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Please cite this paper as:

Sandrey, R. *et al.* (2011), "Agricultural Trade and Employment in South Africa", *OECD Trade Policy Working Papers*, No. 130, OECD Publishing.
http://dx.doi.org/10.1787/5kg3nh58nvq1-en

OECD Trade Policy Working Papers
No. 130

Agricultural Trade and Employment in South Africa

Ron Sandrey, Cecilia Punt,
Hans Grinsted Jensen, Nick Vink

A product of the **International Collaborative Initiative on Trade and Employment (ICITE)**

JEL Classification: F16

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Abstract

AGRICULTURAL TRADE AND EMPLOYMENT IN SOUTH AFRICA

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National Agricultural Marketing Council and Consultants to the OECD

This report provides an overview of policy changes in South African agriculture over the past three decades, and of some of the associated impacts on output, trade patterns and employment. In agriculture, the story is one of widespread substitution of labour for capital. While the sector has shed more than a million jobs over the past four decades, the paper highlights its continuing role as an employment creator in rural areas, albeit mainly in low-wage occupations. As for its principal analytical contribution, this paper considers future trade liberalisation in the agricultural sector. Using two different economic models, we find a remarkably consistent pattern whereby agricultural trade liberalisation in the region is predicted to increase agricultural employment.

JEL classification: F16 (Trade and labour market interactions).

Keywords: Trade, employment, wages, inclusive growth.

Acknowledgements

The OECD-led **International Collaborative Initiative on Trade and Employment (ICITE)** has brought together ten international organisations in an effort to deepen our understanding of the linkages between trade and jobs and to develop policy-relevant conclusions. ICITE is mobilising resources world-wide in an extensive programme of research, dialogue and communications. Participating organisations include: ADB, AfDB, ECLAC, IADB, ILO, OAS, OECD, UNCTAD, World Bank and WTO. The OECD is publishing this series of Trade Policy Working Papers drawing on the ICITE research programme.

The ICITE project is being implemented under the auspices of a team at OECD. Douglas Lippoldt is the project manager and Secretary to ICITE. In relation to the ICITE working papers, Ania Jankowska and Monika Sztajerowska provided analytical, editorial and other substantive inputs, and Katjusha Boffa and Jacqueline Maher provided secretarial and administrative support. The OECD ICITE team is based in the Development Division, headed by Michael Plummer, and under the direction of Raed Safadi, OECD Deputy Director for Trade and Agriculture, and Ken Ash, OECD Director for Trade and Agriculture.

The OECD ICITE team gratefully acknowledges the quality of the submissions received from the working paper authors. The papers have benefitted from comments and other support from ICITE partner organisations (especially members of the ICITE Steering Committee), the Working Party of the OECD Trade Committee and other national experts, participants at the three ICITE regional conferences held during 2011 in Africa, Asia and Latin America, and other parts of the OECD (especially the Directorate for Employment, Labour and Social Affairs). Their contributions helped the authors and the OECD to further develop these papers and other aspects of the ICITE project.

This paper has been developed as an input to the ICITE project. The views expressed are those of the author(s) and do not necessarily reflect those of the OECD, OECD member country governments or partners of the ICITE initiative.

Table of contents

Tables

Figures

Executive Summary

The linkages between agricultural trade and employment in South Africa have to be assessed against the background of the significant agricultural reform process over the last ten to twelve years as well as the legacy of the policies and resulting institutional framework inherited from the apartheid era. By the late 1970s the racial segregation of South African agriculture was complete, subsidization of commercial farming peaked and the productive base of the farming sector in the homelands ceased to provide any meaningful income opportunities to all but a handful of farmers. By the end of the 1990s, the deregulation of domestic agricultural markets as well as the liberalisation of trade was all but complete.

However, despite reformist policies such as land reform and institutional restructuring, the sector remained divided: on the one hand, commercial (largely white) farmers faming on privately owned land, and on the other hand, small-scale subsistence (exclusively black) farmers in the communal areas. There are fewer than 40 000 commercial farms overall. While fewer than 2 500 farmers produce more than half the total output, well over 1.2 million are subsistence farmers. The latter represent a wide range of farming systems, with a few commercial farmers and mostly homestead gardens. Where employment data for agriculture do exist, it is almost always for the commercial farmers only. This, combined with the poor quality of employment data, complicates analysis of the linkages between reform and employment in the sector. The principal policy dilemma in this case is that reforms designed to improve productivity in agriculture are at odds with the policy of trying to decrease rural unemployment and, thus, poverty.

Other reforms in the post-apartheid era have included the introduction of minimum wages and improved employment conditions for farm workers; the deregulation of the Control Boards that were responsible for interventions in the agricultural market; substantial liberalisation of international trade; and the withdrawal of a large proportion of the farmer support services provided to commercial and small-scale farmers alike. While these reforms took place after South Africa became a signatory to the Marrakech Agreement, the country unilaterally lowered most of its tariffs in agriculture to well below the bound rates of the Agreement on Agriculture. There are two consequences of the comprehensive shifts in policy that are important: the change in the agricultural production portfolio of the country and the shift in trade patterns.

Since 1965-67? animal production has generally maintained its relative share of total agricultural production (40%) and, given the nature of South Africa's agricultural resources with only some 17% of the available agricultural land suitable for cultivation, this is to be expected. However, the relative share of different kinds of animal products has shifted over this period, with the production and consumption of red meat stagnating and being replaced by the increasing production of poultry meat. Horticulture has

increased its share of production by 10 percentage points to 27% at the expense of field crops (with historical highs of 49.5% in 1980 and historical lows of 24.1% in2005). This increased horticultural production is especially apparent in the case of fruit and wines that experienced exceptional growth.

It is the demand-pull from an increase in exports of horticultural products that is driving the relatively faster growth in their production. This, in turn, has influenced the agricultural trade balance of the country, although it is a striking feature of South African agricultural exports that there have been limited overall changes in its export portfolio and destination for several decades. Conversely, equally influential on the other side of the agricultural trade balance has been the dramatic increase in soybean-oil cake for poultry feed: from ZAR 195 million in 1996 through to ZAR 2.4 billion in 2010.

While the employment levels are notoriously difficult to enumerate, (given the presence of seasonal labour, etc.), the trend is unambiguous: agriculture has shed about a million workers over the past four decades. Employment on farms fell by 50% or 800 000 workers from 1968 to 2003 in the period prior to democratization and the significant agricultural reforms. Nevertheless, since 2003 almost another 200 000 employment opportunities have been lost in primary agriculture. There are some signs of improvement, but many of the newly created employment opportunities are limited to seasonal workers during harvest in the orchards and vineyards and, thus, remain volatile. One encouraging feature is that the hiring and firing patterns seem to be gender neutral.

Reviews of the linkages between trade liberalisation and poverty reduction in South Africa have attracted considerable attention over recent years. There are no conclusive answers except that liberalisation alone was not sufficient to reduce unemployment and poverty, especially not amongst the unskilled and rural poor. This is partly because the poor are largely disconnected from the formal sector, partly because economic and export growth has not created employment anyway and finally, because liberalisation is still seen as incomplete by some.

The recent initiative of South Africa's Trade Policy and Strategy Framework identifies the government's major national development goals as, *inter alia*, employment creation, economic growth, poverty reduction, industrial development and restructuring, and the promotion of high value-added exports. However, the key question about the impact of trade liberalisation on growth, employment and poverty is a complex and largely unanswered one. The *process* of trade liberalisation is well-documented and straightforward. The *extent* of liberalisation is equally well-documented, but not universally accepted. Most difficult to assess has been the *impact* of trade liberalisation in South Africa on trade, employment, prices and productivity, and this is especially true for assessing the impact of trade liberalisation on growth and poverty. Researchers have argued that the political economy questions surrounding the distortions created by the apartheid era are particularly important for the rural sector where production became increasingly capital- and skill-intensive following liberalisation (contrary to the initial expectations that there would be an increase in employment of the abundant low-skilled labour).

This paper uses two different computer models to assess the impact of liberalisation on employment in the agricultural sector. While they are different, with different underlying assumptions and structures, they both indicate a positive relationship between liberalisation and employment in the sector, in contrast to the empirical evidence over recent years. Perhaps the post-apartheid adjustment has largely taken place in the

agricultural sector and, therefore, the past may not be an accurate indicator of the future in South African agriculture.

The GTAP model suggests increases in agricultural employment in the primary sector of around 1% and of 1.5% in the secondary sector. This is in response to general output price increases of around 0.5% in the agricultural sector. The PROVIDE model also gives an employment increase of 1.5%, based upon the latest numbers of persons employed in agriculture. Importantly this job increase is orientated towards females and the increase in non-white household income is double that of white household income.

1. Introduction

South Africa represents an interesting yet frustrating case study of the relationship between trade and employment in the agricultural sector. It is an interesting case because there has been considerable liberalisation of agricultural trade since 1994, and frustrating because of the poor quality of employment data. This latter aspect is exacerbated by the dualistic nature of agricultural production, with fewer than 40 000 commercial farms (mostly white-owned, and where fewer than 2 500 farmers produce more than half the total output), and well over 1.2 million subsistence farmers. The latter are almost exclusively black, live in the former homeland areas, and represent a wide range of farming systems, with a few commercial farmers and mostly homestead gardens. Where employment data for agriculture do exist, it is almost always for the commercial farmers only.

Yet the relationship between trade and employment in agriculture is an important one, not least because agriculture has been earmarked to contribute a million of the 5 million jobs that the government has promised under its new economic initiatives. A better sense of the strength of this link will assist in deciding on priorities for the sector, especially if the relationship between trade, economic growth, employment and poverty alleviation can be investigated further.

