diversion occurs when consumers switch from an efficient foreign supplier to buying from partners in the trade agreement. Empirically, I showed that regional trade agreements increase trade within members.

4 CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

This chapter outlines the study area and the analytical methods. The models that were used in the study, the gravity and labour models, are described. Lastly, the sources of data are identified.

4.2 Study area

South Africa is situated at the southern tip of Africa, bordering Botswana, Lesotho, Mozambique, Namibia, Eswatini and Zimbabwe (Figure 4.1). South Africa comprises of nine provinces: Limpopo, Mpumalanga, Gauteng, Free State, Western Cape, Eastern Cape, Northern Cape, North West and KwaZulu-Natal. The total area of South Africa is about 1,219,090 square kilometres. The land area comprises about 1,214,470 square kilometres, while the area covered with water is approximately 4,620 square kilometres. Moreover, South Africa's coastline is about 3000km from the desert border with Namibia on the Atlantic coast southwards around the tip of Africa and then north to the border of subtropical Mozambique on the Indian Ocean (The World Factbook, 2021).

Figure 4.1: Map of South Africa

Source: The World Factbook (2021)

The total population of South Africa was estimated at approximately 56.02 million in 2016. The race demographic is 80.08% Africans, 8.88% coloured, 8.45% white and 2.59% Indian/Asian (World Bank, 2019). The country has 11 official languages, which are English, Afrikaans, isiZulu, isiXhosa, Sepedi, Setswana, Sesotho, Xitsonga, Tshivenda, Ndebele and siSwati.

South Africa is an upper middle-income country with a GDP of around R4, 014.65 billion in 2016. The agriculture, forestry and fisheries sector comprises of about 2.33% of the GDP, while manufacturing and services have a share of 13.44% and 78.26%, respectively. The challenges facing South Africa, among others, are unemployment, poverty and inequality. In 2016, unemployment remained at a record high of about 24.8% (World Bank, 2019).

4.3 Analytical methods

The study used the gravity model to analyse the effect of trade agreements on subsectors of the agro-processing industry in South Africa. The labour regression model was used to analyse the impact of trade on agro-processing industry's employment. The panel regression was estimated using a Stata version 14 Software..

The effect of FTAs on the subsectors of the agro-processing industry's exports and imports (objective one) was analysed using the gravity model. A binary variable has the value of one from implementation or zero otherwise. A positive and significant binary variable indicates that either exports or imports of agro-processing products have increased because of the implementation of FTAs and *vice versa.*

However, with respect to the second objective, to assess the effect of FTAs on employment in the agro-processing industry, a significant import-domestic demand ratio variable with a negative sign indicated that employment is declining due to increasing imports, while the opposite is true for the export-output ratio variable. The result of the gravity model and the labour model were compared to assess the link between employment and trade agreements. If an FTA positively impacts exports of agro-processing products, and exports of agro-processing products positively impact employment, it is concluded that the FTA has a positive effect on employment and *vice versa*.

4.3.1 Gravity model

In estimating the gravity model, equation 3 was applied. This modified gravity equation was used by Engstrom and Verdier (2010) in the analysis of the benefit of trade integration in the SACU.

$$ln(X_{ijt}) = \beta_0 + \beta_1 lnY_i Y_j + \beta_2 \ln P_i P_j + \beta_3 lndist_{ij} + \beta_4 \ln(Area_i Area_j) + \beta_{FTA} FTA_{ijt} + \sum_i \beta_i D_{ij} + \mu_{ijt} \quad \ldots\ldots(4)$$

Where:

$\boldsymbol{X_{ijt}}$ is bilateral trade, which is exports and imports between countries *i* and *j* at time *t*

$\boldsymbol{Y_i}$ is real GDP in country *i*

$\boldsymbol{P_i}$ is the population in country *i*,

Yj is real GDP in country *j*,

Pj is the population in country *j*,

$\mathbf{dist_{ij}}$ is the distance between countries *I* and *j*,

$\boldsymbol{Area_i}$ is the area of country *i*,

Areaj is the area of country *j*,

$\boldsymbol{FTA_{ijt}}$ is the dummy variable equal to one if countries *i* and *j* share a trade agreement at time t,

$\boldsymbol{D_{ij}}$ are dummies that show the characteristics of the country pair, such as common language, border etc., and

$\boldsymbol{u_{ijt}}$ represents the variables that are not captured by the model.

4.3.2 Labour model

The labour model is depicted in equation 4, from Jenkins and Sen (2006), whereby lagged employment of agro-processing divisions depends on wage, output, import-domestic demand ratio and export-output ratio (Table 4.1).

$$\ln L_{it-1} = b_0 + b_1 lnw_{i,t} + b_2 lny_{i,t} + b_3 lnIR_{i,t} + b_4 lnER_{i,,t} + e_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Table 4.1: Variable descriptions and expected signs

Variable	Description	Expected signs
L	Total employment	
W	Average real wage	-
Y	Real output	+
IR	Import-domestic demand ratio	-
ER	Export-output ratio	+

Table 4.1 shows the basic assumptions of the model. An increase in wages and import-domestic demand ratio negatively affect employment, while an increase in output and export-output ratio positively impact employment.

4.3.3 Test for fixed or random effects

Comparing the fixed or random effects, the Hausman test was run. Hausman test tests if there is a significant difference between the fixed and random effects estimators. In the Hausman test, the null hypothesis indicates that the model to be preferred is random effects. However, the alternative hypothesis indicates that the model to be preferred is fixed effects. The results showed that the Hausman test is insignificant. Therefore, the fixed effects model was preferred. However, the random effect results are also analysed because it captures the time-invariant variables which critical for the gravity model. The fixed effects model omitted time-invariant variables such as common language, colony and landlocked due to collinearity.

4.4 Data

The study used panel data, with exports and imports data sourced from the United Nations Statistics Bureau, COMTRADE and Global Trade Atlas databases. The real GDP and population data were sourced from the International Monetary Fund and the World Bank. While the binary variables (landlocked, colony and common language) data and the data for area and distance are sourced from the CEPII database. The data is from 1996 to 2016, and it is annual data. The data for all 11 divisions of agro-processing in accordance with the SIC: food products, beverages, tobacco, textiles, wearing apparel, leather and leather products, footwear, wood and wood products, rubber products and furniture; and was sourced from the Quantec EasyData database for the period 1970 to 2016. The study data for agro-processing is at SIC level three. The data used in the study are secondary, and it is accessible to the public without any restrictions.

4.5 Summary of the chapter

This chapter highlighted the area of the study, South Africa. It outlined the study's analytical methods and provided the sources of data. The models that were estimated to answer the research questions were described: the gravity and labour models.

5 CHAPTER 5: TRADE AGREEMENTS AND THE AGRO-PROCESSING INDUSTRIES' EXPORTS AND IMPORTS

5.1 Introduction

This chapter presents descriptive statistics and the results of the impact of trade agreements on the South African agro-processing industry's exports and imports, identifying if the SADC (excluding SACU) FTA, SACU-EFTA and the TDCA have significantly influenced exports and imports of wearing apparel; food and beverages; tobacco products; textiles; leather and leather products, footwear; wood and wood products; paper and paper products; rubber products and furniture.

5.2 Descriptive statistics

Table 5.1 presents the descriptive statistics. The number of observations is about 4011. The variable year shows that the data is from 1996 to 2016. The gross domestic product (lnYiYj) has a mean of 50.30 with a standard deviation of 2.47. Additionally, the gross domestic product has a minimum value of 40.51 while the maximum value is 57.22.

Table 5.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	4,011	2006	6.056056	1996	2016
lnXij	4,011	8.029867	5.531284	0	19.22186
lnYiYj	4,011	50.30224	2.470198	40.50626	57.22186
lnPP	4,011	33.0769	2.210125	26.70737	38.88552
lndstnc	4,011	8.971712	.4871912	6.904225	9.676805
lnAA	4,011	31.70859	2.844186	21.26667	37.18501
Common language	4,011	.2670157	.4424558	0	1
Colony	4,011	.382199	.4859854	0	1
Landlocked	4,011	.1832461	.3869164	0	1
SADC (excluding SACU)	4,011	.0583396	.2344137	0	1
SACU-EFTA	4,011	.013463	.1152607	0	1
TDCA	4,011	.0635752	.244025	0	1

Table 5.2 shows that all variables have positive overall, between and within variations. The overall variations for gross domestic product (lnYiYJ) is 2.47, while the within and between variations for distance is 2.39 and 0.63, respectively. Therefore, the gross domestic product has more between variations than the within variations. However, the time-invariant variables like common language, colony and landlocked, have positive between variation and zero within variation. The zero within variations shows that the observation for a given country does not change over time.

Table 5.2: Summary of variables

Variable		**Mean**	**Std. Dev.**	**Min**	**Max**	**Observations**
Year	overall	2006	6.056056	1996	2016	N = 4011
	between		0	2006	2006	n = 191
	within		6.056056	1996	2016	T = 21
lnXij	overall	10.95632	3.113038	0	19.22186	N = 4011
	between		2.880075	4.73693	19.10742	n = 191
	within		1.676737	1.333807	17.67992	T = 21
lnYiYj	overall	50.30224	2.470198	40.50626	57.22186	N = 4011
	between		2.393362	43.77632	56.78606	n = 191
	within		0.634246	43.08343	52.97308	T = 21
lnPP	overall	33.0769	2.210125	26.70737	38.88552	N = 4011
	between		2.207532	26.93147	38.70191	n = 191
	within		0.189103	32.20292	34.06304	T = 21
lndstnc	overall	8.971712	0.487191	6.904225	9.676805	N = 4011
	between		0.488008	6.904225	9.676805	n = 191
	within		0.019776	8.404018	10.02519	T = 21
lnAA	overall	31.70758	2.845826	21.26667	37.18501	N = 4011
	between		2.850602	21.26667	37.18501	n = 191
	within		0.115427	28.81308	36.72643	T = 21

Common language	overall	0.267016	0.442456	0	1	N = 4011
	between		0.443563	0	1	n = 191
	within		0	0.2670157	0.2670157	T = 21
Colony	overall	0.382199	0.485985	0	1	N = 4011
	between		0.487202	0	1	n = 191
	within		0	0.382199	0.382199	T = 21
Landlocked	overall	0.183246	0.386916	0	1	N = 4011
	between		0.387885	0	1	n = 191
	within		0	0.1832461	0.1832461	T = 21
SADC (excluding SACU)	overall	0.05834	0.168303	0	1	N = 4011
	between		0.05455	0	0.2380952	n = 191
	within		0.159264	-0.208926	0.9815507	T = 21
SACU-EFTA	overall	0.013463	0.091689	0	1	N = 4011
	between		0.020128	0	0.0952381	n = 191
	within		0.089464	-0.086761	0.9608576	T = 21
TDCA	overall	0.06352	0.244025	0	1	N = 4011
	between		0.218342	0	0.8095238	n = 191
	within		0.110057	-0.745949	0.2540514	T = 21

5.2.1 Wearing apparel

Table 5.3 shows the Hausman test results for the wearing apparel division. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Hausman test is significant as Prob>χ2 is less than 0.05. Therefore, there's no evidence to accept the null hypothesis that the random effect model is preferred. As a result, the fixed effects model is preferred.

