UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

THE IMPLICATIONS OF GLOBALISATION ON SOUTH AFRICAN GENDER AND ECONOMY: A COMPUTABLE GENERAL EQUILIBRIUM (CGE)ANALYSIS

by

GODBERTHA K. KINYONDO

Thesis submitted in partial fulfilment of the requirements for the degree of

PhD (ECONOMICS)

in the

FACULTY OF ECONOMICS AND MANAGEMENT SCIENCES

at the

UNIVERSITY OF PRETORIA

STUDY ADVISOR: Professor. Dr. M. Chitiga

PRETORIA   **JULY 2007**

DEDICATION

This thesis is dedicated to the memory of my loved ones:

My father: Omuhesi Johesaphat Bishashaga Kinyondo

My brother: The Honourable Sebastian Rukiza Kinyondo

My sister: Christina Kokulengya Kinyondo

My mother-in-law: Harriet Peuse

My nephew: Richard Muheleji

MAY YOUR DEAR SOULS REST IN PEACE

APPRECIATION

I am grateful to the International Food Policy Research Institute for providing access of their general model. Their courses on economy-wide modeling have benefited me enormously in terms of conducting my study. My special appreciation goes to Hans Löfgren who was able to spare his busy time at the World Bank in Washington DC to explain the model and its adjustments to gender issues. Thanks also go to James Thurlow for responding to my queries concerning the South African social accounting matrix.

I thank my supervisor, Prof. Dr. Margaret Chitiga who saw me through the challenge of my research. Her feedback and guidance throughout the research process are greatly appreciated. I thank, too, Dr. van Lindie of the Statistics department for the assistance in processing the survey data.

I thank Professor Van Heerden for introducing me to CGE and his ability to teach adult learners. He showed maturity in the way he directed his teachings.

My special thanks go to my family, Dr. Gene Peuse, my sons Mulokozi and Imani who have supported me both financially and emotionally. My husband's constant encouragement and patience gave me the motivation to persevere in getting the model operational.

I thank my mother, brothers, sisters, friends and Ruta who have encouraged and prayed for me in order to accomplish this task.

All the thanks, however, goes to my God who guides and protects me in every way of my life.

Godbertha K. Kinyondo

ABSTRACT

Using a Computable General Equilibrium model, this study analyses the effects of globalisation on gender and the South African economy, disaggregated into 49 sectors. The analysis assesses the effects of three policies: full trade liberalisation, increased productivity, and liberalisation under Doha Round commitments.

Trade liberalisation results in contraction of import-competing, labour-intensive sectors, resulting in job losses. Some losses are offset by increased employment demand in expanding export-oriented and service sectors. All skill types, particularly unskilled women, witness growth of employment, hence improved earnings. Skilled men gain the most and unskilled women the least due to their initial lower wages, greater job losses in women-intensive sectors and relocation to low-paying positions.

Economy-wide productivity is expansionary, resulting in increased employment demand and earnings of all skill types for men and women, with skilled men gaining the most. A productivity rise directed at only a few sectors contributes to job losses for all skill types, but as efficient sectors expand, inputs are demanded from linked and service sectors, leading to overall economic improvement hence economy-wide job creation which offset job losses.

If world prices in agriculture increase under the Doha Round, production and exports of agricultural commodities such as maize increase, resulting in employment demand of all skill types for men and women, who relocate from mining and manufacturing to the profitable agricultural sector. The benefits however will follow the extent of price rise due to offsetting domestic policy of tariff reduction, coupled with the abolished policies of domestic support and subsidies. Doha results in a slight impact at the aggregate level.

Globalisation improves household welfare, where high-income households gain from ownership of capital and skilled labour, while poor-households gain from employment growth of unskilled labour and reduced domestic prices enabled by cheap imports.

Where globalisation results in increased employment for women, even unskilled women, who earn far less than their skilled counterparts, report greater autonomy and sense of an improved personal and household decision-making. Therefore, promoting greater job remuneration and equity between genders require appropriate education, training and collective-bargaining so as to reverse gender setbacks hence enabling full participation of all in a globalised economy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

AMS	Aggregate Measure of Support
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
CGE	Computable General Equilibrium
CES	Constant Elasticity of Substitution
CET	Constant Elasticity of Transformation
CPI	Consumer Price Index
EU	European Community
EV	Equivalent Variation
FDI	Foreign Direct Investment
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
IDC	Industrial Development Corporation
IFPRI	International Food Policy Research Institute
IES	Income Expenditure Survey
ILO	International Labour Organisation
ISCO88	International Standard Code
LFS	Labour Force Survey
OHS	October Household Survey
R&D	Research and Development
RDP	Reconstruction and Development Programme
SADC	Southern African Development Community
SAM	Social Accounting Matrix
URA	Uruguay Round of Agricultural Trade
WTO	World Trade Organisation
TIPS	Trade and Industry Policy Society

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

The issue of globalisation and its effects on gender has raised a great deal of interest in both domestic and international arenas. *Globalisation* is generally understood as resulting in greater economic interdependence among countries through international trade, capital flows and international production. *Globalisation,* as used in this study, refers to the expansion of foreign trade and foreign physical capital investment. The purpose of this study is to analyse how globalisation policies affects the employment, wages, incomes, and welfare for South African men and women workers. In the 1990s, South Africa embarked on a policy of rapid trade liberalisation to invigorate its economy that had stagnated during the turbulent apartheid era of the 1980s. This conveniently occurred during a decade when many of the restrictive measures were being removed from international trade (Roberts 2000; Kusi 2002). The trade reforms initiated by South Africa during the 1990s paved the way for the country's subsequent impressive economic performance (see section 1.6 for a description of the economy).

Despite economic growth, South Africa still faces significant economic challenges. Foremost among them is the fact that nearly 26% of its citizens are unemployed, varying from almost 0% unemployment rate for highly skilled labour to more than 40% for unskilled and semi-skilled workers (LFS 2006). Therefore, employment creation, in particular for the unskilled labour, is one of the most pressing economic objectives of the South African Government.

The unemployment rate affects more women than men in South Africa (LFS 2000-2006). For example, in 2006, the unemployment rate of women stood at 32%, while that of men was 26%. A 2002 study in South Africa, *Women and Men*, found unemployment to be highest among urban women at 35.7% (Budlender 2002). Women often lack productive resources such as land, capital and skills, putting them at a disadvantage compared with men in seeking employment or becoming self-employed. Obstacles faced by women are not isolated to South Africa economy. A comparative study by Floro (1999) in the Philippines and Zambia found globalisation to have provided job market opportunities for the Philippines women, but it had negative impact to Zambian women due to their lack of skills and resources to start their own businesses. As Haddad, Richter and Smith (1995) note, because societal norms define different roles for men and women, globalisation inevitably has a gender dimension.

Studies indicate both positive and negative outcomes associated with economic globalisation. For example, positive effects include increased employment opportunities for women in sectors that have grown in response to expanding global trade. The cut-flower and apparel industries are examples of the feminisation[1] of economic activity stimulated by globalisation, leading in some instances to the creation of permanent employment for women (ILO 1999). On the other hand, globalisation has also resulted in less secure subcontracting in manufacturing and the informalisation of women's work, often involving poor working environments and low-paid jobs. In addition, in some instances, new technologies that lead to efficiency have led to the transfer of work from women to men (Standing, 1989, 1999; Valodia 2000; Artecona & Cunningham 2002). On implementing the Economic Structural Adjustment Programs (ESAPs), which resulted in job losses, McGowan (1994) found that women with paid jobs in the formal sector suffered more job losses when compared with the retrenchment of men under. In addition, import-competing sectors that realise increased imports tend to employ a significant number of women, which has a negative employment implication for women workers.

Standing and Grown (1999) and Elson and Cagatay (2000) argue that the increased overall demand for women labour may or may not result in higher wages for women relative to men. In addition, they contend that higher wages and more employment opportunities for women improve their welfare only if women can control their earnings. In most instances, earnings for women are controlled by the men in the households. This view is supported by Chambers (2000) who argues that, despite the increase in women labour participation rates, many working women do not control their earned income, therefore, remain economically disempowered.

Some gender activists have recommended halting trade reforms until there is a better understanding of its effect on men and women (Mohau 2001). Other gender activists are campaigning for the establishment of women's committees or mainstreaming gender into the Trade Policy Review Mechanism of the World Trade Organisation (WTO), which governs

---

[1] The concentration of women employed in certain occupations or economic sectors

global trade. Many gender advocates contend that globalisation needs to be managed carefully so as to ensure that higher economic growth improves the welfare of all members of a society.

1.2 THE PROBLEM STATEMENT

How does globalisation affect economies like those of South Africa and, more specifically, how does globalisation impact on employment, wages, earning, welfare and well-being in such economies from a gender perspective? Multilateral organisations such as the World Trade Organisation, International Monetary Fund and the World Bank, and governments of Western countries are promoting foreign investment and liberalisation of trade as the solution to advance the economies of developing nations. However, in countries like South Africa, women, who comprise 52% of the total population, face different inequalities than their counterparts in Western societies and indeed their men counterparts in South Africa.

Many researchers contend that globalisation has gender-differentiated impacts. Studies show that: i) both sexes are negatively impacted, but women more so; ii) women are negatively impacted while men are not or are positively impacted; and iii) women are positively impacted while men are not or less so. Overall, studies tend to show that globalisation more adversely affects women.

Globalisation has gender-discriminating effects because of gender-differentiated initial conditions faced by women in developing economies. Women struggle in the face of many inequalities such as lack of access to education, healthcare, food and economic resources. Women are not able to access credit because they lack collateral, and they often are denied rights to own or inherit productive land-based assets. Furthermore, many women are still held back by cultural beliefs and traditional practices of the society which favours men over women. In non-farm endeavours, women find it difficult to take advantage of new employment opportunities that involve advanced technological skills. This is based on low skill levels possessed by most women.

Gender economists have shown that globalisation policies have differing impacts on men and women (Fontana and Wood 2000, Fontana 2001). Fontana, Jockes and Masika (1998) contend

that the impact of globalisation depends on the initial economic conditions and industrial composition of a country when it liberalises its trade and enters the global economy.

This study, therefore, first establishes the current economic conditions of the South African economy by disaggregating it into 49 sectors and then further disaggregating these sectors by labour type (i.e. unskilled, semi-skilled, skilled) and by gender. It then raises the following research questions:

Under a scenario of full trade liberalisation, what would the effect be on employment, wages, and income earnings for men and women?

Under a scenario of increased productivity emanating from increased foreign direct investment, what would the effect be on employment and wages for men and women?

If the Doha Round of agricultural policies were to be implemented, what would the effect be on employment and wages for men and women?

Under all of the above scenarios, what would the impact be at household level in terms of welfare and, more specifically, on the well-being of women who enter an economy as it expands and/or contracts with globalisation?

1.3 OBJECTIVES OF THE STUDY

The objectives of the thesis are to uncover the gender dimensions of the process and current trends in men and women's status and wellbeing as a result of the various dimensions of economic globalisation, especially in South Africa. More specifically, this study will (1) determine the employment impacts of globalisation policies on different skills types (skilled, semi-skilled and unskilled) by gender in different sectors, (2) observe changes in wages between different skills levels of men and women in various sectors, (3) ascertain various household welfare effects resulting from globalisation policy reforms, and (4) analyse the well-being of working women at household level emanating from their participation in the labour force. Furthermore, the study will identify the sectors of the economy which have experienced contraction or an influx of women workers as a result of globalisation policies.

Because the changes caused by globalisation policies may affect all or various sectors of the economy through sectoral interlinkage, a computable general equilibrium (CGE) model is adapted for this study in order to simulate the impact of selected globalisation policies. Three simulations are conducted: (1) a simulation of full trade liberalisation under different factor

mobility assumptions, (2) a simulation of factor productivity increase, resulting from globalisation, specifically as it relates to foreign direct investment (FDI), among all economic sectors and among only a few selected sectors that have realised increase in FDI and those that employ or have potential to employ women, and (3) a simulation of world price increases to assess possible effects of the Doha Round.

1.4 SOUTH AFRICAN TRADE REFORMS

1.4.1 Introduction

This section reviews the literature on trade reforms, describes their implementation in South Africa, and the progress thereafter. The chapter then looks at the effect of trade reforms in relation to imports, exports and employment. The general economic outlook of the country is outlined, and the chapter ends with a brief analysis of the country's macroeconomic situation.

1.4.2 Significance of trade reforms

Trade liberalisation is expected to produce greater efficiency through the reallocation of resources to more productive activities. O'Rourke and Williamson (2000) find trade to induce efficiency by restructuring of resources among economic activities and to influence aspects such as scale of output and the distribution of income.

Edwards (1998) finds that South Africa's trade openness contributes to productivity through technological change which has the effects of promoting growth. Roberts (2000:609) observes increased diffusion of technology, knowledge and increased investment brought about by globalisation. In addition, he finds that trade contributes to allocative efficiency, specialisation and increased exports. As a result of increased exports, the country witnesses increased demand for manufactured goods, greater domestic production and hence increased employment. Pretorius (2002) equates increased trade with the improvement in absolute living standards or the improvement in the quality of life.

It is alleged that countries with more open and outward-oriented economies outperform those with restrictive trade and investment regimes (OECD 1998). For developing countries as a whole, liberalisation has led to trade increasing by 8.3% and economic growth by 5.5% (Gondwe 2001). Masson (2001) finds dramatic increases in *per capita* income that have accompanied the expansion of trade by countries such as Korea, China and Ghana.

He concludes, based on overwhelming evidence, that openness to international trade is an answer to fast economic growth and development, a view shared by neoclassical economists.

In summary, globalisation through increased trade and FDI leads to improved productivity, increased output, exports, employment, and improved household welfare. Yet, due to the multifaceted nature of globalisation, its specific impact in South Africa is open to debate; there are no clear-cut links between globalisation, employment and growth (TIPS 2002).

1.4.3 South Africa's progress in trade reforms

Since the early 1990s, trade liberalisation in South Africa has progressed substantially. The government has instituted a wide range of policy reforms to stimulate a more competitive, open, and market-oriented economic system. The government has complied with the WTO obligations, engaged in consultations concerning a Southern African Development Community (SADC) free trade area, completed a free trade agreement with the European Union (EU), and played an instrumental role in launching the Doha Round.

Trade reforms, however, started as early as the 1970s when South Africa embarked on reforms in order to counter the anti-export bias[2] of import protection, which involved the use of quantitative restrictions (Tsikata 1999). The quantitative restrictions (QR) replaced policies of equivalent tariffs and other duties. In the 1980s, the country promoted exports through customs duty drawbacks and duty exemptions. During the 1990s, these were replaced by the general export incentive scheme (GEIS)[3], which encouraged the anti-export bias on the output side, rather than on the input side, through import liberalisation. For example, from 1993 to 1996, the anti-export bias shifted from 1.19 to 1.32 for the economy, while shifting from 1.27 to 1.45 for manufacturing (Lewis 2001).

The government rationalisation programme consisted mainly of (a) a reduction in the number of tariff lines from over 100 to six tariff categories at rates of 0%, 5%, 10%, 15%, 20% and 30%, (b) a conversion of the tariff regime for industrial products, and (c) a conversion of all quantitative restrictions on agricultural imports to bound ad-valorem tariff rates. The average-

---

[2] The promotion of trade by eliminating obstacles to trade.

[3] An economy-wide package, based on value added & local content with incentives to promote export.

weighted import duties were also to be reduced from 34% to 17% for consumption goods, from 8% to 4% for intermediate goods, and from 11% to 5% for capital goods (Cassim, Onyango & Van Seventer 2002).

1.4.4 Progress in trade reforms

As shown in Table 1.1 below, South Africa underwent a dramatic reduction in tariffs on agricultural products, from 9.23% in 1996 to 1.4% in 2000. Manufacturing progress, comparatively, was somehow slow, shown by a fall of only 2.8% from 1996 to 2000.

Table 1.1 The 1996 and 2000 average import-weighted tariffs

Category	1996 Applied rates (%)	2000 Applied rates (%)
Agricultural products	9.23	1.4
Industrial products	11.4	8.6
Average	11.3	7.3

Source: Van Seventer (2001) and TIPS (2002).

Table 1.2 compares the 2000 and 2001 schedules to show changes that occurred. The number of unique ad-valorem tariffs over 40% dropped by 11, which constitutes a 17.5% decline, and tariffs between 30 and 40% dropped by 19. The number of zero-rated lines remained more or less constant. South Africa, which at one time had 47 tariff bands, has had to make significant changes to move towards compliance with the WTO agreement of six tariff bands.

South Africa reduced its import-weighted average tariff rate from more than 20% in 1994 to 7% in 2002. However, broad categories of goods such as processed foods, motor vehicles and components, tobacco, rubber products and clothing and textiles still have tariff peaks (Lewis 2001). TIPS (2002), argues that an anti-export bias still exists and notes the existence of a high effective rate of protection (EPR) on motor vehicle and parts, textiles, leather, footwear and clothing. By the year 2000, there were 7 000 tariff lines, as opposed to less than 6 000 as required under the WTO commitment. Fedderke and Vaze (2001) observe that 50% of South Africa's gross domestic product (GDP) is produced in sectors where EPR rose between 1988-93 and 1994-98, while 15% comes from sectors where EPR has fallen.

Nonetheless, the country has made a commendable progress from the 15 000 tariff lines that existed in 1995.

Table 1.2 Tariffs as of July 2000 and March, 2001

Ad valorem & other tariffs	No. of HS8 lines July 2000	% of No. of lines July 2000	No. of HS8 lines March 2001	% of No. of lines March 2001
tariff > 40%	63	0.8	52	0.7
30% < tariff < 40%	168	2.1	149	1.9
20% < tariff< 30%	681	8.7	694	8.9
15% < tariff < 20%	576	7.4	578	7.4
10% < tariff < 15%	539	6.9	565	7.2
5% < tariff < 10%	366	4.7	378	4.8
0% < tariff < 5%	5	0.1	5	0.1
0%	3485	44.5	3484	44.5
Other tariff	1941	24.6	1926	24.6
Total lines	7824	100.0	7831	100.0

Source: Van Seventer 2001, TIPS 2002.

1.4.5   Exports and employment

Table 1.3 shows an increase in both import and export demand since 1991. Kusi (2002) notes small increases in exports with coefficients of 0.8 for manufacturing and 0.5 for agricultural exports and 0.5 for total exports. In addition, he finds trade liberalisation to have positively affected sectors with low protection rates. For example, he finds the mineral processing sector to have had increased its exports, more than sectors with high protection rates such as finance, insurance, agriculture, gold and uranium. Kusi recommends more openness for the South African economy in order to raise economic efficiency.

Table 1.3 Export performance 1991-2000

Percentage growth										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Exports		2.5	4.8	4.3	10.4	9.3	5.5	2.2	1.3	8.2
Imports		5.3	8.1	16.1	16.9	8.7	5.4	1.2	-7.4	7.2
As a percentage of GDP										
Trade balance	4.5	4.3	3.9	2.0	0.9	1.0	1.1	1.3	3.4	3.7
Exports	19.6	20.5	21.2	21.5	23.0	24.1	24.8	25.2	25.0	26.3
Imports	15.1	16.2	17.3	19.5	22.1	23.1	23.7	23.8	21.6	22.5

Source: SARB Quarterly Bulletin (2002)

EXPORT AND IMPORT OF GOODS AND SERVICES AS PERCENTAGE OF GDP (1980-2005)
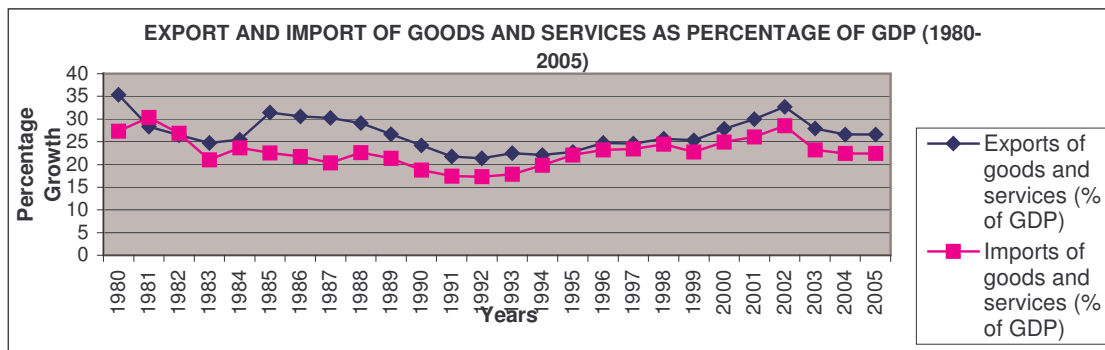
Figure 1-1 Export performance 1980-2005

Source: World Bank (2006)

TIPS (2002) and Fedderke and Vaze (2001) support Kusi's contention that trade liberalisation has led to the diversification of South African exports away from primary products such as mining, which have been declining. For example, as a percentage of GDP, gold exports have declined as follows: 33% (1990), 31.2% (1993), 23.5% (1996) and 16.3% (1999). Exports of primary products as a percentage of GDP have also declined as follows: 24.5% (1990), 25.4% (1993), 21.5% (1996), and 20.4% (1999) (Quantech database 2004).

In contrast, exports of material-intensive products rose from 6.1% (1990), 5.7% (1993), 7.1% (1996) to 7.9% (1999) as a percentage of GDP, and the export rate for manufactured products also increased as follows: 9.2% (1990), 14.4% (1993) 19.9% (1996) and 23.6% (1999). Figure 1.1 shows time series data indicating that trade openness had a strong impact on South Africa's international trade with both exports and imports growing substantially. The openness coefficient value, the import penetration coefficient value and the share of the country in imports and exports, all grew. Despite the growth of exports in many sectors, economic growth overall has been low (TIPS 2002; Edwards 2002). South Africa is still a primary manufacturing and export country. However, the country is clearly moving towards the production of other manufactured goods and services such as information technology (IT). For the detailed sectoral composition and relative importance of trade flows, see Chapter 4.

South Africa is the world's largest producer and exporter of gold and platinum, and exports a significant amount of coal. In 2000, platinum replaced gold as South Africa's largest foreign exchange earner. The value-added processing of minerals to produce ferroalloys, stainless steels, and similar products is a major industry and an important growth area.

The country's diverse manufacturing industry makes it a world leader in several specialised sectors such as railway rolling stock, synthetic fuels, and mining equipment and machinery.

In 2003, the tertiary sector (services) represented 65% of the GDP, followed by the secondary sector (industry) at 24% and the primary sector (agriculture and mining) at 11%. Primary agriculture accounts for about 4% of the gross domestic product. Major export crops include citrus and deciduous fruits, corn, wheat, dairy products, sugarcane, tobacco, wine, and wool. South Africa's agricultural production, much of it under modern irrigation schemes, is highly productive and makes the country a net exporter of food.

South Africa's major export markets include the European Union (EU.), United Kingdom (UK), United States of America (USA), Germany, Italy, Japan, East Asia, and sub-Saharan Africa. In 2003, exports were worth US $36.3 billion, amounting to 28.2% of GDP, up from 11.5% in the previous decade while imports amounted to US $34 billion. Major imports comprise machinery, transport equipment, chemicals, petroleum products, textiles, and scientific instruments, primarily supplied by Germany, the USA. Japan, UK and Italy (see figure 1.1 above for the import and export trend in South Africa).

South Africa continues to pursue both regional and international trade partners. In 1999, it successfully completed the negotiation of a EU-South Africa free trade agreement (FTA), which became operational in January 2000. Under this agreement, the phasing in of South African access to EU markets was set to occur over a 10 years period, while the reduction of South African tariffs on EU products was set to take place over a period of 12 years. The country receives the benefits accruing from the USA's African Growth and Opportunity Act (AGOA), a USA trade agreement with some African countries that qualifies plenty of African products for export to the USA.

South Africa is a member of an oldest custom union; the Southern African Customs Union (SACU). Under SACU, revenues collected in the member countries' (Botswana, Lesotho, Namibia and Swaziland) common custom area are shared among themselves according to an agreed revenue sharing formula. In August 1996, South Africa signed a regional trade protocol agreement with the Southern African Development Corporation (SADC). Under the agreement, the government intends to provide duty-free treatment for 85% of SADC trade by 2008 and 100% by 2012. South African trade with other Sub-Saharan African countries, particularly those in the Eastern and Southern Africa regions, has increased substantially. In late 2005, the country signed a memorandum of understanding with the government of

Tanzania relating to trade, economic, scientific, technical and cultural cooperation. In addition, South Africa has developed bilateral trade agreements with other African countries. South Africa accounts for 71% of the SADC's GDP. Lewis (2001), questions the feasibility of satisfying the conflicting obligations and potential tensions among the varying trade related institutions and their various members.

The distribution of employment among the four major sectors in South Africa includes 12% for both agriculture and mining, 28% for manufacturing and 60% for services. A fundamental difference between the South African economy and that of most other developed economies lies in the importance of primary industries. In South Africa, the primary industries remain both rural and mostly in mining when compared with that of developed countries.

In the 1990s, jobs in the primary sector declined by 3.5% (TIPS 2002; Pretorius 2002). From 1993-2000, employment in the manufacturing sector declined by 11.2%. However, from 1994-2001, employment for the higher-skilled workers increased by 8.2% and by 7.2% for semi-skilled workers (Edwards 2002). Jenkins (2001) reports that between 1994 and 2001 there was a growing bias towards more skilled labour caused by the changing pattern of trade in South Africa. Figure 1.2 below shows that jobs have been declining over the years starting from the year 1990. Figures 1.3 indicates how job losses have mostly affected unskilled labour while skilled and highly skilled labour demand has been rising significantly. Figure 1.4 shows an increased demand of skilled men and women for the year 2003 when compared with the demand for unskilled men and women labour (figure 1.5); skilled men gain the most.
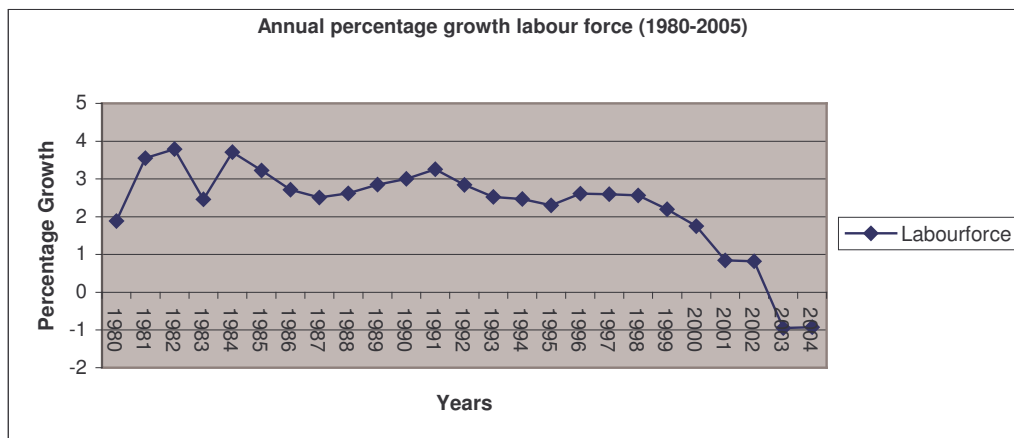
Figure 1-2 Annual percentage growth of labour force 1980-2005

Source: World Bank (2006)
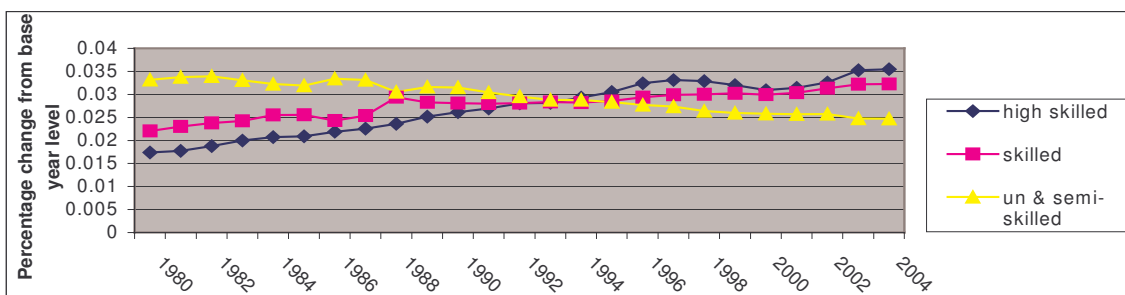
Figure 1-3 Annual percentage growth different skill types of labour

Source: Own calculation from Quantech database
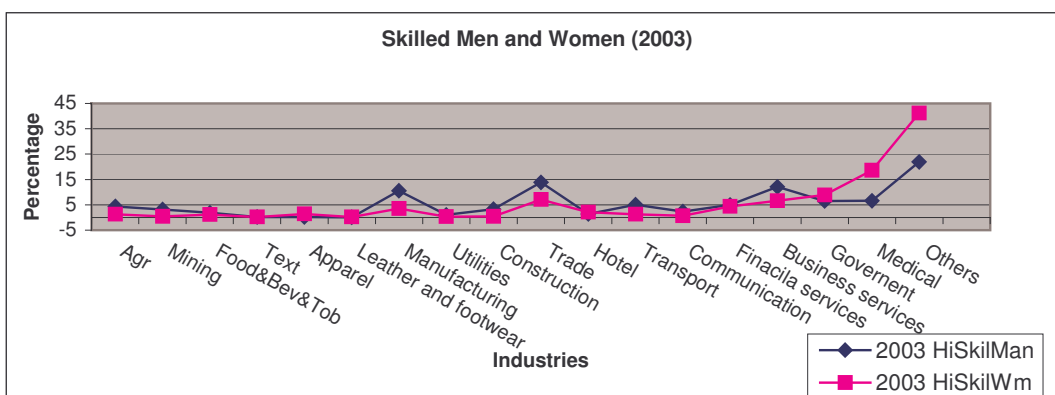
Figure 1-4 Skilled Men and Women (2003)
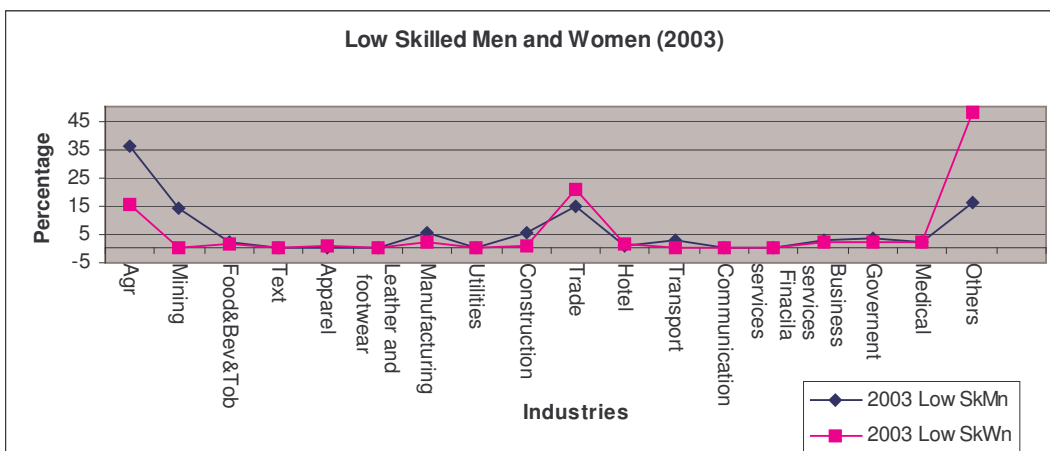
Figure 1-5 Low skilled men and women (2003)

Source: Own calculation from Labour force survey (2003)

1.5   TRADE REFORMS IN RELATION TO AGRICULTURE

1.5.1   The Doha Round of multilateral trade negotiations

Agricultural support policies such as subsidies to farmers by the Organisation of Economic Co-operation and Development (OECD) have negative effects on less-developed countries' agriculture. Subsidies allow the EU and USA to sell crops at artificially low prices, creating unfair competition against farmers in the less-developed countries (LDCs) in both their domestic and international markets. For example, the United Kingdom (UK) sells each ton of wheat and sugar on the international market at an average of 40% and 60%, respectively, below the cost of production.

These distortions benefit the OECD farmers who obtain higher prices, estimated at 31% above the world prices (ActionAid 2002). If current distortions on cotton[4] were removed, African producers would increase their gross revenue by about 19% (ActionAid 2002). Cheap food imports benefit consumers in LDCs in the short term. However, it undermines the sustainable livelihoods of local men and women farmers and farm workers. As local men and women farmers stop producing crops that cannot compete with cheaper imports, there is an increased dependence on food imports and decreased national food security. In addition, food imports contributes to a shift in consumption patterns away from locally produced foods, worsening the situation for local farmers.

1.6   AGRICULTURAL TRADE REFORMS IN SOUTH AFRICA

After joining the WTO in 1995, South Africa signed the agreement that eliminated its old economic system, which was based on import substitution, high tariffs and subsidies, anti-competitive behaviour, and extensive government intervention in the economy (TIPS 2002). Agriculture, together with other sectors, were subjected to rapid trade liberalisation policies (Kirsten 2000; TIPS 2002). The marketing boards which were responsible for the quota system and setting of prices were dismantled. In 1995, the government established the agricultural market division of the South African Futures Exchange where crops such as maize, wheat and sunflower seed currently trade. The government has also implemented the

---

[4] Cotton production in South Africa accounts for about 2% of the total agricultural production.

non-tariff provisions of the WTO agreement in agriculture, such as the removal of domestic support and domestic subsidies (see Table 1.4).

Table 1.4 Domestic support reduction: Aggregate measure of support (AMS[5])

Domestic Support Reduction										
Crops	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Green Box[6]		2,494.8	2,351.3	2506.8ᵍ	2,494.8	2,585.80	3,023.59	3,023.59	2,015.4	4,355.7
AMS Commitment		2,435.3	2257.31	2,267.3	2,183.3	2,099.40		2,015.42		3,950.8
Current AMS		1640.33	1938.6	2198.3	820.13	0	0	0	0	0
	Wheat	611.98	818.86	1,160.2	805.67	0	0	0	0	0
	Sugar	847.11	862.43	928.02	805.67	789.920.	0	0	0	0
	Tobacco	115.86	118.32	27.13	0	0	0	0	0	0
	Cotton	4.20	46.66	33.74	-4.81	0	0	0	0	0
	Maize	100.48	242.42	0	0	0	0	0	0	0
	Tea	61.18	92.01	49.19	14.46	0	0	0	0	0
Percentage total agricultural production		1.6		0.63	0.09	0.02	0	0	0	0

Source: WTO notifications (1995-2003), DOA, International Trade Unit (2005)

Table 1.4 shows a rapid reduction of the domestic support and the country's commitment to reduce distortions in agriculture as measured by the current aggregate measure of support (AMS). In 1995, the rate of non-product-specific domestic support was 1.60% of the total value of agricultural production. By 1999, the level had declined to 0.02%. It reached 0.0% in 2000. The maize price support was phased out in 1997, followed by the withdrawal of wheat and tobacco price support in 1998. In 1999, the cotton sector was granted an administered price below the external reference price due to its use as a raw material for the country's textile and garment industries. The sugar sector retained price support until 2001, because of its processed output nature (WTO notifications 1995-2003).