To this end this report starts with an overview of policy implementation in South African agriculture over the past three decades, and of some of the consequences of the rather radical policy shifts that have taken place. The emphasis here is on the impact of the policy changes on output and trade patterns. This is followed by an overview of the available employment data for primary agriculture in South Africa. Here, the story is one of widespread substitution of labour for capital. While the sector has shed more than a million jobs over the past four decades, it continues in its unique position as an employment creator in rural areas, albeit mainly in low-wage occupations.

Sections 4 and 5 constitute the analytical part of the report. Here we start by examining the work that has been undertaken in South Africa looking at trade liberalisation and employment and poverty, and find that much of this work has concentrated upon the latter. The general conclusion is that trade liberalisation alone is not sufficient to reduce unemployment and poverty. We then employ two different economic models to assess future trade liberalisation in the agricultural sector and find a remarkably consistent pattern whereby agricultural trade liberalisation in the region is predicted to increase agricultural employment. Section 6 offers a summary.

2. Deregulation of South African agriculture

A short overview of the process of deregulation of South Africa's agricultural sector is necessary in order to better understand the patterns of trade in agricultural products that have resulted. This process of reform has been well-researched (see e.g. van Zyl *et al.*, 2001; Vink and Schirmer, 2002; Vink, 2003; Sandrey and Vink, 2006), and regularly updated, *inter alia* in a recent OECD working paper (Sandrey and Vink, 2008) and World Bank publication (Kirsten *et al.*, 2009). What follows is a concise version, updated where possible.

The racial segregation of South African agriculture was complete by the 1970s: subsidization of commercial farming peaked and the productive base of the farming

sector in the homelands ceased to provide any meaningful income opportunities to all but a handful of farmers. In the period around 1980, however, farm policy started to change. Deregulation started outside the sector, with financial sector deregulation, which marked the beginning of a long period of devaluation of the currency and increased interest rates. The result was severe pressure on farm inputs (which have a relatively large import component) as well as credit. Furthermore, many controls over the movement of labour were lifted by the mid-1980s, setting in motion vast population movements to the towns and cities. Finally, considerable microeconomic deregulation took place, leading to a significant increase in activity in the informal economy, including the increase in informal marketing of farm products in the urban areas.

Within the sector, there were a wide range of policy shifts, which included a start in the tariffication of some trade protection for farm commodities; deregulation under the Marketing Act of 1968 and other legislation; a reduction in the implicit subsidy represented by income tax concessions to farmers; and a decrease in direct budgetary expenditure on agriculture.

Thus, the 1980s were marked by attempts to improve the efficiency and viability of the commercial farming sector and happened largely in the interest of fiscal sustainability within the existing institutional framework. This changed with the first democratic election of 1994. The most important policy initiatives taken since include: trade liberalisation, land reform, institutional restructuring in the public sector, the promulgation of the Marketing of Agricultural Products Act and the Water Act as well as labour market policy reforms. South Africa's trade regime for agriculture changed when the quantitative restrictions, specific duties and price controls, import and export permits and other regulations in place under the old Marketing Act were replaced by tariffs after South Africa became a signatory to the Marrakech Agreement. However, South Africa also unilaterally lowered most of its tariffs in agriculture to well below the bound rates of the Marrakech Agreement.

The three most important trade relations in the Southern African region include the Southern Africa Customs Union (SACU), which exhibits the deepest level of integration, the Southern African Development Community (SADC), and the South Africa-Zimbabwe bilateral agreement. Of the extra-regional influences, the Cotonou preferences[1] (and the on-going Economic Partnership Agreement negotiations) of the European Union (EU), the Africa Growth and Opportunity Act (AGOA) of the United States, and South Africa's separate bilateral Trade, Development and Cooperation Agreement (TDCA) with the European Union are most influential.

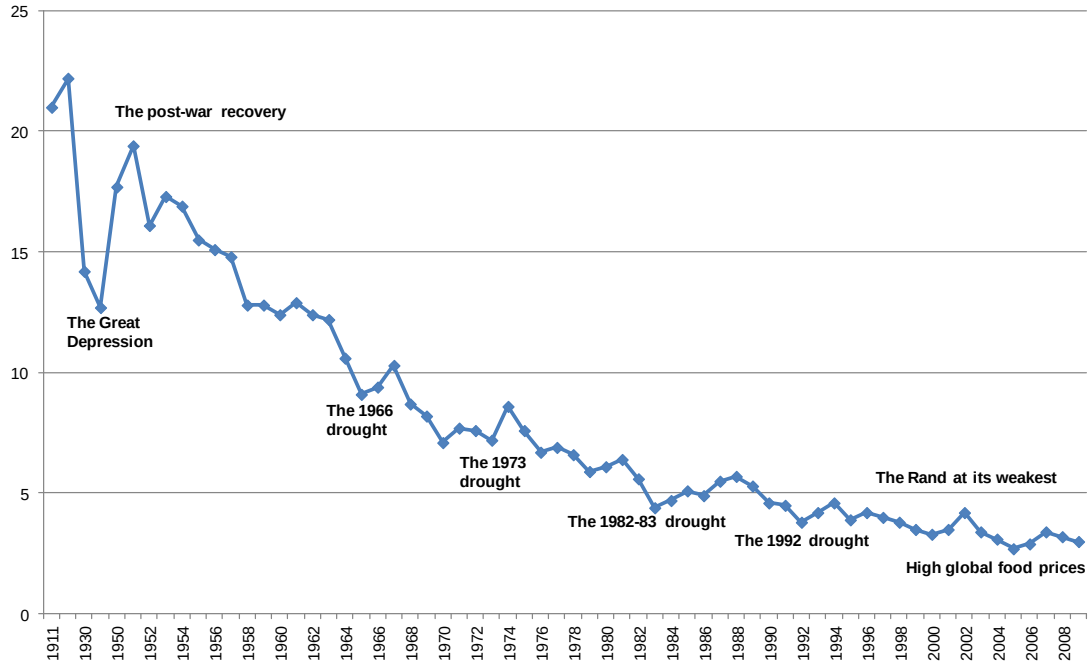
The consequences of these comprehensive shifts in policy have been extensively reported (Vink, 2003). Here we summarise this research, focusing on the change in the agricultural production portfolio and the shift in trade patterns.

1. South Africa is a contracting party of the Cotonou Agreement, but not all the provisions apply to the co-operation between South Africa and the EC (see Protocol 3 of the Cotonou Agreement). Further information can be obtained at the European Commission's EuropeAid website: ec.europa.eu/europeaid/where/acp/overview/cotonou-agreement/index_en.htm

Agricultural output and composition

South African agriculture is at times heavily influenced by weather occurrences (Figure 1.). As a resource-poor country, South Africa is especially plagued by droughts, though these are often localized. However, the current period (i.e. since the first fully democratic elections in 1994) is unusual, as there has not been a country-wide drought, in contrast to severe country-wide droughts in 1966, 1982-84 and 1992-93. The sector is also highly exposed to global markets: farmers receive no subsidies and trade at the borders has been substantially liberalized. Hence, a peak in the value of output is evident in 2002, when the Rand was at its weakest against the major international currencies.

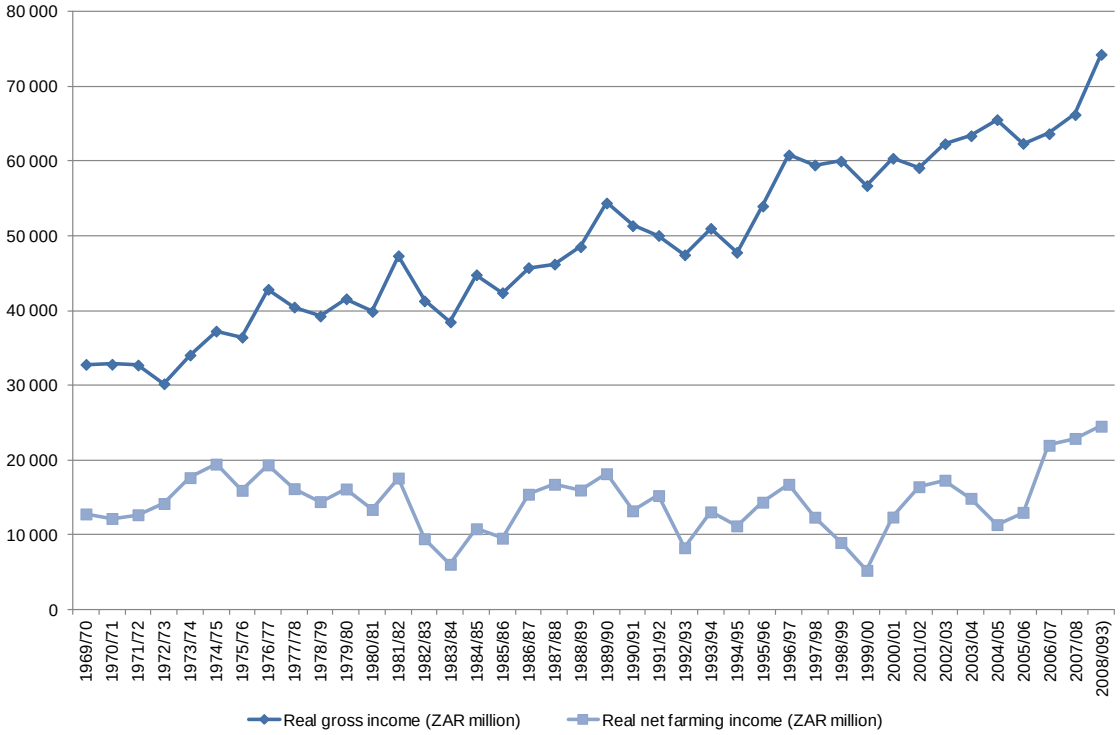
Figure 1. The contribution of agriculture to GDP since 1911



Source: Adapted from DAFF, 2010. *Abstract of Agricultural Statistics*. Pretoria, National Department of Agriculture, Forestry and Fisheries

