Analysis of export and employment opportunities for the South African manufacturing industry

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SUMMARY

Throughout history the role of trade in economic growth has been consistently debated. Although different opinions exist within the literature, this study offers evidence that there is a positive relationship between trade and economic growth.

The South African government realises the importance of international trade with regard to economic growth and employment creation. As a result, government has addressed the importance of increasing exports in a number of policy documents.

The research objectives of the study were focussed on identifying the sectors within the South African manufacturing industry in which an increase in export would offer the greatest benefits with regard to economic growth and employment creation. The subsequent research question relates to identifying the export opportunities within these sectors in order to address government's policy objectives of stimulating economic growth and creating more jobs.

In order to identify the sectors that offer the greatest benefits for economic growth and employment creation a social accounting matrix multiplier analysis (SAMMA) was employed. Once these results had been obtained, the Decision Support Model (DSM) methodology was applied in order to identify the realistic export opportunities (product-country combinations) for these sectors.

The results from the SAMMA indicated that three of the top five manufacturing sectors that had the greatest effects on GDP and employment creation are related to agricultural or primary manufacturing. Comparing the top performing sectors from the SAMMA with those that offer the greatest potential export value according to the DSM offers interesting results. It seems that the South African economy is structured in such a way that the lower value manufactured exports have a greater effect on the broader economy (in terms of GDP and labour creation) when compared to higher value manufactured exports with higher export potential.

The results from the DSM for the sectors identified in the SAMMA indicate that the most realistic export opportunities for South Africa are in markets where South Africa has, at the time of this study, very little or no market share. However, these markets have a large import demand that are growing in the short or long term or both. Examples include palm oil (151110) in Singapore; wheat/meslin flour (110100) in

Angola; unsweetened concentrated milk and cream (040110) in Saudi Arabia; wooden doors and frames (441820) in Japan and parts of seats (940190) in Mexico. Further research opportunities include exploring the marketing strategies to pursue these identified export opportunities and also identifying the barriers to realising more value added manufactured exports.

Keywords: manufacturing sectors, economic growth, employment creation, South Africa, exports, government policy

OPSOMMING

Regdeur die geskiedenis was die rol van internasionale handel in ekonomiese groei reeds ‘n hewige debat. Alhoewel daar verskillende opinies in die literatuur verskyn rondom die onderwerp, bied dié studie genoegsame inligting om die standpunt te staaf dat daar ‘n positiewe verwantskap is tussen handel en ekonomiese groei.

Die Suid-Afrikaanse regering erken die rol wat internasionale handel kan speel in terme van ekonomiese groei en werkskepping. Gevolglik het die regering die belangrikheid daarvan om uitvoere te laat groei in vele beleidsdokumente vervat.

Die navorsingsdoelwitte in die studie het gefokus daarop om dié sektore te identifiseer wat die meeste voordele bied in terme van ekonomiese groei en werkskepping. Die daaropvolgende navorsingsdoelwit se fokus was om die uitvoergeleenthede vir dié sektore te identifiseer om sodoende die regering se behoefte aan te spreek om ekonomiese groei te stimuleer en meer werk te skep.

Om die sektore te identifiseer wat die grootste voordele inhou vir ekonomiese groei en werkskepping is ‘n sosiaal-rekenkundige matriksveelvuldigingsanalise (SAMMA) gebruik. Nadat die resultate ingesamel is, is ‘n besluitnemingsondersteuningsmodel (DSM) toegepas om die produk-land-kombinasies te indentifiseer vir dié sektore.

Die resultate vanuit die SAMMA het aangedui dat drie van die top vyf vervaardigingsektore wat die grootste voordele inhou vir die BBP en werkskepping verbind is tot landbou- of primêre vervaardiging. Wanneer dié sektore vergelyk word met die sektore vanuit die DSM wat die hoogste potensiële uitvoerwaarde bied, wil dit voorkom of die Suid-Afrikaanse ekonomie so gestruktureer is dat laer-waarde vervaardigingsuitvoere ‘n groter effek het op die breër ekonomie (in terme van BBP en werkskepping) as hoë-waarde vervaardigingsuitvoere (wat ‘n hoër potensiële uitvoerwaarde bied).

Die resultate vanuit die DSM vir die identifiseerde sektore dui aan dat die meeste geleenthede vir Suid-Afrika in markte is waar Suid-Afrika baie min of geen teenwoordigheid het op die tyd van opskryf nie. Hierdie is groot markte wat groeiend is in die kort- of langtermyn of in beide. Voorbeelde sluit onder meer die volgende in: palmolie (151110) in Singapoer; koringmeel (110100) in Angola; onversoete

gekonsentreerde melk en room (040110) in Saudi-Arabië; houtdeure en -rame (441820) in Japan en onderdele van sitplekke (940190) in Meksiko.

Veredere navorsingsgeleenthede sluit onder meer in om die bemarkingstrategieë na te gaan vir die geïdentifiseerde uitvoergeleenthede, asook om die hindernisse te identifiseer wat meer toegevoegde waarde uitvoere sal moontlik maak.

Sleutelwoorde: vervaardigingsektore, ekonomiese groei, werkskepping, Suid-Afrika, uitvoere, regeringsbeleid

ABBREVIATIONS

ANC	African National Congress
ASGISA	Accelerated and Shared Growth Initiative
BACI	Base pour l'Ananlyse du Commerce International
BRICS	Brazil, Russia, India, China, South Africa
CEPII	Centre d'etudes prospectives et d'informations internationales
CGE	Computable General Equilibrium
CIF	Cost, Insurance and Freight
CIP	Competitive Industrial Performance
DSM	Decision Support Model
FOB	Free on-board
GCI	Global Competitiveness Report Index
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GVC	Global value chain
HHI	Herfindahl-Hirshmann-Index
HS	Harmonised system
I/O	Input/output
IDC	Industrial Development Corporation
IMF	International Monetary Fund
ITAC	International Trade Administration Commission
ITC	International Trade Centre
MTSF	Medium-Term Strategic Framework
MVA	Manufacturing Value Added
NDP	National Development Plan
NTM	Non-tariff measure
ONDD	Office Nationale du Ducroire
RCA	Revealed Comparative Advantage
RDP	Reconstruction and Development Programme
REO	Realistic export opportunities

RTA	Revealed Trade Advantage
SAM	Social Accounting Matrix
SAMMA	Social Accounting Matrix Multiplier Analysis
SAPPI	South African Pulp and Paper Industries Ltd.
SARB	South African Reserve Bank
SASOL	South African Coal, Oil and Gas Corporation
SIC	Standard Industrial Classification
UNIDO	United Nations Industrial Development Corporation
VOC	Dutch East-India Company
WEF	World Economic Forum

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1. INTRODUCTION

1.1 Background

“(Trade) enriches nations…” (Appleyard, *et al.,* 2010). Over the centuries the role of trade as a catalyst, component or spectator to economic growth has been fiercely debated and acknowledged by a host of economists.

It is mostly accepted that the way in which countries integrate into the global economy has become important for the well-being of the individual country as well as for the global economy. Trade has been identified as an effective method to allocate resources and it plays an important role in assisting with the development of economies of scale, promoting technological advances, creating new products and fostering healthy competition between domestic and export markets. Trade therefore yields productivity and long-term growth (Krugman, 1979; Grossman & Helpman, 1991; Sachs and Warner, 1995; Edward, 1998; Dodzin & Vamvakidis, 2004) (see chapter 2.3.1 for a more detailed literature overview).

Empirical evidence also suggests an overall positive relationship between trade and employment (depending on the labour intensity of production) (Kucera, Roncolato & Von Uexkull, 2012; Xiong, Zhou & Li, 2012). More specifically, increased export is found to foster better employment conditions and opportunities (Colen, Maertens & Swinnen, 2012) (chapter 2.3.1 will elaborate).

Thus, a proposed positive relationship between trade, economic growth and employment forms the basis of this study.

The South African government recognises the important role of international trade with regard to economic growth and employment creation and has addressed these matters in a number of policy documents. Consequently a discussion regarding South African government’s recognition of international trade as a means to address employment and economic growth follows in section 1.2. Section 1.3 addresses with the problem statement which is followed by the research objectives in section 1.4. Section 1.5 discusses the research method after which the chapter is concluded with the chapter division for the study in section 1.6.

1.2 Motivation

“While South Africa has maintained a reasonably sound trade balance, owing largely to high commodity prices, it is of concern that high value-added and labour-intensive exports are slowing” (National Planning Commission, 2011).

1.2.1 South African national policies

The National Plannig Commission set out clear goals for South Africa in its National Development Plan (NDP), which documents strategies for growth going forward to 2030. South Africa draws advantages from its rich resource endowment. This advantage is promoted by high commodity prices and a weakening Rand, leading to increased export values. However, volatility in commodity prices is common (Tsen, 2009; Jacks, O’Rourke & Williamson, 2011). In a very strongly commodity-based economy such price fluctuations can have far-reaching effects. The NDP states that higher exports in value-added and labour intensive goods, an increase in skills and diversifying the economy can offset the distorting effects of fluctuating commodity prices and the fluctuating exchange rate. There is also a strong focus on investment into value-added industries and increasing those exports (National Planning Commission, 2011).

This commitment at the national level to assist the manufacturing industry is reiterated in IPAP 2012/13 to 2014/15 (DTI, 2012b). Numerous applications were filed to The International Trade Administration Commission (ITAC) for increases, rebates and reductions of duties across a spectrum of sectors (DTI, 2012b). The Minister of Finance has also released R5,8 billion over the course of a three-year (2012-2014) Medium-Term Expenditure Framework (MTEF) towards the new Manufacturing Competitiveness Enhancement Programme (MCEP). The MCEP aims to increase the confidence of investors into the South African manufacturing industry in uncertain economic times by upgrading the industry’s competitiveness. The MCEP is focussed on manufacturing in labour-intensive and value-added industries (DTI, 2012a). The medium-term strategic framework (MTSF) implemented by government for 2014-2019 also identifies the manufacturing sector as an important part of the economy both in terms of economic growth and employment creation. As a result there is a strong focus on education for future artisans and engineers. The MTSF has set goals of growing the number of artisans and engineers

produced each year by 32% and 14% respectively (The Presidency, 2014). Thus, there is a strong emphasis at the national level to achieve higher levels of competitiveness within these industries which, amongst others, will lead to increased exports for these industries.

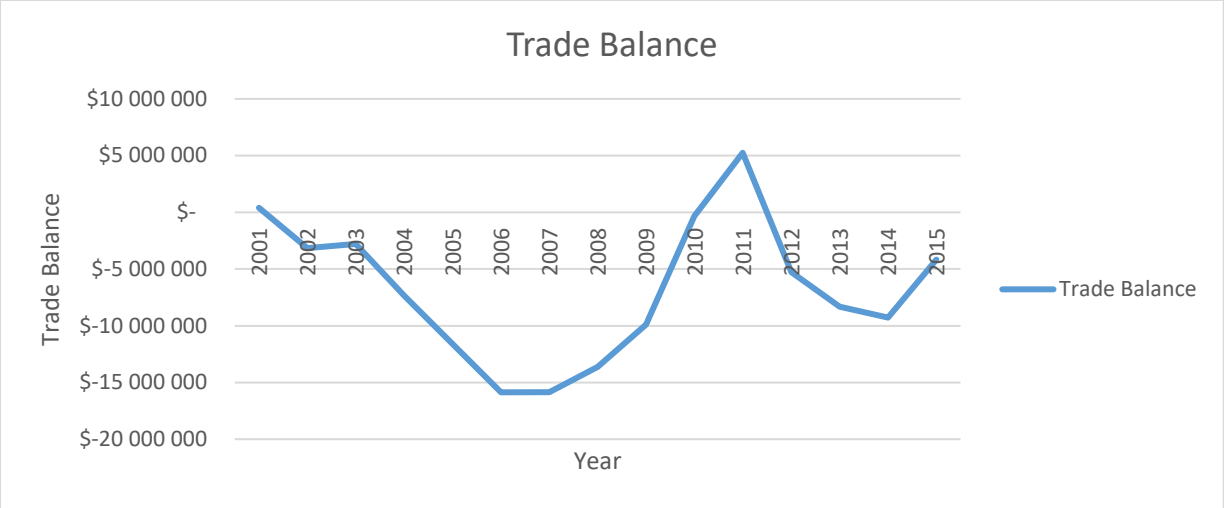
In the light of these objectives and goals set out by the South African government, section 1.2.2 deals with South Africa's overall trade performance and more specifically the manufacturing sector's production and trade performance.

1.2.2 South African trade performance: with specific focus on the manufacturing industry

South Africa has witnessed a slowdown in its exports in recent years. Imports are growing at a much faster rate than exports. Trade data for January to February 2012 and January to February 2013 show a significant negative increase in South Africa's cumulative trade balance from just under R24 billion to just over R34 billion (SARS, 2013). The trade deficit trend continued throughout 2014. According to SARS (2015) the cumulative trade deficit for 2014 totalled R95.3 billion after 2013's cumulative deficit reached R71 billion. However, the negative trade balance seems to improve when the periods January to July of 2014 and 2015 are compared. The cumulative trade balance for 2014 totalled in excess of negative R53 billion, but showed improvement in 2015 to negative R25.2 billion. (SARS, 2015). On a month-to-month basis, exports grew by 4.7% from June to July 2015, but imports grew by more than 12% for the same period strongly offsetting the gains made by exports (SARS, 2015).

The graph below indicates the trend in South Africa's trade balance since 2001.

Figure 1.1: Fifteen year trend in South African trade balance



Source: UN COMTRADE data

The graph confirms that the South African trade balance has been negative for the majority of the past fifteen years.

When considering manufacturing production the year-on-year production growth rate of the sector hit a negative growth slump during the global financial crisis where the average during this period was -20%. Even though it recovered to a positive growth rate of 2,5% in the fourth quarter of 2011 (Stats SA, 2014b), production and export growth needs to be substantially higher in order to play a role in creating 11 million new jobs by 2030 as set out in the national policy goals (National Planning Commission, 2011).

The South African manufacturing sector continues to record a negative trade balance. When quarter three of 2012 is compared to the corresponding period in 2011, the manufacturing sector recorded a 6.8% increase in export value. However, during the same period this increase in exports was overshadowed by an increase of 17.2% in import value. For the same period, intermediary[1] goods' exports fell from around R68 billion to R65 billion, while imports grew from R71 billion to R80 billion. During 2013, similar patterns of a growing negative trade balance were recorded and the trend continued into 2014 as the manufacturing trade deficit widended to R40.7 billion as imports of manufactured goods reached R223.4 billion for the year. This was due to the strong depreciation of the Rand and the inability of the export sector

[1] Goods produced to be utilised in the production of other products

to capitalise on the weakened Rand because of supply side constraints (Industrial Development Corporation, 2015). These figures further accumulate the deficit on an already growing negative national trade balance. The 2015 year, however, saw a narrowing of the overall trade balance of which increased exports played a significant part.

Turning to employment figures, the South African government seems to struggle in its mandate to alleviate unemployment in any significant manner. At first glance the overall employment outlook seems positive. The number of employed people has grown for five consecutive quarters since the second quarter of of 2014 and national unemployment has decreased by 0.5% between the second quarters of 2014 and 2015. Unemployment for the economy is, however, still at 25%. It is also interesting to note that the labour absorption rate[2] or the employment-to-population ratio has grown over the period from 42.7% in the second quarter of 2014 to 43.5%. This effectively means that of the working-age population (15 to 64 years) only 43.5% of people are working (Stats SA, 2015b).

Statistics on manufacturing employment reveal a 1.3% decrease in real terms for the period 2003 to 2010 (Stats SA, 2012). In terms of employment, the statistics reflect what is seen in the trade balance. Manufacturing employment decreased by 0.2% from the third quarter of 2011 to the third quarter of 2012 (Industrial Development Corporation, 2012). When the formal non-agricultural sector is considered[3] growth in terms of employment for the year 2013 was marginal. Considering each quarter indivually shows a net growth of 0.4% for the year (Stats SA, 2015a). For the same sector there was a 0.2% decline in employment figures in the period between December 2013 and December 2014 (Stats SA, 2015a). From the first quarter of 2015 to the second quarter of 2015 employment decreased by 1.7% and on a year-on-year basis manufacturing employment has only grown by 0.7% (Stats SA, 2015b).

It is clear that South Africa's manufacturing sector is not achieving national goals of increasing manufacturing exports. Additionally it appears not only that the

[2] The proportion of the working-age population that is employed.
[3] Further disaggregated information is not available from Stats SA.

manufacturing industry is unable to create more jobs, it is struggling to retain current levels of employment.

1.3 Problem statement

The preceding paragraphs allude to the fact that South Africa has to promote its exports to contribute towards stimulating economic growth and employment growth. Finding new export opportunities and stimulating manufacturing exports can serve as a catalyst in achieving South African national policy objectives such as creating more jobs and stimulating economic growth (National Planning Commission, 2011). The focus of this study is to identify which South African manufacturing sectors hold the greatest economy-wide effects (focussing on economic growth and labour absorption) in the event of an increase in exports. After these sectors have been identified, the export opportunities for each of these top sectors will be identified. The identification of these top sectors can contribute towards a more focussed approach to export promotion in South Africa.

The research questions are therefore set out as follows:

i. Which South African sectors within the manufacturing industry hold the highest potential economic growth and employment creation if exports increase?
ii. What are the export opportunities for these South African manufacturing sectors?

1.4 Research objectives

The objectives of the study are to identify:

i. the South African manufacturing sectors that have the greatest effects on economic growth (GDP) and employment creation if exports are increased.
ii. within each of these manufacturing sectors, what are the realistic export opportunities (product-country combinations) in order to be able to be more focussed and effective with export promotion.

1.5 Research method

The research method for the study will consist of two parts; a literature review and an empirical study.

Phase 1: Literature review

The literature review is divided into two parts. The first section provides an overview of the literature pertaining to industrialisation and manufacturing and its effect on economic growth, along with a brief historical view of industrialisation and South African manufacturing. The second section focuses on the relationship between trade and economic development and a view of South Africa's current employment in the manufacturing sector.

Phase 2: Empirical study

The empirical study is divided into two parts:

i. A social accounting matrix (SAM) multiplier analysis was used to determine which manufacturing sectors hold the highest potential for economic growth and employment creation for South Africa when an export shock is applied. SAM multiplier analysis is used when an estimation is made to measure the effects of a change in one part of the economy upon the rest of the economy (a detailed description of the SAM multiplier analysis follows in chapter 3).
ii. A specific market selection instrument, namely the Decision Support Model (DSM) was then applied to determine the export opportunities (which markets to export to and the size of these export opportunities in terms of number and value), within those manufacturing sectors that hold the highest economy-wide benefits (especially economic growth and employment creation for South Africa). The DSM was constructed to assist export promotion organisations in selecting the best possible export opportunities and determining their export promotion strategies, by means of a four-stage filtering process (a detailed description of the DSM methodology is given in chapter 4).

Data for the study was collected from the UN COMTRADE statistics database, as well as the South African Reserve Bank for the construction of the social accounting matrix.

1.6 Chapter division

Chapter 1 provides the background and motivation for the study. The problem statement, research questions and objectives are also provided.

Chapter 2 offers a review of the literature with regard to industrialisation and manufacturing and its role in economic development. A historical view of South African manufacturing is also given. The relationship between trade and economic development is reviewed, as well as an overview of the South African manufacturing industry.

Chapter 3 discusses the method and results from the social accounting matrix (SAM).

Chapter 4 discusses the method of and results from the Decision Support Model (DSM).

Chapter 5 concludes the study with an overview of each chapter, along with key findings and recommendations for future study in this regard.

2. LITERATURE REVIEW: MANUFACTURED EXPORTS AND EMPLOYMENT

2.1 Introduction

This chapter provides an overview of the literature reviewed, specifically pertaining to manufacturing and the relationship between increased manufactured exports and employment. Reviewing the literature emphasises the importance of increased exports for South Africa within the manufacturing sector.

The chapter is sub-divided into two sections. The first section (2.2) addresses industrialisation while the second (2.3) reviews international trade. Each sub-division consists of two parts: the first part of each sub-division addresses the theory as seen in the literature while the second part reviews the relevance of this specific aspect of literature to South Africa. Section 2.2.1 views international literature on industrialisation and manufacturing and its effect on economic growth and development. Section 2.2.2 specifically investigates the history of industrialisation and manufacturing in South Africa. Section 2.3.1 analyses the literature on the link between trade and economic development. Section 2.3.2 then investigates the current employment situation in the South African manufacturing sector.

2.2 Industrialisation and manufacturing: contribution to economic growth and development

An overview of industrialisation and its impact on economic growth and development is provided in this section. Manufacturing that came about as a result of industrialisation is specifically discussed. Furthermore, this section views the history of industrialisation and subsequent manufacturing in South Africa.

2.2.1 The role of industrialisation and manufacturing in economic growth and development

A shift in production that started in the late 18th century moved productive activities away from agriculture towards industry. Technological breakthroughs in the production of textiles, as well as the application of steam energy also led to a change in manufacturing. This allowed for new levels of human labour output to be possible (Szirmai, 2012). This process is best described as industrialisation (Kemp, 1978).

According to Kemp (1989) industrialisation is widely seen as a major means for growth, referring to increasing per capita income, as well as creating a more balanced structure in the economy.

Industrialisation is traditionally viewed as starting in Britain, and from there spreading throughout Europe to North America. The process of change in productivity distinguished the 'advanced' countries from the 'backward' ones and brought about changes in lifestyles and forms of labour that announced the dawn of the modern world. Industrialisation caused the world to be divided into industrial economies and agricultural economies since the mid nineteenth century (Lewis, 1978a,b; Maddison, 2001, 2007). This differentiation would lay the foundation of what would later be known as developed and developing economies.

Due to higher manufacturing output potential in developed economies, there was a higher demand for primary agricultural and mining goods to sustain these levels of output. Consequently, developing economies supplied developed economies with primary goods to sustain manufacturing. Developing economies would then repurchase these goods in the form of manufactured goods from these developed economies at much higher prices to assist with the production of primary agriculture and mining goods. Technological advances and infrastructure improvement allowed for more effective means of trade to facilitate this process (Szirmai, 2012).

Industrialisation played a significant role in changing the structure of manufacturing and adding value to the economy. Various studies (Kuznets, 1966; Chenery *et al.*, 1986; Chenery & Srinivasan, 1988) that have viewed industrialising countries and current developed economies indicate that, at an aggregate level, economic development is characterised by structural change that is marked by an initial rise in industries and an eventual decline of these industries. These structural changes are seen to follow the following three stages: i) primary goods production dominates the economy (usually agriculture), ii) industrialisation and then iii) the developed economy. The last stage is characterised by a decline in industry and more specifically a declining contribution from manufacturing to GDP and employment. Services then start to play a more prominent role in both GDP contribution and employment.

Wells and Thirlwall (2003) analysed data from 45 African countries for the period 1980 to 1996 and found that the GDP growth rate was both positively and strongly related to the degree to which manufacturing grows faster than agriculture and services. However, agriculture still plays an important role in employment in middle-income economies. Black and Gerwel (2014) point out that even though agriculture accounts for a small and often declining share of output in middle-income economies, its share of employment is often three or four times that of its output. This highlights the importance of the agricultural sector for the welfare of low-skilled, lower-income communities.

Szirmai (2012) makes some interesting observations with regard to industrialisation and economic growth in developing economies. His study on industrialisation as an engine of growth in developing countries, presents data on structural change for 67 developing economies and 21 advanced economies over the period 1950 to 2005. The study challenges the traditional thought that manufacturing was in fact the driver of most modern-day economies, implying that current developing economies should follow the same growth path. Data shows that developing economies[4] already had well-established service sectors by 1950, where the average contribution to GDP was 40%. This was a mere 3% behind advanced economies' average contribution from the service sector to GDP. This poses a very different picture to the traditional growth path of having a dominant manufacturing sector before services start to make a significant contribution to GDP. However, in 1950, the average contribution from manufacturing to GDP was 11% in developing economies compared to 31% in advanced economies. Over time a contraction in manufacturing in advanced economies, together with rapid growth in most developing economies' manufacturing sector, narrowed this gap significantly. In 2005, developing economies' manufacturing share in GDP was 18% in comparison to advanced economies' 17%. The study concludes that no other sector of the economy has had such a significant effect on economic growth as manufacturing for both developing and advanced economies. It also concludes that manufacturing has many inter-industry linkages, opportunities for capital accumulation and positive spill-over effects. It does however pose the question whether manufacturing will continue to play such a prominent role

[4] Malaysia, Taiwan, Sri Lanka, Philippines, South Korea, Argentina, South Africa, Brazil, Chile, Colombia, Mexico, Venezuela, Egypt, Ghana – all above 40%

for developing countries and acknowledges that further research is required in this regard.