Table 5.3: Hausman fixed random: exports of wearing apparel

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.2966719	0.6112477	-0.314576	0.046633
Population	1.179611	0.0725358	1.107076	0.2004509
Distance	-1.302156	-3.834666	2.53251	1.50694
Area	0.5080261	-0.0216034	0.5296294	0.2241991
SADC (excluding SACU) FTA	-0.154777	0.2157749	-0.370552	0.122236
SACU-EFTA	0.1252845	0.4226274	-0.297343	0.1222887
TDCA	0.0021325	0.4530959	-0.450963	0.1062432
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 71.35				
Prob>$\chi 2$ = 0.0000				

The fixed effects model results in Table 5.4 show that the variables with positive and significant coefficients are GDP, population and area. An increase in GDP, population and area by 1% results in an increase in South African exports of wearing apparel by approximately 0.29%, 1.18% and 0.51%, respectively. However, the SADC (excluding SACU) FTA, SACU-EFTA and the TDCA show no evidence that they have a statistically significant positive effect on South African exports of wearing apparel. The variables common language, colony and landlocked were omitted due to collinearity as they are time-invariant.

The random effects model results, on the other hand, show that the variables with positive and significant coefficients are GDP, common language and the TDCA. An increase in GDP by 1% results in an increase in South African exports of wearing apparel by 0.61%. The TDCA and common language increase South African exports of wearing apparel by 0.45% and 1.7%, respectively. Therefore, the TDCA has a statistically significant positive effect on South African exports of wearing apparel. However, the SADC (excluding SACU) FTA and SACU-EFTA have insignificant coefficients. This indicates that there is no evidence to support that they have a statistically significant positive effect on South African exports of wearing apparel. The variables with negative and significant coefficients are distance and landlocked. Distance

and landlocked variables are proxies of transportation cost, reducing South African exports of wearing apparel by approximately 3.84% and 0.68%, respectively (Table 5.4).

Table 5.4: Regression results for exports of wearing apparel

Dependent variable: exports of wearing apparel				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.296672	0.000	0.61125	0.000
Population	1.179611	0.000	0.07254	0.471
Distance	-1.302156	0.394	-3.8347	0.000
Area	0.508026	0.030	-0.0216	0.742
Common language	(omitted)		1.79036	0.000
Colony	(omitted)		0.28824	0.329
Landlocked	(omitted)		-0.676	0.024
SADC (excluding SACU) FTA	-0.154777	0.595	0.21577	0.413
SACU-EFTA	0.125285	0.783	0.42263	0.334
TDCA	0.002133	0.993	0.4531	0.044
Constant	-48.42484	0.004	11.6556	0.000
sigma_u	4.145673		1.3692	
sigma_e	1.690236		1.69024	
rho	0.857465		0.39621	
R-sq:				
within =	0.0509		0.0395	
between =	0.1963		0.7137	
overall =	0.1354		0.4988	

5.2.2 Food and beverages

Table 5.5 shows the Hausman test results for South African exports of food and beverages. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is the fixed effects. The results of the Hausman test are significant as the Prob>χ2 is less than 0.05. Therefore, the fixed effects model is preferred.

Table 5.5: Hausman fixed random: exports of food and beverages

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.1299803	0.4305935	-0.3006133	0.0272581
Population	2.196803	0.7628526	1.433951	0.1377029
Distance	0.5977936	-3.368713	3.966506	1.193685
Area	0.1073699	-0.2898829	0.3972528	0.1756669
SADC (excluding SACU) FTA	-0.495266	-0.0018013	-0.493465	0.0688404
SACU-EFTA	-0.503947	-0.1439629	-0.359984	0.0101999
TDCA	0.101142	0.4465677	-0.3454257	0.0620676
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 145				
Prob>$\chi2$ = 0.0000				

The fixed effects model results show that the variables that have positive and significant coefficients on South African exports of food and beverages are GDP and population. Therefore, an increase in GDP and population by 1% may result in an increase in exports of food and beverages by 0.13% and 2.20%, respectively. Regarding the link between GDP and exports in South Africa, Ajmi *et al.* (2015) share the same conclusion that GDP positively influences exports. Similar findings are seen in Cipamba (2015), who observes that the real GDP positively impacts exports in South Africa. Despite these studies being done at an aggregate level, they show that GDP has a positive impact on exports.

The TDCA has positive coefficients, but it is insignificant. However, the SADC (excluding SACU) FTA and SACU-EFTA have a negative coefficient. Therefore, there is insufficient evidence to conclude that the SADC (excluding SACU) FTA, SACU-EFTA and the TDCA have a statistically significant positive effect on exports of food and beverages.

The random effects model results (Table 5.6) indicate that the variables with positive and significant coefficients are GDP, population, common language and colony. An increase in

GDP and population result in an increase in South African exports of food and beverages by 0.43% and 0.76%, respectively. Common language and colony are proxies of cultural closeness. They account for an increase of about 1.04% and 0.60%, respectively, in South African exports of food and beverages.

The variables with negative and significant coefficients in the random effects model results are distance, area and landlocked. They account for about a 3.37%, 0.28% and 1.29% decline in South African exports of food and beverages, respectively. The TDCA has a positive and significant coefficient, accounting for an increase of about 0.45% in exports of food and beverages. Therefore, the TDCA has a statistically significant positive effect on South African exports of food and beverages. The SADC (excluding SACU) FTA and SACU-EFTA have negative and insignificant coefficients. Conversely, there is no sufficient evidence to support that the SADC (excluding SACU) FTA and SACU-EFTA agreement have a statistically significant positive effect on South African exports of food and beverages (Table 5.6).

Table 5.6: Regression results for exports of food and beverages

Dependent variable: exports of food and beverages				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.12998	0.008	0.4305935	0.000
Population	2.1968	0.000	0.7628526	0.000
Distance	0.59779	0.624	-3.368713	0.000
Area	0.10737	0.566	-0.2898829	0.000
Common language	(omitted)		1.043073	0.002
Colony	(omitted)		0.6015331	0.050
Landlocked	(omitted)		-1.291052	0.000
SADC (excluding SACU) FTA	-0.4953	0.033	-0.0018013	0.994
SACU-EFTA	-0.5039	0.113	-0.1439629	0.650
TDCA	0.10114	0.610	0.4465677	0.018
Constant	-74.934	0.000	5.41035	0.071
sigma_u	4.71679		1.4775367	
sigma_e	1.35219		1.352187	
rho	0.92406		0.54421077	
R-sq:				
within =	0.115		0.0898	
between =	0.2178		0.6686	
overall =	0.1896		0.5136	

5.2.3 Tobacco

Table 5.7 shows the Hausman test results for South African exports of tobacco. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>$\chi 2$ is less than 0.05, indicating that the Hausman test is significant. Therefore, there's no evidence to accept the null hypothesis that the random effect is preferred.

Table 5.7: Hausman fixed random: exports of tobacco

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	1.067806	0.4293803	0.638426	0.2521682
Population	-0.3281	-0.0470842	-0.2810554	0.7076348
Distance	-1.69315	-4.132134	2.438979	2.62909
Area	0.384686	-0.1297135	0.514399	0.7705786
SADC (excluding SACU) FTA	-0.6449	-0.2938735	-0.3509984	0.2333885
SACU-EFTA	1.77858	1.737745	0.0408345	0.3144413
TDCA	-1.3615	-1.709873	0.3484128	0.242187
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2$ (4) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 21.91				
Prob>$\chi 2$ = 0.0026				

The regression results for the determinants of South African tobacco exports are presented in Table 5.8. The fixed effects model results show that the variables with positive and significant coefficients are GDP and the SACU-EFTA. Therefore, there is insufficient evidence to conclude that the SADC (excluding SACU) FTA and the TDCA have a statistically significant positive effect on exports of tobacco products. However, the SACU-EFTA agreement has a statistically positive effect on South African exports of tobacco products.

The random effects model results for the determinants of South African tobacco exports are presented in Table 5.8. The variables with positive and significant coefficients are GDP and the SACU-EFTA, account for an increase in exports of tobacco by approximately 0.43% and

1.74%, respectively. However, the variables with negative and significant coefficients are distance and the TDCA, but the coefficient of the TDCA does not have an expected sign. Moreover, there is insufficient evidence to conclude that the SADC (excluding SACU) FTA has a statistically significant effect on exports of tobacco products. However, the SACU-EFTA has a statistically positive effect on exports of tobacco products.

Table 5.8: Regression results for exports of tobacco

Dependent variable: exports of tobacco				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	1.067806	0.000	0.4293803	0.001
Population	-0.32814	0.660	-0.0470842	0.842
Distance	-1.693154	0.527	-4.1321340	0.000
Area	0.3846855	0.624	-0.1297135	0.381
Common language	(omitted)		-0.4614399	0.479
Colony	(omitted)		0.3656982	0.549
Landlocked	(omitted)		-0.1056554	0.879
SADC (excluding SACU) FTA	-0.644872	0.206	-0.2938735	0.516
SACU-EFTA	1.778579	0.099	1.7377450	0.092
TDCA	-1.36146	0.013	-1.7098730	0.000
Constant	-30.3029	0.428	30.55479	0.000
sigma_u	3.9547214		2.2887427	
sigma_e	2.724543		2.724543	
rho	0.678136		0.4137229	
R-sq:				
within =	0.0356		0.0245	
between =	0.006		0.3189	
overall =	0.0015		0.1991	

5.2.4 Textiles

Hausman test results for South African exports of textiles are presented in Table 5.9. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results indicate that the Prob>χ2 is less than 0.05. Therefore, the Hausman test is significant. As a result, the null hypothesis that the random effect is preferred cannot be accepted; hence the fixed effects model is preferred.

Table 5.9: Hausman fixed random: exports of textiles

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.0829339	0.3519886	-0.2690547	0.0413141
Population	0.2979099	0.3073504	-0.0094405	0.1949845
Distance	0.644085	-2.500263	3.144348	1.465069
Area	0.1437603	0.0816663	0.0620941	0.2173421
SADC (excluding SACU) FTA	0.0074216	0.0221774	-0.0147558	0.0940448
SACU-EFTA	-0.838651	-0.7574946	-0.0811564	0.0311898
TDCA	-0.047065	0.2481988	-0.2952641	0.0850082
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 146.63$				
$Prob>\chi 2 = 0.0000$				

Table 5.10 shows that the variables of the fixed effects model, namely, GDP, population, distance and area, have insignificant coefficients. However, in the random effects model, most of the variables have statistically significant coefficients with the correct signs. The fixed effect model shows that there is no sufficient evidence to support that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically significant positive impact on exports of textiles.

The random effects model results (Table 5.8) show that the variables with positive and significant coefficients are GDP, population and common language, accounted for an increase of about 0.35%, 0.31% and 1.22%, respectively, in South African exports of textiles. The variables that have negative and significant coefficients are distance and landlocked. Distance and landlocked are proxies for transportation cost and are responsible for a respective decline of about 2.50% and 0.79% in exports of textiles.

However, there is insufficient evidence to support that SADC (excluding SACU) FTA SACU-EFTA and TDCA have a statistically significant positive impact on exports of textiles.

