

CHAPTER 3

SOUTH AFRICA'S

AGRICULTURAL SECTOR AND

INTERNATIONAL TRADE

Context, composition and performance





3.1 INTRODUCTION

From Chapter two it has become evident that the agricultural sector has an important role in economic development, as well as in employment creation of any country. The second chapter furthermore emphasised the importance of international trade in the process of structural transformation of developing countries. Hence, this third chapter will provide some perspectives and background for South Africa as it analyses the country's agricultural sector and its international trade. Firstly, this chapter discusses the South African agricultural sector from both an international and a national perspective. This will provide insights into South Africa's agricultural orientation. Secondly, an in-depth analysis of the performance of South Africa's agricultural trade is conducted, using several instruments of trade diagnostics for analysing the country's trade growth in the intensive margin, the extensive margin, the quality margin, and the sustainability margin.

Overall, this chapter discusses the status quo and challenges regarding South Africa's agricultural trade. This will form the basis for further analyses on the diversification pathways in the next chapters of this thesis.

3.2 SOUTH AFRICA'S POSITION IN GLOBAL AGRICULTURE

This section will give a brief discussion of global trends in agriculture and provide some international comparisons of agricultural production, land endowment and productivity.

3.2.1 *Global trends*

Dynamics, such as a shift in dietary patterns to more animal protein, regional food security concerns, bio-fuel production from food crops, high food prices, ecological sustainability, urbanisation, and an ever-increasing world population, have all put a renewed focus on the global agricultural sector. The FAO (2012) estimates that about 870 million people in the global population are currently chronically undernourished and estimates that agricultural production has to increase by 40 per cent to feed the global population of nine billion by



2050. This implies that significant increases in production of several key commodities are necessary (FAO, 2009). Annual production of cereal should increase by almost one billion tonnes, and meat by over 200 million tonnes. Most of this increase in production should come from developing countries (FAO, 2009).

Globally, the potential for increasing the agricultural area is limited; less than five per cent by 2050 (FAO, 2012). Hence, production increases have to come from enhanced productivity (e.g. improved crops) and supply chain efficiency (e.g. a reduction of food loss). Owing to the sluggish growth in the R&D spending in agriculture and the extensive time needed to develop and adopt new technologies, productivity gains in the medium term should come from bridging the productivity gap in the developing countries. Since an estimated 25 per cent of all agricultural land is highly degraded (FAO, 2012), this productivity gap should be filled in a sustainable manner.

3.2.2 South Africa's position in global agricultural production

Globalisation has resulted in a more interlinked global food sector. Hence, South Africa is increasingly being integrated into several international agricultural supply chains and has a role to play in ensuring local, regional and global food security. Although South Africa is largely an arid country with only 13 per cent of the total land surface suitable for crop production, it has a relatively well developed commercial agricultural sector. South Africa is the 27th largest economy (World Bank, 2012) and it ranks comparably as the 32nd largest agricultural producer, with a share of 0.6 per cent in global production.

Figure 3.1 below reflects a comparison of the total value of agricultural production for the period 2005 to 2010 between South Africa and selected countries. It is evident from the figure that South Africa is a relatively small producer of agricultural products in value terms. Apart from Egypt, Ukraine and Sudan, the total value of agricultural production of the selected countries is at least more than twice the value of South Africa's production.

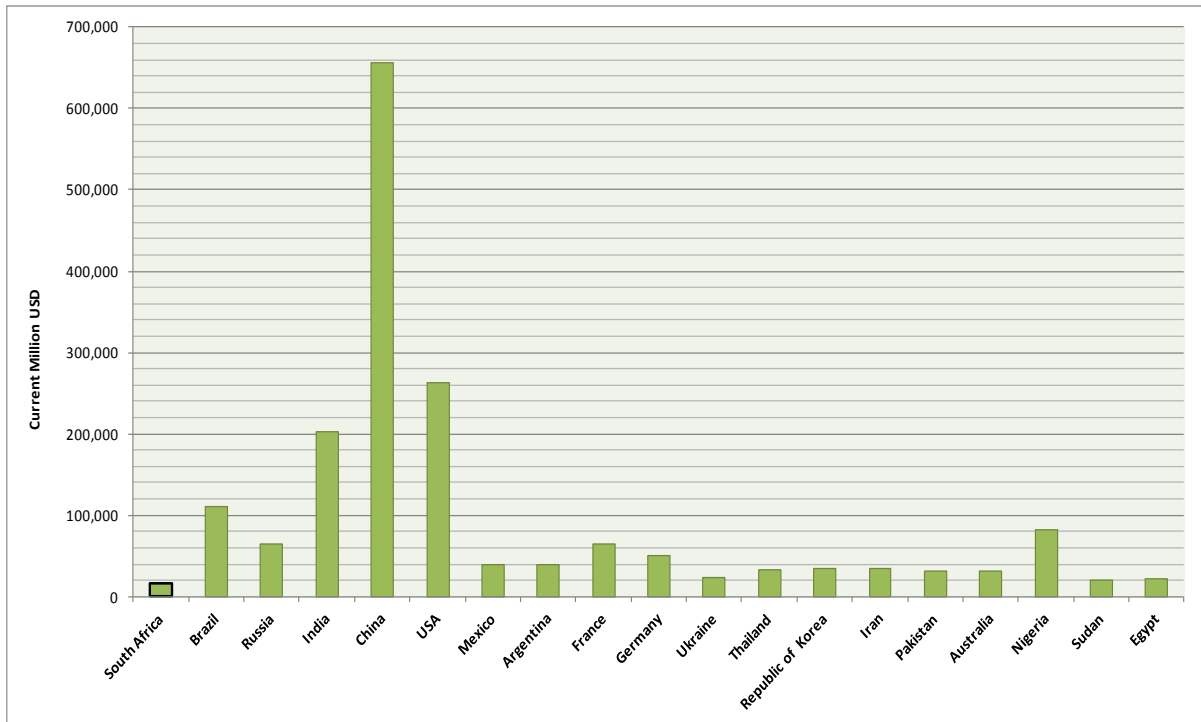


Figure 3.1: Comparison of total value of agricultural production (2005-2010 average)

Source: Author's own calculations based on data from FAOSTAT (2013)

As economies develop, the contribution of their agricultural sectors to a nation's GDP becomes relatively smaller (see also Chapter 2). Hence, a comparison of the relative importance of the agricultural sector in South Africa and selected countries² is provided in Figure 3.2 below. These shares only reflect the contribution of primary production and not of processing and transport activities and are thus an underestimation of the relative economic importance of the sector.

From Figure 3.2, it is evident that the contribution of South Africa's agricultural sector to GDP is smaller than in most other developing middle-income economies. The country compares well with advanced economies, such as Australia and Korea, as well as with the global situation.

² No data available for Nigeria

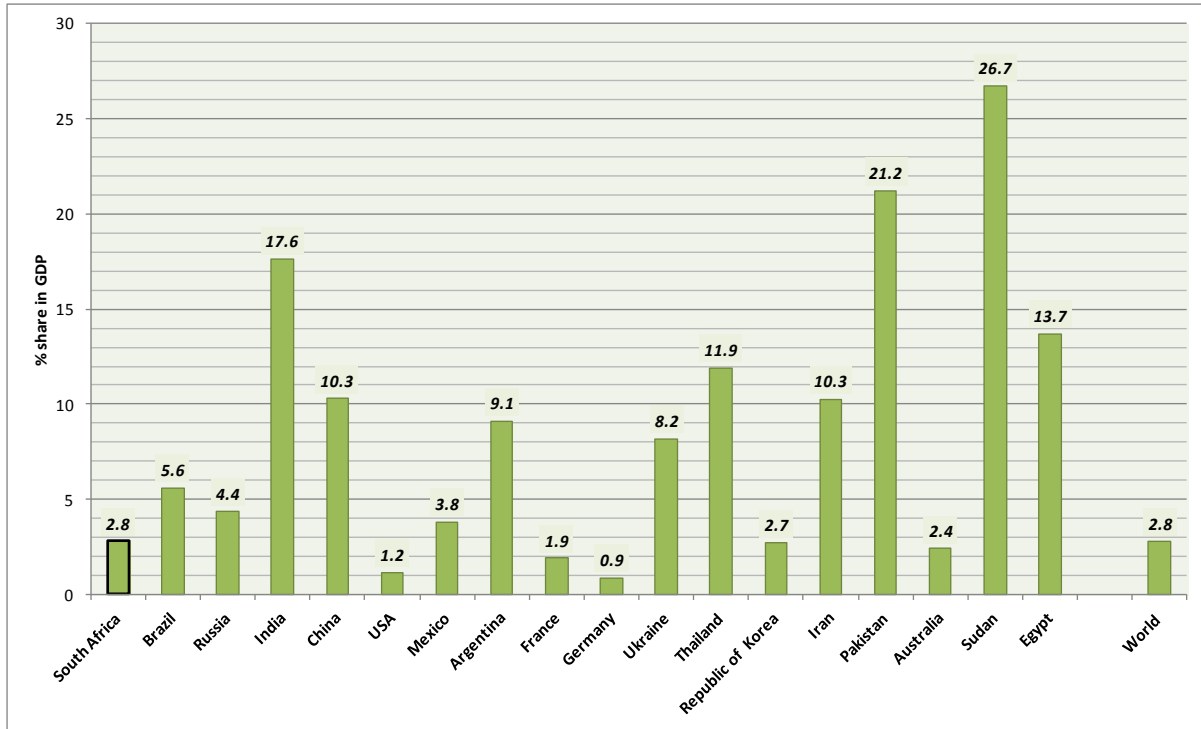


Figure 3.2: Comparison of agriculture's contribution to GDP (2008-2011 average)

Source: Author's own calculations based on data from the World Bank (2012)

The long-term production trend of South African agriculture compared to the world is shown in Figure 3.3 below. South Africa has performed well with regard to increasing its agricultural output and has kept pace with global trends. Global agricultural output has increased by more than 75 per cent over the last fifty years, whereas South Africa's total agricultural production grew by almost 73 per cent in that same period.

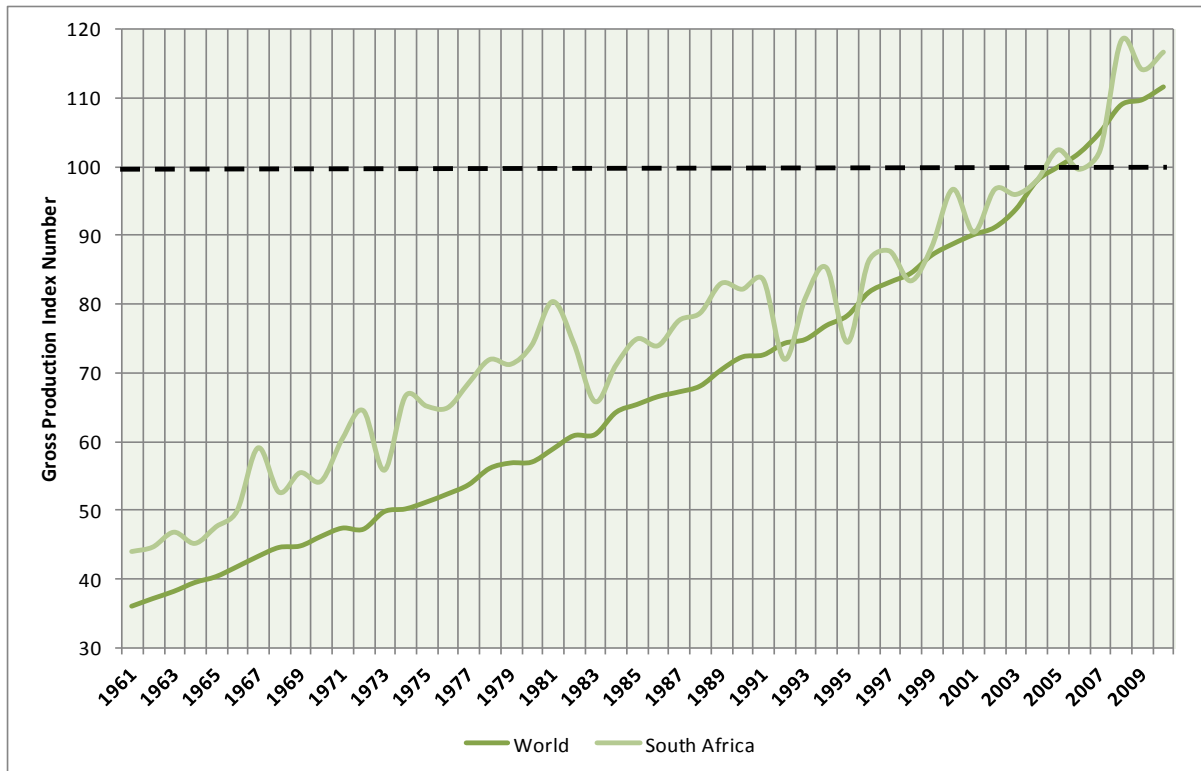


Figure 3.3: Long-term agricultural production trend for South Africa and the world (2005 = 100; primary products only)

Source: Author's own calculations based on data from FAOSTAT (2013)

The long-term per capita agricultural production in South Africa, as depicted in Figure 3.4 below, has underpinned the increasing pressure on the agricultural sector to provide food for an ever-increasing population over the last fifty years. The global population more than doubled and the South African population almost tripled (from 18 to 52 million) in that same period. The increase in per capita production of crops was relatively high, but the increase in per capita production of food and livestock products has lagged behind since the early 1960s. The figure also reflects the volatile nature of agricultural production with significant year-to-year changes in production of livestock products, crops and food.

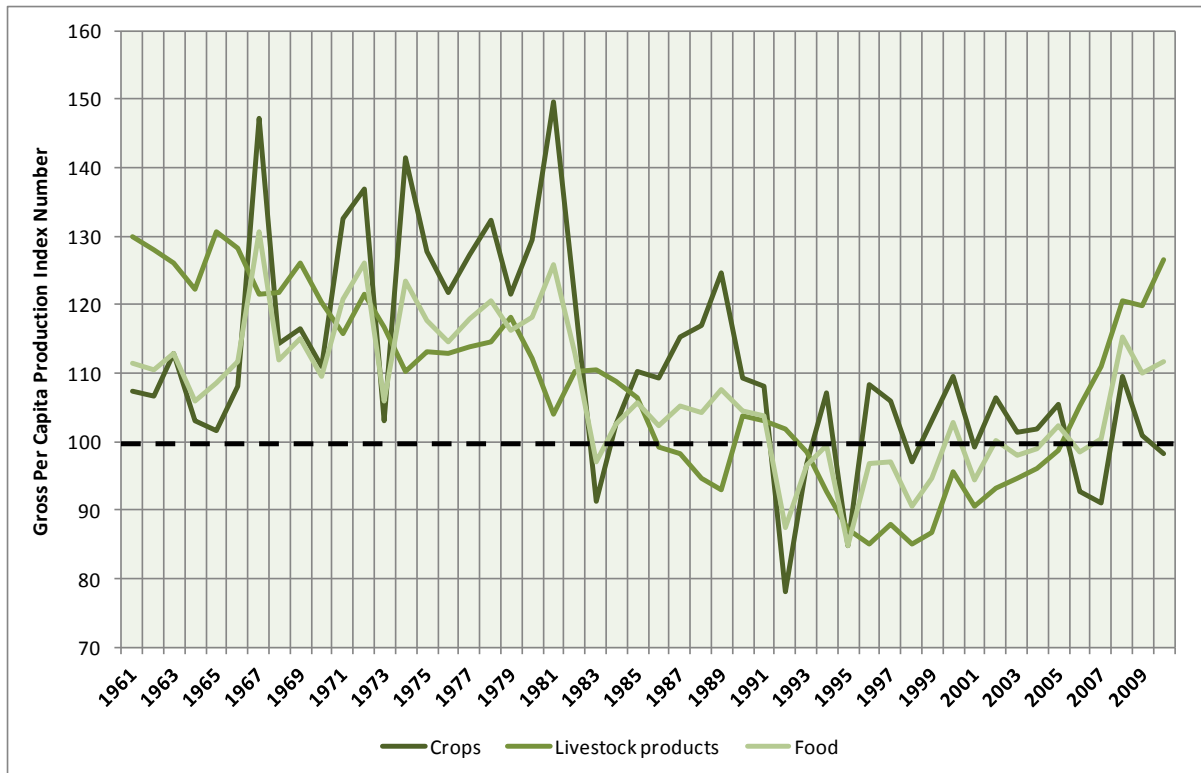


Figure 3.4: Long-term per capita agricultural production trend for South Africa (2004 - 2006 = 100³; food: processed primary products)

Source: Author's own calculations based on data from FAOSTAT (2013)

3.2.3 South Africa's position in global agricultural land

Land is a very significant factor of production for the agricultural sector, therefore a comparison of the availability of agricultural land in South Africa and selected countries is provided in Figure 3.5 below. From this figure, it is evident that the ratio of grazing land to arable land is comparable to that of Brazil. Compared to some of the selected countries, South Africa's total agricultural area is relatively small; its agricultural area is more than four times smaller than Australia's but more than three times larger than France's agricultural area. On a global scale, South Africa is ranked 13th. Considering both the total area of arable land and permanent crop land on a global scale, the country is ranked 21st and 35th respectively. In an African perspective, only Sudan has more agricultural land available, and with regard to crop land, only Sudan and Nigeria surpass South Africa.

³ Production quantities of each commodity are weighted by 2004-2006 average international commodity prices and summed for each year. To obtain the index, the aggregate for a given year is divided by the average aggregate for the base period 2004-2006 (FAOSTAT, 2013).

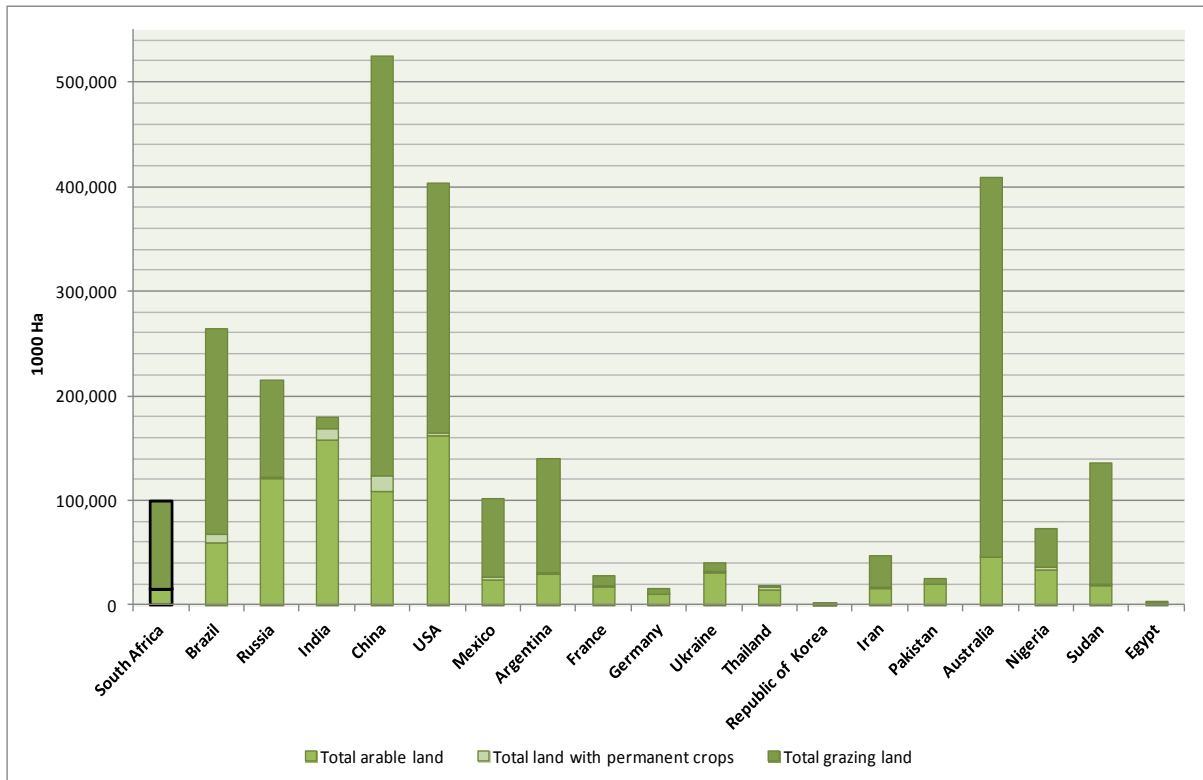


Figure 3.5: Comparison of the amount of farm land

Source: Author's own calculations based on data from FAOSTAT (2013)

Figure 3.6 below makes a comparison of the amount of total cropland per capita for the selected countries. This indicator will provide insights into the supply potential of food crops for the domestic market, as well as surplus production for export markets. South Africa is relatively well endowed with an amount of 0.31 hectares of cropland per capita. This is well above the global average of 0.22 hectares per capita and the country has thus more land available to produce food per person than other developing countries such as China, India, Thailand, Pakistan and Nigeria. However, this availability of cropland does not provide any information on the quality of the land in terms of production potential.

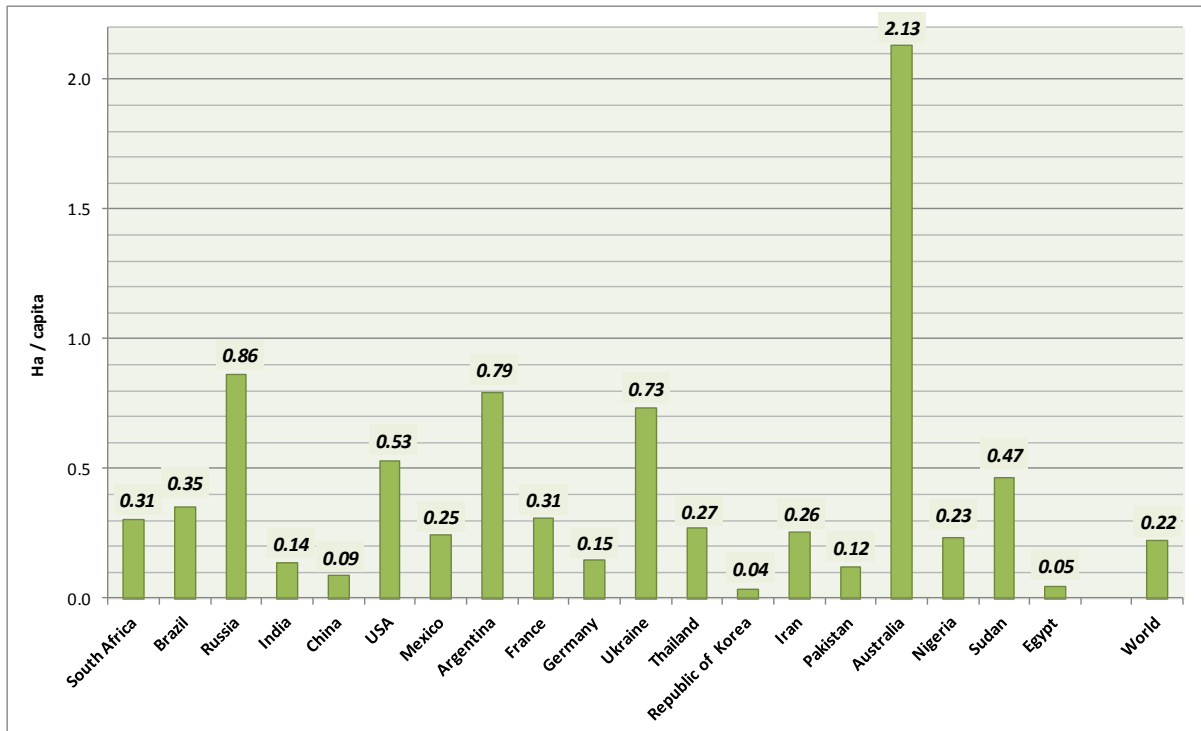


Figure 3.6: Comparison of per capita cropland

Source: Author's own calculations based on data from FAOSTAT (2013)

3.2.4 South Africa's position in global productivity of agricultural land

Apart from the assessment of land endowment, an understanding of the agricultural significance of South Africa also requires a global comparison of the productivity of agricultural to be carried out. Figure 3.7 below provides an overview of the average land productivity for crops per hectare in the selected countries. From the figure, it is evident that South Africa's average land productivity is relatively low and even below the global average. Out of the selected countries, South Africa's land productivity only surpasses that of Russia, Ukraine and Nigeria. Land productivity in Argentina is twice as high, three times higher in China and Brazil, and seven times higher in Germany.

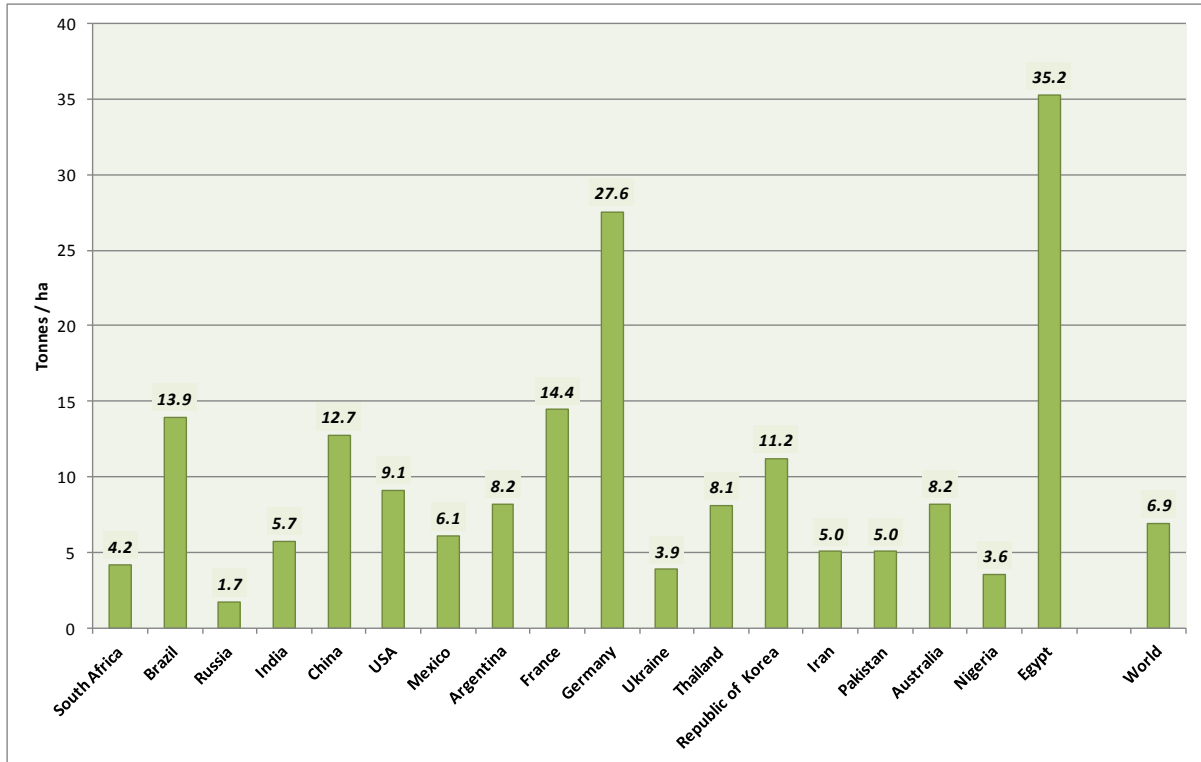


Figure 3.7: Comparison of average cropland productivity

Source: Author's own calculations based on data from FAOSTAT (2013)

Factors such as agro-ecological and climatic conditions, institutional environment, adaption of production technologies, and policies play a very important role in explaining these differences in productivity. A more in-depth analysis of South Africa's yield gaps is provided in Figure 3.8 below. The figure provides a comparison of the differences between South Africa's average yields and average global yields for selected crops. It reveals that South Africa's productivity of cereal crops is slightly lower, and productivity of horticultural crops is significantly higher, than average global yields.

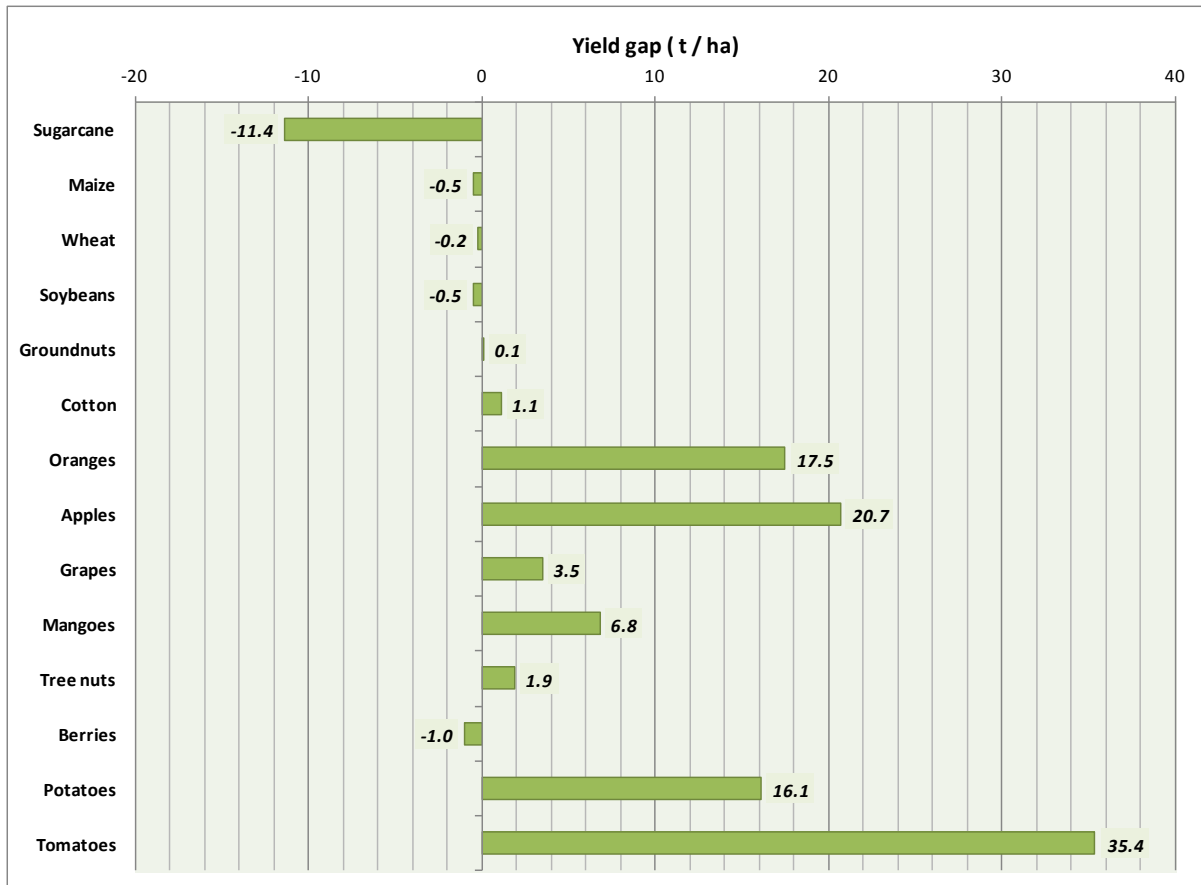


Figure 3.8: South Africa's yield gaps for primary crops (2008 – 2010)

Source: Author's own calculations based on data from FAOSTAT (2013)

The productivity of a country's grazing land can be measured and compared by the average carrying capacity per hectare. Hence, Figure 3.9 below makes a broad comparison of the carrying capacity measured in Large Stock Units (LSU)⁴ for South Africa and selected countries⁵. It is evident that South Africa has a relatively low productivity for grazing land, with an average carrying capacity of only 0.2 LSU per hectare. Of the selected countries, only Australia has a lower average carrying capacity for livestock. For instance, China and the USA can stock twice as much LSUs per hectare, whereas Germany can stock fourteen times more LSUs per hectare than South Africa.

⁴ Includes cattle, buffalo, sheep and goats (sheep and goats were converted to LSU).

⁵ No data available for Egypt and the Republic of Korea.