McCausland and Theodossiou (2012) conducted a study as a consequence of renewed interest in Kaldor's law. Kaldor proposed that manufacturing acts as the engine of economic growth and that there is a positive correlation between the growth of a nation's manufacturing output and its growth in GDP (Kaldor, 1967). This renewed interest in Kaldor's view is fuelled by structural changes in developed economies that see a decline in industry and a rise in services, as also mentioned earlier. The study uses a panel data estimation for eleven countries to examine whether Kaldor's theories still hold true. They conclude that in spite of the growing size of the services sector, services do not have the same effect on the broader economy as manufacturing. It confirms that growth in manufacturing output is still an important determinant of GDP growth (McCausland & Theodossiou, 2012).

An interesting study by Mollick and Cabral (2008) examined the effects of labour productivity and total factor productivity on employment across 25 Mexican manufacturing industries for the period 1984 to 2000. The study found that higher productivity exerts positive effects on employment within the manufacturing sector. In this regard, higher manufacturing output correlates positively with employment which in turns allows for greater manufacturing output to be possible.

It should be noted that Sturgeon and Gereffi (2009) point out that learning plays a key role in industrial upgrading. Economies that are behind in terms of development need to absorb knowledge that is generated elsewhere. This emphasises the need for skilled labour within the economy. However, this study does not investigate competencies of labour and its effect on industry and the economy as a whole.

From the literature it is clear that industrialisation has positive effects on manufacturing output and employment growth, which in turn cause positive economic growth and promote economic development.

2.2.2 History of industrialisation and the manufacturing sector in South Africa

Since the focus of this study is on the manufacturing sector of South Africa, this section briefly provides an overview South Africa's economic history, with specific reference to the manufacturing sector.

2.2.2.1 Early beginnings

Early documented economic activity in South Africa dates back to the 1500s when Portuguese seafarers pioneered the sea route to India and made frequent stops along the South African coastline to replenish their fresh food supplies by means of barter (GCIS, 2013).

In 1652, the Dutch East India Company (VOC) set up a station in what is known today as Cape Town to supply passing ships on their way to the East with fresh food and water. This station soon allotted arable land to European farmers in the local Cape area that established the foundation of the agricultural industry of South Africa as it exists today (GCIS, 2013).

The British soon took control of the Cape and incorporated it into its colonial empire. This brought about 4500 British settlers arriving at Algoa Bay (Port Elizabeth) in 1820. These settlers were people from various occupations and they brought with them knowledge about industry. The development of South African industry was very slow and operated on a small scale, compared to other British colonies. However, the discovery of diamonds and gold in the late 19th century was the dawn of the mining industry in South Africa, which subsequently led to many manufacturing support industries to be established (GCIS, 2013).

2.2.2.2 Diamonds and gold

By 1870 the Cape was the centre of manufacturing with around 70 manufacturing firms[5]. These were mainly brickfields, fish-curing firms, steam flour mills, soap and candle factories and iron and brass factories. Manufacturing centred around the local market for the most part, esuring the local Cape economy produced most of its own basic consumables.

Growth and manufacturing output accelerated rapidly from 1870 with the discovery of gold on the Witwatersrand in Johannesburg, coupled with the discovery of diamonds close to Pretoria and Kimberley respectively. Continuous growth of the mining industry required of other manufacturing sectors to provide equipment and services (mechanical service depots, mining equipment provision and related services, transport), thus stimulating manufacturing. However, politics and the

[5] No reliable data could be found on manufacturing output before this period.

Anglo-Boer War of 1899 caused a temporary slowdown in South African industry. Yet, during the years 1890 to 1910 the number of factories still grew from 550 to 1500 (Coleman, 1983).

However, manufacturing was still in its infancy. Before the Anglo-Boer War there were mainly two strategies that existed to encourage industry. The first was to grant sole right to operate an industry to businessmen. This grant could last up to 30 years. For the most part, the manufacturing of new products was scarce. Most businessmen went about importing goods and then just packaging those raw materials properly or assembling goods. This system established the production of explosives, cement, bricks, tiles, leather, liquor, sugar and paper, amongst some others (Jones & Müller, 1992).

The second way of encouraging manufactures was imposing high import tariffs to protect some of the local industries. The dawn of the First World War forced South Africa to be more self-sufficient. In Britain and Europe the production of civilian goods was stopped which allowed the South African market to be naturally more protected. This also offered South Africa the opportunity to export to these disrupted markets. However, a lack of capital equipment and other imported materials was often a constraint on South Africa's ability to sustain these levels of production and exports. Estimates are that South African industrial output during 1917 to 1920 increased by 43%, after allowing for inflation (Jones & Müller, 1992).

2.2.2.3 Iron, steel and mining

The early 1920s saw the dawn of the iron and steel industries in South Africa. A Bill that was presented to Parliament to create the South African Iron and Steel Corporation (Iscor) in 1927 was rejected and even opposed by the public. However, in 1928 the Bill was passed and it was decided that Iscor would be jointly owned by government and the public.

In 1932 the share offer was made and very few private investors bought shares, due to the heavy weight of the depression. In April 1934 Iscor produced its first steel (Jones & Müller, 1992:169). The impact of Iscor, in spite of opposition, was drastic and almost immediate. According to Coleman (1983:209) employment in the metal products and machinery subsector of manufacturing increased from 25 800 to

56 400 over the period 1932 to 1939. For the same period net output increased from around £10-million to almost £33-million. This significant growth might also be attributed to the revival in the gold industry after the devaluation of the South African pound in 1932 (Coleman, 1983).

However, the recovery in international steel prices in 1937 allowed Iscor to quickly outgrow its capacity. Original capacity was 142 000 metric tons of steel, but by 1940 production reached 320 000 and profits were well in excess of £1-million (Jones & Müller, 1992:168-170).

The Second World War posed a new set of challenges for manufacturing in South Africa. In 1940 the South African government created the Industrial Development Corporation (IDC) to support industry. During the war, the IDC focussed on making the country more self-sufficient as various sources of imports started to dry up as countries involved in the war poured all their resources into war-related industries. Some consumer goods were to be in short supply for the entire war period. However, a decrease in foreign competition coupled with the needs of the Allied Forces created new opportunities for South African manufacturers. As Jones and Müller state (Jones & Müller, 1992:171), "South African-made military boots were in great demand because of their comfort and durability." The war period also cemented the value of the steel industry in South Africa, as various new Iscor products were used in the war for armourplating, grenade and bomb casting, as well as military bridges.

The unprecedented growth of the 1940s continued through the 1950s and into the early 1960s. In 1948, industry[6] contributed 23% to GDP. By 1970, the contribution was 31% and industry's contribution was almost twice that of agriculture and mining combined (Feinstein, 2005). New gold mines and uranium plants made a large contribution to manufacturing as they required capital equipment and industrial stores. The diversification of the mining industry caused mines to not only stimulate manufacturing demand, but also become involved in secondary industry themselves. Anglo American, especially, made a large contribution to the manufacturing sector. The big mining companies could afford to make massive investments into industry, because of foreign investment, technical skills and knowledge and managerial

[6] Manufacturing, construction, electricity, gas and water.

resources. This added further momentum to a rapidly growing manufacturing sector (Houghton, 1976).

2.2.2.4 Protectionism

Throughout the 20th century South Africa followed a strict regime of protectionism (Feinstein, 2005). These measures of protectionism were part of government's drive to support industrialisation of the economy. Two examples of the success of these measures are the development of South African Pulp and Paper Industries Ltd. (SAPPI) and the automotive industry.

SAPPI illustrates the effect of the policy implemented by government which guaranteed market share to local manufacturers. SAPPI was established by the Union Corporation, one of the large mining houses. The idea was to supply the local market with newsprint and paper from local supplies of timber, which up to that point had been imported. The plant required large capital outlays for specialised capital equipment. The agreement was that government would not issue any new import permits for newsprint or any other type of paper before the local market had absorbed SAPPI's total output, thereby protecting Union Corporation's investment and guaranteeing a risk-free venture. Government gave the same guarantee with regard to future growth in capacity, protecting it against foreign competition (Feinstein, 2005:181).

Government control was also an important part in establishing the local motor vehicle industry. As early as the 1920s Ford and General Motors established local assembly plants for their imported vehicles. In spite of government's efforts, local manufacturers only contributed 17% of assembled vehicles by the 1950s. Locally manufactured components were, however, not functional parts, but rather tyres, glass and batteries. These were not high value-added components. Local demand for vehicles was growing and, adding to the country's already high propensity to import, caused government to initiate an import-replacement programme for motor vehicles in 1960 (2005:182). The idea was that this industry would act as means of increasing local manufacturing capacity and capability, whilst acting to improve the balance of payments (due to the high and growing demand for vehicles). The initial phase (Phase 1) saw tariff protection offered on various items, as well as excise duty rebates for manufacturers who exceeded the minimum level of local supplies. Phase

2 was initiated in 1964 where the aim was to move toward a level of supply where at least 55% of the components (by weight) were manufactured locally. Phase 3, announced in 1969, aimed at moving the figure up to 66% by 1976 and also gradually to start including commercial vehicles into the programme.

The programme was successful in expanding employment and expertise, but at a high cost to foreign capital. Due to the component make up 'by weight', multinationals used low value, high weight components to be locally manufactured, translating into 66% of components (that were locally made) only amounting to 40% of the vehicle's final value. Foreign capital equipment that was required for both the assembly plants, as well as component manufacturers remained a burden on the balance of payments. In addition, government decided to distance itself from further intervention to be more in line with a free enterprise system. Consequently, no further restrictions were placed on the number of manufacturers, leading to a relatively small demand being divided among many small manufacturers. This led to underperformance of component manufacturers in terms of output. Due to the high number of small manufacturers that each required its profits, the cost of production per vehicle was 45% higher in South Africa than it was by US standards in 1965 and 62% higher in 1976 (Feinstein, 2005:180-183).

More direct government intervention was initiated by the IDC, which started operating as an industrial bank. By 1973 the IDC had a portfolio of R484 million worth of assets and used these to fund various projects. These included Iscor, Foskor (production of superphosphates for agricultural purposes), SASOL and Armscor. SASOL was possibly the most important project the IDC ran. Established in 1950, the South African Coal, Oil and Gas Corporation (SASOL) aimed at transforming coal (which was available in abundance) into gas, and gas into petrol, diesel and other liquid products (Jones & Müller, 1992). The project was too large to be funded solely by the private sector and also had immense strategic value to the country's oil supply as various sanctions were being imposed on South Africa due to its racial policies. The vast amounts of capital were mainly provided by the IDC and eventually the project achieved its primary aim and played a pivotal role in developing the wider petro-chemical industry (Feinstein, 2005:183-184).

It is clear that protectionism played a large part in the development of the South African manufacturing industry.

2.2.2.5 Growth slowdown and the post-Apartheid era

The 25 years following the Second World War (1939-1945) saw unprecedented growth in the South African economy. Over this period real GDP grew by 5% per annum, while the 1960s also witnessed an average real GDP growth of 5.8% per annum and per capita income rose by more than 3% per annum. Recessions were merely slowdowns in growth where the pace of growth decreased, rather than growing negatively.

The industrialisation period of 1930 to 1960 laid the foundation for manufacturing to be the leading sector contributing to GDP in South Africa. The nature of manufacturing during this period was driven by the availability of antural resources. As a result manufactures during this time were centered around primary products (gold, iron, coal, steel, diamonds, timber and pulp) with less of a focus on value added production (for example SASOL). However, real value added in manufacturing grew by an average of 7.1% per annum in the 1970's, while real GDP grew at an average of 5%. Manufacturing played a critical role both in GDP contribution and as a source of employment. Manufacturing employment figures doubled over the period 1960 to 1975 from around 650 000 to more than 1 300 000 jobs.

However, the early 1970s saw a rapid decrease in both economic and industrial growth. Annual GDP growth dropped from 5.8% in the 1960s to 3.4% in the 1970s to a mere 1.1% in the early 1980s. Real value added in manufacturing showed a similar pattern of slowed growth. During the 1980s unemployment figures rose and per capita income started decreasing (Jones & Müller, 1992). Various factors contributed to this broad slowdown in the South African economy. Some were exogenous and others were due to endogenous factors. Feinstein (2005:202) offers three economic explanations for the deterioration of the economy during this period:

i. The position of the gold mines was reshaped due to negative changes in both local supply and international demand. After the richer seams of gold had been exhausted, the cost of production increased. Contrary to this, the international view that gold was the ultimate reserve of value lost its position

in the international monetary system. However, this shift in international perception was not immediate. In fact, during the 1970s the international gold price continued to rise. But the 1980s saw a dramatic plunge in the international gold price which brought the engine that moved the South African economy forward to a grinding halt.

ii. From the 1970s, trade and output – which saw rapid growth rates after the Second World War – experienced a rapid slowdown in growth. Higher oil and other commodity prices caused severe inflationary pressure on South Africa. Coupled with higher exchange rates, it was even more difficult for manufacturers to export. When these trends normalised, political pressure on South Africa led to a decrease in confidence in the country and a substantial outflow of capital from the economy.

iii. The final cause was the continuous weaknesses (being resource dependent, as well as having a high propensity to import) in the South African economy that caused high costs of production and low levels of efficiency. These structural weaknesses could no longer maintain the economy's momentum as international economic conditions became more challenging and political pressure on South Africa mounted to a breaking point.

By 1986 some of the Apartheid era's economic policies and constraints were rolled out of the way, but there were still great disparities between black and white citizens. By 1994 South African output per worker fell considerably below that of many other countries. South Africa continued to have a poor standard of labour productivity which was mirrored in the fact that South African labour productivity was between 20% and 50% of that in developed countries and between 50% and 75% of that in other developing countries (Golub & Edwards, 2003).

This problem was amplified by the fact that South African labour may have been 'cheap', but it certainly wasn't inexpensive. In other words, it is not the level of wages alone which matters, but the level of productivity that goes with those wages. The relationship known as unit labour cost is widely seen as an accurate indication of international competitiveness. For the period 1990 to 1994 South African unit labour cost was 59% higher than a group of eleven leading developing economies. Most of these economies are Asian and they also tend to be the largest exporters of

manufactured goods to developed markets, creating competition for South African manufacturers that they simply cannot compete with (Feinstein, 2005: 244-246).

2.2.2.6 More recent economic policy and competitiveness indicators

The challenges facing the new South African democracy under the ANC-led government are not just challenges relating to economic policy. As mentioned earlier, government recognises the need to address various social, economic and political issues, while creating a sustainable, inclusive economy. Various policy documents have been developed since the first democratic elections in 1994 of which the latest is the National Development Plan (NDP) – see section 1.2.1.

The first document to be put forward in the post-Apartheid South Africa was the Reconstruction and Development Programme (RDP). This was part of the African National Congress' primary socio-economic policy for the 1994 democratic elections (South African History Online, 2014). The main focus was on creating an equal society where all South Africans are educated and have equal job opportunities. The RDP was replaced due to its inability to be fully functional in the fiscal and economic environment of that specific period. As a result, the growth, employment and redistribution (GEAR) plan was presented in 1996 with a focus on creating 400 000 jobs per annum by the year 2000 at a GDP growth rate of 6% per annum (Department of Finance, 1996). GEAR had a broad focus which included improvement of non-gold exports, investment in the public service sector and investment in infrastructure development through labour-intensive methods (Department of Finance, 1996). However, the Accelerated and Shared Growth Initiative – South Africa (ASGISA) was presented in 2004 during President Thabo Mbeki's incumbency (SAHO, 2014) as a means of addressing the inability of GEAR to create sufficient jobs for the economy. The main focus of ASGISA was to halve unemployment and poverty by 2014 – that would mean less than 15% unemployment – and raise GDP to above 6% (The Presidency of South Africa, 2004). These goals never materialised. The most recent document, the NDP, was officially accepted by government in 2011 and it has two main aims: to create an

additional 11 million jobs by 2030 and to create and maintain an annual GDP growth rate in excess of 5% (National Planning Commission, 2011)[7].

Over the years these policy documents were set out with noble intentions, but seldom achieved its goals. The medium term strategic framework (MTSF) set out by the African National Congress (ANC) as guideline for the next electoral term (2014-2019), emphasises that unemployment remains at high levels and growth has been stagnant (The Presidency, 2014). South Africa's competitiveness has been affected by its lacklustre economic performance. The following table compares the BRICS countries and their ranks according to two competitiveness indices, namely:

i. The Global Competitiveness Report's Index (GCI) which measures competitiveness across 12 pillars (World Economic Forum, 2014b). These pillars do not only consider manufacturing competitiveness, but take a broad view of the economy. Some of the key pillars are: institutions, infrastructure, macro-economic environment, healthcare, education, labour market efficiency and financial market development.

ii. UNIDO's Competitive Industrial Performance (CIP) Report which includes a composite index that measures a country's ability to manufacture and export goods competitively (UNIDO, 2013). The CIP is constructed from three main dimensions. These three dimensions are each country's capacity to produce and export manufactures; technological deepening and upgrading; and world impact.

Table 2.1: Indices measuring South African competitiveness against BRICS counterparts

Country	GCI ranking 2013/14	CIP ranking 2012/13
Brazil	56	33
Russian Federation	64	36
India	60	43
China	29	7
South Africa	53	41

Source: World Economic Forum (2014b) *and UNIDO* (2013)

[7] For a broader examination of these various policy documents, refer to Chapter 1 of the NDP (see National Planning Commission, 2011).

Table 2.1 indicates that South Africa has a fair ranking in terms of competitiveness when compared to its BRICS counterparts. Despite the fact that South Africa ranks fairly well among its BRICS counterparts in the World Economic Forum's GCI, it appears to be of lower rank when an industrial view is taken of these countries (CIP rankings).

To gain a greater perspective on these rankings, table 2.2 offers the CIP rankings over an 18-year period.

Table 2.2: BRICS CIP rankings from 1995 - 2013

Country	1995	2000	2005	2013
Brazil	29	31	34	33
Russian Federation	36	39	36	36
India	48	52	52	43
China	26	23	18	7
South Africa	37	42	39	41

Source: UNIDO (2013)

It is of great concern that South Africa seems to be on a decline in terms of the CIP rankings, while India and especially China seem to be consistently improving their industrial competitiveness. These figures depict a trend that predicts that India can soon overtake South Africa with regard to industrial competitiveness. Even though these tables do not disclose the details of each report, it does reflect South Africa's rather lacklustre performance in comparison to other developing countries.

This concludes this section that provided a brief history of South African industrialisation and manufacturing industry which intended to provide context for the rest of this study.

Since the focus of this study is on export promotion of the South African manufacturing sector, the next section highlights the link between international trade and economic development and provides an overview South Africa's manufacturing trade and employment.

2.3 International trade and economic development

International trade and economic development form the basis for this section. The section is divided into two sub-sections. Section 2.3.1 provides a literature overview of the link between international trade and economic development, after which

section 2.3.2 addresses the current state of the South African manufacturing industry's trade and employment.

2.3.1 The link between international trade and economic development

Trade is a generator of economic well-being (Appleyard, Field & Cobb, 2010). The neoclassical theory of international trade by Heckscher (1919) and Ohlin (1933) assumes that countries take advantage of the exogenous differences in resources, technology and taste that exist between trading parties. Trade then yields productivity gains and helps with the flow of goods internationally. These were preceded by David Ricardo's theory of comparative advantage (1891) that stated that gains from trade are available to both parties in an international trade transaction even when an absolute advantage is held by one party on both traded products. This is because of differences in factor endowments and technological advances that create opportunity cost. However, the new trade theory by Helpman and Krugman (1989) reverses some of the unrealistic assumptions of the neoclassicists. Imperfect competition and increasing returns to scale are assumed. However, gains from trade are still attainable under this theory (Singh, 2011).

Contrary to these trade theories, the neoclassical theory of economic growth (Solow, 1956; Swan, 1956) does not recognise the role of trade in economic growth. The assumption is made that an increase in factor inputs (capital and labour) drives economic growth and any residual growth values are left to exogenous technological progress that is not affected by trade.

The post-neoclassical endogenous theory of economic growth (Romer, 1986; Lucas, 1988) specifically models these technological advances and supposes that endogenous factors, including trade, do have positive effects on productivity and economic growth. Multiple studies point out that increased access to technology, intermediate and capital goods as well as the reduction of corruption and increase in competition are the most prominent trade-related factors that cause long-term growth (Grossman & Helpman, 1991; Sachs & Warner, 1995; Edward, 1998).

The assumption that international trade and economic growth have a positive relationship does necessitate further study into the nature of this relationship. Dodzin and Vamvakidis (2004:326) conducted estimates from a panel of 92 countries over

the period 1960 to 2000. “Despite the existence of a large body of empirical literature on the impact of openness on growth, no study has examined the impact of trade liberalisation on different sectors of production in developing economies”. Consequently they examined the effects of trade liberalisation on three main sectors of the economy, i.e. agriculture, industry and services. They argue that determining which sectors react positively to trade liberalisation has specific policy implications. The empirical evidence from the study highlighted that trade liberalisation for the 92 countries under review for the period 1960 to 2000 produced output growth in the industrial sector, albeit at the expense of the agricultural sector, while services showed no noteworthy differences. The study concludes that openness to trade has a positive effect on industry’s production. These findings therefore indicate that openness to trade leads developing countries to industrialisation.

In a study on Senegalese exports by Colen, Maertens and Swinnen (2012:1086-1087) it is indicated that as an industry positions itself for increased exports, it increases the employment conditions, employment opportunities and employment periods for poor households in such an industry.

An empirical study on the relationship between foreign trade and employment in the Southwest minority region of China (Xiong, et al., 2012) found that GDP growth and international trade can promote employment growth, while imports in themselves cannot promote employment effectively.

An analysis of trade contractions conducted by Kucera, Roncolato and Von Uexkull (2012:1126) indicates that international trade is positively correlated to employment. The study focussed on the effects of international trade contractions on employment, as a result of the global financial crisis. Based on import mirror data from the USA and the EU, it is estimated that, due to contractions in South Africa’s exports as a result of the crisis, an estimated 886 000 jobs were lost and a possible 77 000 “possible jobs created” were lost in South Africa.

In terms of the impact of international trade on employment it is, however, important to keep in mind that even though export can drive growth, it does not always correlate directly with more labour absorption. Certain (more labour-intensive) industries are more conducive to increasing employment. Various factors, such as policy bias, public sector involvement, levels of productivity and pubic sector rural

development spending, play a role when determining whether an industry would absorb more labour as a result of increased trade (Babatunde, Oyeranti, Bankole & Ogunkola, 2012).

More apparent is that an increasing number of developing countries seek to become part of high value activities in global value chains (GVCs)[8], in conjunction with having industrialisation export strategies as a means of economic growth stimulation. Governments and entrepreneurs alike seem to recognise that participation in international value chains and production networks are also keys to economic growth (Gereffi, Humphrey, Kaplinsky & Sturgeon, 2001). GVC's are especially attractive to government export promotion agencies with industrialisation strategies, as participation in GVC's do not require extensive after-sales and customer care effort (Gereffi & Lee, 2012).

Lall (2000) finds that technological composition and the degree of technological advancement play a significant role in the performance of developing a country's exports. Comparing world trade statistics with those of a group of developing countries and the world's largest developed countries over the period 1985 to 1998, Lall finds that, world-wide, manufactured exports grew nearly three times as fast as primary exports. Within manufacturers, resource-based products grew the slowest and high technology products grew the fastest. He notes that low technology and medium technology products grew at the same rate, but medium technology products (where capital equipment and intermediary goods are included) constituted the largest part of manufactured exports. These high-value products in turn increase a country's export value without requiring the same volumes as lower value products.