Table 5.10: Regression results for exports of textiles

Dependent variable: exports of textiles				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.0829339	0.217	0.35199	0.000
Population	0.2979099	0.186	0.30735	0.006
Distance	0.644085	0.667	-2.5003	0.000
Area	0.1437603	0.532	0.08167	0.277
Common language	(omitted)		1.22204	0.002
Colony	(omitted)		0.36556	0.318
Landlocked	(omitted)		-0.7969	0.027
SADC (excluding SACU) FTA	0.0074216	0.979	0.02218	0.934
SACU-EFTA	-0.838651	0.051	-0.7575	0.077
TDCA	-0.0470652	0.849	0.2482	0.285
Constant	-13.10518	0.429	2.22095	0.525
sigma_u	2.9200531		1.67237	
sigma_e	1.6542815		1.65428	
rho	0.75703094		0.50544	
R-sq:				
within =	0.0051		0.0036	
between =	0.145		0.5636	
overall =	0.1412		0.4079	

5.2.5 Leather and leather products, footwear

Table 5.11 shows the Hausman test results for exports of leather and leather products, footwear. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. The Hausman test is significant. Therefore, the null hypothesis that the random effect is preferred is not accepted. The fixed effects model is preferred.

Table 5.11: Hausman fixed random: exports of leather and leather products, footwear

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.5128937	0.8565757	-0.343682	0.0730525
Population	0.9555105	0.1696223	0.7858883	0.2510061
Distance	-0.1076957	-3.492666	3.38497	1.549306
Area	0.7105243	-0.0363603	0.7468846	0.3444433
SADC (excluding SACU) FTA	-0.316859	-0.0938433	-0.2230156	0.1096513
SACU-EFTA	1.021668	1.080059	-0.0583906	0.1068012
TDCA	-0.240623	-0.1174887	-0.1231339	0.0903559
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 41.99				
Prob>$\chi2$ = 0.0000				

Table 5.12 shows the regression results for South African exports of leather and leather products, footwear. As the results of the fixed effects model show, the GDP, population, area and SACU-EFTA have positive and significant coefficients in exports of leather and leather products, footwear. An increase in GDP, population, and area by 1% may result in an increase in South African exports of leather and leather products, footwear by 0.51%, 0.96% and 0.71%, respectively. The SACU-EFTA agreement, on the other hand, has a statistically significant positive effect on exports of leather and leather products, footwear. However, there is no evidence to indicate that the SADC (excluding SACU) FTA and TDCA have a positive and statistically significant effect on exports of leather and leather products, footwear.

The random effects model results (Table 5.12), on the other hand, show that GDP, common language and the SACU-EFTA have positive and significant coefficients, accounting for an increase in South African exports of leather and leather products, footwear of about 0.86%, 1.79% and 1.08%, respectively. The variable with a negative and significant coefficient is distance, accounting for a contraction of approximately 3.49% in exports of leather and leather products, footwear. Therefore, the SACU-EFTA has a statistically significant positive effect on exports of leather and leather products, footwear. However, the coefficients of the SADC (excluding SACU) FTA and TDCA are insignificant, indicating that there is insufficient

evidence to support that these agreements have a positive effect on exports of leather and leather products, footwear.

Table 5.12: Regression results for exports of leather and leather product, footwear

Dependent variable: exports of leather and leather products, footwear				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.5128937	0.000	0.8565757	0.000
Population	0.9555105	0.001	0.1696223	0.214
Distance	-0.1076957	0.946	-3.492666	0.000
Area	0.7105243	0.046	-0.0363603	0.682
Common language	(omitted)		1.789996	0.000
Colony	(omitted)		-0.1326311	0.755
Landlocked	(omitted)		-0.2371844	0.568
SADC (excluding SACU)	-0.3168589	0.302	-0.0938433	0.743
SACU-EFTA agreement	1.021668	0.034	1.080059	0.021
TDCA	-0.2406226	0.365	-0.1174887	0.638
Constant	-70.41381	0.000	-7.776262	0.050
sigma_u	4.1574813		1.891854	
sigma_e	1.7508702		1.7508702	
rho	0.84936035		0.53864494	
R-sq:				
within =	0.0625		0.0555	
between =	0.2480		0.6392	
overall =	0.1464		0.4465	

5.2.6 Wood and wood products

The Hausman test results for South African exports of wood and wood products are presented in Table 5.13. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Hausman test is significant as Prob>χ2 is less than 0.05. Therefore, the null hypothesis that the random effect model is preferred is not accepted; thus, the fixed effects model is preferred.

Table 5.13: Hausman fixed random: exports of wood and wood products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.1570444	0.2723386	-0.1152942	0.0523299
Population	-0.237024	0.1822345	-0.4192584	0.2342963
Distance	1.269578	-2.972836	4.242413	1.683303
Area	0.1635367	0.1372468	0.0262899	0.2468275
SADC (excluding SACU) FTA	0.6479431	0.6378826	0.0100605	0.1205202
SACU-EFTA	-0.362005	-0.2560711	-0.1059343	0.1845466
TDCA	-0.124687	0.2143664	-0.3390532	0.1077283
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 60.80				
Prob>$\chi2$ = 0.0000				

As the fixed effect regression results show in Table 5.14, the variables with positive and significant coefficients in South African exports of wood and wood products are the GDP and SADC (excluding SACU) FTA. An increase in GDP by 1% results in an increase in exports of wood and wood products by 0.16%. The SADC (excluding SACU) FTA, on the other hand, has a statistically significant positive effect on exports of wood and wood products. However, there is no evidence indicating that the SACU-EFTA and TDCA have a positive effect on South Africa's exports of wood and wood products.

The random effects model results (Table 5.14) for South African exports of wood and wood products show that the variables with positive and significant coefficients are GDP, common language and colony. The GDP, which indicates the size of the market, accounts for an increase of about 0.27% in exports of wood and wood products. Likewise, common language and colony, showing the closeness of trading partners culturally, account for an increase of 1.17% and 0.82%, respectively, in exports of wood and wood products.

Moreover, the random effects model results show that a trade agreement with positive and significant coefficients is the SADC (excluding SACU) FTA. Therefore, the SADC (excluding SACU) FTA has a statistically significant positive effect on South African exports of wood

and wood products. However, there is no evidence indicating that the SACU-EFTA and TDCA have a positive effect on exports of wood and wood products. Lastly, the distance and landlocked variables have a negative impact on exports of wood and wood products, accounting for a decline of about 2.97% and 1.33%, respectively.

Table 5.14: Regression results for exports of wood and wood products

Dependent variable: exports of wood and wood products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.1570444	0.058	0.27234	0.000
Population	0.2370239	0.380	0.18223	0.175
Distance	1.269578	0.460	-2.9728	0.000
Area	0.1635367	0.534	0.13725	0.127
Common language	(omitted)		1.17371	0.010
Colony	(omitted)		0.82068	0.052
Landlocked	(omitted)		-1.3268	0.002
SADC (excluding SACU) FTA	0.6479431	0.048	0.63788	0.036
SACU-EFTA	-0.362005	0.537	-0.2561	0.646
TDCA	-0.124687	0.665	0.21437	0.422
Constant	-5.691349	0.766	11.9422	0.003
sigma_u	3.3630695		1.88547	
sigma_e	1.8920401		1.89204	
rho	0.7595834		0.49826	
R-sq:				
within =	0.0044		0.0019	
between =	0.0568		0.5354	
overall =	0.0086		0.3299	

5.2.7 Paper and paper products

Table 5.15 shows the Hausman test results for paper and paper products exports. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis is that the preferred model is fixed effects. The Hausman test results show that it is significant as the Prob>χ2 is less than 0.05. Therefore, the null hypothesis that the random effect model is preferred is not accepted. Therefore, the fixed effects model is preferred.

Table 5.15: Hausman fixed random: exports of paper and paper products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	-0.1599847	0.0243359	-0.1843206	0.0450843
Population	0.5235849	0.7101013	-0.1865164	0.2101306
Distance	0.2802457	-3.100883	3.381129	1.679811
Area	0.5054354	0.1666143	0.3388211	0.248652
SADC (excluding SACU) FTA	0.3815041	0.2926665	0.0888377	0.103955
SACU-EFTA	-1.41704	-1.379959	-0.0370804	0.0812447
TDCA	-0.262739	0.0120569	-0.2747962	0.0890446
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4) = (b-B)'[(V_b-V_B)^{(-1)}](b-B) = 89.01$				
Prob>$\chi2 = 0.0000$				

Table 5.16 shows the regression results for South African exports of paper and paper products. The fixed effects model results show that the variables with positive and significant coefficients are population and area. The coefficients of the GDP and SACU-EFTA are significant but have an unexpected sign. An increase in population and area by 1% results in an increase in exports of paper and paper products by 0.52% and 0.50%, respectively. However, regarding trade agreements, there is insufficient evidence that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically positive effect on exports of paper and paper products.

As presented in the random effects model results in Table 5.16, the variables with positive and significant coefficients are population, area and colony. However, variables with expected negative and significant coefficients are distance and landlocked. The SACU-EFTA has a negative and significant coefficient, but it has an unexpected sign. The SADC (excluding SACU) FTA and TDCA have positive but insignificant coefficients. Therefore, there is no evidence to support that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically positive effect on exports of paper and paper products.

Table 5.16: Regression results for exports of paper and paper products

Dependent variable: exports of paper and paper products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	-0.1599847	0.040	0.02434	0.701
Population	0.5235849	0.039	0.7101	0.000
Distance	0.2802457	0.871	-3.1009	0.000
Area	0.5054354	0.058	0.16661	0.082
Common language	(omitted)		0.77961	0.117
Colony	(omitted)		1.47107	0.001
Landlocked	(omitted)		-1.9124	0.000
SADC (excluding SACU) FTA	0.3815041	0.246	0.29267	0.348
SACU-EFTA	-1.41704	0.007	-1.38	0.008
TDCA	-0.2627393	0.349	0.01206	0.964
Constant	-15.87035	0.405	8.59759	0.052
sigma_u	3.4061607		2.14801	
sigma_e	1.9070743		1.90707	
rho	0.76133832		0.55921	
R-sq:				
within =	0.0075		0.002	
between =	0.1864		0.5536	
overall =	0.1296		0.3621	

5.2.8 Rubber products

Table 5.17 shows the Hausman test results for exports of rubber products. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results of the Hausman test are significant. Therefore, the null hypothesis that the random effect is preferred is not accepted. Thus, the fixed effects model is preferred.

Table 5.17: Hausman fixed random: exports of rubber products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.245187	0.4934033	-0.248216	0.0369712
Population	1.207696	0.363343	0.844353	0.1698761
Distance	-1.809067	-3.904726	2.095658	1.340923
Area	0.3736967	0.0222204	0.3514763	0.1992566
SADC (excluding SACU) FTA	0.2399593	0.5163009	-0.276342	0.1004272
SACU-EFTA	-1.101227	-0.8949813	-0.206246	0.0765874
TDCA	-0.038071	0.3062705	-0.344342	0.0881622
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 64.6				
Prob>$\chi 2$ = 0.0000				

The regression results for South African exports of rubber products are presented in Table 5.18. The fixed effects model results show that the positive determinants for South African exports of rubber products are GDP, population and area. An increase in GDP, population and area by 1% results in an increase in exports of rubber products by 0.25%, 1.21% and 0.375%, respectively. The SACU-EFTA has a statistically significant positive effect on exports of rubber products. However, there is no evidence to indicate that the SADC (excluding SACU) and TDCA have a positive effect on exports of rubber products.

The random effects model results (Table 5.18) show that the positive determinants for exports of rubber products are GDP, population, and common language. Furthermore, the SADC (excluding SACU) FTA has a positive and significant coefficient, while the TDCA has a positive coefficient, but it is insignificant. Therefore, the SADC (excluding SACU) FTA has a statistically significant positive effect on exports of rubber products. However, there is no evidence to indicate that the SACU-EFTA and TDCA have a positive effect on South Africa's exports of rubber products.