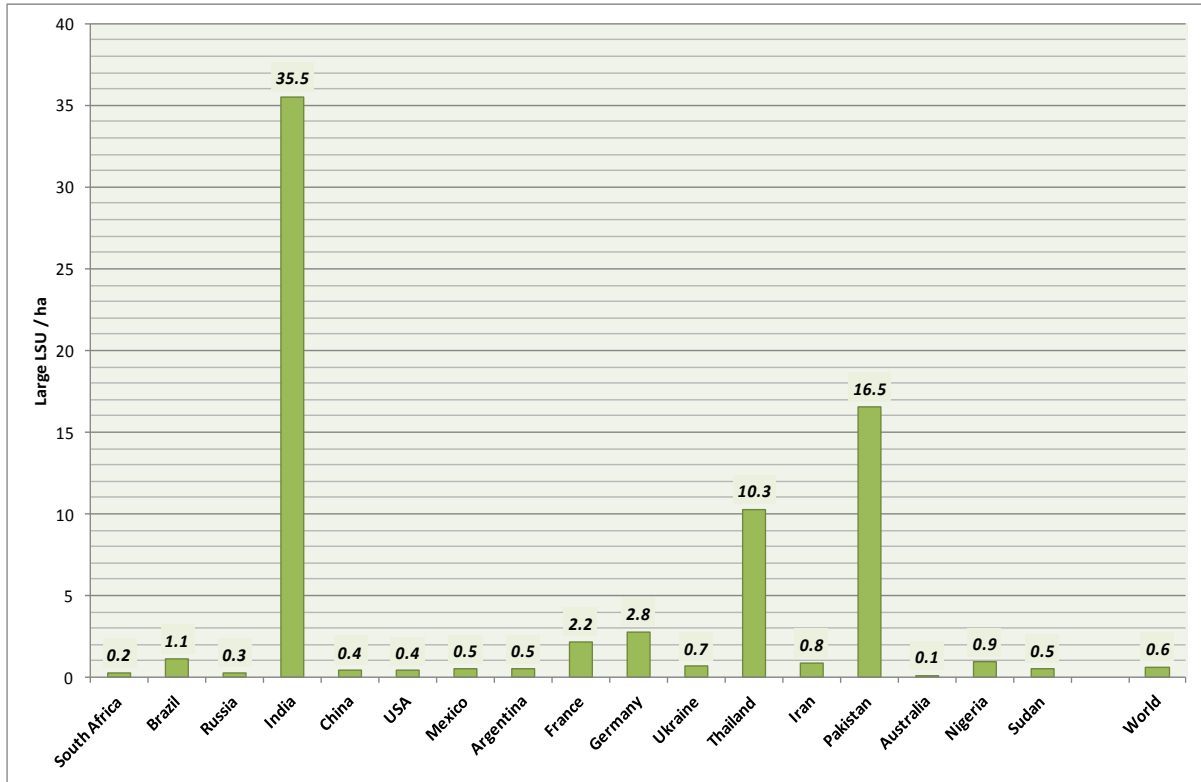


Figure 3.9: Comparison of grazing land productivity

Source: Author's own calculations based on data from FAOSTAT (2013)

This section clearly indicates that, although South Africa has a relative abundance of farmland, the productivity of its agricultural land is relatively low. The only exception is horticultural crops, although permanent cropland only comprises one per cent of South Africa's total agricultural area. This relatively low land productivity can only be offset by sound management practices, technological advances in production and developing the right livestock breeds and crop varieties. This is something which South Africa has clearly managed to do, as is evidenced by its agricultural production growth, which is further discussed in Section 3.3.4. Furthermore, Section 3.3.1 specifically will provide more detail on South Africa's agricultural land potential.

3.2.5 South Africa's position in global agricultural employment

As discussed in Chapter 2, as countries develop, a relatively smaller share of the population is dependent on agriculture for their livelihoods. Figure 3.10 below reflects a comparison of



the share of the agricultural population⁶ of South Africa and selected countries and shows an almost similar pattern to the economic contribution of agriculture depicted in Figure 3.2 above. To illustrate the trend in agricultural population, both the shares for 1980 and 2010 are shown. It is evident that agricultural population declined in all of the selected countries. Globally, the agricultural population decreased by 12 per cent over the last thirty years. The decline was the strongest in Korea, Nigeria, Egypt (-29%), Brazil (-25%), and Thailand (-23%). In South Africa, the decline of the agricultural population has been moderate, at -15 per cent. In 2010, 10 per cent of South Africa's population, equal to 4.9 million people, were dependent on agriculture for their livelihoods; in most developing countries, such as Thailand, India, China and Sudan, this proportion is significantly higher. However, South Africa's relative agricultural population is much larger than in most developed countries, such as the USA, France, Germany, and Australia. Within the South African context, this population group consists of a small proportion of commercial farmers (17 per cent of total farmers) and relatively large proportion of small-scale and subsistence farmers (83 per cent of total farmers), together with their formal and informal workers and all their dependents.

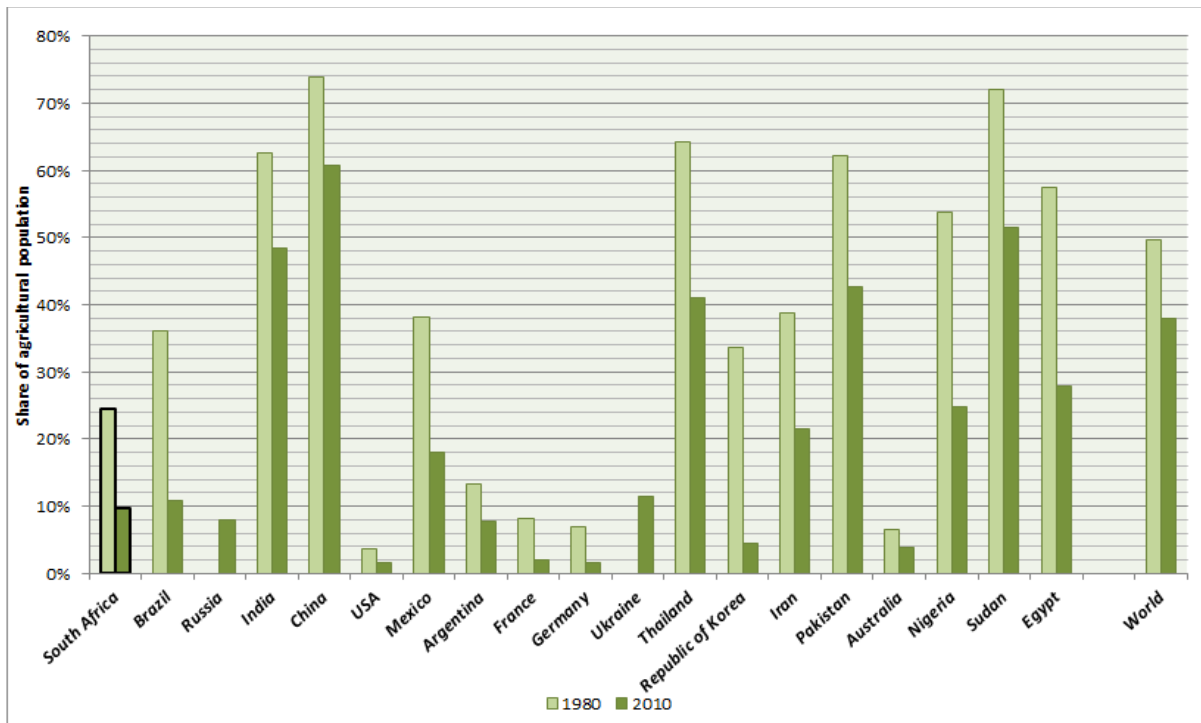


Figure 3.10: Share of agricultural population in the total population (1980 and 2010)

Source: Author's own calculations based on data from FAOSTAT (2013)

⁶ Comprises all persons economically active in agriculture, forestry and fishery, as well as their dependents (FAOSTAT, 2013)



In order to provide a comparison of South Africa's global position in agricultural labour productivity, Figure 3.11 below shows the value added per worker for the agricultural sectors in selected countries⁷. The figure shows that, although South Africa's agricultural labour productivity is relatively low compared to advanced economies such as the USA and France (13 and 15 times lower, respectively), it is among the highest of other developing countries. The country's labour productivity is on par with Brazil and Mexico, and well above the global average.

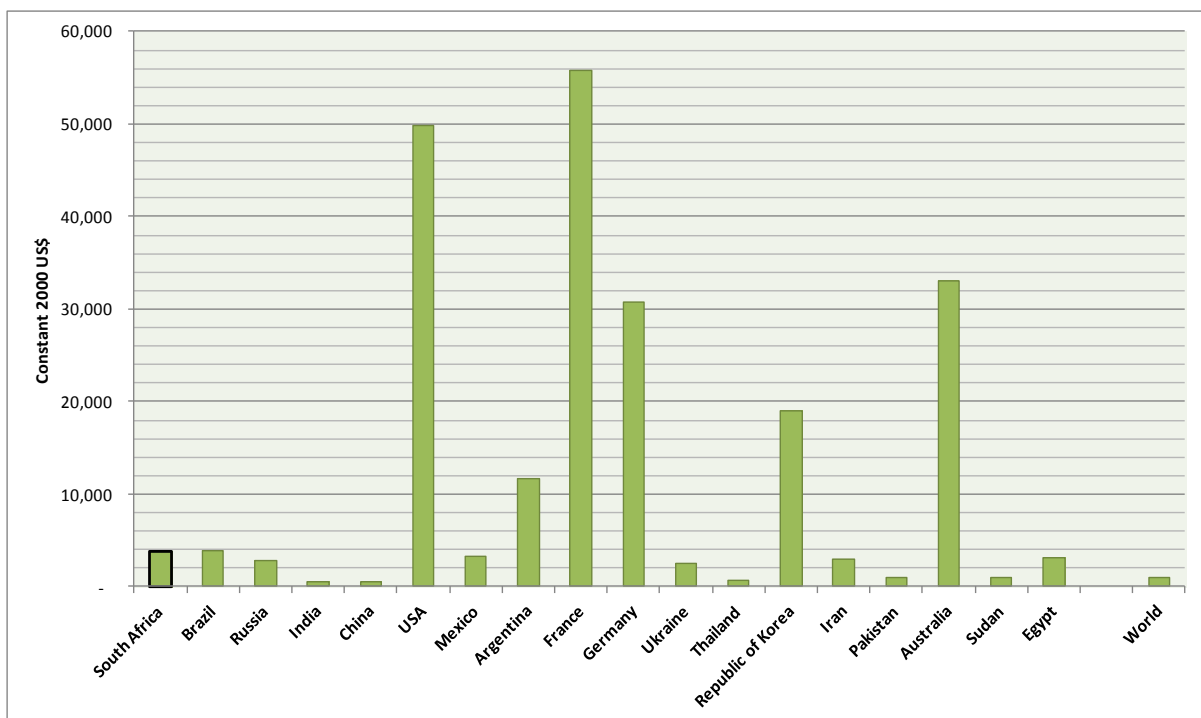


Figure 3.11: Comparison of agricultural value added per worker (2008 – 2010)

Source: Author's own calculations based on data from the World Bank (2012)

This section clearly shows that the agricultural population in South Africa is relatively smaller than in most other developing nations, but in relative terms, it is still five times larger than in most of the advanced economies. South Africa's agricultural labour productivity compares favourably to other transitional economies, such as in the BRIC countries.

⁷ No data available for Nigeria.



3.3 SOUTH AFRICAN AGRICULTURE FROM A NATIONAL PERSPECTIVE

The previous section discussed the South African agricultural sector in a global context and this section will specifically analyse the sector within a national framework.

3.3.1 Introduction

The foremost characteristic of the structure South African agricultural sector is its dualistic nature. According to the latest agricultural census of 2007, there are an estimated 39 966 large-scale and capital intensive commercial farming units, compared to about 221 341 low-input and labour-intensive small-scale farmers (StatsSA, 2007). Hence, there are five times more small-scale than commercial farmers. Most of these small-scale farmers can be found in the former homelands of the Eastern Cape, KwaZulu-Natal and the North West Province. Most of these farmers are subsistence farmers but a significant proportion can also be classified as emerging farmers who strive to become commercial producers.

The dualism in agriculture has a historic context in that the Land Act of 1913 gave the white population ownership of 87 per cent of the land. Furthermore, the “traditional” small-scale agriculture in the former homelands, in the perspective of the apartheid government, served the economic function to reproduce and subsidise the cost of labour (Wolpe, 1972). In this way, the homelands subsidised industrialisation in South Africa’s “white-owned” manufacturing and mining sectors (Hall, 2004). Against this background, the current policy of land reform endeavours to rectify these past injustices by transferring 30 per cent of farmland to historically disadvantaged individuals. This policy is founded on three pillars, namely restitution, redistribution and tenure reform. However, the pace of this transformation is very slow and exact statistics are not available as no formal and recent land audit is available. Furthermore, the rate of success of these land transfers are also low, at between 7 and 30 per cent, depending on the source quoted (see Anseeuw and Mathebula, 2008; Kirsten and Machethe, 2005; Idsardi, Jordaan and van Schalwyk, 2010).

The farm size structure of the South African agricultural sector has also changed dramatically over the last century. In 1910, there were more than 75 000 commercial farm



units and this number increased to its peak in 1953, with almost 120 000 farming units. However, in the second part of the twentieth century the number of farming units dropped significantly by 67 per cent to almost 40 000 commercial units in 2007 (Liebenberg and Pardey, 2010). Urbanisation and conservancy only lead to a marginal decrease in total farm land units in the last fifty years, thus consolidation of farms into larger units was the main cause of this trend. Furthermore, the total agricultural output in South Africa more than doubled in the same period, illustrating the drive for economies of scale in the sector. However, this has not led to the establishment of a large proportion of big farming enterprises. About 76 per cent of the commercial farming units in South Africa have an annual turnover of less than 1 million Rand and can thus be classified as SMMEs (Vink and Van Rooyen, 2009).

Despite the significant growth of the agricultural sector (see Figure 3.2 above), the rise of other economic sectors, such as mining and services, has led to agriculture's diminishing contribution to the overall economy. Primary agriculture's proportion to GDP steadily declined from 20 per cent in the 1910s to less than three per cent in 2011 (Liebenberg and Pardey, 2010).

3.3.2 *Agricultural resources*

Most of South Africa's agricultural production is taking place in an extensive production system. Hence, land and rainfall conditions are important biophysical production factors. South Africa is largely an arid and semi-arid country, with an average annual rainfall of 450 mm and only 53 per cent of the country's land surface receives more than 400 mm of precipitation (FAO, 2006). This precipitation threshold is often used as an absolute minimum for rain-fed crop production. Since the annual rainfall distribution is skewed towards below average rainfalls, drought conditions are a common phenomenon.

About 99.3 million hectares, which equals 81 per cent of South Africa's land surface, is used for farming activities. Fifteen per cent of this farmland, equal to 15.3 million hectares, is suitable for cultivation and almost 85 per cent of the farmland is suitable for grazing. Of the cultivatable land, about nine per cent is used for permanent crop production and the rest is



used for non-perennial crop production. The land area under irrigation currently comprises 10 per cent of the cultivatable land in South Africa, ranking the country 34th on a global scale of the total land under irrigation (FAOSTAT, 2013).

Apart from the amount of farmland, the capability of the land also plays an important role in agricultural production. The land capability is determined by factors such as soil types and climatic conditions. Table 3.1 below provides an overview of the eight different agricultural land capability classes found in South Africa, corresponding to their potential agricultural land uses. The table clearly shows that only two per cent of South Africa's land area can be classified as prime cropland; and adding the irrigated land, the total of prime cropland amounts to approximately four per cent of the total cultivatable area. Most of this high productive land can be found in the Eastern and North-Eastern parts of South Africa. A further 11 per cent of the land can be classified as marginal arable land. The potential of these lands can be unlocked if more intensive land use strategies are used in order to increase South Africa's food production.

Table 3.1: Overview of agricultural land capability classes in South Africa

Land capability class	Category	Agricultural land use options	Share of total land area	Broad land use group
I	Prime cropland	W, F, LG, MG, IG, LC, MC, IC, VIC	0.2%	Arable land
II		W, F, LG, MG, IG, LC, MC, IC	1.8%	
III	Intermediate cropland	W, F, LG, MG, IG, LC, MC	10.6%	
IV	Prime grazing land / marginal cropland	W, F, LG, MG, IG, LC	11.0%	Grazing land
V	Intermediate grazing	W, F, LG, MG	10.5%	
VI	land	W, F, LG, MG	15.5%	
VII	Marginal grazing land	W, F, LG	36.1%	
VIII	Wilderness	W	14.4%	Wildlife

Notes: W = wildlife farming, F = forestry, LG = light grazing, MG = moderate grazing, IG = intensive grazing, LC = poorly adapted cultivation, MC = moderately well adapted cultivation, IC = intensive well adapted cultivation, VIC = very intensive well adapted cultivation

Source: ARC (2004)

3.3.3 Agriculture and the South African economy

The total value added from the agricultural sector in 2011 was 67.5 billion Rand, which contributed three per cent to South Africa's GDP. In addition, total value added by agro-



processing⁸ in that same year amounted up to 97.3 billion Rand, contributing four per cent to GDP. An overview of the relative economic importance of the agricultural sector is depicted in Figure 3.12 below.

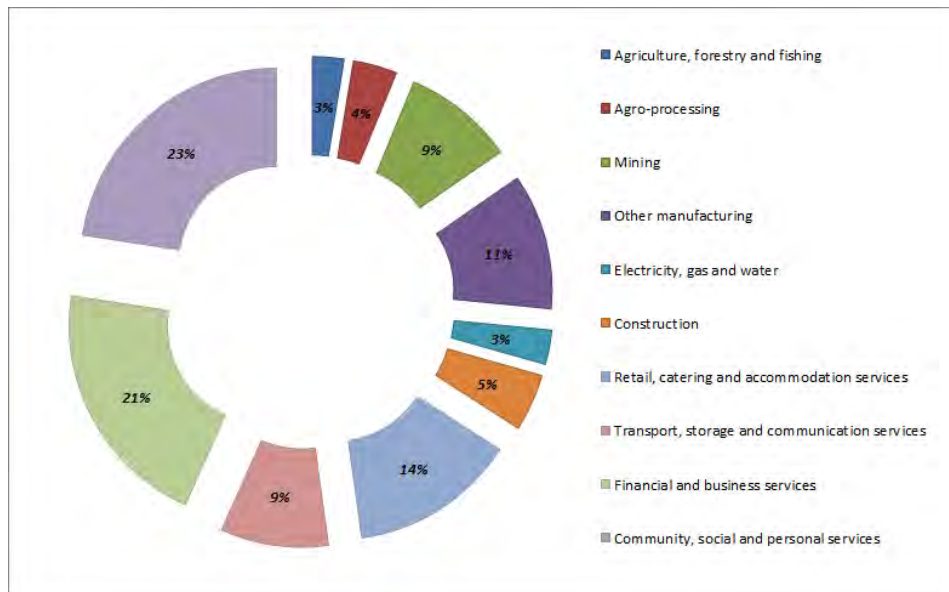


Figure 3.12: Economic structure of South Africa (2009 – 2011 shares in GDP)

Source: Author's own calculations based on data from Quantec (2012)

From the figure, it is seen that the combined share of the primary and secondary agricultural sectors of the GDP is seven per cent, which is larger than the construction, electricity, gas, and water sectors, and slightly smaller than the mining and transport sectors, but significantly smaller than the other sectors. However, the share of the agro-complex (which comprises the entire food, feed and fibre value chains) would even be higher if food retailing and wholesale trade of agricultural raw materials and livestock were to be included⁹.

Further analysis of the sectoral contribution to total economic growth over the period 1993 to 2012 reveals that the agricultural sector has only made a minor contribution of 0.5 per cent (see Figure 3.13 below). The largest contribution was made by the finance, real estate

⁸ Includes the manufacturing of food, beverages, tobacco, wood, and paper

⁹ Data limitations prohibit the inclusion of these specific disaggregated sectors in the agro-complex.



and business services sector, followed by the wholesale, retail trade, hotels and restaurant sector. Elements of the latter are part of the food supply chain.

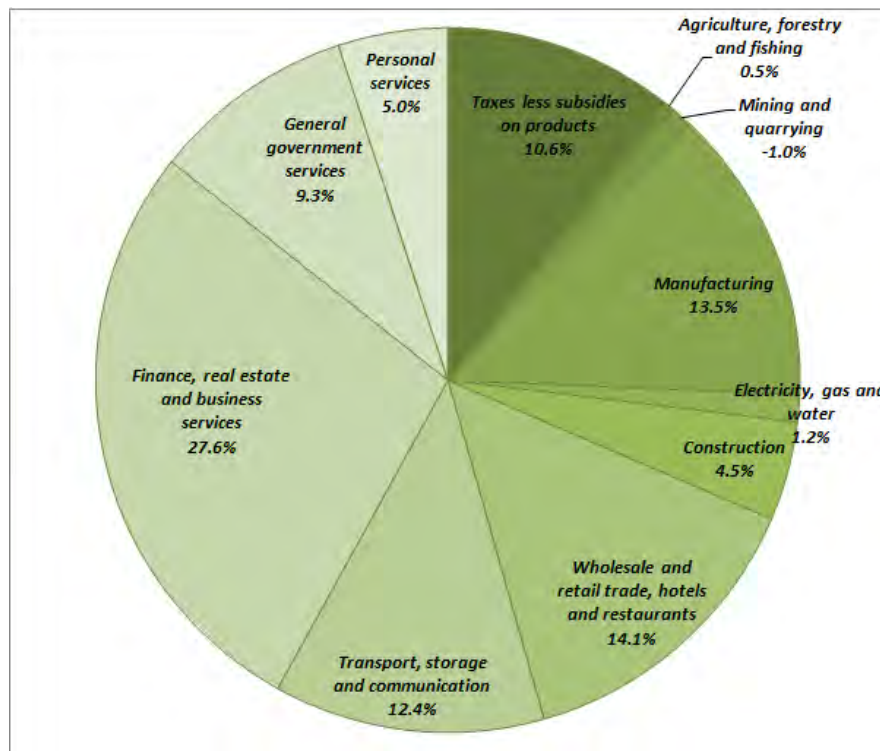


Figure 3.13: Decomposition of South Africa's economic growth (1993 – 2012)

Source: Author's own calculations based on data from Quantec (2012)

Apart from its direct contribution to GDP, the agricultural sector also uses inputs from other sectors in its production processes and supplies intermediate inputs to other sectors. The most important back and forward industry linkages of the agricultural sector are shown in Table 3.2 (below). This table shows that the basic chemical sector is the largest input supplier for the agricultural sector, with a share of 18 per cent. The table further shows that of total inputs, only 41 per cent is contributed by value adding activities within the agricultural sector, illustrating the significant burden of input cost on the sector. On the output side, more than 66 per cent of the agricultural production is supplied as inputs to other economic sectors and 34 per cent is supplied directly to end users. The bulk share of agricultural production is supplied to the food manufacturing sector (69.8%), and a further 5.3 per cent of intermediate output is supplied within the agricultural sector.



Table 3.2: Input-output structure of South Africa's agricultural sector (2011)

Total input (cost), R165,174 million:		Share	➔	Total output (sales), R165,174 million:		Share
Gross domestic product: R67,518 million		41.4%			Final demand: R55,445 million	
Intermediate input: R95,655 million		58.6%		Intermediate output: R107,728 million		66.0%

Intermediate input from sector:		Share	↓	Intermediate output to sector:		Share
Basic chemicals		18.0%			Food manufacturing	
Transport and storage		13.8%		Agriculture, fisheries and forestry		5.3%
Wholesale and retail trade		12.0%		Wood and wood products		4.9%
Food		10.8%		Beverage manufacturing		4.4%
Petroleum		10.4%		Paper and paper products		3.3%
Agriculture, fisheries and forestry		5.8%		Catering and accommodation services		1.6%
Other services		4.8%		Textiles		0.9%
Machinery and equipment		4.0%		Rubber products		0.9%

Source: Author's own calculations based on data from Quantec (2012)

The back and forward linkages of the agricultural sector as illustrated in Table 3.2 can be further analysed by determining the production multipliers. The production multiplier indicates the additional value added created in other sectors of the economy by R 1 million of additional production in the target sector. The South African agricultural sector has an indirect production multiplier of 0.8 (PROVIDE, 2006). This implies that a R1 million increase in agricultural production will lead to a R0.8 million increase in total output by all industries that supply inputs to the sector (i.e. backward linkage). This is relatively low when compared to other industries in South Africa and the agricultural sector only ranks ninth compared to the twelve distinguished broad economic sectors.

The induced production multiplier of South Africa's agricultural sector is 1.3 (PROVIDE, 2006). This implies that as a result of an additional R 1 million increase of production in the agricultural sector, the additional wages and salaries that are paid out will result in an additional consumer spending of R1.3 million. Compared to South Africa's other economic sectors, this is relatively high; the agricultural sector is ranked fourth out of the twelve sectors. Taking the direct¹⁰, indirect and induced production multipliers into consideration, the total production multiplier effect of the agricultural sector is 3.1, ranking the sector sixth overall.

¹⁰ The direct production multiplier reflects the additional increase in output within the sector and is always equal to 1.0.



3.3.4 Agriculture and food production

The single most important contribution of the agricultural sector to the South African economy is the adequate supply of food, which directly impacts on the welfare and productivity of its citizens. The long-term trends of total production in both primary¹¹ and secondary agriculture (i.e. the agro complex), reflected by the value added, is shown in Figure 3.14 (below). The total value of production increased 112 times from 1970, to reach a total value of R164 billion by 2011. Although this performance seems significant, all other broad economic sectors performed better with regard to the value added during the same period. For instance, total manufacturing value added increased 131 times and the value added by financial services increased 333 times since 1971.

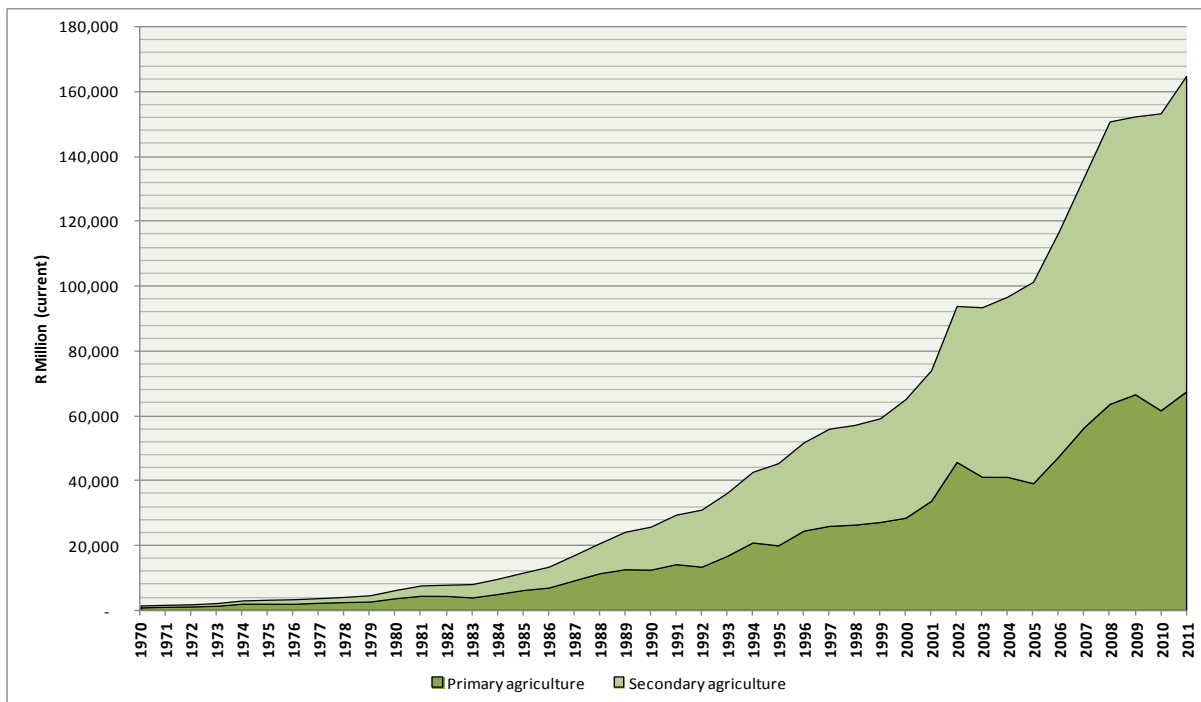


Figure 3.14: Long-term trend in primary and secondary agricultural production

Source: Author's own calculations based on data from Quantec (2012)

The annual average growth for primary and secondary agriculture was 12 and 13 per cent, respectively. Significantly, the contribution of secondary agriculture (i.e. agro-processing) to total agricultural value added experienced a significant increase. In 1970, primary

¹¹ Includes forestry and fisheries



agricultural production contributed 59 per cent to total production of the agro-complex and by 2011 this share had fallen to 41 per cent. Hence, some slight structural changes have taken place in the agro-complex over time.

Analysing specifically the structural changes in South Africa's crop production, Figure 3.15 below shows the long-term trends in quantities produced for different crop groupings for the period 1961 to 2011. The total increase in the production volume of crops was 150 per cent over that period. The figure reveals that South Africa's production structure in the crop sector has not changed drastically over the last forty years. Cereals remain South Africa's most important crop, with a share of 50 per cent in total production volume, although its share is decreasing in favour of increases in the production volumes of fruit, vegetables, and roots and tubers. Pulses, oil crops, and tree nuts do not make an important contribution to the production structure in the crop sector, although the latter two experienced significant increases in total production, from a relatively low baseline.

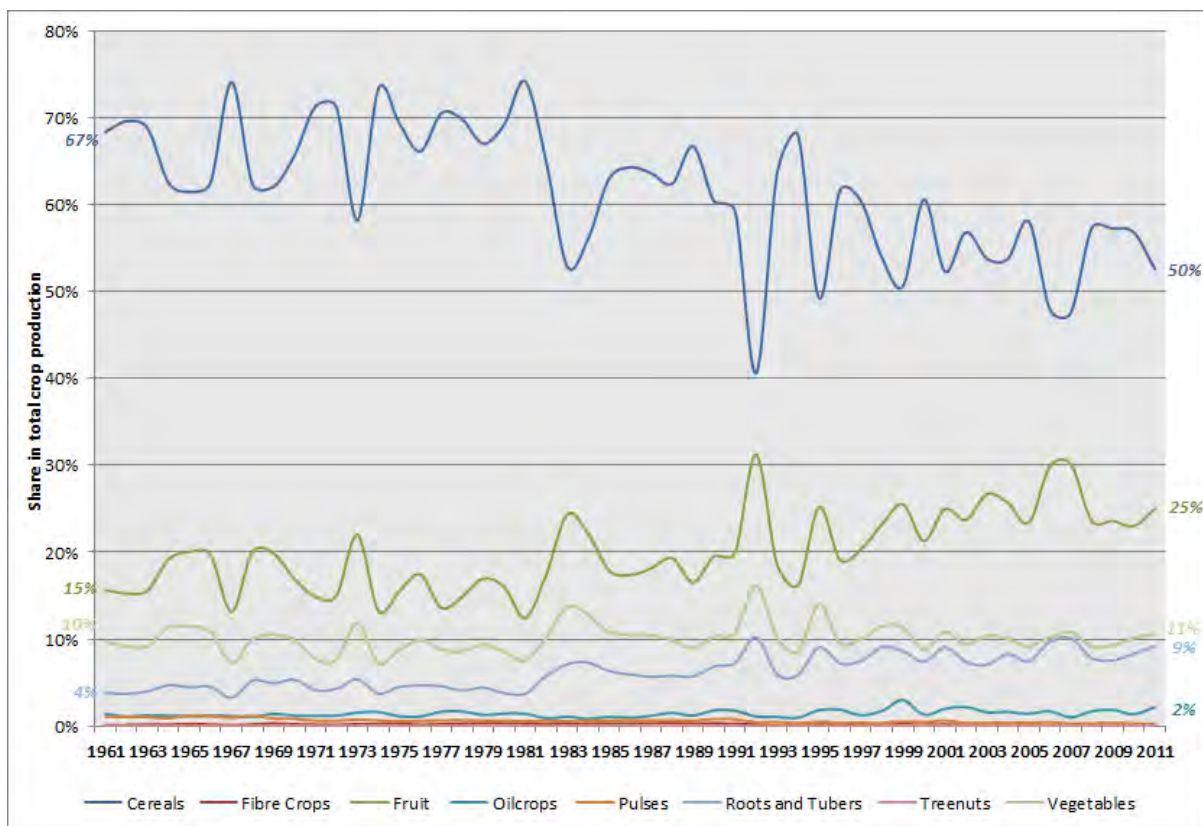


Figure 3.15: Long-term trend in the structure of South Africa's crop production (1961 - 2011)

Source: Author's own calculations based on data from FAOSTAT (2013)



The structural changes in South Africa's meat sector for the period 1961 to 2011 are shown in Figure 3.16 below. Total meat production in that period increased by 344 per cent. It is evident from the figure that the production structure in the meat sector has changed significantly in the last forty years. Poultry meat recorded a strong increase in its share in total production volume, from 15 per cent in 1961 to 55 per cent in 2011. This increase was predominantly at the expense of the contribution of beef production, the share of which dropped from 64 to 31 per cent in that same period. Sheep meat also lost share in the total production volume, although the decrease of 12 per cent was not relatively that significant. The share of pork in total production remained relatively stable over the period from 1961 to 2011. The shift in production structure in the meat sector is clearly driven by a significant increase in total production of poultry, which has outperformed production increases in the other sub-sectors by far. Pork production also increased significantly (by 256 per cent), whereas the total production of beef and sheep meat has only increased moderately (by 112 and 35 per cent, respectively) in the last forty years.