Montobbio and Rampa (2005) conducted a similar study that viewed nine large developing countries and their exports. The study analysed the relationship between technological innovation, export performance and economic stimulation on country and sectoral levels. Montobbio and Rampa acknowledge that various factors are to be considered when looking at the effect that technologically-intensive exports on economic growth; skill levels, foreign direct investment, technical capabilities and

[8] Global value chain is the term used when production activities are coordinated across various geographies. See https://globalvaluechains.org/concept-tools

productivity. The study points out that these exports are of higher value with lower or similar volumes. The paper finally suggests that technological activity is related to export gains and economic growth. Thus, these high value exports can have greater positive effect on the local economy if it is positioned as an economy that is driven by the production of high technology products.

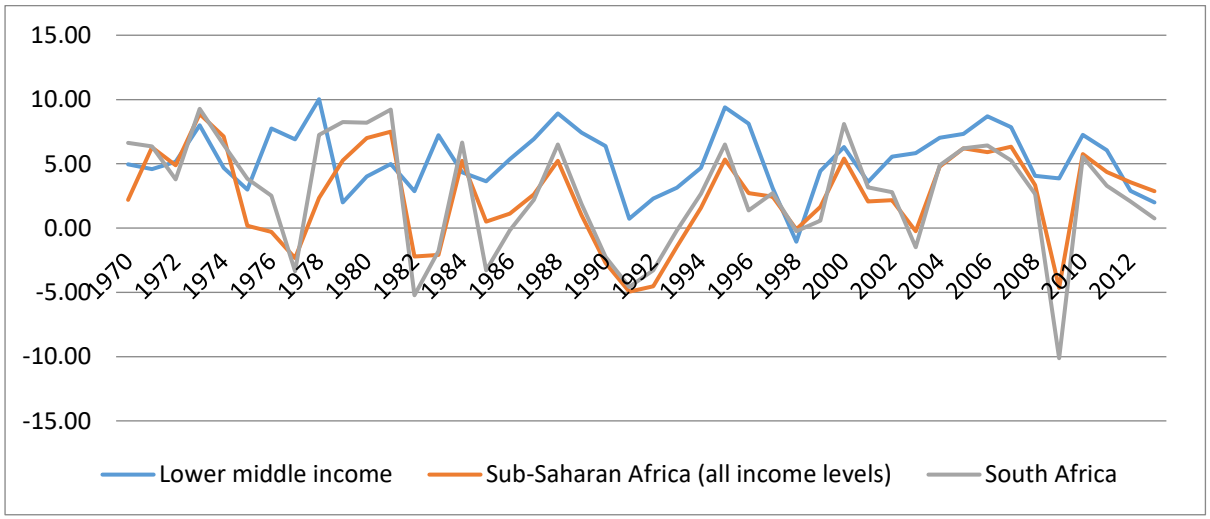
Consequently, it can be deduced that increased trade – more specifically, manufactured exports – has positive effects on economic and employment growth.

2.3.2 Current employment in the South African manufacturing sector

This section links to section 1.2.2 and aims to elaborate on the current situation within the South African manufacturing industry.

Figure 2.1 shows the annual growth percentage South African manufacturing value added (MVA) *versus* lower-middle income and Sub-Saharan African countries (includes South Africa).

Figure 2.1: Manufacturing[9] value added (annual growth %)



Source: World Bank (2014).

It is noted that South Africa's annual growth rate for MVA moves very closely with Sub-Saharan Africa's. However, due to the fact that there are very few other manufacturing countries in Sub-Saharan Africa apart from South Africa, the growth mean for this region might be largely influenced by South Africa and consequently

9 The World Bank defines manufacturing as industries belonging to International Standard Industrial Classification (ISIC) divisions 15-37.

the average growth for this region reflects South Africa's growth rate rather than the other way around. Of concern, however, is the fact that South Africa continuously performs below the average of the lower middle-income countries' MVA growth rate.

Despite the great effort at the national level to increase manufactured exports the sector has seen a slowdown in recent years (see section 1.2.2).

Severe as it was, the global financial crisis does not fully explain why South Africa continues to see an expanding current account deficit. As referred to in section 2.2.2, South Africa traditionally has a high propensity to import. These factors are sufficient to justify a more aggressive approach to manufactured goods export promotion.

Section 1.2.2 alluded to various statistics that confirm the lacklustre performance of the manufacturing sector in terms of exports and employment creation. When considering manufacturing production and sales, Statistics SA (2014) reveals that between November 2012 and November 2013, manufacturing output grew by a mere 0.3%. Seasonally adjusted figures for the three months ending November 2013 show that six of the ten manufacturing divisions in the country recorded negative growth when compared with the previous three months (Stats SA, 2014b). Section 1.2 also mentioned the poor state of employment in the manufacturing sector that has been in a decline in real terms.

In 2011, the respective contributions of the three main economic sectors to South Africa's GDP were as follows (Stats SA, 2013):

- Primary – 12.3%
- Secondary – 19.4%
- Tertiary – 68.3%

Despite the critical role it plays in the South African economy, the manufacturing sector's contribution to GDP has declined in real terms from 19% in 1993 to 17% in 2012 (Stats SA, 2013).

Obinyeluako and Sako (2014) viewed the interaction between the manufacturing and service sectors of South Africa. They indicate that even though the broad perception is that the service sector is in a constant employment growth phase, statistics from the study show that the sector's employment growth has been declining from 2007 to 2011. Manufacturing employment has also not grown during this period, and has

maintained a negative employment growth rate. Yet, manufacturing contributes around 53% of South Africa's exports, while services recorded only 16%. The study also emphasises the fact that manufacturing has not had a positive annual trade balance going back to 2000. The subsectors within manufacturing that do continue to record positive trade balances are less technologically intensive. These include food processing and basic chemicals. At the same time electrical machinery, machinery and other equipment continue to struggle. South Africa's high value manufactured imports continue to strongly offset mostly low technological intensive exports (Obinyeluaku & Sako, 2014).

Clearly, South Africa's manufacturing sector is not growing its exports in line with national goals. In addition, not only does the sector appear to be failing to create more jobs but it is struggling to retain current levels of employment.

2.4 Summary

This chapter provided the literature background to the study.

The first section of literature addressed industrialisation while the second related to international trade and development.

The literature pointed out that industrialisation results in positive effects in the form of manufacturing output and employment growth. These effects then result in positive economic growth and economic development.

The literature pertaining to international trade concluded that increased trade, more specifically manufactured exports and high value exports, has positive effects on both economic and employment growth.

After considering South Africa's current trade and employment statistics for the manufacturing sector, the conclusion is drawn that South Africa's manufacturing sector is not growing its exports in line with government goals, nor is the manufacturing sector retaining current levels of employment, much less creating new employment opportunities.

This study aims to contribute to the export promotion of the manufacturing sector in South Africa by identifying the manufacturing sectors for which exports will have the most benefits for growth and employment within the country. New export

opportunities in each of these sectors will also be identified to inform export promotion organisations' strategies (see chapter 4).

Chapter 3 discusses the method and the results of the social accounting matrix used to determine the sectors within the South African manufacturing industry that have the best multiplier effects on economic growth and employment when an export shock is applied.

3. IDENTIFYING KEY MANUFACTURING SECTORS FOR GROWING EMPLOYMENT: A SAM MULTIPLIER APPROACH

3.1 Introduction

The following two chapters present the methodological and analytical framework of the dissertation. The current chapter aims to apply a Social Accounting Matrix (SAM) Multiplier Analysis to identify those sectors within the manufacturing industry that have the greatest potential to drive economic and employment growth through the promotion of exports. Identifying these sectors is an important part in the process of prioritising the manufacturing sectors in terms of export promotion. Prioritising these manufacturing sectors can aid government in achieving its policy goals of growing the economy and stimulating employment creation through increasing exports (see chapter 1.2.1). For this, the next step is to apply the Decision Support Model (DSM) to identify the realistic export opportunities for these sectors in Chapter 4.

The remainder of this chapter is structured as follows: the next section discusses the data used in the execution of the multiplier analysis methodology. This is followed by a discussion of the multiplier analysis method. The second part of the chapter provides some insight into the SAM multiplier results. The results discussion commences by analysing all sectors using various macro-economic metrics and concludes by discussing the top five sectors with the greatest economy-wide benefits in more detail.

3.1.1 The data: Social Accounting Matrix (SAM)

This section provides a brief description of the data used for the multiplier analysis to assess the impact of increased manufactured exports on selected macroeconomic and labour market indicators in South Africa.

As the study endeavours to identify the impact of increased exports on various macro-economic indicators, a Computable General Equilibrium (CGE) model is best suited for the task. According to Dervis *et al.* a CGE model is "*an economy-wide model that includes feedback between demand, income and production structure, and where all prices adjust until decisions made in production are consistent with decisions made in demand*" (1985:132). However, the most recent CGE models that are publicly available for South Africa use databases that date back to 2005/2006

(Stats SA, 2001). This poses a challenge in terms of the accuracy of the data for current use as this model and its data are more than ten years old.

Accordingly, this study employs a SAM Multiplier Analysis (SAMMA) as an alternative to the CGE modelling approach and is seen as a sufficient method for determining the relative impact of increased exports across manufacturing sectors. A SAMMA is efficient in the sense that it can employ multi-sectoral analysis in an accurate and comprehensive manner, measuring the flow of transactions within the economy from income to the expenditure or outlay (Sadoulet & de Janvry, 1995).

The core or data used to perform the multiplier analysis is a SAM. The structure of a SAM is simple. Round (2003) states that a SAM has three main features: First of all, accounts are displayed in a square matrix where the income and expenditure for each account are displayed in the corresponding row and column of the matrix (see table 3.1). The transactions are displayed in each cell, thus the connections between the various accounts are clear. Secondly, a SAM is a comprehensive system. All economic activity of the system is published in the SAM (production, consumption, accumulation and distribution), albeit not in equal detail for each activity. And thirdly, a SAM is flexible. Even though a basic framework is in place for the functioning of a SAM, there is scope for various levels of disaggregation desired or specific emphasis on different parts of the economic system. Blancas (2005:30) clearly explains the structure of a SAM as "*a double-entry bookkeeping table, which can be used to display national income and product, inter-industry flows, flows of funds, and other combined sets of accounts*." Consequently, row and column totals need to correspond to ensure a balanced system.

Apart from just being an accounting system to measure the flow of economic activity within the economy, a SAM has households at the core of its focus. Hussain Ali Jafri, *et al.* (2003), indicate that some of the most popular impact analysis models used include input/output (I/O) and SAM-based models. These models are, however, not exactly the same. There is one big difference between I/O and SAM models and that is scope. I/O models simply provide an analytical framework of an economy with the purpose of analysing the interdependence between industries within that specific economy. A SAM uses the same I/O tables as a basis in its composition, but national income statistics and household income and expenditure are also added.

Consequently, a SAM provides a much broader and realistic view of the economy with various transactions and industry linkages being considered as well as their social background.

The SAM provides the information for the economic and social structure of the economy as well as providing a broad framework to understand income formation within the economy, whether locally or nationally. This also provides the database for a multiplier model (Li & Lian, 2010). In general, a SAM has six main accounts to categorise the flow of money through the economy, that is, an activity or production account, a commodity account, a factor account, institutions, a capital account and the rest of the world account.

The following summarises the functioning of a SAM. A SAM has various accounts that represent both producers and consumers. In the SAM the rows represent income and the columns represent payments from one account to another. Because of the double-entry accounting principle the SAM is a consistent economy-wide database. It simply means that expenditure from one sector would be income for another and the system balances. Thus, no amount or transaction is left unaccounted for, providing a clear picture of the structure of the economy for a given period.

On the following page an adaptation of a SAM is presented in table 3.1. It is a square matrix with eight rows and eight columns. The rows represent receipts and the columns represent the payments. Following this table, the basic accounts included in a SAM will be discussed.

Table 3.1: Basic social accounting matrix framework

	Sectors	Products	Factors	Households	Government	Investment	Rest of world	Total
Sectors		Marketed supply						
Products	Intermediate demand*			Private consumption*,#	Public consumption*	Investment demand*	Export demand*	**Total demand**
Factors	Value-added*,#							**Factor income**
Households			Income distribution#				Transfers†,#	**Household income**
Government	Indirect tax*	Indirect tax*,‡	Factor tax†	Income tax†,#			Transfers†	**Total revenues**
Savings				Private savings†,#	Public savings†		Foreign savings†	**Total savings**
Rest of world		Import supply*						**Total foreign payments**
Total	*Gross output*	*Total supply*	*Factor payments*	*Total household spending*	*Recurrent spending*	*Total investment*	*Total foreign receipts*	

Source: (Arndt, Davies & Thurlow, 2011); (*) Supply-use tables (Stats SA, 2010); (#) household and labour force surveys (Stats SA, 2006); (†) South African Reserve Bank Quarterly Bulletin; (‡) Customs data and tax revenue authorities

In any SAM there are accounts to which the flow of money is allocated (as indicated in Table 3.1). These accounts can be further sub-divided to a micro-level. A brief description of each account follows (Sadoulet & de Janvry, 1995):

1. *Activity or production account (sectors)* – this account represents the purchase of raw materials and the hire of factor services in order to produce intermediate commodities. The expenditures thus include the purchase of intermediate commodities. The remainder of the expenditures form the value added component, of which a part could be, for example, a value added tax paid to the government. Value added is then distributed to factors of production by way of wage payments and rent for the fixed factors. Receipts in this account come from sales on the domestic market, exports and export subsidies.
2. *Commodity account (products)* – this account represents the commodity or product market. The commodity account purchases goods from local producers and imports goods, while also paying for trade services and trade-related costs. Receipts proceed from sales on the domestic market of intermediate goods to activities, final products to households and government and investment goods to the capital account.
3. *Factor account (factors)* – capital and labour accounts are included here. Payments are received from the sale of services to activities in the form of wages and rent, as well as remittances and capital income from abroad. Receipts are distributed to households in the form of labour income and distributed corporate and unincorporated profits and to firms and non-distributed profits after taxes have been paid to government.
4. *Institutions (households and government)* – this account represents the current account for households, firms and the government (households can be further disaggregated into different socio-economic groups). Households' incomes come from transfers from other households, factor incomes, government, firms or from abroad. Expenditures consist of consumption and income tax, while residual income or savings are taken to the capital account. Firms receive profits and transfers and spend on taxes and transfers. Residual savings are also taken to the capital account. The government account is different from the administrative activities in the activity account.

These administrative activities buy intermediate goods, pay wages and render "administrative services". The government account uses its current expenditures to buy directly from the services offered in the activity account. Remaining expenditures are transfers to households and firms, while residual savings are also transferred to the capital account. Income is generated by means of tax revenues and transfers from abroad.

5. *Capital account (savings)* – this account collects savings from local institutions as well as net foreign transfers (also called foreign savings) from the rest of the world. These funds are then used for fixed capital formation and changes in stocks. In theory a separate capital account could be created for each institution, but in practice such detailed data is seldom available.
6. *Rest of the world* – the last account contains the transactions between the local economy and the rest of the world. Exports generate income for the local economy, while imports create an outflow of funds. Factor income could also be generated from abroad, which offsets factor payments that are made to the rest of the world. Current transfers can be made to and from institutions' current accounts. Current account deficits are covered by foreign savings. Due to the mathematical design of the SAM it would happen that the last account balances if all other accounts are balanced.

The account structure shows that a SAM is built on basic accounting principles. Income in one sector comes from being an expense in another. For example, personal income tax is considered a household expense, but at the same time this expense serves as government revenue. In this way the flow of money is measured throughout the whole economy.

A SAM represents a snapshot of economic activity in certain accounts for a specific year. This provides a good framework on the structure of the economy as a SAM is a macro-framework, but allows for disaggregation of various sectors. Thus, it can be considered a meso-level framework, acting as a bridge between the macro-framework of the economy and the finer details of institutions and markets (Round, 2003). The particular SAM used for this study is a representation of South Africa's economic structure and captures all flows of income and expenditure from various segments of the economy, as well as from the rest of the world into South Africa.

The SAM is the information entered into whichever method of analysis. Thus, the SAM itself is not a model. The circular flow of income within a SAM forms the basis of such an analysis and starts with the generation of income with activities producing commodities. The income payments for these activities are followed to various factors of production, the distribution of factor and non-factor income to households and the eventual spending of income by households on commodities (Round, 2003). One of the main outcomes of SAM applied in multiplier analysis is to determine the effect of real shocks on the economy on the distribution of income across various socio-economic groups of households. Another outcome or feature of SAMMA is the fact that it is easier to decompose, thereby adding more transparency to the nature of linkages in the economy and understanding the effects of exogenous shocks on income distribution and poverty. SAMMA will be discussed at greater length in section 3.1.3.

This section focused on introducing the SAM as an apt dataset for modelling economy-wide impacts when a shock is applied. Now that the data used is understood, the next section focuses on the process of constructing a SAM followed by the SAM multiplier methodology.

3.1.1.2 Construction of a SAM

The construction of a SAM is largely dependent on the application of the SAM and the country it is being constructed for. Thus, applying very specific data requirements for the construction of a SAM is difficult. The level of aggregation or disaggregation will also determine the data requirements for the specific SAM.

The starting point for the construction of any SAM is at a highly aggregated level using national accounting statistics for the country in question. This allows for a solid foundation to work from should there be a need for further disaggregation. To further disaggregate accounts, three sets of data form the base according to Sadoulet and de Janvry (1995):

i. Activity and commodity balances taken from I/O tables.
ii. Disaggregation of value added into income by labour categories and profits. These are usually taken from employment or sectoral surveys. Accounting for informal sector activities is of course very difficult.

iii. Determining incomes and outlays from private institutions and households is the most difficult part in constructing a SAM. With regard to expenditure, government data can be used to track taxes and consumption surveys can be used for household (and private institutions) spending. Income for households can be a challenge. A multi-purpose household survey would be sufficient, but these are rarely available. Consequently, some compromises will have to be made. Labour force surveys, rural and urban distribution surveys or family expenditure surveys will have to be collected. Income and expenditure for all firms aggregated together are often available in national accounts documents and transfers between government and private institutions are often available from the central statistics agency of a country. Funds transfers of data between firms (both local and international) are often a challenge as these are rarely, if ever, available. To adjust to this lack of information a complete balance of payments can be used to determine the flow of money between local and international companies.

Data in the South African SAM used in this study comes from three different sources and was first constructed by Arndt *et al.* (2011): the national supply-use table is obtained from Stats SA (2010); national accounts from the South African Reserve Bank (SARB)[10] and the nationally-representative household income and expenditure survey for 2005[11] from Stats SA (Stats SA, 2006). The national accounts from the SARB provide information on the composition of the GDP at factor cost (that is, sectoral value-added) and by broad expenditure groups at market prices [C + I + G + X - M)]. The technical coefficients in the supply-use table provided by Stats SA are used to estimate intermediate demand based on sectors' level of GDP or gross output. It also disaggregates government and investment demand across products. The household survey by Stats SA is used to segment labour markets (disaggregate labour income into different education groups). The survey also defines households' expenditure patterns and the distribution of factor incomes to representative household groups and the survey data serves as the key determinant of income differences among households, as well as the distributional effect of income. Table 3.2 presents all the sectors, factors and households in the South African SAM.

[10] South African Reserve Bank Quarterly Bulletin. https://www.resbank.co.za/Publications/QuarterlyBulletins/Pages/QuarterlyBulletins-Home.aspx

[11] At the time of writing this dissertation, this was the most recently available SAM for South Africa. More recent household survey data is available, but not in a constructed SAM.

Table 3.2: Sectors and activities included in the South African SAM

Sectors and activities					
1	Citrus fruit farming	17	Dairy	33	Electrical machinery and apparatus
2	Deciduous fruit farming	18	Grain milling, bakery & animal feeds	34	Communication, medical and other electronic equipment
3	Sub-tropical fruit farming	19	Other foods	35	Manufacturing of transport equipment
4	Vegetable farming	20	Beverages and tobacco	36	Other manufacturing and recycling
5	Livestock farming	21	Textiles, clothing, leather & footwear	37	Electricity
6	Game farming	22	Wood and wood products	38	Water
7	Dairy farming (milk only)	23	Furniture	39	Building and construction
8	Forestry	24	Paper and paper products	40	Trade
9	Fishing	25	Publishing and printing	41	Accommodation
10	Cereal and crop farming	26	Chemicals and chemical products (including plastics)	42	Transport
11	Poultry farming	27	Rubber products	43	Communication
12	Other agriculture	28	Non-metallic minerals	44	Finance and insurance
13	Gold mining	29	Basic metal products	45	Real estate
14	Coal and lignite mining	30	Structural metal products	46	Business services
15	Other mining	31	Other fabricated metal products	47	General government services
16	Meat, fish, fruit, vegetables, oils and fats	32	Machinery and equipment	48	Community, social and personal services

Source: SAGE (Arndt, *et al.,* 2011)

Sectors 16 to 36 represent all the manufacturing sectors within the South African SAM. These sectors will be discussed in further detail after the application of the SAMMA.

The next section focuses on the method, i.e. the SAMMA, and its specific application in this study.

3.1.2 The method: SAM Multiplier Analysis

The SAM itself is not a model, but is rather a collection of data presented in such a way that it is possible to be channelled into chosen model structures for analysis (Round, 2003). With this foundation in mind, SAMs are effective at measuring the application of shocks on the economy through SAMMA. Because of its transparent functionality, the SAM provides insight into the socio-economic structure of the economy and various other inter-economy relationships. An important feature for this study would be the relationship between the structure of production and the ability of each sector to absorb labour.

As I/O tables form part of the basis of SAMMA there are some assumptions that need to be noted before commencing the discussion on the model application for this study. The most important assumption with I/O analysis is that sectoral production is totally demand-driven. This implies that all sectors have excess production capacity readily available and are able to meet higher demand with increased production without any price changes. These assumptions form the basis of the application of the model for this study.

The standard I/O Leontief model for which coefficients and multipliers are calculated are based on the following equation:

$$M^{L} = (I-A)^{-1}$$

where:

I represents the identity matrix and *A* represents the matrix of input coefficients.

Accounts have to be partitioned into endogenous and exogenous accounts in order to extend the analysis from I/O to SAMMA (Sadoulet & de Janvry, 1995). Endogenous accounts are accounts for which any change in the level of income is followed by changes in the level of expenditure. For exogenous accounts, however, this is not the case. Expenditure for these accounts is set independently of income (Sadoulet & de Janvry, 1995).

Once the accounts have been partitioned, the SAM multipliers are calculated as follows:

$$M^{S} = (I-M)^{-1}$$

where:

I represents the identity matrix and *M* is the matrix of expenditure shares of the endogenous accounts.

In this study the endogenous accounts are activities, commodities, labour, land, capital, enterprises and households. The exogenous accounts are government, capital account, rest of the world and a residual. When the SAM is set up and all accounts are balanced then the column shares or column coefficients need to be

calculated. This allows for the structure of the economy to be determined as well as computing matrix multipliers.

Within the multiplier analysis there are three levels or types of effects that are identified. The first level of impact is called direct effects. The direct effects refer to the immediate economic impact made on the economy – also referred to as the first round of effects. The description of the impact and the significance thereof would depend upon the economic indicator being discussed. The second level of impact – or second round of effects – is called indirect effects. These effects are the subsequent economic activities that come about as a result of the direct effects. Thus, the effects that are measured in this instance are the contributions to economic indicators by 'indirect industries'. Finally, induced effects measure the spending of additional wages that are paid as a result of the direct and indirect effects. The inputs necessary to build a laptop are used to illustrate these impacts. The investment in designing and building new laptops would be a direct effect from the IT-industry on GDP. The increased demand for laptop casings and microchips would represent the indirect effects (on GDP, production and additional labour), while the spending of additional wages paid to employees as a result of the higher demand for laptop casings and microchips would represent the induced effects.