The negative determinants for exports of rubber products are distance and landlocked. These are proxies for transportation cost. If countries are far from each other or a country is landlocked, it increases the cost of trading. Distance and landlocked account for a decline of approximately 3.91% and 1.05%, respectively, in exports of rubber products.

Table 5.18: Regression results for exports of rubber products

Dependent variable: exports of rubber products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.245187	0.000	0.4934033	0.000
Population	1.207696	0.000	0.363343	0.000
Distance	-1.809067	0.184	-3.904726	0.000
Area	0.3736967	0.073	0.0222204	0.720
Common language	(omitted)		1.382307	0.000
Colony	(omitted)		0.276792	0.343
Landlocked	(omitted)		-1.045787	0.000
SADC (excluding SACU) FTA	0.2399593	0.355	0.5163009	0.031
SACU-EFTA	1.101227	0.002	-0.894981	0.010
TDCA	-0.038071	0.864	0.3062705	0.132
Constant	-36.92595	0.014	8.380469	0.003
sigma_u	3.2460956		1.3790629	
sigma_e	1.5100039		1.5100039	
rho	0.82210599		0.45477	
R-sq:				
within =	0.0593		0.0506	
between =	0.4017		0.7521	
overall =	0.2921		0.576	

5.2.9 Furniture

Table 5.19 shows the Hausman test results for exports of furniture. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The Hausman test results show that the Prob>$\chi 2$ is less than 0.05. Therefore, the Hausman test is significant; thus, the fixed effects model is preferred.

Table 5.19: Hausman fixed random: exports of furniture

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.3448632	0.5953639	-0.2505007	0.0581549
Population	0.3609829	-0.0875592	0.4485421	0.2353125
Distance	-1.584103	-3.591971	2.007868	1.669249
Area	0.3356892	0.111632	0.2240572	0.2523084
SADC (excluding SACU) FTA	0.0095192	0.2880461	-0.2785269	0.1379894
SACU-EFTA	-0.142728	-0.0152313	-0.1274964	0.1130133
TDCA	-0.188803	0.362633	-0.5514358	0.1301332
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 50.42				
Prob>$\chi 2$ =0.0000				

As presented in Table 5.20, the fixed effects model results show that South African exports of furniture are positively impacted by GDP, indicating that increasing GDP by 1% results in an increase in furniture exports by approximately 0.35%. Regarding trade agreements, there is no evidence that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically significant positive effect on furniture exports.

Likewise, the random effects model results (Table 5.20) show that South African exports of furniture are positively impacted by GDP and common language. Meanwhile, distance negatively impacts exports of furniture. Distance is an indication of transportation cost; as distance increases, the exports of furniture decline by about 3.59%. The SADC (excluding SACU) FTA, SACU-EFTA and TDCA have statistically insignificant coefficients. Therefore, there is no evidence indicating that these agreements have a statistically significant positive effect on furniture exports.

Table 5.20: Regression results for exports of furniture

Dependent variable: exports of furniture				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.34486	0.000	0.59536	0.000
Population	0.36098	0.167	-0.0876	0.438
Distance	-1.5841	0.350	-3.592	0.000
Area	0.33569	0.202	0.11163	0.129
Common language	(omitted)		1.87652	0.000
Colony	(omitted)		0.13319	0.696
Landlocked	(omitted)		-0.3587	0.303
SADC (excluding SACU)	0.00952	0.977	0.28805	0.326
SACU-EFTA agreement	-0.1427	0.776	-0.0152	0.975
TDCA	-0.1888	0.513	0.36263	0.159
Constant	-15.578	0.408	11.0505	0.001
sigma_u	2.62869		1.53744	
sigma_e	1.87623		1.87623	
rho	0.6625		0.40172	
R-sq:				
within =	0.0206		0.018	
between =	0.2908		0.644	
overall =	0.197		0.4475	

5.3 The Impact of free trade agreements on imports in the agro-processing industry

5.3.1 Wearing apparel

The Hausman test results for South African imports of wearing apparel are presented in Table 5.21. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The Hausman test results show that the Prob>χ2 is less than 0.05. Therefore, the Hausman test is significant. Consequently, the fixed effects model is preferred.

Table 5.21: Hausman fixed random: imports of wearing apparel

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.5525926	0.7080205	-0.1554279	0.0439527
Population	1.973246	1.169663	0.8035831	0.2047363
Distance	2.247865	-0.6578155	2.905681	7.191401
Area	-0.7891533	-0.6089809	-0.1801724	0.2261635
SADC (excluding SACU) FTA	-0.522744	-0.0665971	-0.4561473	0.099904
SACU-EFTA	-1.976603	-1.740684	-0.2359188	0.0663043
TDCA	-0.20737	0.0074496	-0.2148199	0.0822187
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 35.43$				
$Prob>\chi 2 = 0.0000$				

Regarding South African imports of wearing apparel, as presented in Table 5.22, the fixed effects model results show that GDP and population are significant with positive coefficients. This means that an increase in GDP and population by 1% may result in an increase in imports of wearing apparel by 0.55% and 1.97%, respectively. Similarly, the variables that are significant with negative coefficients are area and the SACU-EFTA. However, the coefficient of the SACU-EFTA does not have the expected sign. Therefore, there is no evidence indicating that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically positive effect on imports of wearing apparel.

As random effects model results indicate (Table 5.22), the variables that are significant with positive coefficients are GDP, population and colony. Similarly, the variables that are significant with negative coefficients are area and the SACU-EFTA. However, the coefficient of the SACU-EFTA does not have the expected sign. Conversely, there is no evidence indicating that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically positive effect on South African imports of wearing apparel.

Table 5.22: Regression results for imports of wearing apparel

Dependent variable: imports of wearing apparel				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.5525926	0.000	0.7080205	0.000
Population	1.973246	0.000	1.169663	0.000
Distance	2.247865	0.755	-0.657816	0.103
Area	-0.7891533	0.001	-0.608981	0.000
Common language	(omitted)		0.3288006	0.529
Colony	(omitted)		0.7079161	0.144
Landlocked	(omitted)		-0.361601	0.463
SADC (excluding SACU) FTA	-0.5227444	0.104	-0.066597	0.828
SACU-EFTA	-1.976603	0.000	-1.740684	0.000
TDCA	-0.2073703	0.435	0.0074496	0.976
Constant	-78.71117	0.229	-39.99706	0.000
sigma_u	3.2518445		2.399045	
sigma_e	1.772477		1.772477	
rho	0.77095097		0.6468875	
R-sq:				
within =	0.1151		0.1116	
between =	0.4128		0.5141	
overall =	0.3349		0.4222	

5.3.2 Food and beverages

The Hausman test results for South African imports of food and beverages are presented in Table 5.23. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The Hausman test results are significant as Prob>χ2 is less than 0.05. Therefore, the fixed effects model is preferred.

Table 5.23: Hausman fixed random: imports of food and beverages

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.5683955	0.8949173	-0.3265218	0.0791534
Population	1.505552	0.6652588	0.840293	0.2741786
Distance	6.220876	-1.058612	7.279488	1.79281
Area	-0.6163175	-0.1994822	-0.4168353	0.2546765
SADC (excluding SACU) FTA	-0.565079	-0.2588645	-0.3062141	0.101595
SACU-EFTA	0.2299904	0.3676168	-0.1376264	0.0606522
TDCA	0.1091623	0.4068557	-0.2976934	0.0887715
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 56.81				
Prob>$\chi 2$ =0.0000				

Table 5.24 shows the regression results for South African imports of food and beverages. The variables in the fixed effects model with positive and significant coefficients are GDP, population and distance. However, distance has an unexpected sign. Area has a negative and significant coefficient. This indicates that an increase in gross domestic product and population by 1% results in an increase in imports of food and beverages by 0.57% and 1.51%, respectively.

The SADC (excluding SACU) FTA has a coefficient with an incorrect sign, while the SACU-EFTA and TDCA have positive but insignificant coefficients. Therefore, there is insufficient evidence to indicate that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically significant positive effect on food and beverages imports.

The random effects model results show that the variables with positive and significant coefficients are GDP, population and common language. The trade agreements, namely, the SADC (excluding SACU) FTA, SACU-EFTA and TDCA, have insignificant coefficients. Therefore, there is insufficient evidence to indicate that these agreements have a statistically significant positive effect on South Africa's food and beverages imports.

Table 5.24: Regression results for imports of food and beverages

Dependent variable: imports of food and beverages				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.5684	0.000	0.89492	0.000
Population	1.50555	0.000	0.66526	0.000
Distance	6.22088	0.001	-1.0586	0.024
Area	-0.6163	0.028	-0.1995	0.084
Common language	(omitted)		2.2757	0.000
Colony	(omitted)		-0.0496	0.932
Landlocked	(omitted)		-0.581	0.318
SADC (excluding SACU)	-0.5651	0.106	-0.2589	0.439
SACU-EFTA agreement	0.22999	0.617	0.36762	0.420
TDCA	0.10916	0.723	0.40686	0.167
Constant	-102.91	0.000	-40.855	0.000
sigma_u	5.03815		2.79862	
sigma_e	2.01417		2.01417	
rho	0.8622		0.65878	
R-sq:				
within =	0.0685		0.0595	
between =	0.1319		0.5208	
overall =	0.1398		0.4346	

5.3.3 Tobacco

Table 5.25 shows the Hausman test results for South African imports of tobacco. The null hypothesis of the Hausman test indicates that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The Hausman test results are significant as the Prob>$\chi 2$ is less than 0.05. Therefore, the fixed effects model is preferred.

Table 5.25: Hausman fixed random: imports of tobacco

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.6914954	1.166658	-0.4751622	0.2114719
Population	2.652016	-0.1479921	2.800008	0.6824706
Area	1.168584	-0.3564567	1.525041	0.666087
SADC (excluding SACU) FTA	-1.628018	-0.5073563	-1.120661	0.5184284
SACU-EFTA	2.225059	2.789866	-0.5648072	0.146947
TDCA	0.1408297	0.3896337	-0.248804	0.1828893
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 28.61				
Prob>$\chi2$ = 0.0001				

As Table 5.26 shows, the GDP, population, area and the SACU-EFTA have positive and significant coefficients for the fixed effects model. However, the SADC (excluding SACU) FTA has a negative and statistically insignificant coefficient, while the TDCA has a positive coefficient, but it is statistically insignificant. An increase in GDP, population and area by 1% results in an increase in South African imports of tobacco by 0.69%, 2.65% and 1.17%, respectively. The SACU-EFTA has a statistically significant positive effect on South African imports of tobacco products, representing an increase of about 2.22%. On the other hand, there is insufficient evidence to indicate that the SADC (excluding SACU) FTA and TDCA have a statistically significant positive effect on tobacco imports.

As the random effects model results show (Table 5.26), the gross domestic product and the SACU-EFTA have positive and significant coefficients. Whereas the SADC (excluding SACU) FTA and TCDA have positive coefficients, but they are statistically insignificant. Similarly, all variables but area with negative signs are insignificant. Therefore, the SACU-EFTA has a statistically significant positive effect on South African imports of tobacco products.