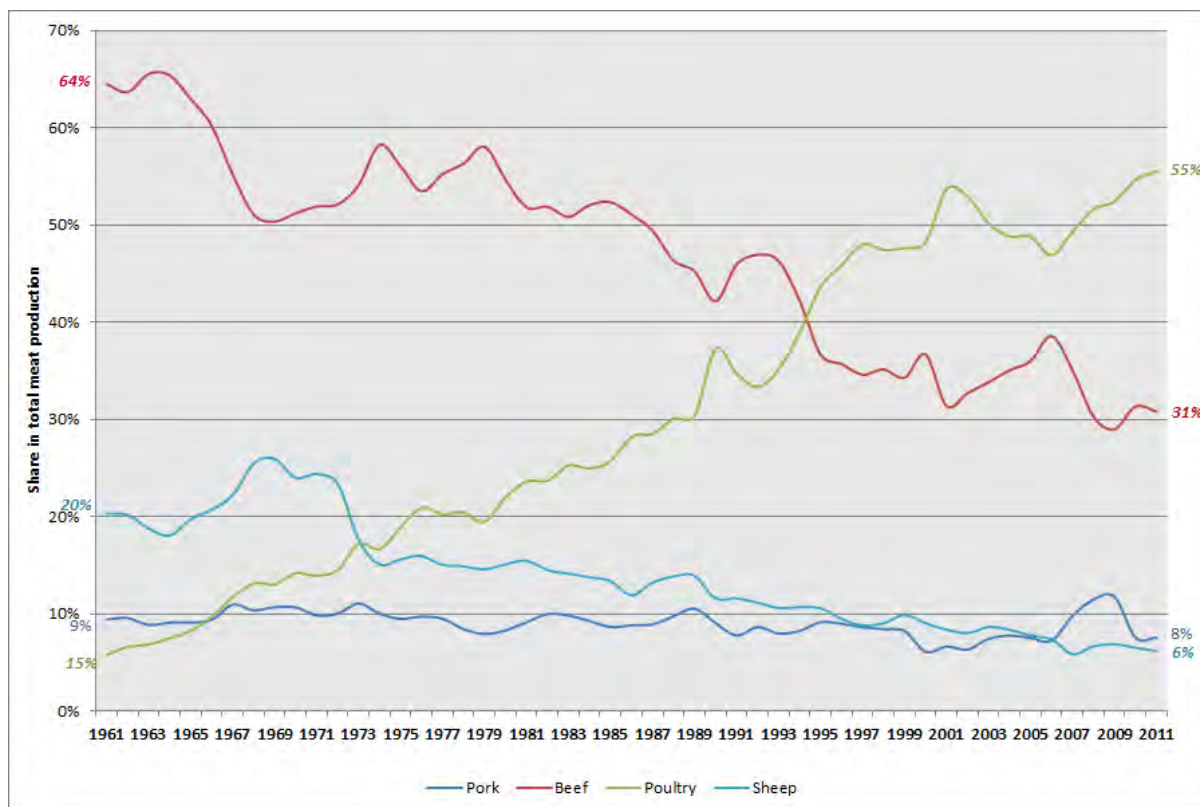


Figure 3.16: Long-term trend in the structure of South Africa's meat production (1961 - 2011)

Source: Author's own calculations based on data from FAOSTAT (2013)



Taking a more in-depth look at the current structure of production in the agro-complex, Figure 3.17 below reveals that chickens are the most important contributor to the primary agricultural sector, followed by maize and cattle with shares of 18, 12 and 11 per cent, respectively. A total of 17 sub-sectors comprise 93 per cent of total primary agricultural production. The other 23 agricultural sub-sectors only contribute seven per cent to primary agricultural production. In terms of performance, the fastest growing agricultural sub-sectors in the last ten years include soya beans, canola, lucerne, cattle, citrus fruit, barley, pork, sunflowers, nuts and poultry. Some of the poorest performing sub-sectors since 2001 include tea, dry peas, tobacco, groundnuts, and cotton. However, 35 out of the 45 agricultural sub-sectors in South Africa showed a positive growth in production values in the period between 2000 and 2011.

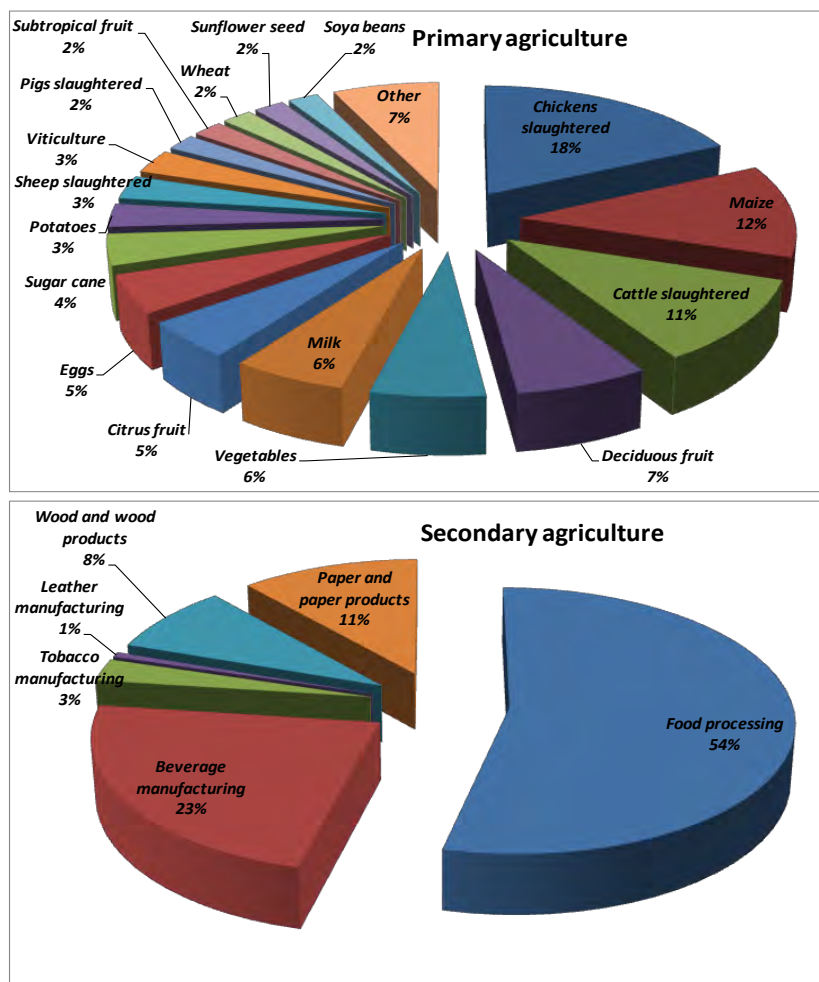


Figure 3.17: Structure of primary and secondary agricultural production (2010 – 2011)

Source: Source: Author's own calculations based on data from DAFF and Quantec (2012)



Figure 3.17 also depicts the structure of secondary agricultural production (i.e. agro-processing). It is evident that food processing is by far the most important secondary agricultural sub-sector, with a share of 54 per cent in total secondary agricultural production.

Productivity is an important indicator for measuring the efficiency of production processes in terms of input requirements per output (see also Section 3.2.4). This concept is important as productivity growth raises living standards as it creates more real income, which raises purchasing power for consumers and increases the competitiveness of firms. Productivity can be measured by three main concepts, namely labour productivity¹², capital productivity¹³, and multifactor productivity¹⁴. Table 3.3 below depicts the relative productivity of South Africa's agricultural sector, compared to the other economic sectors, as well as its long term productivity growth (since 1980).

Table 3.3: Comparison of sectoral productivity in South Africa

Economic sector	Labour productivity		Fixed capital productivity		Multi-factor productivity	
	2011	Growth 1980 - 2011	2011	Growth 1980 - 2011	2011	Growth 1980 - 2011
Agriculture, forestry and fishing	R 201	295%	R 111	92%	R 138	147%
Mining and quarrying	R 71	23%	R 67	-63%	R 69	-55%
Manufacturing	R 128	83%	R 104	-5%	R 118	38%
Electricity, gas and water	R 87	88%	R 61	24%	R 70	44%
Construction	R 159	68%	R 96	-24%	R 119	18%
Trade, catering and accommodation services	R 118	30%	R 99	21%	R 107	23%
Transport, storage and communication	R 109	226%	R 94	69%	R 99	143%
Financial services	R 120	-51%	R 116	65%	R 117	-14%
Community, social and personal services	R 106	51%	R 99	10%	R 105	42%

Source: Author's own calculations based on data from Quantec (2012)

The table clearly shows that the agricultural sector performs significantly well with regard to the absolute values, and indicates the productivity growth for all three indicators. This

¹² Labour productivity is the value output per unit of labour input (Quantec, 2012).

¹³ Capital productivity is a measure of value output per unit of fixed capital input (Quantec, 2012).

¹⁴ Multifactor productivity is a measure of the growth in value output that is not explained by the growth in the quantity of inputs. This includes factors such as: technical progress, weather, improved management practices and economies of scale (Quantec, 2012).



shows that the sector has efficient production systems in place and is relatively attractive with regard to employment and investment. Furthermore, the relatively high multi-factor productivity indicates efficient risk management practices and technology adoption within the agricultural sector.

3.3.5 Agricultural exports and imports

Apart from supplying food, feed and fibre for the local market, the agricultural sector is also an important earner of foreign currency. Many of South Africa's agricultural and food products, especially fruits and wine, have found their way to a wide range of markets around the world. In 2011, about 9.4 per cent of South Africa's total exports consisted of agricultural and food products. Since the 1980s, this share has hovered between eight and sixteen per cent.

Table 3.4 below shows the trends in exports to output ratios and import to domestic demand ratios for the different economic sectors of South Africa. The primary and secondary agricultural sectors are depicted in bold.

Table 3.4: Trade ratios for the different economic sectors

	Export-output ratio		Imports-domestic demand ratio	
	1980	2011	1980	2011
Agriculture, forestry and fisheries	20%	21%	5%	10%
Manufacturing	12%	28%	20%	37%
Food manufacturing	15%	9%	4%	14%
Beverage manufacturing	2%	14%	4%	7%
Tobacco manufacturing	0.3%	9%	2%	3%
Leather manufacturing	16%	38%	22%	44%
Wood and wood products	6%	10%	9%	9%
Paper and paper products	9%	21%	17%	16%
Mining and quarrying	87%	66%	69%	45%
Electricity, gas and water	0.7%	2%	0%	1%
Construction	0.1%	0.1%	0.2%	0.4%
Trade, catering and accommodation services	4%	5%	2%	2%
Transport, storage and communication	15%	7%	9%	8%
Financial intermediation, insurance, real estate and business services	3%	3%	5%	1%
Community, social and personal services	0.2%	1%	2%	1%

Source: Quantec (2012)



Table 3.4 above shows that the export–output ratio of the primary agricultural sector was 21 per cent in 2011. This ratio implies that 21 per cent of total output of the primary agricultural sector was exported. This ratio has been steady since 1980. The secondary agricultural sectors (agro-processing) show some variation in the export–output ratios, with the leather and paper industries showing the most export orientation. The beverage and leather industries especially showed a significant increase in their export orientation since 1980.

Compared to the export–output ratios of the mining and manufacturing sectors, at 66 and 28 per cent in 2011, respectively, the agricultural sector is relatively less export orientated. However, some individual agricultural sub-sectors have significantly higher individual export–output ratios (e.g. apples, grapes, and wine).

To satisfy the domestic demand for food, feed and fibres, South Africa is also dependent on the imports of a variety of agricultural products. Some of these products cannot be produced locally or cannot be produced in sufficient quantities. Table 3.4 above shows that the imports–domestic demand ratio for the agricultural sector was 10 per cent in 2011, implying that 10 per cent of the domestic demand for agricultural products was satisfied by imports. This is lower than the corresponding ratios for the mining and manufacturing sectors, at 45 and 37, respectively. Both the leather and food processing industries showed the largest increase in import dependency since 1980. The leather industry has thus both a high export–output ratio and import–domestic demand ratio, indicating a significant level of inter-industry trade.

The trend in South Africa's agricultural and food exports and imports is shown in Figure 3.18 below. Agricultural exports grew from R9.0 billion in 1994 to more than R54.3 billion by 2011, thus increasing six times in terms of value over a period of 18 years. Agricultural imports amounted to a total value of R5.8 billion in 1994 and grew to R46.7 billion by 2011, an increase by eight in 18 years. Hence, imports showed an average annual increase of 14 per cent, where exports increased on average by 12 per cent in the period from 1994 to 2011. Since 1994 the majority of agricultural exports, on average 60 per cent, consisted of unprocessed products whereas the majority of agricultural imports in that same period, on



average 62 per cent, were processed products. This is an unfavourable situation with regard to the terms of trade, local value adding and employment.

Figure 3.18 below also shows the trend in the agricultural trade balance which has been positive since 1994 and has hovered between 14 (e.g. 2011) and 50 (e.g. 2001) per cent of exports. Hence, it is evident that South Africa is overall a net-exporter of agricultural and food products. However, the country is a net-importer of processed agricultural products, with a trade deficit of more than R9.1 billion in 2011.

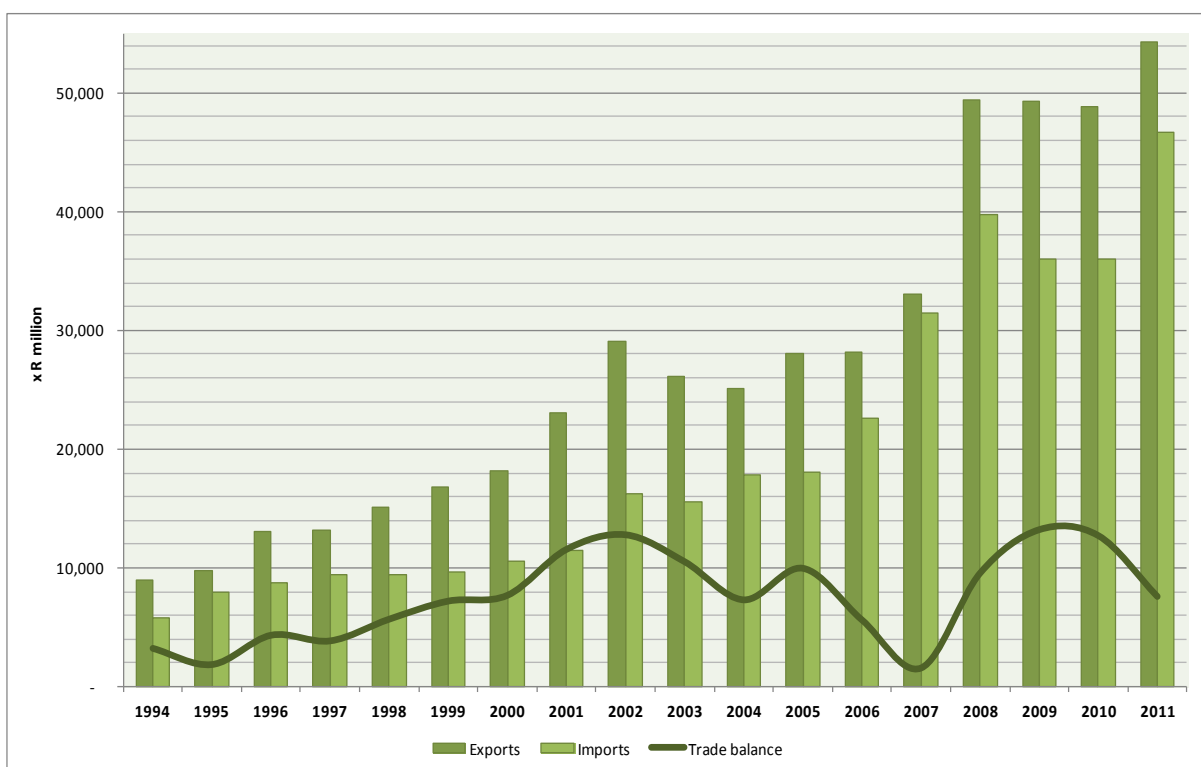


Figure 3.18: Trends in South Africa's agricultural imports and exports (1994 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

An in-depth analysis of South Africa's trade in agricultural and food products will be conducted later in this chapter (see Sections 3.4 through 3.8).



3.3.6 Agricultural employment

South Africa's official unemployment rate is one of the highest in the world. In 2012, this rate was 25 per cent and from 1996 unemployment hovered between 19 and 30 per cent (Quantec, 2012). Taking into consideration that about 70 per cent of the unemployed are younger than 34 years old, this is a serious concern for social stability. The agricultural sector has traditionally been a significant absorber of labour in both permanent and seasonal employment for harvesting, animal handling, and cultivation activities. In the 1940s the agricultural sectors had a share of 42 per cent in total employment (Liebenberg and Pardey, 2010). An estimated 4.9 million people in South Africa are currently dependent to some extent on agriculture for their livelihoods. This agricultural population includes both the formal and informal agricultural sectors.

The total employment in primary agriculture has declined significantly over the years, from 1 950 032 in 1970 to 703 865 people in 2011 (Quantec, 2012), a decline of 64 per cent over forty years. Figure 3.19 below shows the trend in total employment in primary agriculture for the period from 1970 to 2011. It is evident from the figure that employment only decreased slightly until 2000, but experienced a significant drop from that year onwards. The share of the agricultural sector in total employment dropped from 25 per cent in 1970 to six per cent in 2011. Its share is equal to that of the construction sector, but larger than the mining, energy, and the transport sectors. Just 14 per cent of the employment in the agricultural sector was informal (Quantec, 2012), which is far lower than, for instance, in the construction, transport and communication, and trade sectors. In terms of human capital, the primary agricultural sector lags far behind the other economic sectors of South Africa, as in 2011 only three per cent of the total workforce was highly skilled and just under five per cent was skilled. The human capital in agriculture improved very slightly over the years from almost 0.3 per cent highly-skilled and three per cent skilled labourers in 1970 (Quantec, 2012). Thus, the majority of the agricultural work force is either semi-skilled or unskilled, which corresponds with the nature of labour activities prevailing in the sector.

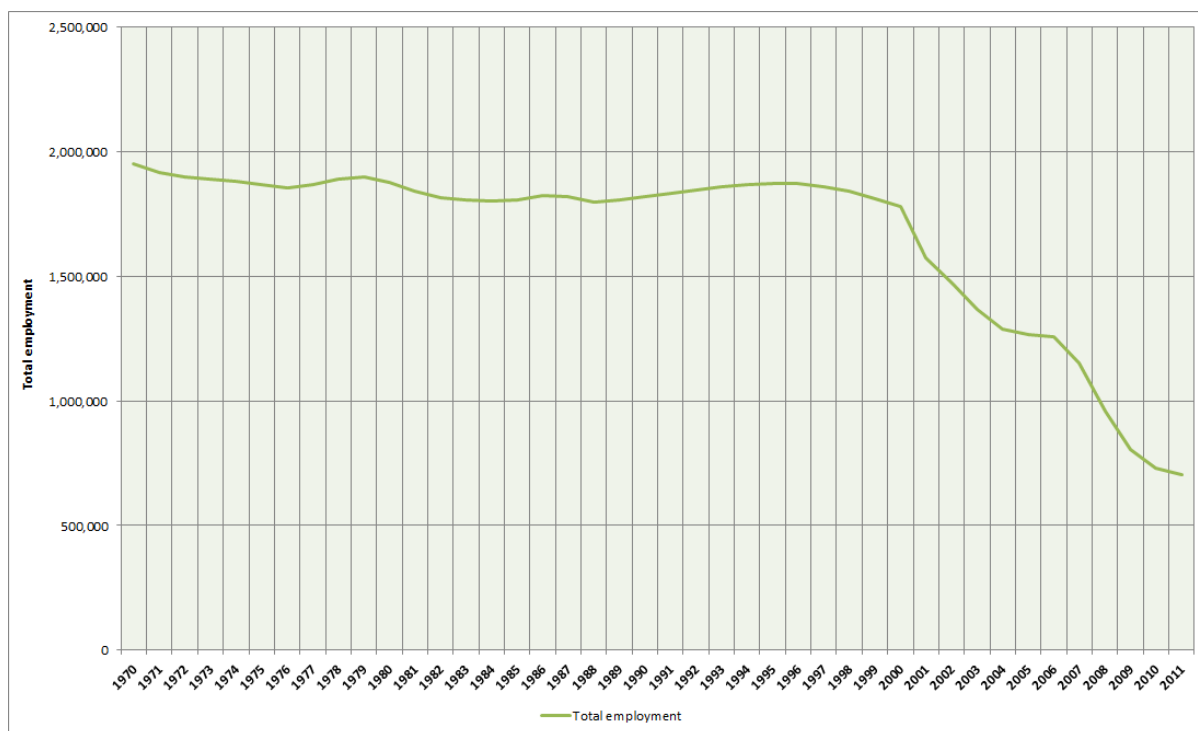


Figure 3.19: Total employment in primary agriculture (1970 - 2011)

Source: Quantec (2012)

Apart from the primary agricultural sector, the secondary agricultural sector (e.g. processing activities) also makes a contribution to the significance of agriculture in total employment. With a labour force of 327 925 in 2011, this sector had a share of three per cent in South Africa's employment (Quantec, 2012). This brings the total share of the agro-complex (i.e. primary and secondary agriculture combined) to nine per cent. Moreover, within the secondary agricultural sector, food processing absorbed the majority of labour (56%), followed by beverage manufacturing (17%) and wood processing (15%). In terms of human capital, the secondary sector outperforms the primary agricultural sector as almost 42 per cent of its workforce is either highly-skilled or skilled. Similar to the primary sector, about 14 per cent of the labour force is employed in the informal component of the secondary agricultural sector (Quantec, 2012).

Figure 3.20 below shows the composition of employment within the agro-complex according to the latest labour force survey of 2007, which included detailed economic sectors. It is evident from the figure that vegetable production, cattle farming and the manufacturing of food have the largest contribution in employment. Combined, these sub-sectors contributed 41 per cent to total employment within the agro-complex.

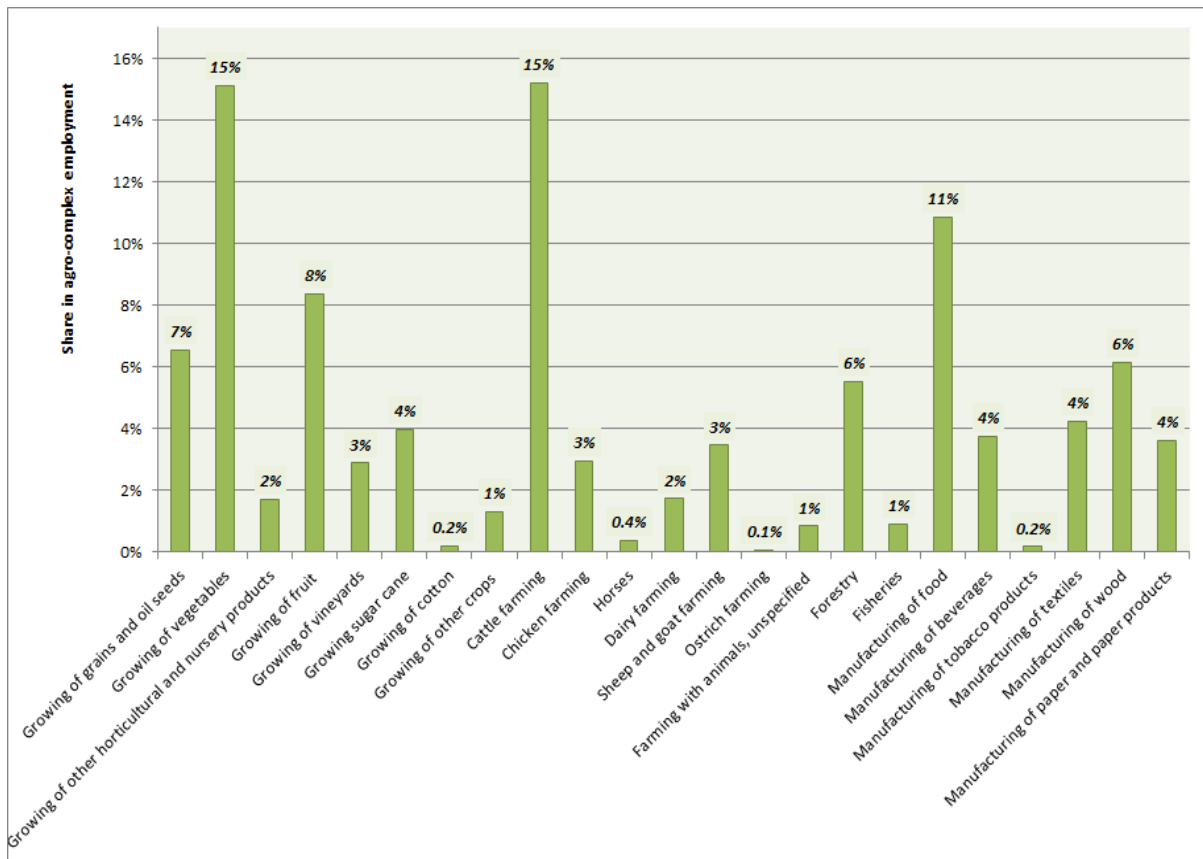


Figure 3.20: Composition of total employment in the agro-complex (2007)

Source: Author's own calculations based on data StatsSA (2007)

3.3.7 Food security

The rising food prices and the consequent food security challenges in recent years have put a focus on creating a more autonomous food supply system and increasing agricultural production. On a national level, South Africa is food secure since the country produces sufficient food and/or has the capacity to import food to feed its citizens. South Africa's self-sufficiency ratios, considering domestic supply, exports and imports, for the main agricultural products show a more detailed picture in this regard. The self-sufficiency ratios for fruit, maize, potatoes, sugar, dairy, and beef are all positive, but the ratios for wheat, poultry, pork and sheep meat are negative. Hence, for these specific product groups, South Africa is dependent on imports to satisfy its domestic demand.

However, looking at the household level, the situation is somewhat different. It is estimated that between 20 (Labadarios, Davids, Mchiza and Weir-Smith, 2009) and 52 per cent



(StatsSA, 2009) of the households in South Africa are food insecure. This is mainly because of poverty and income inequality, since most households have access to food but do not have the financial means to obtain it. Thus, this is a challenge for stimulating household food production, increasing income of the poor and/or decreasing food prices, all of which can be channelled through the agricultural sector.

Apart from income and price, food supply and demand is also driven by increases in population. Recall that agricultural production will have to increase by 40 per cent to feed the global population of nine billion by 2050 (FAO, 2012). Since South Africa is an important supplier of food for the region, population growth both at home and in southern Africa will significantly impact on domestic food production and supply. Increases in South Africa's population in the period from 2012 to 2050 are expected to be moderate, with a growth of 12 per cent (UN, 2012). This implies that the domestic food supply system needs to account for an additional six million South Africans who will need to be fed within the next 38 years. This implies that local cereal supply needs to increase by 1.1 million tonnes and local meat supply needs to increase by 0.3 million tonnes. The question remains whether these increases in South Africa's food supply will come from local production or imports. In a regional context, the food supply needs to increase more sharply, as by 2050 there will be 1.12 billion more Africans living on the continent, an increase by 105 per cent. Hence, this poses significant opportunities for the South African agricultural sector.

Income growth, both local and regional, will have a further impact on South Africa's supply and demand of food, as well as on food security. This will impact particularly on increases in purchasing power and changing dietary patterns (e.g. more animal protein and convenience food). Economic growth locally is expected to be moderate in the medium-term, from 3.0 per cent in 2013 to 4.1 per cent in 2017 (IMF, 2012). Sub-Saharan African economic growth in the medium-term is projected to be somewhat higher, from 5.7 per cent in 2013 to 5.8 per cent in 2017. However, economic growth rates for the DRC, Ivory Coast, Mozambique, Zambia, Ghana, Rwanda, Uganda and Tanzania are all projected to be above seven per cent over the next five years (IMF, 2012). Hence, both the quantity and quality of food demand in the region will rise rapidly.



3.3.8 South Africa's agricultural policy context

The policy environment for South Africa's agricultural sector since 1994 has been shaped by reducing poverty, rural development, land-reform, transformation, improving food security, and developing value adding activities. The major policy reforms over the last decades include: the deregulation of controlled agricultural markets, the liberalisation of trade, the abolishment of certain tax concessions favouring the sector, the reduction in budgetary expenditure on the sector, and the equitable access to services and resources for all population groups.

As mentioned in Section 3.3.1, one of the main policies currently affecting the agricultural sector revolves around diminishing the duality of the sector by implementing a land reform programme. Another important policy impact, which has shaped today's agricultural sector, are the reforms of South Africa's agricultural markets. A number of commodity-specific statutory initiatives, such as export subsidies and price support for grain and livestock commodities, were taken by the South African government in the 1920s and 1930s after the agricultural lobby complained about low and unstable prices (Baylay, 2000). The *Marketing Act of 1937* stipulated the establishment of farmer-controlled boards which determined who should produce, market, handle, process, and trade agricultural commodities. By the 1950s and 1960s, over 90 per cent of the agricultural production in South Africa was subject to marketing controls through 17 different schemes (Baylay, 2000).

In the early 1980s, the deregulation of agricultural markets began as a result of policy reforms outside the sector. The most important was the liberalisation of the financial system which led to a real depreciation of the Rand. Furthermore, the scaling down of interest rates subsidies on Land Bank loans, the poor performance of the agricultural sector, legal challenges, pressure from the sector and the increased pressure on the government budget also played a significant role (Baylay, 2000). As a result, government subsidies to the agricultural control board system were withdrawn.

Real increases in the prices of food instigated a series of official investigations into the agricultural marketing system in the 1990s. All of these found that agricultural prices



needed to be more market related. Up to 1996, most market reforms were implemented under the *1968 Marketing Act* and were more *ad hoc* in nature and relatively easily reversible. Thereafter, reforms were more rigorous, with the implementation of the *Marketing of Agricultural Products Act of 1996*. The controlled marketing system was abandoned by this Act owing to its many inefficiencies and large net welfare transfers from consumers to producers. It was envisaged that the deregulation would result in a more efficient use of agricultural resources, a more competitive agricultural sector, a real fall in food prices, accountability of risk management by the sector itself, and a reduction in government spending (Baylay, 2000).

The responses to agricultural market regulation by the sector itself have been impressive. These cannot, however, be seen in isolation from trade policy reforms and the relaxation of exchange controls. The most important structural changes in the agricultural sector since deregulation include (Baylay, 2000):

- Increasing numbers of agricultural exporters
- Increasing numbers of agricultural enterprises
- Real value of agricultural exports has increased
- Real retail food prices have become more stable
- Relief of government finances
- Establishment of an agricultural futures market.

Apart from domestic deregulation, South Africa's agricultural sector has also undergone major policy shifts in terms of international trade liberalisation since the early 1990s. This was spurred by a shift from an import-substitution strategy towards one based on export-led growth as South Africa emerged from nearly two decades of isolation and sanctions. South Africa's trade regime before liberalisation was characterised by numerous quantitative restrictions and permits, as well as non-ad valorem duties and surcharges (Lewis, 2001).

After South Africa became a signatory to the *Marrakech Agreement* in 1994, the pace of trade liberalisation speeded up. South Africa's World Trade Organisation (WTO)



commitments have resulted in the reduction of agricultural tariff lines as well as tariff levels. Tariff cuts really took off during the first half of the 1990s (Lewis, 2001), resulting in an increase in foreign competition on the domestic agricultural market, which necessitated local firms becoming more productive. Accordingly, agricultural tariff levels have declined by 38 per cent since 1997.

Despite the rigorous reforms, the South African overall tariff regime remains complex, and for some products the applied tariffs are changing frequently (OECD, 2007). Non-tariff measures are currently only in place for SPS measures and export subsidies have been discontinued since 1997 (OECD, 2007). In some instances import and export permits are required for agricultural products which are, for example, subject to quota windows with third countries (e.g. the EU and the USA) or for products subject to import control measures.

The country's import protection for agricultural and food products mainly consists of specific and ad valorem tariffs. Some country- and product-specific tariff rate quotas also exist, as well as anti-dumping and countervailing duties. Import duties are on average the highest for animal products, followed by fruits, vegetables, cereals and dairy products (UNCTAD, 2013). Import duties are generally the lowest for sugar, confectionary, cotton, oilseeds, fats and oils (UNCTAD, 2013).

South Africa is a founding member of the General Agreement on Tariffs and Trade (GATT), the predecessor of the World Trade Organisation. Furthermore, the country is a member of both the Southern African Customs Union (SACU) and the Southern Africa Development Community (SADC), which are two important regional economic communities. An overview of the country's most important multilateral and bilateral trade agreements is provided here:

- SACU: a customs union comprising South Africa, Botswana, Lesotho, Namibia and Swaziland, which ensures free trade between its members.
- SADC: a 14-member community of southern African states, formed in 1994, which is currently in the process of establishing a free trade area within the context of a tri-



partite alliance with the Eastern African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA).

- Zimbabwe: a preferential trade agreement was signed in 1964, covering a wide range of agricultural products.
- EU: the Trade, Development and Cooperation Agreement (TDCA) with the EU has been in place since 2000 and provided for the establishment of a free trade area by the end of 2012, covering 90 per cent of bilateral trade. Currently, negotiations are underway to include South Africa in the SADC group of the Economic Partnership Agreement (EPA) framework.
- European Free Trade Area (EFTA): a free trade agreement signed in 2006 with the economic community of Liechtenstein, Switzerland, Norway and Iceland, covering a wide range of agricultural products.
- India: a preferential trade agreement with SACU is currently under negotiation.
- MERCOSUR: a preferential trade agreement with the economic community of Brazil, Argentina, Uruguay, Paraguay and Venezuela is under negotiation.
- USA: South Africa is eligible for participating in the preferential trade regime with the USA under the African Growth and Opportunity Act (AGOA).
- Canada: South Africa has a preferential status under the Canadian Generalised System of Preferences (GSP).
- Japan: South Africa has a preferential status under the Japanese Generalised System of Preferences (GSP).

A brief overview of the most important government policies and programmes that focus on the development of the agricultural sector is provided below.

- *National Development Plan (NDP)*: This plan was developed by the National Planning Commission (NPC) to provide a long-term roadmap for socio-economic development for South Africa. The plan identifies a number of national challenges and institutional solutions to enhance prosperity and equality. With regard to agriculture, the plan suggests an expansion of irrigated agriculture and dry land production, with a strong focus on smallholder farms (NPC, 2011).
- *New Growth Path*: This national policy aims to enhance employment creation, growth and equity. The policy's principal target is to create 5 million jobs by 2015 and stipulates



government's commitment to prioritise employment creation in all economic policies. The policy, furthermore, revolve around massive investments in infrastructure and skills development. Another focus area is the green economy and agriculture. The New Growth Path stipulates that employment in agriculture will be increased by efficiency gains through addressing the high cost of production inputs, by developing agro-processing and improving export marketing. Furthermore, the policy states that the livelihoods of smallholders will be improved by providing better access to inputs, resources, markets and extension services (South African Government, 2013a).