The next section presents and discusses the results obtained from the SAM multiplier analysis.

3.2 Results from the SAM Multiplier Analysis

The discussion that follows will focus on the manufacturing sectors from the SAM. As indicated in section 3.1.2 (table 3.2), only sectors 16 to 36 relate to manufacturing and will thus be the focus of the results. As stated earlier the focus of the results is to identify those sectors within the South African manufacturing industry (through the application of SAM multiplier analysis) that have the greatest potential to drive economic growth and employment creation through increased exports. A uniform export shock will be applied to each manufacturing sector individually to determine the effects on GDP and employment.

A brief discussion of the multiplier results across the two macroeconomic indicators for each of the manufacturing sectors serves as an introduction to the results. Results pertaining to the export shock (increase) applied for each of the manufacturing sectors are be discussed, after which the top five manufacturing sectors with the greatest economy wide effects are discussed at length.

3.2.1 Pre-shock results

Table 3.3 shows the twenty-one manufacturing sectors from the SAM ranked in descending order based on their GDP and employment multiplier values. The export shock is applied to all manufacturing sectors to see which of them have the greatest GDP and labour effects. For each of the multipliers, each indicator contains a direct, indirect and induced multiplier effect. A total GDP and employment multiplier effect is calculated by simply adding up these two indicators' multiplier effects, as shown in Table 3.3. As mentioned earlier, the demand-driven position which requires greater production forms the basis of the multiplier. These multiplier values are calculated before the export shock of R1 million is applied[12]. It is important to note that the multiplier values capture the inter-industry linkages for the listed sectors. These multiplier values do not indicate the size of a specific sector. Sector A might be the biggest manufacturing sector with poor linkages to other sectors, while sector Z might be a medium sized sector, but with very strong linkages to other sectors.

[12] The aim of the shock is not the value of the shock itself, but rather that the shock is applied individually to each manufacturing sector. This allows for effective comparison of each sector's performance in terms of GDP and employment multiplier results.

The following table has the manufacturing sectors ranked from highest combined multiplier score to the lowest.

Table 3.3: Manufacturing sector's GDP and employment multipliers

Manufacturing sectors	GDP multipliers (Rand million, 2010 Prices)	Employment multipliers (number of jobs generated by each Million Rand)	Total GDP and employment multiplier effects[13]
Textiles, clothing, leather & footwear	1.02	11.10	12.12
Wood and wood products	1.32	10.68	11.99
Grain milling, bakery and animal feeds	1.32	10.33	11.65
Dairy	1.31	9.92	11.23
Publishing and printing	1.32	9.82	11.14
Meat, fish, fruit, vegetables, oils and fats	1.19	9.62	10.81
Non-metallic minerals	1.31	8.91	10.23
Paper and paper products	1.17	8.99	10.16
Beverages and tobacco	1.34	8.80	10.14
Electrical machinery and apparatus	1.18	8.49	9.67
Other foods	1.31	8.09	9.40
Other manufacturing and recycling	1.35	7.50	8.85
Structural metal products	1.21	7.51	8.72
Furniture	1.24	7.47	8.70
Machinery and equipment	1.11	7.42	8.54
Basic metal products	1.17	7.19	8.36
Other fabricated metal products	1.13	7.09	8.22
Communication, medical and other electronic equipment	1.07	6.94	8.01
Rubber products	1.12	6.83	7.95
Chemicals and chemical products (including plastics)	1.14	6.80	7.94
Manufacturing of transport equipment	0.88	5.63	6.51

Calculations based on multiplier analyses

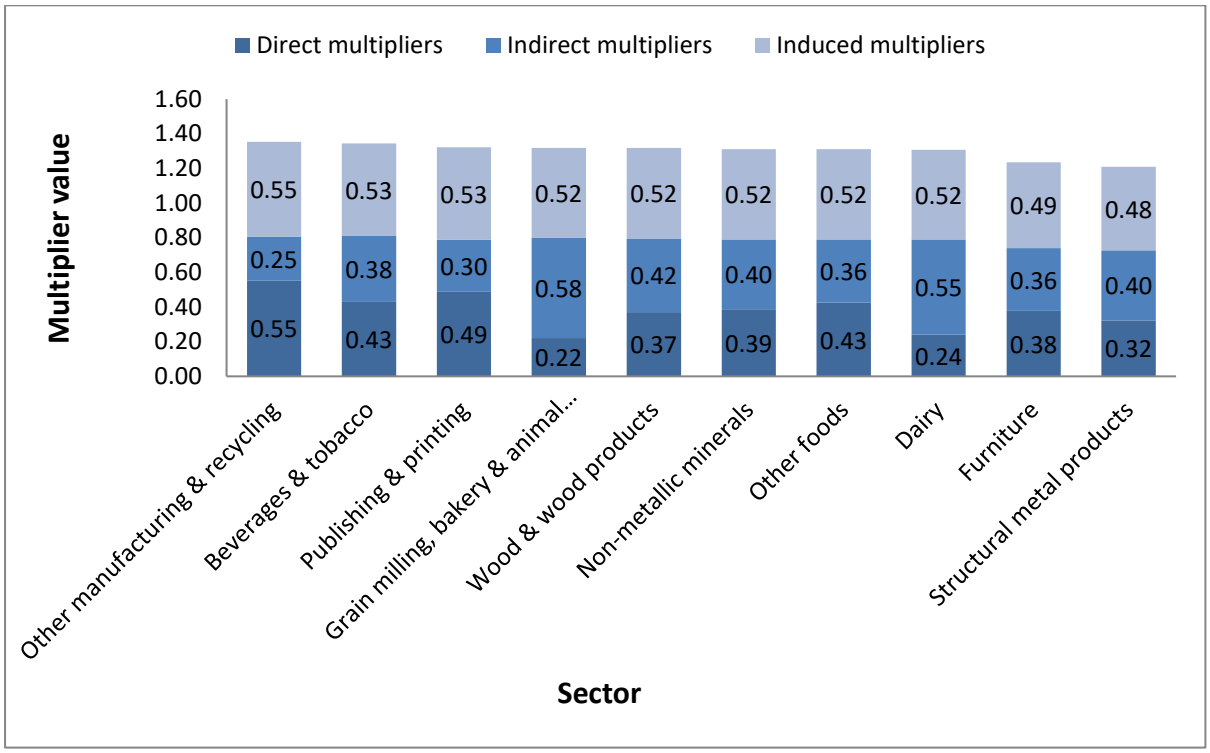
The table ranks the manufacturing sectors based on the sum of the GDP and employment multiplier effects. From the table we see that for every R1 million produced in the textiles, clothing, leather and footwear industries there is a R1.02 million increase in GDP with 11.1 additional jobs created throughout the whole economy. The same interpretation holds true for the rest of the industries. It is interesting to note that in spite of a smaller effect on GDP compared to the other sectors, the textiles, clothing, leather and footwear industries create the most jobs

[13] Even though the GDP and employment multipliers are in different unit measures the combined value is merely utilised as a means of determining which sectors offer the greatest combined effect.

relative to production output. Its high employment multiplier enables this sector to have the greatest total multiplier effect when these two metrics are added together. Other manufacturing and recycling have the greatest effect on GDP. It is interesting to note that all the manufacturing sectors have a GDP multiplier that is greater than 1.0, except for the manufacturing of transport equipment. This sector also has the lowest employment multiplier of only 5.63 jobs per R1 million. From the table it is noted that the higher value added sectors are ranked lower and the more primary manufactured goods are higher on the table. The reason is found in the fact that the labour multiplier accounts for a much larger share in the total multiplier effect than GDP. Of course primary manufactured goods (e.g. textiles, clothing, leather and footwear or wood and wood products) often pay lower wages to its labour than highly specialised manufacturing jobs would (e.g. communication, medical and other electronic equipment or machinery and equipment) explaining these results. Of the top five sectors, all five are directly related to agriculture or primary goods.

The next set of results focuses on composition of the manufacturing sectors' GDP and labour multipliers. The multiplier values that are displayed in table 3.3 are composed of direct, indirect and induced multiplier effects (see section 3.1.3) that add up to form the total GDP (see figure 3.1) or employment (see figure 3.2) multiplier effect on which the ranking is based.

Figure 3.1: Top ten sectors ranked according to GDP multipliers



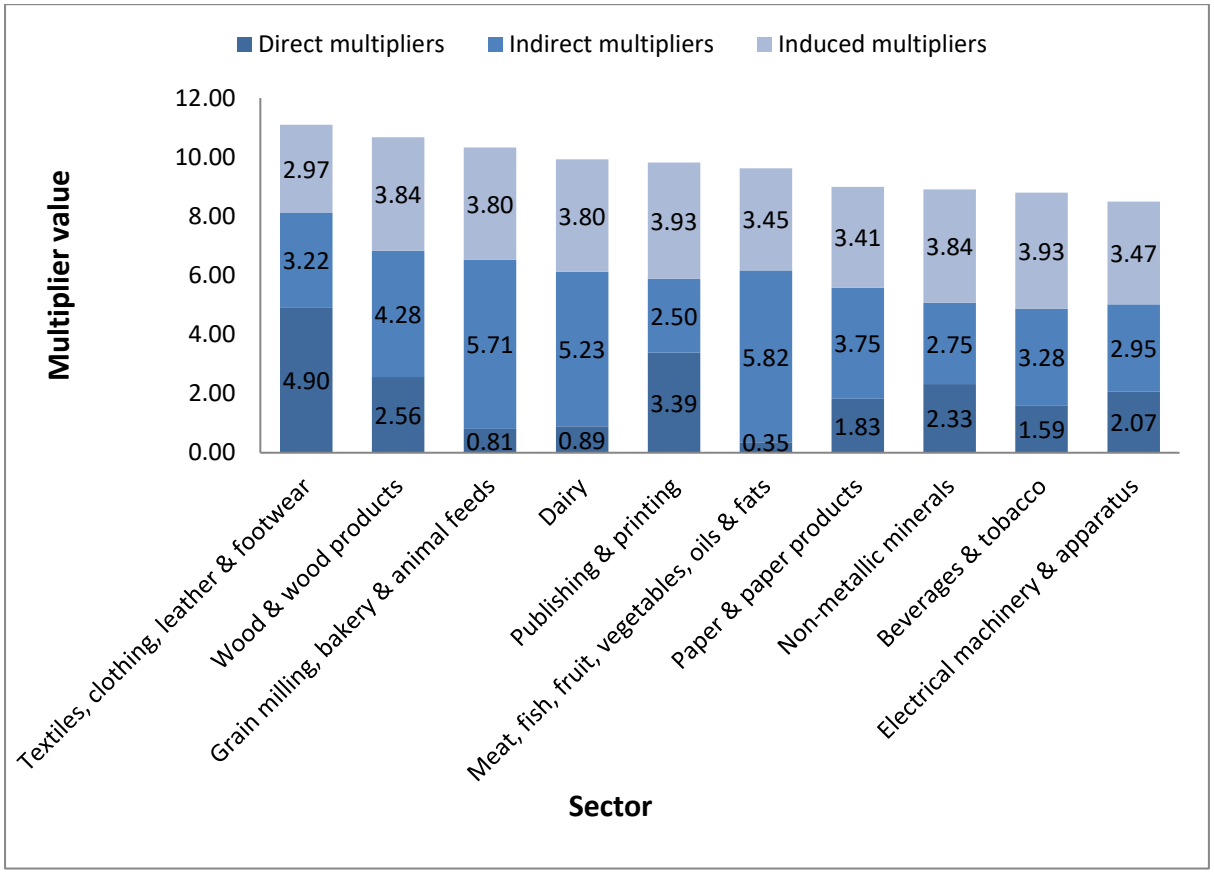
Calculations based on multiplier analyses

The above figure presents the results for the top ten manufacturing sectors based on the total multiplier effect for GDP. The total multiplier effects range from 1.35 for other manufacturing and recycling to 1.2 for structural metal products.

Figure 3.1 indicates that most sectors that have a strong GDP multiplier effect are sectors that add more value in the manufacturing process as only three of the ten sectors are related to agriculture (grain milling, bakery and animal feeds, wood and wood products and dairy). It is interesting to note that two of these agricultural sectors – grain milling, bakery and animal feeds and dairy – have the lowest direct multiplier effect. At the same time, these two sectors have the highest indirect multiplier effect. The sector with the highest score – other manufacturing and recycling – has the highest direct multiplier effect as well as the highest induced multiplier effect.

Figure 3.2 ranks the top ten manufacturing sectors according to labour multipliers.

Figure 3.2: Sectors ranked according to labour multipliers



Calculations based on multiplier analyses

Figure 3.2 presents the top ten manufacturing sectors based on the total multiplier effect for labour. The total multiplier effects for the top ten range from 11.1 for textiles, clothing, leather and footwear to 8.49 for electrical machinery and apparatus.

As seen from table 3.3, textiles, clothing, leather and footwear is the top sector in terms of the labour creation multiplier. This sector's direct multiplier effect is almost twice that of all of the other sectors (except for publishing and printing that ranks second). This means that almost five new jobs are created immediately (direct effect) with an increase in production of R1 million in this industry (and more than three jobs in the case of publishing and printing). The figure affirms what is seen in table 3.3 with regard to the link with primary or agricultural manufacturing. The sectors with the highest indirect effect are all directly related to primary or agricultural manufacturing. These industries are (ranked according to indirect multiplier effect):

meat, fish, fruit, vegetables, oils and fats; grain milling, bakery and animal feeds; dairy; wood and wood products. This indicates a stronger linkage between agricultural manufacturing and its complementary industries and the effect the aforementioned sectors have on labour. At the same time, these sectors (with the exception of wood and wood products) have a weaker ability to create new jobs in the sector itself relative to the other manufacturing sectors. The induced effect has a smaller variance between the sectors when compared to the direct and indirect effects.

The next set of results are considered following the application of the export shock.

3.2.2 Post-shock results

The subsequent results are presented after the export shock (increase) was applied for each manufacturing sector. The shock is applied and the effects on labour and GDP are measured (measuring the effects on all manufacturing sectors within the SAM). As mentioned earlier, an increase in export demand has to be met with greater production output. Consequently, the export shock translates to greater production per sector, resulting in changes in other sectors in the economy as the demand for inputs in one sector affects the production and consequently demand for inputs of other sectors as well. The degree to which the shock in each manufacturing sector has an effect on the other sectors is dependent on the inter-linkages that exist between the sector being shocked and the sectors linked to this sector. Calculating the post-shock values requires multiplying the multiplier value with the value of the shock. However, due to the Leontief inverse being applied and an adjustment made for leakages[14] when the shock is applied the highest multiplier values do not necessarily always translate directly into the greatest values after the shock is applied. As a result, the top sectors from Table 3.3 may not necessarily translate directly into being the top sectors after the export shock is applied.

Table 3.4 analyses the effects on GDP.

[14] Leakages are often intermediate goods “imported” from other industries to aid in the manufacturing process.

Table 3.4: Top five sectors with their effects from all manufacturing sectors on the GDP indicator (values in Rand thousand)

Manufacturing sector	Meat, fish, fruit, veg, oils and fats	Grain milling, bakery and animal	Dairy	Furniture	Wood and wood products
Meat, fish, fruit, vegetables, oils and fats	426	5	7	1	1
Dairy	15	7	471	1	1
Grain milling, bakery and animal feeds	17	495	10	1	1
Other foods	11	5	7	1	1
Beverages and tobacco	34	15	23	4	1
Textiles, clothing, leather and footwear	3	2	2	12	5
Wood and wood products	3	2	2	43	520
Furniture	4	4	5	306	30
Paper and paper products	26	13	18	10	11
Publishing and printing	3	2	2	3	3
Chemicals and chemical products (including plastics)	54	37	34	244	41
Rubber products	1	1	1	1	1
Non-metallic minerals	5	3	3	4	3
Basic metal products	9	5	6	22	20
Structural metal products	0	0	0	1	8
Other fabricated metal products	9	4	6	7	5
Machinery and equipment	18	11	12	28	14
Electrical machinery and apparatus	2	1	1	7	1
Communication, medical and other electronic equipment	1	0	0	3	0
Manufacturing of transport equipment	4	4	3	5	5
Other manufacturing and recycling	1	1	1	2	1
Manufacturing effects total	**646**	**617**	**614**	**704**	**673**
All SAM sectors' total effects	**1480**	**1343**	**1253**	**1183**	**1134**
GDP ratio	**1 : 1.29**	**1 : 1.17**	**1 : 1.04**	**1 : 0.68**	**1 : 0.68**

The table ranks the top five sectors according to GDP effects after applying the export shock.

The table presents the effects that the shock in the specific sector has on all manufacturing sectors within the SAM and then it also offers the total GDP effects for all sectors in the SAM (including non-manufacturing sectors). A manufacturing GDP ratio is calculated[15] to indicate the effect on GDP outside the manufacturing industry per R1 increase in GDP in the manufacturing industry. This is a simple calculation done to indicate the width and extent of the GDP effect in the manufacturing industry itself as well as the broader South African economy.

The sectors that have the greatest effect on GDP are meat, fish, fruit, vegetables, oils and fats with a total GDP effect of R1,48 million of which R646 000 is generated within the manufacturing industry. This sector also has the highest GDP ratio indicating its ability to also generate GDP outside the manufacturing industry. The highest GDP generated within the manufacturing industry itself, however, is the furniture sector that ranks in fourth place when the total GDP effects are measured. The sector has strong linkages with other manufacturing sectors, but does not have strong linkages outside of the manufacturing industry creating the lowest amount of GDP outside of the manufacturing industry when compared to the rest of the top five sectors (with the exception of wood and wood products that similarly has a high GDP effect on manufacturing, but has the same manufacturing GDP ratio). Of interest is the fact that the chemicals and chemical products (including plastics) sector has the highest GDP effect after the direct effect of the shock on the individual sector itself for every sector in the top five. This indicates the strong linkage between the chemicals and chemical products (including plastics) sector and the other five manufacturing sectors. Wood and wood products have the strongest direct effect on itself creating R520 000 of GDP in the sector after the shock. As mentioned earlier, its weaker linkages with sectors outside of the manufacturing industry mean that it has the lowest total GDP effects of the top five.

In the top five it is interesting to note that the top three sectors are related to agriculture. This perhaps indicates that the agricultural manufacturing industry has a

[15] Dairy example (1253-614)/614 = 1.04

stronger ability to have a positive effect on GDP than other manufacturing sectors when exports are effectively promoted for this sector.

Table 3.5 follows the same pattern of presenting the top five sectors from the manufacturing industry in a table based on their effect on labour after applying an export shock.

Table 3.5: Top five sectors with their effects from all manufacturing sectors on the labour indicator (number of jobs created)

Manufacturing sector	Meat, fish, fruit, vegetables, oils and fats	Grain milling, bakery and animal feeds	Dairy	Wood and wood products	Beverages and tobacco
Meat, fish, fruit, vegetables, oils and fats	3431	41	56	10	13
Dairy	116	52	3572	9	17
Grain milling, bakery and animal feeds	134	3873	80	8	15
Other foods	68	31	45	5	10
Beverages and tobacco	220	97	149	5	3502
Textiles, clothing, leather and footwear	28	17	19	56	18
Wood and wood products	25	18	17	4210	31
Furniture	27	25	29	182	30
Paper and paper products	199	96	136	86	246
Publishing and printing	25	15	18	20	23
Chemicals and chemical products (including plastics)	323	223	205	246	184
Rubber products	9	7	7	5	4
Non-metallic minerals	31	17	20	19	104
Basic metal products	53	33	35	121	48
Structural metal products	3	2	2	51	2
Other fabricated metal products	56	28	38	30	92
Machinery and equipment	122	73	77	95	77
Electrical machinery and apparatus	11	8	7	7	6
Communication, medical and other electronic equipment	3	3	3	2	2
Manufacturing of transport equipment	27	23	19	32	14
Other manufacturing and recycling	5	4	5	4	3
Manufacturing sectors' total effects	**4916**	**4685**	**4536**	**5204**	**4439**
All SAM sectors' total effects	**11 973**	**10 956**	**10 071**	**9 261**	**8 143**
Manufacturing labour ratio	**1 : 1.44**	**1 : 1.34**	**1 : 1.22**	**1 : 0.77**	**1 : 0.83**

Table 3.5 presents the results after ranking the top manufacturing sectors measured by labour after the export shock was applied.

The table also presents the sectors ranked according to the effect on all sectors included in the SAM. The effect of the increase in the exports of the related sector is also measured for the manufacturing sectors. Similar to the GDP table listed previously, a manufacturing labour ratio is also calculated[16] to indicate the number of jobs created outside the manufacturing industry per one job created in the manufacturing industry. This is a mere indication of the width of the employment impact that the specific sector has in the economy.

The sector that creates the most employment after the export shock is applied is meat, fish, fruit, vegetables, oils and fats with 4 916 jobs created within the manufacturing industry only and 11 973 new jobs for all industries included in the SAM. It also has the highest manufacturing labour ratio of 1.44 indicating its ability to also create new jobs in the broader economy. The sectors that follow in the ranking are: grain milling, bakery and animal feeds, dairy, wood and wood products and beverages and tobacco. The sector that has the greatest direct employment effect on itself is wood and wood products with 4 210 jobs. It also has the most jobs created in the manufacturing industry with 5 204 new jobs. However, a low manufacturing ratio means that it does not create new jobs outside the manufacturing industry as effectively, leaving it fourth on the rankings for total number of new jobs created. Across all five of the top sectors listed the chemicals and chemical products (including plastics) sector seems to have strong inter-sectoral linkages as it is constantly the sector with the highest employment creation after the industry being ‘shocked’ (except for beverages and tobacco where it is second highest after paper and paper products). This confirms the strong linkage between chemicals and chemical products (including plastics) and other manufacturing sectors – similar to what is seen with GDP.

Similar to the GDP metric the first three sectors on this ranking are all related to agricultural manufacturing indicating the ability of the agricultural manufacturing sector to create new jobs when exports are effectively promoted.

[16] Dairy example: (10 071-4536)/4536 = 1.22

Table 3.6 lists the top five sectors with the greatest combined benefits of GDP and employment creation after applying the export shock to each of the manufacturing sectors in the SAM.

Table 3.6: Top five manufacturing sectors with the greatest economy wide effects

Macro-economic variables	Top five sectors ranked (labour and GDP combined)				
	1. Meat, fish, fruit*	2. Grain milling+	3. Dairy	4. Wood and wood products	5. Furniture
∆ GDP (R thousand)	1 480	1 343	1 253	1 134	1 183
∆ Labour (Number of jobs)	11 973	10 956	10 071	9 261	8 080

*Calculations based on SAM multiplier analyses; * Meat, fish, fruit, vegetables, oils and fats; +Grain milling, bakery and animal feeds*

Table 3.6 presents the top five manufacturing sectors, measured by GDP and labour creation, from left to right and the following is observed from the table:

i. Of the top five sectors, the first three are related to agriculture.
ii. Meat, fish, fruit, vegetables, oils and fats have the greatest overall economy-wide benefits. There is a wide range of products or sub categories involved in this sector, allowing for a wider scope in terms of inter-industry linkages and this is apparent from the table as the sector has the greatest multiplier effects across both indicators.
iii. In terms of employment creation, the furniture sector has the lowest employment creation figure in the top five, making it less attractive than the other sectors in the top five (see chapter 1). However, it still has an employment effect of creating more than eight thousand jobs after applying the export shock.

3.3 Summary

As a result of economic circumstances the South African government commenced on a path of growing the economy and creating new jobs through driving its manufacturing exports forward (see chapter 1.2.1). The aim of this chapter was to identify those sectors in the South African manufacturing industry that offer the greatest effects on GDP growth and employment creation when an export shock is applied. Identifying these sectors serves as a starting point in the process of achieving government's goals of stimulating both economic growth and employment creation.

The chapter set out to discuss the data and methodology specific to SAM multiplier analysis and then presenting and discussing the results obtained through the application of the method to a South African-specific SAM.

The first section of the chapter discussed the background of a SAM and SAMMA. This emphasised the fact that a SAM in itself is not a model but is rather a collection of data than can be used in multiplier analysis.