Table 5.26: Regression results for imports of tobacco

Dependent variable: imports of tobacco				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.6914954	0.009	1.166658	0.000
Population	2.652016	0.000	-0.1479921	0.592
Distance	(omitted)		-0.9340967	0.154
Area	1.168584	0.091	-0.3564567	0.048
Common language	(omitted)		0.4158002	0.619
Colony	(omitted)		0.0482304	0.949
Landlocked	(omitted)		0.3298106	0.665
SADC (excluding SACU) FTA	-1.628018	0.072	-0.5073563	0.494
SACU-EFTA	2.225059	0.035	2.789866	0.007
TDCA	0.1408297	0.766	0.3896337	0.373
Constant	-157.3129	0.000	-27.96141	0.000
sigma_u	7.9391748		2.7342801	
sigma_e	2.396772		2.396772	
rho	0.9164738		0.5654942	
R-sq:				
within =	0.0869		0.067	
between =	0.0182		0.2533	
overall =	0.0139		0.1497	

5.3.4 Textiles

Table 5.27 shows the Hausman test results for South African imports of textiles. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. Consequently, the Hausman test is significant. Therefore, there's no evidence to accept the null hypothesis that the random effect is preferred, and thus the fixed effects model is preferred.

Table 5.27: Hausman fixed random: imports of textiles

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b -V_B)) S.E.**
Gross domestic product	0.2862274	0.4891313	-0.202904	0.0733184
Population	-0.268951	0.2780192	-0.5469703	0.2614151
Distance	1.570212	0.0430572	1.527155	7.593807
Area	0.1750091	0.1400137	0.0349954	0.2340455
SADC (excluding SACU) FTA	1.364086	1.040787	0.3232993	0.0912788
TDCA	0.1217355	0.3457081	-0.2239726	0.0750341
SACU-EFTA	-0.886442	-1.016427	0.1299845	0.00000
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 89.03				
Prob>$\chi 2$ = 0.0000				

As presented in Table 5.28, the fixed effects model results show that GDP and the SADC (excluding SACU) FTA have positive and statistically significant coefficients on South African imports of textiles. It indicates that an increase in GDP by 1% results in an increase in South African imports of textiles by 0.29%. Moreover, the SADC (excluding SACU) FTA increases imports of textiles by approximately 1.36%. The TCDA has positive but statistically insignificant coefficients, while the SACU-EFTA has a negative and significant coefficient but has an unexpected sign. Therefore, there is insufficient evidence to indicate that the SACU-EFTA and TDCA have a statistically significant positive effect on South African imports of textiles. On the contrary, the SADC (excluding SACU) FTA has a statistically significant positive effect on South African imports of textiles.

The random effects model results (Table 5.28) show that the GDP and the SADC (excluding SACU) FTA have positive and significant coefficients on South African imports of textiles. This indicates that the SADC (excluding SACU) FTA has a statistically significant positive effect on South African textiles imports. The SACU-EFTA has a statistically significant coefficient but with an unexpected sign. The TDCA, on the other hand, has a positive but statistically insignificant coefficient. Therefore, the SACU-EFTA and TDCA have no statistically significant positive effect on South African textiles imports.

Table 5.28: Regression results for imports of textiles

Dependent variable: imports of textiles				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.2862274	0.011	0.48913	0.000
Population	-0.2689511	0.391	0.27802	0.108
Distance	1.570212	0.837	0.04306	0.926
Area	0.1750091	0.499	0.14001	0.207
Common language	(omitted)		0.62591	0.318
Colony	(omitted)		0.78536	0.170
Landlocked	(omitted)		-0.3614	0.517
SADC (excluding SACU)	1.364086	0.000	1.04079	0.002
SACU-EFTA agreement	-0.8864423	0.050	-1.0164	0.025
TDCA	0.1217355	0.671	0.34571	0.211
Constant	-14.31713	-0.210	-29.722	0.000
sigma_u	3.800306		2.65695	
sigma_e	1.8720204		1.87202	
rho	0.80473048		0.66826	
R-sq:				
within =	0.0137		0.0102	
between =	0.1424		0.4516	
overall =	0.1672		0.3867	

5.3.5 Leather and leather products, footwear

The Hausman test results for South African imports of leather and leather products, footwear are presented in Table 5.29. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results of the Hausman test are significant. Therefore, the fixed effects model is preferred.

Table 5.29: Hausman fixed random: imports of leather and leather products, footwear

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.5256713	0.5938983	-0.0682271	0.0756812
Population	0.0588939	0.5222375	-0.4633436	0.258776
Distance	-0.0991934	-0.1022176	0.0030242	0.2162728
Area	-0.0991934	-0.1022176	0.0030242	0.2162728
SADC (excluding SACU) FTA	-0.06847	-0.3552289	0.2867588	0.1147075
SACU-EFTA	-1.724815	-1.791933	0.0671181	0.0670119
TDCA	-0.354624	-0.2590963	-0.0955277	0.0725965
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 34.12				
Prob>$\chi 2$ = 0.0000				

As the fixed effects model show (Table 5.30), the imports of leather and leather products, footwear are impacted positively by GDP, with an increase in GDP by 1%, resulting in an increase in South African imports of leather and leather products, footwear by 0.53%. Regarding trade agreements, the SADC (excluding SACU) FTA and TDCA have insignificant coefficients, whereas the SACU-EFTA has a negative and significant coefficient. Therefore, there is no evidence to support that the SADC (excluding SACU) FTA and TDCA have a statistically significant positive effect on South Africa's imports of leather and leather products, footwear. The SACU-EFTA has a statistically significant coefficient but has a wrong sign.

In random effects model results (Table 5.30) on South African imports of leather and leather products, footwear, GDP, population and common language have positive and significant coefficients. The SADC (excluding SACU) FTA and TDCA have an insignificant coefficient. However, the SACU-EFTA agreement has a negative and significant coefficient. Therefore, there is no evidence to support that the SADC (excluding SACU) FTA and TDCA have a statistically significant positive effect on South African imports of leather and leather products, footwear. The SACU-EFTA has a statistically significant coefficient but has a wrong sign.

Table 5.30: Regression results for imports of leather and leather products, footwear

Dependent variable: imports of leather and leather products, footwear				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.52567	0.000	0.593898	0.000
Population	0.05889	0.850	0.522238	0.003
Distance	3.53759	0.619	-0.45282	0.344
Area	-0.0992	0.683	-0.10222	0.356
Common language	(omitted)		1.33263	0.036
Colony	(omitted)		-0.2248	0.701
Landlocked	(omitted)		-0.288	0.628
SADC (excluding SACU)	-0.0685	0.851	0.35523	0.306
SACU-EFTA agreement	-1.7248	0.000	-1.7919	0.000
TDCA	-0.3546	0.186	-0.2591	0.316
Constant	-47.409	0.464	-31.72	0.000
sigma_u	3.87025		2.76836	
sigma_e	1.74966		1.74966	
rho	0.83031		0.71457	
R-sq:				
within =	0.0262		0.025	
between =	0.1022		0.4603	
overall =	0.1206		0.3748	

5.3.6 Wood and wood products

Table 5.31 presents the Hausman test results. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. The Hausman test is significant. Therefore, the null hypothesis that the random effect is preferred is not supported by the data presented in Table 5.31. Therefore, the fixed effects model is preferred.

Table 5.31: Hausman fixed random: imports of wood and wood products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.5469474	0.6884887	-0.141541	0.1092136
Population	-0.310629	-0.1788258	-0.131803	0.344322
Distance	-0.2277008	-1.957289	1.729588	1.570842
Area	0.2809695	0.2515724	0.029397	0.212859
SADC (excluding SACU) FTA	-0.183158	-0.2774257	0.094268	0.094673
SACU-EFTA	0.5302398	0.3541039	0.176136	0.11607
TDCA	0.32354	0.4422803	-0.11874	0.0684824
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 27.52				
Prob>$\chi 2$ = 0.0003				

The imports of wood and wood products in South Africa, as fixed effects model results show in Table 5.32, are influenced positively by GDP, indicating that an increase in GDP by 1% results in an increase in South African imports of wood and wood products by 0.54%. On the contrary, the coefficients of the SADC (excluding SACU) FTA, SACU-EFTA and TDCA are insignificant. Therefore, there is no evidence to support that these agreements have a positive effect on South African wood and wood products imports.

The random effects model results (Table 5.32) show that the South African imports of wood and wood products are influenced positively by GDP, area and common language but are impacted negatively by distance. The TDCA has a positive and significant coefficient on South African imports of wood and wood products. However, the coefficients of the SADC (excluding SACU) FTA and SACU-EFTA are insignificant. Therefore, the TCDA has a statistically significant positive effect on imports of wood and wood products. Whereas there is no evidence to support that the SADC (excluding SACU) FTA and SACU-EFTA have a positive effect on wood and wood products imports.

Table 5.32: Regression results for imports of wood and wood products

Dependent variable: imports of wood and wood products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.5469474	0.000	0.6884887	0.000
Population	-0.3106289	0.428	-0.1788258	0.338
Distance	-0.2277008	0.889	-1.957289	0.000
Area	0.2809695	0.244	0.2515724	0.026
Common language	(omitted)		1.78232	0.006
Colony	(omitted)		-0.1772949	0.761
Landlocked	(omitted)		-0.889395	0.126
SADC (excluding SACU)	-0.1831582	0.567	-0.2774257	0.363
SACU-EFTA agreement	0.5302398	0.321	0.3541039	0.497
TDCA	0.32354	0.217	0.4422803	0.080
Constant	-13.73751	0.467	-10.16351	0.061
sigma_u	3.2212337		2.6994011	
sigma_e	1.7210216		1.7210216	
rho	0.7779385		0.71099548	
R-sq:				
within =	0.0184		0.0179	
between =	0.282		0.4219	
overall =	0.2457		0.3112	

5.3.7 Paper and paper products

Table 5.33 shows the Hausman test results. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. Therefore, the Hausman test is significant, and the null hypothesis that the random effect is preferred is not supported by the Hausman test results. Thus, the fixed effects model is preferred.

Table 5.33: Hausman fixed random: imports of paper and paper products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.1784906	0.9313001	-0.7528095	0.0816358
Population	2.473857	0.3212805	2.152577	0.3305092
Distance	0.2748696	-0.3482079	0.6230775	2.032604
Area	-0.1976363	-0.1064929	-0.0911434	0.2693279
SADC (excluding SACU) FTA	-1.587245	-1.318972	-0.2682724	0.1418604
SACU-EFTA	-1.191807	-0.9599687	-0.2318383	0.0264786
TDCA	0.1668384	0.6233698	-0.4565314	0.0896496
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi2(4) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 96.97$				
$Prob>\chi2 = 0.0000$				

The fixed effect results in Table 5.34 show that South African imports of paper and paper products are affected positively by population. Therefore, an increase in population by 1% results in an increase in South African imports of paper and paper products by 2.47%. Regarding trade agreements, there is no evidence to support that the SADC (excluding SACU) FTA, SACU-EFTA and TDCA have a statistically significant positive impact on South African imports of paper and paper products.

The random effects model results (Table 5.34) show that the South African imports of paper and paper products are affected positively by GDP, population and colony. The GDP, common language and colony have positive and significant coefficients. Regarding trade agreements, the TDCA has a positive and significant coefficient, indicating that it has a positive impact on South African paper and paper products imports. However, there is no evidence to support that the SADC (excluding SACU) FTA and SACU-EFTA have a statistically significant positive impact on South African imports of paper and paper products.