- *Accelerated and Shared Growth Initiative of South Africa (ASGISA)*: ASGISA has identified the agricultural sector as one of the economy sectors destined for accelerated growth, and accordingly provides a platform on which improved economic performance can be built. ASGISA seeks to deal with the constraints that inhibit positive economic movement, aiming for a higher range of investment, job creation and thus economic growth. The current key constraints include:

- i. Relative volatility of the currency and interplay among main indicators,
- ii. Barriers to entry and competition in sectors of the economy,
- iii. Cost and efficiency of the national logistics system and some infrastructure,
- iv. The regulatory environment and burden on small and medium enterprises,
- v. A shortage of suitably skilled labour and disjointed spatial settlement patterns,
- vi. Deficiencies in state organisation, capacity and strategic leadership.

ASGISA and its interventions aim to optimise public investment and a better environment for private sector growth, and it implements a range of projects to address specific barriers. These systematic interventions should result in higher agricultural output, redistribution of income, higher exports and increased investment in agro-industries. The National Department of Agriculture has identified five key focus areas/projects for ASGISA, including a 50 per cent increase in land under irrigation, improved livestock productivity, accelerated land reform, bio-fuels and the development of agricultural development corridors (South African Government, 2013b).

- *Review of the Strategic Plan for South African Agriculture*: The strategic plan for South African agriculture was developed by the government in partnership with organised agriculture. The vision of this plan entails the sustained profitable participation of all



stakeholders within the country's agricultural sector. The long-term strategy is based on the concepts that commercial production should be increased, international competitiveness should be enhanced and the historical legacies in agriculture should be addressed (DAFF, 2007).

- *Agricultural Black Economic Empowerment Programme (AgriBEE)*: This policy stimulates the implementation of Black Economic Empowerment (BEE) initiatives in the agricultural sector. The main aim is to increase levels of black participation (especially of women and youth) in the ownership and control in the agricultural economy (DTI, 2013a).
- *Industrial Policy Action Plan (IPAP)*: The aim of this programme is to develop industrialisation and the diversification of manufacturers in the long-term. This should be done by stimulating production in those sectors with high potential for value adding and employment, as well as with competitive prospects in international and local markets. Agro-processing is one of the three clusters included in this industrial policy (DTI, 2013b).

3.4 INTRODUCTION INTO THE ANALYSIS OF AGRICULTURAL TRADE PERFORMANCE

The second part of this chapter, comprising Sections 3.4 to 3.7, focuses on South Africa's agricultural trade. A variety of quantitative indicators are used to assess South Africa's historical agricultural trade performance, largely following the methodology as set out in the World Bank's *Trade Competitiveness Diagnostics Toolkit* described by Reis and Farole (2012). Four different dimensions of trade performance are analysed, namely the intensive margin, the extensive margin, the sustainability margin, and the quality margin. Understanding South Africa's relative performance in these dimensions will identify its strengths, weaknesses and challenges, and will provide a summary of the sector's competitiveness in a global context. Although the predominant focus of the analysis will be on exports, imports are also included in the analysis, where possible.



Since some of the indicators will focus on country-specific analysis and others on positioning South Africa in the global landscape for other indicators, the following eight peer countries were selected:

- Brazil (BRA),
- Argentina (ARG),
- Chile (CHL),
- Australia (AUS),
- India (IND),
- Thailand (THA),
- The United States of America (USA),
- France (FRA).

The purpose of selecting only a few peer countries is to set South Africa's trade performance in context and not to conduct a comprehensive global ranking exercise. The specific selection of these peer countries is based on their relative significance in global agricultural production and trade, their similarities in agricultural production (Chile, Argentina, Brazil and Australia), similarities in development (Brazil, India, Thailand, Chile), their location (southern hemisphere: Australia, Chile, Argentina and Brazil), their analogous classification as middle-income countries (Brazil, Thailand, Chile and Argentina), their competition in agricultural markets (Chile, Brazil and Australia), their involvement in the Green Revolution (India and Thailand) and the difference in their stages of economic development (France, USA and Australia) to South Africa. Furthermore, on a global scale, all these countries are relatively large agricultural producers.

The data used in the trade performance analysis will be comprised of international trade statistics classified according to the Harmonised System (HS) nomenclature of 2002 (i.e. H2) and the less detailed Standard International Trade Classification (SITC), Revision 2 nomenclature of 1976. For a meaningful, in-depth product-level investigation, this study will conduct most of its analysis at the four-digit (i.e. product groups) and six-digit levels (i.e. products) of the HS classification. Hence, the dataset of the agricultural sector is disaggregated into the following product clusters:



- Primary agricultural production (including fisheries): 72 product groups, 221 products
- Agro-processing of food: 138 product groups, 522 products
- Agro-processing of non-food: 105 product groups, 413 products
- Forestry: 58 product groups, 222 products
- Agricultural inputs: 18 product groups, 78 products.

These clusters roughly represent the different stages of the agro-food value chain. For a complete list of the entire 391 agricultural product groups and 1 456 agricultural products, please refer to Data Supplement I¹⁵. The SITC classification will be used for those few instances where long-term and aggregated trade data is required. Data Supplement II provides an overview of the SITC product groupings used for the analysis in this study.

3.5 THE INTENSIVE MARGIN OF SOUTH AFRICA'S AGRICULTURAL TRADE

As mentioned in Section 3.2, South Africa is the 32nd largest global producer of agricultural products. In terms of total agricultural exports, South Africa only ranks 46th globally and compares well with countries such as Norway, Finland, Romania and Pakistan. Compared to the selected peer countries (see Section 3.4), South Africa's agricultural exports are relatively small: Chile's agricultural exports are twice as large and the USA's agricultural exports are some 18 times larger. Against this background, this section assesses the level, growth, and market share performance of South Africa's existing agricultural trade – the intensive margin. Section 2.5 in the previous chapter indicated clearly the important role of the intensive margin in export growth. This section commences with an analysis of the country's trade openness, followed by an investigation into the growth trends, composition, market position, destinations and growth orientation of its agricultural trade flows.

¹⁵ All data supplements are available from the author on request.



3.5.1 Trade openness

The trade to GDP ratio is one of the most basic indicators of openness to foreign trade. The ratio weighs the combined importance of exports and imports of an economy. Figure 3.21 below shows a bubble graph of the average trade to GDP ratios from 2009 to 2011 for South Africa (ZAF) and its selected peers (see Section 3.4). The ratio is plotted against the share of agriculture in the total exports of each selected country for that same period. The sizes of the bubbles indicate the relative levels of income (i.e. per capita GDP, PPP) for each country. The figure clearly shows that trade is relatively important for the South African economy, at a trade to GDP ratio of 42 per cent and that its openness is similar to that of France. Hence, this indicates that South Africa is well integrated in the global economy. However, the share of agriculture in its total exports (13 per cent) is comparatively low.

More developed economies tend to have a smaller proportion of agricultural products in their export basket; see for instance the USA, Australia and France. However, emerging economies, such as South Africa, India and Thailand, also have a relatively low share of agriculture in total exports. In comparison, Argentina and Chile, which are more developed countries, have a relatively high proportion of agriculture in their exports. Thus, a relatively large dependency on agricultural exports is not necessarily associated with lower levels of development.

Large countries, in terms of geography and population, tend to have lower trade to GDP ratios than smaller countries, as they can normally undertake a larger share of trade within their borders. Note for instance, the positions of the USA, India, and Australia in Figure 3.20. The figure furthermore shows that the level of income is not the only determinant of a country's openness. Based on the similarities in levels of income, South Africa could either be less open, like Brazil, or have a far higher openness to foreign trade, like Thailand. Structural characteristics, such as population, location (i.e. landlocked), remoteness, and cost of trading, also all play an important role in the (potential) dependency on foreign trade. However, taking these characteristics into consideration, analysis by Reis and Farole (2012) shows that larger countries tend to trade less than smaller countries relative to the size of their economy.

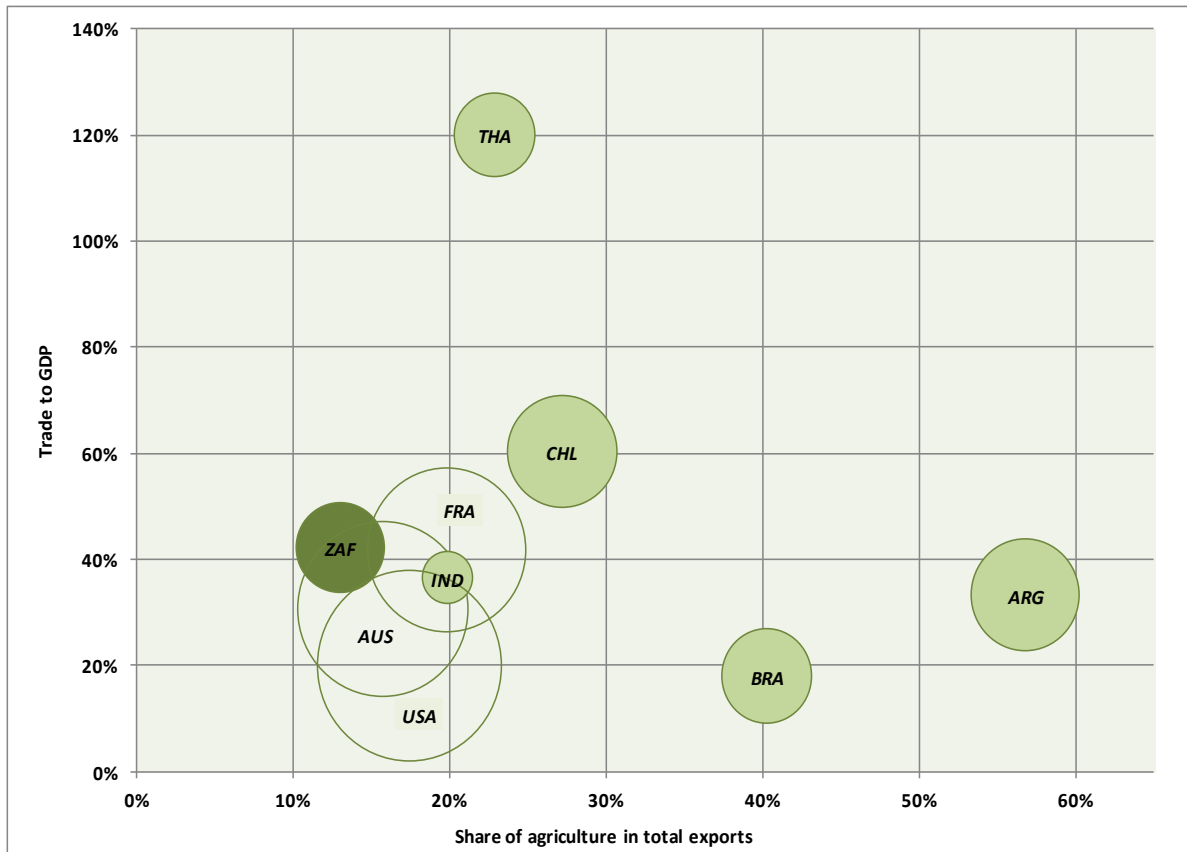


Figure 3.21: Trade openness, income and agricultural exports (2009-2011)

Source: Author's own calculations based on data from IMF (2012) and UN Comtrade (2013)

3.5.2 Trends in agricultural trade growth

Another basic indicator of South Africa's agricultural trade orientation is the assessed broad long-term trend in total agricultural exports. This trend will indicate whether growth is sustained and has kept pace with the global trend. The line in Figure 3.22 shows South Africa's trend in total agricultural exports and the columns indicate the annual growth of both South Africa's and world exports of agricultural products in the period 1992 to 2011¹⁶. It is evident from the figure that the country's agricultural exports showed stagnating growth until 2002 (averaging two per cent annually) and an impressive growth from 2002 onwards (averaging 11 per cent annually). South Africa's total agricultural exports increased from 3.2 billion USD in 1992 to 9.6 billion USD in 2011. Furthermore, South Africa's annual growth trend for the last 20 years corresponds very well with the global trend. This implies

¹⁶ The SITC Rev 2 classification was used for the calculation of the long-term trend in agricultural exports (see also Data Supplement II).



that the country is well integrated with the global agricultural markets. However, in 11 out of the 19 years under investigation South Africa's export growth was either smaller or the decline even larger than the global trend, This implies that the country has some potential for improving its export sustainability in global markets by addressing supply side constraints as well as product and market diversification.

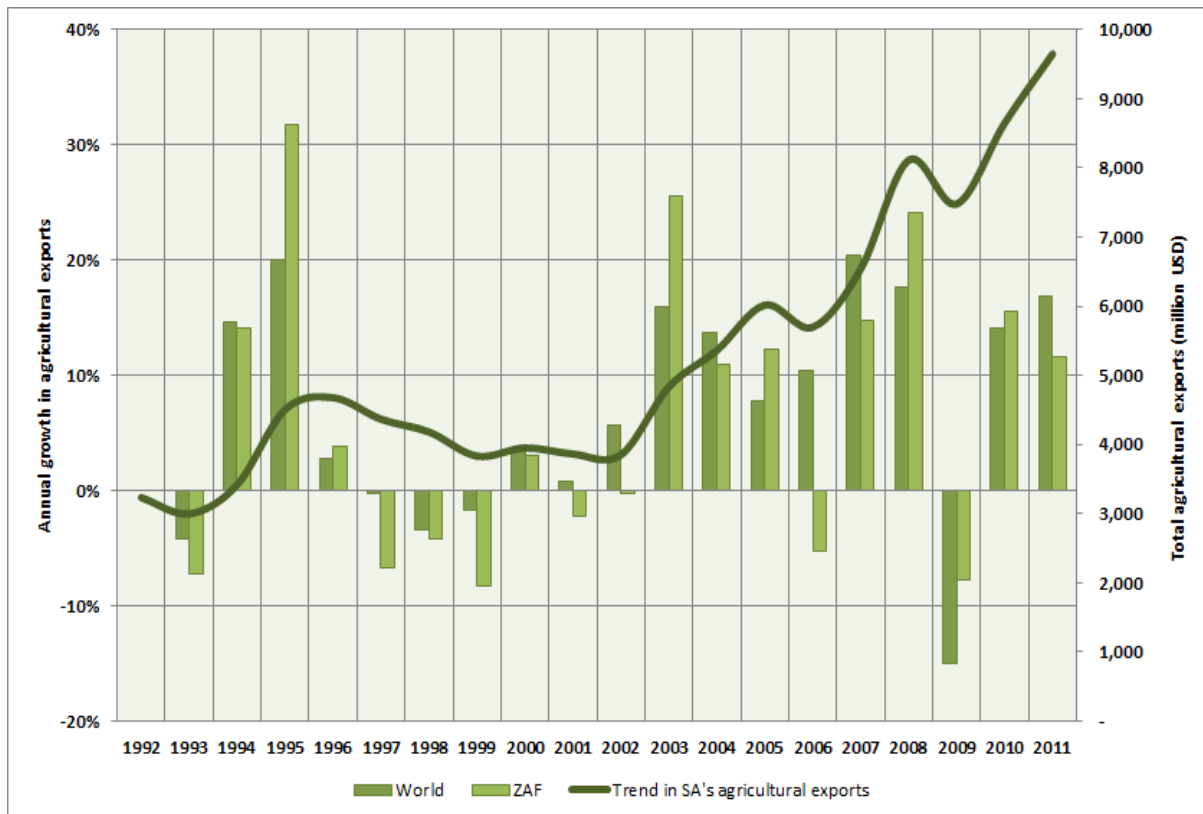


Figure 3.22: South Africa's agricultural export growth (1992-2011)

Note: total agricultural exports are plotted on the secondary vertical axis

Source: Author's own calculations based on data from UN Comtrade (2013)

3.5.3 Composition of agricultural trade

In order to assess South Africa's composition of agricultural trade, the five broad product clusters (i.e. primary agriculture, agro-processing: food, agro-processing: non-food, forestry, and agricultural inputs¹⁷) are used and compared with the trade composition of the selected peer countries. The shares of these clusters will provide valuable insights into the factor intensity and the structure of the respective agricultural sector. Figure 3.23 below shows the

¹⁷ Please refer to Data Supplement I for a comprehensive overview of the products classified under these five clusters.



composition of agricultural exports for the period from 2009 to 2011. It is evident from the figure that with a share of 36 per cent, South Africa has the second largest proportion of primary products in its agricultural export basket. This proportion is also significantly higher than the share of primary agricultural products in global agricultural trade. Furthermore, South Africa's share of 37 per cent in processed products (i.e. both food and non-food) in total agricultural exports is second lowest after the USA. Its share is also significantly lower than the share of processed products in global agricultural trade. South Africa's relatively strong focus on land-intensive agricultural activities is representative of that of most developing countries in Africa. Hence, it seems that there exists some potential for expanding agro-processing activities in South Africa in order to capture more value from these supply chains and stimulate agricultural based manufacturing. Chapter 5 will elaborate further on this issue.

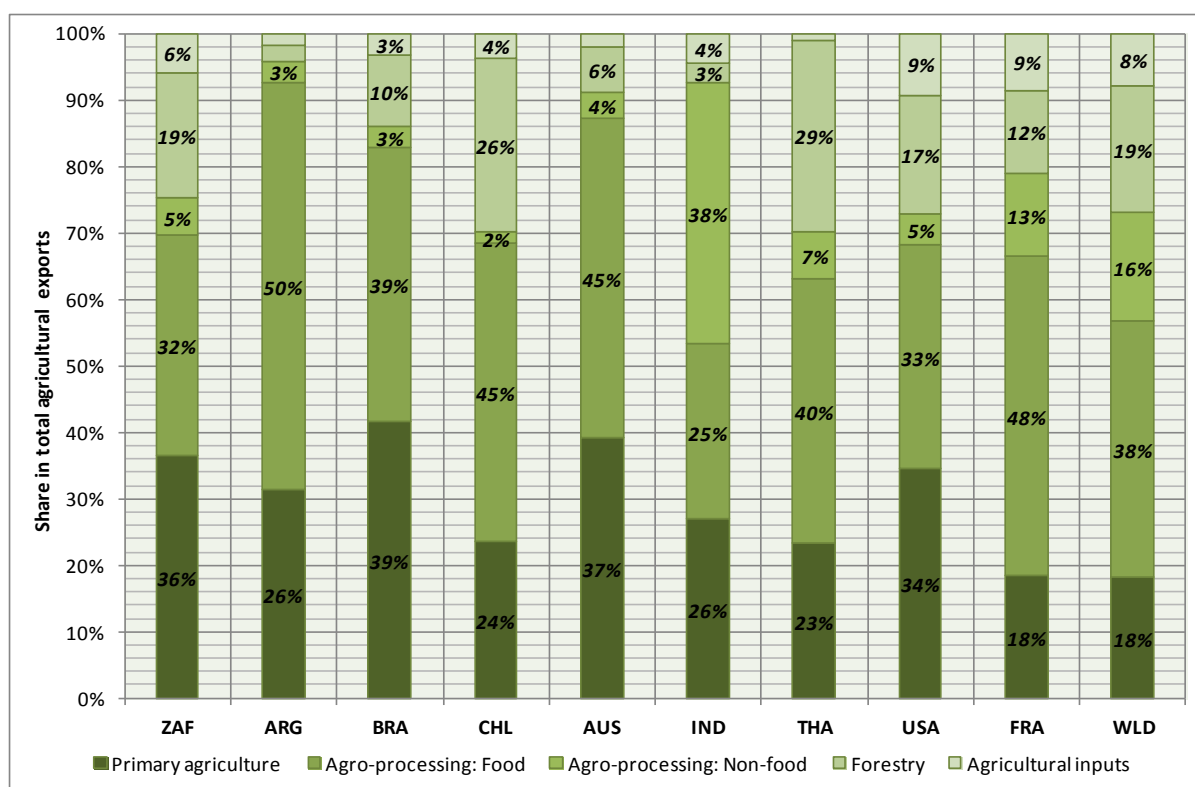


Figure 3.23: Agricultural export composition in broad product clusters (2009 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Figure 3.23 also shows that South Africa's proportion of processed non-food products in agricultural exports is on par with most of its peers. Only India and Thailand have a



significantly higher proportion of these products in their export basket, mainly attributable to their well-developed textile industries. The share of forestry in agricultural exports is only higher in Thailand and Chile. Hence, this reveals the relatively well-developed wood and paper industry of South Africa.

Besides agricultural exports, the relative dependency on agricultural imports provides a more balanced view of a country's agricultural trade composition. Hence, Figure 3.24 below shows the agricultural exports-to-imports ratio¹⁸ for each of the selected peer countries per product cluster. A ratio of more than one indicates a positive trade balance and a ratio of between zero and one indicates a negative balance of trade for the respective product cluster. Furthermore, the higher the ratio, the less dependent the country is on agricultural imports.

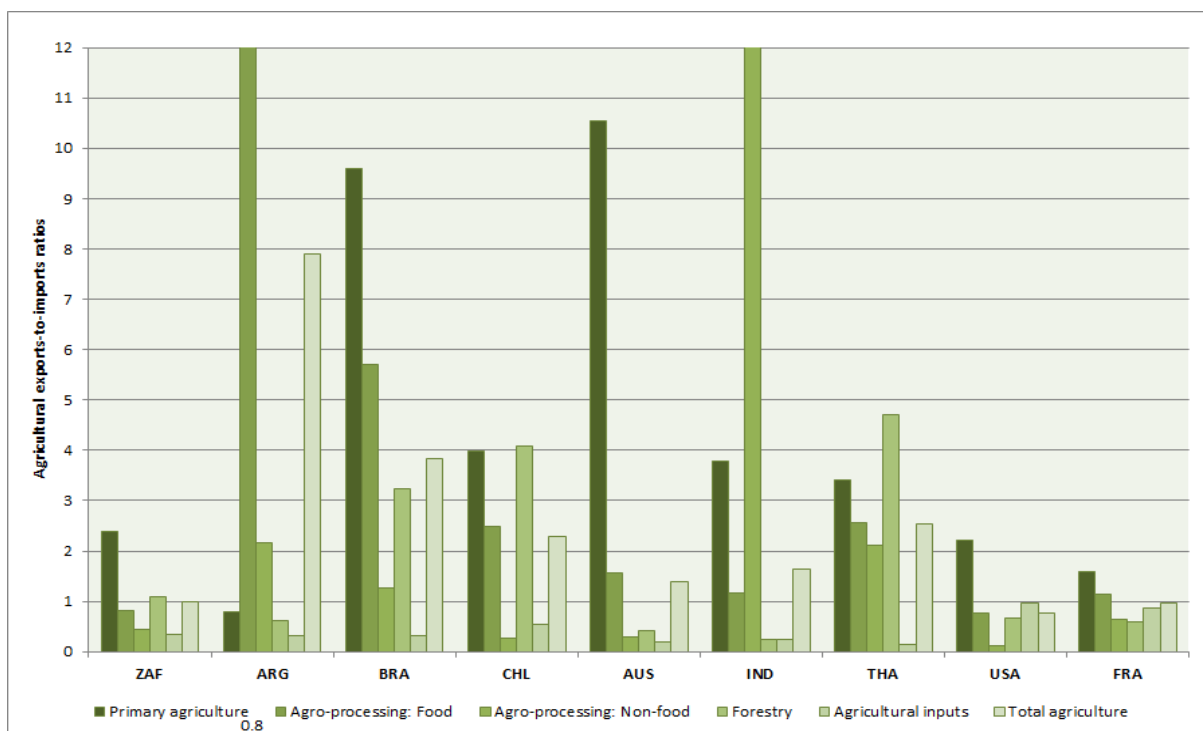


Figure 3.24: Agricultural exports-to-imports ratios per product cluster (2009 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

South Africa's agricultural exports-to-imports ratio of 2.4 (see Figure 3.24) for primary products indicates that exports of these products are 2.4 times larger than imports. Hence,

¹⁸ The export-to-import ratio is calculated by dividing exports by imports for each of the five product clusters.



South Africa has a positive balance of trade for these products. Combined with the trade deficit for processed food products, South Africa is still a net food exporter. Furthermore, the country has a trade surplus for forestry products. Its trade deficit for agricultural inputs specifically is not that problematic for a developing, middle-income country like South Africa, as these are vital as capital investments for the technological development and the long-term growth of the sector.

However, its overall exports-to-imports ratio for agricultural products is just slightly below one. Compared to the middle- and low-income peer countries, South Africa's balances of trade for the different agricultural product clusters are significantly less favourable, although they compare well with those of the developed peer countries, such as France and USA. Overall, South Africa's agricultural trade has a relatively large component of imports, especially of processed products, which could prevent the development of domestic production capacities. This accordingly might put pressure on internal wealth creation and might ultimately lead to a "debt trap"¹⁹.

Figure 3.25 below shows the composition of export growth for South Africa and the selected peer countries for the period 2002 to 2011. Although its overall agricultural exports kept the trend with global agricultural exports (see Section 3.5.2), the composition of this growth into the five agricultural product clusters shows a somewhat different picture. South Africa's overall export growth lags behind that of other middle-income countries, such as Brazil, Argentina, Chile, and Thailand, as well as of a low-income country like India. Compared to these countries, South Africa performs relatively poorly, especially with regard to the export growth rates of primary agricultural products and agricultural inputs. Compared to global trade growth, the country's performance is relatively poor with regard to processed food and non-food products, as well as agricultural inputs.

¹⁹ A worsening trade deficit, whereby a country predominantly exports relatively lower-priced primary agricultural products and imports higher-priced secondary agricultural products, may lead to a deficit in the Balance of Payment which needs to be supplemented by debt until the terms of trade improve.

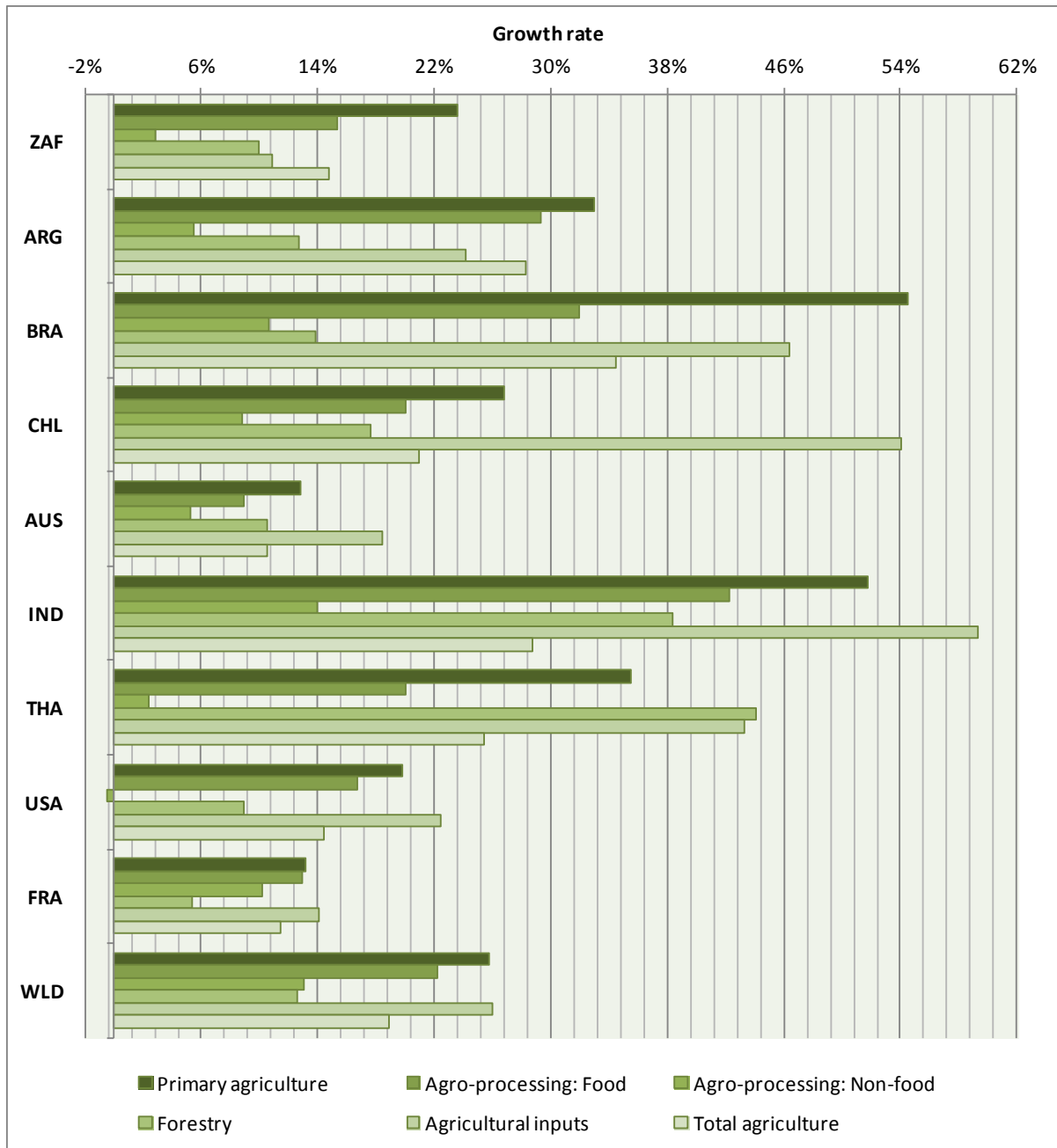


Figure 3.25: Compound annual average growth rate of agricultural exports (2002 – 2011)

Note: Growth rates for India were calculated for the period 2003 – 2011 owing to data limitations

Source: Author's own calculations based on data from UN Comtrade (2013)

A more detailed overview of changes in South Africa's agricultural trade composition is provided in Table 3.5 below. Column 1 shows the five different product clusters, as well as the three main export products per cluster (based on 2011 trade).



In Table 3.5, columns 2 and 3 provide South Africa's total value of exports for each cluster and product across 2002 and 2011. These columns further show the share in total agricultural exports per cluster or product for the two time periods, as well as the relative specialisation in exports and imports per cluster. The index for the relative specialisation in exports was calculated using the Revealed Competitive Advantage (i.e. RCA or RXA)²⁰ and the specialisation in imports was calculated using the Revealed Comparative Import Advantage index (i.e. RMA)²¹. A value of more than one reveals a relative specialisation. Thus, an $RCA > 1$ for exports reveals a relative comparative export advantage in the global context, which is favourable for South Africa's agricultural trade performance. However, an $RMA > 1$ for imports reveals a comparative import advantage in the global context, which may be adverse for its performance. Column 4 depicts the trend in total exports, as well as the cluster-level trade specialisation for the period from 2002 to 2011.

The RCA index is often used as an indicator for relative export advantage or competitiveness, but it only accounts for exports. Hence, the Revealed Trade Advantage (i.e. RTA)²² index accounts for exports and imports simultaneously and is used as an indicator of product-level competitiveness in column 5. An $RTA > 0$ reveals positive comparative trade advantage or trade competitiveness and an $RTA > 1$ reveals relative export competitiveness accounting for imports. Since agriculture is prone to natural shocks, the index was calculated as an average of the period 2009 – 2011.

²⁰ $RCA_{ij} = (X_{ij} / \sum_{t \neq j} X_{it}) / (\sum_{n, n \neq i} X_{nj} / \sum_{n, n \neq i} \sum_{t \neq j} X_{nt})$ Where X represents exports, i is a country, j is a product, t is a year, and n represents all countries.

See: Liesner (1958) and Balassa (1965). (Sometimes also referred to as the RXA index)

²¹ $RMA_{ij} = [(M_{ij} / \sum_{t \neq j} M_{it}) / (\sum_{n, n \neq i} M_{nj} / \sum_{n, n \neq i} \sum_{t \neq j} M_{nt})]$

²² $RTA_{ij} = RCA_{ij} - RMA_{ij}$
See: Vollrath (1991).



Table 3.5: Changes in the composition of South Africa's agricultural trade (2002 – 2011)

Exports (1)	2002 (2)				2011 (3)				2002 – 2011 (4)			Product competitive- ness 2009- 2011 (5)
	Total exports (1000 USD)	Share	Cluster specialisation		Total exports (1000 USD)	Share	Cluster specialisation		Average annual exp growth	Change in cluster specialisation		
			Exp	Imp			Exp	Imp		Exp	Imp	
Primary Agriculture	1,269,869	28%	2.31	0.99	3,971,928	37%	1.51	0.70	24%	-35%	-29%	
<i>Maize</i>	82,437.87	2%			744,911	7%			89%			3.51
<i>Oranges</i>	131,292.33	3%			588,858	6%			39%			21.95
<i>Table grapes</i>	127,393.03	3%			427,233	4%			26%			12.14
Agro-processing: Food	1,426,547	31%	1.12	0.67	3,389,964	32%	0.62	0.82	15%	-45%	22%	
<i>Wine, containers < 2 l</i>	252,741	6%			498,436	5%			11%			4.48
<i>Wine, containers > 2 l</i>	29,066	1%			221,243	2%			73%			11.83
<i>Food preparations nes*</i>	30,788	1%			149,992	1%			43%			-0.08
Agro-processing: Non-food	78,166	10%	0.66	0.41	98,834	6%	0.26	0.61	3%	-61%	49%	
<i>Cigarettes</i>	49,561	1%			96,036	1%			10%			0.68
<i>Smoking tobacco</i>	5,117	0.1%			59,100	1%			117%			5.19
<i>Leather of ostriches / game animals</i>	25,258	1%			59,071	1%			15%			28.00
Forestry (wood and paper)	1,080,113	24%	1.22	0.66	2,045,440	19%	0.76	0.70	10%	-38%	6%	
<i>Chemical wood pulp</i>	196,929	4%			586,464	6%			22%			36.67
<i>Wood chips, non-conif.</i>	185,637	4%			214,766	2%			2%			18.83
<i>Kraftliner in rolls</i>	12,507	0.3%			173,289	2%			143%			20.58
Agricultural inputs	311,576	7%	1.22	2.03	616,215	6%	0.50	1.71	11%	-59%	-16%	
<i>Biocides</i>	3,432	0.1%			77,657	1%			240%			1.99
<i>Herbicides</i>	59,771	1%			74,005	1%			3%			-0.67
<i>Chemical fertiliser (3 el)</i>	48,283	1%			64,615	1%			4%			3.04
TOTAL AGRICULTURE	4,566,271		1.24	0.76	10,622,382		0.74	0.82	15%	-40%	8%	

Source: Author's own calculations based on data from UN Comtrade (2013)



Table 3.5 above reveals that, apart from primary agricultural products, South Africa's agricultural export specialisation has declined below the threshold of 1 for three of the product clusters since 2002, namely processed food products, forestry products and agricultural inputs. Hence, South Africa has lost significant ground in its agricultural export competitiveness, especially for inputs and processed food products. The export specialisation for processed non-food products remained negative throughout the entire period from 2002 to 2011. In terms of agricultural import specialisation, the shifts were less significant; apart from agricultural inputs, all product clusters remained below the threshold of 1. This is not surprising, given South Africa's relatively small local and regional markets (i.e. re-exports). However, South Africa's growing import specialisation in processed food and non-food products is cumbersome for its own economic development.