The General Export Incentive Scheme (GEIS) was abolished in 1997, and the country changed agricultural assistance to "Green Box", as required by the WTO. By 1998, 72% of agricultural

---

[5] AMS is the measure of subsidy that is not allowed by the World Trade Organisation (WTO). AMS measures the total expenditure on domestic support, including the value of market price support through administered prices provided by the policies not exempt under the Agreement.

[6] These policies were considered to have the smallest potential effects on production and trade. *Green* means that countries could go ahead with these policies, that is, they are exempted from support reduction exemption (example, research, infrastructures, etc.).

goods received tariffs of less than 15%, while 38% received a 0% tariff (WTO 1998). In 2005, agricultural products subjected to high tariff duties were meat and dairy products. Important crops such as sugar, maize and wheat have variable duties that are driven by changes in world prices. For example, the wheat sector receives protection that makes up the difference between the external reference price and the South African-applied administered reference price. Poultry's protection against lower international prices involves a 27% flat rate on frozen chicken parts. South Africa ranks second in the world in antidumping initiations in terms of US dollar of imports (Van Zyl 2001), although none have ever involved agriculture.

The significant liberalisation of South Africa's agricultural trade policy has produced an efficient sector. Both exports and imports of agricultural commodities, food, tobacco and beverages have increased rapidly as seen in Figure 1.6 below. However, small farmers and most farm workers have not benefited significantly from trade liberalisation of agricultural policies since the early 1990s (Van Zyl, Vink & Kirsten 2000).
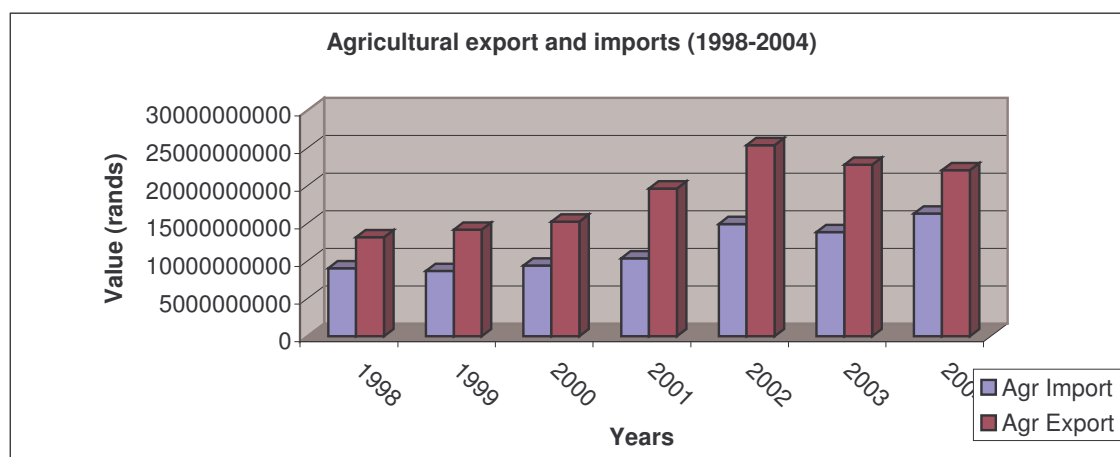
Figure 1-6 Import and Export of Agricultural Sector (1998-2004)

Source: The Department of Agriculture (International Trade Division)

1.7 SOUTH AFRICAN AGRICULTURE AND GENDER

The South African agricultural sector is a dual system consisting of commercial and subsistence agriculture. The commercial sector is highly capitalised and is increasingly being integrated into the world markets. The sector consists of 46 000 – 60 0000 white farmers who own 87% of the total arable land. The subsistence sector comprises 2.4 million black households who farm the other 13% of the arable land. The black farmers, who lack resources

and technology produce mainly for their household consumption (Kirsten *et al.* 2000).

The direct contribution of the primary agricultural sector to the economy is about 4% of the GDP. However, agricultural exports comprise 7-10% of total South African export revenue. The largest export groups are sugarcane, fresh grapes, citrus, nectarines, wine and deciduous fruit. Other important exports include maize, meat, wheat, avocados, plums, black tea, groundnuts, pineapples, tobacco, wool, cotton, and dairy products (Agricultural Census 2002; Van Zyl, Vink & Kirsten 2000).

Although formal agriculture is low-paying it provides employment for about 1 million farm workers. Men occupy 82% of the permanent positions (e.g. farm managers and foremen), while women occupy 18% of such positions. On the other hand, women hold 54% of casual jobs in agriculture (Agricultural Census 2002). The rural survey of June 1997 shows that 823 000 households of the 2.4 million households in the subsistence sector, are engaged in subsistence farming, of which 586 000 are women-headed and 236 000 are men-headed. The high woman to men ratio in subsistence farming is consistent with findings in other LDCs. For example, women comprise 70-80% of agricultural producers and processors in rural areas in most sub-Saharan countries (FAOSTAT 2006).
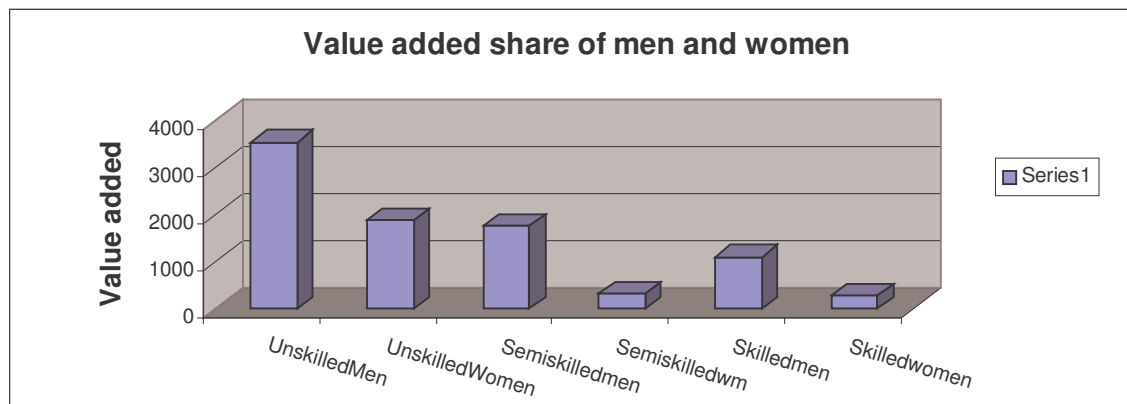
Figure 1-7 Value-added share by men and women in South African agriculture

Source: Own calculation based on the 2000 gendered Social Accounting Matric (SAM)

Figure 1.7 shows that South Africa women have lower value added shares in agriculture than men for all skills types. However, this does not include value-added on agriculture produced for home consumption, because it was not included in the 2000 South African Social Accounting Matrix (SAM). The household value-added production not captured by the 2000 South African SAM is for the 902 000 households that own livestock, 766 000

16

households raising chickens, and 1.4 million households growing field crops, the majority who are women (Rural Survey 1997).

In addition to direct employment, agriculture creates indirect employment through agricultural linkages with sectors such as agro-processing and the food industry. The South African input-output table for 1993 shows that 66% of agricultural output is used as intermediates in other sectors. The supply of agricultural raw materials for the manufacturing sector is termed forward linkages, while the purchase of goods such as fertilisers, chemicals and implements form backward linkages to the manufacturing sector. The existence of agricultural's linkages enables the agro-industrial sector to contribute 15% of the GDP in South Africa.

In addition, South African agriculture is becoming an important source of food for many sub-Saharan African countries, most of which are not self-sufficient in terms of food production. Dependence on agriculture is and will continue to be important for a significant part of the population, largely for subsistence livelihood. Therefore, there is no robustness of the 'depeasantisation'[7] thesis in Africa which is promoted by scholars such as Bryceson (2002) and others. It is suggested that the development path for South Africa, which will create jobs and reduce poverty, must include support of agriculture (Lipton & Lipton 1993).

1.8   GLOBALISATION: PRODUCTIVITY AND FOREIGN DIRECT INVESTMENT (FDI)

1.8.1   Productivity

The technological spillover from manufacturing to the rest of the economy is important for the economic growth. Higher TFP growth has been attributed to the significant increase in the growth of real GDP during the post apartheid period, from an average of 1% in 1980-93 to 2.8% in 1994-2001 (Aurora & Bhundia 2003).

South Africa realised labour productivity growth of 3.47% in the non-agricultural formal sector of the economy from 1994 to 2002, as against 1% per annum from 1982 to 1993. Capital productivity (defined as output per unit of fixed capital input) on the other hand,

---

[7] *depeasantisation* is the school of thought that recognises the contribution of agriculture to poverty alleviation, but attaches more importance to non-agricultural activities, such as rural non-farm enterprises and social services.

declined at an annual average rate of 0.8% during 1982–1993, while it grew positively at an average annual rate of 1.3% during the period 1994–2002. Multifactor productivity rose at a faster rate during 1994–2002, than during 1982–1993 with an average annual growth rates of 0.2% and 3.45%, respectively.

The highest increase in multifactor productivity has been in electric machinery (4.53%), other non-metallic mineral products (4.89%), metals, metal products, machinery equipment (4.39%), and transport equipment (4.45%).

The decline in multifactor productivity is mostly noticed in communication (-2.72%), wood, paper, paper product, publishing, printing, furniture and other-manufacturing (-0.14%) sectors which are mostly labour-intensive sectors (see Table 1.5).

The main source of productivity is attributable to globalisation because of increased inflows of FDI. In order to finance the current account deficit, and to increase investment due to low low levels of private and public saving rates, South Africa has embarked on FDI attraction.

FDI is credited with the introduction of new technologies, increased productivity, improved management, and access to markets, training, higher wages and improved economic growth (Markusen & Venables 1999; Robinson 1998; Harris and Robinson 2002). Empirical literature shows a direct relationship between FDI and the rise in productivity in many countries. For example, Blalock and Gertler (2005) found FDI to have raised average productivity in foreign and domestic firms in Indonesia, Barrel and Pain (1997) found this in the United Kingdom (UK) and West Germany, and Chuang and Chi-Mei (1999) observed the same in Taiwan. Biggs, Tyler, Shah and Srivastava (1995) made a similar conclusion for Ghana, Kenya and Zimbabwe. Urata and Kawai (2000) for Japan, and Arezki, Ahmed and Funke (2003) for South Africa (see Chapter 3 for details). Productivity has consistently improved in manufacturing sectors and in service sectors in South Africa.

Table 1.5 Productivity in South African sectors

	Multifactor ProductivITY					Labour productivity					Capital productivity				
	1980	1990	2000	2001	2002	1980	1990	2000	2001	2002	1980	1990	2000	200	2002
Agriculture	85.7	116.7	134.3	132.8	138.6	88.1	118.	140.1	140.5	151.9	84.9	116	131.1	129.	133.6
Mining	157.4	94.4	114.8	112.1	107.3	89.4	88.2	137.3	138.5	136.2	178	101.	94.3	91.8	89.3
Food ,BeverageTobbacco	105.7	106.2	99.6	108.1	108.6	79.3	88.8	112.9	124.3	125.9	131.1	122.	87.6	95.4	96.4
Textile,leather, apparel	95.6	89.1	91.1	92.2	91.8	95.6	89.3	92.5	94.3	94.0	95.7	88.3	83.8	82.8	83
Paper, wood,print	113.8	99.6	89.2	91.8	95.5	108.	97.5	92.9	96.6	100.2	123	102.	82.7	83.6	87.7
Petroleum, chemical, rubber	76.1	95.4	105.1	108.5	107.3	65.1	87.3	109.4	117.7	118.4	85.5	102.	101	100.	99.4
Other non-metallic, mineral	91.4	86.6	123	128.7	132.4	83.1	83.4	164.8	175.7	183.3	103.(	91.6	88	92.4	95.9

	Multifactor ProductivITY					Labour productivity					Capital productivity				
Metals, machinery and equip	115.9	103.7	122.6	128	133.5	98.6	86.7	142.2	147.1	151.3	160	138.	98	105.	115.1
ElectricMachinery	107.2	95.3	113.8	116.3	125.2	120.	100.	117.7	122.6	132.6	84.8	85.5	108.9	107.	114.8
Radio, TV, instruments,	101.7	115.8	104.1	93.5	89.3	108.	116.	106.2	99.4	98.5	87.1	113.	98.6	76.6	66.7
TransportEq	125.4	110.9	112.4	115.9	126.7	99.1	96.9	126.	133.6	151.7	194.8	136.	91.2	90.7	94.1
Furniture & other manufacturing	59.8	114.4	96.6	97.9	98.8	54.5	107.	114.4	116.4	112.5	63.5	117	89.5	90.3	92.8
Electricity , gas, water	64.4	73.8	127.8	132.9	138.1	49.7	68.3	117.8	120.5	124.3	69.4	76	133.1	139.	145.1
Construction	115.9	96.3	145.2	152.7	157.1	118.	95.1	171	183	193.2	104.	102.	106.5	109.	108.4
Trade, catering, hotel	86.3	93.4	97.2	99.1	99.9	76.5	87.8	99.8	102.9	105.3	97.4	100	94.6	95.6	95.3
Transport	62.8	75.4	145.5	157.3	163.4	51.3	67.1	176.9	197.2	204.6	85.9	87	122.1	127.	132.9
Finance,insurance, real estat	109.2	97.5	124.5	127.9	127.7	118.	98.6	131.	134	130	103.	96.8	120.9	124.	126.5
Community, social and	78.5	95.3	99.9	99.6	98.9	76.1	94.4	100.5	100.2	99.3	88.6	100.	96.9	96.2	96.5
All industries	92.5	94.8	113.4	116.3	118.1	80.5	90.9	120.3	124.4	126.8	104.7	100	105.3	107.	109

Source: UNDP Human Development Report (2003)

Table 1.6 Sector Productivity between men and women workers (value added)

Sector	Men	Women	Sector	Men	Women
Agriculture	79.3	20.7	Metal products	54.9	45.1
Coal mining	62.0	38.0	Machinery	61.7	38.3
Gold mining	74.3	25.7	Electrical machinery	65.2	34.8
Other mining	74.6	25.4	Comm. equipment	61.1	38.9
Food processing	67.6	32.4	Scientific equipment	79.9	20.1
Beverage / tobacco	65.4	34.6	Vehicles	71.7	28.3
Textiles	71.9	28.1	Transport equipment	95.8	4.2
Clothing	71.7	28.3	Furniture	56.1	43.9
Leather products	61.6	38.4	Other manufacturing	43.1	56.9
Footwear	73.3	26.7	Electricity / gas	53.9	46.1
Wood products	70.1	29.9	Water	75.6	24.4
Paper products	70.0	30.0	Construction	88.1	11.9
Printing / publishing	56.3	43.7	Trade services	43.4	56.6
Petroleum products	76.6	23.4	Hotels / catering	61.1	38.9
Chemicals	72.9	27.1	Transport services	75.0	25.0
Other chemicals	69.5	30.5	Comm. services	45.7	54.3
Rubber products	69.0	31.0	Financial services	53.3	46.7
Plastic products	70.2	29.8	Business services	62.2	37.8
Glass products	69.0	31.0	Other services	56.8	43.2
Non-metal minerals	75.5	24.5	Other producers	55.1	44.9
Non-ferrous metals	52.9	47.1	Government services	64.1	35.9

Source: own calculation from 2000 gendered SAM

Women are mostly associated with low-productivity domestic production sectors. Table 1.6 indicates that in virtually all the sectors, women productivity as measured by the value-added component is lower than that of men. Women productivity, however, is higher than that of men in the service sectors of trade and communication and in the other-manufacturing sector. Comparing productivity levels between men and women in women-intensive sectors of textile and apparel, men productivity is still higher than that of women workers. This follows the vertical hierarchy nature of many sectors with men concentrated in the highly paying top

management and technical positions while women are concentrated in lowly paid jobs.

1.8.2   Trends of FDI in South Africa (1993-2001)

Figure 1.8 illustrates a slight upward trend of South Africa's inflows of FDI since 1994. The government policy of privatisation led to the entry of FDI linked to privatisation. This occurred in 1997 and 1999 when the government privatised Telkom and Eskom. Then in 2001, there was a massive FDI inflow due to the buy-out of the De Beers minority shareholders, the Anglo American company. In 2005, FDI was boosted by the overseas purchase of ABSA Bank (SARB 2005). Pretorius (2002) documents how South Africa moved from the sole dependence of domestic-owned corporations towards increased involvement of foreign-owned corporations in the economy from the early 1980s to 2000.

Figure 1.9 shows FDI to have largely been attracted to four major sectors: automotive, chemicals, clothing and textiles, and metals. FDI in clothing and textiles is attributable to investment related to the African Growth Opportunity Act, a USA initiative to promote trade especially in the African textile sector and the European Union (EU) free trade agreement.
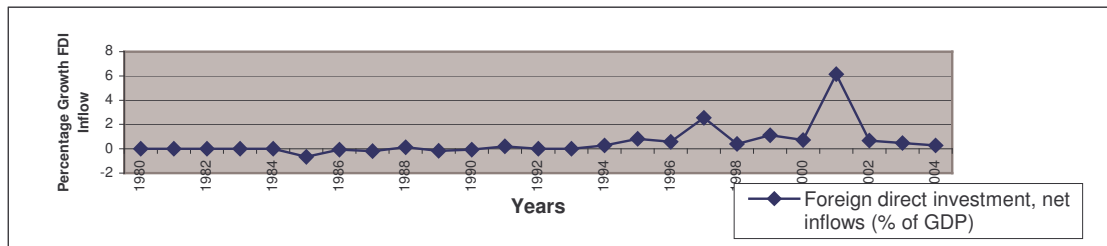
Figure 1-8 Foreign direct investment, net inflows (% of GDP), 1980-2004

Source: South African Reserve Bank, Quarterly Bulletins (various)
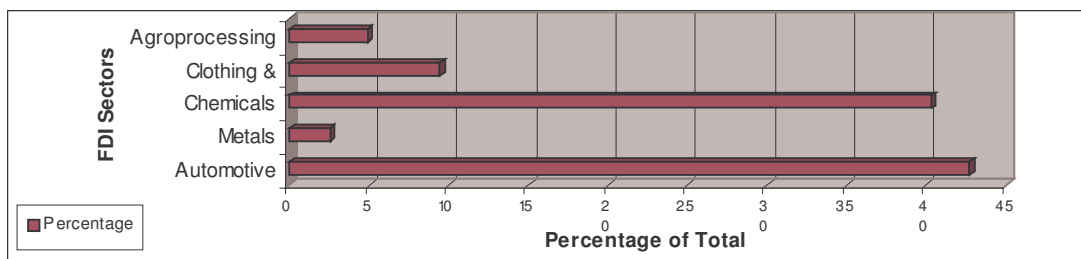
Figure 1-9 Investment (stock) 2001

Source: South   African   Reserve   Bank   Quarterly Bulletins

20

1.8.3   Government incentives to FDI

The South African government has developed an industrial policy that focuses on the development of a high-technology knowledge economy. The strategy is to provide incentives for FDI in energy-intensive, mineral processing, and in high-technology and services sectors (the Department of Trade and Industry 2002). The incentive programmes include the Small and Medium Enterprise Development Programme, which provides cash grants to small and medium-sized foreign firms in the tourism, manufacturing, and high-value agriculture and aquaculture. The Critical Infrastructure Fund covers part of the infrastructure development cost incurred by local authorities to attract investment. The Skills Support Programme provides cash grants to foreign businesses in order to train employees. The Foreign Investment Grant assists with relocation costs, and the Strategic Investment Programme provides a tax allowance for large FDIs with strong employment and linkage effects.

1.9   OVERVIEW OF THE SOUTH AFRICAN ECONOMY

The South African economy grew at a level of more than 5% per annum in the 1970s and more than 3% in the 1980s, which were both above the rate of population growth. Real per capita income declined after 1974, however. The economy was characterised by a number of negative features that have been ascribed to apartheid and bad economic policies (Kritzinger-Van Niekerk, Eckert & Vink 1992). For example, in agriculture, the consolidated Marketing Act of 1968 tightened control over the marketing of agricultural products, which led to a shift away from smallfarmer-friendly policies to those that supported highly mechanised, commercial agriculture. This enabled the rise of a modern agro-industrial complex created through import substitution (Kassier Report 1992). By the beginning of the 1980s these distortionary influences on agriculture, together with a range of farm-specific policies, had created an agricultural sector needing reforms (Kassier Report 1992).

South Africa has made great progress in dismantling its old economic system, but the effects of the apartheid era will not disappear quickly. The country still has a two-tiered economy, with one tier rivalling other developed countries and the other tier resembling that of most developing countries. The GINI coefficient, a measure of inequality, was 0.59 in 2000 and stood at 0.61 in 2005 (Stats SA 2000-2005), which is nearly the highest in the world, second only to Brazil. About 86% of the agricultural arable land is held by 60 000 white commercial farmers, while more than two million black households farm on the remaining 13% of the arable land. These small farm holders operate an average of 1.3 hectares, compared with the

white farmer's average of 1570 hectares (Deininger & May 2000). Large farms are mostly capital intensive and rely mostly on irrigation as opposed to rain-fed reliance of smaller farms.

After the 1994 elections, the new government under Nelson Mandela established a separate institution called the Reconstruction and Development Programme (RDP) and located it in the President's office. The RDP was designed to provide the majority of the population with better housing, basic services, education, and health care through free access to more rural clinics. This was intended to reduce poverty and inequality, emphasising both economic growth as well as efforts to improve service delivery and human resource development for historically disadvantaged citizens. The country implemented land reforms under the RDP, but less than one million hectares of land was transferred after six years of implementations (Sibanda 2001). In 1996, the RDP office was closed and was succeeded by GEAR.

The government introduced its five-year (1996-2000) Growth, Employment and Redistribution (GEAR) strategy in 1996. This macroeconomic strategy was aimed at strengthening economic development, broadening employment, and redistributing income and creating socioeconomic opportunities in favour of the poor. Key objectives were to produce economic growth of 6% by the year 2000, maintain inflation at less than 10%, and keep employment growth above the growth of the economically active population. It also aimed at restricting the deficit between 2% and 3% on the current account and the balance of payments, reducing the budget deficit to below 4% of GDP, and maintaining a ratio of gross domestic savings to GDP at 21.5%.

The GEAR strategy has had mixed success. On one hand, it has brought greater financial discipline and macroeconomic stability. The government has significantly lowered the budget deficit and inflation. However, critics contend that GEAR's stringent monetary and fiscal targets conflicted with the RDP objectives of job creation, reducing poverty and promoting a more equitable distribution of wealth. South Africa's growth rate has remained far short of the 6% goal, which is a level deemed necessary to reduce unemployment.

However, the government has adhered to its GEAR policy, contending that in the long term, it will provide South Africa with solid economic growth. Economic growth reached 4.9% in 2005 and the government is using the Accelerated and Shared Growth Initiative for South Africa (ASGISA) to further lift economic expansion. ASGISA was introduced in 2005, with the aim of achieving an economic growth rate of 4.5% by 2009 and of 6% by 2014, as well as halving unemployment and poverty by 2014. Furthermore, ASGISA is to deal with excessive currency volatility, infrastructure weaknesses, skills shortages, barriers to competition,

regulatory obstacles, red tape, and capacity constraints through a partnership between government, private sectors and others (Government of South Africa 2005).

Proponents of gender equality find some government policies not "gender neutral". For example, they cite policies associated with GEAR which promote greater labour market flexibility in order to attract foreign investment and to improve competitiveness as having a negative effect on women workers (Valodia 2000). In addition, the type of jobs created for women perpetuate poor working conditions and keep women vulnerable and unprotected. With greater labour market flexibility, proponents of gender equality contend that the position of women worsens. That is, women experience less flexibility with regard to working time and parental responsibilities and often take new jobs with decreased benefits. Furthermore, as government reduces spending on social services, such as health, women need to engage in a great amount of unpaid labour to care for their families, further limiting their access to alternative economic opportunities. In many respects, GEAR entrenches the economic oppression that women face and increases their risk of poverty (Verhoef 1996; Valodia 2000).

1.9.1   Growth as measured by GDP

South Africa's GDP is expected to increase gradually during the next few years. Between 1993 and 2003, annual GDP growth averaged 2.6%. In 1998, there was a downturn after the global economic turmoil brought about by the Asian financial crisis and turbulence on the money markets. Growth fell to 0.8%, but rebounded to 2.0% in 1999. In 2000, GDP grew at a rate of 3.5%, but slowed to 2.7% in 2001. Growth in the economy slowed to 1.9% in 2003, and then rose to 4.5% in 2004 (see Figure 1.10).
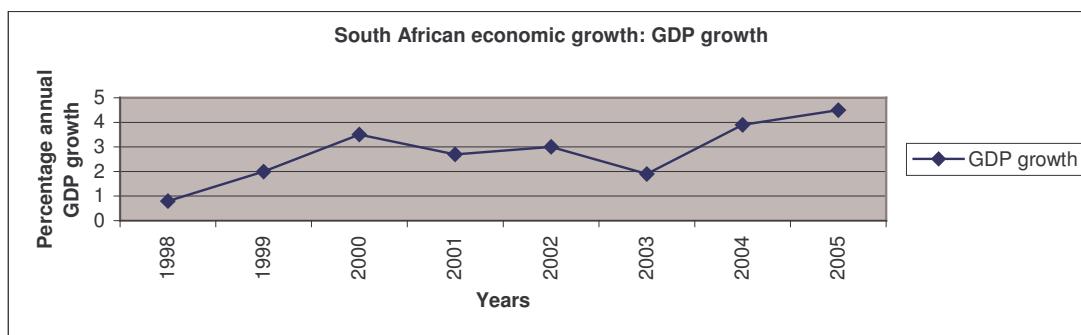
Figure 1-10 South African economic growth: GDP growth (1998-2005)

Source: SARB, Quarterly Bulletin (2006)

The economy grew by 4.9% in 2005 and by 4.5% in 2006. Growth based on improved domestic demand, large foreign capital inflows because of interest rates, the low inflation rate, and other macroeconomic stability are credited as the source of the country's economic performance. However, the government estimates that the economy must achieve a minimum growth of 6% in order to offset unemployment, of which the narrow unemployment is estimated at 28% while the broad unemployment was reported to be as high as 41% in 2006. In an effort to boost economic growth and spur job creation, the government has launched the special investment corridors to promote development in specific regions and is working to encourage small, medium, and microenterprise development (the Department of Trade and Industry 2003).
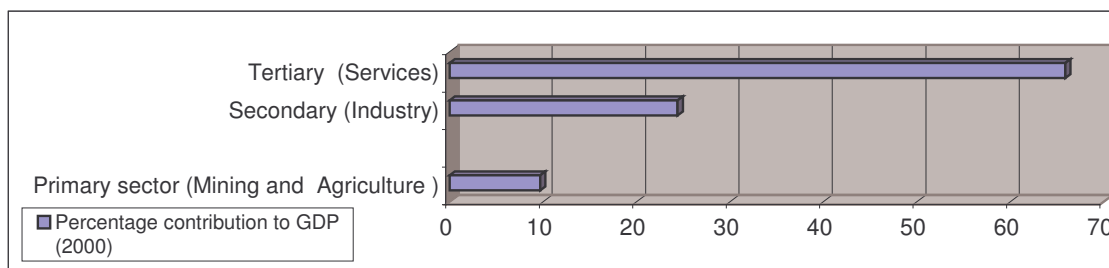
Figure 1-11 Percentage contribution of sectors to GDP in the year 2000

Source: SARB Quarterly Bulletin (2002)

Figure 1.11 above shows that the service sector is the most significant sector in terms of its contribution to GDP. Manufacturing, composed of various sectors, ranks a distant second, followed by agriculture and mining, which once were the two pillars of the economy.

1.10   MACROECONOMIC POLICIES

Table 1.7 Macroeconomic indicators for South Africa (1997-2004)

	199	199	199	200	200	200	200	200
Current account balance (% of GDP)	-1.5	-1.64	-0.51	-0.14	0.13	0.62	-1.4	-3.5
Exports of goods and services (% of GDP)	24.6	25.7	25.33	27.9	30	32.7	27.9	26.6
Exports of goods and services (annual % growth)	5.62	4.63	1.261	8.31	1.76	0.53	0.27	2.49
Foreign direct investment, net inflows (% of GDP)	2.56	0.41	1.129	0.73	6.14	0.66	0.46	0.27
GDP growth (annual %)	2.65	0.52	2.358	4.15	2.74	3.69	2.98	4.47
GDP per capita (constant 2000 US$)	3030	2975	2972	3020	3046	3122	3181	3346
Gross domestic savings (% of GDP)	17.8	18.1	18.97	18.9	19.2	20.2	21.7	21.7
Gross savings (% of GDP)	15.1	15.2	15.87	15.8	15.4	17.2	18.4	19.0
Imports of goods and services (% of GDP)	23.4	24.5	22.74	24.9	26.1	28.5	23.2	22.4
Imports of goods and services (annual % growth)	5.39	2.01	-8.36	5.34	0.22	5.06	8.85	14.1
Fiscal deficit	5.06	8.85	10.00	2.41	3.6	1.10	2.60	3.10
Inflation, consumer prices (annual %)	8.6	6.88	5.181	5.34	5.70	9.16	5.86	1.39

	199	199	199	200	200	200	200	200
Labour force, female (% of total labour force)	39.7	39.5	39.2	39	38.9	38.9	38.6	38.4
Lending interest rate (%)	20.0	21.8	18.0	14.5	13.8	15.8	15.0	11.3
Average exchange rate	4.6	5.5	6.2	6.2	8.6	10.5	8.5	7.6
Unemployment, total (% of total labour force)	21	22.9	25.2	23.3	25.8	29.7	30.7	28.4

Source: The World Bank (2006)

1.10.1 Fiscal policy

South Africa has embraced budgetary reforms such as the Medium-Term Expenditure Framework and the Public Finance Management Act, which are intended to promote better reporting, auditing, and increased accountability. Under GEAR, the country adopted a fixed-deficit GDP ratio of 3%. This, however, reduces public infrastructure investment, which counteracts the objective of GEAR regarding job creation through increased infrastructure development.

Nonetheless, the government has made strides in reducing the fiscal deficit and increasing foreign currency reserves. Reduction of deficit has occurred through a combination of strengthened revenue performance, improved tax administration, and more effective spending controls (Lewis 2001; IMF 2005). The deficit declined from a high of 10% to 2% of GDP in 1999/00, 1.1% in 2002 and 2.6% in 2003. The government's 2004 budget called for a moderate increase in spending in order to promote faster growth and poverty alleviation. Fiscal policy has major direct and indirect effects on poverty reduction, growth and employment creation thus can play a critical role in creating sustainable livelihoods.

1.10.2 Monetary policy

The government's structural changes to its monetary policy framework and inflation targeting have created more transparency and predictability. Monetary policy is an important tool for promoting growth and employment because it can stimulate or dampen economic activity. However, despite the dramatic changes in government priorities since 1994, South Africa's monetary policy framework has remained unchanged since 1989. The South African Reserve Bank relies heavily on the bank rate as the key instrument of monetary policy (Lewis 2001). Some critics assert that South Africa's disinflationary monetary policy is at the cost of reduced growth, lower national income, and higher unemployment. In 1997, a study commissioned by the National Institute for Economic Policy, indicated that from 1990 to 1995, an amount ranging between R9 billion and R13 billion was the average yearly costs of the disinflation policy in terms of GDP growth foregone. In 1997, the government ended its sole reliance

on broad money and credit as performance indicators, shifting instead to a broader set of measures including M3, credit, the exchange rate, capital flows, and international reserves. The Reserve Bank also announced its intention to phase out the foreign exchange market intervention discount window with a liquidity auction as its primary intervention mechanism.

1.10.3 Interest rates

South African interest rates have averaged 17.3% from a period of 1980–1993 to 17.2% between 1994–2002%, placing severe pressure on domestic borrowers. A high real interest rate negatively affects investment, consumption and government interest payments on its debt. Furthermore, high real interest rates promote instability in the financial market by encouraging speculative investment and attracting international short-term capital, which increases the volatility and vulnerability of the economy to the international financial market.

The country's high interest rate is due to a sizeable "risk premium" demanded by international markets concerned with South Africa's vulnerability, because of a weak foreign currency reserve position and poor economic growth (Lewis 2001). Higher interest rates constrain opportunities for men and women who require affordable financial services and land to move out of the informal sector. The international evidence shows that poor access to financial resources generally limits women's economic opportunities in small and micro-enterprises. The Grameen Bank in Bangladesh has shown that if women gain access to even very small amounts of financial resources, large gains in economic development and welfare can be achieved (Elson 2002). However, South Africa's GEAR policy of high interest rates and restrictions on credit availability works against access to the economic opportunities for those in the informal sector (Finnemore & Van der Merwe 1996). A higher interest rate, however, has a positive effect on saving, since interest is seen as the compensation for delaying consumption.

1.10.4 Inflation

For nearly 20 years prior to 1998, the consumer inflation rate was running in double digits, but by 1998, it had fallen to 6.9% and to less than 6.0% in the subsequent two years. In the year 2000, the Reserve Bank introduced an inflation-targeting framework that has a CPIX (excludes home loans) target ranging between 3% and 6%. The rand's rapid depreciation in late 2001 caused inflation to jump to 9.2% in 2002. The South African Reserve Bank increased interest rates and this, along with the 28% rand appreciation in 2003, led to a reduced consumer inflation of 5.8% in 2003. The target range was changed in November 2004 to a

continuous target rather than an annual goal. The index reached 4.8% in 2004, and rose to 5.6% in 2005, and was 5% in 2006 (SARB 2006).

1.10.5   Current account

In 2002, South Africa posted the positive current account of 0.3%, which had been negative since 1993. In 2003, the current account, which is the country's broadest measure of trade, showed a deficit of about 0.8% of GDP. The current account deficit was 1.3% of GDP in 2004, widening to 1.8% in 2005 and it is currently (2007) running over 6%. The 2004 and 2005 compares favourably with the 2004, 2005 mid-term budget forecasts of 1.4%, while the 2006 rate differs from the forecasted rate of 2%. The impact of the strong domestic currency (rand) on growth is the major factor that has pushed the current account on the balance of payments into deficit, although the strong currency has helped to guide inflation downwards. The recommended current account deficit is 3% of GDP.