The results revealed that there is a difference between the multiplier values of the manufacturing sectors within the SAM and the multiplier effects once an export shock is applied. This was attributed to leakages in the form of imports. Thus, the top five sectors measured by both GDP and labour effects after the export shock was applied are (in order): 1) meat, fish, fruit, vegetables, oils and fats, 2) grain milling, bakery and animal feeds, 3) dairy, 4) wood and wood products and 5) furniture.

From these results (as well as the results that measure GDP and labour separately) it can be seen that an increase in exports in the agricultural manufacturing or agro-processing seems to benefit the South African economy the most in terms of GDP and employment creation. This is due to its strong linkages to other manufacturing and non-manufacturing sectors. The top three sectors in each of these instances are occupied by agricultural manufacturing industries.

The next chapter addresses the second part of the empirical analysis – that is the application of the DSM methodology for identifying export opportunities for these sectors that offer the greatest effects on GDP and employment. The top sectors identified in the course of the SAMMA are the focus in the following chapter when the DSM methodology is applied in order to identify the realistic export opportunities (product-country combinations) for these sectors.

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4. IDENTIFYING EXPORT OPPORTUNITIES FOR THE SOUTH AFRICAN MANUFACTURING SECTOR: A DECISION SUPPORT MODEL

4.1 Introduction

Chapter 3 provided the first phase of the empirical analysis. The chapter employed a SAM multiplier analysis to identify those sectors that offer the greatest economic and employment benefits after an export shock was applied. Now that these sectors have been identified, this chapter investigates how this increase in exports can be practically pursued by means of a Decision Support Model (DSM).

Thus, this chapter introduces the second part of the empirical analysis. Similar to chapter 3, this chapter first discusses the methodology of the DSM and then analyses the results from the model. The aim of the DSM for the purposes of this study is to identify the export opportunities (product-country level) for the South African manufacturing industry with specific focus on the sectors that were obtained from the SAM (chapter 3) in order to focus on export promotion strategies in those sectors that offer the highest potential increase in GDP and has the potential for creating the most number of new jobs.

4.2 The methodology of the Decision Support Model (DSM) for identifying realistic export opportunities

The DSM is an international market selection method that was designed to assist export promotion organisations in selecting the most realistic export (product-market) opportunities.

The DSM is based a framework first suggested by Walvoord for selecting foreign markets (Jeannet & Hennessey, 1998:137-140). Walvoord's idea was that certain filters or screenings should be used to evaluate international market opportunities. Walvoord's model focuses on selecting foreign markets for a firm; however, Cuyvers, De Pelsmacker, Rayp and Roozen (1995) used the basic structure of Walvoord's model to construct the DSM – a product-country level market selection model specifically designed to aid government export promotion agencies. The DSM mainly focuses on offering a scientific approach to identifying realistic export opportunities (REOs) for an exporting country and offers policy makers and firms an export

promotion tool that helps to allocate resources more effectively when considering new export markets or expanding current export operations.

The DSM was first developed for the Flemish Export Promotion Organisation (EPO) in Belgium in the early 1990s (Cuyvers, *et al.*, 1995). Following Belgium, the DSM was applied to Thailand and the Philippines (Cuyvers, 1996; Cuyvers, 2004). The model was subsequently adapted for South African conditions (Pearson, Viviers, Cuyvers & Naudé, 2010; Cuyvers, Steenkamp & Viviers, 2012b) and most recently applied to the Netherlands (Vivier, Cuyvers, Naudé, Steenkamp, Rossouw, Cameron, Idsardi & Parry, 2014). As a result, the DSM was developed to offer realistic export opportunities for various countries.

The DSM initially includes all worldwide products and countries. Using a comprehensive filtering system, the DSM eliminates the opportunities that are less realistic and identifies the realistic export opportunities (REO) with the highest export potential. A specific categorisation and potential value are attached to each of these REOs in order to prioritise and formulate export promotion strategies.

Filter 1 evaluates the political and commercial risks associated with each of the importing markets. Subsequently it assesses certain macro-economic indicators that determine whether the importing country has adequate market capacity and growth potential. *Filter 2* measures import demand in the remaining importing countries. Demand is measured at HS 6-digit level for all products in terms of import size and growth. The degree of market concentration and barriers to entry is used as measures in determining the market accessibility in *Filter 3*. *Filter 4* concludes the process by categorising the REOs based on the the import size and growth in each of the importing countries (demand side, determined in filter 2), as well as the exporting countries' market share relative to the top six competitiors within the market (supply side).

Each filter is consequently discussed according to the most recently refined and updated DSM (the TRADE-DSM version 2014). This study applies the DSM with 2011 data.

4.2.1 Filter 1: Identifying preliminary market opportunities

All countries in the world for which the necessary data is available are included into the model as a starting point. As a means of starting the process of selection the DSM eliminates countries that pose too high political and/or commercial risk to the exporting country (filter 1.1), as well as countries that do not offer sufficient macro-economic size or growth (filter 1.2). Consequently, the first filter allows users of the model to eliminate countries with high risk and low overall demand in order to investigate in more detail the countries and opportunities that, on a macro-level, offer more potential (Cuyvers, Steenkamp & Viviers, 2012a:56).

4.2.1.1 Filter 1.1: Political and commercial risk analysis

The first part of filter 1 assesses the political and commercial risk that exporters would encounter in dealing with a particular country.

Commercial risk can be defined as the risk resulting from a deterioration in the importer's financial position that can lead to the event of non-payment. Political risk, on the other hand, can be defined as anything that can occur in the importing country that would take on the same nature of a *force majeure* event, such as wars, natural disasters, revolutions, currency shortages and government action (ONDD, 2014)[17].

Commercial risk is rated by an "A", "B", or "C". In this instance "A" indicates low commercial risk and "C" indicates high commercial risk (ONDD, 2014). Political risks are rated on a scale of 1 to 7, where 1 represents a low level of political risk and 7 a high political risk. Political risk ratings are assigned over the short, medium and long term (ONDD, 2014).

Once these ratings are allocated, each of the three political risk ratings is transformed from a 1 to 7 scale to a 1 to 10 scale. Commercial risk ratings are transformed from "A", "B", and "C" to 3.33, 6.67 and 10 respectively. These transformations allow for the calculation of an overall risk rating. When the transformations are complete a simple average of three political risk indicators are calculated for a general political risk rating. The average political rating is then combined with the commercial risk rating in an equal weighting. This provides the final total country risk rating (ONDD, 2014).

[17] Detailed information of each risk type's analysis can be found at http://www.delcredere.be

An example from Cuyvers, Steenkamp and Viviers (2012a) is provided in table 4.1 along with the author's own calculations.

Table 4.1: Risk ratings for country X (score out of 7)

	Political Risk: Short Term	Political Risk: Medium Term	Political Risk: Long Term	Commercial Risk
Country X	3	6	4	B

Each of these risk ratings is then transformed to generate the overall country risk rating out of 10.

Table 4.2: Transformed risk ratings for country X

	Political Risk: Short Term	Political Risk: Medium Term	Political Risk: Long Term	Commercial Risk
Country X	4.29[18]	8.57	5.71	6.67

The average political risk in this example is 6.19[19]. Combining the average political risk with the commercial risk (6.67) gives an overall country risk rating of 6.43[20].

Countries with risk ratings equal to or greater than the 80th percentile of the country risk ratings of all countries for which data is available, are eliminated and do not proceed to filter 2 (Viviers *et al.*, 2014).

4.2.1.2 Filter 1.2: Economic size and growth

The second part of filter 1 focuses on the economic size and growth of all the countries under consideration. GDP and GDP per capita as well as GDP growth and GDP per capita growth are used as indicators. Data for each country over the given period is obtained from the IMF and the World Bank. A cut-off value is calculated to eliminate countries that do not offer attractive macro-economic indicators.

The 20th percentile is used as cut-off value for the GDP and GDP per capita values of the countries selected in filter 1.1. A country is selected based on its macro-

[18] (3/7) x 10. Risk rating transformed. Same applies for other values in this table.
[19] (4.29+8.57+5.71)/3.
[20] (6.19+6.67)/2.

economic size when its GDP and GDP per capita values are higher than the cut-off values for at least two consecutive years out of the latest three-year period (2009-2011) for which data is available (Cuyvers, *et al.*, 1995; Cuyvers, *et al.*, 2012a).

To measure macro-economic growth, GDP growth and GDP per capita growth values are used. For these indicators the average over the countries selected in filter 1.1 are used as cut-off values. Countries are selected for their macro-economic growth if their GDP and GDP per capita growth values are higher than the cut-off values for all three years of the latest three-year period (2009-2011) for which data is available (Cuyvers, *et al*., 2012a).

Countries can be selected in filter 1.2 for either macro-economic size (GDP and GDP per capita) or/and growth (GDP growth and GDP per capita growth).

For a country to move onto filter 2 it has to be selected in both filter 1.1 (country risk) and filter 1.2 (macro-economic size and growth).

The next filter investigates in more detail the import demand in the countries that have passed through filter 1.1 and filter 1.2 for specific products.

4.2.2 Filter 2: Identifying possible opportunities

In this filter, the import demand for all the HS 6-digit products in each of the countries selected in filter 1 is analysed and categorised. Data for this filter is obtained from the Centre d'etudes prospectives et d'informations internationales Base pour l'Ananlyse du Commerce International (CEPII BACI) world trade database. The database is built on the United Nations Statistics Division's UN Comtrade database and reconciles more than 140 countries' reported trade data. Trade mirror data is also used for an additional 50 countries, creating data on a pool in excess of 190 countries. One trade figure is calculated for each bilateral trade flow by reconciling the CIF values reported by the importer with the FOB values reported by the exporter. This creates one net figure per bilateral trade flow, instead of having two values for the same bilateral relationship. The BACI database has provided data on almost 200 countries since 1995 and provides data for bilateral trade flows in HS 6-digit format. Data is updated every year (CEPII, 2013).

Three indicators are used in this filter, namely short-term import growth, long-term import growth and import market size. Short-term import growth refers to the most recent simple annual rate of growth in imports that is avaiable. Long-term growth is the compounded annual percentage growth in imports over the last five year period (2007-2011). Finally, import market size is the total imports of product category *j* for country *i* (Cuyvers, Steenkamp & Viviers, 2012a:61).

Cut-off values are subsequently calculated to select only the product-country combinations with the highest demand potential. Cut-off values are less stringent for products in which the exporting country for which the model is applied are already export specialists (Cuyvers, *et al.*, 1995; Cuyvers, *et al.,* 2012a). Consequently Balassa's (1965) Revealed Comparative Advantage (RCA) Index is used to determine cut-off values for each of the criteria mentioned in this filter.

The RCA calculation is expressed in an equation as (Balassa, 1965):

$$RCA_{n,j} = \left(\frac{X_{n,j}}{X_{W,j}} \right) / \left(\frac{X_{n,tot}}{X_{W,tot}} \right)$$

where:

$X_{n,j}$: the exports for country *n* (the exporting country for which DSM is applied) of product *j*;

$X_{W,j}$: world exports of product *j*;

$X_{n,tot}$: total exports of country *n*;

$X_{W,tot}$: total world exports (all categories).

An RCA closer to zero would indicate that the country exports a relatively small amount of the product or nothing at all (when equal to zero). An RCA value greater than or equal to one, would indicate that the country is relatively specialised in exporting the specified product or product category (Balassa, 1965).

Once the RCA values have been determined, the cut-off values for filter 2 can be calculated. These values are calculated as follows (Cuyvers, 2004):

A scaling factor, $s_{n,j}$, is defined for short- and long-term growth as a means of incorporating the degree to which the exporting country *n* specialises in exporting product category *j* ($RCA_{n,j}$) (Willemé & Van Steerteghem, 1993 in Cuyvers, 2004:260). The scaling factor is defined as:

$$s_{n,j} = 0.8 + \frac{1}{\left(RCA_{n,j} + 0.85\right)exp^{\left(RCA_{n,j} - 0.01\right)}}$$

Cut-off values for short- and long term import growth are then calculated by:

$$g_{i,j} \geq G_j$$

where $g_{i,j}$ represents the import growth rate of product category *j* by country *i*, and

$$G_j = g_{W,j}.s_{n,j}\ , if\ g_{W,j} \geq 0$$

or

$$G_j = g_{W,j} \div s_{n,j}\ , if\ g_{W,j} < 0$$

where $g_{W,j}$ is the growth in world import of product *j*.

This implies that, if the exporting country *n* for which the model is applied, does not specialise in exporting a particular product *j* (RCA < 1), the import growth rate must be between one and two times the world imports growth rate to justify the selection of the product based on these criteria. On the other hand, if the exporting country specialises in exporting a product *j* (RCA ≥ 1), the import growth rate is allowed to be below the world import growth rate of the product in question (Cuyvers, *et al*., 2012a). The ability to already export the product justifies selecting the product even though the import growth rate is lower.

Concerning the cut-off values for the size of import demand, Cuyvers (2004) considers the relative import market size to be sufficient when:

$$M_{i,j} \geq S_j$$

where $M_{i,j}$ represents total imports of product *j* by country *i*. Also consider:

$$S_j = 0.02M_{w,j}\ , if\ RCA_{n,j} \geq 1$$

or

$$S_j = \left[\left(3 - RCA_{n,j}\right)/100\right] M_{w,j}\ , if\ RCA_{n,j} < 1$$

The abovementioned implies that country *i*'s imports of product *j* should be greater than or equal to 2% of total world imports of the product when the exporting country *n*, is specialised in exporting the product (RCA ≥ 1). If, however, the exporting country is not specialised in exporting the product (RCA < 1), the cut-off value is stricter, being a value greater than 2% and up to 3% of total world imports of the product (depending on the $RCA_{n,j}$ value).

For short- and long-term growth, as well as market size, a "1" is allocated in the relevant column of table 4.3 if these criteria are met and a "0" is allocated if these conditions are not met.

The following table illustrates the categories for the product-country combinations, considering the above-mentioned criteria.

Table 4.3: Categorisation of product-country combinations as per filter 2 criteria

Category	Short-term import market growth	Long-term import market growth	Relative import market size
0	0	0	0
1	1	0	0
2	0	1	0
3	0	0	1
4	1	1	0
5	1	0	1
6	0	1	1
7	1	1	1

Source: Cuyvers, Steenkamp and Viviers, 2012a:65

Only product-country combinations that rank from category 3 to 7 are selected for filter 3 (Cuyvers, 2004:261; Cuyvers *et al.*, 2012a). Consequently, only markets that are considered to be (i) adequate in size (even though not showing promising growth), (ii) growing in both the short- and long-term (not necessarily large markets) or (iii) growing in the short- and/or long-term and are adequately sized, are selected to enter filter 3. Import demand is critical in ensuring successful and sustainable exports. As a result, the criteria is built around indicators that point to strong or rising import demand.

The identification of probable and realistic export opportunities is subsequently discussed in filter 3.

4.2.3 Filter 3: Identifying probable and realistic export opportunities

Cuyvers *et al.* (1995) allude to the fact that growth and size of import demand (considered in filter 2) do not indicate whether a market can be easily penetrated. As a result, filter 3 considers market concentration and barriers to entry into each of the remaining markets. The filter consists of two parts, namely market concentration (filter 3.1) and market accessibility (filter 3.2).

4.2.3.1 Filter 3.1: Degree of import market concentration

A concentrated market is a market that is difficult to penetrate, according to Cuyvers *et al.* (1995:180). A concentrated market is not a market with many importers, but rather only a few. Few importers mean that each of these importers hold a large market share with a lot of market experience and knowledge and are well-known by the local market. This poses many challenges to new entrants into such a market. Cuyvers *et al.* (1995:180) confirmed this statement by conducting a partial analysis and finding a negative correlation between export performance and market concentration and concluded that it would be largely inefficient for export promotion organisations to use limited resources on such markets.

For the DSM, the Herfindahl-Hirshmann-Index (HHI) of Hirshmann (1964) is used to measure the degree of market concentration in each market. The index is calculated as follows:

$$HHI_{ij} = \sum \left(\frac{X_{k,ij}}{M_{tot,ij}} \right)^2$$

where:

$X_{k,ij}$: represents the exports of country *k* to country *i* for product *j*

$M_{tot,ij}$: country *i*'s total imports of product *j*

An HHI-value[21] equal to one indicates that the importing market is supplied by only one exporting country, while a HHI value of closer to 0 indicates lower market concentration (many exporting countries, each with relatively small market shares supplying the market). It would consequently be very difficult for an export country to penetrate a market with a HHI value closer to 1 *(*Cuyvers *et al.*, 1995:180; Cuyvers 2004:261).

Once the HHI is calculated, a cut-off value has to be calculated for market concentration. In this regard, Cuyvers *et al.* (1995:180) note that market concentration can be amplified in a market that is not growing, as few suppliers control the market and no market growth implies no new opportunities to potential entrants to the market. In a large, growing market, opportunities are available for potential entrants to obtain market share, even in the case of a market being more concentrated. As a result of this, the cut-off values for market concentration are dependant on the category to which the specific market was allocated to in filter 2 (see table 4.3).

The cut-off values are defined as follows:

$$h_k = HHI_{i,j}$$

where:

h_k <= 0.4, for category 3,

h_k <= 0.5, for categories 4, 5 and 6,

h_k <= 0.6, for cateogry 7

Thus, for relatively large markets with a concentration of up to 40% allowed, markets growing in both the short- and long term, as well as large markets that are growing in either the short- or long-term are allowed a concentration of no more than 50% and large markets that are growing in both the short- and long-term are allowed a concentration of no more than 60% (Viviers *et al.*, 2014).

[21] South Africa is left out in the numerator in the equation in order to still select markets where South Africa causes the concentration.

4.2.3.2 Filter 3.2: Trade barriers

Filter 3.2 considers the various trade barriers that an exporting country might encounter as it exports to different trading partners worldwide. Barriers to trade include tariffs and non-tariff barriers, logistics, trade costs, trade time, infrastructure and distance (Jacobs, Viviers & Steenkamp, 2014).

With regard to non-tariff barriers, the World Economic Forum's Enabling Trade Report (World Economic Forum, 2014a) makes important statements that are necessary to mention here. It notes that research regarding market accessibility is complicated by the fact that data on non-tariff barriers are outdated and there is no standardised global measure for non-tariff barriers. The WEF report states that the assessment of non-tariff barriers should not stop at the border, but should also measure activities "behind the border". Reference is made to the fact that the International Trade Centre (ITC) is engaged in efforts to collect data for the continuous development of an indicator on the presence of NTMs affecting international trade. Furthermore, relying on surveys by experts in the field is a process that is slow and extremely costly. The ITC is not yet in the position of providing an updated data set with a global coverage. However, the data is available for approximately 60 countries (World Economic Forum, 2014a) and the scope of the DSM's analysis is much larger. In the light of these challenges with data availability, non-tariff barriers can not yet be included in the analysis of filter 3.2.

In addition, for the purposes of this study, it is argued that the cost of trade (which includes international transport, documentation, customs clearance and inland transport and handling, captures the limiting impacts that trade time, distance, infrastructure and logistics would have on trade.

As a result, the following cost of trade indicators are used to measure the trade barriers an exporter would face in a particular importing market:

i. Tariffs
ii. International shipping costs
iii. Domestic cost to import

Each of these values are calculated as a percentage of the value of the goods traded (*ad valorem*) and are all added together to arrive at the total *ad valorem* trade cost per product-country combination.

A discussion of each of the indicators follows.

4.2.3.2.1 *Ad valorem* equivalent tariffs per product

Ad valorem equivalent tariffs are used in this study as it is difficult to compare specific duties (e.g., €3/kg of oranges) with *ad valorem* tariffs (e.g., 3% of the value of imports) across a series of countries and products. *Ad valorem* equivalent tariffs are then defined as a tariff presented as a percentage of the value of the goods that are cleared through customs. It is the equivalent of a corresponding tariff measure that is based on a unit quantity such as weight, volume or number (ITC, 2014a).

The International Trade Centre's (ITC) MacMap is used in this study to gather the *ad valorem* equivalent tariff information on a HS 6-digit product level for all product-country combinations that enter filter 3 (ITC, 2014b).

The Interntaional Monetary Fund (IMF, 2005) validates the use of MacMap by emphasising the accuracy of MacMap for individual country exports' tariff levels due to its inclusion of bilateral, regional and preferential tariff systems. MacMap is also very compatible with the DSM as its data is available in HS 6-digit level and comparible for a large number of countries.

4.2.3.2.2 Domestic cost to import per country

The domestic cost of transportation and clearance of goods was obtained from the World Bank Doing Business report's cost to import information (from the Trading Across Borders section) (World Bank, 2014). The cost to import includes the costs related to all documentation, inland transportation (and handling), customs clearance and inspections, port and terminal handling and other costs (World Bank, 2014). In order to calculate the cost to import for each country, the World Bank used a standard measure whereby the levies calculated are based on cargo for a 20-foot container of general cargo with a value of US$ 20 000. Tariffs and ocean-related transport costs are excluded.

Calculating the *ad valorem* equivalent for domestic cost simply requires dividing the cost to import per country by the US$ 20 000 value of the cargo.

4.2.3.2.3 International shipping cost per country

Matthee (2007) conducted a literature overview on the role of transport costs in international trade. Amongst others, the overview includes the significance of transport costs, the measurement of transport costs and the factors that influence transport costs. With regard to the measurement of international transport costs, there appear to be two sources for obtaining international transport costs. The one source is obtaining direct quotes from the shipping industry or transport operators (see Hummels, 1999; Martínez-Zarzoso, Pérez-García & Suárez-Burguet, 2008). The other is national customs data presented as CIF import values and FOB export values. The CIF value is divided by the FOB export value to give an indication the bilateral transport costs between countries (see Baier & Berstrand, 2001; Limäo & Venables, 2001). Chasomeris (2007), however, found that this measure is inaccurate for South Africa and consequently suggested that, in the South African case, a different measure for shipping costs should be used.

Consequently, quotes for the shipment of a 20-foot container of general cargo with an estimated value of US$ 20 000, from Durban harbour to the most likely port[22] in the country under review, were obtained from World Freight Rates (2014). The container size, type of cargo, value of the consignment and harbours used were specified the same as those used by the World Bank Doing Business Report in determining domestic cost to import. This makes the data compatible and enables the researcher to combine the international and domestic transport costs into one measure.

To calculate the *ad valorem* equivalent for international shipping cost, the cost to import per country is divided by US$ 20 000.

To arrive at the total *ad valorem* equivalent (%) trade cost to transport goods from the harbour in the exporting country (Durban, in this case) to the final destination in the importing country, the various *ad valorem* equivalent elements are added up. Thus, adding the *ad valorem* equivalent tariff, domestic cost to import and

[22] Port information was obtained from the authors of the World Bank Doing Business report in order to ensure correct transportation cost calculations.

international shipping costs provides the total *ad valorem* equivalent precentage trade cost per product-country combination.

The cut-off value is determined at the 80th percentile of the total *ad valorem* equivalent trade cost values for all product-country combinations that entered filter 3.

Product-country combinations that meet both criteria in filter 3 (for market concentration and trade barriers) move on to the final analysis, filter 4.

4.2.4 Filter 4: Final analysis of opportunities

The final filter in the DSM does not eliminate any remaining markets, but rather categorises each product-country combination that came through filters 1 to 3.

Cuyvers *et al.* (1995:181) argue that the strength of an exporting country's market position is related to its competitiveness in comaprison to other prominent importers in that market. Consequently, the market share of exporter *n* relative to the top six competitors in country *i* in product category *j* is calculated. The following equation illustrates this calculation (Viviers *et al.*, 2014):

$$\mu_{n,ij} = \left(\frac{X_{n,ij}}{X_{six,ij}}\right)$$

where:

$X_{n,ij}$: country *n*'s export of product *j* to country *i*

$X_{six,ij}$: top six competitors' total exports of product *j* to country *i*

The different relative market shares are categorised as follows (Viviers *et al.*, 2014):

i. If South Africa's market share is less than 5% of the market share of the top six competitors, then it is considered a relatively small market share ($\mu_{n,ij} < 0.05$).
ii. If South Africa holds between 5% and 25% of the market share of the top six competitors then its market share is considered to be intermediately small ($0.05 \leq \mu_{n,ij} < 0.25$).

iii. In the event of South Africa holding between 25% and 50% of the market share of the top six competitors then the market share is intermediately large ($0.25 \leq \mu_{n,ij} < 0.5$).

iv. Finally, when South Africa has a market share that is 50% or greater than the market share of the top six competitiors,the market share is deemed relatively large ($\mu_{n,ij} \geq 0.5$).