At the product-level, table 3.5 reveals that some products showed some significant growth in exports since 2002. This growth corresponds well with the increases in the respective shares of those products in agricultural exports, especially for maize; wine: containers > 2 litres, Kraftliner; smoking tobacco; and biocides. Column 5 reveals that trade competitiveness is positive for most of the key primary and processed export products. However, no trade competitiveness was revealed for food preparations n.e.s. ("not elsewhere specified") and herbicides, indicating a relatively strong dependency on imports. Thus, the exports of these products are mainly made up of re-exports. Data Supplement III provides further product-level detail of the composition of South Africa's agricultural trade by ranking the top 25 exports and imports per product cluster.

A further analysis of the product-level trade competitiveness is demonstrated in the scatter plots in Figure 3.26 below. All of South Africa's 1 339 agricultural trade products are plotted per agricultural product cluster against its respective export value on the horizontal axis, and its RTA index on the vertical axis. The bold horizontal reference line divides the products according to their positive or negative trade advantage (i.e. RTA) and the bold vertical reference line divides the products according to the average export value for the period 2009 to 2011. The percentages represent the share of products per quadrant.

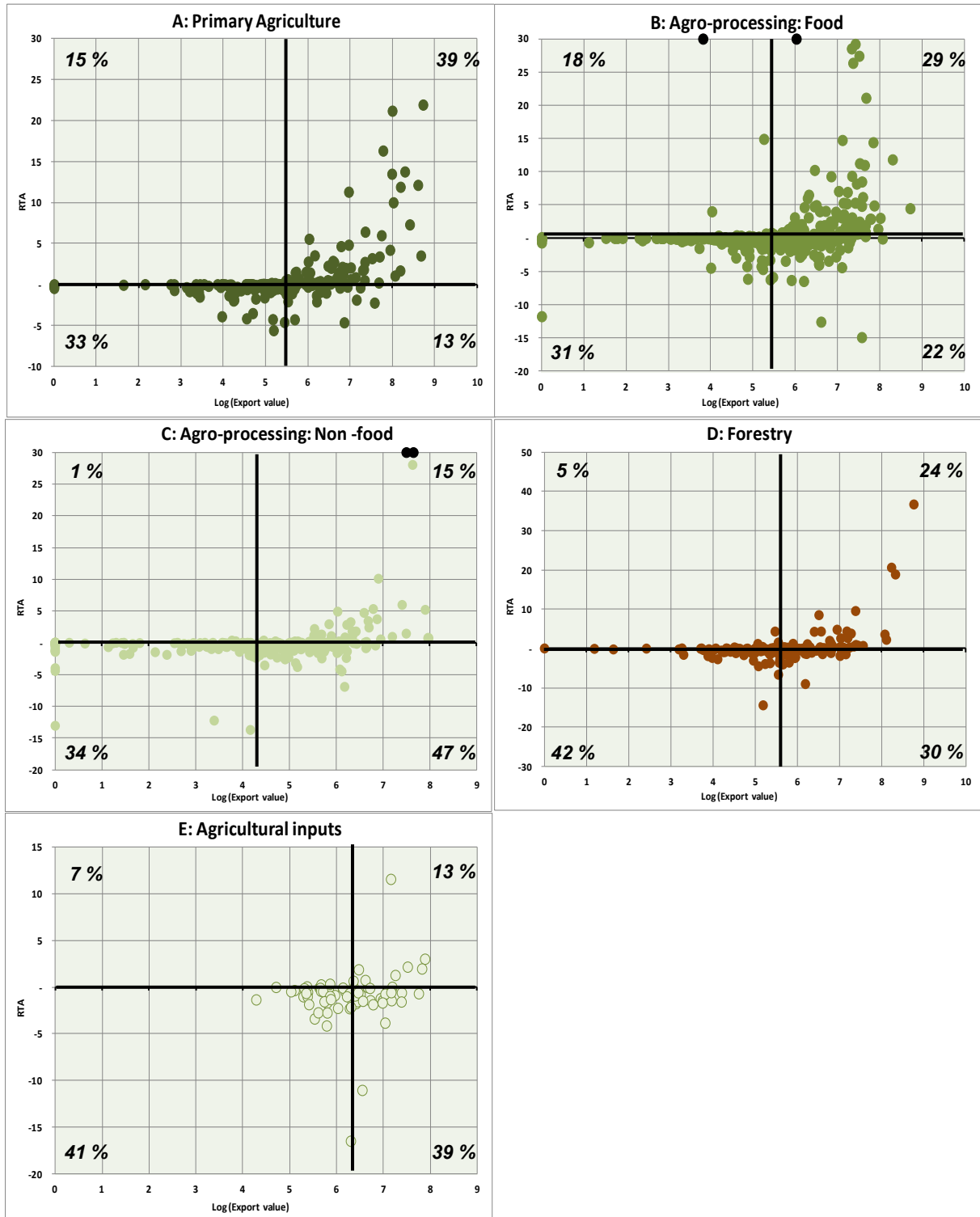


Figure 3.26 (A – E): Product-level trade competitiveness per agricultural cluster (2009 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)



Figure 3.26 A shows the position of the 202 primary agricultural products. Most of these products (39 per cent) are positioned in the upper-right quadrant, indicating an above average export value and a revealed trade competitiveness. This is the best performance among the five agricultural product clusters. The 15 per cent of products in the upper-left quadrant show the most potential for export increase, and include products such as coarse animal hair (both carded and not carded), leguminous vegetables and combed wool in fragments.

Fifty-four per cent of South Africa's primary agricultural products show a revealed competitiveness (i.e. $RTA > 1$). South Africa's most competitive primary agricultural export products include oranges, grapefruit, fine animal hair, plums, greasy wool (not carded/combed), tree nuts n.e.s., fresh grapes, pears, wool (not carded/combed, carbonised), lemons, and apples. Most of these products are also listed among South Africa's top ten export products (see Data Supplement III). However, about 33 per cent of the country's primary agricultural products have relatively low export values and are uncompetitive; the most important of these products are turmeric, tobacco refuse, live duck/geese, nutmeg, millet, coriander seeds, fennel seeds, rattans, seeds of cumin, and lucerne. Note that half of these products consist of spices which have low production potential in South Africa. However, that is not the case for millet, lucerne, and duck/geese.

The trade performance of South Africa's 507 processed food products are shown in Figure 3.26 B. The average value of processed food exports is similar to that of primary products. About 29 per cent of these products are located in the advantageous upper-right quadrant. A further 18 per cent of processed food products also have a relative trade advantage but their exports are relatively small. This group mainly consists of niche products, such as meat of reptiles, wine lees, peel of citrus fruit, and fish livers.

Only 15 per cent of South Africa's processed food products have a relative competitiveness (i.e. $RTA > 1$) and the key products include meat of sea mammals, ivory, preserved apricots, flour of oilseeds, preserved pears, grapefruit juice, maize meal, meat of reptiles, frozen long-finned tuna, and preserved peaches. Apart from preserved peaches and maize meal, none of these products are ranked among the top exports of processed foods. However, the



majority of the traded processed food products (53 per cent) have an RTA < 0 and are not trade competitive. The products with a relatively high export value, but which have no revealed competitiveness, include soya bean oil, sardines, kidney beans, palm kernel oil, whiskies, cotton seed oil, roasted chicory, natural gums, sunflower oil, and palm oil. The significant proportion of vegetable oils in this group is noteworthy.

Figure 3.26 C depicts South Africa's trade performance for 359 processed non-food products. The average export value for these products is significantly lower than for the other product clusters. Only 15 per cent of these products are located in the advantageous upper-right quadrant. Furthermore, the average RTA index for all processed non-food products is -0.4 , corresponding with the low levels of trade specialisation as reflected in Table 3.4. The majority of these products (47 per cent) have relatively high export values but have no trade competitiveness. Most of these are finished textile products, such as leather trunks, men's jackets, and cases, as well as semi-processed products such as felt, woven fabrics of cotton, hides of bovine animals, cotton yarn, and yarn of jute. Only seven per cent of the processed non-food products showed a relative trade advantage (RTA > 1). The most important products in this group include wattle extract, raw sheepskins, ostrich leather, yarn of fine animal hair, smoking tobacco, skins of reptiles, essential oil of lemons, hides of game animals, and hides of bovine animals.

The performance of the 200 forestry products (i.e. wood and paper) traded by South Africa is depicted in Figure 3.26 D. These products have the second highest average export value of the five agricultural clusters. Most products (42 per cent) are grouped in the lower-left quadrant, indicating a relatively low export value and a revealed trade disadvantage. Some of the products with the lowest trade competitiveness include chemical wood pulp (sulphite, other than dissolving grades), wood sawn lengthwise, Kraft paper, casks, self-copy paper, seats of bamboo, greaseproof paper, and cork stoppers. Only 28 per cent of the forestry products show a relative trade advantage and a mere 12 per cent reveal export competitiveness. The forest products with the strongest competitiveness include chemical wood pulp (dissolving grades), Kraftliner, wood chips, uncoated paper, hoopwood/poles (non-coniferous), wood in the rough, charcoal, fibres from recovered paper, and balata.



The 75 agricultural inputs traded by South Africa are shown in figure 3.26 E. The average export value of this smallest cluster is the highest of all five clusters. However, this cluster has the smallest proportion of products located in the upper-right quadrant. Hence, as was evident from Table 3.4 and supported by an average RTA of -1.35, this cluster is predominantly import-orientated. The agricultural inputs with the largest relative trade disadvantage include brewery machinery, potassium sulphate, machines for sorting/cleaning eggs, urea, disc harrows, wine pressers/crushers, straw/fodder balers, tractors, seeders/planters, and harvesters.

Only 13 per cent of agricultural inputs are grouped in the advantageous upper-right quadrant. A further 11 per cent of products have relatively trade competitiveness ($RTA > 1$); these include double salts, chemical fertilisers (containing the 3 elements), ammonium nitrate, biocides, machinery for sugar manufacturing, poultry keeping machinery, potassic fertiliser, phosphatic fertiliser, pedestrian controlled tractors, and self-loading agricultural trailers.

3.5.4 Market shares of agricultural trade

The degree to which a country is integrated in global agricultural markets is a good indicator of its ability to produce agricultural products that can sustain foreign competition. Therefore, Figure 3.27 below depicts the respective shares in global agricultural trade in the years 1983, 1995 and 2011, for South Africa and the eight peer countries. The figure confirms that South Africa is a relatively small exporter of agricultural products. The country's small share declined by 0.34 per cent from 0.87 per cent in 1983 to 0.53 per cent in 2011. All of the developing peer countries recorded small increases in their respective shares in global agricultural trade, whereas the three developed countries all recorded a decline. However, South Africa's decrease in global market share was significantly smaller than its developed counterparts, such as the USA and France.

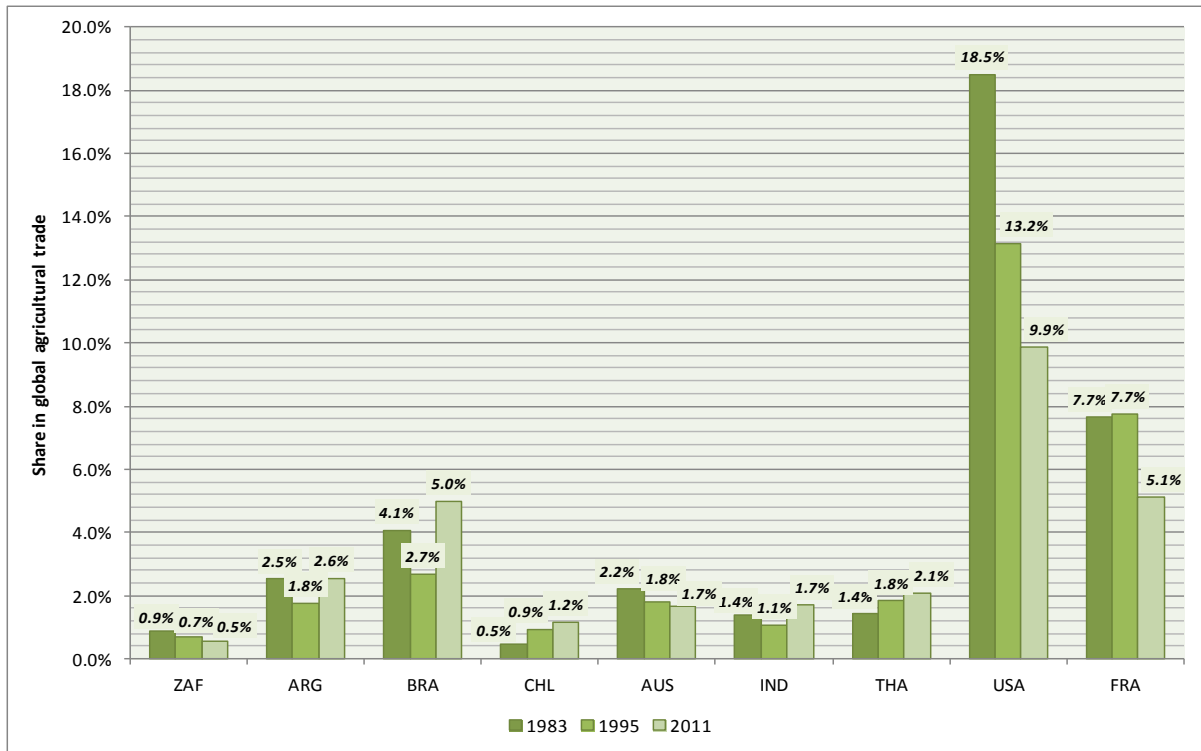


Figure 3.27: Shares in global agricultural trade (1983, 1995, and 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Measuring the market shares at product-level provides a further measure of integration in global agricultural markets: Figure 3.28 (A-E) shows the market shares and sizes at product level according to the five agricultural clusters. South Africa's (ZAF) global market share per product is plotted against the respective global market size. This exercise will reveal whether South Africa is exporting those agricultural products that have relatively large global markets. Since log values were used, the values closer to 0 indicate a higher relative market share or size. The results of this analysis often correlate with the outcomes of the RTA analysis, since most products with large market shares will also have a relatively high level of revealed competitiveness. However, a high RTA is not a sufficient precondition for exporting to larger markets.

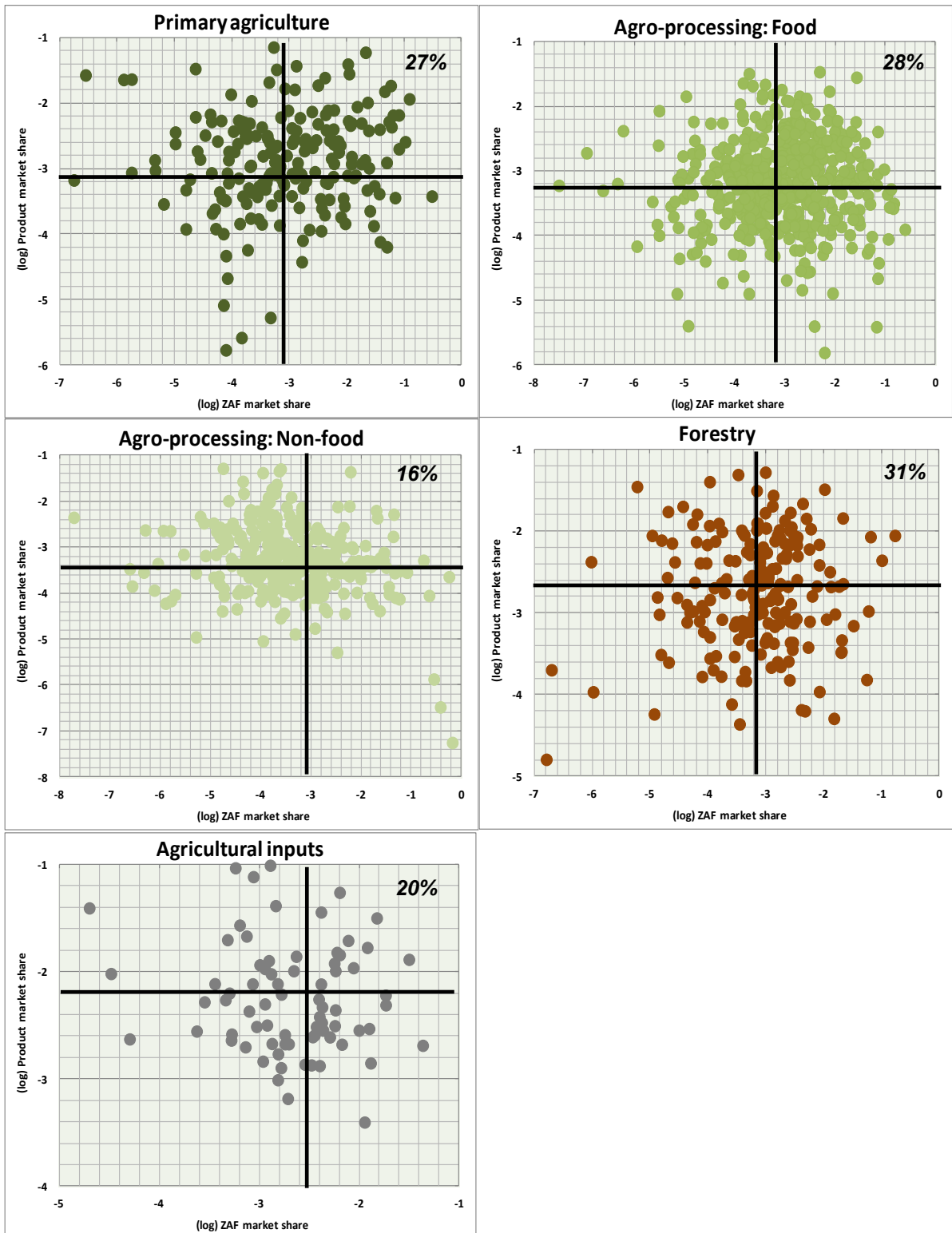


Figure 3.28 (A-E): Global market shares for SA's agricultural products (2009 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

The graphs in Figure 3.28 are divided into four quadrants by two bold reference lines. The horizontal reference line depicts the average global market share; the larger this share the



larger the global market size for the product. The vertical reference line depicts South Africa's average share in global exports for the period 2009 to 2011. The products located in the upper-right quadrant have a relative large global market and South Africa has a disproportionately high market share in these products.

About 27 per cent (i.e. 54 products) of South Africa's primary agricultural exports have a relatively high market share in products with a relatively large global market (see Figure 3.24 A). The most important products and their respective market shares include oranges (12%), grapefruit (10%), plums (8%), greasy wool; not carded/combed (8%), pears (6%), tree nuts n.e.s. (6%), fresh grapes (6%), and lemons (5%). The figure also shows that South Africa has a relatively small share of some of the primary agricultural products with relatively large global markets (i.e. upper-left quadrant). These include wheat, durum wheat, bananas, cocoa beans, rape seed, tomatoes, live bovine animals, barley, fresh peppers, and almonds. However, some of these products cannot be competitively produced under South African conditions.

A considerable 28 per cent (i.e. 139 products) of South Africa's processed food exports have relatively high market shares for products with a large global market size (see Figure 3.24 B). The most important of these products and their respective market shares include preserved peaches (9%), wine; containers > 2l (7%), meat offal n.e.s. (7%), frozen rock lobster (5%), fermented beverages (5%), preserved fruit mixtures (4%), sunflower oil (4%), and grape juice (4%). A substantial proportion of South Africa's top processed food exports can be classified as niche products (i.e. lower-right quadrant), as those products have a relatively small global market.

Only 16 per cent (i.e. 51 products) of South Africa's exports of processed non-food exports have a relatively large presence in the respective larger-sized global product markets (see Figure 3.24 C). This is the smallest proportion of all the five product clusters. The most important of these products and their respective market shares include cigarettes (5%), raw sheep skins (4%), essential oils of lemon (3%), and hides of bovine animals (2%). The figure shows, furthermore, that South Africa has little presence in the relatively larger global processed non-food markets, which mainly consists of textile products.



Of South Africa's forestry products, about 31 per cent (i.e. 62 products) have a relatively high share in the larger global markets for those products (see Figure 3.24 D). This is the largest proportion of all five product clusters. The best performing products in the upper-right quadrant and their respective market shares include chemical wood pulp; dissolving grades (17%), Kraftliner (10%), wood chips (6%), chemical wood pulp; sulphite (2%), and paper and paperboard; not containing fibres (2%).

South Africa's exports of agricultural inputs have the second smallest share of products in the upper-right quadrant, at twenty per cent (i.e. 15 products). The products with a relatively large share in exports in the larger global markets include biocides (3%), poultry keeping machines (2%), chemical fertilisers; containing the three elements (2%), and ammonium nitrate (1%). Most of South Africa's agricultural inputs can be classified as niche products on the global markets (i.e. lower-right quadrant).

3.5.5 *Agricultural trade partners*

The trends in the number of agricultural export destinations and their respective market shares reveal South Africa's dynamism and ability to reorient or diversify its markets. Figure 3.29 below indicates the total number of agricultural export markets for South Africa and the selected peer countries for 1995 and 2011 which have a share in exports of more than 0.5 per cent. The figure reveals that the number South Africa's export destinations increased significantly by 14 to reach 78 markets in the period from 1995 to 2011. The country is only outperformed by India. South Africa also performs well in terms of the total agricultural export markets; it even outperforms the three developed peer countries and is only surpassed by Brazil and India.

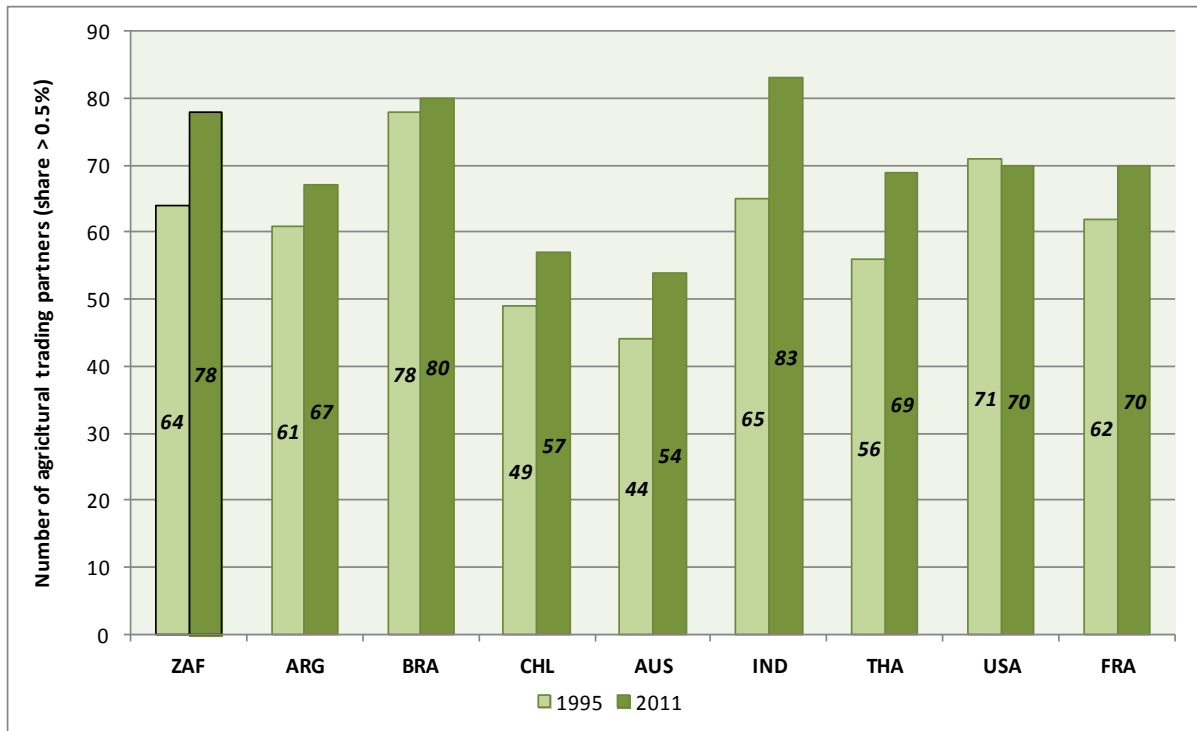


Figure 3.29: Trend in the number of agricultural export markets (1995 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Figure 3.30 below elaborates further on the regional composition of South Africa's agricultural export destinations and their respective shifts between 1995 and 2011. It is evident from the figure that there have been no extreme shifts in this composition over the last 15 years. However, East Africa took over from Western Europe as the most important export destination for agricultural products during this period. Its share rose by 3.6 per cent to 20.9 per cent, whereas Western Europe's share dropped by 3.1 per cent to 20.7 per cent. The third most important export region is Eastern Asia, which also recorded a small decline in its market share. The top three regional export destinations comprised 56 per cent of total market share in 2011.

Other regions which increased their market share in agricultural exports from South Africa include Eastern Africa (+3.6%), Central America (+3.5%), Western Africa (+2.1%), and Eastern Europe (+1.6%). Relatively large decreases in South Africa's market share of agricultural exports were experienced by Southern Europe (-4.4%), Northern America (-2.1%), and Australia and New Zealand (-1.6%).

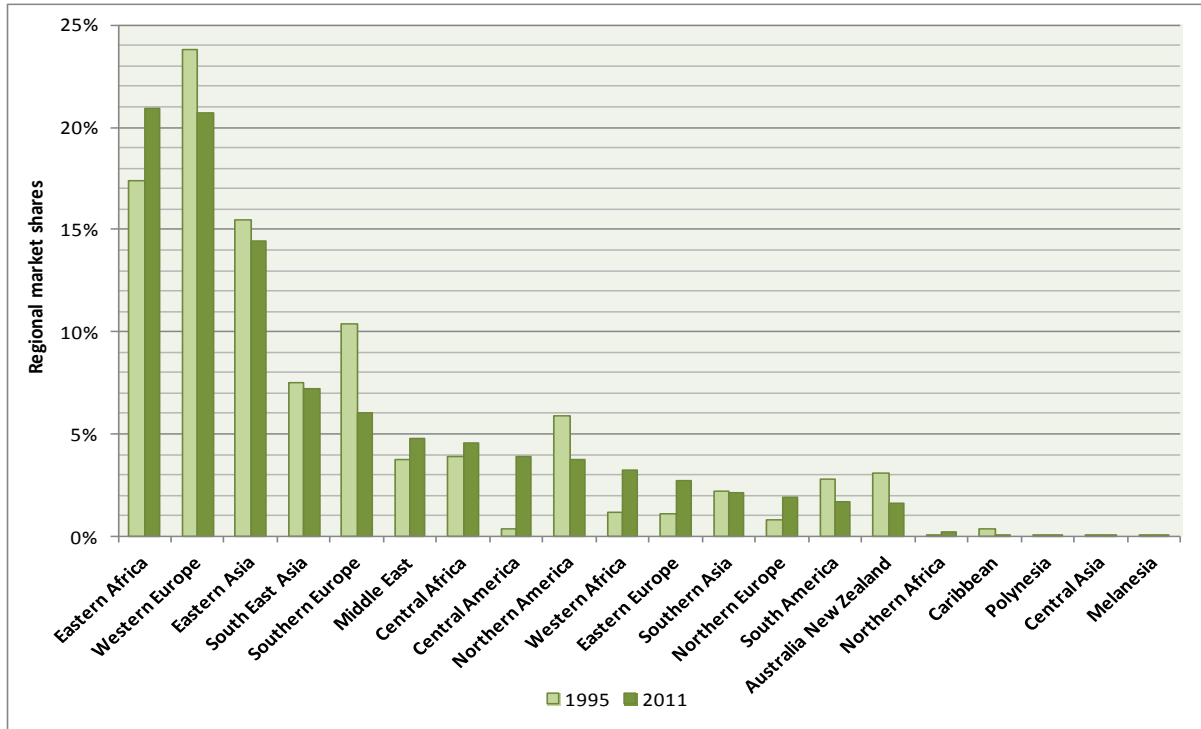


Figure 3.30: Trend in regional market shares for South Africa's agricultural exports (1995 / 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Analysing the relative importance of each of South Africa's agricultural export destinations reveals another important dimension of the country's trade patterns. The Trade Intensity Index (TII) is used in this regard since it measures South Africa's exports to a country relative to its total agricultural exports, divided by the world's agricultural exports to that country relative to global agricultural exports²³. This measure is similar to the RCA index but thus applied to export markets. An agricultural export market with a TII higher than 1 indicates that South Africa's exports to this market represents a larger share of its total agricultural exports than the share of world exports to this market.

In Figure 3.31 below, the TII for South Africa's 182 agricultural export markets (y-axis) is plotted against the respective total agricultural imports from the world of each market (x-axis). The countries located above the bold horizontal threshold line have comparative

²³ $TII_{ij} = \frac{x_{ij}}{x_i} / \frac{x_{wj}}{x_w}$ Where x is exports, i is South Africa, j is a country, and w is the world.



agricultural trade intensity for South Africa. The figure shows that most of South Africa's export markets with a relative high TII are continental markets, such as Zimbabwe, Zambia, Malawi and Mozambique. However, the country also has a strong presence in some of the larger agricultural import markets, such as the UK, the Netherlands and Japan. Overall, the country has a positive TII in 35 per cent of its agricultural export markets. Owing to the significant size of some agricultural export markets (e.g. USA, China, Russia, and France), it is not surprising that South Africa has a relatively low TII in those markets. However, some of the relatively medium-sized agricultural export markets for which South Africa has a low TII (i.e. below 1) include Belgium, Italy, Poland, Austria, Turkey, Switzerland, Vietnam, Egypt, Portugal, Czech Republic, Denmark, Singapore, and the Philippines. It seems South Africa has some potential to increase its TII of these markets as most of these are in the vicinity of the country's main important export markets.

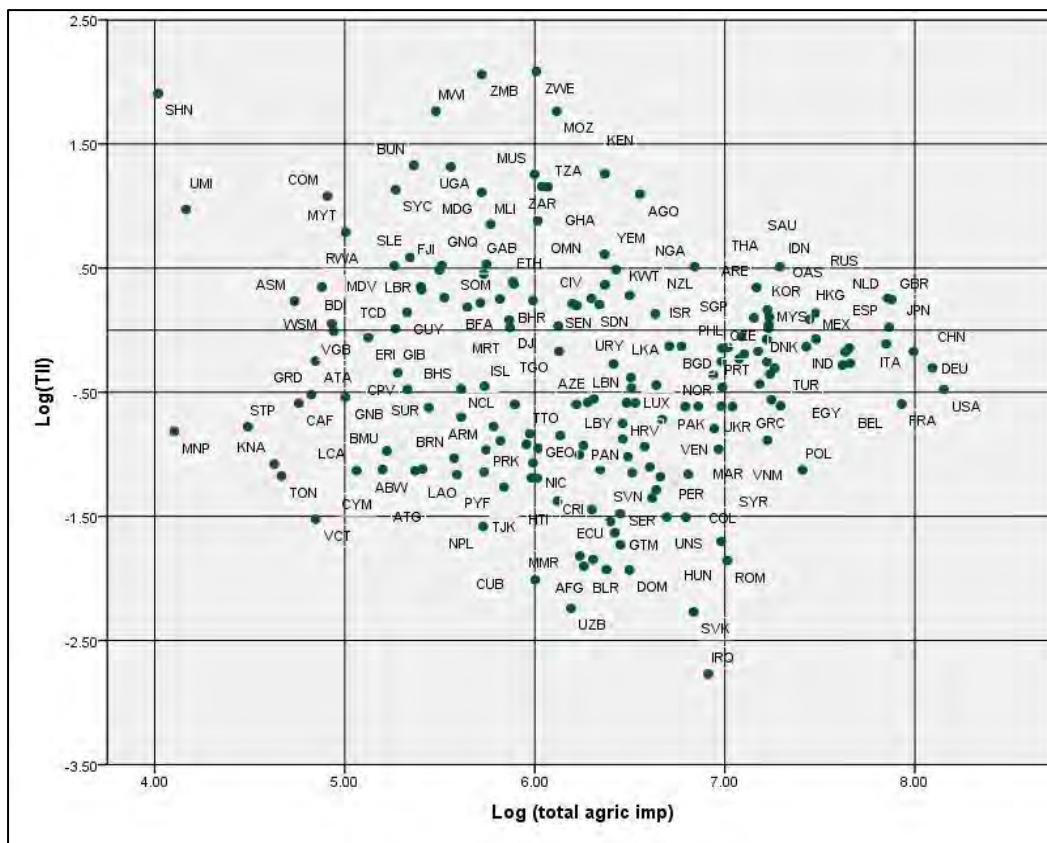


Figure 3.31: South Africa's agricultural Trade Intensity Index (2009-2011)
Source: Author's own calculations based on data from UN Comtrade (2013)



3.5.6 Growth orientation of agricultural trade

How South Africa's agricultural export basket is orientated towards global growth in products or markets will determine future performance and is a critical part of analysing the intensive margin. Of the 1 206 agricultural products exported by South Africa in the period from 2002 to 2011, 818 products, or 68 per cent, showed a positive growth and 788 products, or 65 per cent, did so in a growing global market. Of the 388 South African agricultural products that showed a negative growth in exports, a predominant share of 90 per cent did so in a growing global market. Figure 3.32 below shows the growth orientation for South Africa's agricultural export products with a positive growth in exports and global imports.