1.10.6   Exchange rate

The rand appreciated by 28% against the dollar in 2003, and continued to appreciate throughout 2006. Much of the rand's strength can be attributed to the weakness in the United States dollar (US$) together with the measurable improvement in the administration of the domestic economy, which has supported the currency. Other reasons include increased portfolio capital inflows, increases in commodity prices on international markets, and the positive nominal interest rate differential between South Africa and rest of the world (SARB, 2006). Although exchange rate volatility remains a concern, the rand has stabilised and has put the South African economy in a much better position today to take advantage of the emerging global economic recovery than a decade ago. The strong rand has also helped to keep inflation low. However, the rand's appreciation appears to have eroded the profits of mining and manufacturing and contributed to employment reduction within these sectors (COSATU 2005).

1.10.7   Investment incentives

South Africa is endowed with good institutions and physical structures that provide incentives for investment. The country has a large financial structure with an active stock market ranking 18th in the world in terms of total market capitalisation. The South African Reserve Bank (SARB) is independent of the government and carries all central banking functions, influences interest rates and monitors liquidity through its interest rates on funds given to private

sector banks. The banks adhere to the Bank of International Standards' core standards and have subsequently abolished the quantitative credit controls and administrative controls of deposit and lending rates. Since 2001, South African companies have an option to invest up to R750 million in Africa and R500 million elsewhere, while private citizens can make a one-time investment of up to R750 000 in offshore accounts.

The country's transportation infrastructure is well developed, supporting both domestic and regional needs. The OR Tambo International Airport in Johannesburg serves as a hub for flights to other southern African countries. The domestic telecommunications infrastructure provides modern and efficient service to urban areas, including cellular and Internet services. In 1997, Telkom, the South African telecommunications parastatal, was partly privatised. Telkom assumed an obligation to facilitate network modernisation and expansion into unserved areas. There is a proposal to establish a second network operator to compete with Telkom. Nonetheless, the country has failed to attract significant levels of FDI. The inflow of FDI was less than 1.13% of GDP for the year 1999 and fell to 0.73% in 2000 before falling even further to 0.27% in 2004 (Lewis 2001; World Bank 2006).

1.10.8   Trade Unions

While unions represent less than 20% of the economically active population, they have significant influence on the discussions related to the South African economy (Finnemore & Van der Merwe 1996). Most union leaders primarily are interested in protecting the jobs and benefits of their members. Organised labour's position on trade liberalisation is that the government should pursue a "go-slow policy". Union leaders recognise that South Africa's decision to seek rapid economic growth through trade liberalisation means that the South African unskilled labour will face growing competition, mostly through trade with lower-wage economies. For this reason, unions are relieved by the emphasis that the government has placed on education and training through the Skills Development Act and the promotion of 25 Sectoral Education and Training Authorities, which were established in 2000 to provide training to workers in all sectors of the economy.

With increased trade liberalisation, collective bargaining is becoming more decentralised because employers and employees must take into account global labour market forces as they impact on specific sectors. Furthermore, in some instances women and men are represented by different unions, which take different positions on specific policies. For example, while the National Union of Mineworkers, representing mainly men workers, is in favour of a national

minimum wage applicable to all industries, representatives of the women-dominated South African Clothing and Textile Workers Union and South African Domestic Worker Union argue for differing minimums for different industries. This reflects an understanding by women union leaders that the industrial and occupational structure of South Africa favours or works against men and women in different ways.

Although estimates suggest that women constitute above 40% of COSATU's membership, women are underrepresented on the agenda and in the structures of the federation. COSATU, an umbrella of unions, has established a special committee to address the issues of women workers. Many of the unions affiliated to COSATU have, in turn, set up their own committee for women members (Budlender 2000). Gender equality and equity in pay and benefits remain important issues for unions in South Africa, although the low number of women in leadership positions in the union movement means that gender issues are often not put to the fore in negotiations (Finnemore & Van der Merwe 1996).

1.10.9 Organisation of the study

The thesis is divided into ten chapters. Chapter 1 describes the background to the study, its purpose and the research problem and reviews recent economic developments and measures applied in South Africa since the implementation of the first trade reforms in 1994. Chapter 2 highlights key gender issues, particularly from an economic perspective. Chapter 3 contains a review of pertinent literature concerning gender and globalisation. Chapter 4 documents the disaggregation of the 2000 SAM into factors and sectors. The CGE specifications are also depicted with an emphasis on the country-specific elements that the model incorporates in order to capture the gender behaviour in the South African economy.

Chapter 5 presents a methodological overview of social Accounting Matrix (SAMs) and CGE models and provides a brief applications of CGE models. Chapter 6 presents the simulations and analyses of full tariff reduction under different factor mobility assumptions. Chapter 7 contains the simulations and analysis about economy-wide and selected sector productivity rise. Chapter 8 details the simulation and analyses concerning the implementation of the Doha Round. Chapter 9 describes the qualitative-quantitative survey results on the well-being of women, and Chapter 10 draws study conclusions and makes policy recommendations.

CHAPTER 2

SOUTH AFRICA AND GENDER

2.1   INTRODUCTION

With globalisation, gender implications have become a concern for governments and indeed the world as a whole. In 1995, with the realisation of considerable differences in women and men's access and opportunities to exercise power over economic structures, governments worldwide made a commitment to promote women's economic rights including access to employment and control of economic resources (Oyugi 2002). The 1995 Commonwealth Plan of Action on Gender and Development and the 2000-2005 update on *Advancing the Commonwealth Agenda into the New Millennium* call for monitoring and analysis of the impacts of macroeconomic and economic reform policies on gender, and the development of strategies, mechanisms and corrective measures to address gender imbalances in key areas.

This chapter provides background information on South African policies concerning gender issues.   The legislation on gender is described.   Women's education, employment, remuneration, and their participation in trade unions, are presented in more detail.

2.1.1   Political representation and government leadership

South Africa has made significant strides in promoting gender equality. The government has passed legislation and established institutions to empower women and promote gender equality. In addition, a bill of rights, enshrined in the Constitution (No. 106 of 1996), bans discrimination based on gender.   The government has passed the Basic Conditions of Employment Act, the Employment Equity Act, and the Labour Relations Act, which give men and women workers equal protection and representation in the place of work.   This is reinforced by a network of structures such as the Commission on Gender Equality and the Office on the Status of Women.   In 1995, South Africa ratified the convention on the elimination of all forms of discrimination against women (CEDAW), the international bill of rights for women (Department of welfare 1999).

According to the 2003 Human Development Report of United Nations Development Programme (UNDP), the country ranked 85 out of 174 countries in the gender-related development index. In 1997, 25% of South African parliamentarians were women (The World Bank 2006). According to the year 2000 figures, women comprised 29.80% of the national Parliament, 29.6% of the national Cabinet, 61.5% of the deputy ministers while at the

local government level, women constituted 30% of elected representatives. In April 2004, the government appointed 22 women to the Cabinet, and four women among its nine Provincial Premiers. This political success is attributed in a large part to the strength of women's organisations that have advocated for gender equality in representation and decision-making (Molokomme 2001). However, South Africa has achieved better results in women's political participation than in improving women's access to economic assets and increased employment. For example, a labour force survey of March 2006 showed women's unemployment at 32% while that of men was at 26%.

2.2 EMPLOYMENT AND REMUNERATION

2.2.1 Employment by industry

Women's participation in the labour force increased in the 1990s. Using data from the population census, Standing (1996) and Baker (1999) show that the women labour supply increased at a much faster rate than men labour supply. In 1960, women accounted for 23% of the labour force, rising to 36% in 1985 and to 41% in 1991. Utilising data from the 1991 and 1996 census and the 1995, 1996, and 1997 October Household Surveys (OHSs), Klasen and Woolard (2000) found women's labour to have risen over these years. Casale and Posel (2002) studied the extent of women's participation in the labour market in South Africa through a descriptive analysis of trends in the labour force. They found both an increase of women in the labour force and increased self-employment in the informal sector.

Several reasons explain the increasing rate of women in the labour market: changing social conventions that a woman's place is in the home, declining fertility rates, rising relative wages for women because of reduced discrimination, rising productivity in the households because of advancing technology, rising divorce rates, increasing poverty among women, rising educational attainment of women, increasing urbanisation and changing family structures, among others (Leresche 1993; Barker 1997).

Although women make up 52,2% of South Africa's population, they only form 36% of the economically active population in the formal sector (Statistics SA 2003; Table 3). Women make up 58% of the informal sector, of which 81% is domestic work (LFS 2003).

Table 2.1 Percentage workers (Employees and self-Employed): by main industry and gender: all sectors

MAIN INDUSTRY	MEN %	WOMEN %	TOTAL
TOTAL	56	44	100
Agriculture, hunting, forestry, fishing	64	36	100
Mining and quarrying	96	4	100
Manufacturing	63	37	100
Electricity, gas & water supply	73	27	100
Construction	92	8	100
Wholesale and retail trade	50	50	100
Transport, storage and communication	80	20	100
Financial intermediation, insurance, real estate & business services	57	43	100
Community, social and personal services	44	56	100
Private households with employed persons	19	81	100

Source: Labour Force Survey (2003)

Table 2.1 shows that women conduct 81% of the private household work, which is largely unpaid and not recognised as a productive sector. Cagatay, Elson and Grown (1995) refers to the private household as being part of the "care economy" and that it should be considered as important as the formal work conducted by firms and government.

As shown in Figure 2.1, women dominate in the health and social work sector (73%) and the education sector (65%), sectors that mirror the unpaid "care economy."
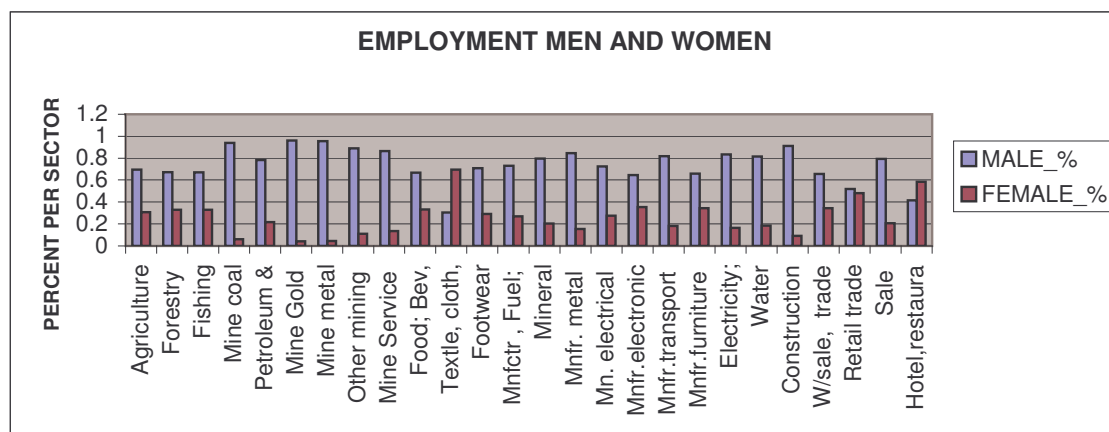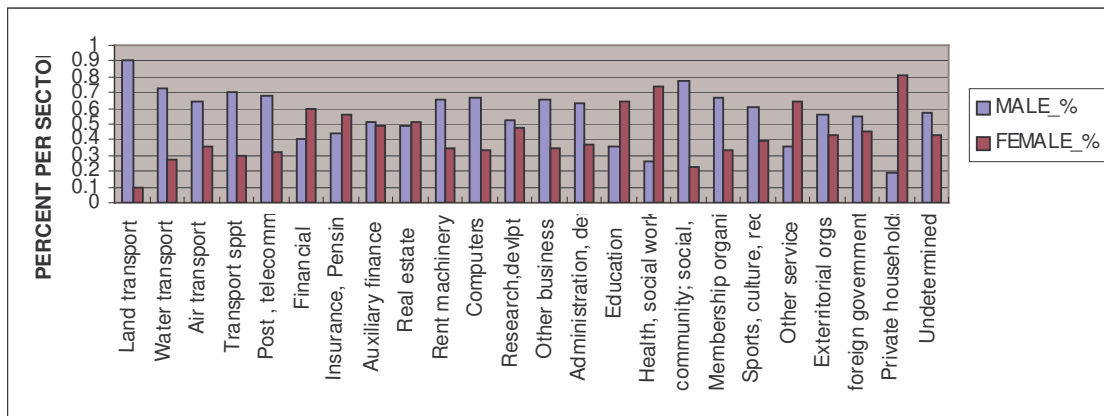
Figure 2-1 Employment of men and women in 51 sectors

Source: Own calculation from the South African 2001 Census

Women represent 70% of the workforce in the production of leather goods, textiles and clothing. They occupy 59% of the labour force in the hotel and restaurant sector and financial services. They comprise 56% of employees in insurance and pension funds, 56% in real estate activities, and 48% in retail and wholesale. Unlike other African countries where women represent as much as 80% of the agricultural workforce, South African women comprise only 30% of the workforce in commercial and subsistence agriculture.

2.2.2 Employment by occupation

South Africa is showing evidence of a trend of feminisation[8] in the labour force. Examining the work of men and women from an occupational perspective, women comprise nearly 77% of the elementary sales and services positions and 76% of the customer service clerks. Almost 84% of the associate health professionals (e.g. nurses) are women and 70% are in associate teaching positions. Men primarily hold occupations that are physically demanding. For example, 92% of workers in extraction, building, metal work, machinery and related trade are men, 84% of stationary plant operators, and 77% of the printers.

Eighty-four percent (84%) of the physical, mathematics and engineering professionals are men, as are 73% of the general managers and 70% of the corporate managers, legislators and

---

[8] Feminisation refers to predominance of women in occupations or economic sectors

33

senior officials. A more equitable balance occurs among life science and health professionals (56% women, 44% men), other professionals and other associate professionals (57% men, 42% women), other craft and related trade workers (53% men, 48% women) and machine operators and assemblers (58% men, 42% women).

Table 2.2 Occupations of men and women in various sectors.

Occupation	Men	Women
Legislators and senior officials	0.69	0.31
Corporate managers	0.70	0.30
General managers	0.73	0.27
Physical; mathematical and engineering science professionals	0.84	0.16
Life science and health professionals	0.44	0.56
Teaching professionals	0.40	0.60
Other professionals	0.57	0.43
Natural and engineering science associate professionals	0.79	0.21
Life science and health associate professionals	0.16	0.84
Teaching associate professionals	0.30	0.70
Other associate professionals	0.58	0.42
Office clerks	0.41	0.59
Customer service clerks	0.24	0.76
Personal and protective services workers	0.70	0.30
Models; salespersons and demonstrators	0.63	0.37
Market-oriented skilled agricultural and fishery workers	0.75	0.25
Subsistence agricultural and fishery workers	0.67	0.33
Extraction and building trade workers	0.92	0.08
Metal; machinery and related trade workers	0.93	0.07
Handicraft; printing and related trade workers	0.78	0.22
Other craft and related trades workers	0.52	0.48
Stationary plant and related operators	0.85	0.15
Machine operators and assemblers	0.58	0.42
Drivers and mobile plant operators	0.93	0.07
Sales and services elementary occupations	0.23	0.77
Agricultural; fishery and related labourers	0.70	0.30
Mining; construction; manufacturing and transport labourers	0.69	0.31
Occupation NEC or unspecified	1.00	0.00
Undetermined	0.50	0.50

Source: Own calculation from the South African 2001 Census

In summary, women are largely associated with the "care-economy" as unpaid homemakers and in jobs that correspond to the stereotype of women roles such as education (care of children) and health workers (care of the ill). They are lowly paid textile labourers, cleaners, teachers and nurses. The division of labour in the sectors, which mainly employ women, is vertical in nature; most women are represented at the low-levels of employment while men dominate the top-level positions. Furthermore, the 1998 October Household Survey shows women representing 40% of full-time workers, 57% of part-time and 51% of

women are casual workers. The dominancy of women in non-full time positions threatens their earnings potential because the sustainability of such types of jobs is questionable.

2.2.3 Remuneration

In order to understand the gendered impact of policies such as trade liberalisation, it is important to evaluate the particular position of women in the economy. In general, women tend to occupy a disadvantaged and vulnerable position in the economy, where they are engaged in low-paid, insecure jobs with minimum legal protection (Verhoef 1996).

The 1995 October Household Survey shows that women made up between 30-40% of the lowest income earners, while they constituted only 10% in each of the three highest income brackets. Figures 2.2 and table 2.3 below indicate that women comprise only 24% in the high-income earners and only 33% of middle-income earners. Earned income distribution in South Africa is clearly skewed along gender lines.

Figure 2-2 Remuneration of men and women in 51 different sectors of South Africa

Source: Own calculation based on the 2001 census (Statistics SA)

Table 2.3 Remuneration of Men and Women in 51 different Sectors of South Africa

Low income		Middle income		High income	
P1	0	P5	R19 201-R38 400	P9	R307 200-R614 400
P2	R1-R4 800	P6	R38 401-R76 800	P10	R614 401-R1 228 800
P3	R4 801 - R9 600	P7	R76 801 - R153 600	P11	R1 228 801-R2 457 600
P4	R9 6001- R19 200	P8	R153 601-R307 200	P12	R2 457 601 or more

Source: Own calculation based on the 2001 census (Statistics SA)

The trend also manifests itself in government where men officials earn higher salaries than women. In 1993, the ratio between highest and lowest pay in the public service was around

25:1, dropping to a ratio of 16:1 in 1996. In 1997, approximately one half of all public servants were women, but only 27% of national and 38% of provincial employees at director level or above were women. As a group, women earn less and hold positions in government that give them relatively less decision-making powers than men (Budlender 1996).

2.3   EDUCATION

Education and skills acquisition[9] are necessary for countries to make efficient use of technological advances associated with globalisation. Because arguments about the merits of globalisation often revolve around differentiated education and skills background of men and women, a brief examination of South Africa educational data is necessary.

The government has realised the importance of education and is devoting a higher percentage of its spending on education. For example, in 2000 approximately 20% of government spending was earmarked for education. According to the World Bank (2006) women are participating at levels comparable or even better than men are in the education system. The percentage of girls in primary school for 1998 through 2000 was 51%. In secondary schools for 1998 and 1999 the attendance by girls was 53%, and in 2002 it was 52%. At the tertiary level, women constituted 54% of the enrolment in 1998 and 1999 and 55% in 2000.

While education is a necessary condition for acquiring the skills and knowledge to participate in the economy, it is not a guarantee of employment. As shown in Figure 2.3 and Table 3 below, women consistently have higher rates of unemployment than men who achieve the same level of schooling. One reason might be due to the need for women to forgo employment and tend to household needs and participate in "the care economy" (Elson, 1996). As noted above, "the care economy" is closely associated with females, and it is more acceptable to withdraw girls from the formal economy in order to attend to household needs. Another possibility is the inherent discrimination against women workers in the work place.

---

[9] Statistic South Africa regards data on educational attainment to be indicators of skill levels in the labour force.
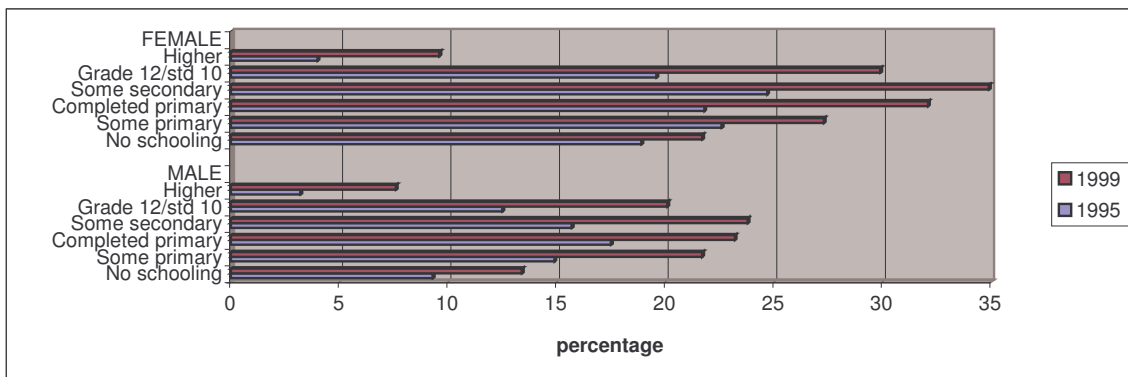
Figure 2-3 official unemployment 1995 and 1999 rates disaggregated by education level and gender

Source: OHS, 1995 and 1999

Table 2.4 Official unemployment rate 2000-2003

	2000	200	200	200
WOMEN				
Unemployment with primary education, female (% of female unemployment)	56.5	54.8	54.7	53.2
Unemployment with secondary education, female (% of female unemployment)	37.9	39.3	40.3	43.3
Unemployment with tertiary education, female (% of female unemployment)	5.1	5.8	6.1	5.9
Unemployment, female (% of female labour force)	32.8	33.7	35.1	31.7
Unemployment, total (% of total labour force)	25.8	29.7	30.7	28.4
MEN				
Unemployment with primary education, male (% of male unemployment)	51.5	49.9	49.3	47.4
Unemployment with secondary education, male (% of male unemployment)	34	36.7	36.8	38.5
Unemployment with tertiary education, male (% of male unemployment)	4	3.4	4.3	4.2
Unemployment, male (% of male labour force)	24.5	26.3	26.9	25.5

Source: World Bank, 2006

Similarly, in choosing a field of study, women at tertiary education, enroll in subjects which mirrors the care economy. Data from the Department of Education (see Figures 2.4 and 2.5 below) reveal that women tend to enrol in the social disciplines, humanities, home economics, and health care. In contrast, men predominate in mathematics, physical science and engineering, fields of study that are associated with skills and sectors where globalisation tends to create long-term and higher salaried employment.
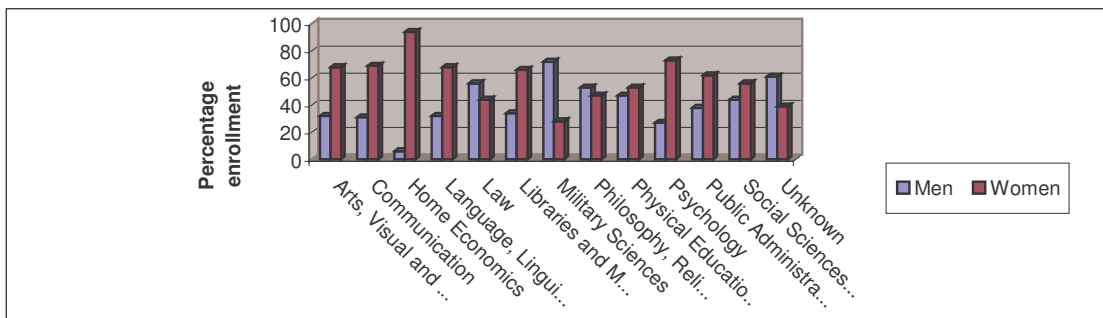
Figure 2-4 University enrolment: classification of educational category

Source: Department of education (DOE) HEMIS database 2000
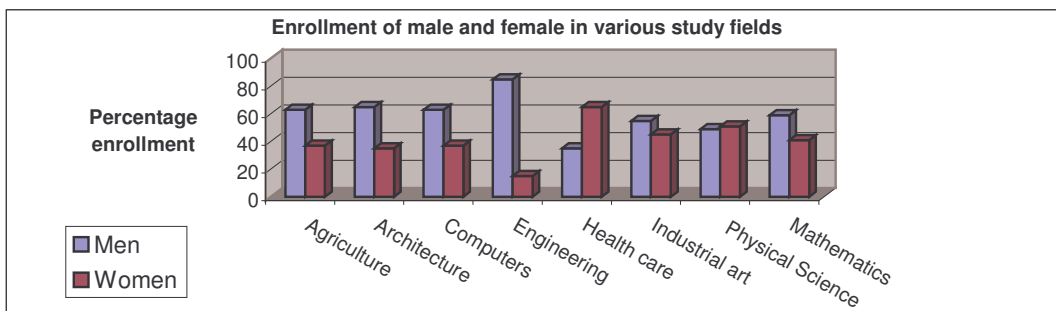
Figure 2-5 Official unemployment rate by education level and gender: 1995 and 1999

Source: Department of education (DOE) HEMIS database 2000

Globalisation creates employment opportunities in some sectors more than in others, and in each sector, there is a need for different sets of human resource skills. As noted earlier, in some instances globalisation will increase the demand for semi-skilled workers, while in other sectors there will be increased demand for higher skills. If women are to benefit from globalisation, in particular for permanent positions, a more conscious effort must be made in order to attract women to fields of study that are normally dominated by men.

In 1998, the Department of Trade and Industry launched the "Technology for Women in Business" programme in order to facilitate access to and the use of technology for South Africa's women in small business. TWIB also aims at exposing girls and young women to science and technology careers through its Techno-Girl initiative. The objective of Techno-Girl is to remove the stereotypes and biases that have often prevented girls from taking science-based courses at school or following careers in science and technology.

2.4 TRADE UNIONS

Women's organisations have played a pivotal role in promoting greater gender equality in positions of political representation and decision-making (Molokomme 2001). For example, the Federation of South African Women, formed in 1954, mobilised 20 000 women in a march to the Union Building to protest against the Urban Areas Act of 1950, which required non-whites to carry passes. The gathering is remembered by their singing of the freedom song, 'Wathint` abafazi, wathint' imbokodo'; i.e. when you strike a woman, you strike a rock and will be defeated (Walker 1982). This gathering provided the impetus for women advocating further political change and the improvement of their economic position.

Although women are not in leadership positions in proportions reflecting their workforce or membership percentages, they have been able to sensitise men union leaders to gender issues. For example, the National Automobile and Allied Workers Union (NAAWU), now part of the National Union of Metalworkers of South Africa (NUMSA), negotiated with a car manufacturer in Pretoria to provide a crèche for their children between the ages of two to six years. BMW paid for the building and running of the crèche. NUMSA is now proposing a nationwide policy of 20 days' leave for childcare. Unions have also tackled issues such as equal pay for work of equal value, job opportunities, health and safety, childcare and sexual harassment issues. It is quite conceivable that as union leaders become more aware of the gender inequalities that spring from globalisation policies, this may become one of the issues raised by organised labour in the future (Leresche 1993).

There is no doubt that the South African Government is pursuing a progressive course in promoting women's empowerment and improved gender equality. Therefore, assessing the positive or negative impact of globalisation on men and women, can serve the government's intention to nurture a more egalitarian society.

CHAPTER 3
LITERATURE REVIEW

3.1 INTRODUCTION

This chapter deals with the theoretical and empirical implications of globalisation on employment, wages, and skills from a gender perspective. Several studies have been conducted regarding the effects of globalisation and gender. These studies are not conclusive regarding the different effects on gender. Most studies show that globalisation has a positive and substantial employment impact on women, in particular unskilled women. Other studies conclude that globalisation, in particular, trade liberalisation, exacerbates the wage differential between men and women and forces women out of formal employment. In addition, technology is associated with reduced employment, particularly women's work.

This study refers to *globalisation* as an economic system that consists of free trade in goods and services (trade liberalisation), foreign direct investment (FDI) and capital markets (portifolio investment). The review, however, encompasses the physical aspect of FDI and excludes portfolio investment. This follows the employment focus of this study. Evidence is provided concerning the attribution of productivity to FDI among several of its determinants. In terms of trade liberalisation, the chapter specifically focuses on the effects of the rise of agricultural world prices trade, which is expected to result from the implementation of the Doha Round, and the effects of full trade liberalisation on agricultural, non-agricultural sectors and on gender.

The chapter examines the literature in terms of both partial and general equilibrium methodologies. Most of the analysis of gender and trade has been on partial equilibrium[10]. However, general equilibrium results are more comprehensive than partial equilibrium results. For example, Chambers (1995) finds partial equilibrium models to overstate the benefits or costs of a given policy change because these models exclude indirect effects, which can cause the major outcome of policies to be different from their immediate impact. CGE models analyse the structural effects of changes in policies, and provide the feedback effects of

---

[10] Methodologies such as growth accounting (Seguino 2000a), and ordinary least squares (Berik 2000) look at specific sectors in isolation and overlook linkages to other sectors.

policies directed at one sector on all sectors of the economy, because they incorporate the inter-sectoral linkages. In certain cases, the general equilibrium models can reverse the predictions of partial equilibrium (Hertel 1992; Fisher 2000).

3.2 AGRICULTURE TRADE POLICY (CGE) MODELS

3.2.1 The Doha Round

The General Agreement on Tariffs and Trade (GATT) was created towards the end of World War 2 to enable the smooth flow of international trade. The concern about food security among nations was used to justify the exclusion of the agricultural sector from the GATT system. It was in the 1980s, with the formation of the Uruguay Round of Trade Agreements (URAA), that agriculture and agricultural services finally made their way onto the trade negotiation agenda.

The URAA required states to reduce all forms of distortions in agriculture, such as the export subsidy. However, the URAA encountered resistance from the EU and the US, which have historically protected their agricultural commodities. The URAA was succeeded by the Doha Round of Multilateral Trade Agreements. The Doha Round was endorsed by the 2001 ministerial meeting held in Doha, Qatar. The Agreement committed the developed world to reduce and subsequently eliminate all forms of trade obstacles. In addition, the Doha Round promoted market access for the LDCs beyond that provided under GATT, and took into account the developmental needs of LDCs, such as food security, rural development, environmental protection, and animal welfare as provided for in the Agreement of Agriculture.

Proponents of free trade believe that the removal of distortions (e.g. import quotas and farm subsidies) through agricultural trade liberalisation will allow for an efficient economy-wide allocation of resources, resulting in gross national product (GNP) gains in the distorting countries and strengthening world agricultural prices (Johnson *et al*., 1985; Anderson & Tyers 1986; Edwards 1987; Hathaway 1987; Hertel *et al.* 1988; Paarlberg 1987; Tangermann *et al.,* 1987 Robinson *et al.* 1989; Robinson *et al.* 1990) in Adilu (2004), ActionAid (2002).

Several studies, which have analysed the URAA Trade Agreement and the Doha Round, have predicted an increase in the world prices of agricultural commodities after their implementation. For example, the Static World Policy Simulation (SWOPSIM) forecasts multilateral trade liberalisation to increase average world agriculture prices by 22% (Roningen & Dixit 1989). In particular, world prices for wheat, coarse grain, oilseeds and products,

dairy products, ruminant meat, and non-ruminant meat were predicted to increase by 3.7% to 12.4%. Beghin and Aksoy (2003) predict that agricultural trade liberalisation will induce significant world price increases by 10% to 20% for cotton, 15% to 20% for groundnuts, 20% to 40% for sugar and dairy, and up to 90% for rice. The increase in prices follows the undervaluation of these commodities due to subsidies paid to farmers in developed countries. They conclude that the price increases will greatly improve the income of producers of these commodities in developing countries.

3.2.2 Effects of the Doha Round on agriculture: CGE analysis

Fontana and Wood (2000) used the CGE model to observe the effects of a rise in the world prices of agricultural imports by an arbitrary rate of 50%. Their model treated men and women as separate factors of production. In addition, they treated and added domestic work and leisure[11] as sectors together with the market economy sectors into the SAM for Bangladesh. Their results indicated gains in the employment and wages of women relative to men in the labour-abundant country of Bangladesh. The greater benefit to women follows agriculture being the greatest employer of women in Bangladesh. Their conclusion revealed that the increase in the price of food boosts the relative demand for women labour by stimulating production in import-substituting sectors which mainly employs many women.

MacDonald and Kirsten (1998) used the CGE with the 1993 South African SAM to simulate the effects of changes in world agricultural prices on agriculture. They found that a rise in world food prices would cause an increase in the agricultural sector output levels, a rise in export volumes and an increase in domestic producer prices. They also simulated a 20% reduction of the agricultural export prices, which led to a decline in demand for intermediate inputs and labour by 3.8% and 0.9%, respectively, while improving wages for farm workers.

Adilu, Veeman and Veeman (2004) used a CGE model to evaluate the effects of the Uruguay Round of Agricultural Trade Agreement (URA) impacts on Canadian agriculture. They utilised a single-country (Canada) general equilibrium framework. Their study involved simulation of individual policies of tariff reduction, domestic support reduction and subsidy

---

[11] Women are assumed to be affected differently from trade policies because of the reproductive work such as raising children, caring for the sick, household chores etc.

reduction in selected sub-agricultural sectors. In addition, they made joint simulations of policies under various scenarios of world prices, which involved a minimum and maximum potential rise in world prices of crops and livestock, for example, the minimum and maximum prices of maize were 4% and 16.3%, respectively. The results showed that a rise in world prices at the minimum level would be too small to offset the negative effects on agriculture from the domestic reductions in tariffs, export subsidies and domestic supports. The Canadian agriculture was shown to undergo negative effects of reduced production, employment and exports if the world prices were to rise at a minimum levels.

However, at the maximum level of world prices, Canadian agricultural producers were expected to gain from the URAA due to increased production and increased exports. This is because the rise in world prices would be large enough to compensate for the reduction of domestic support and subsidies. Specifically, exports for wheat, other grains, and processed foods increased significantly while imports of milk and poultry products and livestock increased substantially. In terms of factors of production, the results showed increased demand of labour and capital in agriculture, particularly in wheat and other grains, while the greatest increase in factor earnings accrued in agricultural land relative to capital and labour.

Van Meijl and Van Tongeren (2001) used a CGE model to simulate partial agricultural trade liberalisation policies in some LDC countries. Their findings showed positive economic effects in general, however, negative effects were found for low-income countries, such as Tanzania and Uganda, which are exporters of primary agricultural commodities. The exports in these countries are expected to fall due to stiffer competition of their produce in the world markets. In addition, they found that low-income food-importing countries will face higher import prices of food and raw materials that will limit their ability to obtain the resources needed in their non-agricultural activities.

Using a global CGE model, Beghin, Rolad-Holst, and Van der Mensbrugghe (2002) quantified the impact of trade and domestic agricultural distortion policies of high-income countries on the terms of trade, welfare, and trade flows of LDCs. In their model, they specified world prices to increase as follows: wheat by 12%, other-cereal grains by 14.5%, bovine-cattle by 18.2%, other-livestock by 2.2%, raw milk by 2.4%, dairy products by 8.3%, refined sugar by 9.0%, and agriculture in general was predicted to increase by 4.3%. Their results predicted substantial expansion of output, exports, wage and income, particularly among the rural poor in LDCs. For example, the rural value-added was predicted to rise by over US$60 billion per annum following rising world food prices which is expected to drive up real wages

across the board. The increases in wages are predicted to be greater than the increase in capital returns, which is good for many developing countries.