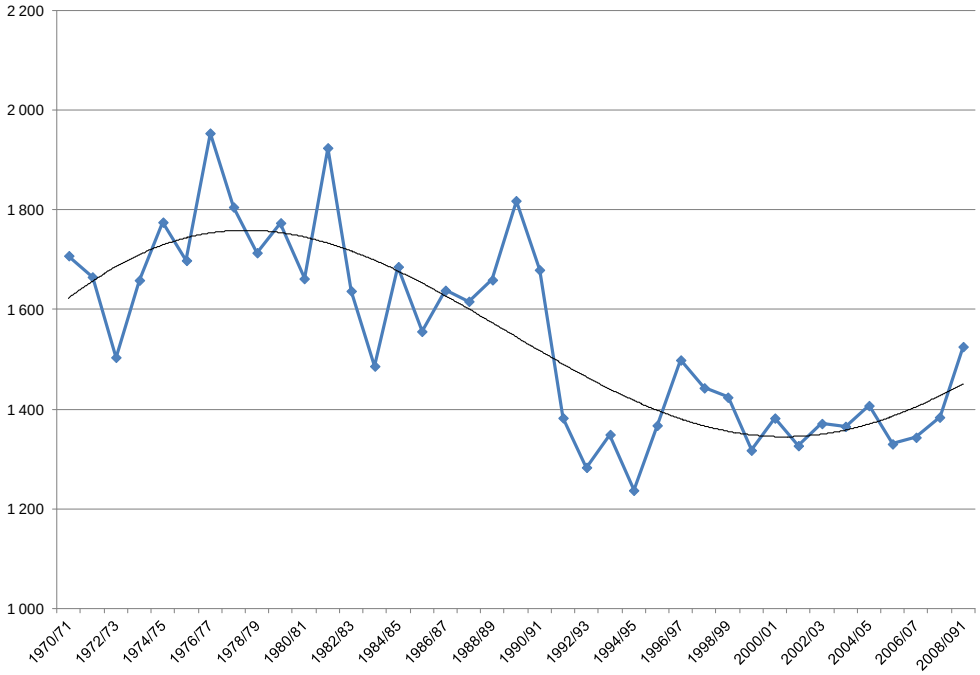
Figure 2 shows the trends in real gross and net farm income over the past four decades. Real gross farm income has increased from around R30 billion (with the year 2004-05 as the base year) in 1970 to over ZAR 70 billion in 2008-09. During that time, real net farm income (defined as gross farm income minus depreciation, salaries and wages, interest, and rent) has remained stagnant. The growth in real gross farm income took place during a period where the South African population increased from around 20 million (1970) to some 49 million people (2009). Figure 3 shows that the growth in production was not sufficient to keep pace with population growth until the middle of the 1990s. This coincides with the democratisation process, accompanied by trade liberalisation and internal market deregulation in agriculture.

Figure 2. Trends in real gross and net farm income from 1970



Note: Base year = 2004-05
Source: Adapted from DAFF, 2010. *Abstract of Agricultural Statistics.* Pretoria, National Department of Agriculture, Forestry and Fisheries.

Figure 3. Real gross farm income per capita since 1970-71 (ZAR)

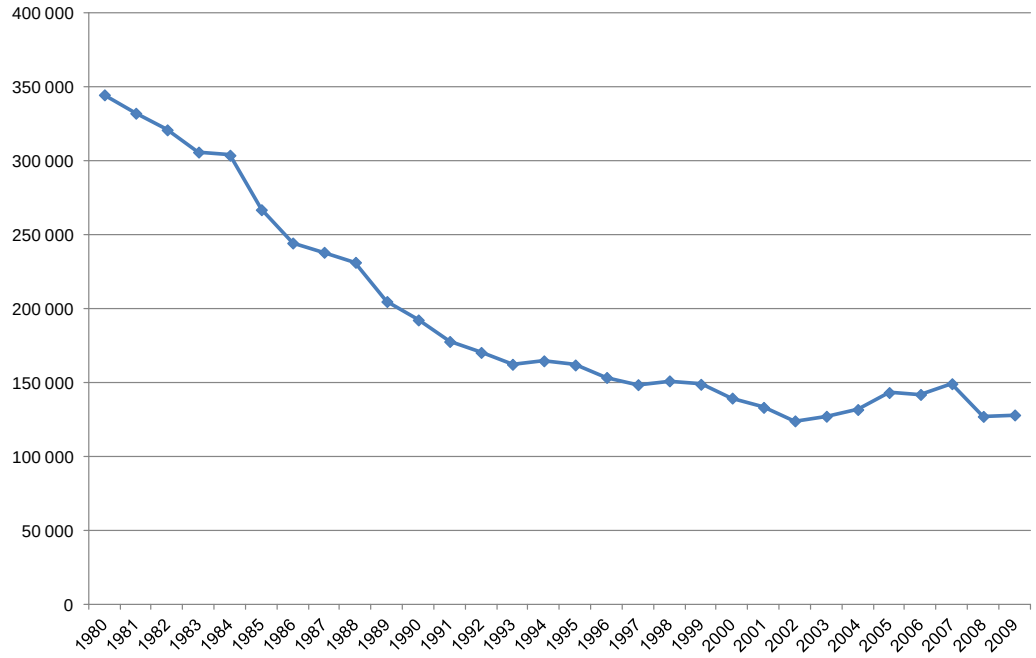


Source: Adapted from DAFF, 2010. *Abstract of Agricultural Statistics*. Pretoria, National Department of Agriculture, Forestry and Fisheries.

The stagnation in real net farm income should be seen in perspective: Figure 4 shows that the value of capital assets in agriculture declined rapidly until 2002, when nominal land prices recovered with the upsurge in inflation and the increase in net farm income that resulted from the collapse of the exchange rate. The result (Figure 5) was that the amount of real net farm income generated from each ZAR 100 in assets increased in the second half of the decade, a reflection of improved efficiency in the use of capital.

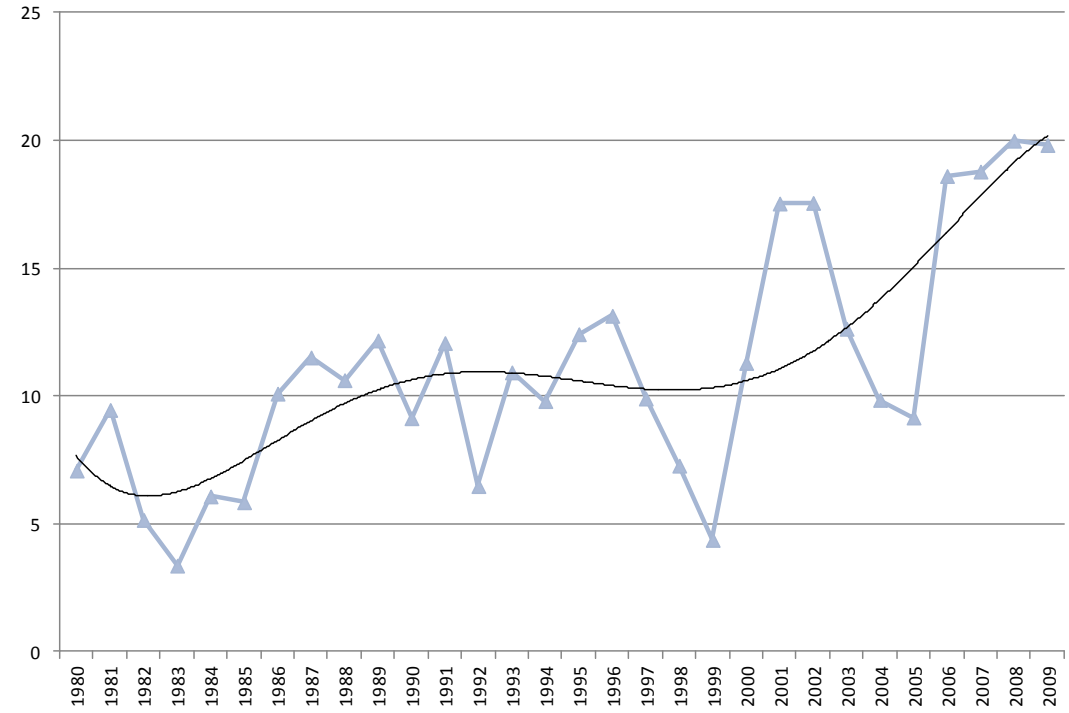
Animal production has maintained its relative share (more than 40%) of total agricultural production over the period 1965 to 2009, as can be expected of a semi-arid country like South Africa, where only 17% of the available agricultural land is suitable for cultivation. However, the relative share of different kinds of animal products has shifted over this period: the production and consumption of red meat has stagnated, while the production of poultry meat has increased considerably. Horticulture has increased its share of production by 10 percentage points up to 27%, at the expense of field crops). As the production of virtually all agricultural commodities has increased over the past couple of decades, this means that the production of horticultural products has, on average, increased at a faster than average rate. This is especially the case with fruit and wines, which have shown exceptional growth.