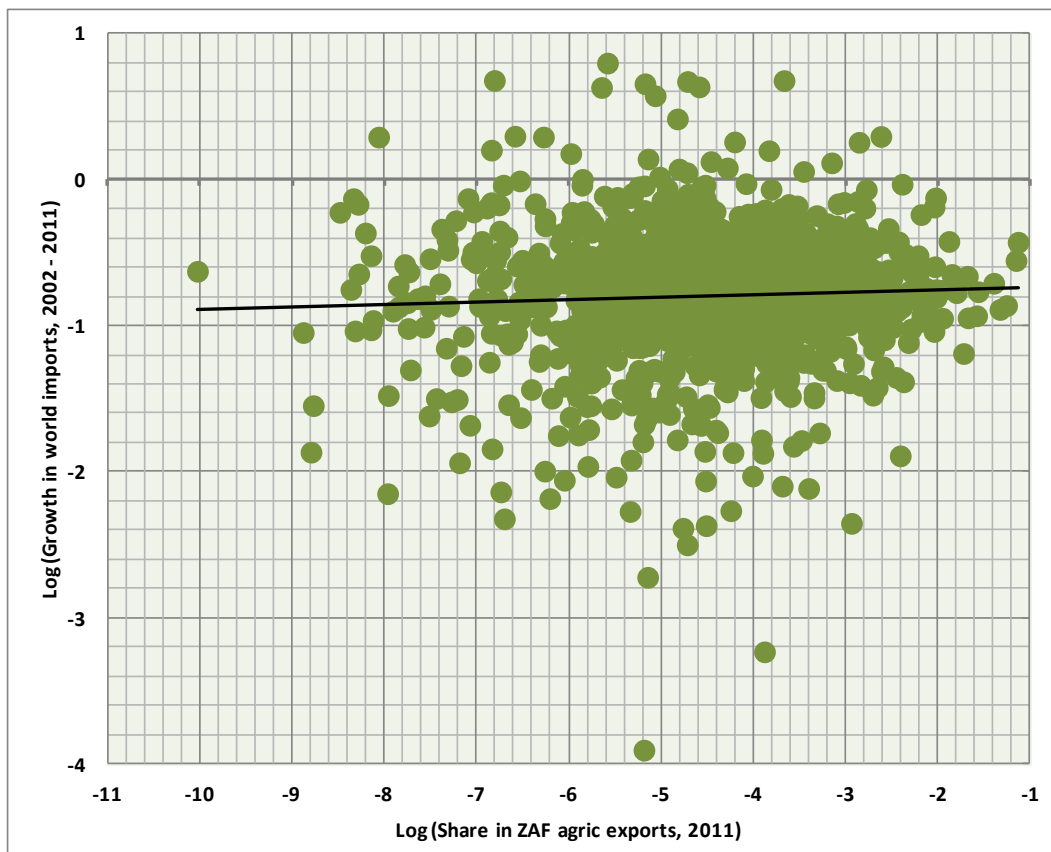


Figure 3.32: Growth orientation of South Africa's agricultural export products

Source: Author's own calculations based on data from UN Comtrade (2013)

Each of the products is plotted against its share in South Africa's agricultural exports (x-axis) and the annual average growth in global imports (i.e. international demand) is plotted over



the period 2002 to 2011 (y-axis). Since log values are used, the products located closer to 1 have a higher share in South Africa's agricultural exports and/or a stronger growth of global imports, respectively. The linear trend shows that there exists a weak correlation between the share in South Africa's agricultural exports and growth in global markets. However, for South Africa's agricultural exports to be pulled further by the global market growth, this correlation needs to be stronger. Furthermore, most of South Africa's export products are located in the lower parts of the graph, thus experiencing below-average growth in global markets. Figure 3.33 shows the growth orientation of South Africa's agricultural export destinations.

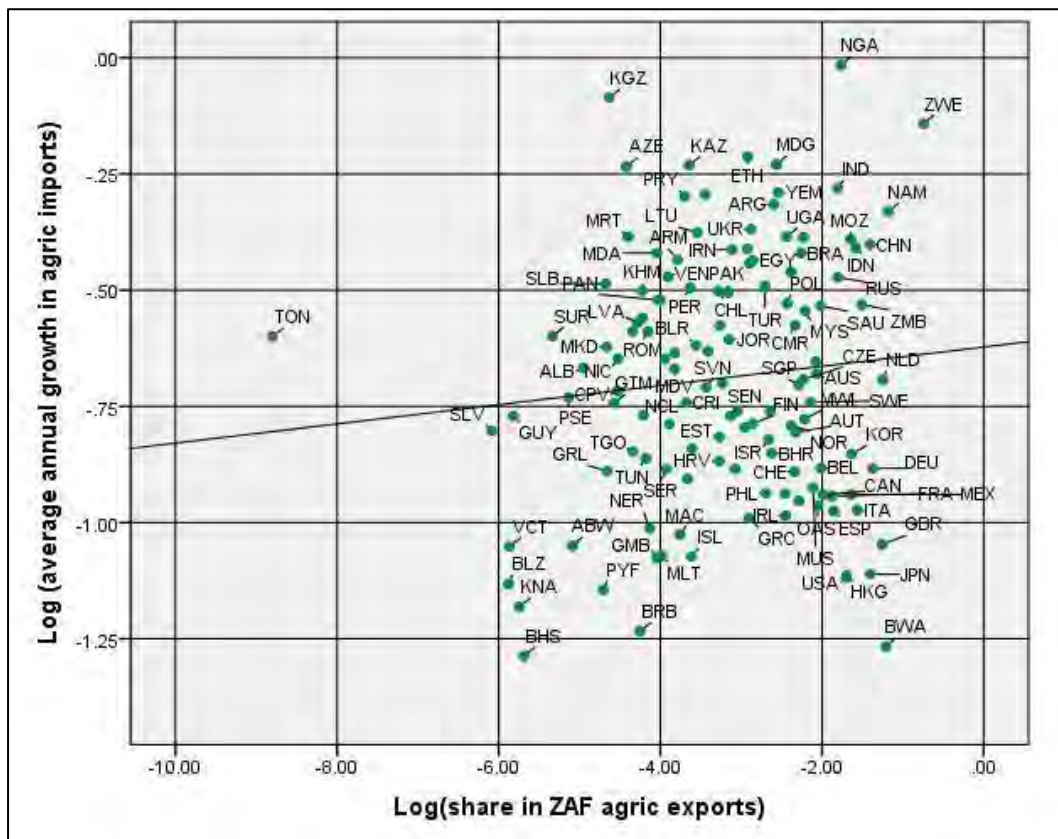


Figure 3.33: Growth orientation of South Africa's agricultural export destinations
Source: Author's own calculations based on data from UN Comtrade (2013)

In Figure 3.33 each export market is plotted against its share in South Africa's agricultural trade (x-axis) in 2011 and its average annual growth of agricultural imports from the world for the period 2002 to 2011 (y-axis). The linear fit line shows that the country's agricultural exports are growth orientated as its export share is positively correlated with export



destinations which recorded higher growth in total agricultural imports. From the previous section, it became evident that South Africa's agricultural products are increasingly being exported to growth markets in Central and Eastern Africa and are being diverted away from Western Europe and Northern America.

3.6 THE EXTENSIVE MARGIN OF SOUTH AFRICA'S AGRICULTURAL TRADE

Although Section 2.5 in the previous chapter clearly indicates that the role of the extensive margin in export growth was small in most developing countries, a more diversified structure of production (and de facto exports) is preferable for structural economic upgrading. Furthermore, the reliance on a narrow export base also weakens a country's resilience to economic shocks in global markets. Apart from the diversification of products, the diversification of export markets is just as important in this regard. Hence, this section will focus on South Africa's agricultural export performance in the extensive margin.

3.6.1 *Agricultural export concentration*

One of the widespread measures used to measure export concentration is the Herfindahl–Hirschman Index (i.e. HHI)²⁴. A country with a diversified export portfolio will have an index close to zero and a country with a concentrated export portfolio will have an index close to one. Figure 3.34 below shows the export concentration (i.e. HHI) per agricultural cluster for South Africa and the eight peer countries. The HHI was calculated at HS6 level for the period 2008 to 2011. The Figure clearly indicates that South Africa performs relatively well with regard to export diversification, especially for processed food products and agricultural inputs. However, the differences in the respective export concentrations for processed food products are marginally small. South Africa has some room for improvement in diversifying its export portfolio of primary agricultural products and forestry products, as well as processed non-food products.

²⁴ $HHI_j = \sum (S_{ij})^2$ Where S is the share of exports j in the total exports of country i .

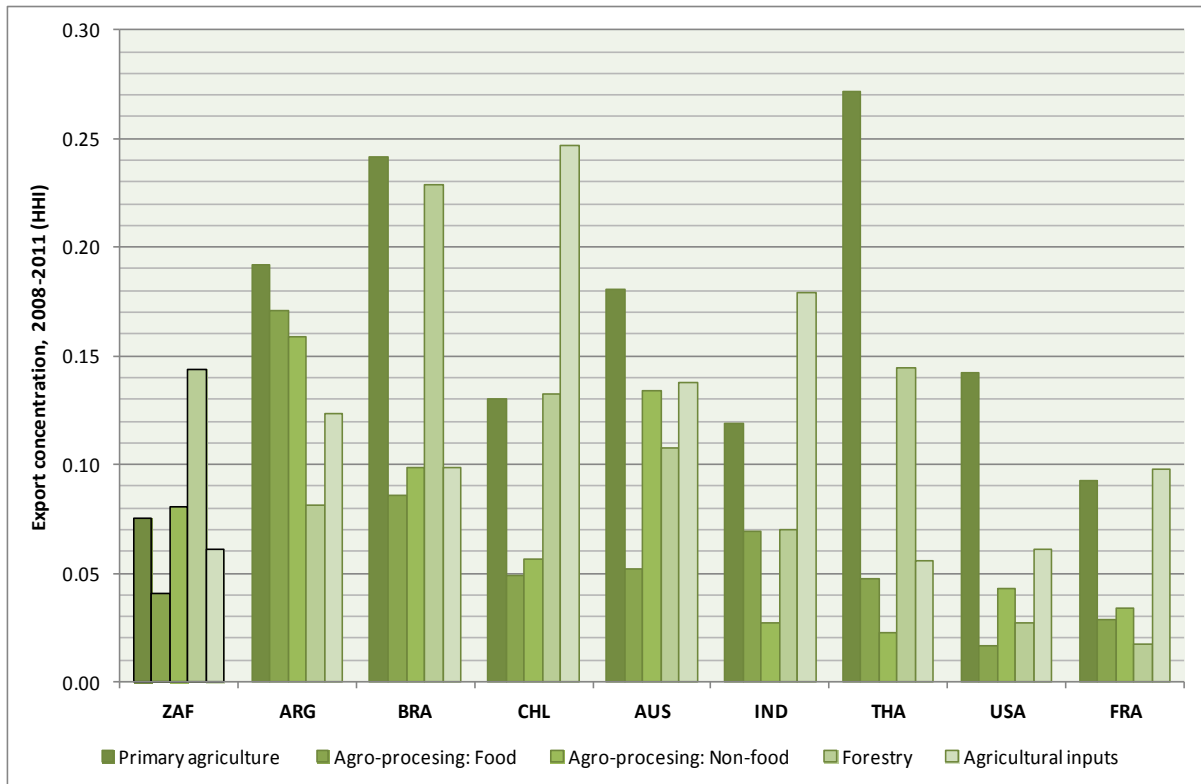


Figure 3.34: Agricultural export concentration per product cluster of South Africa and peer countries (2008 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Although South African agricultural export is relatively diversified in comparison to the eight peer countries, further analysis of the trends in its agricultural export concentration shows a different picture. Figure 3.35 below shows the long-term trend in South Africa's agricultural export concentration for the period 1976 to 2011, reflected by the share of the top five products in exports. The figure shows that since the mid-1990s there has been a marked increase in the concentration of the agricultural export portfolio. The top five products in this portfolio did not change much over time. Products that have featured consistently in the top five since 1976 are oranges, grapes, and wood pulp. Hence, South Africa's agricultural export growth is mainly driven by the intensive margin. The only important export growth from South Africa's extensive margin came from wine.

The trend depicted in Figure 3.35 may well be in line with the diversification path discussed in Section 2.5. Imbs and Wacziarg (2003) found that most countries tend to diversify their economy (i.e. exports) up until a certain threshold of income, after which a process of



specialisation follows. This u-shaped relation between export diversification and income may be an indication of South Africa's progress on the development path towards a more specialised agricultural sector.

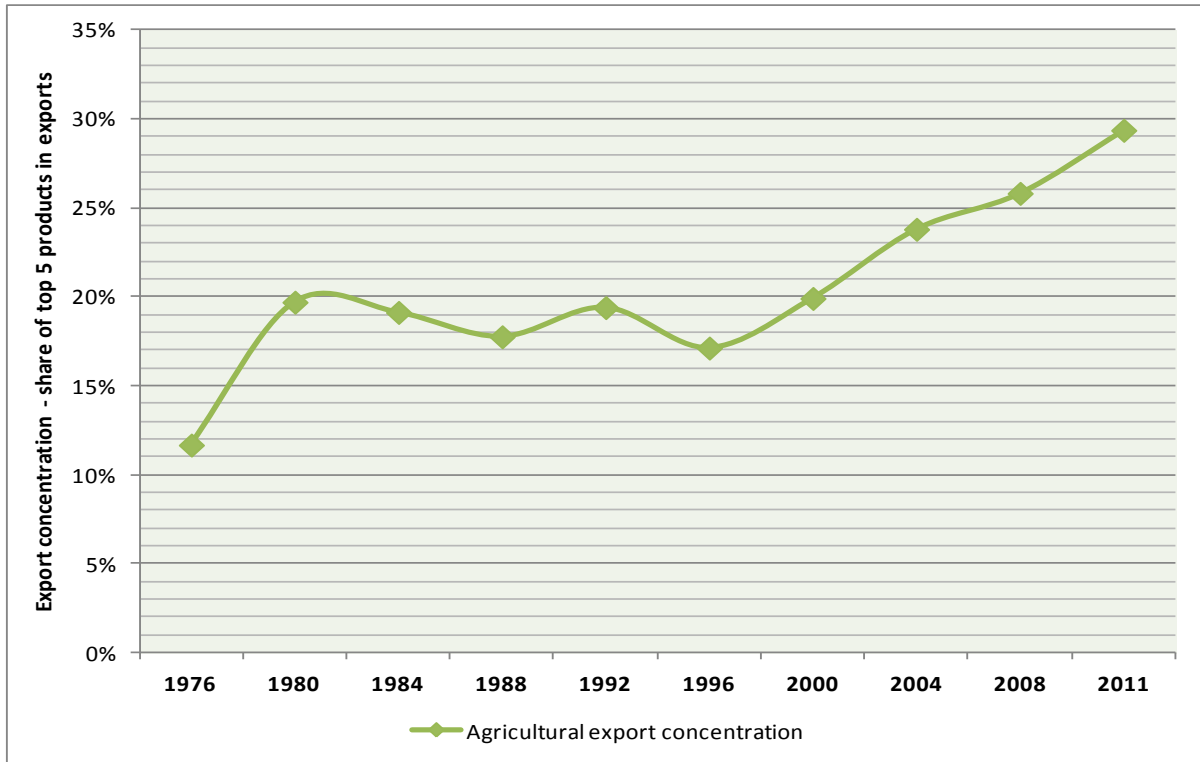


Figure 3.35: Trend in South Africa's agricultural export concentration of products (1976 - 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Further detail on the increase in South Africa's agricultural export concentration is depicted in Figure 3.36 below. The figure shows the trends in export concentration per agricultural product cluster for the period 2002 to 2011. It becomes evident that the export concentration in especially primary agricultural and forestry products has been rapidly increasing. On the contrary, exports of processed food products and agricultural inputs became more diversified.

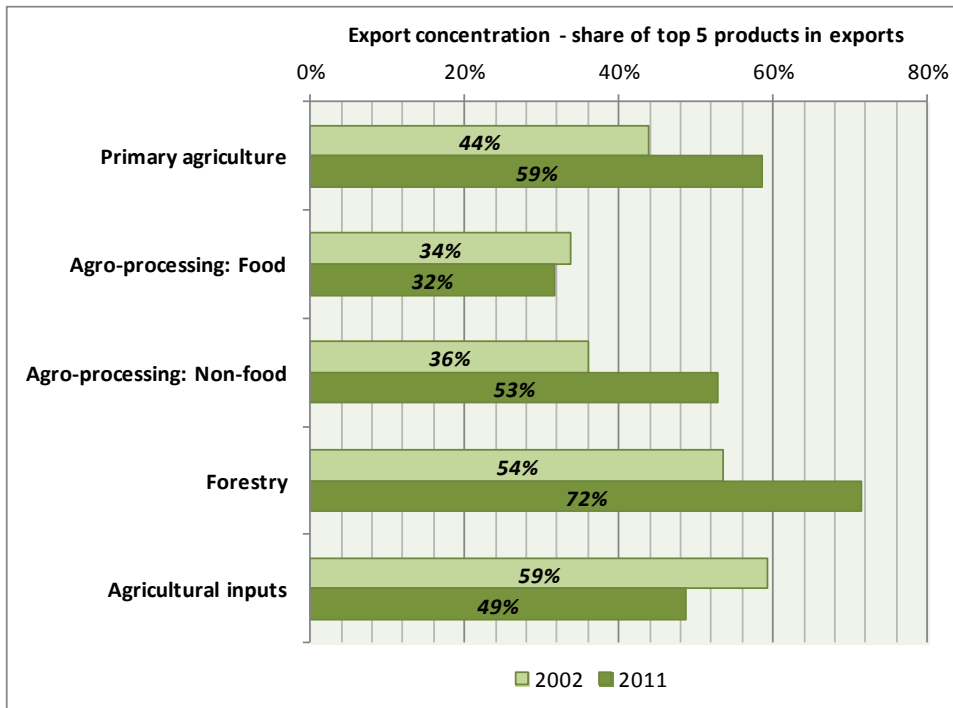


Figure 3.36: Trend in South Africa's agricultural export concentration per product cluster (2002 -2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

The concentration of export markets is an important indicator of market diversification and South Africa's integration in global markets. Figure 3.37 below shows South Africa's agricultural export market concentration for the period 1976 to 2011. The concentration of export destinations is reflected by the share of the top five markets in total agricultural exports. From Figure 3.37 it is evident that South Africa's export market concentration markets declined significantly, from 85 per cent in 1976 to 42 per cent in 2011. Hence, in 2011 the country had a more diversified portfolio of agricultural export markets. However, preliminary signs of an upsurge in export market specialisation are apparent for the period from 2008 to 2011. As discussed in Section 3.5.5, South Africa's agricultural exports are slowly diverting away from markets in Western Europe and Northern America to regional markets. The UK, Germany, Japan, and the USA dominated the top five agricultural export markets from the late 1970s until the end of the 1990s, after which alternative markets such as Zimbabwe, Botswana and Mozambique gained importance. Although losing ground, the UK still remains one of South Africa's most important agricultural export destinations.

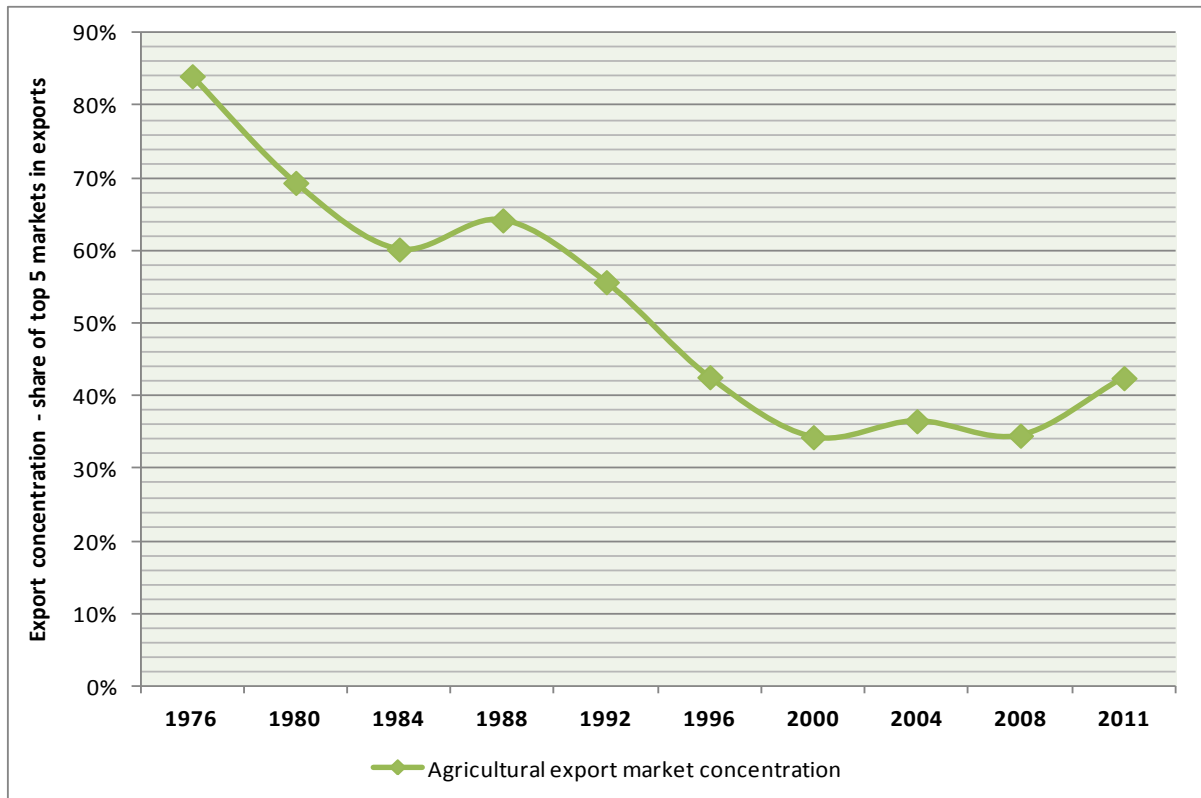


Figure 3.37: Trend in South Africa's agricultural export market concentration (1976 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

3.6.2 The agricultural intensive and extensive margin

As discussed in Section 2.5 in the previous chapter, export growth can take place in the intensive margin (e.g. selling existing products to existing markets) or at the extensive margin (e.g. selling existing products to new markets, and selling new products to existing or new markets). Following the work of Hummels and Klenow (2005), this section will determine how South Africa has performed in its intensive and extensive margins for each agricultural product cluster for the years 2002 and 2011, compared to the eight peer countries. This performance will be measured on the basis of how big a player South Africa is in what agricultural products it exports (i.e. intensive margin) and how important South Africa's agricultural exports is to the world (i.e. extensive margin). The latter is thus an indication of the width of a country's export portfolio. The intensive margin (IM) is



calculated as South Africa's market share in what it exports²⁵ and the extensive margin (EM) is calculated as the share of the agricultural products included in South Africa's export portfolio in world trade²⁶.

Figure 3.38 (A-E) below plots the Hummels–Klenow intensive margin (y-axis) and extensive margin (x-axis) of South Africa and its peers for the five different agricultural product clusters. The figure shows that South Africa has a relatively static position in terms of its growth in the intensive and extensive margin for most clusters. The figure furthermore reveals that it is relatively diversified with regard to its export position in all clusters.

South Africa's exports of primary agricultural, processed food, agricultural input, and forestry products have shown almost no movement in both the intensive and extensive margins since 2002. The country's only slight shift was recorded by the exports of processed non-food products, which experienced a decrease in mainly the extensive margin. Hence, overall the country's agricultural sector experienced no structural change and consolidated its status quo.

In most of the agricultural product clusters depicted in Figure 3.38, the low- and middle-income countries experienced significant positive shifts in the extensive margin and relatively smaller increases in the intensive margin. On the contrary, the high-income countries showed relatively larger decreases in the intensive margin and only a minor negative shift in the extensive margin.

²⁵ $IM_i = \frac{\sum_{k^i} X_k^i}{\sum_{k^i} X_k^w}$ Where k^i is the set of products exported by country i , w is world, X is exports.

²⁶ $EM_i = \frac{\sum_{k^i} X_k^w}{\sum_{k^w} X_k^w}$

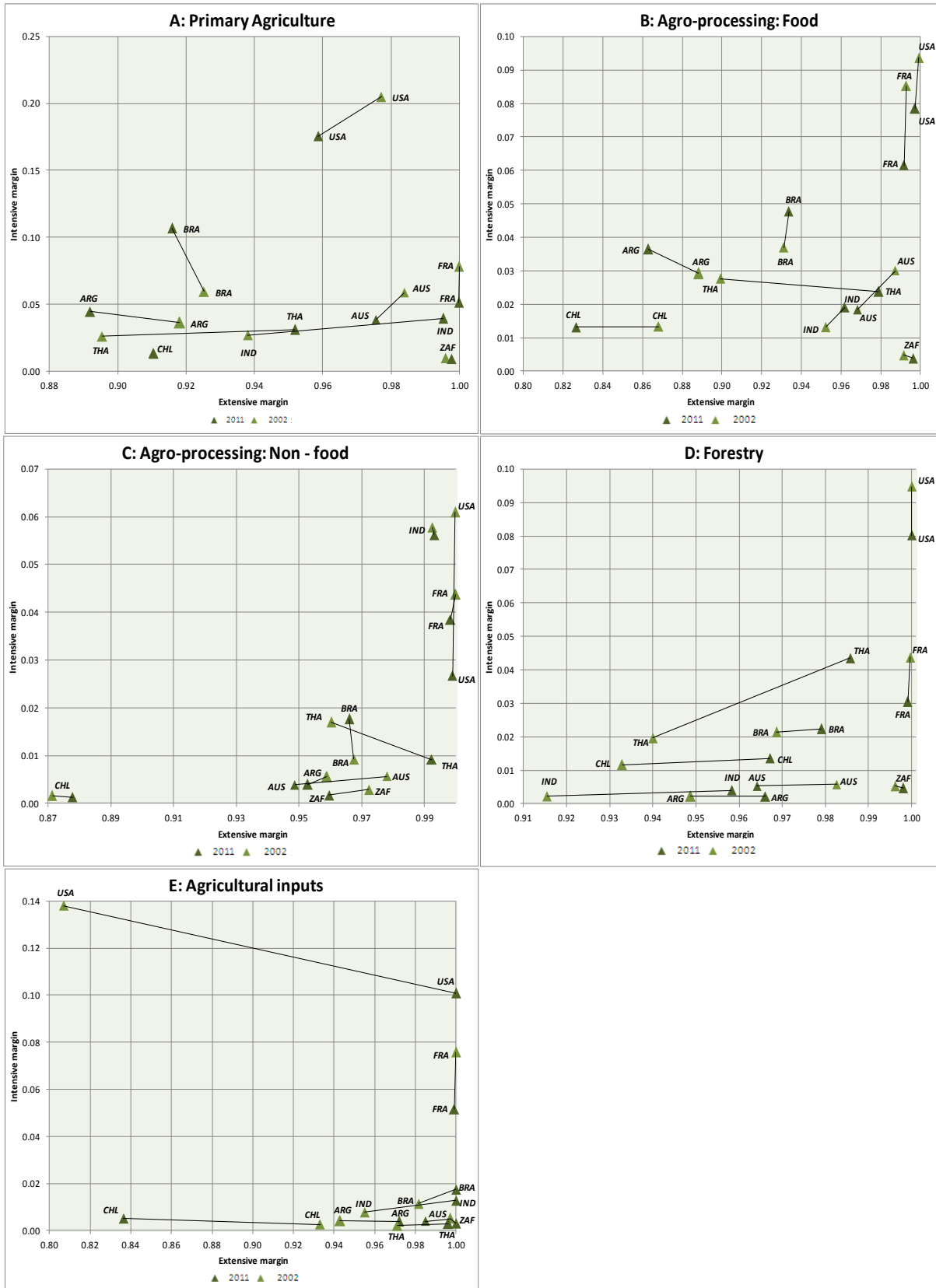


Figure 3.38 (A-E): Intensive and extensive margin in agricultural products (2002 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)



The structural changes in global agriculture that are illustrated by Figure 3.34 include:

- i. high-income countries lose ground in agricultural trade to strong growth in the intensive margin of developing countries in Southern America
- ii. the high-income countries lose ground in agricultural trade to strong growth in the extensive margin of developing countries in Asia
- iii. the increase in the extensive margin of agricultural inputs for all the low-, middle- and high-income countries shows the intensification of technology in agriculture, globally.

It seems that most of South Africa's growth in agricultural exports has to come from the intensive margin. The country has not much room for growth in the extensive margin of primary agriculture, since its exports are diversified. However, another important dimension of South Africa's position in the extensive margin is the extent to which its exports consist of a domestic or an import component. In other words, how much of its diversification is due to re-exports and how much is due to exports of domestic production. The trade competitiveness analysis in Section 3.5.3 reveals in this regard that the following shares of products exported by South Africa have a negative trade balance²⁷:

- i. 56 per cent of primary agricultural products;
- ii. 53 per cent of processed food products;
- iii. 78 per cent of processed non-food products;
- iv. 73 per cent of forestry products;
- v. 81 per cent of agricultural inputs.

It is evident from these shares that South Africa is reliant on imports for the majority of its agricultural export products. Hence, the country is an important trade hub for agricultural products. Analysis in Section 6.3.3 will provide more detail on the specific products and value contribution of these re-exports to the country's total exports within the agro-complex. However, the domestic component in its agricultural exports needs to be increased as this will lead to a more structural, agricultural-led growth path. Within this more nuanced context, South Africa's growth in the intensive margin has to come from those agricultural products with a positive trade balance, and growth within the extensive

²⁷ For the period 2008 to 2011



margin has to come from an increase in the domestic content of those agricultural products with a negative trade balance (i.e. import substitution).

Apart from growth from products, the performance in the intensive and extensive margins of agricultural export markets is another important element of export growth. Section 3.5.5 has already shown that South Africa has a relatively high market diversification of its agricultural exports. Figure 3.39 elaborates on this by plotting the trend in the intensive and extensive margins in agricultural export markets for South Africa and the eight peer countries for the period 2002-2011. The intensive margin in this figure is the accumulation of those in Figures 3.38 A to E.

The position of South Africa in the extensive margin of agricultural export markets shows that its market diversification captures a considerable proportion of the global market. Hence, there is not much potential for expansion in the extensive margin of markets. South Africa experienced some growth in its number of agricultural export markets (see also Figure 3.29) but since South Africa had already captured a large share of the global markets in 2002, the growth in the extensive margin was marginal (see Figure 3.39). Similarly, most of the developing peer countries did not experience much growth in their extensive margin in markets as they already had a significant proportion of global markets in their agricultural export portfolio. Only France, the USA and Brazil recorded a relatively large increase in their extensive margins in agricultural export markets.

South Africa's agricultural export markets are diversified against the background of having low trade intensity in 65 per cent of the markets. Therefore, growth in the extensive margin of agricultural trade has to come from exporting existing products to new markets.