Table 5.34: Regression results for imports of paper and paper products

Dependent variable: imports of paper and paper products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.1784906	0.154	0.9313001	0.000
Population	2.473857	0.000	0.3212805	0.085
Distance	2.473857	0.000	-0.3482079	0.483
Area	-0.1976363	0.503	-0.1064929	0.376
Common language	(omitted)		0.3480738	0.603
Colony	(omitted)		1.015728	0.098
Landlocked	(omitted)		0.8564839	0.173
SADC (excluding SACU)	-1.587245	0.000	-1.318972	0.001
SACU-EFTA agreement	-1.191807	0.029	-0.9599687	0.079
TDCA	0.1668384	0.610	0.6233698	0.047
Constant	78.2052	0.001	-42.73802	0.000
sigma_u	5.1400174		2.7531581	
sigma_e	2.1318568		2.1318568	
rho	0.8532255		0.62516053	
R-sq:				
within =	0.0573		0.0401	
between =	0.1868		0.4857	
overall =	0.1566		0.4549	

5.3.8 Rubber products

The Hausman test results for rubber products are presented in Table 5.35. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. Therefore, the Hausman test is significant, and the null hypothesis that the random effect is preferred is not supported. Thus, the fixed effects model is preferred.

Table 5.35: Hausman fixed random: imports of rubber products

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.2764707	0.7882023	-0.5117315	0.0640676
Population	2.230678	0.7673148	1.463364	0.2592923
Distance	-0.048325	-0.3738344	0.3255094	8.192155
Area	0.0703291	-0.3058857	0.3762148	0.2572172
SADC (excluding SACU) FTA	0.1877977	0.3894987	-0.201701	0.1049734
SACU-EFTA	-0.679016	-0.5204518	-0.1585641	0.0427986
TDCA	0.0752913	0.4162209	-0.3409296	0.089863
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 93.17				
Prob>$\chi 2$ = 0.0000				

Fixed effect results (Table 5.36) show that the determinants of rubber products imports with positive and significant coefficients are GDP and population, indicating that an increase in these variables by 1% results in an increase in South African imports of rubber products by 0.28% and 2.23%, respectively. The SADC (excluding SACU) FTA, SACU-EFTA and TDCA have statistically insignificant coefficients. Therefore, there is no evidence to support that these agreements have a statistically significant positive effect on South Africa's imports of rubber products.

The determinants of rubber products imports with positive and significant coefficients, as presented in the random effects model results in Table 3.36, are GDP and population. However, the determinants of rubber products imports with negative and significant coefficients are area and landlocked. The SADC (excluding SACU) FTA, SACU-EFTA and TDCA have statistically insignificant coefficients. Therefore, there is no evidence to support that these agreements have a statistically significant positive effect on South African imports of rubber products.

Table 5.36: Regression results for imports of rubber products

Dependent variable: imports of rubber products				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.27647	0.007	0.7882	0.000
Population	2.23068	0.000	0.76731	0.000
Distance	-0.0483	0.995	-0.3738	0.414
Area	0.07033	0.801	-0.3059	0.005
Common language	(omitted)		0.71473	0.234
Colony	(omitted)		0.43334	0.432
Landlocked	(omitted)		-1.0751	0.052
SADC (excluding SACU)	0.1878	0.609	0.3895	0.268
SACU-EFTA agreement	-0.679	0.129	-0.5205	0.243
TDCA	0.07529	0.805	0.41622	0.154
Constant	-80.039	0.283	-42.756	0.000
sigma_u	4.90925		2.66194	
sigma_e	2.01902		2.01902	
rho	0.85533		0.6348	
R-sq:				
within =	0.0679		0.0578	
between =	0.2766		0.5285	
overall =	0.2321		0.4469	

5.3.9 Furniture

Table 5.37 shows Hausman test results for imports of furniture. The null hypothesis of the Hausman test is that the preferred model is random effects. However, the alternative hypothesis states that the preferred model is fixed effects. The results show that the Prob>χ2 is less than 0.05. Therefore, the null hypothesis that the random effect is preferred is not supported by the Hausman test results. As a result, the alternative hypothesis that the fixed effects model is preferred is accepted.

Table 5.37: Hausman fixed random: imports of furniture

	Coefficients ----			
	(b) fixed	**(B) random**	**(b-B) difference**	**sqrt(diag(V_b-V_B)) S.E.**
Gross domestic product	0.6965023	0.8963252	-0.1998228	0.108293
Population	0.5494334	0.2683921	0.2810412	0.3422335
Distance	-1.206811	-0.3484551	-0.8583561	7.204178
Area	-0.3842357	-0.2689866	-0.1152491	0.2224332
SADC (excluding SACU) FTA	-0.0535849	-0.0296376	-0.0239472	0.1214079
SACU-EFTA	-0.2439284	-0.2351084	-0.00882	0.0862308
TDCA	0.6017305	0.8203639	-0.2186334	0.0830087
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\chi 2(4)$ = (b-B)'[(V_b-V_B)^(-1)](b-B) = 15.85				
Prob>$\chi 2$ = 0.0265				

The regression results for imports of furniture products are presented in Table 5.38. The fixed effects model shows that the variables with positive and significant coefficients are GDP and the TDCA. Thus, an increase in GDP by 1% results in an increase in South African imports of furniture by 0.70%. Moreover, the TDCA has a statistically significant positive effect on imports of furniture division. The TDCA results in an increase of about 0.60% in South African furniture imports. However, the SADC (excluding SACU) FTA and SACU-EFTA have statistically insignificant coefficients. Therefore, there is no evidence to support that these agreements have a statistically significant positive effect on South African imports of rubber products.

The random effects model results (Table 5.38) on South African imports of furniture products show that the variables with positive and significant coefficients are GDP, common language and the TDCA. However, the SADC (excluding SACU) FTA and SACU-EFTA have statistically insignificant coefficients. The variable with negative and significant coefficients is area. Therefore, it can be concluded that the TDCA has a statistically significant positive effect on South African imports of rubber products.

Table 5.38: Regression results for imports of furniture

Dependent variable: imports of furniture				
	Fixed effects		**Random effects**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**
Gross domestic product	0.6965023	0.000	0.89633	0.000
Population	0.5494334	0.151	0.26839	0.115
Distance	-1.206811	0.867	-0.3485	0.413
Area	-0.384236	0.118	-0.269	0.010
Common language	(omitted)		0.90002	0.099
Colony	(omitted)		0.70983	0.151
Landlocked	(omitted)		0.65854	0.209
SADC (excluding SACU)	-0.053585	0.876	-0.0296	0.926
SACU-EFTA agreement	-0.243928	0.587	-0.2351	0.594
TDCA	0.6017305	0.025	0.82036	0.001
Constant	-20.80047	0.751	-34.205	0.000
sigma_u	2.6405441		2.32926	
sigma_e	1.775652		1.77565	
rho	0.6886112		0.63246	
R-sq:				
within =	0.0599		0.0593	
between =	0.4067		0.4803	
overall =	0.3977		0.4533	

5.4 Summary

This chapter shows that the Hausman test results indicate that the fixed model is preferred since it is statistically significant in the imports and exports model of all agro-processing divisions. However, the fixed effect model omitted the time in-variate variables. But in the random effect model results, all variables are estimated.

Moreover, the chapter shows the results of the effect of trade agreements on South Africa's agro-processing trade. Regarding the SADC (excluding SACU) FTA, there is evidence indicating that it has a positive impact on exports of wood and wood products (0.65%) and rubber products (0.52%). Concerning imports, the SADC (excluding SACU) FTA has a positive effect on textiles. This implies that SADC (excluding SACU) FTA increases textiles imports by about 1.36%. Jensen *et al.* (2012), Kagochi and Durmaz (2018) and Ngepah and Udeagha (2018) have similarly shown that the SADC FTA has benefited South Africa's trade.

Similarly, the TDCA positively affects South African exports of food and beverages. Therefore, the TDCA increases South African exports of food and beverages by 0.45%. Meanwhile, the TDCA positively affects South African imports of wood and wood products, paper and paper products and furniture products. Consequently, the TDCA increases South African imports of wood and wood products, paper and paper products and furniture products by 0.45%, 0.62% and 0.70%, respectively. This is similar to the observations made by Jordaan and Kanda (2011) and Potelwa *et al.* (2016), showing that the TDCA has increased South Africa's trade. However, there is no evidence indicating that the SACU-EFTA has resulted in an increase in exports and imports of South African agro-processing products but tobacco and rubber. The SACU-EFTA increases South African tobacco and rubber exports by about 1.74% and 1.10%, respectively. Lastly, it increases South African tobacco imports by 2.22%.

6 CHAPTER 6: TRADE AGREEMENTS AND THE AGRO-PROCESSING INDUSTRIES' EMPLOYMENT

6.1 Introduction

This section presents the results of the effect of trade agreements on employment in the South African agro-processing industry. It begins by showing the effect of exports and imports on employment in the agro-processing industry. The results of the gravity model are juxtaposed with the results from the labour model to infer the effect of trade agreements on the agro-processing industry's employment. Therefore, the section indicates whether trade agreements are linked to employment gain or loss in the South African agro-processing industry.

6.2 Regression results for agro-processing employment

6.2.1 Food products

Table 6.1 shows the regression results for food products. The dependent variable is employment, whereas the independent variables are real wage, real output, import-domestic ratio and export-output ratio. The variable with a positive and statistically significant coefficient is real output, while the coefficient of the export-output ratio is positive but insignificant. This implies that an increase in real output by 1% may result in an increase in employment for food products by 0.59%. Likewise, the variables with negative and statistically significant coefficients are real wage and import-domestic ratio. However, the coefficient for the import-domestic ratio is insignificant. Therefore, an increase in real wages by 1% may reduce employment in food products by 0.87%.

Table 6.1: Regression results for the impact of trade on employment in food products

Dependent variable: employment in food products		
Variables	**Coef.**	**P-value**
Constant	15.32841	0.0000
Real wage	-0.8696236	0.0000
Real output	0.5856985	0.0000
Import-domestic ratio	-0.875675	0.1090
Export-output ratio	0.0647984	0.2180
R-squared	0.7935	
Adjusted R-squared	0.7734	

6.2.2 Beverages

Table 6.2 shows the regression results for the beverages division. Real output has a positive and statistically significant coefficient. This indicates that an increase in real output by 1% may increase employment in the beverages division by approximately 0.46%. Real wage has a negative and statistically significant coefficient. Therefore, an increase in real wage by 1% may increase employment in the beverages division by 0.67%. The import-domestic ratio and export-output ratio have an unexpected sign. This could imply that exports of beverage products in bulk negatively impact employment in the beverages division. The opposite is likely true for imports of beverage products that need further processing.

Table 6.2: Regression results for the impact of trade on employment in the beverages division

Dependent Variable: employment in beverages		
Variables	**Coef.**	**P-value**
Constant	13.59127	0.000
Real wage	-0.6651177	0.006
Real output	0.4597969	0.000
Import-domestic ratio	0.0974772	0.097
Export-output ratio	-0.1749412	0.000
R-squared	0.829	
Adjusted R-squared	0.8123	

6.2.3 Tobacco products

Table 6.3 shows the regression results for the tobacco division. Real output and the export-output ratio have positive and statistically significant coefficients. Therefore, an increase in

real output and the exports-output ratio by 1% may increase employment in the tobacco division by 0.56% and 0.04%, respectively. The coefficient of real wage is negative but statistically insignificant. However, the coefficient of the import-domestic ratio is significant but has an unexpected sign. This could indicate imports of tobacco products that require further processing.