The filtering process leads to the following matrix (table 4.4) where the REOs that were identified from filter 1 to filter 3 are categorised according to size and growth in demand and the exporting country's current market share relative to the top six competitors in the specified markets.

Table 4.4: Categorisation of REO's in the DSM

Size and growth of importing market	**Country *n*'s relative market share**			
	Relatively small	Intermediately small	Intermediately large	Relatively large
Large product market	Cell 1	Cell 6	Cell 11	Cell 16
Growing (short- & long-term) product market	Cell 2	Cell 7	Cell 12	Cell 17
Large product market with short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large product market with long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large product market with short- and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: (Cuyvers et al., 2012a:70)

The size and growth of import demand determined in filter 2 are used for the row classification and the current supply or relative market share of the exporting country for which the model is applied, which is determined in filter 4, is used for the columns (country *n*'s current market share relative to the top six players in each market). The final lists of product-country combinations are each assigned or categorised into one of these cells. This cell classification aids the exporter in identifying, for example, which product-country combinations have large potential, but are under-utilised (cells 1 to 5) and in which combinations South Africa's market share is already relatively high (cells 16 to 20). The cell matrix also provides the exporter with information that

lends itself towards developing export market strategies in entering repsective markets.

4.2.5 Potential value calculation

The inclusion of a potential export value allows for a ranking among REOs. Merely identifying REOs leaves uncertainty regarding the relative value of these opportunities, where a potential export value creates a prioritisation among these opportunities (Cuyvers & Viviers, 2012a).

The following equation describes the calculation of the potential export value per product-country combination:

$$potexp_{i,j} = \text{average}\ (M_{six1,i,j}\ ,\ M_{six2,i,j}\ ,\ \ldots\ ,\ M_{six6,i,j}\ )$$

where:

$M_{six1,i,j}$ is country *i*'s imports of product *j*, from each of the top six competitors. In this calculation the exporter for which the model is being applied is not taken into account.

This value is used as a more realistic reference point to measure the potential for each product-country combination. It can also be used to compare the exporting country's actual export to that of the competitors in each market. The potential export value is thus considered equal to the average of the top six competitors' import values. This value corresponds with the cell category determined in filter 4 and will in many cases be higher than the exporting country's (South Africa in this case) actual export value, especially if the opportunity is categorised in cells 1 to 10. If the opportunity is assigned to cells 11 to 20 the actual export of the country will be closer to the potential value. If the actual value is higher than the potential value it indicates that the country is amongst the top six competitors within the market and, thus already has a relatively large market share that is higher than the average market share of the top six competitors in each market.

4.2.6 Revealed trade advantage (RTA)

Up to this point the DSM considers mostly the import demand and accessibility into the destination country. However, the exporting country's ability to produce and export the product in question is not considered (Cuyvers *et al.*, 2012a).

Consequently, the revealed trade advantage (RTA) index of Vollrath (1991) is applied. The RTA value is calculated taking exports, as well as imports, into consideration. An RTA value of greater than 0 implies that the particular product being exported is manufactured or produced locally.

$$RTA_{nj} = RCA_{nj} - RMA_{nj}$$

RCA is the revealed comparative export advantage (see section 4.2.2[23]) and the RMA measures relative import advantage. It is calculated as (Vollrath, 1991):

$$RMA_{n,j} = \left(\frac{M_{n,j}}{M_{W,j}} \right) / \left(\frac{M_{n,tot}}{M_{W,tot}} \right)$$

where:

$M_{n,j}$: the imports for country *n* (the exporting country for which DSM is applied) of product *j*;

$M_{W,j}$: world imports of product *j*;

$M_{n,tot}$: total imports of country *n*;

$M_{W,tot}$: total world imports (all categories).

This calculation is used to distinguish between products that South Africa produces locally and exports competitively (RTA > 0) and those products that are not (RTA ≤ 0). For the purposes of this study, the RTA value is calculated over a five-year period to ensure data accuracy and account for any outlier/once-off transactions or trade flows.

The difference between RTA and RCA is explained in the following example: South Africa has an RCA of greater than 1 for rice, indicating that South Africa specialises in the export of rice. However, South Africa does not produce rice itself and merely imports and re-exports it (thus RTA ≤ 0). This can create a misleading picture in terms of South Africa's ability to produce and export the specific product.

[23] The RCA was used in the scaling factor to determine the cut-off values in filter 2. If the export country for which the model is applied specializes in producing and exporting a product (RCA≥1), the cut-off values for the size and growth of import demand were less stringent.

For the purpose of this study, only products with an RTA > 0 are considered in order to ensure that opportunities are identified that can be realistically pursued in the short and medium term. It is, however, possible to consider other products for South Africa which do not yet have an RTA > 0, but the country has potential to build capacity in the long term. These results can be obtained from the authors.

The next section discusses the results obtained from the DSM for the South African manufacturing industry.

4.3 Results from the DSM

This section discusses the realistic export opportunities (REOs) for the South African manufacturing industry obtained from the DSM[24] analysis. The results section is divided into two sub-sections.

The first sub-section focuses on results from the DSM for the broad manufacturing industry. Firstly, this section identifies the top regions in terms of potential export value. This will be followed by the top 20 countries, the top ten sectors and then the top ten products for the manufacturing industry in South Africa in terms of potential export value.

The second sub-section views the results from the DSM for the five top sectors as identified in die SAM (chapter 3). As discussed in chapter 3 a social accounting matrix (SAM) was employed to determine which sectors within the manufacturing industry hold the highest economy wide benefits for economic growth and employment. As a result of the application of the SAM the following sectors were identified as the top five sectors (see chapter 3.2): 1) meat, fish, fruit, vegetables, oils and fats, 2) grain milling, bakery and animal feeds, 3) dairy, 4) wood and wood products and 5) furniture. Specific product-country combinations with high export potential within each of these sectors will be highlighted as an illustration of the value of the DSM results. These results can also provide valuable information to policy makers on specific export opportunities within the manufacturing industry that will contribute the most toward the main goals of the governments' national development plan, namely growth and employment.

[24] Data used at the time of obtaining the DSM results is based on 2011 data. This is similar to the date of the construction of the SAM used in the study.

4.3.1 DSM results for the South African manufacturing industry

This section provides an overview of the results obtained from the DSM for the South African manufacturing industry as a whole[25]. The results start at the regional level and conclude with the specific products that offer the greatest potential export value. It is important to reiterate that all the results obtained from the DSM discussed in this study are for products with an RTA > 0. There might be instances of products that have high potential export value, but due to the fact that South Africa does not produce and export that product competitively (RTA < 0), it is not included in this discussion (see section 4.2.6).

The following table offers the top ten regions that offer the greatest potential export value for the South African manufacturing industry.

Table 4.5: Top ten regions by potential export value (values in US$ thousand)

Region	Potential export value
Western Europe	**72 426 586**
East Asia	**45 956 554**
North America	**42 424 148**
South Asia	**17 171 184**
South-East Asia	**13 803 100**
Central Europe	**12 193 250**
South-West Asia	**11 704 827**
Southern Europe	**10 489 614**
South Western Europe	**5 030 283**
Northern Europe	**4 383 735**

Most notably the top region – Western Europe – has 50% more potential export value than that of the second placed East Asia, indicating that the potential in the Western European market for manufactured goods is considerably higher. North America also falls in the top three and offers more than double the potential export value of fourth-placed South Asia.

Table 4.6 presents the countries with the highest potential export value.

[25] DSM results for any specific region, country, sector or product can be obtained from the authors.

Table 4.6: Top twenty countries by potential export value (values in US$ thousand)

Country	Potential export value
United States of America	**37 026 364**
Germany	**24 925 793**
China	**23 642 766**
India	**16 780 851**
United Kingdom	**15 169 883**
France	**11 674 815**
Belgium-Luxembourg	**11 188 881**
Italy	**10 041 724**
Netherlands	**9 350 858**
Hong Kong (SARC)	**8 820 927**
Switzerland	**7 431 636**
Japan	**7 120 156**
South Korea	**6 372 704**
Turkey	**5 548 376**
Canada	**5 397 785**
Thailand	**4 742 370**
Spain	**4 544 337**
Australia	**3 537 558**
Singapore	**2 884 623**
Indonesia	**2 787 969**

The above table represents the top twenty countries by potential export value.

The USA, Germany and China are the countries that hold the highest export potential for the South African manufacturing industry, each from a different region. Of note is also the prominent role that the USA plays in the North American region's potential export value score. The USA represents more than 87% of the region's potential export value, with Canada (placed in fifteenth position on this table) completing the remaining 13%. Of the top ten countries, eight are located in the European region, confirming Europe's dominance in terms of potential export value over the other regions. Of note is the fact that no African country is included in the list, with the first African country, Egypt, in the 33rd place and the first Southern African country, Angola, in 62nd place.

The top ten manufacturing sectors (according to the SAM ranking) with their potential export value are presented in table 4.7.

Table 4.7: Top ten sectors by potential export value (values in US$ thousand)

SAM sector	Potential export value
Basic metal products	**61 063 323**
Other manufacturing and recycling	**53 407 025**
Manufacturing of transport equipment	**45 627 904**
Chemicals and chemical products (including plastics)	**30 388 272**
Meat, fish, fruit, vegetables, oils and fats	**8 817 163**
Textiles, clothing, leather and footwear	**8 711 158**
Paper and paper products	**8 027 839**
Beverages and tobacco	**7 649 886**
Other foods	**5 295 894**
Structural metal products	**4 395 547**

This table lists the top ten sectors, as categorised by the Standard Industrial Classification (SIC). It is important to emphasise that the results considered are only for products with an RTA > 0. The focus of the results is on products that South Africa already produces and exports. Thus, these sectors offer opportunities that South Africa can readily pursue as there is already manufacturing and export capacity for these. At the same time the DSM has the ability to identify those opportunities that do not have an RTA > 0 as is indicated in section 4.2.[26]

The top three sectors in the table are separated by similar margins with a bigger margin between third and fourth place which is followed by a big difference to fifth place. The top sector according to the DSM is basic metal products (see section 2.2.2 for the history of metal production in South Africa). The first four sectors on the table all appear to be higher value-added sectors (perhaps with the exception of basic metal products) and they also offer more potential export value. The rest of the top ten seems to be sectors that are related to more labour intensive manufacturing or primary production manufacturing (agriculture and forestry). Basic metal products and structural metal products are the only sectors that are related to mining.

The following table presents the top fifty manufacturing products with the highest potential export value.

[26] A simple change in the filtering process will allow for all opportunities to be presented and is available from the supervisor, on demand. This would be of value if there is a specific need for identifying new sectors for building capacity within the South African manufacturing industry.

Table 4.8: Top fifty products by potential export value (values in US$ thousand)

Product description	Potential export value
710812 - Gold (including gold plated with platinum), in unwrought forms (excluding powder)	**26 471 462**
870323 - Vehicles (excluding of 8702 and 870310) principally designed for the transportation of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >1500cc but not >3000cc	**20 932 808**
710239 - Diamonds, non-industrial other than unworked / simply sawn / cleaved / bruted	**12 325 017**
740311- Cathodes and sections of cathodes, of ref. copper, unwrought	**7 263 863**
710231 - Diamonds, non-industrial, unworked / simply sawn / cleaved / bruted	**5 741 838**
870322 - Vehicles (excluding of 8702 and 870310) principally designed for the transportation of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >1000cc but not >1500cc	**5 622 084**
870421 - Motor vehicles for the transportation of goods (excluding of 8704.10), with compression-ignition internal combustion piston engine (diesel / semi-diesel), not >5tonnes	**3 986 739**
720449 - Ferrous waste and scrap (excluding of 720410 to 720441)	**3 506 341**
840820 - Compression-ignition int. comb. piston engines (diesel / semi-diesel engines) of a kind used for the propulsion of vehicles of HS87	**3 441 438**
760110 - Aluminium, not alloyed, unwrought	**3 399 314**
710691 - Silver (including silver plated with gold / platinum), unwrought	**3 121 961**
740400 - Copper waste and scrap	**2 880 072**
890190 - Vessels for the transportation of goods and for the transportation of both persons and goods (excluding of 890110 to 890130)	**2 770 513**
940190 - Parts of the seats of 9401	**2 632 133**
220421 - Wine other than sparkling wine of fresh grapes, including fortified; grape must with fermentation prevented / arrested by the addition of alcohol, in containers of 2 l / less	**2 610 342**
870331 - Vehicles principally designed for the transportation of persons (excluding of 8702 and 870310 to 870324), with compression-ignition internal combustion piston engine (diesel / semi-diesel), of a cylinder capacity not >1500cc	**2 583 053**
721049 - Flat-rolled products of iron / non-alloy steel, of a width of 600mm / more, otherwise plated / coated with zinc (excluding electrolitically), other than corrugated	**2 516 842**
730890 – Structures and parts of structures of iron / steel (excluding of 730810 to 730840); plates, rods and the like, prepared for use in structures, of iron / steel	**2 316 045**
760120 - Aluminium alloys, unwrought	**2 264 967**
750210 - Nickel, not alloyed, unwrought	**2 253 847**
390210 - Polypropylene, in primary forms	**2 232 904**
760612 - Plates, sheets and strip, rectangular (including square), of a thickness >0.2mm, of aluminium alloys	**2 169 673**
620342 - Men's / boys' trousers, bib and brace overalls, breeches and shorts (excluding swimwear; excluding knitted or crocheted), of cotton	**2 152 952**
210690 - Food preparations, not elsewhere specified	**1 923 878**
611020 - Jerseys, pullovers, cardigans, waist-coats and similar articles, knitted or crocheted, of cotton	**1 851 767**
240220 - Cigarettes containing tobacco	**1 634 475**

Table 4.8: Top fifty products by potential export value (values in US$ thousand) (continued)

Product description	Potential export value
470329 - Chemical wood pulp, soda / sulphate, other than dissolving grades, semi-bleached / bleached, non-coniferous	**1 571 303**
870870 - Road wheels and parts and accessories thereof for the motor vehicles of 8701 to 8705	**1 546 566**
290243 - p-Xylene	**1545 854**
720712 - Semi-finished products of iron / non-alloy steel, containing by weight <0.25% of carbon, of rectangular (other than square) cross-section	**1 527 873**
381800 - Chemical elements doped for use in electronics, in the form of discs / wafers / similar forms; chemical components doped for use in electronics	**1 505 238**
720851 - Flat-rolled products of iron / non-alloy steel, of a width of 600mm / more, hot-rolled, not clad / plated / coated, not in coils, not further worked than hot-rolled, of a thickness >10mm	**1 441 970**
284420 - Uranium enriched in U 235 and its components; plutonium and its components	**1441 742**
842139 - Filtering / purifying machinery and appliances for gases, other than intake air filters for int. comb. Engines	**1 397 901**
390230 - Propylene copolymers, in primary forms	**1 387 717**
760200 - Aluminium waste and scrap	**1 382 681**
720839 - Flat-rolled products of iron / non-alloy steel, of a width of 600mm / more, hot-rolled, not clad / plated / coated, in coils, not further worked than hot-rolled (excluding pickled), of a thickness of <3mm	**1 236 919**
284410 - Natural uranium and its components; alloys, dispersions (including cerments), ceramic products and mixtures containing natural uranium / natural uranium components	**1 197 273**
711299 - Waste and scrap of precious metal / metal clad with precious metal; other waste and scrap containing precious metal / precious metal components	**1 062 833**
740200 - Unrefined copper; copper anodes for electrolytic refining	**1 028 121**
330210 - Mixtures of odoriferous substances and mixtures (including alcoholic solutions) with a basis of one / more of these substances, of a kind used in the food / drink industries	**995 657**
290511 - Methanol (methyl alcohol)	**985 853**
720421 - Waste and scrap of stainless steel	**966 663**
290121 – Ethylene	**951 563**
720917 - Flat-rolled products of iron / non-alloy steel, of a width of 600mm / more, in coils, not further worked than cold-rolled (cold-reduced), not clad / plated / coated, of a thickness. of 0.5mm / more but not >1m	**941 059**
711291 - Waste and scrap of gold, including metal clad with gold but excluding sweepings containing other precious metals	**918 672**
290122 - Propene (propylene)	**916 548**
790111 - Zinc, not alloyed, unwrought, containing by weight 99.99% / more of zinc	**893 569**
720110 - Non-alloy pig iron containing by weight 0.5% / less of phosphorus, in pigs / blocks / other primary forms	**889 588**

This table lists the top fifty products that offer the greatest potential export value to the South African manufacturing industry.

Gold (unwrought, including platinum plated gold) ranks first on the table. This is followed by vehicles and diamonds in second and third place respectively. The top three are specifically mentioned as they offer significantly greater potential export value compared to the products that follow. Diamonds[27] in third place offer more than 70% more than the fourth-placed cathodes. Similarly, vehicles offer almost 70% more than third-placed diamonds and gold in turn offers 26% more than vehicles. Thus, gold offers more than double the potential export value of diamonds in third place. Metal-related sectors combined (basic metal products and structural metal products), appear eighteen times in the top fifty. Chemicals and chemical products (including plastics) appear eleven times and manufacturing of transport equipment appears seven times.

This section focused on the results from the DSM for the South African manufacturing industry according to the SIC. For these results only products with an RTA > 0 were considered. The next table draws a comparison between the top sectors from the SAM – measured according to the impact of increased exports on GDP and employment creation – and the top sectors from the DSM based on potential export value.

Table 4.9: Top manufacturing sectors according to the SAM and DSM

Rank	SAM	DSM
1	Meat, fish, fruit, vegetables, oils and fats	Basic metal products
2	Grain milling, bakery and animal feeds	Other manufacturing and recycling
3	Dairy	Manufacturing of transport equipment
4	Furniture	Chemicals and chemical products (including plastics)
5	Wood and wood products	Textiles, clothing, leather and footwear
6	Beverages and tobacco	Meat, fish, fruit, vegetables, oils and fats
7	Paper and paper products	Paper and paper products

[27] Even though export promotion is rarely involved with commodities, these results are kept because of the magnitude of these opportunities and the fact that they are offered as manufacturing products that South African can produce and export competitively.

Table 4.9: Top manufacturing sectors according to the SAM and DSM (continued)

Rank	SAM	DSM
8	Non-metallic minerals	Beverages & tobacco
9	Basic metal products	Other foods
10	Publishing and printing	Structural metal products

The table presents a comparison between the manufacturing sectors with the greatest GDP growth and employment creation potential for South Africa and those sectors that offer the highest potential export value according to the DSM. The table provides some interesting differences that give an insight into the South African economy. The manufacturing sectors selected by the DSM are sectors that offer the greatest potential export value. The manufacturing sectors selected by the SAM in contrast are not measured by potential export value, but by the effect an increase in exports would have on GDP and employment creation in the South African economy.

It appears that the highest potential export value does not translate directly into the greatest effects on GDP and employment creation when the table is considered. Of the ten sectors listed from the DSM only four are also on the SAM list. Thus, there are six sectors that have higher potential export value according to the DSM, but have lesser effects on GDP and employment than sectors that offer less potential export value. The four sectors that do appear on both sides of the table are: basic metal products (9th SAM, 1st DSM); meat, fish, fruit, vegetables, oils and fats (1st SAM, 6th DSM); paper and paper products (7th SAM, 7th DSM) and beverages and tobacco (6th SAM, 8th DSM). It also appears that there is not a specific correlation between the position occupied by these sectors on the separate lists (two of the sectors are in almost opposite positions, one sector is in the same position on both lists and one sector differs only two positions). The sectors that appear in the SAM list, but not in the DSM seem to be sectors that are primarily dependant on agriculture or other raw materials. The only exception seems to be publishing and printing. A definite conclusion is that some of the manufacturing sectors in South Africa that offer lower potential export value seem to have greater linkages to other sectors within the South African economy as these have greater effects on both GDP

and employment when an export shock is applied. In terms of individual sectors it is interesting to note that chemicals and chemical products (including plastics) are not included in the SAM's top 10 list as tables 4.7 and 4.8 indicated that there are various opportunities for South Africa in this sector. The same holds true for the manufacturing of transport equipment and other manufacturing and recycling sectors.

Considering the fact that there are various higher value-added sectors that have a smaller impact on GDP and employment than sectors with lower potential export values, there are a few questions that come to mind: why do high value manufacturing sectors – that have the potential to gather significant amounts of foreign exchange for the South African economy – have a lesser impact on important macro-economic metrics such as GDP and employment creation? And at the same time, why are lower value sectors better positioned to impact the economy compared to high value sectors? The answers to these questions are not simple and do not lie within the scope of this study. However, section 2.2 in chapter 2 indicated the strong reliance of the South African economy on mining and the production of primary goods. Over time the South African economy's structure has been built around these primary manufacturing industries (agriculture, mining and to a lesser extent forestry) and support industries (inter-industry linkages) have been set up accordingly. Thus, high value manufacturing sectors may add immediate value, but linkages to these sectors are underdeveloped when compared to the traditional strengths of the South African economy (i.e. primary goods manufacturing). As a result of the significant portion of the South African labour force being lower[28]- and semi-skilled[29] (Stats SA, 2014a), the economy will not benefit as much in the short term with greater impetus into high-skilled export industries[30].

The next set of results focuses on the export opportunities and supporting results for the top five sectors identified in the SAM.

4.3.2 Results for the top five sectors from the SAM

These sections present the export opportunity analysis for the top five sectors that were identified in the SAM that has the greatest effect on South African GDP and

[28] Elementary jobs and domestic work
[29] Clerks, craft and related trades and machine operators
[30] Skilled occupations – 25%. Semi-skilled – 46%. Low-skilled – 29%

employment creation (see chapter 3, section 2) when exports are increased. Specific export opportunities are therefore identified within the manufacturing sectors in which an increase in exports would have the highest impact on GDP and employment creation. This is in line with national development policies that prioritise economic growth and employment creation as key economic objectives of the South African economy.

4.3.2.1 Meat, fish, fruit, vegetables, oils and fats

The manufacturing sector in which an increase in exports would have the largest impact on economic growth and employment creation, is sector SIC 301: meat, fish, fruit, vegetables, oils and fats (see chapter 3, section 2).

A brief overview of the DSM results for this sector is presented, after which the cell matrix analysis (see section 4.2.4) will be conducted to give a broad view of the opportunities within this sector. The top thirty product-country combinations are used to conclude the results for this specific sector.

4.3.2.1.1 Discussion of the results

From the DSM, 2 684 REOs (product-country combinations) were identified for meat, fish, fruit, vegetables, oils and fats, after which a final group of 1 397 product-country combinations were selected for the 118 products in which South Africa specialise in producing and exporting, using an RTA > 0 (see section 4.2.6).

On a regional-level, Western Europe (34% of total opportunities), East Asia (23%) and North America (11%) offer the most opportunities for this sector when potential export value is considered. These three regions combined constitute 68% of the final opportunities for this sector. When the aggregate of the potential export value (see section 4.2.5) in each market is considered, Germany, China and the USA are the top three markets. The top three products (and HS6 codes) are palm oil (crude - 151110), flours, meals and pellets of fish (230120), whole bovine hides and skins (410150).

The following table presents the results from the cell matrix of filter 4 (see section 4.2.4) for this sector.