3.2.3 CGE models: Trade policy in economic sectors and gender

3.2.3.1 Trade policy and employment

Fontana and Wood (2000) utilised the CGE model to study the effect of trade on women in Bangladesh. Their innovation was to extend the conventional CGE model by treating men and women as separate factors of production. Their model, also, treated domestic work and leisure as separate sectors in addition to the standard market economy sectors. They simulated four trade-related shocks and examined changes in the allocation of women labour between market and non-market sectors, and their average wage rate. Their results found trade liberalisation to raise the employment and wages of women in the labour-abundant country of Bangladesh. However, in applying the same model and analysis to the natural resource-abundant country of Zambia, Fontana (2001) found women to be affected differently, depending on their level of education and the type of household to which they belonged. While, educated women benefited, uneducated women, who mainly belong to poor households, were negatively affected by trade liberalisation policies in Zambia.

Ardnt, Robinson and Tarp (2000) used a CGE model to study the impact of trade policy reform, particularly the links between trade reform, product prices and wages by gender in Mozambique. They found trade reform to have little effect on gender differences within skills categories, but found significant effects on wage differentials across skills. Since a large share of women work as unskilled agricultural labour in Mozambique, they are mostly affected by any policy change that affects agriculture. The authours recommend that Mozambique ought to focus on upgrading the skills base of the women labour force, which is below that of men, rather than looking at the differential gender impacts in labour categories due to trade policies.

Examining the impact of tariff reforms on the overall welfare of women in India by incorporating factors of production distinguished by gender and informality in the model, Sinha and Sangeeta (2001) showed that formal households benefited more from trade liberalisation policies than informal households. Their results had negative implications for women wage earners who are concentrated in informal households when compared with men. Fofana, Chitiga, Mabugu, (2005) used a CGE with a 1998 South African SAM to test the effects of trade liberalisation on gender. Their results indicated contraction in output and value-added prices of highly protected sectors such as garments, beverages and tobacco,

44

metal, and electrical equipment, while export-oriented sectors expanded because of import-driven exchange rate depreciation coupled with the fall in input costs. They also found men wages to rise more relative to women's because men's wages is associated mainly with export sectors while women's wages are concentrated in protected sectors. Similar results were reached by Thurlow (2006) who used a dynamic CGE model with a 1993 South African SAM to assess the effects of trade liberalisation on growth, and employment among men and women in South Africa. He found both men and women to have benefited from trade liberalisation, although men-headed households benefited more from rising factor incomes relative to women-headed households. He further found trade liberalisation to have reduced a gender wage gap from rising employment among higher-skilled women workers.

3.2.4 Partial equilibrium models and trade policy

3.2.4.1 Trade policy and employment

As early as the 1970s, economists presented evidence that an increase in exports would result in an increase of the employment of women (Elson & Pearson 1981). A study by Wood (1994) showed an increase in women's employment in export industries in South Korea (75%), Mauritius (80%) and Malaysia (86%). In that same year, employment gains for women were found in countries with the presence of third national corporations (TNCs) and export-processing zones (Joekes & Weston 1994). Using a cross-country data, Cagatay and Ozler (1995) demonstrated that, with an increasing export orientation, the number of women in the labour force increases. Some studies suggest that economic change and trade liberalisation have improved women's employment in developing countries at a more accelerated pace than in developed countries during their industrialisation (Tzannatos 1995).

However, economists with a gender perspective argue that women in export sectors often endure conditions that are less favourable than those for men. In Asia, Ghosh (1996) shows how the increased demand for women employees over a period of two decades was accompanied by both dramatic increase and underemployment of women coupled with a deterioration in their working conditions. He also indicates occupational segregation, age and marital discrimination, with younger, unmarried women being preferred over older, married women. Other studies on the export sectors of semi-industrialised countries reveal large concentrations of women in increasingly casual, irregular and flexible forms of employment (Joekes & Weston 1994; Mehra & Gammage 1999).

Floro (1999) found structural adjustment policies to have forced women in Zambia to create their own employment in the informal sector after being retrenched from formal jobs.

In South Africa, Valodia (2000) found feminisation in labour-intensive industries and contends that trade liberalisation was impacting negatively on sectors of the economy that employ large numbers of women. He finds an estimated 18% fall in employment in the clothing and textile industries between 1994 and 1997 which he attributes largely to trade liberalisation, which has continued at a rapid pace since 1995. Valodia goes on to cite a number of cases studies that have shown that trade liberalisation is increasingly leading to the informalisation and instability of women's work in South Africa.

Furthermore, he notes shifting of the South African economy towards capital-intensive production, which favours the employment of skilled men. He concludes that the short-term costs of trade liberalisation are being borne disproportionately by women, whilst the potential longer-term employment benefits of the liberalisation process are likely to favour men.

Trade policies associated with structural adjustment are found to have caused job losses for many women in Africa (e.g cloth makers in Kenya and Ethiopia). Many African women lose their source of livelihood because their informal enterprises cannot compete with cheap imports from both the emerging and industrialised countries. In addition, African working women carry the burden of retrenchment because they dominate the non-professional lowest categories that are normally the first to be eliminated under structural adjustment UNCTAD (1999). On the other hand, trade reforms have benefited African women who are engaged in expanding non-traditional agricultural export such as cut flowers, and fruit and vegetables.

A theoretical study by Ertürk and Darity (2000) depicts trade liberalisation leading to the feminisation of employment in the South, while import-penetration in the North leads to the defeminisation of labour[12]. The feminisation of labour in the export sectors in the South has been accompanied by a decline in the quality of work environment for women. The researchers warn that the new global division of labour between the North and South may impede the economic benefits customarily associated with trade liberalisation.

---

[12] Ertürk and Darity use the term South as a reference to developing countries and the term North, as a reference to developed countries.

3.2.5 Trade policy and wages

It is argued that even in cases where trade liberalisation seems to benefit women in terms of increased employment, their 'competitive advantage' as workers lies in their acceptance of lower pay and poorer working conditions. For example, the World Bank (1995) found that during the Latin American adjustment episodes, the hourly earnings of women declined more radically than that of men, because women were concentrated in the most affected low-paying sectors such as apparel and, textile. Performing a regression analysis using a plant-level data, Berik (2000) and Ozler (2000) assessed the impact of export-oriented policies for Taiwan and Turkey, respectively. They found the greater export orientation in 1984-93 to have had adversely affected both women's wages and men's wages. This reduced gender wage inequality because men's wages suffered even more than women's wages. However, they do not explain the reason for this phenomenon. Beyer, Rojas and Rodrigo (1999) used time series data to test the effects of a long-term correlation between openness and wage inequality between skills in Chile. Their results showed a positive relation between trade openness and the wage differential whereby additional openness was found to have increased wage inequality between unskilled and skilled labour in Chile.

Controlling for observed productivity differences, Berik, van der Meulen, and Zveglich (2002) conducted a study on the impacts of trade liberalisation in Taiwan. They found rising import shares during 1981–1999 in major export sectors such as textiles, apparel, electronics and electrical industries to have widened the wage gap between men and women. Using industry level data, Berik (2003) found that Taiwan's rising trade openness and highly competitive industrial structure were associated with rising gender wage inequality. In contrast, a similar study in Korea, found Korea's declining total trade openness from 1980 to 1998, coupled with its less competitive industrial structure, to have had been associated with a gradual narrowing of the manufacturing sector gender wage gap.

Even in countries where wage inequalities are not increasing, as in those Asian countries that relied heavily on women labour for export-led industrialisation, the gender wage gap has not diminished and in some cases has even widened (Seguino 1997). At the same time, however, Seguino (1997, 2000) found that the gender wage gap narrowed only marginally in South Korea between 1975 and 1990, despite an average increase in exports of 15% per year. Analysing data from the period 1970-1994 in Japan in relatively women-intensive sectors, Yamamoto (2000) found women's wages to have declined more than the wages of men. In the US economy, Baldwin (1995) found that wage differences among women increased

twice as much as wage differences among men. He also found that in the UK and France wage inequality increased more among women than among men. This is attributable to a trade-off caused by trade between the US and developing countries, in which women workers in developing countries gain and women workers in the US lose in terms of relative wages.

Other studies find favourable results for women. For example, Tzannatos (1999) shows that men-women wage gaps fell at an average rate of 1% per year in a sample of 12 developing countries between the late 1970s and the early 1990s. Earlier, Tzannatos (1995) had found an overall improvement in the position of women in the labour market, which resulted from increases in women's pay in sectors more than from shifts between sectors, particularly in manufacturing, after allowing for educational attainment and work experience. During the rapid trade liberalisation in the 1990s, Rama (2001) found the decline in gender gap earnings from 39% to 26% in Vietnam.

Similar wage equalisation results were found by Artecona and Cunningham (2002) after conducting a study in Mexico. In a cross-country study based on occupational wage data from the ILO October Inquiry, for the period 1983-1999 covering more than 80 countries around the world, Oostendorp (2004) found that higher trade and FDI net inflows caused the gender wage gaps to narrow in relatively low-paid occupations in low and middle income developing countries. In addition, she found the labour market institutions to interfere with the impact of globalisation, by narrowing the occupational gender wage gaps. Interference by the labour unions in South African economy has been identified as one of the cause of unemployment.

Joekes and Weston (1994) and Joekes (1999a) reviewed several case studies of specific sectors, and some cross-country econometric studies, which showed that the growth of export-oriented manufacturing had created many jobs for women, especially in south and south-east Asia. However, they found lower wages for women than for men but concluded that while women wages were lower than that of men, their wages from export-oriented work were higher than they would have earned in the alternative forms of work available to them.

Standing (1999) and Elson and Cagatay (2000) argue that the increased overall demand for women labour may or may not result in higher wages for women relative to men. They contend that higher wages and more employment opportunities for women improve their welfare only if women can control their earnings, which are often controlled by the men in the households. This view is supported by Chambers (2000) who argues that despite the increase in female participation rates, women remain economically disempowered and that many

working women's earned income is either controlled by her spouse or a male family member.

These studies provide mixed results with some studies supporting the hypotheses that openness may narrow gender wage gaps while others show evidence that does not support the hypothesis that greater openness reduces the gender wage gap. Gender economists suggest that export successes and growth in semi-industrialised countries should not be at the expense of gender equality and women's rights. They caution against using gender inequality as an instrument of international competition as it may result in long-term adverse effects on the terms of trade of developing countries (Cagatay 2001).

3.2.6   Trade policy and skills

Wood (1991) found increased trade to have decreased manufacturing employment for unskilled workers in the OECD countries. Investigating the changes in relative wages and the supply and demand for skilled labour in Cost Rica before and after trade liberalisation, Robbins and Gindling (1999) found trade to have caused a greater demand for skilled labour.

The outset of export-orientation in East Asian industrialised economies during the 1960s and 1970s reduced wage inequality in those economies Wood (1994, 1999). Such an outcome supported the neoclassical trade theory which postulates that trade liberalisation benefit the internally abundant factor. However, the outcome was different for countries that liberalised their trade later. For example, Robbins (1994) examined changes in the structure of wages in Chile, following trade liberalisation, and found the wage growth to have been only limited to skilled labour. He found unskilled labour to have suffered the brunt of job and wage losses due to trade liberalisation.

Harrison and Hanson (1999) examined changes in both wages and employment of skilled and unskilled workers after trade liberalisation in Mexico and found little variation in employment levels. However, they found a significant increase in skilled workers' relative wages whereby foreign firms and firms involved in export markets paid higher wages to skilled labour.

While studying the trade effects in the US in health, education, social welfare, finance, wholesale and retail trade, and transportation, Armah (1995) found men employees to benefit more from gains in employment than women employees. This included cases where men in these sectors were less educated and less skilled than women employees, indicating the presence of gender discrimination.

Utilising an input–output methodology to study the impact of globalisation on the South African labour market, Edwards (2001) found a significant shift away from unskilled employment which he attributed to a technological change in the manufacturing trade, particularly in export manufacturing. He found the elasticity of substitution of skilled and unskilled workers to range from 0.408% to 0.47%, that is, a 1% rise in the relative wage of skilled workers results in a 0.408% to 0.47% decline in the skills intensity of production. Evaluating the impacts of globalisation on income distribution in South Africa for the period 1993-2001, Pretorius (2002) found job losses particularly for semi-skilled and unskilled workers in the manufacturing sector and improved labour productivity for high-skilled workers. These studies, however, did not differentiate between men and women workers.

In summary, there is mixed evidence concerning the impact of trade liberalisation on women. In most cases employment of women has increased in many different sectors. However, this increase in employment has mostly benefited unskilled labour in low paying sectors. Gender wages also show varying effects due to trade liberalisation.

3.3 FOREIGN DIRECT INVESTMENT (FDI)

3.3.1 Importance of productivity

Two types of foreign investment form part of globalistion, namely foreign direct investment and financial capital (portfolio flows). These types of investments are supported by increasing global mobility of multinational national corporations (MNTCs) and international financial institutions. The current study focuses on FDI, a non-financial investment, because of its job creation potential.

Productivity is an important force underlying the growth of real output, employment, and national income (Blalock & Gertler 2005; Edwards & Golub 2004). Using a CGE model Diao, Rattsø and Stokke (2005) found that the high economic growth of Thailand has been brought about by productivity driven by foreign spillover that fed capital investment. Counterfactual analysis shows protection to have had a serious detrimental effect on the growth rate due to productivity and investment slowdown with less foreign spillovers. A study by the McKinsey Global Institute (2003) in the automotive sector of India, found a three-times increase in productivity brought about by FDI which subsequently led to triple increase in output due to efficiency and increased employment.

Using a 2000 South African CGE model with disaggregated food and agricultural sectors,

Punt et al. (2004) found a 2% agricultural efficiency gain to cause job losses of between 0.84% and 2.44% in the sector. However, through sectoral linkages they found efficiency gains in agriculture to have increased economic activity and factor demand elsewhere in the economy, causing increase in the overall returns to factors of between 0.27% and 0.34%. In addition, they found efficiency gains to have varying welfare impacts upon different types of household. Rural households gain less than urban households, because of job losses in the agricultural sector that offset welfare gains associated with lower prices.

A study by Sun (1998) in China, concluded that FDI significantly promoted economic growth by contributing to domestic capital formation, increasing exports, and creating new employment. This is because FDI flows improve the productive efficiency of resource allocation of the Chinese domestic sectors by transferring technology, promoting exports, and facilitating inter-regional and inter-sectoral flows of labour and capital.

Fussel (2000) found technological improvement of the Mexican *maquiladoras* to result in productivity that was associated with a defeminisation of labour. He attributed the fall in women employment to the skills disadvantages of women relative to men workers. Belli *et al.* (1993) and Fallon and de Silva (1994) found export growth to be correlated with total factor productivity growth in South Africa. Tsikita (1999), Pretorius (2002) and Mai (2003) found productivity growth to have a negative employment impact because, as sectors expand due to increased efficiency they employ less primary factor inputs per unit of output which compel them to shed or use less factors. This negative labour outcome mostly affects unskilled labour relative to skilled labour, a situation referred to as skills biased technology.

Berman and Griliches (1994) found the factor content of skills biased technological change to have accounted for more than 70% displacement of unskilled workers, while 30% by the factor content of trade in the United States manufacturing. In South Africa, Edwards (2003) tested for the factor content by using firm-level data and found the technological change to account for the shift towards skills-intensive labour production while reducing employment of unskilled labour.

Testing the effects of productivity on gender, Arndt and Tarp (2000) used a CGE model with risk-aversion and gender-divided production factors to yield a 30% increase in agricultural productivity for Mozambique. Their results indicated a decline in men's wages in commercial agriculture while wages of women in food crops rose.

3.3.2 Determinants of total factor productivity

The importation of capital goods, licensing agreements, international trade, investment in machinery and equipment as a share of total investment have been identified as sources for productivity (Arora & Bhundia 2003; Klein, Aaron & Hadjimichael 2000:3-4). Arora and Bhundia (2003) sought to find out the determinants of TFP in South African economy. Their findings showed that between 1994-2001 the share of trade in real GDP contributed 46.6% of TFP, the share of equipment and machinery in investment contributed 50.4%, the share of private business sector in investment contributed 72.1%, while the share of private business sector in investment in equipment and machinery contributed 73.1% of TFP in South Africa.

Arezki, et al. (2003) found trade openness and private sector participation to have accounted for 90% of actual TFP growth during the 1990s in South Africa. Earlier, Grossman and Helpman (1991) and Rivera-Batiz and Romer (1991), Romer (1990) found trade openness to have contributed to TFP by allowing an economy greater access to imports of equipment and machinery. Such imports embody technological improvements, stimulate a need for a wider range of intermediate inputs, and subject domestic firms to more competition.

Research and development (R&D) is attributed as a source of productivity although it has not played a major part in the case of South Africa (Grossman & Helpman 1997). This is attributed to low inflows of FDI in South Africa. For example, Pain (2000) found foreign firms to contribute significantly to R&D in US and Canada while domestic firm's contribution to R&D was found to be low. Braunstein (2000) and Edwards (2003:29) accredit education with productivity because investment in human capital contributes to future growth potential by enhancing labour force productivity and the functioning of civil society.

Söderbom and Teal (2003) used panel data on 93 countries spanning the 1970-2000 period in order to find if openness to trade and higher levels of human capital promote faster productivity growth. Their results showed a significant effect of openness on productivity growth with the doubling of the level of openness of an economy resulting in the increase of technical progress by 0.8% per annum. In addition, they found a significant impact of the level of human capital on the level of income but found no effect on core productivity growth emanating from the level of human capital.

Evidence indicates that FDI is a more comprehensive source since it packages and integrates elements from all of the above mechanisms.

3.3.3 Theoretical framework of FDI

Dunning (1973) is credited for the "OLI[13]" framework, which is an "eclectic" theory of FDI that explains the foreign investment activities by ownership, location and internalisation. In this framework, ownership (O) indicates the advantage that a foreign firm possesses, such as a patent, blueprint, trade secret, or trademark, or a reputation for product quality that provides the firm with market power to outweigh the disadvantages of doing business abroad. Location (L) are characteristics that are necessary to attract FDI, such as large domestic markets, availability of natural resources, a skilled labour force, good infrastructure, low labour cost, good institutions, and political stability. Internalisation (I) considers the reasons why FDI extends to foreign markets. For example, if the transaction costs of exploiting firm-specific assets through a market arrangement are high, the owners of the asset may choose to internalise the market transaction through FDI (Markusen &Venables 1999).

It is argued that in South Africa the "L" has traditionally attracted mainly market and resource-seeking FDI, rather than efficiency-seeking manufacturing FDI. For example, Gelb and Black (2000) surveyed 162 FDI firms and found that except for primary and infrastructure firms, all other firms relocated to South Africa because of market-seeking purposes. They found foreign firms' domestic sales to account for up to 81%. However, they attributed technology progress within seven local sectors to technological spillover from FDI.

Other studies conducted in South Africa have found that increases in foreign capital utilisation by local firms significantly increase productivity (Edwards 2001, 2002; Hodge 2002). However, factors such as low rates of economic growth, limited trade openness (Lewis 2001, TIPS 2005), lack of telecommunication infrastructure, and lack of labour skills limit South Africa's attractiveness for FDI (Arezki. *et al.,* 2003).

3.3.4   Literature on FDI and productivity

Proponents of FDI contend that it increases efficiency in the use of scarce resources, stimulates economic growth in capital-deficient countries, and increases competition, innovation and capital formation. FDI also creates forward and backward linkages within the domestic

---

[13] Ownership, location, and internalization

economy, indirectly creating additional employment. However, others argue that FDI causes job loss and downward pressure on wages. Blalock (2002) and Blalock and Gertler (2005) used a plant-level panel dataset of the Indonesian manufacturing establishment, between 1988-1996 in order to find the impact of FDI on the productivity of local firms by distinguishing between horizontal and vertical externalities. They found evidence for vertical externalities. Blomstrom and Sjohol (1999) used plant-level cross-section data of 13, 663 Indonesian manufacturing firms to find if FDI has any effect on productivity. They found the existence of productivity spillover from FDI.

There is evidence that FDI improves efficiency in existing markets by promoting increased competition, thereby enhancing productivity (Cotton & Ramachandran 2001). Chuang and Chi-Mei (1999) used a regression analysis on firm-level data of 8,846 manufacturing establishments in Taiwan to assess the impact of FDI on labour quality, market structure, and export performance. They found beneficial spillovers from FDI. For example, a 1% increase in an industry's FDI ratio produced a 1.40 to 1.88% increase in a domestic firm's productivity.

Barrel and Pain (1997) also observed positive results relative to FDI in the UK and Germany. Their analysis found inward FDI to have raised manufacturing output by 12.5% or by 1.2% per year, which accounted for 30% of the growth of the UK manufacturing sector over the ten-year period (1985-95). They further estimated the efficiency spillover from FDI for the UK and for West Germany from 1972-1995 and found that a 1% rise in FDI enhanced labour efficiency by 0.27%.

A study by Markusen and Venables (1999) in Taiwan, found FDIs to have had a positive effect on the productivity of domestic firms and their propensity to export. FDI raised product quality, improved productivity and created product diversity hence became a catalyst for the development of Taiwanese local industry.

The prevalence of productivity in foreign firms has been found in several studies. For example, in the Czech Republic foreign-owned firms outperformed joint ventures with foreign partners, which in turn outperformed locally owned firms (Djankov & Hoekman 2000). In Africa, firms with a majority foreign ownership perform better than others (Ramachandran & Shah 1997).

Urata and Kawai (2000) compared the level of total factor productivity in 266 Japanese parent firms and 744 affiliates in textiles, chemicals, general machinery and electric machinery. They concluded that FDI regime promoted technology transfer and increased

productivity. They found, however, that small firms lag behind large firms in transferring technology, a phenomenon strongly correlated with technology absorption capacity. Coe, Helpman and Hoffmaster (1997) also found FDI to contribute to TFP through technological spillovers.

A study in some African countries by Biggs, Tyler, Shah & Srivastava (1995) concluded that both foreign ownership and technology transfer by FDI in the early 1990s in Ghana, Kenya and Zimbabwe had a significant impact on firm efficiency. In Kenya and Zimbabwe, they found an increased value added by 30% while an increase in Ghana amounted to over 60%.

A panel study of semi-industrialised countries by Seguino (2003) found productivity to be negatively correlated with inward FDI. She attributes the negativity to the global mobility of capital which can relocate quickly in terms of disputes such as wages. This view supports that of Haddad and Harrison (1993) who used firm-level data to test for dynamic externalities in the Moroccan manufacturing sector, and found FDI to have a statistically insignificant impact on total factor productivity growth. Aitkens, and Harrison (1999) used the plant-level survey of manufacturing establishments with over 50 workers in Venezuela between 1976-1990 to determine whether domestic firms benefit from FDI. They found an increase of FDI to be associated with the falling productivity in domestic firms.

Differing results are not due to methodological differences but rather to differences in the countries' ability to benefit from FDI, due to varying levels of indigenous human resources, to disparate degree of private sector sophistication, to differing levels of competition and to contrasting host country policies towards trade and investment.

3.3.5   FDI in relation to wages, skills and employment

Studies show that the impact of FDI on the employment of men as well as women at the aggregate level is quite limited. However, in overall employment as well as the employment of women, there are considerable disparities by sector, industry and country. For example, in developing countries it is argued that FDI has provided women in some countries with significant employment opportunities in manufacturing, promoting their economic positions by providing them with income and offering better working conditions than many alternative employment prospects available to them.

Other studies argue that most of the jobs that women hold in manufacturing through FDI in non-equity arrangements have mainly been low-skilled jobs, especially in export-oriented

industries. In service sectors, women's job has been as helpers, cleaners, waitresses, and sales persons in hotels, offices and retail establishments and in data processing (UNCTAD 1999).

However, there are certain services such as software and financial services that employ relatively large proportions of women at higher levels. Adler and Izraeli (1994:23) argue that because many FDIs operate in an extremely competitive environment they are forced to select the best people available for a job. In addition, they are increasingly characterised by network structures in human resource management, for which women are better equipped. They suggest that FDIs, at least those that are global and integrated, provide greater opportunities for women to enter managerial positions and advance further, and act as a role model that could catalyse firms in host countries that have not considered promoting women in numbers to managerial positions.

Aitken, Harrison and Lipsey (1996) investigated the relationship between wages and FDI in Mexico, Venezuela and the US and found higher levels of FDI to be associated with higher wages in the US. However, in Mexico and Venezuela, FDI was associated with higher wages only for affiliate companies, indicating that there was little if any wage spillover. Graham and Wada (2000) also investigated the effect of FDI on relative wage levels in Mexico. They found foreign firms to be paying higher wages, which increased income inequality.

Using data from 1975-1988, Feenstra and Hanson (1997) investigated the impact of FDI on the share of skilled labour wage against total wages in Mexico during the 1980s. They found rising FDI inflows to be positively correlated with the demand for skilled labour, and to account for over 50% of the increase in the skilled labour share of total wages.

Applying Oaxaca decomposition and using pooled data for various years and dummy variables for the ownership structure of companies, Mazumdar, Dipak and Mazaheri (2000) analysed earnings for eight African countries (Cameroon, Cote d'Ivoire, Ghana, Kenya, Tanzania, Zambia, and Zimbabwe). They found that foreign firms (including joint ventures) had a significant positive impact on earnings of employees, even after allowing for firm size. However, higher earnings were only associated with higher skills of the workers relative to low skilled workers.

Te Velde and Morrissey (2002) examined macro-evidence for skills-based wage inequality in five east Asian countries (Korea, Singapore, Hong Kong, Thailand and the Philippines) for the years 1985-1998. They found that FDI raised skills-based wage inequality in Thailand, but this was less clear for the other countries. Using wage and employment data from

household survey data and focusing primarily on the 1990s data, Te Velde (2003) found FDI to have played a relatively minor inequality-reducing role in Bolivia, Chile and Costa Rica with Colombia being the possible exception. He found most of the benefits of FDI to have accrued only to skilled workers as measured by occupation and education.

Zhao (2000) found foreign firms to have raised skills requirements in China, although he attributed his findings to competition of FDI with the state sector. This follows China's dual labour market comprising of the relatively privileged state sector and a private sector where foreign firms locate. As a result, the educated workers seek employment in the privileged state sector, while the less educated are concentrated in the private sector. Such a phenomenon forces transnational companies to pay skilled workers higher wages in order to entice them out of the state sector, which has the effect of raising the overall skills-based wage premium.

3.4   SUMMARY

Trade liberalisation and foreign direct investment in the developing countries have increased opportunities for some women, bringing them into sectors where they were previously under-represented. However, significant gender differentials remain and the terms and conditions of employment are frequently insufficient to guarantee more than poverty level wages.

There is increasing evidence that show that FDI leads to increased productivity. Studies on FDI in relationship to wages and skills indicate that while foreign firms often do pay higher wages, skilled workers seem to get most of the benefits. The skills disadvantages of women as compared with men workers are generally thought to be a key constraint that prevents women benefiting from FDI and trade liberalisation in general (Fussell 2000). Indeed, empirical studies of human resources have indicated that skilled labour is an important part of attracting FDI (Ritchie 2002 ; Miyamoto 2003).

CHAPTER 4

DATABASE DEVELOPED FOR THE GENDERED CGE MODEL

4.1 INTRODUCTION

This chapter describes the database developed for the gendered CGE model. The database of the model has three elements: (a) the social accounting matrix (b) data on gender and trade policies, and (c), elasticities for production, consumption, import demand, export supply and gender employment. Because data were obtained from various sources that had different formats, considerable effort was applied to convert data into the format required by the framework of the current gendered CGE model.

The chapter is arranged as follows: Section 4.2 gives a definition of the Social Accounting Matrix (SAM), and provides a brief overview of the schematic SAM. This section presents also the 43 sectors that are in the SAM, and describes the development of the database for South Africa. Section 4.3 elaborates on the procedure for the disaggregation of the agriculture sector into seven agricultural subsectors. Section 4.4 presents the methodology used to disaggregate data by gender. Section 4.5 documents data sources used for this study. The last section explains the methodology used to balance the gendered SAM.

4.2 THE SOCIAL ACCOUNTING MATRIX (SAM)

The first step required in the construction of the CGE model is the Social Accounting Matrix (SAM). The SAM serves both as a database and as a conceptual framework that is used for policy analysis (Löfgren, 2001). Generally, the SAM represents a static image of the social and economic structure of a country in a specific year, presented in the form of double entry bookkeeping. The SAM comprises series of accounts in which income and expenditure must balance. Each account consists of a row responsible for recording the details of receipts and a corresponding column that records expenditures in the form of a square matrix.

Table 4.1 presents a schematic gendered SAM with its explanations in section 4.2.1. The main difference between the conventional SAM and the SAM created for this study concerns factors of production. This study distinguishes factors of production by gender and by different skills across a variety of labour types (see Table 4.1 column 5). The flow of value added is then mapped from sectors to gender differentiated labour and capital, and the flow of these factor earnings is mapped to different types of factor   owners in their respective households.

Table 4.1 Schematic gendered social accounting matrix (SAM)

R		Activities	Commodities	Gendered l	Household	Enterprise	Government	S & I	Rest of world (ROW)	Total
E	Activities	I-O flow	Marketed outputs		Home-consumed outputs					Activity income gross output
C	Commodity	Intermediate inputs	Transaction costs		Private consumption		Government consumption	Investment	Exports	Demand
E	Gendered labour	Value-added							Factor income	Factor income
I	Household			Factor income to household	Inter-household transfers	Surplus to household	Transfers to households		Transfer to house-holds from ROW	Household income
P	Enterprises			Factor income to enterprise			Transfers to enterprises		Transfer enterprise from ROW	Enterprise income
T	Government	Producer taxes, value-added tax	Sales taxes, tariffs, export taxes	Factor income to govt factor taxes	Transfers to government direct	Surplus to govt, enterprise taxes			Transfer to Govt from ROW	Goverment income
S	Savings Investment				Household savings	Enterprise saving	Governmnt savings		Foreign saving	Savings
	Rest of world (ROW)		Imports	Factor income to ROW		Surplus to ROW	Government transfers to ROW			Foreign exchange outflow
	Total	Activity	Supply expenditures	Factor expenditure	Household expenditure	Enterprise expenditure	Government expenditure	Investment	Foreign exchange inflow	

EXPENDITURE (column header spanning top)
RECEIPTS (row header spanning left)

Source: Löfgren 2001 (IFPRI)

4.3   THE 2000 SOCIAL ACCOUNTING MATRIX FOR SOUTH AFRICA

The baseline data that represents the South African economy in the year 2000, which is used in the current study, is based on the 2000 conventional SAM published by Thurlow and Van Seventer (2002). It distinguishes between 43 various commodities and 43 different industries (see Table 4.15 in Appendix 4.A for the full list of commodities). The SAM includes one government, enterprises, 14 households and the rest of the world (ROW). This study adjusts this conventional SAM in order to conduct gender analysis.

Thurlow and Van Seventer (2002) produced two South African SAMs; one for 1998 and the other for the year 2000. The current gendered study utilises the 2000 SAM, because it contains data that properly reflects the impacts of globalisation. This is because the South African Government implemented trade reforms after joining the WTO in 1995, and in 1996, the SADC trade protocol came into effect. In   addition, the Government implemented the

free trade agreement with the EU, South Africa's largest regional trading partner. Table 4.2 shows data sources used to construct the 2000 South African conventional SAM.

Table 4.2 Summary of data Sources used to construct the 2000 SAM

Source of Data	Relevant accounts	Reference
Supply-Use Tables (1993 and 2000)	Intermediate demand; Capital and labour value-added; Activity, sales and trade taxes; Marketed output; Government demand; Household demand; Investment demand; Imports and exports; Transaction costs;	Stats SA (1999c and 2000)
Census of electricity, gas, steam (1993)	Intermediate demand; Capital and labour value-added	Stats SA (1996e)
Manufacturing censuses (1993 & 1996)	Intermediate demand; Capital and labour value-added	Stats SA (1995 and 1997c)
October Household Survey (1995)	Labour income from activities	Stats SA (1996a)
Income and expenditure surveys (1995 and 2000)	Income from activities; Labour income to households; Corporate dividends; Household transfers to government, households, and rest of world; Personal taxes; Household savings; Government and rest of world transfers to households; Household consumption demand	Stats SA (1996b and 2001a)
World Trade Analyser (various years)	Regional trade shares and region-specific tariffs	WTA (2000)

Source: Thurlow and Van Seventer (2002)

The objective of this study is to analyse the effects of globalisation policies on gender. This necessitated the disaggregation of labour in a conventional SAM according to gender. The disaggregation resulted in a 2000-gendered SAM with seven factors of production, six different types of labour distinguished by skills and gender, and one type of capital.

This study also focuses on agriculture, as it relates to the Doha Round. This required the disaggregation of the agricultural sector into seven agricultural subsectors according to their significance in the WTO Doha Round agreement. The 2000 South African-gendered SAM with disaggregated agricultural sector consists of 49 sectors, 49 commodities, six types of gendered labour and capital (see section 4.3 on disaggregation according to agriculture). This study does not disaggregate capital according to gender due to lack of appropriate data.

Depending on the problem to be analysed, various accounts in a SAM can be specified at different levels of aggregation. This study identifies effects on gender in disaggregated sectors, as opposed to effects at the industry level (e.g. agriculture, manufacturing, services and government). To devise appropriate policies, it is important to disaggregate the sector into subsectors so as to avoid blanket applications of policies. For example, despite food, textile, leather and others being subsectors of manufacturing, they are individually affected differently by policies when compared with the effects of such policies on the aggregated sector of manufacturing.

4.3.1 The contents of the 2000 South African gendered SAM

4.3.1.1 Commodities and services

The 49 commodities and services in the gendered 2000 South African SAM, are disaggregated according to the Standard Industrial Code 3 (SIC 3). However, agriculture, mining, electricity, construction, and service sectors of trade, hotel, finance, business, transportation, and communication are disaggregated at SIC 1 level.

Table 4.3 shows both the proportion of domestically produced commodities destined for exports and the final demand imported from the rest of the world. The table shows a relatively high proportion of mining commodities as being exported. For example, gold is exported at the rate of 86%, coal at the rate of 41%, and other-mining at 64.8%. Although mining represents about 8% of economic output, it provides almost 50% of export revenues.

Relatively high levels of exports are also observed in leather, basic metals (iron and steel), and non-ferrous metals. A relatively low export level is found in the clothing, footwear, non-metal minerals, and scientific equipment sectors. The same is true in the service sectors, except the hotel and catering, which has an export intensity of 26%. In terms of imports, the greatest import penetration is found in the communication equipment (56.1%), transport equipment (53.7%), and machinery (41.9%). The imports shares are also high in other-mining, footwear, chemicals, electrical machinery, scientific equipment, and vehicles. On the other hand, the mining sector (gold and coal), and basic metals (iron and steel), accommodation, electrical machinery, transportation equipment, and textiles have low levels of import penetration.