Table 6.3: Regression results for the impact of trade on employment in tobacco products

Dependent variable: employment in tobacco		
Variables	**Coef.**	**P-value**
Constant	3.084828	0.015
Real wage	-0.0615658	0.502
Real output	0.5633764	0.000
Import-domestic ratio	0.0950814	0.002
Export-output ratio	0.040544	0.014
R-squared	0.446	
Adjusted R-squared	0.0.3920	

6.2.4 Textiles

Table 6.4 presents regression results for the textiles division. The coefficient of real wage is statistically insignificant with an incorrect sign. The coefficients of real output and the export-output ratio are statistically significant with an unexpected sign. However, the import-domestic ratio has a negative and statistically significant coefficient. This implies that an increase in the import-domestic ratio by 1% may decrease employment in the textiles division by approximately 1.17%.

Table 6.4: Regression results for the impact of trade on employment in textiles

Dependent variable: employment for textiles		
Variables	**Coef.**	**P-value**
Constant	24.22953	0.000
Real wage	0.0803853	0.667
Real output	-0.975328	0.000
Import-domestic ratio	-1.170023	0.000
Export-output ratio	-0.2667046	0.000
R-squared	0.8957	
Adjusted R-squared	0.8856	

6.2.5 Wearing apparel

Table 6.5 provides the regression results for wearing apparel. The variables with positive and statistically significant coefficients are real output and the export-output ratio. This implies that an increase in real output and the export-output ratio by 1% may increase employment in wearing apparel by 0.12% and 0.06%, respectively. Likewise, real wage and the import-domestic ratio have negative and statistically significant coefficients. Therefore, an increase in real wage and the import-domestic ratio by 1% may reduce employment in the wearing apparel division by 0.39% and 0.19%, respectively.

Table 6.5: Regression results for the impact of trade on employment in wearing apparel

Dependent variable: employment for wearing apparel		
Variables	**Coef.**	**P-value**
Constant	14.35208	0.000
Real wage	-0.3856995	0.000
Real output	0.1266754	0.085
Import-domestic ratio	-0.1950515	0.000
Export-output ratio	0.0551071	0.040
R-squared	0.9194	
Adjusted R-squared	0.9115	

6.2.6 Rubber products

Table 6.6 depicts the regression results for rubber products. The real output has a positive and statistically significant coefficient. This indicates that an increase in real output of rubber products by 1% may increase employment in rubber products by 0.47%. Real wage and the import-domestic ratio negatively affect employment in rubber products. An increase of 1% in real wage and the import-domestic ratio may reduce employment in rubber products by 0.49% and 0.47%, respectively. The coefficient for the export-output ratio is negative but insignificant.

Table 6.6: Regression results for the impact of trade on employment in rubber products

Dependent variable: employment in rubber products		
Variables	**Coef.**	**P-value**
Constant	12.96075	0.000
Real wage	-0.4855865	0.000
Real output	0.473978	0.001
Import-domestic ratio	-0.4468983	0.001
Export-output ratio	-0.0745989	0.151
R-squared	0.8915	
Adjusted R-squared	0.8809	

6.2.7 Footwear

Table 6.7 shows the regression results for the footwear division. The variables with negative and statistically significant coefficients are real wage and the import-domestic ratio. The implication of this is that an increase in real wage and the import-domestic ratio by l% may decrease employment in the footwear division by 0.29% and 0.57%, respectively. However, the coefficients of real output and the export-output ratio are statistically insignificant.

Table 6.7: Regression results for the impact of trade on employment in footwear

Dependent variable: employment in footwear		
Variables	**Coef.**	**P-value**
Constant	17.52751	0.000
Real wage	-0.2849658	0.028
Real output	-0.3559929	0.161
Import-domestic ratio	-0.5650733	0.000
Export-output ratio	0.092518	0.154
R-squared	0.7557	
Adjusted R-squared	0.7319	

6.2.8 Leather and leather products

Table 6.8 presents the regression results for leather and leather products. Employment in leather and leather product is the dependent variable. The variables with negative and statistically significant coefficients are real wage and the import-domestic ratio. This implies that an increase in real wage and the import-domestic ratio by 1% may decrease employment in leather and leather products. However, the real output and the export-domestic ratio have statistically insignificant coefficients.

Table 6.8: Regression results for the impact of trade on employment in leather and leather products

Dependent variable: employment in leather and leather products		
Variables	**Coef.**	**P-value**
Constant	14.73805	0.000
Real wage	-0.4078211	0.000
Real output	-0.0825186	0.267
Import-domestic ratio	-0.2704581	0.002
Export-output ratio	0.022948	0.622
R-squared	0.8808	
Adjusted R-squared	0.8692	

6.2.9 Wood and wood products

Employment in the wood and wood products division, as presented in Table 6.9, is positively affected by real output and the export-output ratio. Therefore, an increase in real output and the export-output ratio by 1% may increase employment in the wood and wood products division by approximately 0.30% and 0.19%, respectively. The coefficient of the import-domestic ratio is significant but carries an unexpected sign. It is likely that the imports of wood and wood products may require further processing or assembling, which could positively impact employment. The coefficient of real wage, on the other hand, is significant with an expected sign. An increase in real wage by 1% may reduce employment in wood and wood products by 0.81%.

Table 6.9: Regression results for the impact of trade on employment in wood and wood products

Dependent variable: employment in wood and wood products		
Variables	**Coef.**	**P-value**
Constant	15.97831	0.000
Real wage	-0.8090745	0.000
Real output	0.3041967	0.000
Import-domestic ratio	0.3091515	0.005
Export-output ratio	0.1901575	0.000
R-squared	0.8444	
Adjusted R-squared	0.8292	

6.2.10 Paper and paper products

The regression results, as illustrated in Table 6.10, show that the coefficients for real wage, real output and the import-domestic ratio are statistically insignificant. Conversely, the coefficient for the export-output ratio is positive and statistically significant. This means that an increase in the export-output ratio by 1% is likely to increase employment in paper and paper products by approximately 0.12%.

Table 6.10: Regression results for the impact of trade on employment in paper and paper products

Dependent variable: employment in paper and paper products		
Variables	**Coef.**	**P-value**
Constant	7.969353	0.000
Real wage	0.0518191	0.196
Real output	0.1481109	0.207
Import-domestic ratio	-0.0220051	0.683
Export-output ratio	0.1226411	0.087
R-squared	0.8318	
Adjusted R-squared	0.8158	

6.2.11 Furniture

Table 6.11 presents the regression results for the furniture division. All variables have statistically significant coefficients with expected signs. An increase in real output and the export-output ratio by 1% may increase employment in the furniture division by 0.32% and 0.09%, respectively. Conversely, an increase in real wage and the import-domestic ratio by 1% may decrease employment in the furniture division by 0.28% and 0.21%, respectively.

Table 6.11: Regression results for the impact of trade on employment in furniture

Dependent variable: employment in furniture		
Variables	**Coef.**	**P-value**
Constant	10.99527	0.000
Real wage	-0.2842371	0.000
Real output	0.3221226	0.000
Import-domestic ratio	-0.2070935	0.000
Export-output ratio	0.0857661	0.000
R-squared	0.8668	
Adjusted R-squared	0.8538	

6.3 The effect of trade agreements on employment in the agro-processing industry

Table 6.12 shows that the SADC (excluding SACU) FTA has a positive and significant effect on South African exports of wood and wood products and rubber products. Likewise, exports have positive effects on employment in the following agro-processing divisions: tobacco, wearing apparel, wood and wood products, paper and paper products and furniture. Therefore, the positive effect of the SADC FTA on exports and the positive effect of exports on employment is seen in wood and wood products. The positive effect of exports on employment in the tobacco division, wearing apparel and paper and paper products are not linked to the SADC (excluding SACU) FTA, as there is no evidence indicating that it positively and significantly affects their exports.

The SACU-EFTA has no significant positive impact on exports of agro-processing products, with the exception of the tobacco division. As exports of the tobacco division are shown to benefit employment positively, the SACU-EFTA positively affects tobacco employment. The TDCA, on the other hand, has a positive and significant effect on exports of food products, beverages and wearing apparel. Employment in the beverages division appears to be negative as exports increase. However, the TDCA has a positive effect on employment in the wearing apparel division.

Table 6.12: Trade agreements' effect on exports and employment in the agro-processing industry

Agro-processing divisions	SADC (excluding SACU) FTA	SACU-EFTA	TDCA	Employment
Food products	- Insignificant	- Insignificant	+ **	+ Insignificant
Beverages	- Insignificant	- Insignificant	+ **	- ***
Tobacco	- Insignificant	+ *	- ***	+ ***
Textiles	+ Insignificant	- *	+ Insignificant	- ***
Leather and leather products	- Insignificant	+ **	- Insignificant	+ Insignificant
Footwear	- Insignificant	+ **	- Insignificant	+ Insignificant
Wearing apparel	+ Insignificant	+ Insignificant	+ **	+ **
Wood and wood products	+ **	- Insignificant	+ Insignificant	+ ***
Paper and paper products	+ Insignificant	- ***	+ Insignificant	+ **
Rubber products	+ **	- ***	+ Insignificant	- Insignificant
Furniture	+ Insignificant	- Insignificant	+ Insignificant	+ ***

* = $p \leq 0.10$, **= $p \leq 0.05$ and *** = $p \leq 0.01$

Table 6.13 shows the nexus between trade agreements, imports and employment in the agro-processing industry. The SADC (excluding SACU) FTA positively impacts South African imports of textiles. Similarly, the TDCA has a positive impact on imports of the following agro-processing divisions: wood and wood products, paper and paper products and furniture. On the other hand, the SACU-EFTA has a positive impact on South African imports of tobacco products. Employment in the tobacco division has shown an increase as the imports increase.

However, South African imports negatively affect employment in the food products, textiles, leather and leather products, footwear, wearing apparel, rubber products and furniture divisions. Conversely, South African imports positively affect employment in the beverages, tobacco and wood and wood products divisions. Therefore, the SADC (excluding SACU) FTA

has a negative impact on employment in the textiles division. The TDCA negatively affects employment in the furniture division. Additionally, the TDCA shows a positive impact on employment in the wood and wood products division.

The results suggest that the negative impact of imports on employment in the agro-processing divisions is likely linked with trade outside the SADC (excluding SACU) FTA, SACU-EFTA and TDCA. This was illustrated by Edwards and Jenkins (2015) in their evaluation of the impact of Chinese import penetration on the South African manufacturing sector. They noted a decline of about 8% in employment in the manufacturing sector due to import penetration, among others.