Figure 4. The real value of capital assets on commercial farms



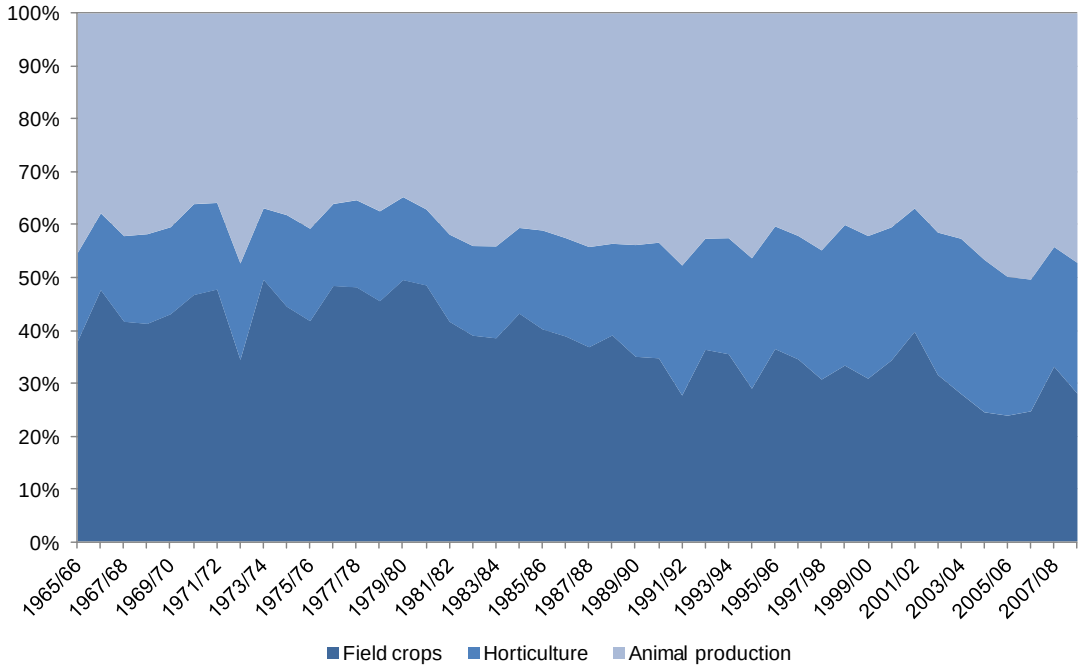
Source: Adapted from DAFF, 2010. Abstract of Agricultural Statistics. Pretoria, National Department of Agriculture, Forestry and Fisheries.

Figure 5. Net farm income generated from ZAR 100 in capital assets



Source: Adapted from DAFF, 2010. Abstract of Agricultural Statistics. Pretoria, National Department of Agriculture, Forestry and Fisheries.

Figure 6. Agricultural production shares by agricultural sectors, 1965 to 2004



Source: Adapted from DAFF, 2010. Abstract of Agricultural Statistics. Pretoria, National Department of Agriculture, Forestry and Fisheries.

The trade portfolio

Trade has been a major driver in the composition of agricultural output as the fast-growing horticultural sector has taken the lead in agricultural exports. The overall trade picture, and agriculture's contribution, is reflected in Table 1, which shows the trends in South Africa's agricultural trade since the 1970s. A number of important shifts can be identified from these data:

- Agriculture's share of total exports was between 8% and 10% since the start of the 1980s (prior to this date, gold bullion exports were not included in total export data). In the second half of the 1990s the proportion increased from below 8% to above 9%, showing that during this period agriculture played the role of a catalyst of export-led growth for the country as a whole. Since then it has declined to under 7%.
- The next row in the table shows the share of exports in total agricultural production: the share declined from around a third during the 1970s to just above a fifth between 1980 and 1994, and then increased back to the level of the earlier period. Since then it has declined to around a quarter. This clearly shows the effect of sanctions in the middle period. This also partly explains the relative lack of competitiveness of agriculture (to be discussed below); during the latter part of the 1990s, the sector achieved little more than a re-entry into markets lost during the 1970s and 1980s.
- Exports of processed agricultural products[2] have increased faster than exports of unprocessed agricultural products – the share of processed agricultural exports has increased from around 40% to 60% since 1970, with the sharpest increase occurring since 1990.
- Agricultural imports have grown faster than agricultural exports, and agriculture's share of total imports has remained relatively stable since 1970. However, the greater import propensity of the rest of the economy meant that agriculture's share of total imports declined from 6.6% to 5.2% after 1999.
- During this period, however, imports increased from 4.55% of total agricultural output to a quarter of total agricultural output.
- As a result, import cover (the ratio of agricultural exports to agricultural imports, a measure of the ability of the agricultural sector to pay for its own imports) declined drastically from 3.95:1 to 1.63:1 from 1970 to 2005, and has been at 1.1:1 on average for the past three years.
- In the final line of the table total exports plus total imports are given as a proportion of total agricultural production, which serves as a measure of the 'openness' of the sector to trade. There has been a significant and consistent increase in this measure over the period under consideration.

There are, in addition, five further structural shifts in South Africa's agricultural trade portfolio that started during the 1990s that should also be noted:

- The concentration of agricultural exports remains high. In 1997 the top ten HS 4-digit product lines accounted for 63% of the total and by 2007 these same lines accounted for an even greater 66%.

2. These are higher value agricultural exports, as opposed to manufactured agricultural goods, i.e. food and beverages.

Table 1. South Africa's trade in agricultural goods since 1965

	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-05	2006-08
Exports								
Total exports (Rm)	2 092	7 305	20 746	45 164	72 534	133 623	272 382	497 210
Total agricultural exports (Rm)	689	1 412	1 946	3 613	5 520	12 132	22 293	32 279
Gross value of output (Rm)	2 100	4 234	8 458	16 087	25 581	42 349	68 282	112 189
Agricultural exports as a % of total exports	32.92	19.33	9.38	8.00	7.61	9.08	8.18	6.49
Agricultural exports as a % of output	32.80	33.35	23.01	22.46	21.58	28.65	32.65	28.77
Processed agricultural exports (Rm)	341	724	942	2 010	2 865	6 650	13 384	17 327
Unprocessed agricultural exports (Rm)	347	688	1 004	1 604	2 654	5 482	8 909	11 495
Processed agricultural exports/total agricultural exports	49.56	51.25	48.42	55.62	51.91	54.81	60.04	60.11
Imports								
Total imports (Rm)	3 243	6 536	18 240	32 499	55 122	125 364	264 682	525 835
Total agricultural imports (Rm)	174	290	870	1 689	3 476	8 317	13 687	29 440
Agricultural imports as a % of total imports	5.38	4.43	4.77	5.20	6.31	6.63	5.17	5.59
Agricultural imports as a % of output	8.30	6.84	10.29	10.50	13.59	19.64	20.05	26.24
Import cover	3.95	4.88	2.24	2.14	1.59	1.46	1.63	0.98
Openness	41.10	40.19	33.30	32.96	35.16	48.29	52.69	55.01

Source: Adapted from DAFF (2010), *Abstract of Agricultural Statistics*, Pretoria, National Department of Agriculture, Forestry and Fisheries.

- While the European Union remains the largest destination for agricultural exports, there has been a rapid increase in exports to the rest of Africa, to the extent that these made up 25% of total agricultural exports by 2000 and 33% by 2009; by contrast, agricultural imports from Africa make up only 6% of total agricultural imports.
- The 25 most important agricultural and food exports from South Africa were responsible for 92% of total export earnings after 2000, with the horticultural industry responsible for 52% of all export earnings in 2008.
- Argentina emerged as the main country of origin for food and agricultural imports into South Africa (largely animal feed, a consequence of the rapid increase in poultry consumption), followed by the United States, the United Kingdom, Australia and Zimbabwe.
- South Africa's trade balance in the manufactured goods category of food and beverages was positive for most of the second half of the 1990s; however, by 2005 imports were equal to exports, i.e. there was a neutral trade balance.

At the end of the 19th century, South Africa's main agricultural exports were wool, fruit and wine, and this is essentially still the case today (these products contributed 51% of total agricultural exports in 2008). However, this aggregation hides a number of underlying trends that show that the sector has been more dynamic than this would suggest. For example, wool, which once dominated the country's total exports, had become relatively insignificant prior to increased world prices over the most recent years. On the other hand, the origin of farm exports has not shifted much: most farm exports still come from the Western Cape, with recent significant increases seen only from the Northern Cape (due to increased exports of table grapes).

Oyewumi *et al.* (2006) examined the export mix from South African agriculture using the PRODY index, which assesses the potential for growth[3] and development through agricultural trade. This methodology postulated that the level of sophistication of the export product can stimulate or retard the growth of GDP. The study found that there is room for the government to encourage the diversification of new export products, such as meat and dairy products. However, the "traditional" exports of sugar, some fresh fruits and nuts scored highest on the sophistication levels within the current export basket.

3. Agricultural employment in South Africa

Figure 7 shows total employment of farm workers and domestic servants on commercial farms in South Africa. While the employment levels are notoriously difficult to enumerate, (given the presence of seasonal labour, etc.), the trend is unambiguous. Agriculture has shed about a million workers over the past four decades. Employment on farms fell by 50% or 800 000 workers from 1968 to 2003. Most of this decline took place before the democratic elections in 1994 and the subsequent opening up of trade in agricultural goods with the rest of the world. Nevertheless, since 2003 almost 200 000 additional employment opportunities have been lost in primary agriculture. Where there