Table 4.3 Trade: Import and export shares year 2000

Commodities	Export Intensity	Import Penetration	Export Share	Import Share
Maize	41.6	5.7	1.8	0.3
Wheat	0.2	0.6	0.0	0.1
Fruit Vegetables	13.3	2.7	0.9	0.4
Poultry	0.0	2.5	0.0	0.3
Dairy Livestock	0.1	1.7	0.0	0.3
Other Agriculture	0.0	1.7	0.0	0.2
Coal mining	40.6	1.7	3.4	0.2
Gold mining	86.0	0.0	10.1	0.0
Other mining	64.8	29.4	19.9	10.0
Food processing	8.8	7.9	3.6	3.6
Beverage / tobacco	8.2	4.5	1.6	1.0
Textiles	10.6	17.2	0.9	1.7
Clothing	6.8	7.4	0.7	0.8
Leather products	40.5	19.2	0.4	0.2
Footwear	3.7	20.6	0.1	0.8
Wood products	17.3	9.9	0.8	0.5
Paper products	19.9	8.5	2.4	1.2

Commodities	Export Intensity	Import Penetration	Export Share	Import Share
Printing / publishing	5.8	13.7	0.4	1.0
Petroleum products	14.8	4.6	3.5	1.2
Chemicals	23.1	25.5	3.8	4.6
Other chemicals	7.7	18.7	1.9	5.1
Rubber products	13.2	22.0	0.5	0.8
Plastic products	6.0	14.4	0.3	0.9
Glass products	10.5	16.0	0.2	0.3
Non-metal minerals	5.8	13.5	0.4	1.0
Iron and steel	41.3	5.0	7.2	1.0
Non-ferrous metals	34.6	15.7	3.5	1.7
Metal products	9.6	12.7	1.1	1.7
Machinery	16.4	41.9	4.6	13.1
Electrical machinery	9.1	21.2	1.0	2.5
Comm. equipment	8.0	56.1	0.7	5.5
Scientific equipment	6.8	41.7	0.4	2.7
Vehicles	12.6	27.3	5.0	12.2
Transport equipment	20.2	53.7	1.1	3.2
Furniture	18.5	6.1	1.1	0.4
Other manufacturing	23.1	19.0	1.5	1.4
Electricity / gas	3.6	0.9	0.5	0.1
Water	0.5	0.7	0.0	0.0
Construction	0.2	0.8	0.1	0.3
Trade services	0.3	0.2	0.2	0.2
Hotels / catering	26.0	17.2	2.6	1.9
Transport services	11.9	17.8	5.3	8.8
Communication services	4.8	6.1	1.1	1.6
Financial services	5.7	3.2	3.0	1.9
Business services	1.8	2.6	1.0	1.7
Other services	2.6	2.5	0.3	0.4
Other producers	2.9	3.8	0.9	1.3
Government services	0.0	0.0	0.0	0.0
All sectors			100	100

Source: 2000 South African-gendered SAM

4.3.2 Commodities demanded by household and government

Table 4.4 shows household expenditure on commodities and services. The households (hhd) range from hhd 0-hhd 924 with the last category (9) highly disaggregated (hhd 92, hhd 921, hhd 922, hhd 923, hhd 924). Household deciles hhd 0-hhd 5, which are considered as low-income (poor) households, spends a relatively large proportion of their income on maize, food, beverage, clothing, footwear, electricity and transportation services. Middle-income households use less of these goods and services than poor households. In comparison to relatively rich households, poor households spend relatively less on vehicles, transportation equipment, furniture, plastics, communication equipment, water, hotel services, business services, and financial services. In total, poor households spend about 96% of their income on goods and services, as opposed to rich households, which spend about 81%.

In addition, Table 4.4 also presents government expenditure (column 16) on goods and services, which shows relatively high expenditures for government services (10%), vehicles (4.138%) and business services (3.188%). Other significant government expenditures

include other-chemicals, transport equipment, other-industry, machinery, financial services, trade, and construction.

Concerning government income, about 21% is spent on goods and services, while other parts are allocated as transfers to households, other institutions and towards government savings.

Table 4.4 Consumption of commodities and services: household and government

Sectors	Hhd 0	Hhd 1	Hhd 2	Hhd 3	Hhd 4	Hhd 5	Hhd 6	Hhd 7	Hhd 8	Hhd 91	Hhd 921	Hhd 922	Hhd 923	Hhd 924	Govt
Maize	0.56	0.53	0.5	0.46	0.42	0.38	0.33	0.29	0.23	0.18	0.13	0.14	0.14	0.13	0.18
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
Fruit Vegetabl	2.72	2.59	2.42	2.25	2.03	1.84	1.61	1.4	1.11	0.86	0.65	0.67	0.66	0.65	0.03
Poultry	1.94	1.85	1.72	1.61	1.45	1.31	1.15	1	0.79	0.61	0.47	0.48	0.47	0.46	0.03
Dairy Livst	1.67	1.6	1.49	1.39	1.25	1.13	0.99	0.86	0.68	0.53	0.4	0.41	0.41	0.4	0.03
Other Agricul	0.13	0.13	0.12	0.11	0.1	0.09	0.08	0.07	0.05	0.04	0.03	0.03	0.03	0.03	0.18
Coal	0.1	0.08	0.07	0.06	0.05	0.05	0.04	0.04	0.05	0.05	0.04	0.04	0.03	0.02	0.08
Gold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Food	38.9	37.13	34.65	32.28	29.11	26.38	23.08	20.15	15.98	12.41	9.51	9.78	9.64	9.47	0.64
Bev tobacco	22.08	21.07	19.66	18.3	16.5	14.94	13.06	11.38	9.01	6.96	5.3	5.46	5.38	5.3	0.07
Textile	0.87	1.05	1.3	1.37	1.46	1.6	1.76	1.61	1.37	1.02	1.15	1.01	0.96	0.85	0.13
Apparel	3.65	4.32	4.82	5.07	5.22	5.27	4.99	4.44	3.58	3.07	2.22	2.14	2.29	1.58	0.12
Leather	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Footwear	1.37	1.62	1.8	1.9	1.95	1.97	1.87	1.66	1.34	1.15	0.83	0.8	0.86	0.59	0.08
Wood	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.04	0.03	0.02	0.02	0.03	0.02	0.01	0.08
Paper	0.02	0.02	0.05	0.05	0.04	0.1	0.16	0.28	0.44	0.71	0.86	0.91	0.95	0.97	0.28
Print	0.05	0.09	0.17	0.28	0.32	0.42	0.58	0.69	0.82	0.91	0.82	1.01	0.89	1.16	0.47
Petroleum	1.14	0.97	0.93	0.94	1.12	1.51	2.31	3.36	4.93	5.12	6.62	6.22	5.81	5.29	1.12
Chemical	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.08
Other-chemic	4.05	3.88	4.02	3.85	3.83	4.02	4.25	4.71	4.66	4.72	4.5	4.54	4.36	3.56	2.47
Rubber	0.02	0.02	0.05	0.07	0.12	0.2	0.37	0.58	0.89	0.93	1.25	1.17	1.1	1.02	0.11
Plastic	0.05	0.06	0.08	0.08	0.09	0.11	0.12	0.12	0.11	0.09	0.11	0.1	0.1	0.09	0.02
Glass	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.08
Non-metal	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.50
Iron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
Non-ferrous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Metal product	0.04	0.06	0.08	0.1	0.13	0.16	0.17	0.18	0.17	0.18	0.19	0.2	0.19	0.15	0.56
Machinery	0.18	0.25	0.35	0.49	0.6	0.75	0.89	1.01	1.09	1.33	1.51	1.4	1.52	1.49	1.94
Electric Mach	0.03	0.05	0.07	0.09	0.12	0.15	0.18	0.21	0.23	0.22	0.28	0.27	0.25	0.21	0.19
Com equip	0.11	0.13	0.15	0.25	0.31	0.37	0.4	0.45	0.45	0.55	0.63	0.47	0.58	0.5	0.23
Science equip	0	0.01	0.04	0.05	0.03	0.06	0.21	0.43	0.64	1.04	1.4	1.17	1.52	1.81	2.04
Vehicles	0.04	0.04	0.1	0.13	0.27	0.56	1.04	1.99	3.73	4.96	5.34	5.47	6.33	6.78	4.14
Trans equip	0.03	0.04	0.04	0.07	0.09	0.1	0.11	0.13	0.13	0.16	0.18	0.13	0.16	0.14	2.18
Furniture	0.47	0.81	1.14	1.35	1.73	2.12	2.27	2.09	1.65	1.21	1.24	1.34	1.13	0.66	0.14
Other industry	0.12	0.14	0.2	0.28	0.33	0.45	0.57	0.77	0.99	1.43	1.7	1.62	1.78	1.74	2.11
Electricity	4.62	3.92	3.12	2.62	2.34	2.22	2.02	2.08	2.21	2.11	1.77	1.68	1.48	0.88	0.35
Water	0.85	0.79	0.76	0.71	0.64	0.63	0.54	0.49	0.39	0.33	0.28	0.28	0.26	0.19	0.30
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.86
Trade	1.76	1.76	1.75	1.71	1.65	1.62	1.56	1.48	1.34	1.23	1.15	1.13	1.14	1.03	1.01
Hotel	0.69	0.9	1.06	1.35	1.71	1.81	2.1	2.35	2.78	3.17	3.35	3.16	3.61	3.47	0.49

Sectors	Hhd 0	Hhd 1	Hhd 2	Hhd 3	Hhd 4	Hhd 5	Hhd 6	Hhd 7	Hhd 8	Hhd 91	Hhd 921	Hhd 922	Hhd 923	Hhd 924	Govt
Transportation	3.52	3.92	4.8	5.45	6.12	6.43	6.35	6.03	4.87	3.99	3.7	3.92	3.5	3.24	0.59
Communication	1.69	2.06	2.81	3.39	3.98	4.26	4.25	4.01	3.12	2.5	2.28	2.47	2.16	2	0.71
Finance	1.94	2.54	2.99	3.8	4.85	5.1	5.94	6.65	7.86	8.98	9.49	8.93	10.22	9.82	1.63
Business	0.46	0.56	0.82	1.08	1.37	2.46	3.29	3.99	7.72	11.63	14.97	16.5	14.22	20.9	3.19
Other serv	1.93	2.2	2.54	2.78	3.34	3.78	4.77	5.68	5.97	5.9	5.39	5.28	4.88	2.97	1.08
Other produce	2.01	2.63	3.1	3.94	5.02	5.29	6.15	6.89	8.14	9.3	9.83	9.25	10.58	10.17	0.10
Government	0.1	0.12	0.14	0.15	0.18	0.2	0.26	0.31	0.32	0.32	0.29	0.29	0.26	0.16	10.49
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

Source: Own calculation from the 2000 Gendered South Africa SAM

4.3.2.1 Activities

By definition, activities, or industries are homogenous establishments defined in terms of inputs, production processes, and outputs. The activities may be aggregated into nine activities according to the SIC 1 classification level for agriculture, mining, manufacturing, electricity and water, construction, transport and communication, trade, accommodation, financial and business services, and community services. The current 2000 gendered South African SAM used for the data input allows for 49 production activities. These activities are classified according to the commodities classifications.

Table 4.5 shows the South African production structure for the year 2000. The largest contributor to the economy is the trade sector which contributes more than 10% to South Africa's GDP at factor cost (share of value added). This is followed by the service sectors such as finance, business, transport, communications, and agriculture. On the other hand, the contribution of each individual manufacturing sector to GDP is rather small mainly due to extensive disaggregation. For example, textiles, chemicals, transport equipment. etc. contribute less than a percentage point of GDP. Aggregate labour value-added is distributed across all sectors, as is the case for intermediates demand. Government services together with trade, financial and transportation services show a significant amount of value-added when compared with other sectors.

The value added generated in a sector is distributed to men and women workers distinguished by their skills. The summation of labour and capital value-added in the Social Accounting Matrix (SAM) is equal to gross domestic product (GDP) at factor cost. There is an association of value added and earnings of factors such as capital and labour which can either be positive or negative.

Table 4.5 Production structure (year 2000)

Sectors	Share of Total Value-Added	Capital's Share of Total Value-added	Share of Value-added in Total Output
Maize	0.5	85.3	44.7
Wheat	0.2	92.0	40.6
Fruit Vegetable	1.1	63.0	61.9
Poultry	0.5	37.5	36.7
Dairy Livestock	0.6	76.4	54.3
Other Agriculture	0.3	57.2	45.9
Coal mining	1.2	54.4	50.8
Gold mining	2.0	29.3	57.3
Other mining	3.2	66.1	51.7
Food processing	1.8	44.0	22.0
Beverage / tobacco	1.3	71.1	39.4
Textiles	0.4	21.4	29.7
Clothing	0.4	13.2	40.5
Leather products	0.0	46.6	18.7
Footwear	0.1	49.2	35.0
Wood products	0.4	30.5	35.7
Paper products	0.9	55.0	28.8
Printing / publishing	0.7	24.0	43.2
Petroleum products	1.4	85.6	32.1
Chemicals	0.9	61.9	28.6
Other chemicals	1.1	33.5	27.4
Rubber products	0.2	29.7	32.5
Plastic products	0.5	10.2	40.3
Glass products	0.1	29.0	40.2
Non-metal minerals	0.6	65.3	39.5
Iron and steel	1.2	51.1	25.8
Non-ferrous metals	1.0	81.5	39.6
Metal products	1.1	33.4	34.3
Machinery	0.8	19.3	30.9
Electrical machinery	0.5	47.7	32.1
Comm. equipment	0.2	27.2	32.6
Scientific equipment	0.1	28.6	32.3
Vehicles	1.4	44.3	19.5
Transport equipment	0.1	7.6	29.1
Furniture	0.3	28.3	31.9
Other manufacturing	0.2	46.9	22.4
Electricity / gas/steam	2.3	65.2	62.1
Water	0.4	67.2	31.6
Construction	2.8	40.1	31.1
Trade services	10.5	45.5	54.9
Hotels / catering	1.9	76.8	66.1
Transport services	5.9	55.5	54.2
Comm. services	3.7	60.2	57.8
Financial services	9.6	60.8	60.8
Business services	8.6	69.0	67.2
Other services	1.8	49.3	49.7
Other producers	3.9	15.6	68.0
Government services	21.0	33.7	78.3
All sectors	100.0	48.9	50.7

Source: 2000 South African Gendered SAM

4.3.2.2   Factors of production: Capital and gendered labour

The 2000 South African SAM is divided into two factors of production: labour and capital. Labour is further disaggregated into categories of skilled, semi-skilled and unskilled labour (see Table 4.6 for the description of labour categories). The gendered SAM further categorises skills into skilled men, skilled women, semi-   skilled men, semi-skilled women, unskilled

men, and unskilled women. The disaggregation by gender allows the analysis of the differentiated employment, wages and earnings of men and women workers in South Africa.

The share of each skills type of men and women worker within a particular sector is obtained from the Income Expenditure Survey 2000 (IES 2000). The government of South Africa conducts various surveys that are relevant for this study. These include the Income Expenditure Survey 2000 (IES 2000), the October Household Survey (OHS), 2001 Census, and the Labour Force Survey (LFS). The LFS was started as a biannual survey in the year 2000 and has since replaced the OHS. For this study, the IES 2000, OHS, Census 2001 and February and September 2000 LFS (Stats SA 2001b) data were used to ascertain the correctness of gender proportions. The IES contains information pertaining to different occupations that were used to group workers into different types of skills (see Table 4.6). The occupations are based on the ISCO-88 Code.

Table 4.6 Description of the SAM men and women labour categories

Labour Category	Occupational Categories
Skilled Men and Women (1-3)	Legislators; Senior Officials and Managers; Corporate Managers Directors and Chief Executives; Professionals; Semi-professional and Technical occupations
Semi-Skilled Men and Women (4-8)	Clerks Workers ; Service Workers ; Sales Workers ;Semi-skilled Agricultural and Fishery Workers Craft and Related Trades Workers; Plant and Machine Operators and Assemblers ; Clerical occupations; Sales occupations; Transport, delivery, and communications occupations; Service occupations; Farmer, and farm manager; Artisan, apprentice, and related Occupations. Production foreman, and production supervisors
Unskilled men and women (9)	Elementary Occupations; Messengers and Related Workers Mining and Construction Labourers; Manufacturing Labourers Agricultural, Fishery and Related Labourers Helpers, Cleaners and Launderers

Source: Statistics South Africa (IES 2000; LFS September 2000)

Unlike other studies that use either education attainment (Fontana & Wood 2000) or the wage rate as a proxy for skills, the current study uses occupation as a proxy for skills level. Statistics South Africa categorises labour skills as follows: Category 1-3 of ISCO88 (skilled labour), Category 4-8 of ISCO88 (semi-skilled labour) and Category 9 of ISCO88 (unskilled labour). The current study followed the recommendation by Statistics South Africa in categorising labour skills.

The IES 2000 gives information on value added (wages and returns to capital) generated by each sector according to the 3-digit level of National Industrial Code (NIC) code. In addition, it gives information on household demographics, spending and income patterns. The IES for the year 2000 was conducted in all nine of the South Africa provinces by Statistics South Africa (Stats SA 2001a). The survey covered 26 265 households and 104 391 individuals. Special weights, based on the data from the   1996 Population Census were created in order

to convert the survey data into a national representation. Therefore, the data used in this study is comprehensive representing all households, factors and factor earnings.

The sectors in the IES are classified at the 3-digit level of the National Industrial Classification (NIC) standards that help characterise men and women workers. The survey contains information on the workers status (i.e. employed or unemployed), separating men and women who are working from those who are not working. Workers in a specific sector report their earnings either in a monthly, yearly, daily rate or as belonging in a specific income bracket. For the purpose of this study, different types of earnings (e.g monthly, yearly, daily, bracket) were converted in a yearly category. Regular wage or salary earning workers are classified as formal workers to distinguish them from informal or casual wage labourers such as own account, and domestic workers. Other information in the IES 2000 which is of interest for this study included hours of work, education levels, occupations, age and industries disaggregated at the 3 IEC level. With regard to age, Statistics South Africa specifies the working age as ranging from 15-65 years.

According to the IES data, total income did not match total expenditure. Although the difference between income and expenditure is termed "savings', the data was screened for inconsistencies.[14] After rectifying the data, the data contained men and women of working age (15-65), who were actively working in specified sectors, and were earning income in the 49 specified sectors.

4.3.2.2.1   Disaggregation of labour by skills and gender

The factors of production in the conventional 2000 South African SAM are disaggregated by skills. This study, however, required disaggregating the skills further into skills according to gender. In order to do so, information was obtained from the IES 2000 and was correlated for consistency with the LFS series. The survey provided data on labour income sources together with the occupations of each worker. For full details of the sources of labour income earnings, see section 4.3.2.3.1. The labour income was converted into a national representation by using

---

[14] For, example, earned income, which had no source of paying industry, was dropped from the analysis. The presence of expenditure, which had no source of income, was also dropped from the analysis. Any data not tied to gender or in the gender category, for example a number 9 (neither man nor woman) was dropped.

weights as provided in the survey. The income was then allocated to the respective worker according to the worker's occupation. This procedure provided the basis for creating the gendered SAM with men and women of different skills.

Men and women's labour incomes were obtained from the working age group which was reported to have been actively working (status 1) in their specified sectors. These workers indicated the specific place of their work and the type of work in which they were engaged in. The place of work helped to group men and women according to various occupations while the type of reported work helped to identify the industry in which they belonged. The value added received by factors of production in each sector was disaggregated across occupational categories and allocated to specific households through a constructed allocation matrix.

After the analysis, the 2000 gendered SAM contains six types of labour distinguished by both gender and skills categories:

- Women labour skilled   Men labour skilled
- Women labour semi-skilled   Men labour semi-skilled
- Women labour unskilled   Men labour unskilled

4.3.2.2.2   Shares of working men and women across sectors

Table 4.7 shows skills of men and women labour shares in South African sectors. After disaggregating by gender, the largest share of unskilled women is found in the trade services (20.81%). This is followed by agriculture (7.4%), which is also a major employer of unskilled women labour. Significant levels of unskilled women labour are found also in government services, clothing sector, plastics products and vehicles sectors. Low shares of unskilled women workers are found in the mining sector (in particular coal mining), leather products, wood, printing, basic metals, and transport equipment.

Unskilled men share is highest in iron and steel (l2.88%), gold mining (12.83%), construction (10.51%), and other mining (8.33%). Other significant employers of unskilled men include transportation services, government services, metal products and food processing.

Skilled labour is highly demanded in the services sector of trade, finance, business services, and other-service providers. In general, there is low demand of skilled labour in the manufacturing sectors relative to their contribution to GDP. In terms of gender, the largest share of skilled women is found in government services (40.39%), followed by trade services

(10.763%), and business services (8.24%). Finance, transportation services, printing, iron and steel, and other-chemicals also have substantial numbers of skilled women labour. Low shares of skilled women are found mostly in gold and other-mining industries, petroleum, rubber, furniture, leather, transport equipment, water, and other-sectors (see Table 4.7).

The significance of women, in particular skilled women, in the government sector is due to equal labour laws, which ares directed towards empowerment of men and women (see Chapter 3). As with skilled women, the largest share of skilled men is found in government services (42.04%), followed by trade services (8.43%), business services (7.07%), and financial services (6.36%). The lowest shares of skilled men are found in the footwear, leather, scientific equipment, and rubber sectors.

Semi-skilled men and women are mostly found in government services (26.91% and 25.99%, respectively), trade services (14.66% and 15.59%, respectively), and financial services (10.68% and 16%, respectively). The lowest shares of semi-skilled men and women are in the leather, footwear, glass, transportation, and scientific equipment sectors. When analysed separately, low shares of semi-skilled women are found in the mining, petroleum, transport, water, and construction sectors.

Table 4.7 Shares of factors (capital, men and women workers) across sectors

	Capita	% men Unskilled	% women Unskilled	% men Semi-skilled	% women Semi-skilled	% men Skilled	% women Skilled
Maize	0.9	0.216	0.117	0.187	0.033	0.152	0.011
Wheat	0.3	0.043	0.023	0.037	0.007	0.030	0.002
Fruit Veg	1.4	2.206	3.968	0.389	0.153	0.139	0.010
Poultry	0.4	1.546	1.224	0.203	0.264	0.495	0.613
Dairy Lvst	1.0	0.554	0.228	0.570	0.066	0.042	0.018
Other Agr	0.3	0.243	1.849	0.164	0.047	0.101	0.052
Coal mining	1.4	3.448	0.001	1.010	0.089	0.695	0.167
Gold mining	1.2	12.832	1.041	1.198	0.036	0.728	0.071
Other mining	4.4	8.333	1.354	1.236	0.079	1.030	0.071
Food processing	1.6	4.141	3.759	1.765	1.025	1.307	0.487
Beverage / tobacco	1.9	1.339	0.596	0.596	0.354	0.845	0.498
Textiles	0.2	2.277	2.071	0.139	0.376	0.261	0.134
Clothing	0.1	1.317	5.197	0.123	0.519	0.146	0.468
Leather products	0.0	0.048	0.534	0.011	0.005	0.013	0.011
Footwear	0.1	0.107	1.456	0.017	0.056	0.030	0.058
Wood products	0.3	1.791	0.986	0.566	0.140	0.201	0.096
Paper products	1.0	0.839	3.064	0.778	0.420	0.362	0.758
Printing / publishing	0.3	0.665	0.750	1.166	0.882	0.950	1.831
Petroleum products	2.4	0.546	0.323	0.380	0.003	0.622	0.077
Chemicals	1.2	1.010	0.458	0.596	0.165	1.073	0.229
Other chemicals	0.8	1.386	3.033	1.035	0.759	1.968	1.253
Rubber products	0.1	0.213	1.810	0.205	0.030	0.220	0.089
Plastic products	0.1	1.126	5.161	0.452	0.621	0.645	0.652
Glass products	0.1	0.551	0.000	0.120	0.021	0.143	0
Non-metal minerals	0.8	0.812	1.418	0.249	0.122	0.325	0.041
Iron and steel	1.2	2.878	0.174	1.086	0.287	0.357	1.789
Non-ferrous metals	1.6	0.935	0.016	0.337	0.114	0.311	0

	Capital	% men Unskilled	% women Unskilled	% men Semi-skilled	% women Semi-skilled	% men Skilled	% women Skilled
Metal products	0.8	4.554	0.189	1.323	0.303	0.718	0.475
Machinery	0.3	2.198	1.610	1.405	0.691	1.207	0.571
Electrical machinery	0.5	0.860	2.022	0.304	0.284	0.633	0
Comm. equipment	0.1	0.337	1.612	0.122	0.192	0.212	0.228
Scientific equipment	0.0	0.166	0.337	0.006	0.127	0.080	0.032
Vehicles	1.2	2.190	4.320	1.263	0.302	1.676	0.303
Transport equipment	0.0	0.571	0.097	0.238	0	0.300	0
Furniture	0.2	1.188	0.468	0.265	0.104	0.177	0.011
Other manufacturing	0.2	0.268	0.533	0.142	0.22	0.064	0.228
Electricity / gas	3.1	1.765	1.723	1.127	0.769	2.679	0.399
Water	0.5	0.226	0.260	0.179	0.096	0.490	0
Construction	2.3	10.505	3.604	2.132	0.396	2.284	0.383
Trade services	9.8	3.977	20.81	14.66	15.59	8.429	10.763
Hotels / catering	3.0	0.334	0.540	1.212	2.067	0.371	0.736
Transport services	6.7	6.131	0.976	10.02	2.511	2.907	2.233
Comm. services	4.6	1.755	1.626	3.133	7.192	2.176	0.890
Financial services	11.9	0.363	0.823	10.68	16.00	6.358	5.186
Business services	12.1	0.237	1.159	3.995	9.899	7.067	8.234
Other services	1.8	0.288	3.660	0.455	1.878	1.650	7.846
Other producers	1.3	4.814	7.070	5.812	8.714	5.298	11.612
Government services	14.4	5.876	6.243	26.91	25.99	42.04	40.392
All sectors	100.0	100	100	100	100	100	100

Source: Own calculation based on IES 2000

4.3.2.2.3　Factor (capital, men and women) shares in sectors

Table 4.8 shows factor shares in sectors. Capital earns approximately 52% of total factor income. Semi-skilled labour is the second-biggest earner and earns approximately 19% of total factor income, of which semi-skilled women earn 6.8% while semi-skilled men earn 13.7%. Skilled labour earns 15%, of which skilled women earn 3.1%, while skilled men earn 8.8%. Unskilled labour earns 12%, of which unskilled women earn 4.8% and unskilled men earn 13.8%. In general, men share of earnings exceeds that of women in all skill types which indicates inherent gender earning inequality.

Men labour share exceeds 50% in gold, textile, wood, print, other-chemicals, glass, metal products, transportation equipment, furniture, and construction sector. Specifically, men labour share in transport equipment comprises 90%, in glass (69%), in gold (60%), in wood (66%), and machinery (63%). Women labour share exceeds 50% in only one sector, the apparel sector (50.8%). Other sectors with substantial women labour share include plastics (43%), footwear (38.8%), leather (37.1%), communication equipment (35.8%), scientific equipment (31.1%), and prints (24.8%). The lowest women labour share includes mining, petroleum, glass, non-ferrous, and transportation equipment sectors, which are export-intensive sectors.

Table 4.8 Factor shares within sector

Sectors	Capital	Low -skilled labour		Middle-skilled labour		Skilled labour		Total Labour		
	All	Men	Women	Men	Women	Men	Women	Men	Women	
Maize	85.3	3.9	0.7	5.2	0.5	4.3	0.1	13.4	1.3	100
Wheat	92.0	2.1	2.1	2.9	0.2	2.3	2.3	7.3	0.7	100
Fruit Vegetables	63.0	18.1	11.2	4.9	1.0	1.8	0.0	24.8	12.2	100
Poultry	37.5	26.9	7.4	5.5	3.6	13.5	5.7	45.8	16.7	100
Dairy Livestockt	76.4	7.9	1.1	12.7	0.7	1.0	0.1	21.6	2.0	100
Other Agriculture	57.2	7.6	20.1	8.0	1.1	5.0	0.9	20.6	22.2	100
Coal	54.4	25.1	0.0	11.4	0.5	7.9	0.7	44.4	1.2	100
Gold	29.3	55.8	1.6	8.1	0.1	5.0	0.2	68.9	1.9	100
Other mining	66.1	22.7	1.3	5.2	0.2	4.4	0.1	32.3	1.6	100
Food	44.0	20.5	6.5	13.6	3.9	10.1	1.3	44.2	11.7	100
Beverage/tobacco	71.1	8.9	1.4	6.2	1.8	8.8	1.8	23.9	5.0	100
Textile	21.4	45.0	14.2	4.3	5.7	8.1	1.4	57.4	21.3	100
Apparel	13.2	27.3	37.3	3.9	8.3	4.7	5.2	35.9	50.8	100
Leather	46.6	9.2	35.3	3.2	0.7	3.9	1.1	16.3	37.1	100
Footwear	49.2	7.2	33.8	1.8	2.9	3.1	2.1	12.1	38.8	100
Wood	30.5	35.7	6.8	17.5	2.2	6.3	1.0	59.5	10.0	100
Paper	55.0	8.6	10.8	12.3	3.3	5.8	4.2	26.7	18.3	100
Print	24.0	8.6	3.3	23.4	8.8	19.2	12.7	51.2	24.8	100
Petroleum	85.6	3.5	0.7	3.8	0.02	6.2	0.3	13.5	1.01	100
Chemical	61.9	9.6	1.5	8.8	1.2	15.9	1.2	34.3	3.9	100
Other Chemical	33.5	11.0	8.3	12.7	4.7	24.4	5.3	48.1	18.3	100
Rubber	29.7	9.5	28.0	14.2	1.0	15.4	2.1	39.1	31.1	100
Plastics	10.2	18.5	29.4	11.6	7.9	16.6	5.8	46.7	43.1	100
Glass	29.0	40.0	0.1	13.6	1.2	16.3	0.1	69.9	1.2	100
Non-metal	65.3	12.2	7.4	5.8	1.4	7.6	0.3	25.6	9.1	100
Iron	51.1	22.1	0.5	12.9	1.7	4.3	7.4	39.3	9.6	100
Non-ferrous	81.5	8.5	0.0	4.7	0.8	4.4	0	17.6	0.85	100
Metal products	33.4	36.6	0.5	16.5	1.9	9.0	2.1	62.1	4.5	100
Machinery	19.3	23.1	5.9	23.0	5.6	19.9	3.2	66.0	14.7	100
Electric machine	47.7	13.9	11.3	7.6	3.5	16.0	0	37.5	14.8	100
Comm equipmen	27.2	14.5	24.1	8.2	6.4	14.3	5.3	37.0	35.8	100
Scienc equipmen	28.6	22.2	15.6	1.2	13.2	16.9	2.3	40.3	31.1	100
Vehicles	44.3	14.2	9.1	12.7	1.5	17.1	1.1	44.0	11.7	100
Transportequipt	7.6	36.5	2.1	23.7	0.1	30.1	0.1	90.3	2.1	100
Furniture	28.3	40.1	5.5	13.9	2.7	9.3	0.2	63.3	8.4	100
Other industries	46.9	13.3	9.2	11	8.5	5.0	6.1	29.3	23.8	100
Electricity	65.2	6.8	2.3	6.7	2.3	16	0.8	29.5	5.4	100
Water	67.2	5.2	2.0	6.4	1.7	17.5	0.1	29.1	3.7	100
Construction	40.1	32.9	3.9	10.4	1.0	11.2	0.6	54.5	5.5	100
Trade	45.5	3.3	6.0	19.1	10.1	11.1	4.9	33.5	21	100
Hotel	76.8	1.6	0.9	8.8	7.5	2.7	1.9	13.1	10.3	100
Transportation	55.5	9.2	0.5	23.3	2.9	6.8	1.8	39.3	5.2	100
Communication	60.2	4.2	1.3	11.6	13.3	8.1	1.1	23.9	15.7	100
Finance	60.8	0.3	0.3	15.3	11.5	9.2	2.6	24.8	14.4	100
Business	69	0.2	0.4	6.4	7.9	11.4	4.6	18.0	12.9	100
Other services	49.3	1.4	6.1	3.4	.0	12.5	20.4	17.3	33.5	100
Other product	15.6	10.8	5.5	20.3	15.1	18.6	14.0	49.7	34.6	100
Government	33.7	2.5	0.9	17.6	8.5	27.7	9.2	47.8	18.6	100
Total	48.9	8.8	3.1	13.7	6.8	13.8	4.8	36.3	14.7	100

Source: South African gendered SAM 2000

4.3.2.2.4 Capital and production in South Africa

Capital forms a major part of the factor of production in many sectors. Many analysts have described this as the source of unemployment, particularly of unskilled labour in many sectors in South Africa. For example, Van Meelis and Makgetla (2004) found that expansion in the capital-intensive sectors could do little to contribute to employment creation. The service sectors such as government, business, finance, trade, transportation, and communication use significant capital in their production processes. Agriculture, coal, and other-mining are other sectors that employ a significant capital in their production process.

On the other hand, textile, apparel, printing, rubber, glass, machinery, communication equipment, transportation equipment, and furniture, are the major manufacturing sectors with low capital usage in their production processes (see Table 4.9). Due to disaggregation, most manufacturing sectors individually use relatively little capital stock. South Africa's exports remain geared primarily towards relatively capital-intensive sectors; notably minerals, chemicals, and the vehicle sectors.

Table 4.9 Percentage share of capital

Sectors	%age share of capital	Sectors	Percentage share of capital
Government services	14.44977	Paper	0.97589
Business	12.06796	Non- metal	0.78861
Finance	11.89725	Other chemicals	0.76469
Trade	9.81331	Metal product	0.75051
Transportation	6.71293	Electrical machines	0.53465
Communication	4.55979	Water	0.53323
Other mining	4.37931	Print	0.33612
Agriculture	4.26999	Machinery	0.33104
Electricity	3.08274	Wood	0.27624
Hotel	2.97532	Textile	0.19551
Petroleum	2.42691	Other industry	0.17069
Construction	2.31781	Furniture	0.15187
Beverage and tobacco	1.93284	Footwear	0.13264
Mothr	1.84978	Rubber	0.12042
Non-ferrous	1.62752	Apparel	0.11469
Food	1.60519	Communication equipment	0.11401
Coal	1.35185	Plastic	0.11226
Other products	1.26088	Glass	0.07224
Vehicles	1.23321	Leather	0.04413
Gold	1.21927	Scientific	0.03852
Iron	1.20466	Transportation equipment	0.02134
Chemicals	1.18244	TOTAL	100

Source: 2000 South Africa gendered SAM

72

4.3.2.3   Household income

The 2000 South African Conventional SAM is classified into fourteen income deciles, denoting the lowest to highest income household categories. Classification according to income is not always appropriate. This is because potential mobility of households between income groups makes it difficult to target specific households or to do any analysis of changes in poverty or distribution (Pyatt & Thoberke 1976). However, categories of households by income are done in studies that require cross-sectional comparisons, such as this one.