Table 6.13: Trade agreements' effect on imports and employment in the agro-processing industry

Agro-processing divisions	**SADC (excluding SACU) FTA**	**SACU-EFTA**	**TDCA**	**Employment**
Food	- Insignificant	+ Insignificant	+ Insignificant	- *
Beverages	- Insignificant	+ Insignificant	+ Insignificant	+ *
Tobacco	- Insignificant	+ ***	+ Insignificant	+ ***
Textiles	+ ***	- **	+ Insignificant	- ***
Leather and leather products	+ Insignificant	- ***	- Insignificant	- ***
Footwear	+ Insignificant	- ***	- Insignificant	- ***
Wearing apparel	- Insignificant	- ***	+ Insignificant	- ***
Wood and wood products	- Insignificant	+ Insignificant	+ *	+ ***
Paper and paper products	- ***	- *	+ **	+ Insignificant
Rubber products	+ Insignificant	- Insignificant	+ Insignificant	- ***
Furniture	- Insignificant	- Insignificant	+ ***	- ***

* = $p \leq 0.10$, **= $p \leq 0.05$ and *** = $p \leq 0.01$

6.4 Summary

The chapter shows the results of the effect of trade agreements on South Africa's agro-processing trade and employment. The employment results are varied with insignificant variables that are insufficient to make a conclusive determination. However, employment in the tobacco, wearing apparel, wood and wood products, furniture and paper and paper products divisions is positively related to exports, while imports of food, textiles, wearing apparel, leather and leather products, footwear, rubber products and furniture negatively affect employment in these divisions

The positive effects of the SADC (excluding SACU) FTA on exports and that of exports on employment are seen in wood and wood products. Hence, the SADC (excluding SACU) FTA has a positive effect on employment in wood and wood products. Conversely, the SADC (excluding SACU) FTA negatively impact employment in the textiles division.

The SACU-EFTA, on the other hand, shows no evidence that it increases exports and imports of South African agro-processing divisions but for the tobacco division. The SACU-EFTA positively affects tobacco employment; however, there is no evidence that it negatively affects employment in other agro-processing divisions.

The TDCA positively affects employment in the wearing apparel division but negatively affects employment in the furniture division. Besides trade agreements' effects on employment, the results suggest that the negative impact of imports on employment in the agro-processing divisions is likely linked to trade outside the agreements under review.

7 CHAPTER 7: SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Introduction

This section summarises the study, followed by the conclusion and recommendations. More importantly, it, in brief, indicates the impact of FTAs on South Africa's trade in agro-processing industry. Furthermore, it indicates the effect of FTAs on employment in South Africa's agro-processing industry.

7.2 Summary

South Africa's economy is characterised by a high level of unemployment, which subsequently led to the prioritisation of the agro-processing industry, among others, as observed in the NDP, IPAP and APAP. South Africa participates in multiple trade agreements, namely, the SADC, the SACU-EFTA and the TDCA. This study analysed the implication of these trade agreements on trade and employment.

Several studies, as the literature review shows, using the gravity model, conclude that FTAs result in trade creation, trade diversion or both. However, regarding the implication of trade on employment, there is evidence indicating that employment changes could be explained by technological changes, while at the same time, international trade is linked to employment changes. The revealed comparative advantage index, on the other hand, is mainly used to identify products in which a country has a comparative advantage or disadvantage.

The study used the gravity model to analyse the impact of FTAs on South Africa's agro-processing industry, focussing on the SADC FTA (excluding SACU), SACU-EFTA and the TDCA. Moreover, the labour model analysed the implications of trade on employment in the agro-processing industry.

Regarding South Africa's macro-economy environment, the South African GDP has shown sluggish growth. This sluggish growth trend is similarly seen in the per capita GDP growth, which mainly remained flat. However, the South African population growth has increased at a faster rate compared to the GDP growth rate.

However, in terms of prices, the CPI appears to be stable, while the rand has shown some high volatility, particularly over the period 2006 to 2016. The investment illustrates a cyclical trend, with periods of net inflows followed by periods of net outflows. However, from 2012 to 2016, was a substantial increase in FDI net outflows.

Regarding trade, South Africa's leading trading partners are China, Germany and the USA. The leading exports are natural or cultured pearls, precious or semi-precious stones; ores, slag and ash; and vehicles other than railway or tramway rolling stock. The leading imports are machinery, mechanical appliances, nuclear reactors, boilers; electrical machinery and equipment; and mineral fuels, mineral oils and products of their distillation.

South Africa's agro-processing trade depicts the following trends. Most of South Africa's exports of agro-processing products are mainly destined to SADC countries, while the sources of imports are mainly from China, India, Germany and France. Employment in South Africa appears to be increasing, though slowly, which is not keeping up with the population growth. However, the share of the agro-processing industry's employment in South Africa's total employment shows a declining trend over the period 2000 to 2016.

The SADC (excluding SACU) FTA has a positive and statistically significant effect on South African exports of wood and wood products and rubber products. Regarding imports, the SADC (excluding SACU) FTA positively affects South African imports of textiles division. This implies that SADC (excluding SACU) FTA increases textiles imports by about 1.36%. The TDCA, on the other hand, has a statistically significant positive effect on exports of food and beverages. Therefore, the TDCA increases South African exports of food and beverages by 0.45%.

On imports, the TDCA has a statistically significant positive effect on wood and wood products, paper and paper products and furniture products. As result, the TDCA increases South African imports of wood and wood products, paper and paper products and furniture products by 0.45%, 0.62% and 0.70%, respectively.

However, the SACU-EFTA agreement showed no evidence that it has resulted in an increase in exports and imports of South African agro-processing products, but for tobacco and rubber. The SACU-EFTA increases South African tobacco and rubber exports by about 1.74% and 1.10%, respectively. Additionally, it increases South African tobacco imports by 2.22%.

Employment in the tobacco, wearing apparel, wood and wood products, furniture and paper and paper products sectors is positively related to exports. Meanwhile, the imports of food, textiles, wearing apparel, leather and leather products, footwear, rubber products and furniture divisions affect employment in these divisions negatively. Therefore, the SADC (excluding SACU) FTA has increased employment in the wood and wood products sector. However, it decreased employment in the wearing apparel sector. The TDCA has positively affected employment in the wearing apparel division but has negatively affected employment in the furniture division. The SACU-EFTA has positively affected tobacco employment; however, there is no evidence that it negatively affected employment in other agro-processing divisions.

7.3 Conclusion

The results of this study indicate that trade in South Africa's agro-processing industry tends to be impacted mainly by the SADC (excluding SACU) FTA and the TDCA to some extent. The SACU-EFTA, however, shows that it is insignificant in influencing exports and imports of almost all the agro-processing divisions but tobacco. However, there is variation concerning the implication of trade on employment in agro-processing divisions.

The SADC (excluding SACU) FTA has positively impacted exports of wood and wood products and rubber products, and imports of textiles. The TDCA, on the other hand, has positively impacted exports of food and beverages and wearing apparel, and imports of wood and wood products, paper and paper products and furniture. The SACU-EFTA agreement showed no evidence of increasing exports and imports of the agro-processing division, except for tobacco.

The SADC (excluding SACU) FTA has benefited employment in the wood and wood products sector due to exports increase but has negatively affected employment in the textiles division due to an increase in imports. The TDCA increased employment in the wearing apparel division; however, the imports encouraged by the TDCA negatively affected employment in the furniture division. The exports influenced by the SACU-EFTA agreement positively affected employment in the tobacco sector; however, there is no evidence that it negatively affected employment in other agro-processing divisions.

In conclusion, though the increase in trade could be explained by the SADC (excluding SACU) FTA and the TDCA, the variation in employment in the agro-processing industry appears not to be fully explained by trade agreements. Trade outside the agreements could partly explain an increase or a decline in employment as trade rises or declines. Therefore, trade agreements and trade are components of employment changes, but the argument that employment could be partly explained by technological changes (Acemoglu, 2002) appears to hold in the context of the South African agro-processing industry.

7.4 Recommendation

The links between trade agreements, exports and imports, and employment in South Africa's agro-processing industry are unique for each division. Trade agreements have been shown to increase both exports and imports of agro-processing divisions. Regarding employment, exports encouraged by trade agreements appear to increase employment, while imports induced by trade agreements seem to have a negative impact on employment.

But some divisions show that exports appear to reduce employment; this may be the case when the country exports products that need further processing, for instance, bulk exports of beverages products like wine. Furthermore, imports have also shown to increase employment in some divisions. This could be because these products need further processing, creating job opportunities in South Africa.

Therefore, it is recommended that South Africa, firstly, needs to go beyond traditional markets (markets where South Africa trades under FTAs) and open trade negotiations for new markets. However, this need not be done at the expense of traditional markets. The SADC markets are significant for South Africa's agro-processing industry. Secondly, to boost exports- induced employment, major to facilitate an increase in trade with traditional markets need to be prioritise, these could include trade facilitations majors that ensure an effective and efficient movement of goods and services. Lastly, noting that imports from trade partners outside trade agreements appear to have a negative impact on employment in South Africa's agro-processing industry, the country must identify priority products that could be supported to mitigate an adversely negative impact on employment induced by imports.

It is further recommended that future studies of FTA, exports, imports and employment nexus may carry out similar studies with an addition of novel variables that are affecting trade and production in the agro-processing industry.

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Appendix A: List of countries as source of data for gravity model

Albania	Canada	Gambia, The
Algeria	Central African Republic	Georgia
Angola	Chad	Germany
Antigua and Barbuda	Chile	Ghana
Argentina	China	Greece
Armenia	Colombia	Greenland
Aruba	Comoros	Grenada
Australia	Congo, Dem. Rep.	Guatemala
Austria	Congo, Rep.	Guinea
Azerbaijan	Costa Rica	Guinea-Bissau
Bahamas, The	Cote d'Ivoire	Guyana
Bahrain	Croatia	Haiti
Bangladesh	Cuba	Honduras
Barbados	Cyprus	Hong Kong SAR, China
Belarus	Czech Republic	Hungary
Belgium	Denmark	Iceland
Belize	Djibouti	India
Benin	Dominica	Indonesia
Bermuda	Dominican Republic	Iran, Islamic Rep.
Bhutan	Ecuador	Iraq
Bolivia	Egypt, Arab Rep.	Ireland
Bosnia and Herzegovina	El Salvador	Israel
Botswana	Equatorial Guinea	Italy
Brazil	Eritrea	Jamaica
Brunei Darussalam	Estonia	Japan
Bulgaria	Ethiopia	Jordan
Burkina Faso	Fiji	Kazakhstan
Burundi	Finland	Kenya
Cabo Verde	France	Kiribati
Cambodia	Gabon	Korea, Rep.
Cameroon	Netherlands	Kuwait
Kyrgyz Republic	New Caledonia	Solomon Islands

Lao PDR	New Zealand	Somalia
Latvia	Nicaragua	Spain
Lebanon	Niger	Sri Lanka
Lesotho	Nigeria	St. Kitts and Nevis
Liberia	Norway	St. Lucia
Libya	Oman	St. Vincent and the
Liechtenstein	Pakistan	Grenadines
Lithuania	Panama	Sudan
Luxembourg	Papua New Guinea	Suriname
Macao SAR, China	Paraguay	Swaziland
Macedonia, FYR	Peru	Sweden
Madagascar	Philippines	Switzerland
Malawi	Poland	Tajikistan
Malaysia	Portugal	Tanzania
Maldives	Puerto Rico	Thailand
Mali	Qatar	Togo
Malta	Romania	Tonga
Marshall Islands	Russian Federation	Trinidad and Tobago
Mauritania	Rwanda	Tunisia
Mauritius	Samoa	Turkey
Mexico	San Marino	Turkmenistan
Micronesia, Fed. Sts.	Sao Tome and Principe	Turks and Caicos Islands
Moldova	Saudi Arabia	Tuvalu
Monaco	Senegal	Uganda
Mongolia	Serbia	Ukraine
Montenegro	Seychelles	United Arab Emirates
Mozambique	Sierra Leone	United Kingdom
Myanmar	Singapore	United States
Namibia	Slovak Republic	Uruguay
Nepal	Slovenia	Uzbekistan
Vanuatu		
Venezuela, RB		
Vietnam		

Yemen, Rep. Zambia Zimbabwe		