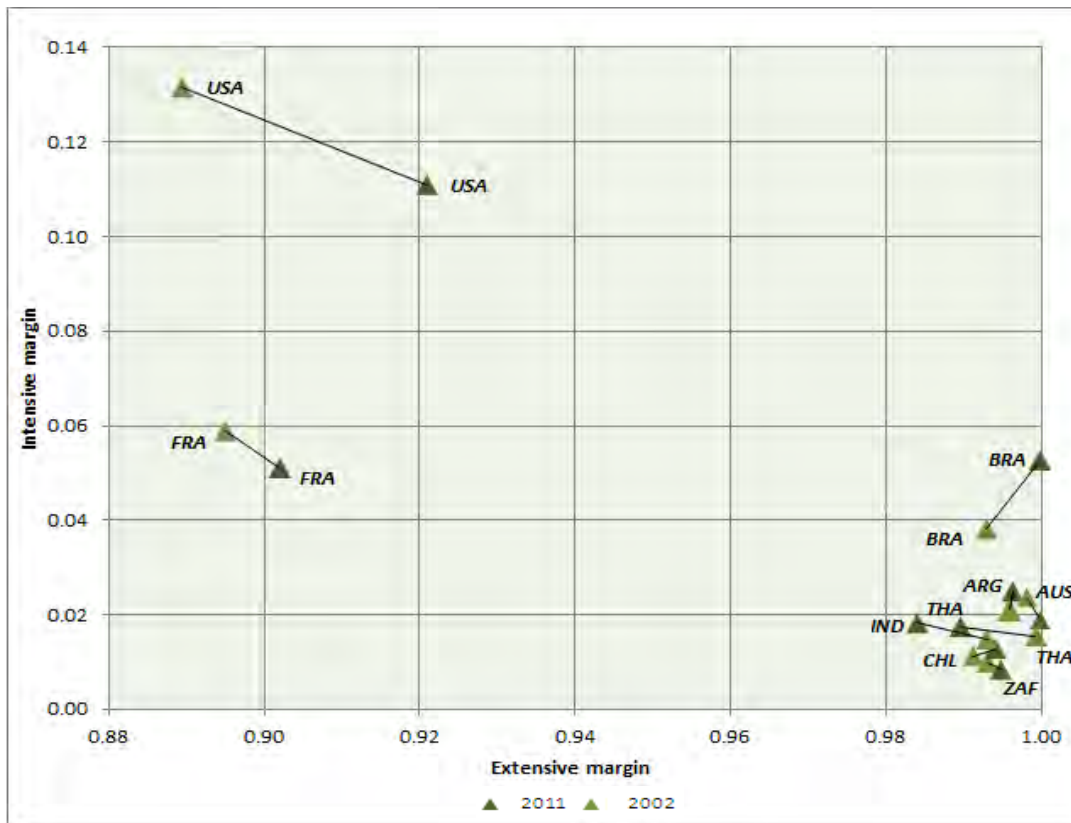


Figure 3.39: Intensive and extensive margin in agricultural export markets (2002 - 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

3.6.3 Market reach of agricultural exports

This section will briefly discuss South Africa's future potential for agricultural export market expansion by analysing how many markets are reached by each export product. This is done by calculating Brenton and Newfarmer's (2009) Index of Export Market Penetration (IEMP) for each of the five agricultural product clusters. The IEMP is estimated by dividing the number of product-country combinations of South Africa (at HS6 level) by the total possible (global) product-country combinations for its exports. This thus provides the maximum number of potential export relations that South Africa can exploit, given its current agricultural export portfolio.

Figure 3.40 below shows the IEMP for the five clusters for the period 2009 to 2011. Although there is not much difference between the clusters, the export of primary agricultural products has the highest exploitation of its export market potential. The export



products in this cluster reached 14 per cent of the potential markets. No country ever exports all its products to all the countries that may wish to import them. One of the most successful exporters, Germany, exploits 50 per cent of its potential and Korea, 28 per cent (Reis and Farole, 2012). Hence, against those benchmark there is room to improve the market reach of South Africa's agricultural exports.

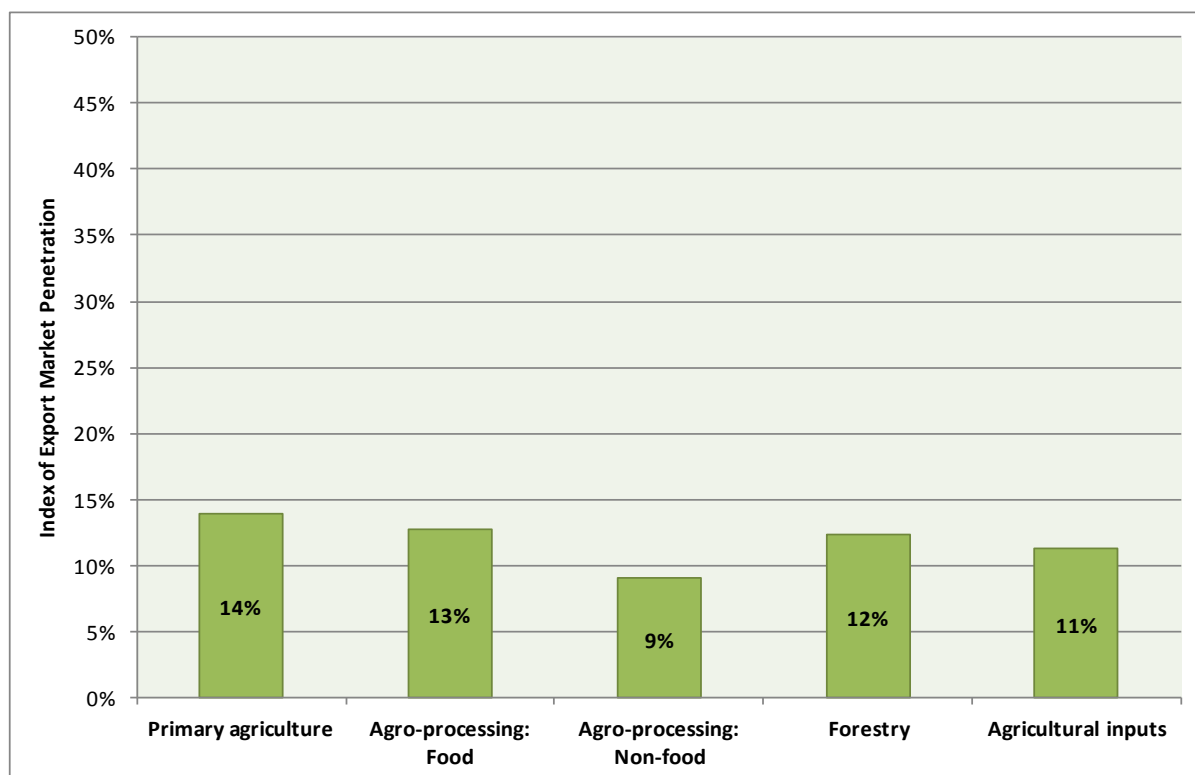


Figure 3.40: Indices of Export Market Penetration for South Africa's agricultural exports (2008 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

Unlike the extensive margin, the exports in the IEMP are not weighted against their relative importance in global trade. Accordingly, Figure 3.41 below shows the number of export markets of the 1 246 South African agricultural export products for the period 2009 to 2011. Each of the export products is plotted against its export value (y-axis) and its total number of export markets (x-axis). The figure clearly shows that the majority of South Africa's agricultural export products are of relatively low value but are relatively successful in reaching a diversity of markets. About 59 per cent of the products (734) are exported to more than ten markets and about seven per cent of the products (85) are exported to more



than 50 markets. Wine (in containers > 2 l.), for example, has a relatively high export value and is exported to 139 markets. However, there is potential for expanding the market reach for the 38 per cent of products (474) that only reach less than ten markets.



Figure 3.41: Market reach of South Africa's agricultural exports (2009 – 2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

3.7 THE QUALITY MARGIN OF SOUTH AFRICA'S AGRICULTURAL TRADE

The sophistication and quality margin of products reveal the level of advancement of factor endowments, technologies, knowledge and capabilities used in its production. The transformation of a country's export basket in terms of the sophistication and quality margin of the products therein provides a lot of information of structural development and growth of an economy. Rich countries tend to produce more complex products (Hausmann, Hwang and Rodrik, 2005).



3.7.1 Technology content of agricultural exports

The sophistication and quality margin can be classified by the technology intensity of products. Hence, the five agricultural product clusters can be arbitrarily classified as follows: agricultural inputs as high-tech, agro-processing and forestry as medium-tech, and primary agricultural production as low-tech. Figure 3.42 below shows the technology intensity of South Africa's agricultural exports, as well as the relative specialisation of the country in these categories, as measured by the aggregated index of Relative Trade Advantage (i.e. RTA).

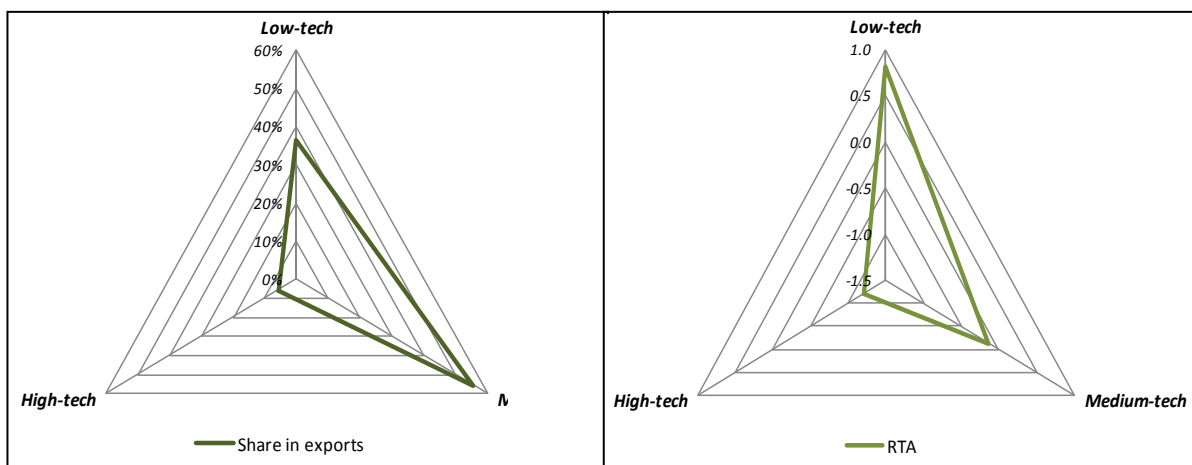


Figure 3.42: Broad classification of technological content and specialisation of South Africa's agricultural exports (2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

The figure clearly shows that South Africa predominantly exports agricultural product with a medium-tech content. However, South Africa is not specialised in these products, given the negative RTA index, but is specialised in exporting low-tech agricultural products.

3.7.2 Complexity of agricultural export products

Instead of predetermining the broad classification of products in technology content as in the previous section, differences in complexity of exports can also be measured at the product level, as was briefly mentioned in Section 2.2.3, Hausmann, Hwang, and Rodrik (2005) estimate the sophistication of products as the basis of the income levels of the



countries that produce those products. In this way, products that are predominantly produced by rich countries would be revealed as sophisticated. This outcome-based measure of product-level sophistication is called PRODY²⁸. This is thus the weighted average, based on the RCA, of the per capita GDP of countries producing that product.

Another measure developed by Hausmann *et al.* (2006) is EXPY²⁹. This is the sum of the PRODY of all products weighted by the value share in total exports of a country. Hence, the EXPY measures the income content of a country's export basket and is regarded a more inclusive measure of complexity than that of technology intensity. The EXPY captures the wages and productivity which is supported by the production of a good. Hausmann *et al.* (2006), as well as Hausmann and Klinger (2007), show empirically that a high EXPY is a significant predictor of economic growth in the future. Furthermore, Felipe (2010) estimates that a 10 per cent increase in EXPY raises growth by a half per cent. Therefore, countries become what they export by converging to an income level implied by their export basket. In general, a country with a higher EXPY than expected from its income will see growth from existing exports, whereas a country with a lower EXPY than expected from its income would see growth from developing new products.

Figure 3.43 below shows the total EXPY and the agricultural EXPY (Y-axis) for South Africa and the eight peer countries, plotted against their respective per capita income levels (x-axis). The agricultural EXPY was calculated using the Hausmann *et al.* (2006) dataset of PRODY for the six-digit level of the HS nomenclature.

Owing to the generally lower income content of agricultural products compared to other goods, the agricultural EXPY is generally lower than the related total EXPY. Although South Africa's income is somewhat lower than other middle-income countries such as Brazil, Argentina and Chile, the sophistication of its export basket is higher. Furthermore, the

²⁸ $PRODY_k = \sum_j \frac{(x_{jk}/X_j)}{\sum_j (x_{jk}/X_j)} Y_j$ Where j is a country, Y is GDP per capita, k is an export product, x is exports, and X is total exports. The weight of the index corresponds to the RCA of each country in good k .

²⁹ $EXPY_i = \sum_l \left(\frac{x_{il}}{X_i} \right) PRODY_l$ Where l is a product and i a country.



country's agricultural export basket is on par with the export sophistication of a high-income country like the USA.

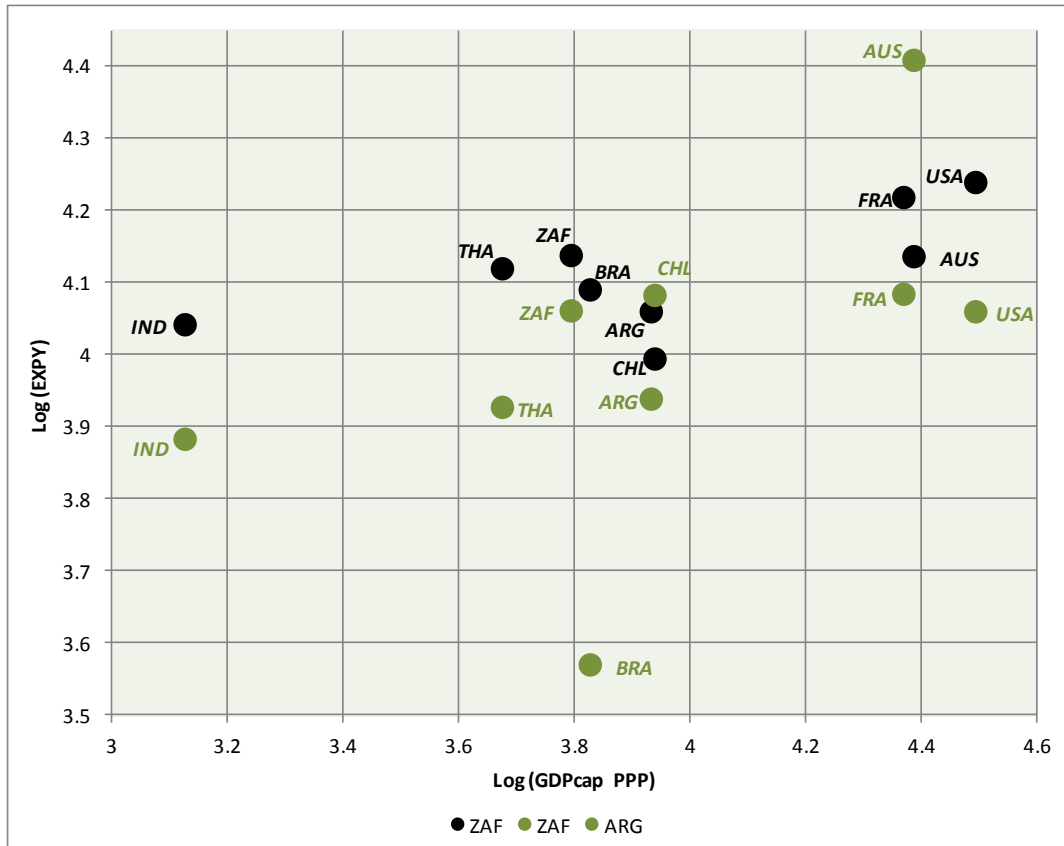


Figure 3.43: Overall EXPY and agricultural EXPY of South Africa and its peer countries
Source: Author's own calculations based on data from UN Comtrade (2013)

The main conclusion from Figure 3.43 is that, given its income level, South Africa has a corresponding complexity of both its agricultural and total export basket. It seems that the country has reached convergence between its level of income and its (agricultural) export sophistication. Hence, South Africa should focus on discovering new export activities to boost its EXPY, while consolidating growth from existing exports.

Figure 3.44 (A-E) below takes a more in-depth look at agricultural export sophistication by comparing the five agricultural product clusters. South Africa is performing significantly well with the sophistication of its processed non-food and forestry export products. With regard to the former, its high level of EXPY is mainly driven by exports of tobacco products and



animal skins. There is some limited scope for increasing the EXPY of primary agricultural products and agricultural inputs by discovering new export activities within these clusters. Australia and Chile can serve as a benchmark for primary products, whereas Australia and France can serve as a benchmark for agricultural inputs. Most potential exists for increasing the complexity of processed food products as South Africa is outperformed on EXPY by all its peers. Hence, structural growth within the agricultural sector will have to come from increasing the complexity within this cluster by discovering new export activities with a relative high PRODY.

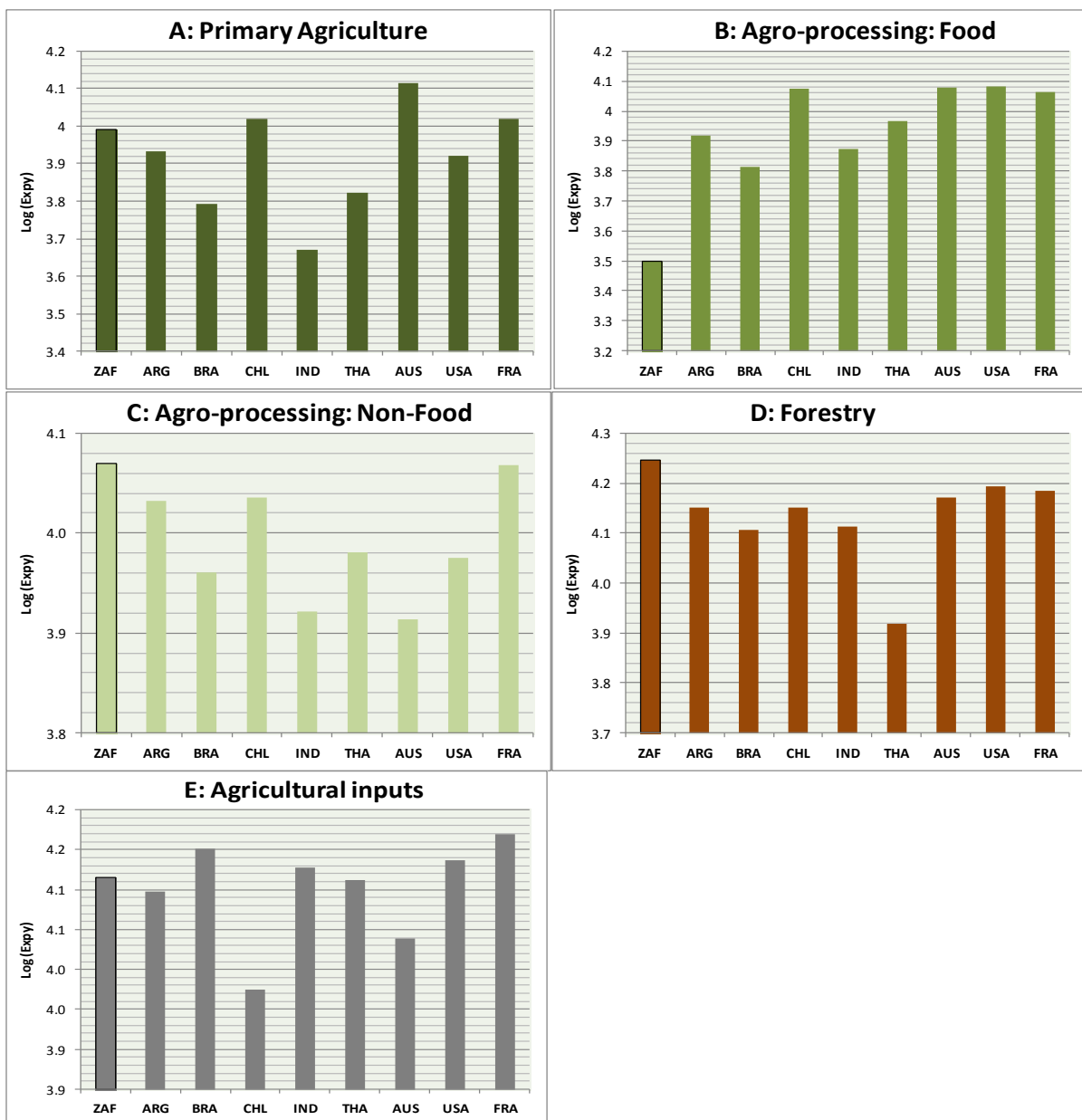


Figure 3.44 (A-E): Export sophistication of agricultural product clusters

Source: Author's own calculations based on data from Rodrik (2006) UN Comtrade (2013)



The EXPY is relatively export biased since it does not account for imports and possible re-exports; it thus neglects the domestic content of export products (i.e. local production). Therefore, Figure 3.45 below plots the position of each of South Africa's agricultural export products with regard to its PRODY (y-axis) and its respective RTA index (x-axis). The latter is an indicator of product-level trade competitiveness, accounting simultaneously for a country's imports and exports and thus is a good proxy for local production. Only 34 per cent of South Africa's agricultural exports have a relative trade advantage. The fit line in the figure shows clearly that the sophistication of South Africa's agricultural export basket declines with an increasing RTA. Hence, structural growth in South Africa's agro-complex should come from an increase in the local production (i.e. domestic content) of those existing export products with a relatively high level of sophistication (i.e. PRODY).

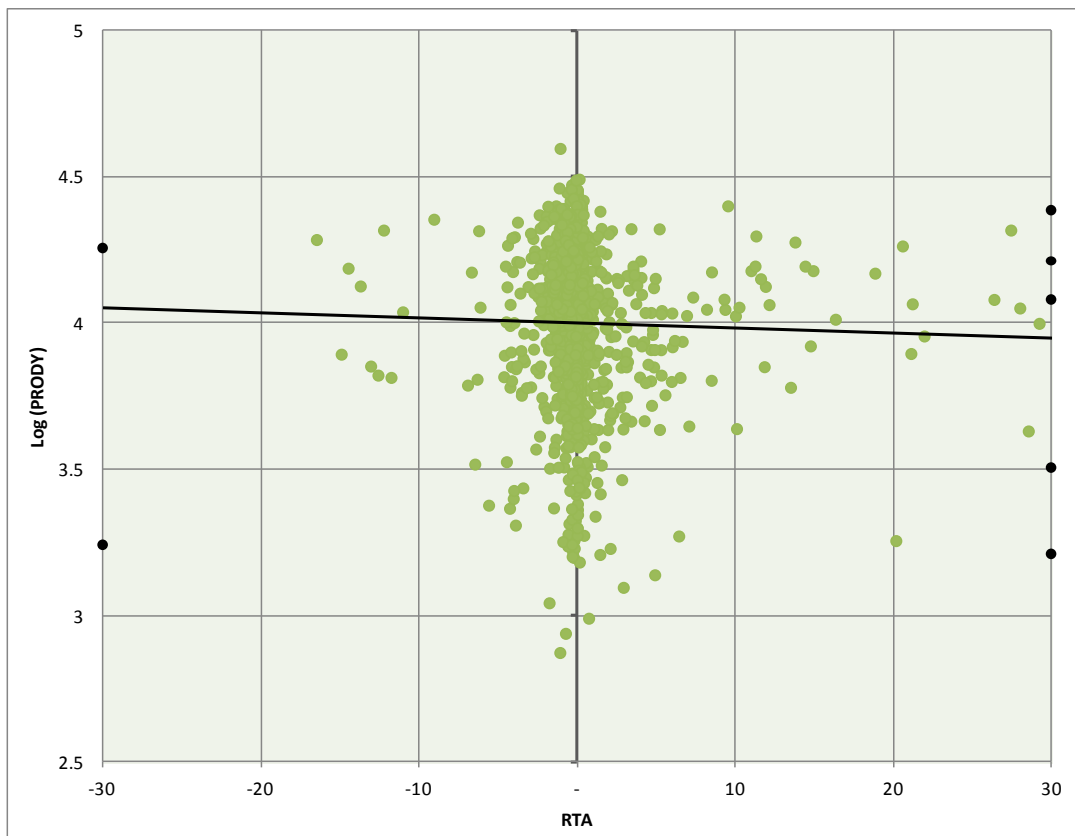


Figure 3.45: Sophistication and competitiveness of South Africa's agricultural export products

Note: black dots represent outlier products

Source: Author's own calculations based on data from Rodrik (2006) and UN Comtrade (2013)



3.7.3 Factor intensities of agricultural export products

The PRODY and EXPY reveal the income intensity of trade portfolios but do not consider the factor content of traded goods as underpinned by the Heckscher-Olin theory of comparative advantage in relative factor endowments (see Section 2.4.1). Shirotori, Tumurchudur and Cadot (2010) have, consequently, developed indices of revealed factor intensity of traded goods, based on the factor endowments of the countries that export them. These indices reflect the intensity of human capital, physical capital and land in exports and are estimated by substituting the income data in the PRODY calculation. Human capital intensity is measured by the average years of schooling and the physical capital intensity by real capital stock per worker, and the land endowment is measured by the amount of arable land per worker.

Figure 3.46 (A-C) shows the revealed factor intensities of the total exports from the agro-complexes of South Africa and its peers. These aggregated revealed factor intensities were calculated by assigning a weight to the indices according to the value share in total exports per product. Each country is plotted against its Revealed Human Capital Intensity (RHCI), its Revealed Physical Capital Intensity (RPCI), and its Revealed Land Resource Intensity (RLRI) (y-axis), as well as their respective actual factor endowments (x-axis). The respective fit lines show the relationship between actual and revealed factor endowments, which is positive in all cases.

It is evident from Figure 3.46 A below that the RHCI of South Africa's agricultural exports is relatively high in comparison with both the high- and middle-income peer countries. Considering the country's actual human capital endowment, as well as the fit line of the country sample, South Africa's agricultural trade patterns reveal a much higher human capital intensity. This difference implies that its agricultural export portfolio puts significant pressure on the current human capital endowment. Furthermore, this situation may prove not to be sustainable in the long run, if there is no positive shift in South Africa's human capital endowment. Cadot (2010) shows, in this context, that there exists a small but significant negative relationship between a country's export survival and the distance between a country's revealed and actual factor intensity (i.e. its comparative disadvantage).

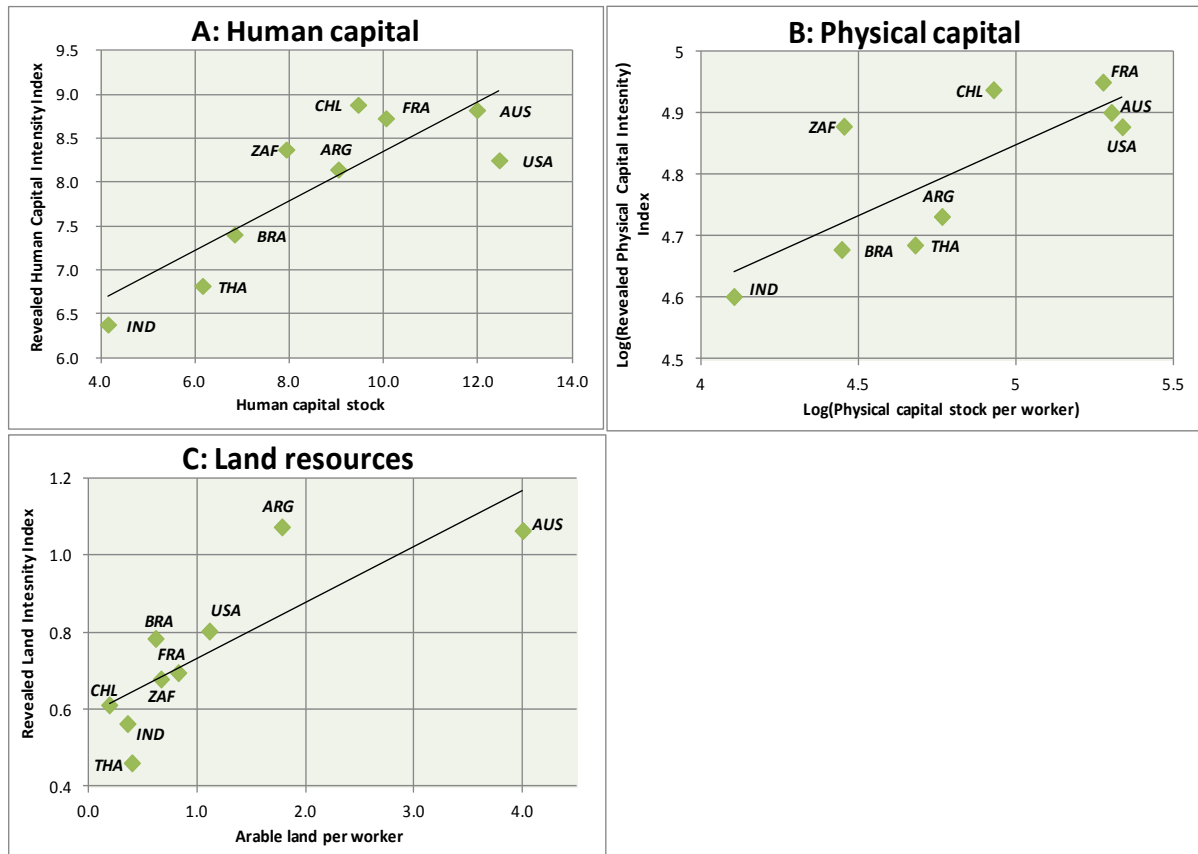


Figure 3.46 (A-C): Revealed factor intensities of exports from the agro-complex
 Source: Author's own calculations based on data from Shirotori et al. (2010) and the World Bank (2012)

South Africa's revealed human capital intensity is comparatively high in its primary agricultural, forestry, and agricultural input export clusters. Most of the peer countries have the highest RHCI in their food processing clusters.

Similar to the RHCI, South Africa also has a comparatively high revealed physical capital intensity (RPCI) (See Figure 3.46 B). The gap with its actual capital stock endowment per worker is significant, as well as its gap with the average trend of the peer countries. Correspondingly with the RHCI, this agricultural trade pattern may not be sustainable in the long-run and some convergence between the actual and revealed capital endowment needs to occur. After Australia, South Africa has the highest revealed capital content of primary agricultural export products. The capital intensity of processed non-food products, forestry products and agricultural inputs are also proportionally high. The revealed capital intensity



of processed food products contributes the most, 34 per cent, to the total capital content of South Africa's agricultural products. However, this share and its total sum compares relatively mediocly with the peer countries.

The first part of this chapter already discussed South Africa's natural resource limitations for agricultural production, especially the availability of arable land. However, on a per worker basis, the amount of arable land still compares well with the other developing peer countries (see Figure 3.46 C). The revealed land resource intensity (RLRI) of South Africa's agricultural export products is on par with the average trend of its peers, but is smaller than its actual arable land endowment per worker. This may be attributed to the quality of arable land or other local agro-climatic conditions that limit its productivity. Section 3.2.4 showed, indeed, that South Africa's productivity of crop land is lower than the global average.

The weighing method used for Figure 3.46 may be biased towards exports without considering the limiting effects of the considerable amount of re-exports of the domestic content of the country's agricultural portfolio exports. However, weighing South Africa's revealed factor indices according to the respective RTA index (i.e. trade competitiveness) per product only yielded slightly lower indices for the RHCI (-4.3%) and the RPCI (-3.9%), but a considerable lower revealed land resource intensity index (-18%). Hence, a large proportion of South Africa's re-exports consists of agricultural products with a relatively large land resource intensity.

The revealed factor intensity of South Africa's agricultural export products is shown in Figure 3.47 below. Each of the products is plotted against its RHCI (y-axis) and its RPCI (y-axis). The size of the bubble reflects the proportion of the product in South Africa's total agricultural exports. The dotted lines reflect the actual factor endowments of South Africa, which amount to 7.9 for human capital stock (ranked 69th globally) and 28 409 for the physical capital stock (ranked 74th globally). Hence, the black solid dot depicts the country's endowment point (i.e. its comparative "advantage"). The figure clearly shows that South Africa's major export products are well diversified with regard to their respective human and physical capital intensities. It is, however, cumbersome that most of the products are located in the upper-right quadrant, which implies that they are typically exported by



countries with higher factor intensities. Most agricultural products are not located too far from South Africa's human capital endowment but there are some significant gaps with regard to its capital endowment. As mentioned, some convergence needs to occur to ensure the sustainability of this agricultural export portfolio with regard to its factor content.

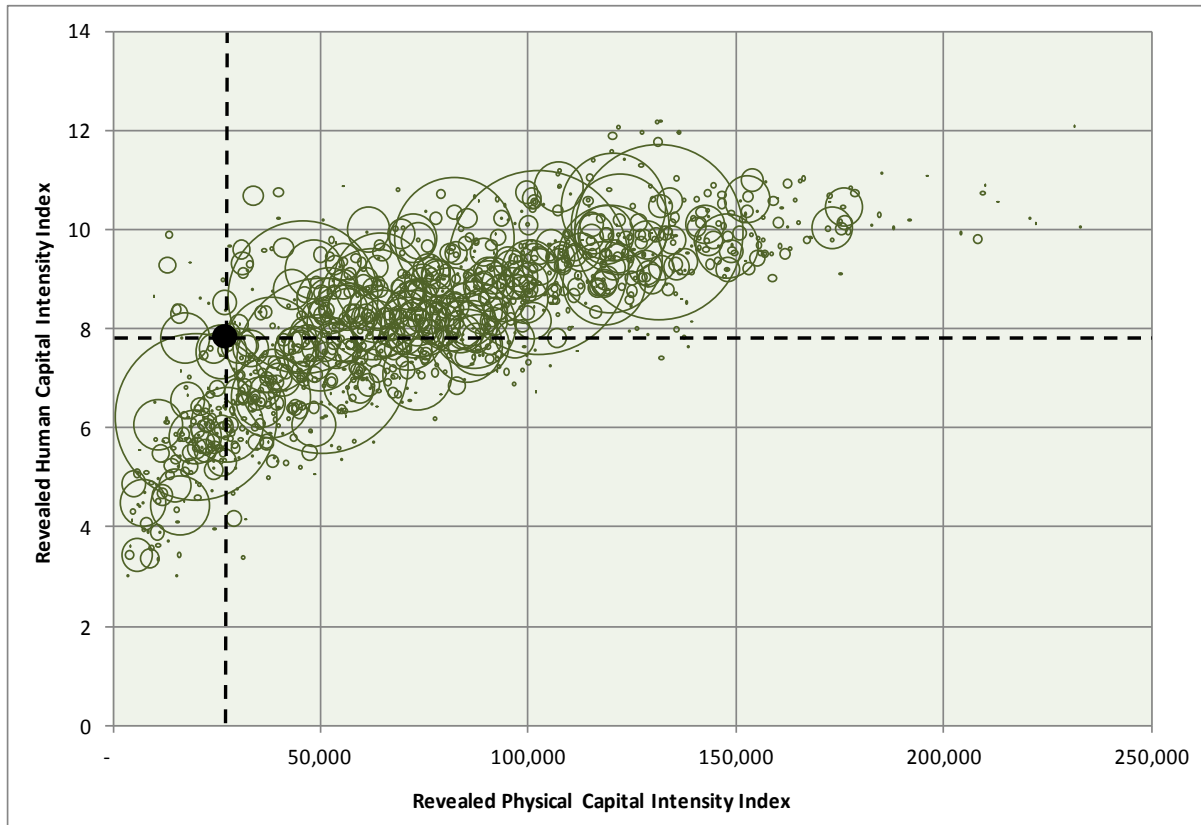


Figure 3.47: Revealed human and physical capital intensities for South Africa's agricultural export products

Source: Author's own calculations based on data from Shirotori et al. (2010) and UN Comtrade (2013)

3.8 THE SUSTAINABILITY MARGIN OF SOUTH AFRICA'S AGRICULTURAL TRADE

The performance of South Africa's agricultural export portfolio largely depends on its ability to sustain export flows over a longer period of time. Most new product-country export relationships of developing countries do not survive more than a few years (Reis and Farole, 2012). This section will briefly assess the dynamics of South Africa's agricultural export survival in order to understand the sustainability margin of its trade competitiveness. This is



done by decomposing South Africa's agricultural export growth for the period 2002 – 2011 at the level of the product-market pairs for both the intensive and extensive margins, following the methodology of Brenton and Newfarmer (2009). Figure 3.48 below illustrates this growth decomposition for South Africa's exports from the agro-complex.