The 14 households receive income from ownership of capital and from earnings of men and women workers. Other sources of household income are listed in section 4.3.2.3.1. For the purposes of this study, households needed to be grouped in 14 households categories according to income earnings. Information concerning the allocations regarding men and women workers was obtained from the 2000 Income and Expenditure Surveys (Statistics SA 2001a). Using this information, 14 household deciles were created with a considerable disaggregation of the top income decile, the same methodology as applied by Thurlow and van Seventer (2002). The household deciles were linked with their respective remuneration from various skills types of men and women workers to match the allocations from labour to various household categories. The value added received by factors of production was allocated to households via the allocation matrix. The baseline factor flow relationship, which shows the mapping from factor demands by sectors to households, was obtained from the base Social Accounting Matrix. The identification of factor owners in a household is required for constructing the SAM. This also helps in determining the welfare effects of households, which depends on the sources of their income. This is because different households obtain their income from different sources.

4.3.2.3.1   Sources of household income

Labour income to households

This study utilises the total labour income to households which is equal to the reimbursement of residents (RB6240) taken from the South African Reserve Bank Quarterly Bulletin as used by Thurlow & van Seventer (2002). These are disaggregated across the household categories using data taken from the 2000 Income and Expenditure Surveys (Stats SA 2001a). The following are types of labour incomes for both 2000 and 2000 gendered SAMs which were taken from the IES 2000:

- Salaries and wages for normal hours worked

- Bonuses and income from overtime

- Commission and director's fees

- Part-time work and cash allowances in respect of transport, housing and clothing

- Value of goods and services received by virtue of occupation and shown as expenditure, example housing and transport

- Imputed income from the value of own production less cost of production

Indirect capital earnings

Indirect capital earnings refer to the share of gross operating surplus and other enterprise (business) income earned by households by virtue of their investments and capital endowments. The value of each household's indirect capital earnings for 2000 was taken from the IES 2000 and included the following values:

- Net profit from business or professional practice/activities or farming (excluding interest and dividends) conducted on a full-time or part-time basis

- Net income from letting of fixed property ; Royalties

- Interest received and/or accrued on deposits, loans, savings certificates, and dividends on building society shares

- Dividends on shares other than building society shares

- Regular receipts from pensions resulting from employment before retirement

- Annuities and similar recurring receipts resulting from own investments

- Net income from hobbies, sidelines and part-time activities

Government transfers received by households

Government transfers to households in 2000 were taken from the IES 2000 and included the following items:

- Social allowances and pensions: Old age war pensions and disability grants

- Social allowances and pensions: Family and other allowances (including state maintenance grant and child grants), Workmen's Compensation, Unemployment Insurance, Pneumoconiosis and Silicosis Funds and similar funds

Non-government transfers received

Non-government transfers include interhousehold transfers and transfers to and from the rest of the world. Non-government transfers for 2000 were taken from the IES 2000 and included:

- Alimony, maintenance and similar allowances received from divorced spouse, family members, etc. living elsewhere
- Regular allowances received from family members living elsewhere
- Payments received from borders and other members of the family
- Other income received inkind or from individuals other than employer
- Lobola or dowry price received

4.3.2.3.2 Share of household in labour income of men and women workers

Table 4.10 shows shares of household income emanating from men and women labour by different skills types. Household deciles hhd0-hhd5 are regarded as poor households. Such households receive most of their income from unskilled labour. According to the data, most women provide their income earnings to poor households. On the other hand, skilled women workers, provide their income earnings mainly to high-income households. This is attributed to few highly paid women in sectors such as government services and the non-traditional women sectors of mining, iron, steel, and transportation services (LFS series; IES 2000).

In general, high-income households receive a large proportion of their income from ownership of property and from semi-skilled labour. The data show that wage income from skilled labour is more insignificant than wage income from semi-skilled labour. This is attributed from the shortage of skilled labour in South Africa. Semi-skilled workers are the major contributors of income to households, in particular to high-income households.

Households hhd0-hhd5 receive 18.84% of the total factor income, while hhd6-hhd8 receive 43.02%. The highest income household category, hhd91-hhd924, which comprises 10% of the population, receives 38.14% of factor income. This means that 90% of the population receives 61.86% of income while the 10% receives the rest which shows concentration of income to a small percentage of the population. This is an indication of unequal income distribution in South Africa. The high-income household, however, pays more taxes, makes transfers and saves more (although the savings are still very low) compared to other households.

From a gender perspective, men comprise 69.44% of the first five income deciles while

women comprise only 30.56% in these deciles. Men comprise 71.16% of second deciles, while women comprise 29%. Men comprise 72% of the top 10% of the high-income deciles while women comprise only 28%. This indicates unequal access to resources between men and women, which has both negative employment and business implications for women. As Haddad (1995) noted, "in order for women to participate more fully in the economy they must own or have access to factors of production and must be allowed to reallocate them in line with the new economic incentives that trade liberalisation precipitates".

Table 4.10 Share of domestic institution (HH) in income of factor (F)

Household Category	Unskilled Labour		Semi-Skilled Labour		Skilled Labour	
	Men	Women	Men	Women	Men	Women
Household decile0	0.023	0.039	0.01	0.017	0.001	0.004
Household decile 1	0.022	0.064	0.012	0.016	0.002	0.003
Household decile 2	0.049	0.064	0.026	0.027	0.005	0.003
Household decile 3	0.069	0.070	0.027	0.031	0.004	0.005
Household decile 4	0.075	0.109	0.055	0.055	0.013	0.014
Household decile 5	0.121	0.078	0.071	0.056	0.028	0.024
Household decile 6	0.110	0.168	0.113	0.084	0.045	0.072
Household decile 7	0.162	0.136	0.160	0.114	0.088	0.110
Household decile 8	0.164	0.122	0.241	0.217	0.210	0.271
Household decile 91	0.097	0.069	0.152	0.172	0.218	0.247
Household decile 921	0.030	0.028	0.045	0.069	0.106	0.067
Household decile 922	0.028	0.018	0.033	0.060	0.103	0.074
Household decile 923	0.030	0.021	0.033	0.061	0.111	0.061
Household decile 924	0.021	0.014	0.021	0.021	0.063	0.045
	1	1	1	1	1	1

Source: South African gendered SAM 2000

4.3.2.4   Other data sources used in gendered SAM

The CGE model requires a set of trade elasticities as data input. This is because the model assumes imperfect substitution of commodities in trade as suggested by Armington (1969). In the absence of the elasticity coefficient, the CGE model assumes perfect substitution between commodities. Such an assumption implies that the elasticity of substitution between two commodities is infinity resulting in constant price ratios, which is a rather unrealistic assumption.

In reviewing the literature, two different sets of trade elasticities in manufacturing sectors were found. Gibson (2003) estimated trade elasticities in 42 South African industries while the Industrial Development Corporation (IDC) estimated trade elasticities for 25 manufacturing sectors for a sample period from 1973 to 1993. The elasticities included Armington import demands (CES), transformation functions (CET) and elasticities of substitution between

factors of production. This study follows Thurlow and Van Seventer (2002) and uses the trade elasticities from IDC.

This study assumes that the elasticities of substitution between factors and intermediates are constant across all activities and set equal to 0.6 where applicable. The aggregator elasticities, which allow commodities to be produced by various industries according to a CES specification, were all set at four (4). Expenditure elasticities by commodity and households were taken from Thurlow and Van Seventer (2002) who adapted them from Case (2000). The expenditure elasticities were based on the 1993 SALDRU survey. The Frisch parameter, which allows for the determination of a subsistence floor in household expenditure, was set to a constant value of three (3) across all household deciles. Elasticities for the agricultural subsectors came from other studies (see Table 4.12). Gender elasticity was set at 0.50 following Fontana and Wood (2000); such a low rate was set because of the rigidity in gender substitution. This rate was revised to higher levels of 1.25 and 3.0 to perform a sensitivity analysis.[15] In addition to the IES and LFS data, other data for factor demands of capital and labour were taken from the Trade and Industrial Policy Strategies (TIPS) database (QUANTECH), which is the standardised industry database for South Africa.

4.4   DISAGGREGATION OF AGRICULTURE INTO SUB-SECTORS

4.4.1   Data requirements

The basic data for the CGE model is the 2000 gendered SAM of South Africa. The data for men and women classification in the agricultural sector was obtained from the 1995 and 2000 Income and Expenditure Survey (IES), a series of Labour Force Surveys (LFS 2000-2005), the annual commercial agricultural surveys (Report No. 11-01-01 1999), and from agricultural census. The agricultural wages for men and women workers were estimated by the value of each worker's labour time. This gave the average wage rates for the whole economy. The data required for the disaggregation of agricultural subsectors was obtained from various sources — IES (1995, 2000), LFS (2000-05), OHS (1999), Input-Output Tables (1993), Supply-Use Tables (1998, 2000) and Conningarth Agricultural Input-Output Tables (1996).

---

[15] Is a revision of elasticity to ensure the robustness of the model--giving realist results while using different elasticities.

The values of the elasticities of substitution for agricultural subsectors are presented in Table 8.1 below. The data was obtained from various sources during literature search. The extra data relevant to gender analysis was estimated, adapted, and harmonized within the SAM as explained.

4.4.2 Intermediate inputs

The 2000 South African input-output table presents agriculture as one single sector. In order to simulate the impacts of the Doha Round, the sector had to be disaggregated into subsectors. This was accomplished through adapting the approach used by Thomassion and Andison (1987), Adilu (2004), and the Conningarth 1996 agricultural input-output table (2000). The subsectors chosen were maize, wheat, poultry, dairy livestock, while the rest of agriculture were aggregated into the 'other agricultural' subsector.

The data used to disaggregate the agriculture sector were obtained from the agricultural census data of 1996 and 2002, the 1993 South African input-output tables, the 1996 Conningarth Consultant's South African agricultural input-output table, the 2000 Supply Use Tables, the IES 2000 and the Quantech database.

Several types of data were needed in order to build the agricultural sub-sectors from a single agriculture sector as provided by the 2000 South African SAM. The receipts and expenditures are both needed in order to formulate the subsectors input-output table. The data on expenditure for input use by each agricultural subsector was obtained from the agricultural censuses of 1996 and 2002. The total expenditure on inputs for the agricultural sector came from the 1993 input-output table. There was a need to disaggregate inputs use by agriculture across selected subsectors of agriculture. The total expenditure values derived from the agriculture census were changed into a share distribution by subsector.

For example, if Q_{ij}, is the expenditure on poultry input, j , by the maize subsector, i , then the share of the maize subsector, i, in the total expenditure on poultry input j is given by:

$$X_{ij} = \left[Q_{ij} / \sum_i Q_{ij} \right]$$

With $\sum_i Q_{ij}$ being the total expenditure on input j by the agricultural sector as reported from the agricultural census data. These proportions are applied to the South Africa's

input-output table. For example, if A_{ij}, in the input-output table represents the total use of poultry, j, in agriculture, their share of maize subsectors, i, in the total use of poultry input j is given by:

$$A_{ij} = S_{ij} * A_{J}$$. The transformation equation S_{ij} was used in order to make the census allocation of inputs consistent with the aggregate input data as contained in the Statistics South Africa's input–output table (see example Thomassion and Andison 1987). To summarise, inputs were distributed among the agricultural subsectors according to the proportions of their expenses that were incurred by each subsector on those inputs. The proportions used to disaggregate inputs among the agricultural subsectors were mostly gathered from the agricultural census.

The 1993 South African Input-Output and the 1996 South African agricultural input–output by Conningarth Consultants (2000) are both in a rectangular format with commodities denoted across rows, and sectors are represented across columns. In order to incorporate the agricultural subsectors in the 2000 gendered SAM, the rectangular format had to be converted into a square format, which represents sectors both across rows and across columns. The rectangular input-output format was thus transformed into a square format by assuming, n, agricultural commodities and m subsectors, which formed a $n * m$ matrix of commodity shares, B_{ij}, and a $n * m$ matrix of intermediate inputs, q_{ij}.

4.4.3 Capital and labour data

In the model used for this study, there are two primary inputs, namely labour and capital. The South African SAM does not contain information concerning land. The data related to capital utilisation in the agricultural subsectors was obtained from the Agricultural Census (1996 and 2001). The same type of data and the remunerations for inputs were also obtained from the IES 2000. Different sources of data, mostly with regards to capital were required in order to ascertain whether agriculture is a capital-intensive sector as postulated by many analysts in South Africa. The quantity of labour in the agricultural subsector was derived from TIPS (Quantech database) and from the 1996 and 2001 agricultural censuses. However, the labour data was not disaggregated by gender. The proportions regarding men and women shares in agricultural subsectors were taken from the 2000 IES.

4.4.4 Agricultural imports tariffs and export subsidies

The aggregate level of import tariff revenue for the South African economy is reported in both the IES 2000 accounts and the 2000 National Input-Output Tables. Import tariff rates and export subsidies for the agricultural subsectors were taken from several studies on agricultural trade liberalisation (TIPS 2002) and from the data obtained from the Department of Agriculture, International Trade Division (see Table 4.11 and Table 4.12).

4.4.5 Data on elasticities of substitution in agriculture

The elasticities of substitution (EOS) data required by the CGE model were derived from the literature search. These included EOS of the CES and CET functions, and the export demand equation; i.e. the Armington elasticities between the domestic and imported use of commodities. The conventional international economics assumes that imported and domestic goods, in a given sector, are perfect substitutes. However, Armington (1969:159) argues that imports and domestic goods are not perfect substitutes in consumption or production. The effects of tariffs, and thus of either an import substitution strategy or of a subsequent tariff reduction programme, depend mainly on the magnitude of the substitution elasticities estimated (Robinson, Yunez-Naude, Hinojosa-Ojeda, Lewis, and Devarajan, Naude *et al.* 1999:42). Table 4.11 shows the trade elasticities of various commodities used in this study while Table 4.12 presents values of the elasticities of substitution for the agricultural subsectors. The percentage data in other columns represents expected world price increase of certain commodities due to Doha Round.

Table 4.11 Trade elasticities

Commodity	Armington Aggregation	Commodity	Armington Aggregation
Agriculture	1.60	Metal products	1.77
Coal mining	1.03	Machinery	0.49
Gold mining	0.50	Electrical machinery	0.75
Other mining	1.03	Comm. equipment	0.75
Food processing	0.74	Scientific equipment	0.95
Beverage / tobacco	2.33	Vehicles	4.26
Textiles	2.81	Transport equipment	4.26
Clothing	2.48	Furniture	2.30
Leather products	4.41	Other manufacturing	0.95
Footwear	6.80	Electricity / gas	0.50
Wood products	0.69	Water	0.50
Paper products	3.67	Construction	0.50
Printing / publishing	3.19	Trade services	0.50
Petroleum products	1.53	Hotels / catering	0.50
Chemicals	1.53	Transport services	1.78
Other chemicals	1.53	Comm. services	0.50
Rubber products	1.50	Financial services	0.50
Plastic products	1.50	Business services	0.50
Glass products	0.57	Other services	0.50
Non-metal minerals	0.57	Other producers	0.50

Commodity	Armington Aggregation	Commodity	Armington Aggregation
Iron and steel	0.84	Government services	0.50
Non-ferrous metals	0.84	All sectors	1.09

Source: IDC (2000) for Armingtons

Table 4.12   Import and export elasticities and possible world price rise due to Doha Round

	Trade elasticitie		Potential Rise in World Price of Agriculture Commodities			
Sectors	**CET**	**CES**	**Roningen & Dixit (1989)**	**Robinson *et al.* (1990)**	**Adilu (2004)**	**Beghin, Holst, & Van der Mensbrugghe (2002)**
Maize	1.596	2	26.3%	10.16%	4-16.3%	14.5%
Wheat	4	4	36.7%	4.3%	4-36.7%	12%
Fruit Veg	2	4	6.4%	4.3%	0	4.3%
Poultry	1.596	2	4%	4.3%	0	4.3%
Dairy Livestock	1.596	2	12.4%	15.70%	0	18.2%
Dairy & produce	1.596	2	6.5%	20-40%	0	2.2-8.3%
Other agriculture	1.596	2	4%	4.3%	10-%	4.3%

Source: Adapted from other studies: as noted above

Table 4.13 Summary of data sources used to construct the gendered SAMs

Data source	Relevant accounts	Reference
South African Reserve Bank Quarterly Bulletin of Statistics (various years)	All accounts in macro SAM Foreign Direct Investment Stock	SARB (1990-2006)
Supply-Use Tables (2000)	Intermediate demand; Capital and labour value-added; Activity, sales and trade taxes; Marketed output; Government demand; Household demand; Investment demand; Imports and exports; Transaction costs;	Stats SA (2003)
Coningarth South Africa Input-Output	Intermediate demand; Capital and men and women value-added	Stats SA (1996e)
Labour Force Survey (series)	Intermediate demand; Capital and men and women value-added	Stats SA (2000)
Mining Censuses (1993 and 1996)	Intermediate demand; Capital and men and women value-added	Stats SA (1996d and 1997c)
October Household Survey (1995)	Labour income from activities	Stats SA (1996a)
Income and Expenditure Surveys (1995 and 2000)	Labour income from activities; Labour income to households; Corporate dividends; Household transfers to government, households, and rest of world; Personal taxes; Household savings; Government and rest of world transfers to households; Household consumption demand	Stats SA (1996b and 2001a)
Census 2001	Labour earnings according to skills	Stats SA (1996b and 2001a)
Personal Survey (2005-06, data from 7 provinces South Africa)		Personal survey (2005-06)
Agriculture trade	Tariff rates of different commodities	International trade unit of DOA

Source: Adapted from the South African gendered SAM 2000

4.5   BALANCING THE SAM

4.5.1 RAS Approach to estimating micro SAM

As noted above, the data entries of the gendered SAM come from a variety of sources, ranging from an input-output table, 2001 census data, national surveys and various national accounts data. The agricultural data were derived from a 1996 publication of the Ministry of Agriculture, but there are discrepancies between this data and the national accounts data. In addition, labour was disaggregated according to gender. The SAM, which results from these disparate sources, is not balanced. The RAS approach was thus used to balance the SAM.

Despite the careful data collection, processing and cleaning, and a very interactive process in assembling the SAM, inconsistencies remained, arising from measurement errors, incompatible data sources, and lack of data. To impose consistency, we used the RAS approach. All the necessary adjustments resulting from the procedure were within the generally acceptable bounds of less than 5%.

The RAS approach is the traditional solution for balancing a SAM with known row and column sums. Typically, the RAS approach is used in updating a SAM, in which the new row and column sums, q^*, are known. The RAS methodology finds a new transactions matrix, A^*, based on the original coefficient matrix, $\overline{A}$ which produces a new transactions matrix, T^*, which is consistent with the new row and column sums. The RAS methodology iteratively modifies the row and column entries proportionately until the totals are reached.

However, the RAS procedure has several drawbacks. It assumes that the initial SAM, upon which it is based, is balanced and that there are no measurement errors in the new row and column sums. Also, there is no way to incorporate other data besides the row and column sums. However, McDougall (1999) demonstrates that the RAS approach is, in fact, an entropy theoretical model and suggests that it is a superior method to the entropy framework. McDougall is supported by Robinson (2000) who is of the opinion that RAS is superior to entropy after using the entropy methodology himself. Careful inspection was done after balancing the SAM using RAS to ensure that the new SAM made sense and was still consistent with known South African data.

APPENDIX 4

Table 4.14 SAM activity and commodity descriptions

Commodities	SA gendered SAMs	Description
Agriculture	Maize, wheat, livestock, fruits and vegetables, etc.	Maize, wheat, livestock, diary, poultry, other-agriculture (aggregate of other subsectors not mentioned)
Mining	Coal mining	Mining of coal and lignite
	Gold mining	Gold and uranium ore
	Other mining	Other mining and quarrying; service activities related to mineral mining
Food products	Food processing	Production, processing and preserving of meat and meat products; Processing and Preserving of fish and fish products; Processing and preserving of fruit and vegetables; vegetable and animal oils and fats; Dairy products; Grain mill products; starches and starch products; Animal feeds; Bakery products; Sugar, including golden syrup and castor sugar; Cocoa, chocolate and sugar confectionery; Other food products n.e.c.
	Beverage / tobacco	Distilling, rectifying, blending of spirits, wine, beer, other malt liquors, malt, soft drinks; production of mineral waters and tobacco products
Textile products	Textiles	Preparation and spinning of textile fibres; weaving of textiles and finishing of textiles; up textile articles, except apparel; Carpets and rugs; Other textiles n.e.c.; Knitted & crocheted fabrics and articles
	Clothing	Wearing apparel; dressing and dyeing of fur; articles of fur
	Leather products	Tanning and dressing of leather; Luggage, handbags and the like, saddles and harnesses
	Footwear	Footwear
Wood / paper	Wood products	Sawmilling and planing of wood, products of wood, cork, straw and plaiting materials
	Paper products	Pulp, paper and paperboard; corrugated paper and paperboard, containers of paper and paperboard; other articles of paper and paperboard
	Printing / publishing	Publishing (excluding recorded media) and printing; publishing and reproduction of recorded media
Chemicals	Petroleum products	Coke-oven products, processing of nuclear fuel and petroleum refineries or synthesisers
	Chemicals	Basic chemicals, except fertilisers and nitrogen compounds; Fertilisers and nitrogen compounds; Plastics in primary forms and synthetic rubber; man-made fibres
	Other chemicals	Pesticides and other agrochemical products; paints, varnishes and similar coatings, printing ink and mastics; pharmaceuticals, medicinal chemicals and botanical products; soap, detergents, cleaning, polishing, perfume- and toilet preparations; other chemical products n.e.c.
	Rubber products	Rubber tyres and tubes; retreading, rebuilding of rubber tyres; other rubber products
	Plastic products	Plastic products
Non-metal minerals	Glass products	Glass and glass products
	Non-metal minerals	Non-structural non-refractory ceramic ware; Refractory and structural non-refractory clay And ceramic products; Cement, lime and plaster; Articles of concrete, cement, plaster, stone andother non-metallic mineral products n.e.c.
Metal and machinery	Iron and steel	Basic iron and steel; casting of iron and steel
	Non-ferrous metals	Basic precious and non-ferrous metals; casting of non-ferrous metals
	Metal products	Structural metal products, tanks, reservoirs and steam generators Forging, pressing, stamping, roll-forming of metal; powder metallurgy, treatment and coating of metals and general mechanical engineering; Cutlery, hand tools and general hardware; Other fabricated metal products n.e.c.
Metal and machinery (others)	Machinery	Engines and turbines, except aircraft, vehicle and motor cycle engines; pumps, compressors, taps and valves; bearings, gears, gearing and driving elements; lifting and handling equipment other general purpose machinery; agricultural and forestry machinery; machine-tools; machinery for mining, quarrying and construction; machinery for food, beverage and tobacco processing; other special purpose machinery; household appliances n.e.c.; office, accounting and computing machinery
	Electrical machinery	Electric motors, generators and transformers; electricity distribution and control apparatus; insulated wire and cable; accumulators, primary cells and primary batteries; electric lamps and lighting equipment; other electrical equipment n.e.c.
Scientific equipment	Communication equipment	Radio, television and communication equipment and apparatus
	Scientific equipment	Medical, precision and optical instruments, watches and clocks
Transport equipment	Vehicles	Motor vehicles (including their engines) and bodies (coachwork) for motor vehicles; trailers and semi-trailers; Parts and accessories for motor vehicles and their engines
	Transport equipment	Other transport equipment n.e.c.

Commodities	SA gendered SAMs	Description
Other manufacturing	Furniture	Furniture
	Other manufacturing	Jewellery and related articles; other manufacturing and recycling of metal- and non-metal waste and scrap
Electricity, water	Electricity, gas and water	Electricity, gas, steam and hotwater supply; collection, purification and distribution of water
Construction	Construction	Buildings, specialist trade contractors, building installation, building completion; site preparation; construction of civil engineering structures and construction of other structures; renting of construction / demolition equipment with operators
Trade / catering	Trade services, hotels and catering	Wholesale trade, commission trade (except of motor vehicles and motor cycles), retail trade; repair of personal and household goods, sale, maintenance and repair of motor vehicles and motor cycles and retail trade in automotive fuel; hotels, camping sites, other provision of short-stay accommodation; restaurants, bars, canteens
Transport / communication.	Transport and communication services	Transport, supporting and help activities related to transport; post, courier activities and telecommunications
Financial services	Financial and business services	Financial intermediation, insurance and pension funding; real estate activities; other business activities
Other services	Other services	Human health, veterinary and social work activities
	Other producers	Education, other services and other activities n.e.c.
Government services	Government services	Other individual and collective general government
All sectors	All sectors	The total for the economy

Source: 2000 Income expenditure survey: Stats SA (2000) for sector descriptions

Table 4.15 Household categories in SA SAM from (SA SAM 2000)

Household categor	Income Range	Decile	Income
hhd0	10% of population	(0-10	R4.9 billion
hhd1	10% of population	(10-20)	R7.0 billion
hhd2	10% of population	(20-30)	R9.8 billion
hhd3	10% of population	(30-40)	R13.2 billion
hhd4	10% of population	(40-50)	R17.8 billion
hhd5	10% of population	(50-60)	R23.3 billion
hhd6	10% of population	(60-70)	R33.6 billion
hhd7	10% of population	(70-80)	R49.3 billion
hhd8	10% of population	(80-90)	R78.4 billion
hhd91	5% of population	(90-95)	R63.5 billion
hhd921	1.25% of population	(95-96.25)	R21.5 billion
hhd922	1.25% of population	(96.25-97.5)	R25.2 billion
hhd923	1.25% of population	(97.5-98.75)	R29.1 billion
hhd924	1.25% of population	(98.75-100)	R58.0 billion

Source: 2000 South African gendered SAM

Table 4.16 South Africa's tariff phase-down under the WTO

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Textile	30.1	33.8	31.8	24.9	23.4	21.9	20.3	18.7	17.3	17.3	17.3
Clothing	73.7	73.6	68.2	54.6	50.5	46.4	42.4	37.7	33.2	33.2	33.2
Leather and leather p	14.9	14.8	14.1	16.5	15.7	14.8	14.8	14.8	14.8	14.8	14.8
Footwear	37.5	41.6	39.1	36.8	34.2	29.1	29.1	29.1	29.1	29.1	29.1
Wood and wood prod	13.9	3.6	3.4	3.5	3.3	3.1	3.1	3.1	3.1	3.1	3.1
Paper and product	9.6	9.3	9.1	8.8	8.7	8.5					
Printing and publish	8.1	1.3	1.2	1.1	1	1	1	1	1	1	1
Petroleum and prod	1.6	-	-	-	-	-	-	-	-	-	-
Industrial chemicals	9.3	7.5	7.5	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6
Other chemical prod	9	3.8	3.7	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5
Rubber products	30.5	14.5	14.1	15.8	15.4	14.9	14.6	14.4	14	14	14
Plastic products	19.8	14.7	13.7	13.2	12.6	12	12	12	12	12	12
Glass and glass prod	11.8	9.5	9	8.3	7.9	7.6	7.6	7.6	7.9	7.6	7.6
Non-metallic mineral	10.6	8.7	8.1	8.4	8	7.7	7.7	7.7	7.7	7.7	7.7
Basic iron and steel	7.6	4.4	4.2	4.2	4.1	3.9	3.9	3.9	3.9	3.9	3.9
Non-ferrous mineral	2.3	2.3	2.3	2.3	2.2	2	2	2	1.9	1.7	1.7
Metal products	13.1	8.2	7.8	7.8	7.6	7.4	7.4	7.4	7.4	7.4	7.4
Non-electrical Mach	16.5	1.4	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Electrical machinery	11	6.1	6	5.8	5.8	5.7	5.7	5.7	5.7	5.7	5.7
Communication eq	12.1	5.1	3.7	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Professional equip	7.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Motor vehicles, parts,	55.4	33.5	31.7	29.3	27.9	26.1	24.8	23.2	22.1	22.1	22.1
Other transport equip	1.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Furniture	28.1	21.4	20.8	20.2	19.6	18.9	18.9	18.9	18.9	18.9	18.9
Other manufacturing	2.9	1	1	5.2	5.1	5	4.9	4.9	4.9	4.9	4.9
Mining	2.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Average	**11.7**	**7.2**	**6.8**	**6.1**	**5.8**	**5.5**	**5.3**	**5.1**	**4.9**	**4.9**	**4.9**

Source: Rangamsamy and Harmse (2003)

CHAPTER 5

THE SOUTH AFRICA COMPUTABLE GENERAL EQUILIBRIUM (CGE) MODEL

5.1 INTRODUCTION

This chapter describes the CGE model used in this study. The model represents a small open economy that has no influence on international prices. Clearly, South Africa has influence in the world price of minerals such as gold and platinum, however, the assumption of a "small country" stands for simplification purposes and because it is applicable to the bulk of non-mining trade. The model is developed in such a way that it is consistent with the gendered Social Accounting Matrix of South Africa for the year 2000 and IES for the year 2000.

The major contribution to the model is to characterise the impacts of changes in globalisation policies for the distribution of income between the factors distinguished by gender and across a variety of household types. The chapter is arranged as follows: the following section gives a short background of the general format of CGE models, and the steps taken in their construction. In section three, the chapter explains the structure of the South African CGE model. Section four presents and explains the model equations indicating both variables and parameters. The equations consist of five blocks: (1) prices, (2) production and trade, (3) income and expenditure, (4) the model equilibrium and (5) macro closure.

5.2 THE CGE MODEL STRUCTURE

This section draws on Sadoulet (1995). A *computable general equilibrium* (CGE) *model* is defined as the fundamental macroeconomic general equilibrium link among incomes of various groups, the pattern of demand, the balance of payments, and a multisector production structure. In addition, the model incorporates a set of behaviour equations, which describes the economic behaviour of the agents, which are identified in the model and the technological and institutional constraints they face (Thissen 1998). For example, consumers strive to maximise utility subject to their budget constraints and prices of both domestically produced and imported commodities. Producers on the other hand, aspire to maximise profits subject to cost constraints and they decide whether to sell their products on the domestic market or to export their products based on relative prices. The interactions of demand and supply by economic agents in the market require market prices to adjust in order to keep all markets in

equilibrium. The government expenditure is set constant either in nominal or in real terms. Different types of tax payments and savings are given by constant coefficients.

The CGE is an equilibrium model whose time frame depends on the amount of time it takes for all markets to adjust to a new equilibrium after experiencing a policy shock[16]. CGE models are also seen as medium-term models because they that solve past the period of adjustment disequilibria, but before major dynamic effects can occur. The period of adjustment is influenced by the extent of mobility of factors of production. For example, in the short run, all factors are fixed, in the medium term, labour is mobile, and in the long run all factors are mobile.

CGE models are homogenous of degree zero in all prices; therefore, the model solves for relative prices. One price, or a price index such as CPI, is usually chosen to serve as the numeraire, against which all other prices are based. Money is regarded as neutral in the model, and agents make decisions according to relative prices.

Several steps are required in order to construct a CGE model. First, a social accounting matrix which is the database for the model, must be established. The producers and consumers, who are the economic agents of the model, are specified, together with other institutions, such as the government, households, enterprises and the rest of the world. The disaggregation of the economy in a SAM is determined both by the availability of data and by the aim of the study. The current study disaggregates factors by gender and skills.

The agents of the economy, which are identified in the SAM, have different rules of behaviour that must be specified. For example, optimisation behaviour is specified with Cobb-Douglas, Constant Elasticity of Substitution (CES) or Linear Expenditure System (LES) functions. Other functions such as translog (Ardnt 2001) could be used, given the data and appropriate focus. Robinson (1982) notes that a CGE framework is flexible enough to incorporate a wide variety of specifications of production technology. For example, Robinson (1993) used the Almost Ideal Demand Systems (AIDS), a flexible functional form, instead of a CES function because AIDS has the advantage of allowing expenditure elasticities which are different from

---

[16] This section draws on Sadoulet (1995)

one. Parameter estimation or lack thereof may also restrict the number of levels of nesting for a given agent's behaviour. The agents will subsequently respond to relative prices according to the specified behavioural rules.

After the construction of the SAM and the specification of the equations, the parameters of the model are selected. Most parameters are chosen through a calibration procedure, in which the parameters are computed from the base year data of the SAM. The calibration procedure is only based on one year's observation and is deterministic in nature. However, calibration is the most practical option of estimation for the detailed structure of the model which has numerous numbers of parameters. The share parameters of the CES and CET functions are derived from observed values in the SAM. The elasticities, i.e. between labour and capital, the income and price elasticities of household consumption, the elasticities of substitutions and of transformation, are usually collected from literature and econometric estimations.

In order to close the model, macro constraints are essential. The CGE induces four main macroeconomic components, the balance of payment, the savings-investment (S-I), the government budget, and the aggregate supply of primary factors of production. In order to achieve equilibrium, among these macro aggregates, the modeller must decide on the 'macro-closure' problem. In the macroeconomic equilibrium equations, some variables are allowed to adjust in order to equilibrate the model while others are fixed exogenously. Although the process does not affect the base run of the CGE model, it affects the outcome of the simulations (Taylor 1991).

The CGE model is first solved without instituting any policy in order to replicate the benchmark equilibrium. If the model is properly calibrated the results replicate the base year equilibrium, which represents the equilibrium for the economy. When the base year SAM is replicated, one is assured that the parameters are properly specified. The base year data serves as the benchmark against which all simulations are evaluated.

The equations of the model solve simultaneously. These equations can be either or both linear and non-linear, can contain a mixture of strict equalities and inequalities that are lined to bounded variables in reciprocity slackness conditions. The equations that contain a mixture of strict equalities and inequalities are referred to as a mixed complementarity problem (MCP).

A sensitivity analysis is usually employed to test the validity of the parameters. The sensitivity of the results to changes in behavioural rules indirectly tests for major behavioural assumptions. There are several ways of evaluating the equilibria, which result from

the simulations. The results generate data on all new prices and quantities, factors employed, income levels, and macroeconomic indicators. In addition, welfare measures, such as consumer surplus or equivalent variation, can be constructed as seen in section 5 below.

5.3 THE STRUCTURE OF THE SOUTH AFRICAN CGE MODEL

The South African computable general equilibrium (CGE) model is a one-country model consisting of 43 sectors. The model is both neoclassical and structuralist in nature assuming perfect competition, perfect market but labour force is not perfect homogenous. Skilled labour and capital are assumed sectorally fixed while semi-skilled and unskilled labour is mobile but unemployed. The model was first developed by Dervis, de Melo and Robinson in 1982 in order to analyse issues of trade. The International Food Policy Research Institute (IFPRI) designed it into a standard model in order to permit a multi-sectoral framework for analysing the effects of exogenous shocks on various global economies (Löfgren *et al.* 2001). Thurlow and Van Seventer (2002) extended the model to explicitly model the South African economic situation.