Table 4.10: Cell matrix with potential export value for meat, fish, fruit, vegetables, oils and fats (values in US$ thousand, unless % indicated)

		South African relative market share				
		Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Import demand size and growth	Large market	**Cell 1** 2 856 571 32.40%	**Cell 6** 152 906 1.73%	**Cell 11** 52 042 0.59%	**Cell 16** 44 944 0.51%	**3 106 462** **35.23%**
	Growing (long- and short-term) market	**Cell 2** 653 489 7.41%	**Cell 7** 49 621 0.56%	**Cell 12** 4 060 0.05%	**Cell 17** 33 952 0.39%	**741 123** **8.41%**
	Large market with short-term growth	**Cell 3** 1 202 365 13.64%	**Cell 8** 82 802 0.94%	**Cell 13** 5 113 0.06%	**Cell 18** 5 530 0.06%	**1 295 810** **14.70%**
	Large market with long-term growth	**Cell 4** 900 231 10.21%	**Cell 9** 144 355 1.64%	**Cell 14** 38 670 0.44%	**Cell 19** 28 888 0.33%	**1 112 145** **12.61%**
	Large market with short- and long-term growth	**Cell 5** 1 666 435 18.90%	**Cell 10** 733 565 8.32%	**Cell 15** 84 023 0.95%	**Cell 20** 77 601 0.88%	**2 561 623** **29.05%**
	Total	**7 279 092** **82.56%**	**1 163 249** **13.19%**	**183 908** **2.09%**	**190 915** **2.17%**	**8 817 163** **100.00%**

The results presented in the cell matrix in Table 4.10 provide the following information:

i. With regard to current market share held by South Africa, the cell matrix indicates that South Africa has various export opportunities within this sector and more than 83% of the opportunities are in markets where South Africa currently holds a very small market share relative to the main competitors (cells 1 to 5). Only 2.2% of the opportunities are in markets where South Africa currently holds a relatively high market share (cells 16 to 20). This implies that South Africa is only sufficiently utilising 2.2% of its export potential in this sector. Even though South Africa specialises in producing and exporting the products included in these results (RCA >0), it does not utilise the export potential sufficiently in the specific markets identified as export opportunities.

ii. In terms of the size and growth of import demand, the most opportunities are found in large markets (35.2%) (cells 1, 6, 11 and 16) and large markets that are growing in the short- and long-term (29.1%) (cells 5, 10, 15 and 20). These two market categories represent almost 65% of all the opportunities in this sector. In the case of export promotion resources being limited, export promotion organisations can focus on cells 5, 10 and 15, as the import demand in these markets are large and growing (over both the short- and long term). Although the same is true for export opportunities in cell 20, South Africa already has a relatively large market share, exporters know these markets and wouldn't need much assistance from export promotion organisations. However, information about these realistic export opportunities can be given to new exporters of those products.

iii. When the individual cells are reviewed, cell 1 (large market where South Africa holds a relatively small market share) represents almost a third of all the opportunities for the sector meat, fish, fruit, vegetables, oils and fats. This is followed by cell 5 (large market with short- and long-term growth where South Africa holds a relatively small market share) that holds almost 19% of the total export potential for this sector.

The findings from the filter 4 cell matrix indicate that South Africa has various opportunities in markets where South Africa currently holds a relatively small market

share, especially in large markets and large markets that are growing in the short- and long-term. This sector holds the highest total potential export value amongst the top five sectors identified in the SAM with a total of US$ 9.5 billion.

The following list provides the top thirty product-country combinations with the highest potential export value for the sector meat, fish, fruit, vegetables, oils and fats.

Table 4.11: Top thirty product-country combinations for meat, fish, fruit, vegetables, oils and fats (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Netherlands	151110 - Palm oil, crude	Cell 1	267 075	0
China	230120 - Flours, meals and pellets of fish / of crustaceans, molluscs / other aquatic invertebrates	Cell 10	239 012	26 277
USA	020230 - Meat of bovine animals, frozen, boneless	Cell 1	236 065	0
Italy	020312 - Hams, shoulders and cuts thereof , fresh / chilled, bone-in	Cell 1	224 103	0
China	410150 - Whole bovine (including buffalo) / equine hides and skins, weight >16kg (fresh / salted / dried / limed/pickled / otherwise preserved but not tanned parchment-dressed / further prepared)	Cell 10	216 034	18 193
China	030379 - Fish, not elsewhere specified, frozen (excluding fillets / other fish meat of 0304 / livers and roes)	Cell 4	195 258	858
Singapore	151110 - Palm oil, crude	Cell 5	174 567	0
Chile	020130 - Meat of bovine animals, fresh / chilled, boneless	Cell 4	127 212	0
South Korea	030379 - Fish, not elsewhere specified, frozen (excluding fillets / other fish meat of 0304 / livers and roes)	Cell 4	126 560	4 063
Germany	020311 - Carcasses / half-carcasses of swine, fresh / chilled	Cell 1	118 210	0
Germany	151110 - Palm oil, crude	Cell 1	105 263	0
Hong Kong (SARC)	020230 - Meat of bovine animals, frozen, boneless	Cell 5	105 262	20
China	410210 - Raw skins of sheep / lambs (fresh / salted / dried / limed / pickled / otherwise preserved)	Cell 10	102 593	9 400
Italy	410150 - Whole bovine (including buffalo) / equine hides and skins, weight >16kg	Cell 3	93 841	3 205
Spain	151110 - Palm oil, crude	Cell 1	91 184	0
Germany	020312 - Hams, shoulders and cuts thereof , fresh / chilled, bone-in	Cell 1	77 243	0
Japan	030379 - Fish, not elsewhere specified, frozen (excluding fillets / other fish meat of 0304 / livers and roes)	Cell 3	75 447	525
Germany	160100 - Sausages and similar products, of meat / meat offal / blood	Cell 1	74 175	0

Table 4.11: Top thirty product-country combinations for meat, fish, fruit, vegetables, oils and fats, continued (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Norway	230120 - Flours, meals and pellets of fish / of crustaceans, molluscs / other aquatic invertebrates	Cell 5	70 863	0
Israel	020230 - Meat of bovine animals, frozen, boneless	Cell 1	68 036	0
Viet Nam	030379 - Fish, not elsewhere specified, frozen (excluding fillets / other fish meat of 0304 / livers and roes)	Cell 5	66 139	173
Germany	200919 - Orange juice, not frozen (excluding of 200919), unfermented and not containing added	Cell 3	65 220	0
Germany	151321 - Palm kernel / babassu oil, crude	Cell 3	65 105	0
United Kingdom	160100 - Sausages and similar products, of meat / meat offal / blood	Cell 1	64 704	0
Italy	20311 - Carcasses / half-carcasses of swine, fresh / chilled	Cell 1	64 520	0
USA	200899 - Edible parts of plants, prepared / preserved, whether or not containing added sugar / other sweetening matter / spirit	Cell 1	63 868	717
USA	200820 - Pineapples, prepared / preserved, whether or not containing added sugar / other sweetening matter / spirit	Cell 1	58 313	6
USA	200911 - Orange juice, frozen, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter	Cell 1	57 934	171
Netherlands	151321 - Palm kernel / babassu oil, crude	Cell 3	54 761	0
USA	160250 - Prepared / preserved preparations of bovine animals (excluding homogenised preparations)	Cell 3	54 526	0

Table 4.11 presents the top thirty product-country combinations by potential export value in the sector meat, fish, fruit, vegetables, oils and fats. From the table, the following is concluded:

i. The geographical representation seems to be in line with the top three regions mentioned earlier, with Western Europe, Eastern Asia and USA being prominent.
ii. Palm oil (crude) appears four times in the list, all of which fall within the top fifteen combinations.
iii. Most apparent of all is the fact that South Africa is currently only exporting to twelve of the top thirty export opportunities in this sector. These present large export opportunities to South Africa as exporters are already exporting these

products, but not to the destinations that are identified as opportunities. For example, South Africa is already exporting flours, meals and pellets of fish to China, Japan, Nigeria, South Korea, Indonesia, Hong Kong and Mozambique, but not to Norway, Denmark, United Kingdom, Ghana, Dominican Republic, Austria, Bulgaria, Slovakia, Armenia, Oman and Estonia, which were also identified as export opportunities for this product. These countries offer new opportunities.

Table 4.11 clearly indicates that there are still a lot of opportunities in the meat, fish, fruit, vegetables, oils and fats sector for South African exporters to explore and investigate.

When the results from the cell matrix and product-country combinations are considered it seems that South Africa has many opportunities in countries where South Africa currently has a relatively small market share. These opportunities are for products which South Africa already exports successfully to other countries (RCA>0), but not necessarily to the countries identified as having high and/or growing demand potential. Consequently, export promotion agencies might, as a first step, focus its efforts on the countries where South Africa has established a relatively high market share for other products in the sector.

The next section discusses the second manufacturing sector identified from the SAM, namely, grain milling, bakery and animal feeds.

4.3.2.2 Grain milling, bakery and animal feeds

The sector within manufacturing that had the second largest multiplier effects in the SAM is the sector grain milling, bakery and animal feeds (SIC 303).

The regional, country and product-level results are briefly discussed, after which the cell matrix and the top thirty product-country results are presented for discussion.

4.3.2.2.1 Discussion

From an initial 497 export opportunities (product-country combinations) for this sector, a final selection of 150 product-country combinations was considered with an RTA value greater than zero (see section 4.2.6).

On a regional, country and product level the results indicate that the top three regions in terms of potential export value are Western Europe (27%), Southeast Asia (19%) and Southern Africa (13%). These three regions combined offer 69% of the opportunities for products in this sector. The top three countries, when the sum of the potential export values is considered, are the Netherlands, Indonesia and Angola. The top three products (and HS6 codes) in terms of potential export value are wheat / meslin flour (110100), maize (corn) starch (110812) and groats / meal of maize (corn) (110313).

The results from the cell matrix from filter 4 (see section 4.2.4) for grain milling, bakery and animal feeds are presented in Table 4.12.

Table 4.12: Cell matrix with potential export value for grain milling, bakery and animal feeds (values in US$ thousand, unless % indicated)

		South African relative market share				
		Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Import demand size and growth	Large market	**Cell 1** 92 567 26.02%	**Cell 6** 0 0.00%	**Cell 11** 0 0.00%	**Cell 16** 0 0.00%	**92 567** **26.02%**
	Growing (long- and short-term) market	**Cell 2** 64 444 18.12%	**Cell 7** 2 282 0.64%	**Cell 12** 0 0.00%	**Cell 17** 317 0.09%	**67 043** **18.85%**
	Large market short-term growth	**Cell 3** 55 207 15.52%	**Cell 8** 0 0.00%	**Cell 13** 0 0.00%	**Cell 18** 0 0.00%	**55 207** **15.52%**
	Large market long-term growth	**Cell 4** 9 337 2.62%	**Cell 9** 5 095 1.43%	**Cell 14** 3 311 0.93%	**Cell 19** 0 0.00%	**17 743** **4.99%**
	Large market short- and long-term growth	**Cell 5** 108 421 30.48%	**Cell 10** 0 0.00%	**Cell 15** 9 709 2.73%	**Cell 20** 5 054 1.42%	**123 184** **34.63%**
	Total	**329 976** **92.76%**	**7 377** **2.07%**	**13 020** **3.66%**	**5 371** **1.51%**	**355 744** **100.00%**

The results presented in the cell matrix in Table 4.12 provide the following information:

i. In the cell matrix not all the cells are populated with opportunities. This is an indication that the 150 REOs with an RTA > 0 are not spread across all market types.
ii. The opportunities are very concentrated in cells 1 to 5 with almost 93% of the opportunities falling in these cells. These are all markets where South Africa has a relatively small market share. This indicates that there are opportunities within this sector that South Africa can still explore and utilise. The remaining opportunities are almost equally divided among markets where South Africa has an intermediately small market share (2.1%), intermediately high market share (3.7%) and a relatively high market share (1.5%).
iii. In terms of import demand size and growth most opportunities are situated in large markets with short- and long-term growth (cells 5, 10, 15 and 20) (34.6%). This is followed by large markets (cells 1, 6 11 and 16) (26%) and short- and long-term growing markets (cells 2, 7, 12 and 17) (18.9%).

The cell matrix indicates that most of the opportunities in the grain milling, bakery and animal feeds sector are in markets where South Africa currently has a relatively small market share. Consequently, export promotion organisations can focus on opportunities that are in cells 1 to 5, but more specifically cell 5 (see table 4.13 for examples of these REO's), as more than 30% of the opportunities for this sector are in large markets with short- and long-term growth. The total value of the opportunities in the sector is just under US$ 356 million.

The following table lists the top thirty realistic export opportunities for the sector grain milling, bakery and animal feeds.

Table 4.13: Top thirty product-country combinations for grain milling, bakery and animal feeds (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Indonesia	110100 - Wheat / meslin flour	Cell 1	45 903	0
Netherlands	110100 - Wheat / meslin flour	Cell 3	37 425	2
Angola	110100 - Wheat / meslin flour	Cell 5	34 124	230

Table 4.13: Top thirty product-country combinations for grain milling, bakery and animal feeds, continued (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
France	110100 - Wheat / meslin flour	Cell 1	18 438	18
Germany	110812 - Maize (corn) starch	Cell 5	14 974	0
United Kingdom	110812 - Maize (corn) starch	Cell 5	11 304	0
Belgium-Luxembourg	110430 - Germ of cereals, whole / rolled / flaked / ground	Cell 1	10 963	0
Angola	110220 - Maize (corn) flour	Cell 15	9 709	3 966
Italy	110430 - Germ of cereals, whole / rolled / flaked / ground	Cell 3	8 148	0
Malaysia	110313 - Groats / meal of maize (corn)	Cell 5	7 622	0
Oman	110100 - Wheat / meslin flour	Cell 2	6 678	0
Israel	110313 - Groats / meal of maize (corn)	Cell 4	6 588	0
Austria	110100 - Wheat / meslin flour	Cell 2	6 077	0
Netherlands	110812 - Maize (corn) starch	Cell 5	5 645	0
Slovakia	110100 - Wheat / meslin flour	Cell 2	5 167	0
Malaysia	110812 - Maize (corn) starch	Cell 9	5 095	565
USA	110812 - Maize (corn) starch	Cell 5	4 776	0
USA	110290 - Cereal flour other than of wheat, meslin, rye, maize (corn), rice	Cell 1	4 704	0
United Kingdom	190420 - Prepared foods obtained from unroasted cereal flakes / mixtures of unroasted cereal	Cell 1	4 024	6
Guatemala	110220 - Maize (corn) flour	Cell 5	3 988	0
Netherlands	190420 - Prepared foods obtained from unroasted cereal flakes / mixtures of unroasted cereal	Cell 3	3 538	0
Italy	190420 - Prepared foods obtained from unroasted cereal flakes / mixtures of unroasted cereal	Cell 3	3 525	0
Philippines	110812 - Maize (corn) starch	Cell 20	3 439	3 640
Cameroon	110313 - Groats / meal of maize (corn)	Cell 14	3 311	774
Portugal	190420 - Prepared foods obtained from unroasted cereal flakes / mixtures of unroasted cereal	Cell 5	3 275	0
Netherlands	110419 - Rolled / flaked grains of cereals other than oats	Cell 5	3 097	0
Germany	110290 - Cereal flour other than of wheat, meslin, rye, maize (corn), rice	Cell 1	3 008	0
Germany	110313 - Groats / meal of maize (corn)	Cell 5	2 803	0
Germany	190420 - Prepared foods obtained from unroasted cereal flakes / mixtures of unroasted cereal	Cell 5	2 771	0
Spain	110290 - Cereal flour other than of wheat, meslin, rye, maize (corn), rice	Cell 4	2 749	0

Table 4.13 presents the top thirty product-country combinations in the sector, grain milling, bakery and animal feeds. From the table the following is noted:

i. Potential export values for grain milling, bakery and animal feeds are significantly lower than the meat, fish, fruit, vegetable, oils and fats sector. With the latter the product-country combination with the highest potential export value is close to US$ 287 million, whereas the highest potential export value for grain milling, bakery and animal feeds is just under US $46 million.
ii. Before specific countries or products are noted, it is apparent that South Africa is not utilising the opportunities that the DSM presents for this sector. Of the top thirty combinations presented for this sector, only eight opportunities are currently being exploited by South Africa (two of these have export values of less than US $10 000). In other words, South Africa produces and exports these products successfully (RTA>0), but does not export them to these countries that were identified as having high export potential. This presents various new export opportunities for South Africa within the sector.
iii. The countries from this list are representative of the regional analysis mentioned above. However, despite the fact that Northern America did not appear in the top three regions for this sector, the USA still has two listings in the top thirty. Germany and the Netherlands each has four listings, emphasising the opportunities held by Western Europe for this sector.
iv. When the products in the list are considered wheat / meslin flour (110100) appears seven times, followed by maize (corn) starch (110812) with six listings. These products are products that South Africa already produce and export successfully (RTA > 0), but it is not exported to some of the destinations listed in these results, offering South African producers and exporters of these products new opportunities.

Results from the cell matrix and product-country combinations tables reveal that there are various opportunities available to South Africa in grain milling, bakery and animal feeds. From the results it can be concluded that South Africa has zero exports to the markets identified for Bulgur wheat (190430), maize oil other than crude (151529) and germ of cereals (110430). Many opportunities exist in the traditionally strong economies of Western Europe, but also in the South-Eastern

parts of Asia and Southern Africa. South Africa has the opportunity to explore new export destinations within the sector grain milling, bakery and animal feeds.

4.3.2.3 Dairy

This section reviews South Africa's export opportunities in the sector SIC 302 dairy, which was identified from the SAM as the third sector with high multiplier effects. A brief overview of the sector's regions, countries and products that offer the highest potential export value are discussed. The cell matrix is then presented, followed by the top thirty product-country combinations for this sector. It is important to note that South Africa is not a large exporter of dairy. However, the potential export value that dairy products offer is of note.

4.3.2.3.1 Discussion

The DSM indicates that there are 305 REOs for South Africa in the dairy manufacturing sector. From these, there are 90 opportunities for the products which South Africa produce locally and export successfully (RTA >0).

When the opportunities are analysed from a regional perspective, the top three regions by potential export value are Western Europe (30% of the opportunities), South West Asia (20%) and Southern Europe (10%). These three regions combined offer more than 60% of the opportunities for this sector. On a country level the three countries presenting the highest total export potential for South African dairy products are Saudi Arabia, Italy and France. Saudi Arabia presents exceptionally high export potential for dairy since it offers more than 70% more potential export value than Italy (in the second place) and almost the same total potential export value as Italy and France (second and third place, respectively) combined. In terms of the products with the highest potential export value for this sector, milk and cream, in various forms, constitute the top three products (concentrated and unsweetened - 040291, concentrated and sweetened - 040299, and not concentrated or sweetened – 040110, respectively). These three products offer more than 75% of the opportunities within the dairy sector.

Table 4.14 presents the results for dairy in the cell matrix from filter 4 from the DSM.

Table 4.14: Cell matrix with potential export value for dairy products (values in US$ thousand, unless % indicated)

		South African relative market share				
		Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Import demand size and growth	Large market	**Cell 1** 57 473 18.89%	**Cell 6** 0 0.00%	**Cell 11** 0 0.00%	**Cell 16** 0 0.00%	**57 473** **18.89%**
	Growing (long- and short-term) market	**Cell 2** 62 086 20.41%	**Cell 7** 0 0.00%	**Cell 12** 3 339 1.10%	**Cell 17** 2 327 0.76%	**67 752** **22.27%**
	Large market short-term growth	**Cell 3** 61 361 20.17%	**Cell 8** 0 0.00%	**Cell 13** 0 0.00%	**Cell 18** 0 0.00%	**61 361** **20.17%**
	Large market long-term growth	**Cell 4** 33 456 11.00%	**Cell 9** 0 0.00%	**Cell 14** 0 0.00%	**Cell 19** 0 0.00%	**33 456** **11.00%**
	Large market short- and long-term growth	**Cell 5** 84 199 27.68%	**Cell 10** 0 0.00%	**Cell 15** 0 0.00%	**Cell 20** 0 0.00%	**84 199** **27.68%**
	Total	**298 575** **98.14%**	**0** **0.00%**	**3 339** **1.10%**	**2 327** **0.76%**	**304 241** **100.00%**

The cell matrix presents the following results:

i. The cell matrix is not entirely populated by opportunities. At a glance it is apparent that almost all the opportunities (98.1%) for this sector are located in cells 1 to 5, markets where South Africa currently holds a relatively small market share if compared to the top six competitors in each market. The remaining opportunities are in markets where South Africa holds an intermediately large market share (1.1%) and markets where South Africa has a relatively high market share (0.8%).
ii. There are, however, a few opportunities that South Africa is already utilising well. Examples of product-country combinations where South Africa has established a high market share are ice cream and other edible ice to Mozambique and Zambia (89% and 74.3% market share respectively) and dairy spreads to Mauritius (84.2% market share). These product-country combinations are categorised in cell 17.
iii. Opportunities seem to be spread rather equally across the five market types. Large markets with short and long-term growth offer the most opportunities for this sector with 27.8%. Large markets with long-term growth have the fewest opportunities of the market types with 11%, whilst the other three market types equally share the remaining opportunities

The cell matrix indicates that the opportunities are concentrated in markets where South Africa currently has a relatively low (or even no) market share, across various market types. It seems sensible for export promotion resources to be utilised in exploring opportunities in cells 1 to 5, and specifically cell 5. Examples of export opportunities in cell 5 include concentrated, sweetened milk and cream (040299) to France, the Netherlands, Spain and Oman; also dairy spreads (040520) to South Korea and Spain (see table 4.15). The sector offers more than US$ 303 million in potential export value in total, which is the lowest of the five sectors under review.

The following table lists the top thirty export opportunities (product-country combinations) for South African dairy.

Table 4.15: Top thirty product-country combinations for dairy (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Italy	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 3	28 875	0
Greece	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 3	26 218	0
Saudi Arabia	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 5	23 718	0
Netherlands	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 5	14 913	0
Philippines	040590 - Fats and oils derived from milk, other than butter and dairy spreads	Cell 4	14 721	0
Saudi Arabia	040590 - Fats and oils derived from milk, other than butter and dairy spreads	Cell 4	13 968	0
France	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 5	10 150	0
Germany	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 5	9 997	0
France	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 1	9 824	0
Hong Kong (SARC)	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 1	9 099	0
Saudi Arabia	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 1	8 948	0
United Kingdom	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 1	8 313	0
France	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 1	7 941	0
Saudi Arabia	210500 - Ice cream and other. edible ice, whether or not cont. cocoa	Cell 2	7 876	0
United Kingdom	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 1	7 345	1
China	040130 - Milk and cream, not concentrated / sweetened, fat content by weight >6%	Cell 2	5 949	0
Netherlands	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 5	5 791	0
Denmark	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 5	5 605	0
Spain	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 5	4 799	0
Germany	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 4	4 767	0
Peru	040590 - Fats and oils derived from milk, other than butter and dairy spreads	Cell 2	4 568	0
Germany	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 3	4 538	3
Oman	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 5	4 344	0
Indonesia	040299 - Milk and cream, concentrated	Cell 2	4 091	0

Table 4.15: Top thirty product-country combinations for dairy, continued (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
United Kingdom	040110 - Milk and cream, not concentrated / sweetened, fat content by weight not >1%	Cell 1	3 786	0
Singapore	040310 – Yoghurt	Cell 2	3 514	0
Singapore	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 2	3 150	0
South Korea	040520 - Dairy spreads	Cell 5	2 803	0
Angola	040299 - Milk and cream, concentrated (excluding in powder), sweetened	Cell 12	2 758	1470
Italy	040291 - Milk and cream, concentrated (excluding in powder), unsweetened	Cell 2	2 579	0

From table 4.15, the following observations can me made:

i. The highest potential export value for this list is lower than the previous two sectors. The product-country combination with the highest potential export value for the dairy sector has a value of US$ 28.9 million.
ii. The table also indicates that very few of the current top thirty opportunities are being utilised by South Africa. Of the top thirty South Africa is only exporting to three of the combinations.
iii. Milk and cream in their various forms (as mentioned above) constitute twenty-four of the thirty combinations in the list. These results also confirm the plethora of opportunities offered by Western Europe in the dairy sector.