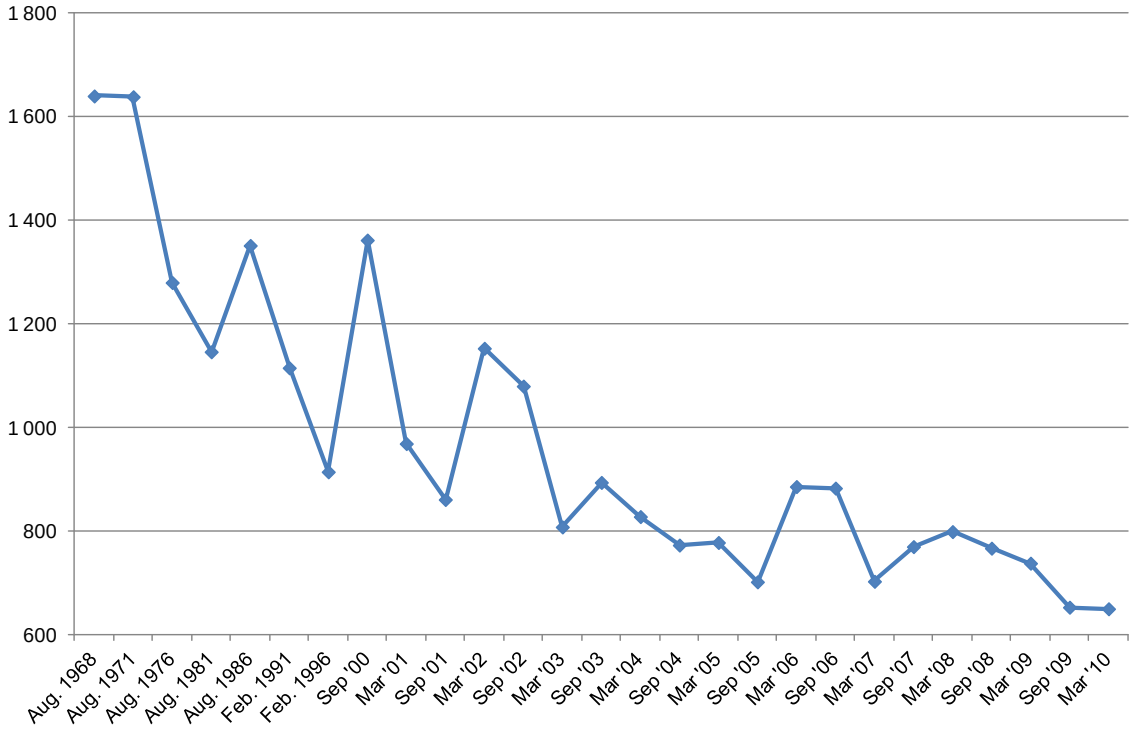
3. The PRODY analysis framework was developed by Hausmann *et al.* (2005), Rodrik (2006) and Hausmann and Klinger (2006). Based on an assumption that an item that is exported by high income countries contributes to higher growth than those items exported by low income countries, the PRODY index provides a rule of thumb as to the potential for growth of items by comparing a country's export portfolio with those of other countries.

have been increases in employment, for example as shown for the Northern Cape and the Western Cape from 2009 to 2010 (Table 2), the employment opportunities were mostly limited to seasonal workers and these numbers are volatile from year to year. This is because the first quarter is the time of harvest in the orchards and vineyards of these two provinces.

Unfortunately, even less is known about the levels of wages in agriculture. Ngqangweni (2010) presented the data in Figure 8, which shows that the average wage in the sector is well above the statutory minimum wage, which was around ZAR 1 000 per month in 2007. In contrast, Aliber *et al.* (2007) shows in Table 4 that average wages were ZAR 6 607 per year (or about ZAR 550 per month) in 2002. They note, however, that this is the average for regular, seasonal and temporary workers.

Finally, Figure 9 shows the gender composition of farm workers. This has hardly changed from a ratio of about two thirds male and one third female: radical shifts such as between March and September 2003 appear to be related to data problems. What these data also show is that hiring and firing seems to be consistent with respect to gender.

Figure 7. Total employment in agriculture in South Africa, 1968-2010

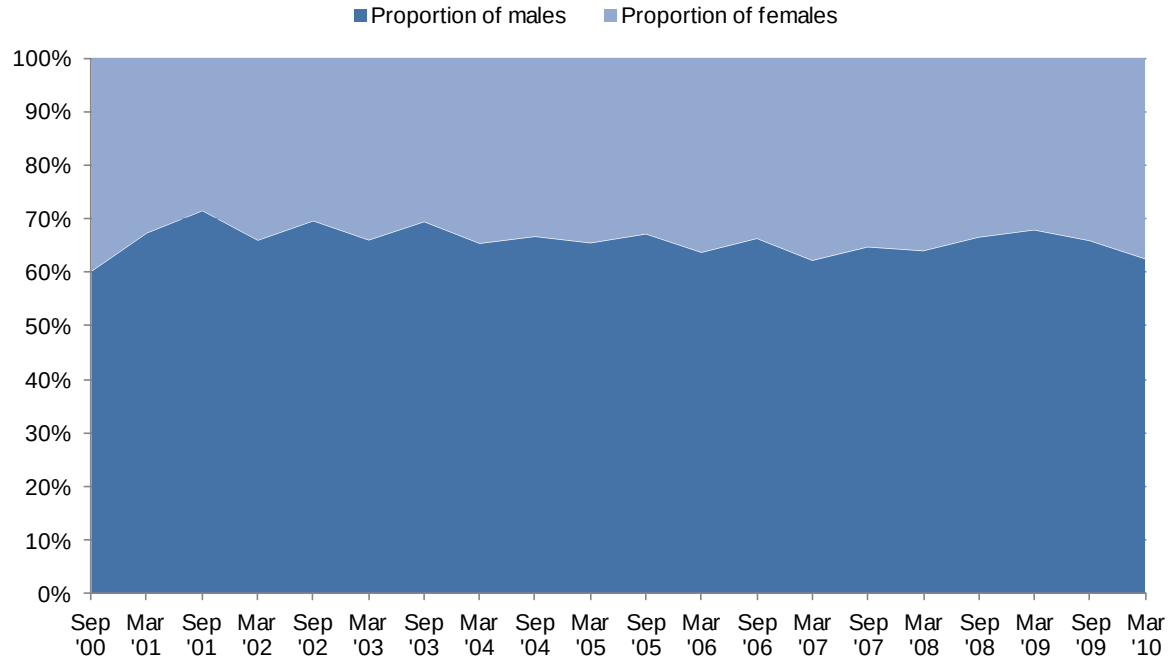


Source: Stats South Africa: Agricultural Censuses and Surveys to February 1996; thereafter Labour Force Survey.

Figure 8. Minimum and average wages in agriculture, 2003-2007 (R per year)

Source: Ngqangweni, 2010.

Figure 9. The gender composition of the farm labour force



Source: Ngqangweni, 2010.

Table 2. Farm employment by province, first quarter, 2008-10

Province	2008	2009	2010
Eastern Cape	75 000	82 000	61 000
Free State	85 000	89 000	75 000
Gauteng	58 000	56 000	29 000
KwaZulu-Natal	129 000	134 000	115 000
Limpopo	70 000	60 000	44 000
Mpumalanga	76 000	81 000	65 000
North West	59 000	49 000	41 000
Northern Cape	65 000	41 000	44 000
Western Cape	181 000	145 000	177 000
Total	798 000	737 000	651 000

Source: Stats SA, Labour force survey 2010, adapted from Holborn, 2010.

Table 3. Average wages in agriculture, 1971-2002

	Number of farms	Employment	Workers/farm	Wage/worker	Wages/farm
1971	90 422	1 516 013	17	2 884	48 345
1985	65 880	1 323 694	20	4 330	87 000
1993	57 980	1 093 265	19	4 806	90 625
2002	45 818	940 820	21	6 607	135 658

Source: Aliber *et al*., 2007.

Table 4. Measures of openness by sector, 1994-2004

	Average schedule tariff %		Effective protection rate	
	1994	2004	1994	2004
Agriculture, forestry & fishing	9	3.3	9.9	1.7
Mining	2.8	0.8	2.3	0.2
Manufacturing	22.9	8.2	52.2	13.8
Food	22.8	11.2	94.7	40.7
Beverages	36.4	8.2	86.2	21.8

Source: Adapted from Edwards and Stem, 2007.

4. A review of South African studies of the trade and employment relationship

The issue of trade liberalisation and poverty reduction in South Africa has attracted considerable attention over recent years. This includes a special edition of the *Journal of Studies in Economics and Econometrics* (SEE) published in August 2007 presenting some of the papers written for the South African Trade and Poverty Project, an undertaking dedicated to analyzing the trade and poverty linkage. Edwards and Stern (2007) summarise the set of papers in this publication in the following manner:

> *"... the net impact of the resulting trade reforms should be to contribute to growth, employment and raising average incomes. But this net impact conceals a range of differential effects: the benefits of reform do not accrue automatically and equally to all households or communities and in some cases poverty and unemployment may rise".*

Furthermore, they argue that tariff liberalisation alone was not sufficient to reduce unemployment and poverty, and especially not amongst the unskilled and rural poor. Overall, during the 1990s, employment creation through export growth was closely matched by employment loss through import penetration, with no net gain. The study concludes that although poor consumers have gained the most from lower tariffs, they have not gained (or lost) in terms of employment. This is partly because the poor are largely disconnected from the formal sector and partly because economic and export growth has not created employment anyway. Finally, they argue it could be in part because liberalisation has not been complete.

Edwards and Stern also provide a summary analysis of the changes in openness of South African sectors from 1994 to 2004. Table 4 illustrates the highly aggregated treatment of agriculture in this analysis. While their analysis highlights that the effective rate of protection in the agricultural, forestry and fishing sector was reduced to 1.7%, it should be noted that the sub-sector of 'Food' still maintained an effective protection rate of 40.7% and an average tariff of 11.2%. Not shown is that the export orientation of "Food", calculated as the share of exports in domestic production, increased from 6.7% to 9.1%, while the comparable import penetration figure similarly increased from 7.6% to 9.8% over the same time span. Also, not shown is that more detail is available in the manufacturing sector, where the 'usual suspects' of textiles, clothing and footwear as well as motor vehicles continue to have high effective rates of protection. While liberalisation has occurred across the board, it has not been even, and there is a potential for further liberalisation.

The methodology used in the Trade and Poverty Project was based on the work of McCullough *et al.* (2001), who trace the linkages from trade reform through to prices, consumption, production and employment. This framework identifies the three channels of distribution which affect price transmission. The channels relevant for this paper are: to what extent enterprises impact wages and employment as well as how the government affects taxes and government expenditure. For the agricultural sector both positive and negative effects on employment can be expected. The positive effects are brought about when liberalisation enhances the ability of the export sector to expand. Conversely, the negative effects are related to reduced domestic prices from tariff and other reforms that drive competitive and efficiency gains in the import competing sectors that, in turn, lead to labour shedding. In the wider analysis of poverty reduction there may well be a

compensating reduction in food prices from these reforms, but as the focus of this paper is on employment this aspect is not considered.