The South African CGE model is built as a non-linear problem which allows inequality and equality constraints in a mixed complementarity specification (MCP). The model is Walrasian in nature, determining only relative prices. The consumer price index (CPI) is chosen as a numeraire. Other prices such as product prices, factor prices, and the exchange rate are defined relative to a numeraire. The model assumes that South Africa is a small country with respect to imports and exports, therefore, it lacks influences on world market prices regardless of the transactions it makes. The terms of trade are thus fixed. It is assumed that all consumers have identical preferences so that their behaviours are modelled by a single representative consumer.

5.3.1 Modifications to the standard conventional South African model

The standard model assumes that men and women labour is perfect substitutes in market production, and in the household supply of labour. However, current literature maintains the existence of imperfect substitution between men and women labour. The South African model is thus made gender-aware by desegregating the factor variables according to gender. As a result, the labour for men and women is allowed to be imperfect substitutes in the market production process. The pioneering work on CGE and gender by Fontana and Wood (2000) stresses the rigidity of gender substitution by fixing the elasticity of substitution (EOS) between men and women labour in market production at a low level of substitution of 0.5

for all sectors. According to Sadoulet and de Janvry (1995), the possible range of substitutability is illustrated by four values: 0.3 for low substitutability, 0.8 for medium low, 1.2 for medium high and 3.0 for very high.

The model is written and solved by using the General Algebraic Modelling Software (GAMS) programming language[17]. The model uses the CES production functions which are preferred for most purposes in economy-wide modelling. This follows the characteristic of the CES production function of having realistic substitution elasticities that capture most of the interactions a modeller wants to analyse.

The production technology is a nested function of constant elasticity of substitution (CES) and Leontief functions. At any set of prices, producers in each sector maximise profits utilising various-level (CES) production function subject to the technology constraint. The production process starts as follows: At the bottom level, men and women labour of the same skills combine to form three types of skills. That is, unskilled men combine with unskilled women to form unskilled labour, semi-skilled men combine with semi-skilled women to form semi-skilled labour. The same applies to skilled men and skilled women. As with Fontana and Wood (2000), the ratio of women to men labour is based on the share parameter of their aggregation function. The share parameter differs across various sectors, varies with the wage rate of women relative to that of men, and induces substitution between men and women labours.

At the second level of the production function, the three skills type of composite labour is aggregated with a substitution elasticity of 0.50, into total labour. The resulting total labour combines with capital using a CES technology to form value added. At the top level, the value added combines with intermediate inputs utilising Leontief technology in order to produce activity total output (see Figure 5.1). The Leontief function aggregates individual intermediate input into an aggregate intermediate inputs.

This model adapts the Armington (1969) assumption that distinguishes imports from domestically produced goods, and exports from goods produced for domestic consumption

---

[17] GAMs is a software package designed to solve systems of equations.

because of imperfect substitutability. For example, a CES function aggregates domestic sales with imported commodities while a CET function combines domestic commodities for domestic sales with commodities for export markets.

Figure 5-1 Various levels within the production process
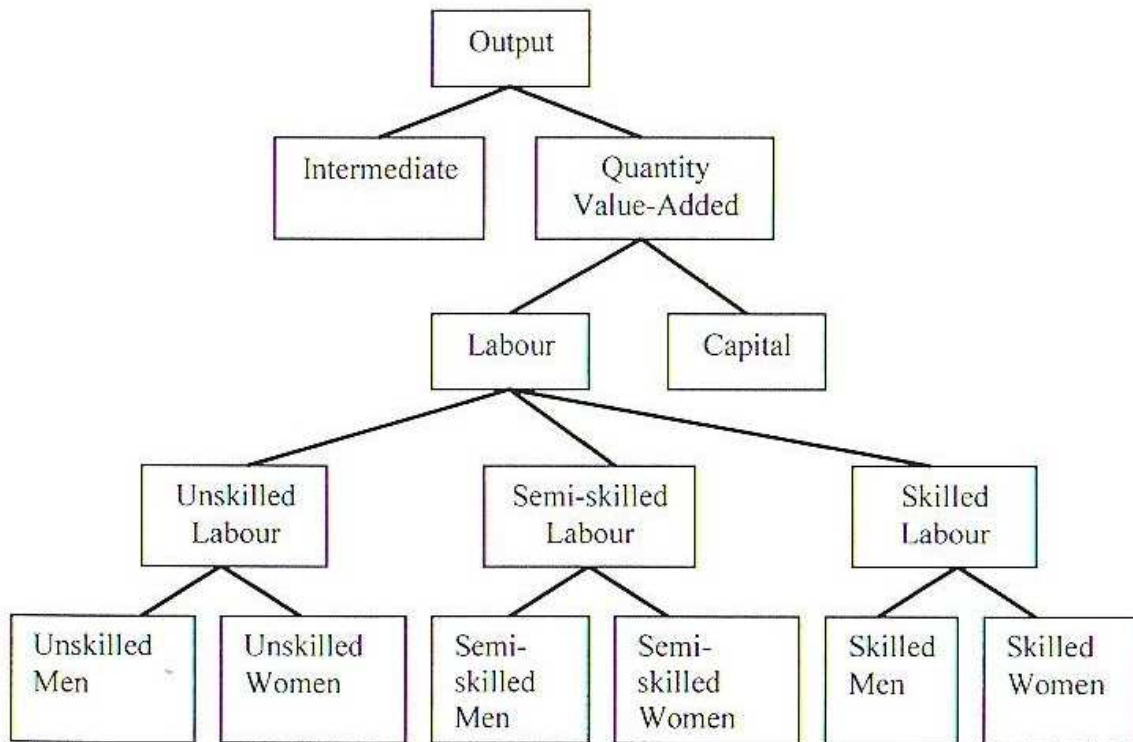
Source: Adapted from the model used in this study

The model institutions include households, government, enterprises, and the rest of the world accounts. As described in Chapter 4, households are disaggregated into 14 income categories. Sources of income include primary factor earnings, transfers from the government, from enterprises, from other households, and from the rest of the world. Households use their income to buy and consume commodities according to a linear expenditure function (LES), they make transfers to other households, pay income taxes, and save the rest.

The enterprises obtain their income from gains made by capital and transfers (from households, government, and the rest of the world). They use a proportion of their income to pay company tax to the government while they retain the rest for saving. Enterprises' savings are proportional to their disposable incomes and are converted into enterprises' investment. On the other hand, the savings of households and firms are referred to as private savings.

The government collects direct taxes from enterprises and households and indirect taxes (e.g. ad valorem tax on final sales) on goods and services; trade taxes on imports; net current transfers from households, firms, and the rest of world; and net capital transfers from government to firms. Indirect taxes are collected from the domestic output for domestic use and for imports. The government uses its income to consume commodities, make transfers to other institutions and to save. Government's savings are converted into public investment.

5.4   THE MODEL EQUATIONS

Section 5.4.1 presents the equations of the price system. Section 5.4.2 illustrates the production and trade block. Section 5.4.3 demonstrates institutional behaviour by showing equations that describe the mapping of value added into institutional income. Section 5.4.4 provides the system constraints that include both market-clearing conditions and the choice of macro "closure" systems for the model. Finally, special features of the model such as consumption are explained.

5.4.1   Price equations

$$PM_c = \overline{pwm_c} * (1 + tm_c) * EXR + \sum_{c' \in CT} PQ_{c'} * icm_{c'c} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: $c \in C$ set of commodities (also referred to as c' and C')

$c \in CM (\subset C)$ set of imported commodities

$c \in CT \subset C)$ set of domestic trade inputs

Equation (1) represents the domestic import price, (PM_c), of commodity, c, as a function of world import price, $\overline{pwm_c}$, expressed in foreign currency, adjusted for tariff rate, (tm_c) and the exchange rate, EXR, plus the transaction cost, ($icm_{c'c}$), per unit of import. The small country assumption applies for all sectors in South Africa, hence, $\overline{pwm_c}$, is set exogenously.

$$PE_c = \overline{pwe_c} * (1 - te_c) * EXR - \sum_{c \in CT} PQ_{c'} * ice_{c'c} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where: $c \in CE (\subset C)$ is a set of domestically produced and exported commodities.

Equation (2) represents the domestic price of exports, PE_c, as a function of world price of export, (pwe_c) given in foreign currency (US $), adjusted for export tax rate, (te_c), or export subsidy (then a + sign) applies and the exchange rate (EXR), plus the cost of trade inputs, $(ice_{c'c})$, per export unit of, c. The tax and the cost of trade inputs reduce the price amount received by the domestic producers of exports. With this model, the cost of trade inputs is subtracted because domestic price of exports does not contain such cost.

$$PDD_c = PDS_c + \sum_{c' \in CT} PQ_{c'} * icd_{c'c} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

Where: $c \in CD(\subset C)$ is a set of commodities with domestic sale of domestic output. Equation (3) is the demand price, (PDD_c), of the domestically produced and sold commodities defined as domestic supply price, (PDS_c), plus the cost of trade, $(icd_{c'c})$, or transportation margins, which distinguish between prices paid by demanders and prices received by suppliers. The cost of trade for South Africa is contained in the 2000 SAM.

$$PQ_c * (1 - tq_c) * QQ_c = PDD_c * QD_c + PM_c * QM_c \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

Equation (4) represents the price of composite commodities, (QQ_c), or the absorption function, as an average of the price, PDD_c of the commodity produced and sold domestically, QD_c, and the price, PM_c of the imported commodity, QM_c, weighted by their particular quantities, plus the sales tax rate, tq_c, which is imposed on both imported and domestically produced commodities. The equation reflects the Armington assumption of imperfect substitutability, which implies that the price that the consumer faces is not totally determined by world prices.

$$PX_c = ((PE_c * QE_c) + (PD_c * QD_c)) / QX_c \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

Where: $c \in CX(\subset C)$ is a set of commodities with domestic output.

Equation (5) represents the average output price, PX_c, of the commodity output, QX_c, given as the weighted average of the price, PD_c, of commodities, QD_c, that are produced and sold

domestically and prices, PE_c, of commodities, QE_c that are domestically produced and exported. The equation reflects the use of constant elasticity of transformation function (CET), which implies that the world price is not completely transmitted to the output price that producers receive.

$$PA_i = \sum_{c \in C} PXAC_{ic} * \theta_{ic} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

$$c \in I, i \in I$$

Equation (6) shows an activity price, PA_i, as being composed of the price, ($PXAC$), of the commodity, c, from activity, i, multiplied by its yield coefficient, θ_{ic}. The summation over all commodities indicates the possibility of an activity producing multiple commodities. In the current model, each activity produces one commodity, as a result, θ_{ic}, is equal to one. If one activity produces multiple commodities, θ_{ic}, equals the share of each commodity in the output of that activity.

$$PINTA_i = \sum_{c \in C} PQ_c * ica_{ci} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

Equation (7) gives the activity-specific aggregate intermediate input price, $PINTA_i$, as a composite commodity prices, (PQ_c) and intermediate input coefficients, ica_{ci}. ica_{ci}, which refers to the quantity of commodity, c, per unit of aggregate intermediate input.

$$PA_i * (1 - ta_i) * QA_i = PVA_i * QVA_i + PINTA_i * QINTA_i \dots\dots\dots\dots\dots..(8)$$

Equation (8) is an implicitly defined value added price, PVA_i which shows the activity revenue less cost as being equal to the payments for value-added and intermediate inputs. Specifically, PVA is the price received by domestic producers less taxes and the value of intermediate demand. Where: PA_i is the activity price, QA is an activity level, $PINTA$ is the aggregate intermediate prices, ta_a is tax for activity, and $QINTA$ is the quantity of intermediates.

$$\overline{CPI} = \sum_{c \in C} PQ_c * cwts_c \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots...(9)$$

Equation (9) represents an exogenous consumer price index (CPI), defined as

94

being equal to domestically marketed output, PQ_i, times the weight, ($cwts_i$), which represents shares of each commodity in total demand of the commodity. Since the core analysis of this model operates through price mechanisms, it is necessary to define a numeraire price against which all relative prices and income changes are be measured. This study uses *CPI* as a numeraire.

$$\overline{DPI} = \sum_{c \in C} PDS_c * dwts_c \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(10)$$

Where: $dwts_i$ is the weight of commodity c. Equation (10) represents the producer price index for domestically marketed output.

5.4.2 Production and trade block

The following section comprises quantity equations that represent the economic agents' decisions on production, domestic sales and international trade depending on the performance of the economy.

5.4.2.1   Production block equations

$$QA_i = \alpha_i^i * (\delta_i^i * QVA_i^{-\rho_i^i} + (1 - \delta_i^i) * QINTA_i^{-\rho_i^i})^{-\frac{1}{\rho_i^i}} \dots\dots\dots\dots\dots\dots\dots..(11)$$

$i \in ICES$ $ICES$:a set of activities with a CES function at the top of the technology nest. At the top of the technology nest, equation (11) defines the production function, QA_i, as a CES function of value-added, QVA_i (composite of factors of production) and intermediate inputs, $QINTA$, with a transformation of the elasticity of substitution (EOS), ρ_i^i, between intermediate input and value-added. The higher the EOS, the smaller the value of ρ_i^i. The parameter, α_i^i represents the technological efficiency.

$$\frac{QVA_i}{QINTA_i} = (\frac{PINTA_i}{PVA_i} * \frac{\delta_i^i}{1 - \delta_i^i})^{\frac{1}{1+\rho_i^i}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(12)$$

$i \in ICES$ is a set of activities with a CES function at the top of the technology nest. Equation (12) shows the optimal mix of intermediate inputs and value added as a function of

the relative prices of value added and the aggregate intermediate input. Where: δ_i^i, is the *CES* activity function share parameter and ρ_i^i is a *CES* activity function exponent.

$$QVA_i = A_i \left[\gamma_i K_i^{\rho_i} r_i + (1-\gamma_i)(\omega_1 QL_{r1} + \omega_2 QL_{r2} + \omega_3 QL_{r3})^{-\rho_i} \right]^{-(1/\rho_i)} \quad ....(13)$$

Equation (13) represents a sector's value-added, QVA_i defined as the *CES* production function which aggregates two primary inputs: capital, (K), and labour, (QL), according to, ρ_i, which is an elasticity of substitution between capital and labour. Labour is a composite of skilled, semi-skilled and unskilled labour. A_i represents a production function shift parameter, γ_i, is a share parameter; QL_{is} is sectoral labour inputs, s is labour skill type (i.e., s represents 1,2 and 3 where 1= skilled; 2 = semi-skilled; 3 = unskilled) while $w_s = \dfrac{W_s}{W_i}$ represents the weighted-share for labour categories.

Gender equation: The South African model is gender neutral; therefore, gender equations were added in order to distinguish the effects of policies on men and women workers.

$$QL_{i_s} = A_i \left[\alpha_i QL_{mn_s}^{-\rho_i} + (1-\alpha_i)QL_{fm_s}^{-\rho_i} \right]^{-(1/\rho_i)} \quad ....(14)$$

Equation (14) shows a composite labour, (QL_{i_s}) defined as an aggregation of men and women workers of the same skill types, (s), with ρ_i as a substitution between men and women workers. Other parameters include, A_i, a production technology or production function shift parameter, QL_{mn_s} as men's labour and QL_{fm_s} as women's labour.

$$QL_{fm_s} = \left[\left(\frac{W_{mn}}{W_{fm}}\right)\left(\frac{\alpha_i}{1-\alpha_i}\right) \right]^{\sigma_i} * QL_{mn_s} \quad ....(15)$$

Equation (15) shows how relative demand for men and women labour, QL_{fm_s}, depends on the share parameter α_i, the relative wage rate $\left(\dfrac{W_{mn}}{W_{fm}}\right)$, and sectoral elasticity of substitution σ_i.

$$QINT_{ci} = \sum_i ica_{ci} * QINTA_i$$

$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots(16)$$

$$i \in I; c \in C.$$

Equation (16) represents the demand for the disaggregated intermediate inputs, $QINT_{ci}$, given as the sum of a fixed input-output coefficient, ica_{ci}, which is multiplied by sectoral outputs. This equation implies that for any level of output, intermediate demand for inputs, c, into sector, i, is determined through a fixed input-output coefficient.

$$QXAC_{ic} = \theta_{ic} * QA_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots\ldots(17)$$

$$i \in I; c \in C$$

Equation (17) indicates the marketed output, $QXAC_{ic}$, of commodity, c, from activity, i, as an output of activity, QA_i, multiplied by the yield coefficient, θ_{ic}, which is equal to one in this model because as mentioned before, each activity produces only one commodity.

$$QX_c = \alpha_c^{ic} * \left[\sum_{i \in I} \delta_{i\ c}^{ic} * QXAC_{ic}^{-\rho_c^{ic}} \right]^{-\frac{1}{\rho_c^{ic}-1}} \ldots\ldots\ldots\ldots.\ldots\ldots..\ldots\ldots\ldots..(18)$$

Equation (18) represents a CES aggregation of the quantities of marketed commodity, QX_c, produced by each activity. The activities are assumed to be imperfect substitutes according to the elasticity of substitution, ρ_c^{ic}. This equation permits more than one activity to produce one commodity or one activity to produce multiple commodities. The aggregation function includes a shift parameter, α_c^{ic}, and a share parameter, $\delta_{i\ c}^{ic}$.

$$PXAC_{ic} = PX_c * QX_c \left[\sum_{i \in I} \delta_{i\ c}^{ic} * QXAC_{ic}^{-\rho_c^{ac}-1} \right] * \delta_{i\ c}^{ic} * QXAC_{ic}^{-\rho_c^{ic}-1} \ldots\ldots.....(19)$$

Equation (19) represents the first-order condition for the domestic output aggregation function given in equation 18. In this equation, the optimal quantity of the commodity from each activity is inversely related to the activity-specific price. This implies that a fall in price, $PXAC_{ic}$, of one activity relative to others would increase the demand of that activity without

affecting the demand for other higher price sources. The degree of substitutability between different producers depends on the value of the elasticity of substitution, ρ_c^{ic}.

$$QX_c = \alpha_c^t \left(\delta_c^t * QE_c^{\rho_c^t} + (1 - \delta_c^t) * QD_c^{\rho_c^t} \right)^{\frac{1}{\rho_c^t}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(20)$$

Equation (20) shows an output supply, QX_c, obtained by domestic producers maximising production subject to a constant elasticity of transformation (CET) function of the commodity, $QD_c^{\rho_c^t}$, supplied to the domestic market and the commodity, $QE_c^{\rho_c^t}$, supplied to the export market. This equation enables an activity to produce differentiated commodities for the domestic and export markets according to the elasticity of transformation, ρ_c^{ic}, which has a lower limit of one. The function's shift parameter is represented by, α_c^t, and a share parameters by, δ_c^t.

$$QE_c = QD_c * \left(\frac{PE_c}{PDS_c} * \frac{1 - \delta_c^t}{\delta_c^t} \right)^{\frac{1}{\rho_c^t - 1}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(21)$$

Equation (21) is the export supply response function, QE_c which shows how exports respond to changes in relative prices. The equation is given as a function of the domestic and export price ratio that defines the optimal mix between exports and domestic sales. The export supply is the first-order conditions from maximisation of equation (20). An increase in the export domestic price ratio generates a rise in the export domestic supply.

$$QX_c = QD_c \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots..\ldots..(22)$$

$$c \in (CD \cap CEN) \cup (CE \cap CDN)$$

Where: $c \in CEN (\subset C)$ represents non-exported commodities while $c \in CDN (\subset C)$ represents commodities without domestic market sales of domestic output.

Equation (22) shows the output supply as a CET function of the commodity supplied solely to the domestic market. This equation is applicable only when the good is not tradable.

$$QQ_c = \alpha_c^q \left(\delta_c^q * QM_c^{-\rho_c^q} + (1 - \delta_c^q) * QD_c^{-\rho_c^q} \right)^{\frac{1}{\rho_c^q}} \quad \text{..........................(23)}$$

$$c \in (CM \cap CD)$$

Equation (23) is the composite commodity supply referred to as Armington function given as a *CES* aggregation function between imports, QM_c, and the domestically produced commodities, QD_c, according to the elasticity of substitution, ρ_c^q, which has a lower limit of minus one. The assumption of imperfect substitutability allows transactions between imports and domestically produced commodity. Other parameters are: δ_c^q, a share parameter and α_c^q, a shift parameter.

$$QM_c = QD_c * \left(\frac{PDD_c}{PM_c} * \frac{\delta_c^q}{1 - \delta_c^q} \right)^{\frac{1}{1 + \rho_c^{qt}}} \quad \text{...............................(24)}$$

$$c \in (CM \cap CD)$$

Equation (24) shows the import demand function, QM_c, which is derived from a CES of the composite commodity equation. An increase of the domestic import price ratio leads to an increase in the import domestic demand. The ρ_c^q represents the elasticity of substitution.

$$QQ_c = QD_c + QM_c \quad \text{...(25)}$$

$$c \in (CD \cap CMN) \cup (CM \cap CDN); \quad c \in CMN (\subset C)$$

Equation (25) represents the composite supply for non-imported outputs and non-domestically produced imports. It replaces the Armington function for the union of commodities that have neither imports nor domestic sales of domestic output but not both.

$$QT_c = \sum_{c'C'} (icm_{cc'} * QM_{c'} + ice_{cc'} * QE_{c'} + icd_{cc'} * QD_{c'}) \quad \text{..................(26)}$$

$$c \in CT$$

Equation (26) is the transaction demand function where total demand for trade inputs (QT_c) is the sum of the demand for the inputs generated by imports, exports and domestic

market sales. In each of the three cases, fixed quantities of one or more transactions service inputs are required per unit of the traded commodity.

5.4.3 The institution block

The institution section shows income and expenditures of the institutions which are represented in the model. These institutions include: households, the government, enterprises together with the investment and savings accounts.

5.4.4 Factor income earnings.

$$
W_s = \frac{W_{fm_s} \sum_i QL_{fm,i} + W_{mn_s} \sum_i QL_{mn,i}}{\sum_i QL_i} \quad \text{..(27)}
$$

Where: W_{fm_s} is women workers' wage rate; W_{mn_s} men workers' wage rate; QL_{mn_s} men labour and QL_{fm_s} women labour and QL_i is total labour (men and women). Equation (27) represents the economy-wide average sectoral wage calculated as the weighted average of the total number of men and women workers of various wage rates. Each sector's wage depends on its respective mixes between men and women workers of various skill types.'

$$
YF_f = \sum_{i \in I} \left(WF_f * \overline{WFDIST}_{fi} * QF_{fi} \right) \quad \text{..(28)}
$$

Equation (28) represents the income, YF_f, of factor, f, earned as payment for their services rendered to activities. The factor income is obtained by the summation across sectors of the average wage, WF_f, times the quantity of the factor demanded, QF_{fi}, by each sector, i, times the wage distribution parameter, $WFDIST_{f,i}$. In the absence of factor market distortations $WFDIST_{f,i}$ equals one.

$$
YIF_{if} = shift_{if} * \left(1 - tf_f \right) * YF_f - trnsf_{row\,f} * EXR \quad \text{............................(29)}
$$

$$
i \in INS \;\; ; \, i \in INSD \;\; (\subset INS)
$$

Equation (29) illustrates the total institutional income, YIF_{if} (households, enterprises, governments, ROW which is available for the factors of production. The income is

100

divided among domestic institutions in fixed shares, $shift_{if}$, after payment of direct factor taxes, tf_f and transfers to the rest of the world, $trnsf_{rowf}$ are made. Transfer to the ROW is fixed in foreign currency and is transformed into domestic currency by multiplying it with the exchange rate.

$$YI_i = \sum_{f \in F} YIF_{if} * \sum_{i' \in INSDNG} TRII_{ii'} + trnsfr_{i\,gov} * \overline{CPI} + trnsf_{i\,row} * EXR \quad \text{........ (30)}$$

$$i \in INSDNG \,,\, i \in INSDNG(= INSDNG' \subset INSD)$$

$TRII_{ii'}$ transfers from institution i'. to i (both in the set $INSDNG$). Equation (30) represents the total income, YI_i, of non-governmental institutions given as the sum of factor incomes, transfers from the government, transfers from the rest of the world, and from enterprises plus any income from the quota premium.

$$TRII_{ii'} = shii_{ii'} * (1 - MPS_{i'}) * (1 - TINS_{i'}) * YI_{i'} \,\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(31)}$$

$$I' \in INSDNG; I \in INSDNG .$$

Equation (31) is the intra-institutional transfers that show that transfers between domestic non-governmental organisations (NGOs) are paid as fixed shares of the total institutional incomes net of direct taxes, $TINS$, and savings. The saving rate of (NGOs), $MPS_{i'}$, is multiplied by an adjustment factor, $shii_{ii'}$, (used in the current study) in which the savings rate adjusts in order to maintain the balance between the savings-investment account..

$$EH_{hi} = \left[1 - \sum_{i \in INSDNG} shii_{ih} \right] * (1 - MPS_h) * (1 - TINS_h) * YI_h \,\ldots\ldots\ldots\ldots\text{..(32)}$$

$$i \in H (\subset INSDN($$

Equation (32) shows total value of household consumption expenditure, EH_{hi}, as the total income less direct taxes, savings, and transfers to other domestic non-governmental institution. Savings and tax payments are determined as the product of household income and fixed savings and tax rates. Among domestic non-governmental organisations only households

demand commodities.

$$PQ_c * QH_{c\,h} = PQ_c * \gamma^m_{c\,h} + \beta^m_{c\,h} * \left(EH_h - \sum_{c'\in C} PQ_{c'} * \gamma^m_{c\,h} - \sum_{i\in I}\sum_{c'\in C} PXAC_{i\,c'} * \gamma^h_{i\,c'h} \right)$$

……………………………………………………………………………………..(33)

Equation (33) gives the linear expenditure system (LES), which is a demand system for marketed consumption, $QH_{c\,h}$. In the second part of the equation, the super-numerary income is calculated as, EH_h, minus the minimum levels of the marketed consumption, $\gamma^m_{c\,h}$, which represents the subsistence or minimum consumption of marketed commodity, c, for household, h. The $\beta^m_{c\,h}$ gives the marginal share of consumption spending on marketed commodity, c, for household, h.

$$QINV_c = \overline{IADJ} * \overline{qinv}_c$$ …………………………………………………..…….………..(34)

The investment demand $QINV_c$ is shown in equation (34) as the quantity of fixed investment demand, $\overline{qinv}_c$, for commodities, c, which is defined as the base year investment quantity, $\overline{qinv}_c$, multiplied by an exogenous adjustment factor, $\overline{IADJ}$, which is used for simulations in which investment adjusts as in savings-driven models. The inventory investment is treated as an exogenous demand.

$$QG_c = \overline{GADJ} * \overline{qg}_c$$ …………………………………………………..……………..(35)

The demand for commodity consumption by the government, QG_c, is given in equation (35). It is defined as the base year quantity of fixed government demand, $\overline{qg}_c$, multiplied by an exogenous government consumption adjustment factor, $\overline{GADJ}$. $\overline{GADJ}$ is used for simulations in which government expenditure is allowed to adjust.

$$YG = \sum_{i\in INSDNG} TINS_i * YI_i + \sum_{f\in F} tf_f * YF_f + \sum_{i\in I} tva_i * PVA_i * QVA_i$$
$$+ \sum_{i\in I} ta_i * PA_i * QA_i + \sum_{c\in CM} tm_c * pwm_c * QM_c * EXR + \sum_{c\in CE} te_c * pwe_c * QE_c * EXR \qquad ...(36)$$
$$+ \sum_{c\in C} tq_c * PQ_c * QQ_c + \sum_{f\in F} YF_{gov\,f} + trnsfr_{gov\,Row} * EXR$$

Equation (36) represents government revenue, YG, which is the sum of revenues from taxes, such as direct taxes on households and enterprises, sales taxes, factor taxes and value-added taxes. Other taxes are import tariff, export taxes and transfers from the rest of the world which are converted in domestic currency by multiplying with the exchange rate.

$$EG = \sum_{c \in C} PQ_c * QG_c + \sum_{i \in INSDNG} trnsfr_{i\,gov} * \overline{CPI} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(37)$$

Equation (37) indicates the government expenditure equation, which is the sum of government spending on consumption, QG_c and transfers, $trnsfr_{i\,gov}$, made to domestic institutions.

$$GSAV = YG - EG \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(38)$$

Equation (38) shows government savings as the difference between government revenue and government expenditure.

5.4.5   The macroconstraint block

The following section illustrates equilibrium conditions which define the constraints that the model must satisfy in order to reach a solution. The equations do not describe the behaviour of agents or determination of prices and quantities but rather indicate conditions that must be satisfied in a closed model.

Factor markets closure

The model has two assumptions: the first assumption is that of full employment and full mobility of all factors of production which include capital, men and women of all skills types. The demand variables are flexible while the supply variable is fixed. Equilibrium in the factor market is reached through adjustment in factor prices refered to as WF_f.

$$\sum_{i \in I} QF_{f\,i} = \overline{QFS_f} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots.(39)$$

Equation (39) indicates the equilibrium condition between the total quantity demanded $QF_{f\,i}$ and the total quantity supplied $\overline{QFS_f}$ (exogenous) for each factor. Specifically:

$$\sum_{i \in I} QF_{fm_s,i} = \overline{QFS}_{fm_s} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(40)$$

$$\sum_{i=I} QF_{mn_s i} = \overline{QFS_{mn_s}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(41)$$

Equation (40) indicates equilibrium between the demand and supply of men labour while equation (41) indicates equilibrium between the demand and supply of women labour. Where: mn : represents men labour while fm represents women labour. With this assumption, the market is assumed to be in equilibrium when a flexible wage adjusts until the demand for all skill types of labour is equal to all skill types of labour supply. The same reasoning applies to fully employed and mobile capital. However, the model assumes that payments to identical factors might vary across activities through the variable that captures the sectoral proportions for factor prices. These proportions are assumed to be a consequence of the use made by activities of factors, rather than of the factors themselves, and are therefore assumed fixed,i.e

$$WFDIST_{k\,i} = \overline{WFDIST}_{k\;i}$$

Factor closure with unemployment assumption:

The second assumption is that (a) capital is fully employed and sector-specific, (b) unskilled, and semi-skilled men and women labour is mobile and unemployed, and (c) Skilled men and women labour is assumed mobile and fully employed. Each market clears when the sum of the sectoral labour equates total supply of labour (QL) for the respective gender categories to yield equilibrium solutions to factor prices as well as the corresponding equilibrium quantities.

(a) Under this assumption, capital is assumed to be sectorally fixed, rendering no mobility between sectors.

$$QF_{k,i} = \overline{QF}_{k,i}$$

The returns to capital due to its services within different sectors are allowed to vary which implies:

$$WFDIST_{k\,i} = \overline{WFDIST}_{k\;i}$$

(b) The supply of unskilled and semi-skilled men and women labour is assumed perfect elastic,

implying infinite supply. This assumption stems from the high rate of unemployment which is related to this type of labour. Such labour is mobile across sectors and not fixed at the base level. Where: *unsmn* : unskilled men; *unsfm* : unskilled women; *sskmn* : semi-skilled men; *sskfm* : semi-skilled women; *WF* : wage of labour; *QFS* : total supply of labour

$$QFS_{un\,mn} = \overline{QFS_{uns\,mn}} \qquad\qquad QFS_{uns\,fm} = \overline{QFS_{uns\,fm}}$$

$$QFS_{sskmn} = \overline{QFS_{sskmn}} \qquad\qquad QFS_{ss\,fm} = \overline{QFS_{ssk\,fm}}$$

The assumption of elastic supply of unskilled and semi-skilled men and women labour, implies that sectors can employ any amount of such type of skills at a fixed price as represented below:

$$WF_{uns\,mn} = \overline{WF_{uns\,mn}} \qquad\qquad WF_{uns\,fm} = \overline{WF_{uns\,fm}}$$

$$WF_{sskmn} = \overline{WF_{sskmn}} \qquad\qquad WF_{ssk\,fm} = \overline{WF_{ssk\,fm}}$$

$$QQ_c = \sum_{i \in I} QINT_{ci} + \sum_{h \in H} QH_{ch} + QG_c + QINV_c + qdst_c + QT_c \ldots\ldots\ldots\ldots\ldots(42)$$

Equation (42) represents equilibrium between the quantities of composite commodity supplied with the quantity demanded. The composite commodity supply, QQ_c, is calculated as the sum of intermediate demands, $QINT_{ci}$, household demands, QH_{ch}, government demand, QG_c, investment demand, $QINV_c$, and stock change, $qdst_c$.

$$\sum_{c \in CM} pwm_c * QM_c + \sum_{f \in F} trnsfr_{row\,f} = \sum_{c \in CE} pwe_c * QE_c + \sum_{i \in INSD} trnsfr_{i\,row} + \overline{FSAV} \ldots (43)$$

Equation (43) represents a current account balance which is an equilibrium between the country's spending and its earning of foreign currency. The left-hand side represents payments to the rest of the world (ROW) in terms of imports and transfers from factors to the ROW while the right hand side represents revenue from the ROW, expressed in terms of exports, transfers from the ROW to sectors and foreign savings, $\overline{FSAV}$. $\overline{FSAV}$ is an exogenous variable expressed in foreign currency, FCU.

$$YG = EG + GSAV \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(44)$$

Equation (44) represents the government balance as the sum of the government expenditures, EG, (no government investment) and government savings, $GSAV$, which is an endogenous variable that clears the government balance.

$$\sum_{i \in INSDNG} MPS_i * (1 - TINS_i) * YI_i + GSAV + EXR * \overline{FSAV} =$$
$$\sum_{c \in C} PQ_c QINV_c + \sum_{c \in C} PQ_c * qdst_c \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(45)$$

Equation (45) shows the equality between the total savings and total investment. Total savings is the sum of savings from domestic non-governmental institutions, the government, and the rest of the world while total investment is the sum of the values of fixed investment (gross fixed capital formation) and stock changes. Since the savings side performs the balancing role, the closure for the current model represents a case of 'investment-driven' savings.

Macroeconomic definitions

The following section presents macroeconomic identities, which are utilised as measuring tools as well as used for the macroeconomic closure rules.

$$TINS_i = \overline{tins_i} * (1 + \overline{TINSADJ} * tins01_i) + \overline{DITINS} * tins01_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(46)$$

Where: $TINS_i$ is the rate of direct tax on domestic institutions, i.

$\overline{TINSADJ}$ direct tax scaling factor (0 for base; exogenous variable).

$\overline{tins_i}$ exogenous direct tax rate for domestic institutions , i.

$tins01_i$ ...... 0-1 parameter, where , i, represents institutions with potential flexible direct tax rates.

$\overline{DITINS}$ change in domestic institution tax share (0 for base; exogenous variable).