To summarise, the dairy sector offers 305 REOs from the DSM. Of these, only 90 are for products which South Africa specialises in producing and exporting (RTA>0). Even though the sector offers fewer opportunities than the other sectors taken from the SAM, there are still various opportunities available to South Africa within the sector, especially to countries that South Africa are already exporting to (e.g. within Europe). From the cell matrix it is clear that South African export promotion should be focussed on cells 1 to 5, as opportunities are concentrated in these cells for this sector.

4.3.2.4 Wood and wood products

The fourth sector being analysed from the results obtained from the SAM (SIC 321 and 322), wood and wood products. As with the previous sectors that were discussed, a brief overview of the regions, countries and products that came out with the highest potential export value are discussed. Furthermore, the sector's cell matrix is discussed along with the top thirty product-country combinations.

4.3.2.4.1 Discussion

From the DSM there were 557 REOs for the wood and wood products sector, but after considering only the products which South Africa specialises in producing and exporting (the RTA > 0), the final pool of opportunities came to 165.

Following the regional analysis, the following three regions had the highest total potential export value: Western Europe (27% of the opportunities), East Asia (18%) and Central Europe (11%). These three regions combine to offer two-thirds of all the opportunities. When the various countries are considered, Japan, Germany and Italy are the three countries with the highest potential export value, with total potential export values of US$ 187 million, US$ 152 million and US$ 102 million respectively. After analysing the individual products within the sector the three products (and HS codes) that had the highest potential export value were i) builders' joinery and carpentry of wood (441890), ii) doors and their frames and thresholds (441820) and iii) pallets, box pallets and other load boards of wood (441520). These three products combine to offer more than 88% of the opportunities within this sector.

Table 4.16 offers the cell matrix for wood and wood products. After the matrix a discussion follows.

Table 4.16: Cell matrix with potential export values for wood and wood products (values in US$ thousand, unless % indicated)

		Relative Market Share of South Africa				
		Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Import demand size and growth	Large market	**Cell 1** 173 885 16.36%	**Cell 6** 0 0.00%	**Cell 11** 33 664 3.17%	**Cell 16** 0 0.00%	**207 548** **19.53%**
	Growing (long- and short-term) market	**Cell 2** 131 576 12.38%	**Cell 7** 35 0.00%	**Cell 12** 0 0.00%	**Cell 17** 617 0.06%	**132 228** **12.44%**
	Large market short-term growth	**Cell 3** 27 390 2.58%	**Cell 8** 3 250 0.31%	**Cell 13** 0 0.00%	**Cell 18** 0 0.00%	**30 640** **2.88%**
	Large market long-term growth	**Cell 4** 196 034 18.44%	**Cell 9** 0 0.00%	**Cell 14** 0 0.00%	**Cell 19** 0 0.00%	**196 034** **18.44%**
	Large market short- and long-term growth	**Cell 5** 480 443 45.20%	**Cell 10** 15 994 1.50%	**Cell 15** 0 0.00%	**Cell 20** 0 0.00%	**496 436** **46.71%**
	Total	**1 009 327** **94.96%**	**19 279** **1.81%**	**33 664** **3.17%**	**617** **0.06%**	**1 062 887** **100.00%**

The cell matrix presents the results for the wood and wood products sector. From the matrix, the following can be deduced:

i. The 165 opportunities with an RTA > 0 are concentrated in certain types of markets and do not populate the whole matrix. Cells 1 to 5 (markets where South Africa has a relatively small market share) contain the most opportunities with more than US$ 11 billion (94.96% of all opportunities) in total coming from these markets.
ii. When the opportunities are considered that South Africa is already utilising, the top three by South African market share are fibreboards of wood to Seychelles (cell 16) with a 100% market share, sheets for veneering to Mozambique (cell 17) with 92.54% South African market share and pallets, box pallets and other load boards of wood to Zambia (cell 17) where South Africa has a 92.2% market share.
iii. When market types are considered, large markets with short and long-term growth hold the most opportunities (46.71%), followed by large markets (19.53%), and large markets with long-term growth (18.44%).

Export promotion organisations in South Africa can focus their resources on opportunities in cells 1 to 5, but specifically cell 5, as most opportunities are located in large markets that are growing in both the short- and long-term. Table 4.17 confirms this on a product-country level. The wood and wood products sector has the third highest total potential export value amongst the five sectors identified from the SAM.

Table 4.17 lists the top thirty product-country combinations for wood and wood products. The South African actual export value for each specific combination is also listed.

Table 4.17: Top thirty product-country combinations for wood and wood products (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Japan	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 5	157 679	0
Italy	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 4	76 465	19
Germany	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 5	66 918	3
USA	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 1	64 766	3
Germany	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 5	48 244	0
Switzerland	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 5	46 857	5
France	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 4	38 397	54
United Kingdom	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 11	33 664	16 623
Japan	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	29 966	0
Norway	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	26 068	0
Belgium-Luxembourg	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 4	25 342	465
France	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 1	24 502	7
Netherlands	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 5	19 748	0
Switzerland	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	18 840	0
Norway	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 2	17 994	0
Netherlands	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 10	15 994	1 743
United Kingdom	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 1	15 821	77
Germany	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	15 759	3
Denmark	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 3	15 325	0

Table 4.17: Top thirty product-country combinations for wood and wood products, continued (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
France	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	14 888	1
USA	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 1	14 675	9
Sweden	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 5	13 453	0
Germany	441510 - Cases, boxes, crates, drums and sim. packings of wood; cable-drums of wood	Cell 1	12 196	16
Austria	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 4	12 177	0
Switzerland	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 4	12 074	2
Netherlands	441890 - Builders' joinery and carpentry of wood, including cellular wood panels	Cell 2	11 762	218
Italy	441520 - Pallets, box pallets and other load boards of wood; pallet collars of wood	Cell 1	11 387	0
Italy	440839 - Sheets for veneering, including those obtained by slicing laminated wood, for plywood	Cell 1	11 039	0
Belgium-Luxembourg	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 4	10 172	0
Austria	441820 - Doors and their frames and thresholds, of wood, including cellular wood panels	Cell 2	8 318	0

From the table the following can be concluded:

i. Within the wood and wood products sector it appears that South Africa is already utilising some of the opportunities in the top thirty, but at low values. Of the top thirty combinations, South Africa is currently exporting to sixteen of the combinations. However, of these sixteen, eight have export values of less than US$ 10 000.

ii. At the top of the list Japan, Germany and Italy is similar to what was seen with the total potential export value results from the country analysis. Western European countries are once again prominent in the top thirty combinations, in line with the results from the regional analysis.

iii. Doors and their frames and thresholds appear most in the table (12 times), followed by builders' joinery and carpentry and pallets, box pallets and other load boards (8 times each).

The table indicates that the most opportunities within the wood and wood products sector are in Western European countries. Even though South Africa is utilising the opportunities available, it is to a low extent. For South Africa new opportunities are situated in cells 1 to 5 from the cell matrix, but there is also opportunity to expand its current exports to existing export destinations.

4.3.2.5 Furniture

In this section the results pertaining to furniture products are discussed (SIC 391). As an introduction, the results are discussed at the regional, country and product levels. The cell matrix from filter 4 in the DSM is the discussed as it relates to this sector and the top thirty product-country combinations will conclude the analysis for this sector.

4.3.2.5.1 Discussion

The furniture sector offers 491 REO's in total. Out of this pool of REOs, South Africa has an RTA greater than zero for 108 opportunities.

The regional analysis indicates that North America, Western Europe and East Asia are the top three regions. The total potential values offered by North America and Western Europe are US$ 1.4 billion and US$ 910 million respectively, while in East Asia it is US$ 193 million. It is therefore noted that North America and Western Europe are well ahead in terms of potential export value. The top three countries are the United States of America, Germany and Canada. The USA offers more than twice the potential export value of second place Germany, while third placed Canada offers less than half of the potential value offered by Germany. There are only four products in this sector in which South Africa specialise in producing and exporting. These are parts of seats (940190), seats (not elsewhere specified - 940180), mattresses of other materials (940429) and mattress supports (940410). In this regard, parts of seats offer the highest export potential. The cell matrix below indicates how these opportunities are positioned in terms of market type and current South African market share.

Table 4.18: Cell matrix with potential export value for furniture (values in US$ thousand, unless % indicated)

		South African relative market share				
		Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Import demand size and growth	Large market	**Cell 1** 433 078 13.95%	**Cell 6** 254 489 8.20%	**Cell 11** 0 0.00%	**Cell 16** 0 0.00%	**687 567** **22.14%**
	Growing (long- and short-term) market	**Cell 2** 214 096 6.89%	**Cell 7** 0 0.00%	**Cell 12** 0 0.00%	**Cell 17** 386 0.01%	**214 482** **6.91%**
	Large market short-term growth	**Cell 3** 47 077 1.52%	**Cell 8** 19 970 0.64%	**Cell 13** 0 0.00%	**Cell 18** 0 0.00%	**67 046** **2.16%**
	Large market long-term growth	**Cell 4** 1 179 529 37.98%	**Cell 9** 0 0.00%	**Cell 14** 0 0.00%	**Cell 19** 0 0.00%	**1 179 529** **37.98%**
	Large market short- and long-term growth	**Cell 5** 458 501 14.76%	**Cell 10** 24 442 0.79%	**Cell 15** 473 799 15.26%	**Cell 20** 0 0.00%	**956 741** **30.81%**
	Total	**2 332 280** **75.10%**	**298 901** **9.63%**	**473 799** **15.26%**	**386** **0.01%**	**3 105 365** **100.00%**

The cell matrix from filter 4 of the DSM presents the opportunities for the furniture sector according to import demand and size (market type, in the rows) and current South African market share (in the columns). From the matrix the following is noted:

i. Not all the cells in the matrix are populated. Opportunities within the furniture sector are concentrated in cells 1 to 5 (markets where South Africa has a relatively small market share), with 75.10% of the opportunities in these cells. Of the remaining opportunities, 15.26% are in markets where South Africa has an intermediately small market share, 9.63% are situated in markets where South Africa already has an intermediately high market share, and only 0.01% is in markets where South Africa already has a relatively large market share.
ii. Of the opportunities that South Africa is already utilising most are categorised in cell 17. The top three product-country combinations, measured by South African market share, are mattresses of other materials to Zambia (more than 96% market share), and mattress supports to Zambia (84.22% market share) and Seychelles (44.57% market share). These opportunities are also categorised in cell 17.
iii. In terms of market types, the most (37.98%) opportunities are in large markets with long-term growth, followed by large markets with short and long-term growth (30.81%) and large markets (22.14%).

As with the grain milling, bakery and animal feeds and dairy sectors, the cell matrix for furniture is not entirely populated. The most opportunities for South Africa are in markets where South Africa currently holds a relatively small market share. Large markets with long-term growth and large markets with short- and long-term growth combine to offer the most opportunities (more than 68% of the opportunities). Furniture offers the second highest total potential export value of the five sectors under review with more than US$ 3.1 billion in potential export value for the sector.

The following table illustrates the top thirty product-country combinations within the furniture sector.

Table 4.19: Top thirty product-country combinations for furniture (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
USA	940190 - Parts of the seats of 9401	Cell 4	1 055 812	4 449
Germany	940190 - Parts of the seats of 9401	Cell 15	463 336	255 094
Canada	940190 - Parts of the seats of 9401	Cell 1	208 407	122
China	940190 - Parts of the seats of 9401	Cell 5	161 320	58
Mexico	940190 - Parts of the seats of 9401	Cell 5	123 593	13
United Kingdom	940190 - Parts of the seats of 9401	Cell 6	112 468	9 894
France	940190 - Parts of the seats of 9401	Cell 1	111 858	822
Spain	940190 - Parts of the seats of 9401	Cell 6	90 159	24 629
Czech Republic	940190 - Parts of the seats of 9401	Cell 4	83 321	704
Poland	940190 - Parts of the seats of 9401	Cell 5	71 627	2 877
USA	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 6	51 862	12 798
Portugal	940190 - Parts of the seats of 9401	Cell 2	49 666	1 312
France	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 1	27 096	35
Germany	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 4	25 121	245
Netherlands	940190 - Parts of the seats of 9401	Cell 2	24 806	48
United Kingdom	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 8	19 970	1 634
Australia	940190 - Parts of the seats of 9401	Cell 2	19 684	79
Japan	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 5	18 328	0
India	940190 - Parts of the seats of 9401	Cell 2	16 975	111
Canada	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 10	16 901	1 053
Germany	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 3	15 914	0
Belgium-Luxembourg	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 1	15 790	98
USA	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 1	14 081	73
United Arab Emirates	940190 - Parts of the seats of 9401	Cell 2	13 959	3
France	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 5	13 512	27
Netherlands	940410 - Mattress supports	Cell 5	13 211	0
Sweden	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 5	12 926	1

Table 4.19: Top thirty product-country combinations for furniture, continued (values in US$ thousand)

Country	Product description	Cell	Potential export value	SA exports 2011
Spain	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 1	12 812	76
Netherlands	940180 - Seats (excluding of 6402), not elsewhere specified in 9401	Cell 3	12 709	263
Netherlands	940429 - Mattresses of other materials (excluding cellular rubber / plastics)	Cell 1	11 921	0

The table illustrates the top thirty product-country combinations for the furniture sector. The following is apparent from the table:

i. In contrast to the other sectors discussed thus far, in the furniture sector South Africa is utilising the top 30 opportunities available more effectively. Of the top thirty opportunities listed only three opportunities are not being utilised at all and two other opportunities have export values of less than US$ 10 000.
ii. Western European countries appear the most in the list and most of these opportunities are already being utilised by South Africa. Encouragingly, the opportunities where South Africa does not export at all are in countries where South Africa is already exporting other products to from the furniture sector.
iii. On a product level, parts of seats appear the most in the top 30 list with fifteen appearances.

This table provides the top thirty product-country combinations for the furniture sector. Within the top thirty, South Africa is already utilising the opportunities available to some extent. However, various opportunities still exist in markets where South Africa has a relatively small market share, according to the cell matrix.

This section provided the results for the top five sectors identified in the SAM that have the greatest effects on GDP and employment creation for the South African economy. The majority of the results indicate that South Africa's main regions of opportunity are Europe (specifically Western Europe), Asia (South East and East) and North America. In terms of market classification, the most opportunities are in markets that South Africa are not utilising effectively (or not at all) at present. These are large markets that are growing in the short and / or long term, presenting South African exporters with attractive opportunities.

The summary below concludes this chapter.

4.5 Summary

This chapter provided the empirical analysis based on the Decision Support Model (DSM). In Chapter 3 a SAM Multiplier Analysis was used to identify the manufacturing sectors in which an increase in exports will have the highest benefits for economic growth and employment in South Africa. The aim of this chapter was to investigate how an increase in exports can be practically pursued by means of export promotion. Realistic export opportunities (product-country) combinations are identified for the South African manufacturing industry with specific focus on the top five sectors identified in Chapter 3 in which an increase in export will have the greatest benefit for economic growth and employment. The method applied is the Decision Support Model (DSM) approach, which was specifically developed for export promotion purposes.

The DSM methodology was discussed after a brief background on the model.

The overall results for the manufacturing industry as a whole were firstly listed on a regional, country, sector and product level. This sequence focussed the results from a broad regional view to listing products on an HS 6-digit level. The top regions were identified as Europe, Asia and North America. The top three countries comprised the USA, Germany and China. The top three sectors were basic metal products, other manufacturing and recycling and manufacturing of transport equipment. In terms of products, the top fifty products by potential export value were mainly products related to metal, vehicles and chemicals.

The top performing sectors from the DSM (based on potential export value) were then compared to those sectors identified in Chapter (SAMMA) as the sectors that offer the greatest effects on GDP and labour when an export shock (increase) is applied. From this comparison it seems that the South African economy is structured in such a way that the lower value manufactured exports have a greater effect on the broader economy (in terms of GDP and labour creation) in comparison to higher value manufactured exports. The reason is the fact that these lower value manufactured sectors have stronger linkages to other sectors in the economy. A strong historical focus on agriculture and other primary manufactures, coupled with a

high propensity to import has aided a stronger development of primary manufacturing activities.

Finally, more detailed DSM results for the top five sectors identified in the SAMMA were provided and discussed. The results indicate that the majority of the opportunities are in markets where South Africa has little or no current presence in the import markets classified as large markets that are growing (be it in the short term, long term or both) and hold the most potential.

The next chapter provides the conclusions of and recommendations emanating from the study.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study. It provides an overview of the study and evaluates to what extent the research questions have been answered. Following the study overview, some policy implications are discussed and recommendations for future study in this field are made.

5.2 Chapter summary

The study commenced with a brief introduction on the role of trade in economic growth and employment. From there South African national policy documents, together with some statistics on the South African manufacturing industry's trade performance served as the basis for the motivation of the study (chapter 1.2.1 and 1.2.2). It was identified that South African policy requires increased exports, especially for manufactured goods, to meet its economic growth and employment goals by 2030. Recent data, however, suggests that current performance is unable to meet the demands of policy documents. The problem statement (chapter 1.3) thus sought to identify the top sectors within the manufacturing industry in which an increase in exports will have the greatest benefits for economic growth and employment creation. Specific export opportunities (country-product combinations) for these sectors would then be identified in order to promote the exports for these sectors effectively. As a result, the focus of the study was summarised in the research objectives (chapter 1.4) as follows. To identify:

i. the South African manufacturing sectors that have the greatest effects on economic growth (GDP) and employment creation when exports are increased.
ii. within each of these manufacturing sectors, realistic export opportunities (product-country combinations) in order to be effective with export promotion.

Chapter 2 gave an overview of industrialisation and trade. The literature with regard to industrialisation and manufacturing and its effect on economic growth and development was discussed first, followed by a historic overview of industrialisation and manufacturing in South Africa (sections 2.2.1 and 2.2.2). Section 2.3.1 then discussed the link from literature between trade and economic development and it

was concluded that increased trade (specifically exports and manufactured exports) has a positive effect on economic growth and employment creation. Section 2.3.2 then viewed the current status of trade and employment in the South African manufacturing sector. The conclusion from this section was that South Africa is not only struggling to increase its manufactured exports and create more jobs, but is also struggling to maintain its levels of employment. This underlined the need for information to inform focused export promotion in the South African manufacturing sector, which is also the main contribution of this study.

The empirical part of the study consisted of two phases. The first (chapter 3) saw the use of a social accounting matrix multiplier analysis (SAMMA) to determine in which sectors within the South African manufacturing industry an increase in export will have the greatest economy-wide effects, specifically for economic growth and employment creation. The basic SAM model was then discussed, followed by the composition and construction of the SAM. The results for the sectors that had the greatest effects on economic growth and employment creation were then discussed.

Chapter 4 discussed the details of the second phase of the empirical analysis, i.e. the implementation of a Decision Support Model (DSM) to identify realistic export opportunities. The DSM's approach and framework were addressed first and then the four-step filtering process was explained. The DSM results were first presented at an aggregated level for all manufacturing sectors (as information is readily available for all manufacturing sectors from the DSM). The focus was then turned to the results for the specific sectors that were identified from chapter 3 (SAM multiplier analysis). The realistic export opportunities for these sectors were presented (first on an aggregated level and then on a more detailed product-county level).

5.3 Main findings

Since its first democratic elections held in 1994, the South African economy has been marred by a series of problems ranging from high rates of unemployment to low rates of economic growth. From the literature (chapter 2) it is apparent that most economies of the world today were built on a strong industrial foundation, many of which came as a direct result of the industrial revolution.

Consequently, this study set out to answer two research questions: i) which South African manufacturing sectors exert the greatest effects on economic growth (GDP) and employment creation when exports are increased?; and ii) within each of these manufacturing sectors, what are the realistic export opportunities (product-country combinations) in order to be effective with export promotion?

As mentioned in the previous section, these research questions were addressed in two empirical phases. Firstly, a social accounting matrix multiplier analysis was applied where an export shock was effected. This allowed to identify which sectors within the South African manufacturing industry held the greatest effects on GDP and employment creation when exports are increased. After the SAMMA application the second phase of the empirical analysis focused on identifying the export opportunities for these sectors by means of a Decision Support Model. The DSM was specifically applied to identify the REOs for the five top sectors identified in chapter 3.

The SAMMA identified that increased exports in 1) meat, fish, fruit, vegetables, oils and fats, 2) grain milling, bakery and animal feeds, 3) dairy, 4) wood and wood products and 5) furniture will have the greatest effect on labour absorption. It was interesting to note that these sectors are related to either agricultural or primary manufacturing. According to the DSM, the five sectors that offer the greatest potential export value are 1) basic metal products, 2) other manufacturing and recycling, 3) manufacturing of transport equipment, 4) chemicals and chemical products and 5) textiles, clothing, leather and footwear. From this comparison it seems that the South African economy is structured in such a way that the lower value manufactured exports have a greater effect on the broader economy (in terms of GDP and labour creation) in comparison to higher value manufactured exports. A strong historical focus on agriculture, coupled with a high propensity to import has aided the stronger development of primary manufacturing activities (Chapter 2). This has resulted in these lower value manufactured sectors having stronger linkages to other sectors in the economy.

More detailed DSM results for the top five sectors identified in the SAM indicate that the majority of the opportunities are in markets where South Africa has little or no current presence in the import markets classified as large markets that are growing

(be it in the short term, long term or both) and hold the most potential. Examples of these include palm oil (151110) to Singapore; frozen boneless bovine meat (020230) to Hong Kong; frozen fish (030379) to Vietnam; wheat / meslin flour (110100) to Angola; groats / meal of corn maize (110313) to Malaysia; unsweetened concentrated milk and cream (040110) to Saudi Arabia; sweetened concentrated milk and cream (040299) to Oman; dairy spreads (040520) to South Korea; wooden doors and frames (441820) to Japan and parts of seats (940190) to Mexico. Creating more jobs and stimulating the economy for meaningful, long-term growth is not something that happens by chance. As seen in the literature pertaining to industrialisation, the process of building economies that are conducive to employment creation through manufacturing and industry takes effort and time. Consequently, South Africa cannot rid itself of high unemployment overnight only by discussing good policies. It will require action by all relevant parties. The results from this study indicate that there are opportunities aplenty for South Africa to grow its manufactured exports and it can be used as a means for creating more jobs in South Africa.

5.4 Policy implications and recommendations

From the findings of this study, policy-makers and export promotion agencies can focus their efforts on developing the sectors that offer the greatest effects on economic growth and employment creation and explore the export opportunities within these sectors. Government can play a key role in developing these export sectors by attracting new potential exporters into the market or encouraging existing export companies to expand. Whether it be tax incentives, leading export missions to new markets or providing funds to these sectors, government can become actively involved in stimulating the export of manufactured goods. Investing in these sectors and their related export opportunities has the potential to contribute to the achievement of reaching policy objectives that the South African government is currently pursuing.

Reference is once again made to the fact that middle-income economies often employ three to four times the amount of labour in primary sectors compared to value added manufacturing sectors (Black & Gerwel, 2014). Taking into account the high unemployment rate that currently faces South Africa, creating employment

opportunities is of the utmost importance. The long-term solution is certainly not a focus solely on primary sector manufacturing, but a more systematic transition from primary sector manufacturing to value added manufacturing and exports. This agrees with the literature findings in chapter 2 (see chapter 2.2.1) that indicate that industrialisation often came from economies that employed large parts of the economy into agriculture and other primary sectors of the economy. As indicated from economic theory and literature in chapter 2.3.1 a better skilled workforce contributes more towards the innovation technological level of manufactured exports and in turn that can again offer more efficient employment creation. Thus, there also has to be a focus on developing a skilled workforce.

Government can aid the achievement of its policy goals to

Following on this study there are other research opportunities that offer value for continued research. Listed below are some research opportunities that can offer value to both policy makers and academia alike.

- Evaluating specific markets and accompanying marketing strategies for utilising the presented opportunities.
- Determining barriers to greater value added manufactures and its exports.
- Examining the labour force's competence within manufacturing export companies and evaluating measures necessary for the production of more value added manufactures.
- Determining what barriers exist that prevent South Africa from exporting products for which it already has an RTA > 0 to destinations that offer greater potential (e.g. Tables 4.11 to 4.19).

Pursuing these fields of study will add further relevance and more practical applications to the results presented in this study.

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