A particular feature of South African agriculture is its acutely dualistic nature. Namely, there is a modern commercial sector, earning more than 95% of the gross farm income, and the numerically larger subsistence sector. The consequences are apparent in the South African poverty data: Edwards and Stern (2007) show that 32.1% of the total population were in the lowest 'ultra poor' quintile of households in terms of expenditure in 2000, concentrated in the rural areas. Some 35% to 40% of adults in this quintile do not participate in the labour force and of those who do participate more than half are unemployed. Pauw *et al*. (2007) go further and show that formal agriculture contributes no more than 6% to poor households' income, but provides 15% to 20% of employment opportunities. This reflects both the low wages in agriculture and its importance as an employer of the poor, but it also highlights how potentially better access to international markets may aid the poor if it stimulates demand for their labour in this regard. In addition, subsistence farming is an important activity for the poor in South Africa, accounting for 20% and 8% of employment in the lowest and next to lowest quintiles respectively.

The dualistic nature of the sector, its associated high concentration of unemployed and poor in the rural sector as well as limited data make it difficult to draw conclusive evidence on the impact of liberalisation. As a result the Trade and Poverty Project struggles to find concrete data past the aggregate level. Case studies are presented for the clothing and automobile sectors, but little detail is available in the agricultural sector other than the work in the wheat to bread chain, discussed later.

Cattaneo (2011) outlines how South Africa's Trade Policy and Strategy Framework document identifies the government's major national development goals as, *inter alia*, employment creation, economic growth, poverty reduction, industrial development and restructuring, and the promotion of high value-added exports. She argues that the structural problems of the South African economy require extensive state intervention through a wide range of economic and social policies, while acknowledging that the economic and social debate in this area has become polarized and ideological. Central to this debate is the question of the impact of trade liberalisation on growth, employment and poverty (often more attention is given to poverty reduction rather than employment *per se*).

The first aspect of this complex relationship is the *process* of trade liberalisation, which is well documented and straightforward. The second aspect, the *extent* of liberalisation, is equally well documented but not so universally accepted, with different opinions on future scenarios. The final aspect, namely the *impact of trade liberalisation*, has been more difficult to assess in South Africa, especially with respect to trade volumes, employment, prices and productivity. This is the aspect on which Cattaneo concentrates. Researchers have used a variety of methodological approaches and Cattaneo and Dodd (2007) review those adopted to explore the impact of trade liberalisation in South Africa on growth and poverty in particular. They argue that the debate on trade reform needs to move beyond the one focusing exclusively on free trade and protectionism, as neither extreme is particularly relevant to South Africa. The conclusion is that "neither trade liberalisation nor the economic growth that has occurred has been able to address the problem of poverty in a context of rising inequality and severe joblessness". What is needed is attention to wider-ranging structural transformation, rather than an ideological debate oscillating between "free trade" and "protectionism". In

reality, the solutions may lie in the middle with selective policy intervention in support of structural transformation and a focus on building capacity to enhance government's ability to undertake such intervention (Cattaneo, 2011). However, Sandrey *et al.*, (2008) show that the substantial unilateral trade liberalisation that has taken place in agriculture in particular leaves South Africa with very limited trade policy space[4].

Segal and Brawley (2009) agree that the free trade-protectionism debate is not particularly relevant to South Africa and unhelpful for understanding why unemployment has remained high despite trade liberalisation. The distortions created by the apartheid era are especially important for the rural sector. Poverty levels need to be placed in a historical and political-economy perspective to explain why following liberalisation production became increasingly capital- and skill-intensive and why we did not observe the expected increase in employment of the abundant low-skilled labour. Segal and Brawley categorise the trade reform debate in a fashion similar to that of Cattaneo. On one hand, there are free marketers pleading for more time for comparative advantage to work and, on the other hand, those who assess the liberalisation as a failure, as it left too many unemployed. They offer the explanation that unleashed market forces merely reinforced the apartheid distortions that artificially cemented the power in the skilled labour[5] sectors through the enforced resettlement of black people[6]. Treating trade as a macroeconomic phenomenon and employment at the microeconomic level tends to ignore this background setting, where unskilled labour, and especially that in the agricultural sector, was not mobile. This limitation, coupled with data restrictions on the product-specific sectors in the broader agricultural industry, accentuates the problem of providing a definitive analysis of the employment impact of trade reforms in South Africa (as the Trade and Poverty Project confirms).

Chinembiri (2010) analysed the impacts of trade liberalisation on employment at the aggregated levels for South Africa and found that derived labour demand in the primary sectors (agriculture, fishery forestry and mining activities) and the secondary sectors (manufacturing, utilities and construction industries) have been impacted negatively by increased imports. Meanwhile, there was insufficient statistical evidence from the aggregate data to suggest that derived labour demand was increased by increased exports openness.

At a more disaggregated level Hobson (2006) examined the wheat-to-bread value-chain in South Africa. He found that there had been considerable employment increases following liberalisation, but that employment growth took place in the downstream baking sector rather than in wheat growing sector. Indeed, after the virtual removal of wheat tariffs (reduced to 2%), substitution of labour for capital had taken place in the wheat growing sector in order to exploit economies of scale and counter the reduced prices caused by increased imports. At liberalisation of the full value-chain there where

4. This of course opens up a whole debate as to what particular further adjustment policies in response to liberalisation are appropriate. Given that there is little policy space for tariff adjustments perhaps some aspects of labour markets need to be examined. However, given the informal nature of much of the agricultural labour market it is difficult to see where specific policy interventions may be appropriate.

5. They cite references from Sherer (1998) that record almost full employment amongst the white population during the 1960s, where only 3.1% were classified as unskilled.

6. Under apartheid, millions of people in the rural areas were resettled out of the commercial farming areas to the Bantustans in an attempt to consolidate these latter areas geographically.

around 3 000 bakers registered, with 80% of the production in the hands of the six main groups. By 2004 there were approximately 7 900 baking units (an increase of over 150%), with 85 wholesale bakeries, 600 in-store bakeries, 3 700 independent bakers, and 3 500 franchise bakers, with the main growth in the latter. In addition, it was estimated that 53 200 informal bakers (including home industries and cake decorators) operate in non-licensed premises. Detailed employment figures were not available, but Hobson considered that this expansion of the baking industry had employed significant amounts of semi-skilled labour in South Africa.

5. Modelling the relationship between agricultural trade and employment

In this section we employ two different economic models to assess the potential linkages between agricultural trade liberalisation and employment in South Africa. The first uses the internationally accepted Global Trade Analysis Project (GTAP) model to simulate the so-called tripartite free trade agreement (FTA) whereby the three African regional trade blocs, namely Southern African Development Community (SADC), East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA) enter into an agriculture-only FTA.[7] The second approach is to use the South African PROVIDE Project computable general equilibrium (CGE) model to assess specifically liberalisation impacts on South African agricultural employment.

Liberalisation of the agricultural sector in Eastern Africa

In assessing South Africa's future trade policy options the increasing focus on the African continent, and in particular the so-called "tripartite" agreements, has to be considered. Jensen and Sandrey (2011) focus on the quantitative analysis of how South Africa's trading relationship with the tripartite countries may be advanced by the adoption of a free trade agreement between South Africa (or, more properly, SACU) and the remaining countries of SADC, EAC and COMESA. To assist with this analysis the internationally accepted benchmark, GTAP database, and its associated general equilibrium model is used as an analytical tool. The starting point for this analysis was the "known" and best-estimate conditions that will prevail at the end of a given period (2020 in this case). It was followed by an assessment of the difference that the full FTA between SADC, EAC and COMESA would make after each of these three regions has made the necessary steps to full sub-regional integration. Thus, Sandrey and Jensen were not examining the benefits to SADC, EAC and COMESA of taking their FTAs to their logical conclusions, but rather the next and final steps in regional integration past that intermediate point.

7. In recent years countries have increasingly become focused on enhancing market access through regional integration in light of the stalled decade-long WTO Doha round of trade of negotiations. Africa is no exception and in 2008, Heads of State and Government from the member states of the regional economic communities (RECs) of the COMESA generally representing the North-Eastern states of Africa, the EAC representing the central Eastern states and SADC representing the Southern states of Africa agreed to establish a Free Trade Area (FTA). The aim of the FTA among others is to enhance market access, harmonise policies in areas of common interest and address the confusing issue of multiple membership. This new configuration would see an expanded market covering 26 countries with an estimated population of 500 million people, a GDP of USD 624 billion and a per capita GDP of USD 1,184.

To allow an analysis of employment effects of liberalisation in South African agricultural, we started from an earlier point using the latest GTAP pre-release Version 8 database that represents global trade in the year 2007, measured in millions of (2007) USD, and simulated the full tripartite FTA from that time. Two points need to be stressed: the first is that benefits from this FTA include the intermediate benefits of the full implementation of the individual FTAs in the region, while the second is that we simulate liberalisation of the agricultural sector only as represented by all agricultural tariffs going to zero along with an assumed 2% reduction in non-tariff barriers (NTBs) to agricultural trade, with manufacturing and service barriers remaining unchanged. We eschew a discussion of the methodology and assumptions used in the model and refer to Jensen and Sandrey for that information and background.

GTAP welfare results

The GTAP output gives welfare gains that are expressed as the Equivalent Variation (EV) that measures annual change in a country's income (gains or losses) following the changes. This EV in income is simply defined as the difference between the initial pre-FTA income and the post-FTA income after implementation of the change, with all prices set as fixed at current (pre-FTA) levels and the data expressed in USD millions, or in other words, as one-off increase in annual welfare at the assessed end-point of 2007.