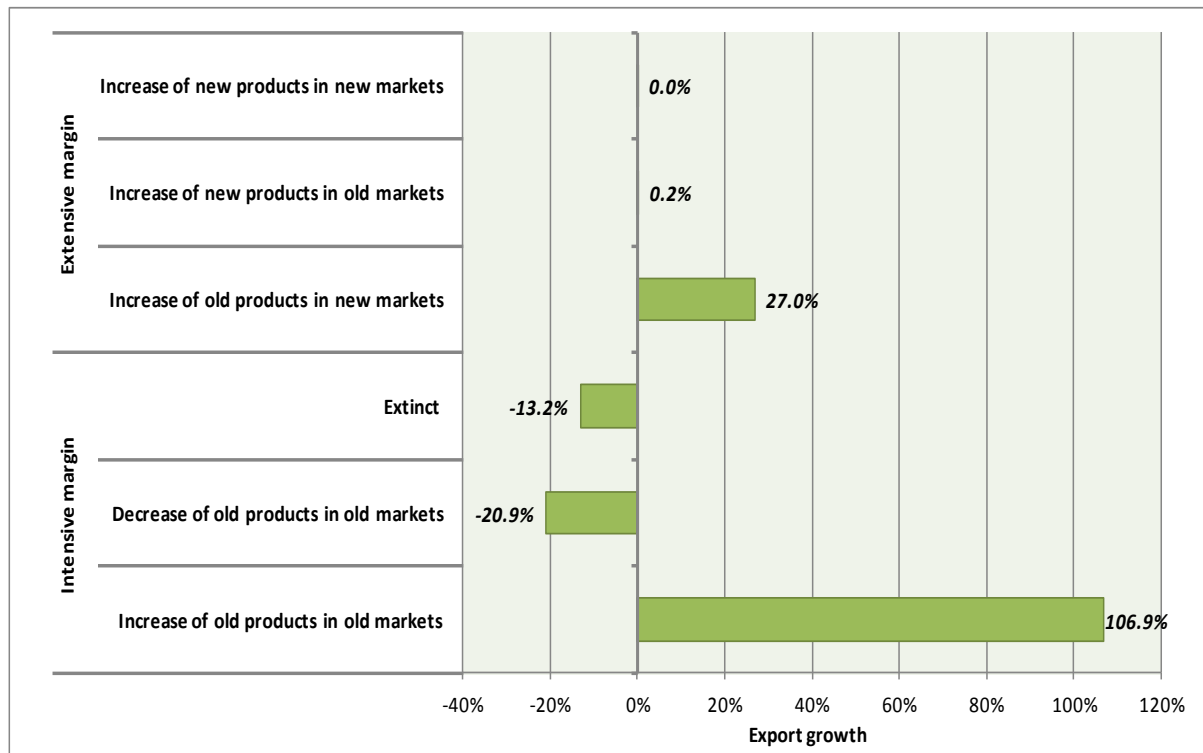


Figure 3.48: Decomposition of South Africa's agricultural export growth (2002-2011)

Source: Author's own calculations based on data from UN Comtrade (2013)

It is evident from the figure that most growth in South Africa's agricultural exports comes from existing export flows to existing markets (i.e. the intensive margin). This is the case for most mature exporters. Furthermore, the decreases in exports of existing products to existing markets, as well the extinction of exports, are relatively high. In the extensive margin most growth is derived from exporting existing products to new markets. The contribution of new export discoveries within the agricultural export growth is very low. Analysis by Brenton and Newfarmer (2009) on the decomposition of total export growth in 99 developing countries shows a somewhat similar pattern, although the average extinction of exports was lower. In aggregate, 72.8 per cent of growth in agricultural exports is



attributed to the intensive margin, and only 27.2 per cent is attributed to the extensive margin.

The relatively high share of extinctions in exports relates to the survival rate of agricultural exports. In absolute terms, there were 9 997 product–country combinations that became extinct in the period between 2002 and 2011. Furthermore, a total of 146 agricultural export products became extinct in that same period. Products that recorded the most “export deaths” between 2002 and 2011 include uncoated paper and paperboard, partly stemmed/stripped tobacco, insecticides, other wooden furniture, and ammonium nitrate. South Africa's agricultural trading partners that experienced the largest decline in product-level export relationships in that same period are: Angola, Australia, the United Kingdom, the USA, and the Seychelles.

3.9 PERSPECTIVES FOR SOUTH AFRICA'S AGRICULTURAL GROWTH PATH

This section will briefly provide some perspectives for agricultural diversification and growth in South Africa and will also provide a summary of the findings from the previous analytical sections.

Development and growth in the South African agricultural sector is subject to the dynamics in the world food markets (see also Section 3.2.1). Hence, the total global population is expected to grow by 18 per cent until 2030 and population growth in Africa is estimated to increase by a vast 46 per cent until 2013. In perspective, South Africa's population is expected to grow by a mere eight per cent in that same period. Thus, the growth in the demand for food will come predominantly from within the region.

Section 3.2.1 elaborated further on the impact of increases of disposable incomes in developing countries on dietary patterns and the increased demand for animal protein, convenience foods and health foods. With regard to the latter, the WHO (2012) has stated that obesity is currently a bigger global health crisis than the effects of hunger and malnutrition. Aligned with that is the rising debate on crop-based, versus animal-based,



foods. Coupled with increased global water scarcities, agricultural development should thus not only be driven by production and trade objectives, but also by ecological and public health objectives.

From a national perspective, agricultural development should contribute to increased food security (mainly from an affordability perspective), employment, and (rural) economic growth. Against the background of the high unemployment rate, poverty, and inequality, it is estimated that the South African economy has to grow by at least six per cent (NPC, 2011) in order for it to make a significant contribution to the alleviation of these burdens within the next few decades. Figure 3.49 below shows a graphical reflection of the current and desired growth paths, based on an extrapolation of an estimated average economic growth rate of about 3.5 per cent (IMF, 2012) and a desired growth rate of six per cent. The size of the bubble is proportional to the projected size of the South African economy. It is evident from the figure that there exists a significant gap between the two economic growth paths.



Figure 3.49: South Africa's projected economic growth paths (2011-2030)

Source: Author's own calculations based on data from StatsSA (2013)



Although relatively small in output (see Section 3.3.3), the broader agricultural sector will also have to make a significant contribution to this aspired growth path. Economic growth will have to come from structural and broad-based changes in the South African economy and cannot only be based, for example, on increased government spending, lower interest rates, and global economic recovery. Hence, it is imperative that these structural changes evolve around the upgrading and diversification of the economy, as well as the improvement of human capital and labour absorption.

One of the main policy directives for economic development in South Africa is the National Development Plan 2030 (NDP) developed in 2011 (NPC, 2011). For agriculture, the plan aims to create 969 500 new jobs in agriculture by, among others things, expanding irrigated agriculture, increasing production on arable croplands in the former homelands and on communal lands, and the processing of agricultural commodities. Given this employment target, Figure 3.50 below depicts the expected growth path for primary agricultural output and additional employment using the direct labour multiplier (see Section 2.3.8) and the annual average historic growth rate of 3.6 per cent in agricultural output for the period 1971 to 2011 as a baseline.

Figure 3.50 shows that the NDP employment goal for agriculture can be reached in 2023. This is subject to the *ceteris paribus* assumption that the structure of domestic agricultural production and the labour absorption of the sector will remain the same. This may be very optimistic against the background of increased minimum wage demands, economies of scale, technology development, and shifts in output of the different agricultural sub-sectors.

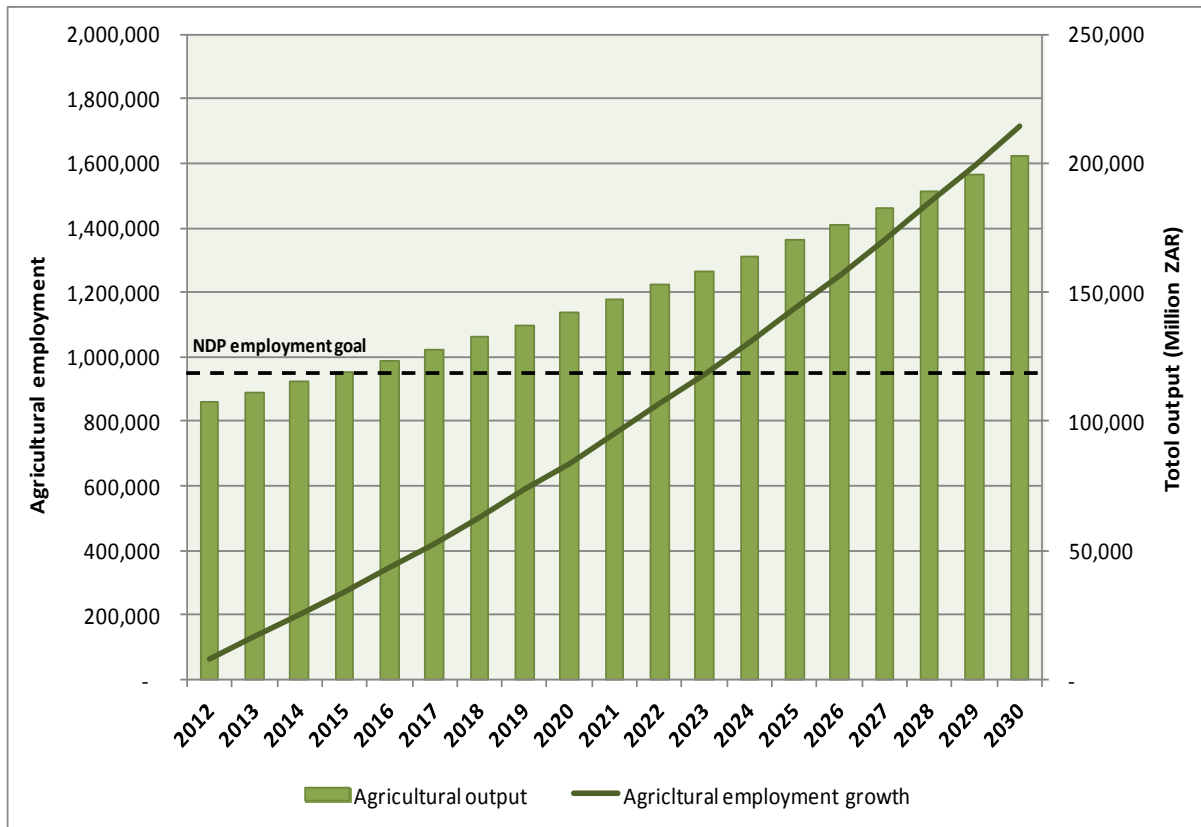


Figure 3.50: Projected growth path for agricultural output and employment (2012 – 2030)

Note: the projected agricultural output is plotted on the secondary y-axis

Source: Author's own calculations based on data from Conningarth Economists and Quantec (2012)

In order for the South African agricultural sector to keep up with local and global population growth, the sector has to either increase the output per unit of land or increase the total units of land used for farming. Large yield increases due to the adoption of new production technologies have diminished somewhat since the introduction of GMO crops and since no existing or additional land can be transformed into agricultural land, most production potential lies with bringing unused arable land into production, and in particular in turning around the production capacity of the emerging farming sector in the “former homelands”. Taking the total land suitable for crop production (see Table 3.1, Categories I, II, III) and the total amount of land cultivated into consideration, it is estimated that a total amount of 2 million ha is available for expansion (BFAP, 2011). Most of the unused medium- to high-potential crop land is located in the former homelands of the Transkei and Bophuthatswana. With regard to additional grazing land, the potential for expansion is limited. The livestock



densities in most areas currently exceed the capacity of grasslands, resulting in overgrazing (Collett, 2008).

Since about 65 per cent of South Africa does not receive sufficient precipitation for rain-fed crop production, the expansion of agricultural production under irrigation may prove to be an option. Current irrigation infrastructure allows for the irrigation of 1.6 million hectares (BFAP, 2011). Limited water availability and unfavourable soil characteristics are the main limitations for expansion of crop production. It is estimated that a maximum of an additional 707 000 ha of land can be brought under irrigation by efficiency gains, additional storage capacity and using existing capacity. Developing the required infrastructure is a long-term process and it is therefore envisaged that in the medium-term of up to ten years, irrigation can be expanded by 145 000 ha (BFAP, 2011).

A final option is to increase the use of ground water for irrigation agriculture. Middleton and Bailey (2008) estimated that in 2008 only 40 per cent of the available ground water resource was being used. If it is assumed that agriculture would use 60 per cent of this available surplus groundwater, an additional 270 000 ha could potentially be irrigated with groundwater (BFAP, 2011).

3.10 SUMMARY

The first part of this chapter has put the South African agricultural sector into perspective from both an international and national viewpoint. The second part of the chapter made an in-depth analysis of South Africa's agricultural trade performance. The main outcomes of these analyses and their implications for agricultural development in South Africa are summarised in Table 3.6 below.



Table 3.6: Outcomes and implications

1. South Africa and global agriculture	
Outcome	Implication for SA
More and richer people in the world over the next few decades, mainly in developing regions (Africa)	<ul style="list-style-type: none"> • Increase in food production • Shifting dietary patterns (animal proteins, convenience and health foods) • More accountable, efficient, and pro-active agricultural supply chains • Increased global food trade and cross-border supply chain integration • Increased global demand for agricultural land • Technology and innovation driven productivity gains
Focus on alternative energy sources: bio-fuels	<ul style="list-style-type: none"> • Food vs fuel • Production vs consumption • Ecological sustainability of fuels
Renewed global focus on agriculture against the backdrop of food security challenges	<ul style="list-style-type: none"> • Increased public and private spending on agriculture
South Africa is a relatively small global agricultural producer	<ul style="list-style-type: none"> • Generally a price taker in global food markets • A niche, rather than a bulk, producer
Agriculture's share in South Africa's GDP smaller than in most other developing and middle-income countries	<ul style="list-style-type: none"> • Relative importance of other sectors • A diversified economy • Risk of neglect by public authorities
South Africa's agricultural output has kept pace with the global trend over past decades	<ul style="list-style-type: none"> • Strong linkages of the sector with population growth and global markets

(Table 3.6 continued)

Stronger growth in South Africa's per capita cereal production than in livestock production over the last few decades.	<ul style="list-style-type: none"> • Pressure on local supply of livestock products will likely increase the dependency on imports • Lower competitiveness of local livestock industry
South Africa's ranks 13 th in total agricultural area, 21 st in total arable land and 35 th in permanent crop land.	<ul style="list-style-type: none"> • On a global scale, South Africa has a relatively large amount of agricultural land
South Africa has more per capita cropland than most other developing countries	<ul style="list-style-type: none"> • Sufficient crop land available to feed its population
Low productivity of South Africa's crop land compared to other developing countries	<ul style="list-style-type: none"> • Unfavourable agro-climatic conditions • Increased rate of technology adaption • Productivity gains mainly from advanced production technologies and innovations • Increased agricultural R&D needed
Positive yield gaps for fruit and vegetables and no yield gaps for cereals compared to global average yields	<ul style="list-style-type: none"> • Comparative production advantages for fruits and vegetables
Low productivity of grazing land compared to other countries	<ul style="list-style-type: none"> • Comparative production disadvantages for extensive livestock production • Focus on intensive livestock production



(Table 3.6 continued)

Size of the agricultural population is lower than in most developing countries but significantly higher than in developed countries	<ul style="list-style-type: none"> • Relatively large dependency on agriculture by rural livelihoods • Shift away from the urban bias in development
Agricultural labour productivity amongst the highest of developing countries but it has a significant gap with developed countries	<ul style="list-style-type: none"> • Balance capital labour ratio • Increase productivity by enhancing human capital • Move from low-skilled to semi- or medium-skilled labour
2. South African agriculture from a national perspective	
Outcome	Implication for SA
Dualistic nature of the sector: <ul style="list-style-type: none"> • Five times more small-scale / emerging farmers than commercial farmers • Commercial farmers produce 90 per cent of agricultural output 	<ul style="list-style-type: none"> • Political uncertainty: land reform, land ownership • Failure of agricultural development and its support structures • Commercial sector under continuous socio-political pressure
Larger farm sizes through consolidation	<ul style="list-style-type: none"> • Economies of scale is a main driver in agriculture
Seventy-six per cent of commercial farms can be classified as SMMEs	<ul style="list-style-type: none"> • Limited number of super-sized farms • Family farms are predominant
Only 53 per cent of South Africa's land area receives more than 400 mm of precipitation	<ul style="list-style-type: none"> • Limitations for rain-fed crop production
Fifteen per cent of farm land is suitable for crop production and 85 per cent is suitable for grazing	<ul style="list-style-type: none"> • Semi-arid climate requires efficient use of resources
Four per cent of South Africa's agricultural area can be classified as high-potential crop land (incl. irrigated land), 10 per cent is intermediate cropland and 11 is marginal cropland.	<ul style="list-style-type: none"> • Intensive land use needed for intermediate and marginal cropland to unlock its potential and increase production
Potential for expansion of medium- to high-potential crop land and limited potential to increase grazing land	<ul style="list-style-type: none"> • Increase the use of croplands in the former homelands of Transkei and Bophuthatswana • Land management to limit the impact of overgrazing on grazing potential
Potential for expansion of irrigated agriculture	<ul style="list-style-type: none"> • Short-term: efficiency gains, additional storage • Long-term: new infrastructure • Increase use of surplus groundwater
Primary and secondary agriculture have a combined share of seven per cent in GDP	<ul style="list-style-type: none"> • Ranked seventh out of the ten broad economic sectors • Contribution of secondary agriculture is larger than primary agriculture • Contribution of agro-complex will be more if food retailing is included (probably equal to mining) • Considering the entire agro-complex, the sector is a significant economic contributor • Contribution of agriculture should not only be measured in direct economic terms but also indirectly and social terms (i.e. food supply)



(Table 3.6 continued)

Role of agriculture in the economy is strengthened by its back and forward linkages with other sectors	<ul style="list-style-type: none"> • Chemical sector largest input provider • Value adding in primary agriculture is relatively low owing to unfavourable terms of trade • 66 per cent of primary agricultural output is used as inputs in other sectors (e.g. food manufacturing)
Sector has a relatively low indirect production multiplier and a relatively high induced production multiplier	<ul style="list-style-type: none"> • Forward linkages are larger than backward linkages • Growth in the agricultural sector is largely dependent on growth in the industries it supplies
Growth in value added of primary and secondary agricultural sectors lags behind that of other sectors	<ul style="list-style-type: none"> • Decrease in profit margins • Growth in secondary agriculture was larger
Long-term increase in value of production larger than the increase in volumes of production	<ul style="list-style-type: none"> • Price increases at the basis of increase in value added
Poultry, cattle and maize most important contributors to primary agricultural production, and food processing is the most important secondary agricultural sub-sector	<ul style="list-style-type: none"> • Main primary sub-sectors comprise intensive production systems which are relatively more capital and knowledge intensive
Labour, capital, and multifactor productivity is amongst the highest compared to other sectors and also has showed good growth	<ul style="list-style-type: none"> • The agricultural sector has efficient production systems
More than nine per cent of total exports are agricultural and food products	<ul style="list-style-type: none"> • Important earner of foreign currency
Export–output ratio is 21 per cent for primary agriculture and up 5.2 per cent from 1980	<ul style="list-style-type: none"> • Agricultural sector is less export-orientated than the mining and manufacturing sectors and the global average for agriculture • Some fruit products, as well as wine, have much higher export-output ratios
Import-domestic demand ratio is 9.5 per cent for primary agriculture	<ul style="list-style-type: none"> • Lower dependency on import than manufacturing and mining
The value of agricultural exports increased six times over the last 18 years and the total value of imports increased eight times over that same period	<ul style="list-style-type: none"> • Pressure on the balance of trade for agricultural products
Majority of exports are unprocessed agricultural products and the majority of imports are processed agricultural products	<ul style="list-style-type: none"> • Negative implications for terms of trade, local value adding and employment
Formal employment in primary agriculture dropped from 25 per cent in 1970 to six per cent in 2011 and the share in total employment of the agro-complex (primary plus secondary agriculture) is 11 per cent	<ul style="list-style-type: none"> • Employment larger than in mining, transport and energy sectors
South Africa is food secure on a national level but not at household level owing to the gap between their limited financial means and increasing food prices. It is estimated that between 20 to 50 per cent of South African households are food insecure.	<ul style="list-style-type: none"> • Increase of income of rural households by creating economic opportunities in agriculture • Population growth locally and regionally will put more pressure on food security • Increase in domestic food supply: local vs. imports



(Table 3.6 continued)

3. Analysis of agricultural trade performance	
Outcome	Implication for SA
South Africa is the 32 nd largest global agricultural producer and the 46 th largest agricultural exporter	<ul style="list-style-type: none"> • Small opportunity gap between production and exports
Trade to GDP ratio is 42 per cent	<ul style="list-style-type: none"> • The country has a relatively open economy, similar to France • Well-integrated in the global markets
Share of agricultural exports in total exports is comparatively low	<ul style="list-style-type: none"> • Even a gap with developed countries
Relatively large proportion of primary agricultural and processed non-food products in its agricultural export basket	<ul style="list-style-type: none"> • Increase proportion of processed food products in agricultural export basket
Only a positive trade balance for primary and forestry exports	<ul style="list-style-type: none"> • Significant reliance on imports for processed food, processed non-food products, and agricultural inputs
Export growth of primary products and agricultural inputs are comparatively low	<ul style="list-style-type: none"> • Stimulate exports of these product clusters
Agricultural export specialisation on the decline for all agricultural product clusters in the period 2002-2011. Three clusters even revealed an export disadvantage by 2011.	<ul style="list-style-type: none"> • The country's global agricultural competitiveness is under pressure
Agricultural import specialisation on the increase for three of the five agricultural clusters from 2002 to 2011.	<ul style="list-style-type: none"> • If imports can be competitively produced locally, the country is virtually importing jobs
Only a small majority of primary agricultural exports has a relative trade advantage; the majority of the products in the other product clusters are not competitive	<ul style="list-style-type: none"> • Learn from winners in international export markets
South Africa's share in the global agricultural market has declined since 1983	<ul style="list-style-type: none"> • Increased international competition from other emerging economies
South Africa's export portfolio has a moderate presence in the larger world markets	<ul style="list-style-type: none"> • Produce and export those products that the world demands
Large increase in agricultural export markets since 1995 and agricultural exports are destined to a relatively large number of markets	<ul style="list-style-type: none"> • Well-diversified portfolio of agricultural export markets • Well-developed transport connections with the rest of the world
Small increases in the market shares of Eastern Africa and Western Africa. Small decreases in market shares of Southern Europe and Northern America	<ul style="list-style-type: none"> • No drastic shifts in the regional composition of agricultural export markets since 1995, although slight diversions from Europe and Northern America to regional markets
Agricultural trade intensity highest with regional markets as well as a few overseas markets (UK, NL, JPN)	<ul style="list-style-type: none"> • Dominance in regional agricultural markets
Agricultural trade intensity low with some medium-sized markets	<ul style="list-style-type: none"> • Agricultural export potential as some of these markets are closely located to existing markets



(Table 3.6 continued)

Sixty-five per cent of South Africa's agricultural export products showed growth in exports and are exported to growing global markets	<ul style="list-style-type: none"> • Growth orientation of agricultural exports is relatively good but could be stronger
The majority of the 35 per cent of South Africa's agricultural export products that showed a decline in exports did so in a growing global market	<ul style="list-style-type: none"> • Lower export supply coupled with an increasing international demand may indicate supply side constraints or issues with competitiveness
Strong growth orientation towards growing agricultural export markets	<ul style="list-style-type: none"> • Selection of the right export markets
Relatively high levels of export diversification for processed food products and agricultural inputs	<ul style="list-style-type: none"> • Potential for improving the diversification of all product clusters but especially primary agricultural products, forestry products and processed non-food products
Agricultural export concentration shows an increasing trend, especially since 1996	<ul style="list-style-type: none"> • Apart from wine, no major shifts in the top agricultural export products since 1976 • Higher export concentration may be related to specialisation that often occurs as economies develop
Export concentration of primary agricultural products and forestry showed the most upward trend since 2002 whereas exports of processed foods and agricultural inputs became more diversified	<ul style="list-style-type: none"> • Increased concentration should be linked to growth, and diversification should not be linked to more re-exports
Agricultural export market concentration declined significantly since 1976 but is rising again since 2008	<ul style="list-style-type: none"> • Agricultural exports divert away from tradition markets to "new" markets
Not much movement in the intensive and extensive margins of agricultural exports since 2002	<ul style="list-style-type: none"> • Most agricultural export growth from intensive margin • Most agricultural export growth in developing countries from the intensive margin
Position in extensive margin largely determined by re-exports. Negative trade balances for more than half of the products in all of the five clusters	<ul style="list-style-type: none"> • Increase domestic content of the extensive margin for fundamental growth in the sector
Not much movement in the intensive and extensive margins of agricultural export markets since 2002	<ul style="list-style-type: none"> • Most growth will have to come from exporting existing products to new markets
Export market penetration is relatively low	<ul style="list-style-type: none"> • Increased exploitation of new export markets
Although export values are relatively low, the market reach of most products is good. Fifty-nine per cent of the agricultural export products are exported to more than ten markets	<ul style="list-style-type: none"> • Increase the market reach of the 38 per cent of agricultural export products that reach less than ten markets
The technology intensity of the agricultural export portfolio is largely low tech	<ul style="list-style-type: none"> • Relative trade advantage in low-tech agricultural products • Only developing agricultural inputs can boost the high-tech intensity of exports



(Table 3.6 continued)

Sophistication of agricultural export basket is higher than most other developing country	<ul style="list-style-type: none"> • Convergence of the level of income and its sophistication of agricultural exports • Further upgrading of the export portfolio (i.e. productive structure) should come from discovering new exports and consolidating growth from existing exports
Export sophistication relatively better in forestry products and processed non-food products compared to selected peer countries. Export sophistication of processed food products significantly lower than it the peer countries	<ul style="list-style-type: none"> • These sectors can serve as best practices for upgrading the productive structures and complexity of the other clusters
Export sophistication shows a negative correlation with the index for relative trade advantage	<ul style="list-style-type: none"> • Products for which South Africa has a relative trade competitiveness have generally a lower level of complexity • Structural growth should come from increasing the domestic content of those export products with a relatively high level of sophistication
The revealed human capital intensity of South Africa's agricultural export is relatively high compared to its peers	<ul style="list-style-type: none"> • The large gap between revealed and actual human capital endowment is unsustainable • Human capital development crucial for the sector
The revealed capital intensity of South Africa's agricultural exports is relatively high compared to its peers	<ul style="list-style-type: none"> • The large gap between revealed and actual capital endowment may be unsustainable and some convergence needs to take place
The revealed land resource intensity of agricultural exports is on par with South Africa's land endowment.	<ul style="list-style-type: none"> • The small gap between revealed and actual land endowment is related to the relatively low productivity of cropland
Most of south Africa's agricultural exports show a large gap with the country's physical capital endowments and a relatively small gap with its human capital endowment	<ul style="list-style-type: none"> • Convergence needs to take place by increasing physical capital and human capital endowments
Most growth in agricultural exports comes from exporting existing products to existing markets, although a significant number of existing export products experienced a decline in their existing markets	<ul style="list-style-type: none"> • Potential growth in intensive margin could have been much larger • Consolidation in existing export markets is important for growth
The number of extinct product-country combinations since 2002 are relatively high	<ul style="list-style-type: none"> • Total value of exports would be 13 per cent higher if positions in these markets were maintained

Source: Author's own findings

Table 3.5 clearly identifies some of the main impediments and opportunities for structural growth within South Africa's agricultural sector. Based on the outcomes of this chapter, four channels are identified to spur growth in South Africa's agro-complex. These channels



depart from the notion that growth in the sector needs to be derived from producing and selling more products. Accordingly, this can potentially be achieved by:

- i. substitution of re-exports by local production;
- ii. production of new export products;
- iii. import substitution;
- iv. market diversification of existing exports.

Growth is thus determined by local and international market demand for South Africa's products. Against the background of the central theme of this study "diversifying for growth and employment", the next chapters will identify growth paths for the agro-complex by addressing some of these main challenges. Figure 3.51 below provides an overview of this identification process of path-dependent growth, based on market-driven diversification, upgrading (i.e. structural transformation and employment).

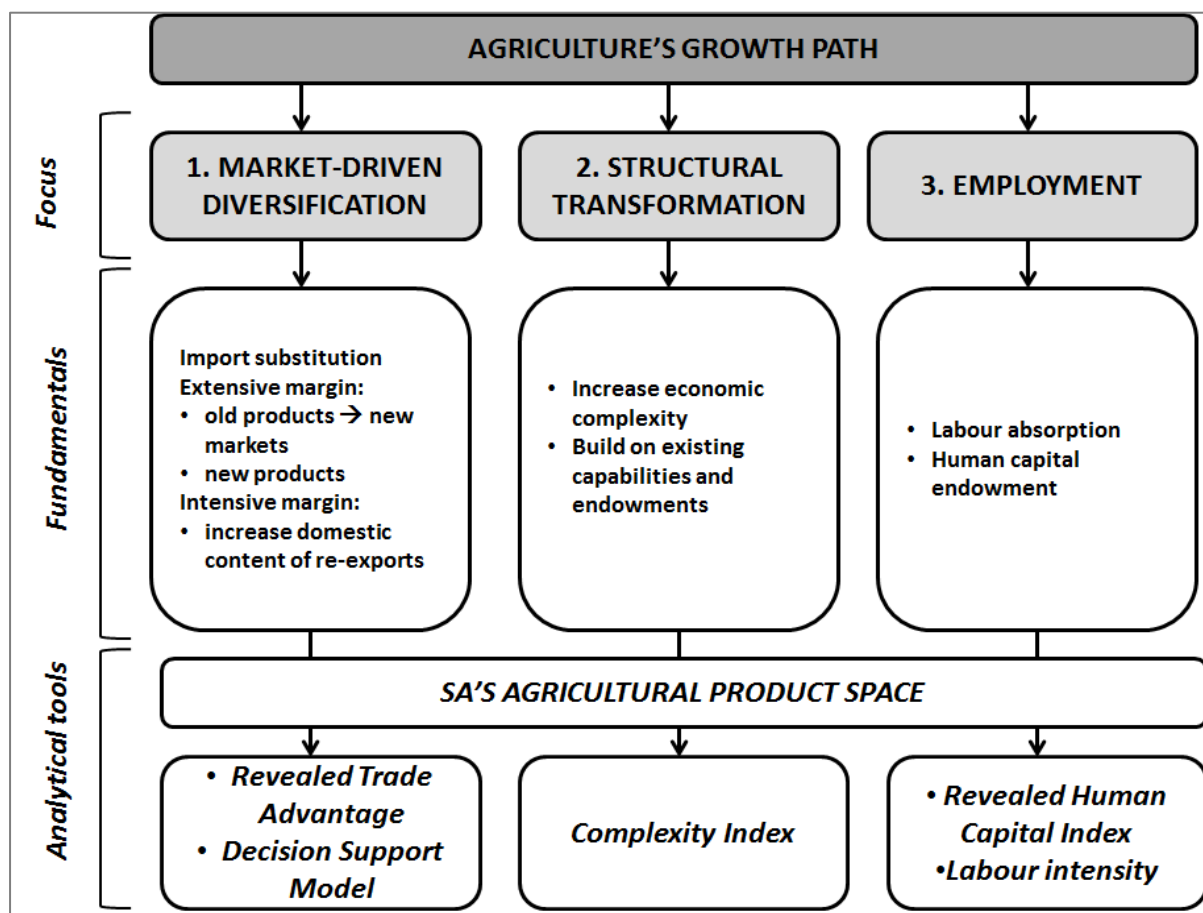


Figure 3.51: Identification process of South Africa's agricultural growth path



The next chapter (four) will provide the methodological framework for the product space, and will describe the analytical tools used to identify growth paths for South Africa's agricultural sector. Chapter 5 will analyse the structure of the agricultural product space and South Africa's position therein, whereafter Chapter 6 will identify pathways for diversification within South Africa's agro-complex.