The results for South Africa are impressive: welfare increases by some USD 382 million, a figure close to the total gain to Africa of USD 433 million and one that represents 0.132% of South African GDP in 2007. These gains are split between USD 156 million from expansion of the amount of capital employed in the economy, USD 95 million from allocative efficiency gains, USD 92 from terms of trade improvements and the final USD 39 million from increased labour-employment. Most of these (USD 365 million) come from the elimination of agricultural tariffs across the tripartite regions with the remainder from reductions in NTBs. We decompose the gains to South Africa by (a) country and region as well as (b) by GTAP commodity. We find that for (a) the main gains are USD 152 million from the rest of East Africa (read Kenya), Mozambique (USD 56 million), rest of Southern Africa (Angola and Democratic Republic of the Congo – USD 50 million), Mauritius (USD 39 million) and Zimbabwe (USD 37 million). For (b) sugar at USD 138 million is the main contributor, followed by other processed foods with USD 77 million, beverages and tobacco with USD 66 million and vegetable oils with USD 23 million.

The gains to Africa, and South Africa in particular, are somewhat offset by losses of USD 273 million to non-African countries and give an overall global welfare increase of USD 159 million. Other major African gainers in the USD 25 to USD 36 million range are the rest of SACU (an aggregation of Lesotho, Namibia and Swaziland),[8] Ethiopia, Mozambique, Tanzania and Uganda. The main African losers are the rest of Southern Africa and the rest of East Africa (an aggregation centred on Kenya), while the other African countries and regions gain or lose single-digit million dollar values. Not surprisingly, all non-African countries and regions lose, with the main losers being the European Union (USD 72 million), the United States (USD 44 million) and the "rest of the world" (USD 82 million).

8. Note that Botswana is modeled separately.

Sector results

Table 5 reports selected highlights of the sectoral changes in South Africa and shows how the changes in agriculture are concentrated in secondary agriculture and, in particular, sugar, 'other food products', beverages and tobacco. There is a marginal reduction in the natural resources sector as allocation effects across the economy take place and a somewhat larger reduction in the manufacturing sector, caused by the same effects. Note that there are significant changes to services as a result of the general expansion of the South African economy. Also note from the right hand column that the output price changes are modest, in particular for secondary agriculture.

Table 5. Changes by GTAP sector

	Change in production		% change in		
	USD million	**%**	**exports**	**imports**	**prices**
Primary agriculture					
Other grains	24	1.3	7.9	0.6	0.4
Vegetable fruits	26	0.5	0.6	2.5	0.4
Cane production	28	4.0			0.5
Other crops	55	2.0	21.7	6.0	0.6
Other agricultural products	26	0.6	-0.3	0.8	0.3
Secondary agriculture					
Other meats	40	1.1	25.0	1.2	0.2
Vegetable oils	58	4.4	36.0	1.3	0.1
Dairy	37	1.0	22.9	4.0	0.1
Sugar	231	11.7	51.8	4.0	0.1
Other foods	200	1.3	10.3	1.1	0.1
Beverages and tobacco	116	1.0	7.6	1.4	0.2
Other sectors					
Natural resources	-18	-0.1	-0.2	-0.2	0.0
Manufacturing	-267	-0.2	-0.7	0.3	0.1
Services	1019	0.1	-0.6	0.4	0.2
Total	1621				

Labour market results

The all-important labour market results for South Africa are shown in Table 6. For both unskilled and skilled labour in primary agriculture there is an increase of 1.09% and 1.08% respectively, while for secondary agriculture the increases rise to 1.44% for both types of labour. There are small percentage losses in the manufacturing and services sectors offsetting this, but the overall results for unskilled labour are positive across the board. Results for capital accumulation in South Africa are also positive. Not shown is that the agricultural employment gains for the rest of SACU are even higher (around 1.2% for primary agriculture and 3% for secondary agriculture) and positive but low (around 0.1%) for Botswana.

In the general discussion earlier we have provided an example on how alternative labour market closures in a CGE model can influence the final welfare results and, hence,

policy advice given. In this current scenario the results of the base simulation are similarly driven by the labour market assumptions as shown in case (B) of Table 7, where the employment changes in unskilled labour were modelled as a function of the unemployment rate for the differing partners. Their alternative scenarios are: (A) where the employment is fixed and changes are reflected in the wage rate; (C) where the real wage rate is pegged to the inflation rate (i.e. real wages are held constant and the adjustment comes through increased employment); and (D) where the real wage is fixed and all adjustments must come through the number of unskilled persons employed.

Table 6. South Africa, percentage change in employment and capital stock in agriculture

	Agriculture		Manufacturing	
	Primary	**Secondary**	**and services**	**Total**
Unskilled labour	1.09	1.44	-0.02	0.06
Skilled labour	1.08	1.44	-0.02	0
Agricultural capital	1.12	2.05	0.13	0.22

Table 7. Unskilled labour market closure, percentage change employment and real wage

EV USD mill		**QGDP%**	**CPI%**	**Assumptions**	**Changes for South Africa**	
(A)	295	0.095	0.132	Fixed employment	Employment Real wage	0.00 0.242
(B)	382	0.132	0.127	..U.. (1-U)	Employment Real wage	0.064 0.214
(D)	767	0.291	0.113	Wage pegged to CPI	Employment Real wage	0.329 0.113
(C)*	1050	0.41	0.09	Fixed real wage	Employment Real wage	0.553 0.00

Source: GTAP output, where * for case (C) is the case (K) with fixed real wages in Table 5 above.

In the base simulation (B), whereby the unskilled labour supply is a function of the unemployment rate, the employment of total unskilled labour increases by 0.064% and the real wage rate by a greater figure of 0.214%, with the changes in the agricultural sector as shown in Table 7. Scenario (A) protects those already in employment: the level of employment is fixed and all adjustments must take place within the wage rate. This is, as expected, more beneficial to those in employment, although their economy-wide wage rate increases by only 0.242%. It is less beneficial for (i) those not in employment and (ii) the economy as a whole as the overall gains are lower than the base case of (B). Scenario (D) has welfare gains double that of (B) as here more emphasis is placed on employment rather than on wages, which are held constant in real terms. The best results are those reported in scenario (C), where the real wage is fixed and all adjustments must come through the number of unskilled persons employed. Here the welfare and real GDP results are around three times higher than the base or primary simulation, and economy-wide employment is up by around 0.553%. This result again highlights that, if South Africa is serious about increasing both welfare and employment in the economy,

policy makers may need to move towards creating jobs rather than rewarding those actually in employment.

Looking more carefully at the output we find that agricultural factor income increases by 1.84%. The individual contributions to this are land (0.797%), unskilled labour (0.513%), skilled labour (0.007%), and capital (0.527%). Labour is, therefore, one of the significant contributors to the final welfare result.

Liberalisation of the agricultural sector in South Africa

The previous section discussed the results from the Global Trade Analysis Project (GTAP) model simulating the so-called tripartite free trade agreement (FTA), whereby the three east African regional trade blocs of SADC, EAC and COMESA enter into a genuine agriculture-only FTA. Results from the GTAP model were used as a starting point for the single-country CGE model for South Africa to determine the likely impacts of liberalisation on employment in agriculture in South Africa, discussed in this section. More specifically, the weighted average changes in import prices and export prices for all commodities faced by the South African industries and markets, generated with the GTAP model, were introduced as a single shock to the PROVIDE model.

The single-country CGE model used here is the PROVIDE Project CGE model (PROVIDE, 2005). The model allows for a generalised treatment of trade relationships by incorporating provisions for non-traded exports and imports, as well as the relaxation of the small-country assumption for exported commodities that do not face perfectly elastic demand on the world market. It also incorporates the Armington function for imports and a constant elasticity of transformation (CET) specification for exports. The model allows for modelling of multiple product activities through an assumption of flexible proportions of commodity outputs by activities with commodities differentiated by the activities that produce them. The model contains nested production functions and value-added production technologies are specified as Constant Elasticity of Substitution (CES). Household consumption expenditure is represented by Stone-Geary utility functions.

Model closures include a flexible exchange rate, fixed government expenditure and investment shares of absorption. Capital and land are assumed fully employed and mobile. For the labour market closure it was assumed that skilled and semi-skilled labour are fully employed, implying flexible wage rates for these two categories of labour. For unskilled labour the real wage is fixed and adjustments come through the number of unskilled persons employed. The implication of the assumptions with regard to labour is that employment increases are possible for unskilled workers only.

The data for the model are presented in a social accounting matrix (SAM) for South Africa for 2007 (Punt, 2010). The SAM contains provincial details for the agricultural production accounts, as well as for all the household and labour accounts. The version of the SAM used in this study contains 417 accounts: 49 product groups (of which 13 are agricultural products), trade and transport margins, 83 activities (of which 47 are agricultural activities), one capital account, one land account, 142 labour accounts, 126 household accounts, one corporation account, eight tax accounts, one general government account, an investment and savings account, an account for stock changes and an international trade and transfers account. Agricultural activities are distinguished by region. Hence, a given agricultural activity represents all farming activities within that region and each region has a fixed total supply of land, but the enterprise mix within that region can vary. The regions within provinces are based on district municipalities.

The changes in international prices for agriculture and food were found to have a positive impact on employment as show in Table 8. Additional employment opportunities created throughout the economy are estimated at 9 470 (0.08%), of which on aggregate 4 864 (51.3%) are in primary agriculture and the remainder in the food sector (4 603). The net impact on other manufacturing, mineral resources and services is negligible. Out of the total jobs created, 5 481 (57.9%) are for black females, 3 917 (41.4%) for black males and 68 (0.7%) for white males. By assumption of the model all the jobs are created in the unskilled categories, because skilled and semi-skilled workers are assumed to be fully employed. The table below shows the distribution of the employment created throughout the nine provinces of South Africa. The most jobs are created in KwaZulu-Natal (3 657), known for its sugar production, followed by Gauteng (1 316) and the Western Cape (1 205). Gauteng is predominantly metropolitan and most of the employment opportunities created here are in value-adding. The Western Cape is one of the main horticultural export provinces and a notable amount of value-adding activities in the food industries is also found in the Western Cape. The main grain producing provinces, Free State and North West and the most sparsely populated Northern Cape, benefit least in terms of employment growth (both in absolute and percentage terms).

Table 8. Employment created (numbers)

Province	Primary agriculture	Secondary agriculture / processed food	Mining, other manufacturing and services	Total
Western Cape	357	854	-6	1.205
Eastern Cape	368	518	150	1 036
Northern Cape	117	59	-30	147
Free State	138	162	18	317
KwaZulu-Natal	2 832	896	-72	3 657
North West	306	372	-133	544
Gauteng	30	1 289	-2	1 316
Mpumalanga	548	253	5	806
Limpopo	169	200	70	438
Total	4 864	4 603	0	9 466

Households are also affected differently as shown in Table 9. Changes in households incomes are affected by the ownership of all factors, not only labour. Along racial lines, it can be seen that on average the household income of non-white households increases by 0.19% and that of white households by 0.10%. Classified by level of income, the lower income households are found to experience an average increase of 0.17% compared to 0.15% for higher income households, so there is a modest amount of redistribution taking place. Households are also classified according to their main source of income, which can be: a) work in the agricultural sector; b) wages and salaries in other economic sectors, c) interest, rental or other income because of asset ownership; and d) welfare grants. The households earning the majority of income through work in the agricultural sector experience the greatest increase in household income (0.55%), followed by households earning returns on assets (0.27%) and then households earning the majority of income through work in non-agricultural sectors (0.13%). Households living on welfare grants

are, as expected, not affected substantially through the growth in the economy as a result of trade, but there is still a benefit of 0.03%. When looking more closely at households earning the majority of income from work in the agricultural sector, it can be seen that there is no notable difference in the proportional increase in income for those households where the income earner is self-employed and those where the income-earner is working for someone else. The total net increase in household income amounts to USD 510 million.

Table 9. Change in household income

Category	% change in household income
Race of head of household	
Black	0.19
White	0.10
Level of household income	
Poor	0.17
Non-poor	0.15
Main source of household income	
Work in agriculture	0.55
Wages and salaries	0.13
Assets	0.27
Welfare	0.03
Type of employment in agriculture	
Labourers	0.54
Self-employed	0.55

Discussion of the modelling results

This section has employed two different economic models to assist in assessing the impacts of agricultural liberalisation on employment in the sector. While they are different, with different underlying assumptions and structures, they both indicate a positive relationship between liberalisation and employment in the sector. This contrasts with the empirical evidence showing what has happened over recent years as discussed in sections 3 and 4. One hypothesis for this dichotomy between model results and past history may be that the post-apartheid adjustment has largely taken place in the agricultural sector and, therefore, the past may not be an accurate indicator of the future in South African agriculture. This is reinforced by Table 1, where it can be seen that liberalisation has left exports as a percentage of production virtually at the same level as prior to liberalisation, albeit following a decline. Conversely imports as a percentage of production have been rising steadily.

Another hypothesis is that trade liberalisation often goes hand in hand with productivity increases. Domestic productivity increases was not explicitly modelled as a future scenario, but the impacts thereof might have been quite significant historically because South Africa experienced a period of isolation before international markets reopened. Therefore, as the results suggest, trade liberalisation under ceteris paribus conditions will lead to increases in employment, but in reality these increases might be

outweighed by the job losses associated with productivity increases. Also, during the period associated with trade liberalisation in South Africa, labour legislation has changed quite significantly and there has been a process of land reform, both of which are often accused of leading to job losses. The expected job creation as a result of trade liberalisation is a result of the stimulation of economic activity because of an increase in production for the export market and given the assumption that there exists a certain level of unemployment in the economy, the economy responds through expansion.

The GTAP model suggests increases of around 1% in agricultural employment in the primary sector and of 1.5% in the secondary sector. This is in response to general output price increases of around 0.5% in the agricultural sector. Employment results from the PROVIDE model are remarkably similar: an increase of 9 500 persons employed in primary and secondary agriculture combined or 1.5% of the 650 000 total, as shown in Table 7. Encouragingly from an equality- and social cohesiveness perspective, the increase from the PROVIDE model is weighted towards female jobs created (60% of the total) and, along racial lines, the average household income of non-white households increases by 0.19%, a figure double that of the 0.10% increase in income of white households. The smallholder sector is not explicitly captured in the PROVIDE model and many of these farmers do not produce for the export market. The benefit of trade liberalisation to the smallholder sector will come from the increases in the producer prices of most primary agricultural products for the domestic market.

6. The gathering of the threads

The linkages between agricultural trade and employment in South Africa have to be assessed against the background of the significant agricultural reform process over the last ten to twelve years as well as the legacy of the policies and resulting institutional framework inherited from the apartheid era. By the late 1970s the racial segregation of South African agriculture was complete, subsidization of commercial farming peaked and the productive base of the farming sector in the homelands ceased to provide any meaningful income opportunities to all but a handful of farmers. By the end of the 1990s, the deregulation of domestic agricultural markets as well as the liberalisation of trade was all but complete.

However, despite reformist policies such as land reform and institutional restructuring, the sector remained divided: on the one hand, commercial (largely white) farmers faming on privately owned land, and on the other hand, small-scale subsistence (exclusively black) farmers in the communal areas. There are fewer than 40 000 commercial farms overall. While fewer than 2 500 farmers produce more than half the total output, well over 1.2 million are subsistence farmers. The latter represent a wide range of farming systems, with a few commercial farmers and mostly homestead gardens. Where employment data for agriculture do exist, it is almost always for the commercial farmers only. This, combined with the poor quality of employment data, complicates analysis of the linkages between reform and employment in the sector. The principal policy dilemma in this case is that reforms designed to improve productivity in agriculture are at odds with the policy of trying to decrease rural unemployment and, thus, poverty.

Other reforms in the post-apartheid era have included the introduction of minimum wages and improved employment conditions for farm workers; the deregulation of the Control Boards that were responsible for interventions in the agricultural market;

substantial liberalisation of international trade; and the withdrawal of a large proportion of the farmer support services provided to commercial and small-scale farmers alike. While these reforms took place after South Africa became a signatory to the Marrakech Agreement, the country unilaterally lowered most of its tariffs in agriculture to well below the bound rates of the Agreement on Agriculture. There are two consequences of the comprehensive shifts in policy that are important: the change in the agricultural production portfolio of the country and the shift in trade patterns.

Since 1965-67 animal production has generally maintained its relative share of total agricultural production (40%) and, given the nature of South Africa's agricultural resources with only some 17% of the available agricultural land suitable for cultivation, this is to be expected. However, the relative share of different kinds of animal products has shifted over this period, with the production and consumption of red meat stagnating and being replaced by the increasing production of poultry meat. Horticulture has increased its share of production by 10 percentage points to 27% at the expense of field crops (with historical highs of 49.5% in 1980 and historical lows of 24.1% in2005). This increased horticultural production is especially apparent in the case of fruit and wines that experienced exceptional growth.

It is the demand-pull from an increase in exports of horticultural products that is driving the relatively faster growth in their production. This, in turn, has influenced the agricultural trade balance of the country, although it is a striking feature of South African agricultural exports that there have been limited overall changes in its export portfolio and destination for several decades. Conversely, equally influential on the other side of the agricultural trade balance has been the dramatic increase in soybean-oil cake for poultry feed: from ZAR 195 million in 1996 through to ZAR 2.4 billion in 2010.

While the employment levels are notoriously difficult to enumerate, (given the presence of seasonal labour, etc.), the trend is unambiguous: agriculture has shed about a million workers over the past four decades. Employment on farms fell by 50% or 800 000 workers from 1968 to 2003 in the period prior to democratization and the significant agricultural reforms. Nevertheless, since 2003 almost another 200 000 employment opportunities have been lost in primary agriculture. There are some signs of improvement, but many of the newly created employment opportunities are limited to seasonal workers during harvest in the orchards and vineyards and, thus, remain volatile. One encouraging feature is that the hiring and firing patterns seem to be gender neutral.

Reviews of the linkages between trade liberalisation and poverty reduction in South Africa have attracted considerable attention over recent years. There are no conclusive answers except that liberalisation alone was not sufficient to reduce unemployment and poverty, especially not amongst the unskilled and rural poor. This is partly because the poor are largely disconnected from the formal sector, partly because economic and export growth has not created employment, and finally because liberalisation is still seen as incomplete by some.

The recent initiative of South Africa's Trade Policy and Strategy Framework identifies the government's major national development goals as, *inter alia*, employment creation, economic growth, poverty reduction, industrial development and restructuring, and the promotion of high value-added exports. However, the key question about the impact of trade liberalisation on growth, employment and poverty is a complex and largely unanswered one. The *process* of trade liberalisation is well-documented and straightforward. The *extent* of liberalisation is equally well-documented, but not universally accepted. Most difficult to assess has been the *impact* of trade liberalisation in

South Africa on trade, employment, prices and productivity, and this is especially true for assessing the impact of trade liberalisation on growth and poverty. Researchers have argued that the political economy questions surrounding the distortions created by the apartheid era are particularly important for the rural sector where production became increasingly capital- and skill-intensive following liberalisation (contrary to the initial expectations that there would be an increase in employment of the abundant low-skilled labour).

This paper uses two different computer models to assess the impact of liberalisation on employment in the agricultural sector. While they are different, with different underlying assumptions and structures, they both indicate a positive relationship between liberalisation and employment in the sector, in contrast to the empirical evidence over recent years. Perhaps the post-apartheid adjustment has largely taken place in the agricultural sector and, therefore, the past may not be an accurate indicator of the future in South African agriculture.

The GTAP model suggests increases in agricultural employment in the primary sector of around 1% and of 1.5% in the secondary sector. This is in response to general output price increases of around 0.5% in the agricultural sector. The PROVIDE model also gives an employment increase of 1.5%, based upon the latest numbers of persons employed in agriculture. Importantly this job increase is orientated towards females and the increase in non-white household income is double that of white household income.

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