Equation (46) defines the direct tax rates of domestic non-government institutions. In the model, all variables on the right-hand side are fixed, which implies fixed values for the direct tax rate variable of all institutions.

$$MPS_i = \overline{mps_i} * \left(1 + \overline{MPSADJ} * mps01_i\right) + DMPS * mps01_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(47)$$

Where: $MPS01_i$ 0-1 parameter with 1 for institutions with potentially flexed direct tax rates

$\overline{mps_i}$ base savings rate for domestic institution, i

$\overline{MPSADJ}$ savings rate scaling factor (=0 for base)

$DMPS$ change in domestic institution savings rates (=0 for base; exogenous variable).

Equation (47) defines the savings rates of domestic non-governmental institutions. Depending on the closure rule for savings-investment balance, one or none of the variables $\overline{MPSADJ}$ and $DMPS$ might be flexible. In the current model, $DMPS$ is flexible, permitting MPS to be adjusted by a uniform rate for selected non-governmental institutions.

$$TABS = \sum_{h \in H} \sum_{c \in C} PQ_c * QH_{ch} + \sum_{i \in I} \sum_{c \in C} \sum_{h \in H} PXAC_{ic} * QHA_{ic}$$
$$+ \sum_{c \in C} PQ_c * QG_c + \sum_{c \in C} PQ_c * QINV_c + \sum_{c \in C} PQ_c * qdst_c \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots..(48)$$

Equation (48) shows the total absorption equation which is measured as the total value of domestic final demands (GDP at market prices).

$$INVSHR * TABS = \sum_{c \in C} PQ_c * QINV_c + \sum_{c \in C} PQ_c * qdst_c \quad \ldots\ldots\ldots\ldots\ldots.\ldots\ldots...\ldots(49)$$

Equation (49) is the ratio of investment to absorption function, $INVSHR$, which is defined as the sum of total investment value $QINV_c$ across sectors plus any sectoral stock change, $qdst_c$.

$$GOVSHR * TABS = \sum_{c \in C} PQ_c * QG_c \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots\ldots\ldots\ldots\ldots.(50)$$

Equation (50) shows the ratio of the government consumption to absorption, $GOVSHR$. The right-hand side defines the value of government consumption, while in the left-hand side, total absorption is multiplied by a variable, $GOVSHR$, which measures the ratio between government consumption and absorption.

5.5   GENERAL MACROECONOMIC BALANCE

The CGE model contains four macroeconomic accounts, which must be balanced: the current account with the rest of the world, the savings-investment account, the government account and the factor markets. In each condition, one or more of the variables serve to equilibrate the market in question. Choosing such a variable(s) is known as the 'closure' of the model. In addition, the CGE models are generally over determined and the way to ensure that the model is mathematically solvable requires the closure rule. The choice of a closure depends on the type of a simulation as well as the modeller's understanding of the structures of the economy Rattsø (1982). Robinson (1989) defines *closure* as being an assumption that one or more of macro account is exogenous, while the closure problem refers to the choice of which a variable is left endogenous in order to achieve equilibrium in savings and investment, government revenue and expenditure, and the balance of trade. The choice of closure is important because it affects the model's results and hence the policy conclusions that are drawn from them. There is no correct choice of closure; the modeller has to justify it.

In order to balance the current account, either the foreign savings are fixed while the real exchange rate varies, or vice versa. When the exchange rate is allowed to vary a specified simulation results in fluctuation of the trade balance. If the foreign savings are variable, this will affect the savings-investment balance. In the current model, the foreign savings are held fixed which keep fluctuations in inflows from affecting welfare. In addition, it prevents the Government from what is called "free lunch'.

If the model is savings-driven, savings rates are fixed (by fixing the *SADJ* variable) while investment varies in order to equilibrate the account. Otherwise, the model is investment-driven, where *IADJ* is fixed while the savings variable is endogenous.

The government balance consists of three equilibrating variables; government consumption, government savings, and tax rates. If the *GSAV* varies, then the model reflects flexible government savings while other variable are fixed. For example, in order to finance rising government expenditure, the government has to obtain money from the capital account thus increasing the budget deficit. If the model shows targeted government savings (i.e. a budget-neutral reform) through flexible tax rates, *DTAXADJ* and *DTINS* adjust accordingly in order to maintain the deficit in the base line level. If the government consumption spending is flexible, *GADJ* adjusts. In certain instances, Government consumption may be fixed as a pre-determined share of total absorption.

Under cases where investment and government spending are both fixed as a share of total absorption, it follows that the consumption is also fixed as a percentage share of total absorption. This method is called the 'balanced' closure, which spreads out the adjustment and ensures that the private savings rate adjust in order to achieve a savings-investment balance. Under such conditions, an external policy shock will affect investment, government expenditure, consumption, and savings.

The capital account ensures that investment is equal to investment. In an investment-driven savings models, there is uniform marginal propensity to save changes for selected institutions such as households and enterprises in order to maintain the investment levels. If the model is savings-driven, then the savings of institutions such as households, government, and enterprises adjust in order to maintain the saving investment balance.

The factor markets can either have, for a given factor, mobility and a fixed average wage across activities, in which case WF, is free, but $WFDIST_{f\,i}$ is fixed, or immobility, in which case the amount of the factor employed in the specific activity (i.e. $QF_{f,i}$) is fixed while $WFDIST_{f\,i}$ is allowed to vary enabling the wage to vary across activities.

5.6 THE CLOSURE RULES FOR THE GENDERED MODEL

Savings and investment balance:

In this model, the economy is investment-driven whereby the share of investment in absorption is fixed, and the level of savings adjusts in order to equate the level of investment as determined by fixed marginal propensities to save for each domestic non-governmental institution. At equilibrium, aggregate investment must equal savings (private, government and foreign), plus government balance and external balance (Kilkenny & Robinson 1990).

External balance:

Consistent with macroeconomic policies in South Africa, a flexible exchange rate is assumed while foreign savings are fixed in the rest of the world (ROW) account. This forms an external constraint for the balance of trade. This constraint helps to support policy changes. For example, trade liberalisation that increases imports has to be offset by increased exports or decreased imports in the rest of the economy. This prevents policy changes from being financed by a free lunch from the rest of the   world (De Melo & Tarr 1992).

Government balance:

The government account balance is achieved by allowing government savings to vary while variables such as tax rates remain fixed at their initial levels. The government consumes a fixed share of total final domestic demand in each sector while government spending is set at a constant share of total absorption. The level of government expenditure is indexed on the consumer prices in order to maintain government expenditure in real terms. Changes in government revenues and expenditures are reflected in changes in the overall government budget deficit/surplus. For example, in order to finance rising government expenditure, the government has to obtain money from the capital account thus increasing the budget deficit.

Assumptions of the gendered model concerning factor (capital, labour) closure

The gendered model has different assumptions concerning the factor closure.

(a) The first assumption takes into consideration the situation of labour in the South African economy. Capital is assumed fully employed and sectorally fixed. Skilled men and women labour is fully employed and mobile across sectors the situation that mirrors rapid job turnover in the South African economy. Although capital is highly mobile (Seguino 2000b), due to difficulties associated in changing capital stock in the short run, capital is assumed to be fixed sectorally. The equilibrating variable is the wage rate for the case of labour while for capital its sector-specific returns adjusts in order to maintain the employment level in the sector. On the other hand, unskilled and semi-skilled men and women labour is modelled as mobile across sectors, but unemployed (elastic supply). This means that they have a fixed average wage across activities, in which case WF is free, but $WFDIST_{f,i}$ is fixed.

(b) Due to South Africa's strong trade unions, it is assumed that all workers face flexible wages in a market that is characteristic of full employment. In this instance, the assumption involves a given supply of fully employed and full mobile capital and men and women of various skills. The labour wages and capital returns move in sectors to equilibriate the labour market.

All prices in the model are expressed relative to consumer price index (CPI), the numeraire, thus expressing all value results of the model in real terms. The CPI enables general equilibrium analysis to continue without having to worry about the effects of inflation (and money supply) on the optimal use of resources.

The model employs a comparative static analysis and contains equations that guarantee that a set of microeconomic and macroeconomic constraints is satisfied. That is, factor and commodity markets, savings and investment, and government and current account balance requirements are met. The comparative static nature of the model gives short-term and medium-term equilibrium results. This means that after each simulation, the result indicates the new equilibrium obtained after the agents, consumers and producers have adjusted themselves to new prices and incomes. The comparative static, unlike the dynamic model, does not provide feedback effects on labour force growth, productivity, and investment behaviour from a policy change.

The gendered CGE model for South Africa has 50 basic equations, comprising 19 equations for production and trade block; 12 for institutions block; 10 for prices; and nine for equilibrium conditions and macroeconomic closures. Since there are 49 production activities and 14 categories of households, the total number of equations to be solved is 4 575 which matches the number of endogenous variables. The model solves because it is identified as containing the same number of endogenous variables as the equations. It is solved as a system of simultaneous non-linear equations and it reflects a Walrasian economy that solves for relative prices. The model is written and solved using the GAMS programming language.

5.6.1 Analysing the simulation results

The simulations performed by the CGE model result in counterfactual equilibriums, which are compared with the base run equilibrium. The results include solutions for all prices and quantities (for goods and factors), as well as utility levels, expenditures and macroeconomic variables. Important macroeconomic variables changes to be taken into considerations after economy-wide simulations of model include the total absorption, government revenues, government savings, government consumption and trade balance changes. Employment changes regarding capital and men and women labour, factor (capital, labour) income earnings and the welfare for households are also important variables to be analysed after the policy shock.

Household welfare indicator (Equivalent variation)

The analysis to determine the welfare of households in most of the CGE models involves using the equivalent variation (EV) measure. The Hicksian equivalent variation is derived from utility and is a commonly applied indicator in CGE analysis, because of its well micro-founded indicators. The CGE models are developed   based on the economic agent's optimization

problems. For example, producers are assumed to maximize profits and households are assumed to maximize utility. As such, utility is used to evaluate the macro impacts of policies. However, utility has several setbacks. For example, it is based on ordinal numbers and not on cardinal numbers, which makes it impossible to quantify. Since the utility level is expressed in absolute numbers, it does not give concrete ideas about welfare status from a viewpoint of actual economic activities. In order to avoid such setbacks of utility as a welfare indicator, the utility given in an absolute number is converted into EVs.

First the expenditure function is employed as follows:

$$E(P_i^q, UU) \equiv \min X_i^p \left(\sum_i P_i^q X_i^p \big| UU = UU(X_i^p) \right)$$

Where: $E(P_i^q, UU)$ expenditure function.

     XP_i^p :   consumption of the i$^{\text{th}}$ commodity

     P_i^q :   price of the i$^{\text{th}}$ commodity and

     $UU(X_i^p)$:   a given utility level.

The right-hand side represents minimum expenditure to achieve the given utility level, UU, under prices, $P_i^{q,}$ of i$^{\text{th}}$ commodity. Because the expenditure functions are given in value terms, it is possible to add them up in case they are more than two households.

The expenditure functions give the utility levels in value terms. In order to compare equilibrium, an indicator known as Hicks equivalent variation is used as follows:

$$EV_h \equiv E(P_i^{q0}, UU_h^1) - E(P_i^{qO}, UU_h^O)$$

Where UU^1 represents changes in utility after policy simulation while UU^O represents the base level utility for household, h, and the prices, P_i^{q0}, refer to the original consumer prices of the i-th commodity. If EV is positive after policy simulation, then the welfare of household, h, is positive. If after the policy shock EV is negative, then the welfare of household, h, is negative. Positive EV implies a certain amount of money a household is willing to be compensated with in order to avoid changes, while a negative EV implies a certain amount of money, a household is willing to pay in order to avoid a policy change. With government and investment spending held constant in real terms in this model, the EV represents the amount of income that would have to be given to the household sector in the base model to reach the

level of overall economic welfare achievable with globalisation. (Varian 1984:264)

Table 5.1 Sets, variables and parameters of the CGE model

Sets	Definition
AC	Global set
i(ic)	Activities
aces(i)	Activities with a CES function at the top of the technology nest
aloe (i)	Activities with a Leontief function at the top of technology nest
c (ic)	Commodities
cd (c)	Domestic commodities
cdn (c)	Non-sold domestic Commodities
cm (c)	Imported commodities
cnm (c)	Non-Imported commodities
ce (c)	Exported commodities
cne (c)	Non-exported commodities
cx (c)	Commodities with output
f (ic)	Factors
flab(f)	Labour factors
fcap	Capital factor
ins	Institution (domestic and rest of world)
insd (ins)	Domestic Institution
insdng (insd)	Domestic non-government institutions
h (ins)	Households
en (ins)	Enterprises

Table 5.2 Parameters appearing in model equations

Parameters	
α_i^i	shift parameter for top-level CES function
α_i^{ic}	shift parameter for domestic commodity aggregation function
α_c^q	shift parameter for Armington function
α_c^t	shift parameter for CET function
α_i^{vi}	shift parameter for CES activity production function
$\beta_{c,h}^m$	LES marginal budget shares of household consumption for marketed goods (commodities)
$cwts_c$	Weights for consumer price index
$\delta_{f,i}^i$	share parameter for top-level CES function
δ_{ic}^{qc}	share parameter for domestic commodity aggregation function
δ_c^q	share parameter for Armington function
δ_c^t	share parameter for CET function
$\delta_{f,i}^i$	share parameter for CES activity production function
$cwts_c$	domestic sales price weights
$dwts_c$	domestic production price weights
$\gamma_{c,h}^m$	LES subsistence minima for marketed goods (commodities)
$\vartheta_{i,c}$	Yield of output c per unit of activity i
$ica_{c,i}$	intermediate input c per unit of aggregate intermediate

Parameters	
$\text{int } q_i$	aggregate intermediate input coefficient
iva_i	aggregate value added coefficient
$icd_{c,cp}$	trade input of c per unit of commodity cp produced & sold domestically
$ice_{c,cp}$	trade input of c per unit of commodity cp exported
$icm_{c,cp}$	trade input of c per unit of commodity cp imported
$mps\,01_{ins}$	0-1 par for potential flexing of savings rates
mps_{ins}	marginal propensity to save for domestic non-governmental inst ins (exogenous part)
$qdst_c$	inventory investment by sector of origin
$qb\,\text{arg}_c$	exogenous (unscaled) government demand
$qbarinv_c$	exogenous (unscaled) investment demand
ρ_i^i	CES top level function exponent
ρ_c^{ac}	domestic commodity aggregation function exponent
ρ_c^q	Armington function exponent
ρ_c^t	CET function exponent
ρ_i^{va}	CES value-added function exponent
$shif_{ins,f}$	share of domestic id in income of factor f
$shii_{ins,insp}$	share of domestic institution id in post-tax post-savings income of inst ip
$\text{sup } ernum_h$	LES supernumerary income
$\upsilon_{i,c}$	yield of commodity c per unit of activity i
$\gamma_{i,c,h}^h$	subsistence consumption of marketed commodity c for household h
$trnsfr_{ins,ac}$	transfers from institution. or factor ac to institution ins
*	
Tax rates	
$tins_{ins}$	direct tax rate on institution ins
ta_i	rate of tax on producer gross output value
te_c	rate of tax on exports
tf_f	rate of direct tax on factors (soc sec tax)
$tins\,01_{ins}$	0-1 parameter with 1 for institutions with potentially flexed direct tax rates
$tinsbar_{ins}$	rate of (exogenous part of) direct tax on domestic institution ins
tm_c	rate of import tariff
tq_c	rate of sales tax
tva_i	rate of value-added tax

Table 5.3 Exogenous model variables

Exogenous Variables	
CPI	consumer price index (PQ-based)
$DTINS$	change in domestic institution tax share
$FSAV$	foreign savings
$GADJ$	government demand scaling factor
$IADJ$	investment scaling factor (for fixed capital formation)

Exogenous Variables	
$MPSADJ$	savings rate scaling factor
QFS_f	quantity of factor supply
QFS_{mn}	quantity of men labour supply
QFS_{fm}	quantity of women labour supply
$TINSADJ$	direct tax scaling factor
$WFDIST_{f,i}$	factor wage distortion variable
DPI	index for domestic producer prices (PDS-based)

Table 5.4 Model endogenous variables

Endogenous Variables	
$DMPS$	change in marginal propensity to save for selected inst
EG	total current government expenditure
EH_h	household consumption expenditure
EXR	exchange rate
$GOVSHR$	govt consumption share of absorption
$GSAV$	government savings
$INVSHR$	investment share of absorption
MPS_{inst}	marginal propensity to save for domestic non-government institutions
PA_i	output price of activity i
PDD_c	demand price for commodity c produced and sold domestically
PDS_c	supply price for commodity c produced and sold domestically
PE_c	price of exports
$PINTA_i$	price of intermediate aggregate
PM_c	price of imports
PQ_c	price of composite good c
PVA_i	value added price
PWE_c	world price of exports
PWM_c	world price of imports
PX_c	average output price
$PXAC_{i,c}$	price of commodity c from activity i
QA_a	level of domestic activity
QD_c	quantity of domestic sales
QE_c	quantity of exports
$QF_{f,i}$	quantity demanded of factor f from activity i
$QLD_{mn,i}$	quantity demanded of men (mn) labour from activity i
$QLD_{fm,i}$	quantity demanded of women (fm) labour from activity i
QG_c	quantity of government consumption
$QH_{c,h}$	quantity consumed of marketed commodity c by household
$QHA_{i,c,h}$	quantity consumed of home commodity c from activity i by hhd h
$QINT_{c,i}$	quantity of intermediate demand for c from activity i

Endogenous Variables	
$QINTA_i$	quantity of aggregate intermediate input
$QINV_c$	quantity of fixed investment demand
QM_c	quantity of imports
QQ_c	quantity of composite goods supply
QT_c	quantity of trade and transport demand for commodity c
QVA_i	quantity of aggregate value added
QX_c	quantity of aggregate marketed commodity output
$QXAC_{i,c}$	quantity of output of commodity c from activity i
$TABS$	total absorption
$TINS_{ins}$	rate of direct tax on domestic institutions ins
$TRII_{ins,insp}$	transfers to dom. institution. insdng from insdngp
$WALRAS$	savings-investment imbalance (should be zero)
$WALRASSQR$	Walras squared
WF_f	economy-wide wage (rent) for factor f
WF_{mn}	wage rate for men workers
WF_{fm}	wage rate for women workers
YF_f	factor income
YG	total current government income
$YIF_{ins,f}$	income of institution ins from factor f
YI_{ins}	income of (domestic non-governmental) institution ins

CHAPTER 6

A CGE ANALYSIS: EFFECTS OF TRADE LIBERALISATION ON THE ECONOMY AND GENDER: FACTOR MOBILITY CONSIDERATIONS

6.1   INTRODUCTION

Using a CGE model, calibrated to the 2000 gendered South African economy, this study attempts a fuller understanding of the implications of trade liberalisation adopted by the government of South Africa on wages, income earnings, employment of unskilled, semi-skilled and skilled men and women workers, on the welfare of households, and on the economy. A simulation of a tariff reduction policy with two factor scenarios is used. The first simulation introduces a short-term analysis where capital is sectorally fixed due to rigidities but full employed. Skilled labour is fully employed and mobile across sectors. However, the reality in South Africa is that there is a high unemployment rate of unskilled and semi-skilled men and women. The simulation takes account of this situation by allowing unemployment and mobility across sectors of the unskilled and semi-skilled labour. The second simulation allows mobility and full employment of all factors of production. The study compares the two simulations and relates the results to other empirical studies done both in South Africa and in other parts of the world.

One of the most dramatic changes in the South African economy during the 1990s was the intensifying of its trade openness, which generated record growth in international trade, particularly of imports. As a consequence, changes were produced in the structure of consumption, production and employment. The effects of such changes on men and women have yet not been fully studied, but there exists a body of research that allows this study to reflect on the relation between trade liberalisation and employment, particularly the consequences as they relate to both men and women workers.   The high level of unemployment in South Africa, particularly for unskilled women, clearly needs a further understanding of the markets and their effects on policy changes.

In order to simplify the interpretation of the results, sectors are grouped in specific categories as follows: capital-intensive sectors (machinery, vehicles, transportation equipments, chemicals, other chemicals, communication equipment, electrical equipment); labour-intensive sectors (textiles, apparel, leather, footwear, print, paper, wood, furniture): intermediates (petroleum, coal, mineral, chemical, rubber,   plastics, metal products) and service sectors

(communication, government, finance, trade, business, transportation services). The data used for this study is fully explained in chapter 4. The low rate of gender elasticity of substitution (0.50) used implies gender rigidity in societies. This follows the low rates as used by Arndt (2001) in Mozambique and Fontana (2001) in Zambia which is a result of gender rigidities associated with many African countries including South Africa.

The rest of the chapter is arranged as follows. Section 6.2 gives the policy simulations that are carried out in this study. Section 6.3 discusses the results of the two simulations which analyse varying impacts under varying factor closure. Section 6.4 concludes the chapter.

6.2 STUDY POLICY SIMULATIONS

Simulation 1 (SIM 1): The first simulation involves a full-tariff reduction on all sectors. The tariffs refer to the nominal tariff rates, excluding any type of rebate concessions provided to certain sectors. Tariffs are applied as an ad valoreum rate to all sectors, irrespective of a sector's import weight. The assumption under SIM 1 includes the existence of unemployment with full mobility across sectors of unskilled and semi-skilled men and women while skilled men and women are assumed fully employed and mobile. On the other hand, capital is fully employed and sector-specific. This assumption reflects the employment characteristics of skills shortage and the existence of high unemployment rate of unskilled and semi-skilled labour in the South African economy.

Simulation 2 (SIM 2): As with SIM 1, SIM 2 undergoes full tariff reduction on all sectors. However, SIM 2 assumes that all factors (capital, skilled men and women, unskilled men and women, and semi-skilled men and women) are fully employed and mobile across various sectors of the economy. SIM 2 applies a neoclassical assumption of free markets characterised by full employment and full mobility of resources. The full-mobility assumption also characterises a long-term analysis where none of the factors is fixed. This assumption is in line with many studies that utilise the neoclassical assumption in their analysis. Gender advocates, however, challenge the full mobility assumption accorded to both men and women. They contend that mobility of men and women differs depending on the social, cultural, and economic conditions they encounter in their communities. For example, in most instances, household production restrains the mobility of women. Furthermore, given the high rate of unemployment, particularly of unskilled labour in South Africa, the assumption of full employment is not realistic. This has prompted many studies to relax some of the neoclassical hypotheses in order to allow for more market imperfections, such as the existence of

unemployment, price rigidities, and imperfect competition in their models. This model hence takes account of pre-existing and continuing unemployment of unskilled and unskilled labour in South Africa.

6.3 SIMULATIONS RESULTS: FULL TRADE LIBERALISATION (SIM 1)

6.3.1 Government and macroeconomic results (SIM 1)

The direct effect of full-tariff reduction on tradable commodities is the reduction of all import prices in local currency relative to domestic prices. This outcome makes imports more attractive to consumers who increase its demand while shifting away from the relative expensive domestically produced goods. Cheap imports include capital, intermediates and consumable goods hence affecting both producers and consumers. In order to maintain a current account balance, exports need to increase in order to offset the rising imports. This is achieved by the depreciation of the exchange rate and hence raising exports. Government revenue declines significantly (3.444%) due to foregone import tax thus widening the government deficit. In order to maintain the government balance, government deficit needs to be financed. Facing declining demand of their output, domestic producers react by reallocating themselves in other profitable entities, mainly exports. Increased demand for exports coupled with cheap imported inputs help producers increase production.

Increased demand of exports coupled with the availability of relatively cheap intermediates and capital imports contribute to the rise of gross domestic product (GDP). The economic expansion leads to growth of employment demand that see job creation for all skill types of men and women labour. The increased earnings for labour and subsequent increased consumption further improve the GDP. In addition, GDP benefits from high returns of sectorally fixed capital which has high initial rent, accorded to it because of its scarcity and its higher productivity. Increased earnings of factors due to improved employment help to raise income, resulting in increased private savings, which offsets reduced government savings, thus narrowing the government deficit. Furthermore, by lowering the domestic prices of importable relative to the prices of exportable, full tariff reduction raises real income which implies higher private savings rates (given a constant propensity to save), and in turn, a higher investment rate, and hence a rise in capital accumulation. The results from simulation of a tariff reduction by using a gendered South African CGE framework are consistent with the theoretical analysis.

6.3.2 General simulation results (SIM 1)

The full tariff reduction policy gives mixed results in various sectors with certain sectors gaining and others losing, depending on the sector's initial protection and its output substitutability. A reduction of domestic import prices coupled with initial import penetration ratios leads to a general increase of imports (3.2%). The greatest import rise occurs mostly in labour-intensive sectors of footwear (43.023%), furniture (25.048%), paper (26.337%), rubber (20.122%), plastics (12.634%), textiles (11.275%), and leather (10.194%). Other significant import rises occur in furniture, wood textiles, glass, apparel and other-industries (see Appendix 6, Table 6.3). Capital-intensive sectors of vehicles, transportation equipment, electrical equipment, communication equipments, beverage and tobacco experience moderate imports rises ranging from 0.2-3.5% respectively. Intermediate sectors of petroleum, coal, iron and steel, mineral, chemical, face moderate import rises. The results show that sectors with relatively high initial tariff rates do experience the greatest increase in import volumes following trade liberalisation. For example, footwear and leather with tariff rates (19.0 %; 9.3 %) witness greater import price fall (12.296 % and 10.108 %) and hence greater imports.

Imports in service sectors generally fall slightly by less than a percentage point due to their low import shares from the base year level. The only rise in import occurs in the service sector of transportation and trade. These sectors are mostly sought after in the vibrant economy by the expanding sectors because of the services they provide. Kusi (2002) indicates the existence of high protection in the service sectors of finance and insurance; however, finance experiences a decline in imports.

High imports result in a substantial decline of domestic production in the import-competing sectors (see Table 6.3 in Appendix 6). This is because producers, faced with lower net prices, choose to produce fewer import-competing goods. In addition, import represents an ample share of local consumption which signifies a negative impact on local demand for domestic production. Output decline is greatest in the labour-intensive sectors of footwear (8.466%), paper (3.658%), and textiles (2.346%), which are sectors which realised high imports while other sectors face a significant decline of around one percent. Intermediates sectors such as petrol, chemical, iron and steel see increased production since their output is required as inputs in the production process of the expanded sectors. The service sector experiences growth, following expanding sectors which demand more of its service. Trade liberalisation therefore benefits the service sector.

Because of higher initial tariff rates on final goods and a relatively high tariff on intermediate goods, sectors that experience high imports have low input usage. This implies reduced cost of production as seen by reduced producer prices, particularly in footwear (9.897%) and the paper sector (2.529%). Sectors that experience low import decline or where import holds steady expand their output. These include export-oriented sectors such as gold (2.695%) and capital-intensive sectors of transportation equipment (2.414%), communications equipment (1.42%), and scientific equipment (1.093%). Certain labour-intensive sectors (apparel, print), intermediates (coal, petroleum, other chemical) and capital-intensive (iron, machinery) which have increased exports experience a slight rise of less than a percentage point in output demand. Increased output follow mainly increased export demand coupled with relatively cheaper imports of capital and intermediate inputs. These mainly accrue to export-oriented sectors. For example, output expands in the mining, and in the capital-intensive sectors (transportation equipment, communication equipment, scientific equipment and machinery). Increased demand for products such as machinery follows its use as an intermediate product in the production process of the expanding sectors such as vehicles and transportation equipment. All of the service sectors (mainly transportation, trade, finance, and communication) expand their production, albeit slightly by less than a percentage point as the expanding economy requires their services in their production process. Trade liberalisation, therefore, has a positive expansionary impact on service sectors, which is induced by expanding and exporting sectors. In addition, growing demand of services comes from increased demand by high-income households, which are greater consumers of services.

Rising imports (3.4%) are partially paid off by rising exports (2.8%), in order to maintain the trade balance. Export rises is enhanced by the depreciation of the real exchange rate (1.2%), which is supported by the rise in imports which raise the supply of a local currency (rand) leading to the depreciation of the currency. In addition, exports benefit from declining domestic costs of production, due to lower prices of imported goods on both final and intermediate goods. The greatest rise in exports is mostly realised in the labour-intensive sectors of footwear (19.449%), plastics (6.535%), furniture (5.899%), glass (5.764%), and scientific equipment (4.086%). Other significant export increases occur with the electrical, communication, and transport equipments. Sectors such as rubber, chemicals, print, paper, wood, leather, textiles, and beverages also see export rises. Faced with a moderate reduction in domestic prices and fixed export prices, producers of exportable goods switch a portion of their sales to the export market. This occurs mostly in sectors where a large share of local production is initially exported, for example, mining sectors of coal, gold, other mining,

and in other export-oriented sectors. The only service sector with a significant export is the hotel sector because of its initial higher export shares.

The results show a concurrent rise of imports and exports in some of the commodities such as it occurs in the labour-intensive sectors of footwear, plastics, furniture, glass and apparel, etc. This phenomenon explains the existence of intra-industry trade in the South African sectors which reflects commodity differentiations among these sectors. It also partially indicates the existence of oligopolists mode of production in the economy.

The favourable export response partially offset declining local sales leading to increased total sectoral production. Declining prices of domestic commodities and cheap imports raise the quantity of composite commodities in all sectors (except leather and chemicals) which improves consumption, and hence the welfare of households.

In summary, trade liberalisation generates a clear sectoral reallocation of resources from the labour-intensive sectors where the initial tariff and import shares are relatively high in favour of export-oriented sectors such as mining, certain few labour-intensive sectors, other manufacturing and service sectors such as trade, transportation, and communication while other sectors remain relatively unaffected. Increase of exports and imports (capital and cheap intermediates) in export-oriented and service sectors help to restore domestic production.

6.3.2.1 Factors of production (SIM 1)

Table 6.4 in Appendix 6 shows the effects of full trade liberalisation on sectoral capital and labour. Tariff reduction affects employment directly by shifting output and wages. Workers, who are able to absorb the bulk of the effect through wages, are able to maintain employment. Workers, such as the unskilled and semi-skilled who are able to maintain the level of wages, are more affected in terms of employment as trade liberation pushes down wages.

Tariff reduction raises labour demand greatly in the transportation equipment (5.786%), followed with the export-oriented sectors of gold (4.601%), other-mining (2.391%), coal (2.064%), apparel (1.512%), communication equipment (2.045%), scientific equipment (2.057%), machinery (1.322%), and vehicles (0.889%). All the service sectors witness growth in employment demand largely in the transportation sector (1.977%). Increased employment demand for factors of production, including labour follows increased sectoral output and exports.

In addition, the positive effects on employment is partially explained by reduced tariffs on imported inputs, including capital which is needed to complement labour in the production process. The increased demand for these complementary factors requires demand for labour. Labour thus increases in both export-oriented sectors and in the sectors that produce commodities which are used as intermediate inputs in the production process.

Labour-intensive sectors (textiles, leather, footwear, paper, rubber, plastics, and glass) are negatively affected by full-trade liberalisation because of their inability to compete with cheap imports. As a result, they contract more relative to less labour-intensive sectors resulting in job losses. The outcome of sector contraction and job losses supports various studies done in South Africa using different methodologies and different datasets (Edwards 2002; Pretorius 2002; Fofana, Cockburn, Chitiga & Mabugu 2005; Thurlow 2006), which find trade liberalisation to have a negative impact on labour-intensive sectors.

Labour that is reduced from import-competing sectors reallocates to the expanded export-oriented and the profitable service sectors. These sectors, mainly apparel and mining, employ more unskilled workers than most of the sectors which shrunk. It is thus natural that such sectors will demand more unskilled labour relative to other skill types. Although there is no way of knowing whether the labour displaced from the import competing sectors is the same that gets jobs in these sectors, there are good reasons to believe that some labour relocates in such sectors. However, labour adjustment to trade liberalization changes comes with a cost. A certain segment of labour stays without work for some time, a situation which reduces improvement from overall GDP and has a negative impact on persons and households affected. Such effects are greater for unskilled and semi-skilled labour which has less job alternatives than skilled labour.

The effects of tariff reduction vary significantly with the skills composition of the sector workforce. The demand for all skill types falls mostly in the labour-intensive sectors due to output and sales reduction in these sectors effected by increased and relatively cheaper imports. The outcome of tariff reduction, which reduces real sales, has a negative effect on the employment of unskilled, semi-skilled and skilled labour employed in such sectors. However, employment demand of all skill types increases in agriculture and in capital-intensive sectors that have expanded their output and increased exports after the tariff cut. The service sector expands and increases its labour demand based on increased service demand by profitable sectors. The greatest increase is seen in the export-oriented mining sectors of gold (unskilled, 4.657%; semi-skilled, 4.624%, skilled, 3.999%); other-mining (unskilled, 2.488%;

semi-skilled, 2.452%, skilled, 1.840%), and coal (unskilled, 2.200%; semi-skilled, 2.169%, skilled, 1.560%). The capital-intensive sector include transportation equipment (unskilled, 6.018% semi-skilled, 5.976%, skilled 5.344%), communication equipment (unskilled, 3.043%; semi-skilled, 2.966%, skilled, 2.357%), scientific equipments (unskilled, 3.092%; semi-skilled, 3.030%; skilled%,), machinery (unskilled, 2.263%; semi-skilled, 2.226%, skilled, 1.103%), vehicles (unskilled, 1.417%; semi-skilled, 1.365%; skilled, 0.579%), and electric machinery (unskilled, 1.160%; semi-skilled, 1.105 %, skilled,%).

The service sectors which increase employment the most are transportation service (unskilled, 2.549%, semi-skilled, 2.471%, skilled, 1.864%) and trade (unskilled, 1.212%; semi-skilled, 1.092%; skilled. 0.494%). Increased employment demand in the trade service is related to the higher employment levels for all skill types from the base year level (see Chapter 4). The expanding economy induces slight employment in the construction sector (unskilled, 0.156%; semi-skilled, 0.118%, skilled, -0.480%) except for skilled labour. The greater beneficiary of employment is unskilled labour when compared with other type of skills. This might be related to their low initial wages and the expansion of work which needs low skills.

Because of the assumption of mobility coupled with unemployment, some of the unemployed, unskilled and semi-skilled labour, who are displaced mainly from the labour-intensive manufacturing sectors, find their way to expanded and exporting labour-intensive sectors (apparel, wood, furniture, other-industries), capital and intermediate-intensive sectors (vehicles, communication equipment, beverage and tobacco, transportation equipment machinery, iron, chemical non-chemicals, non-ferrous). Most labour also relocates to the service sector; in particular trade, electricity and transportation, which are sectors that have expanded their output after the policy change. These sectors, which are mostly labour-intensive and utilise unskilled labour, experience an upsurge of this type of labour. The simulation results show negligible demand changes pertaining to capital, because it is modelled as fully employed and fixed within sectors. However, capital is complemented by the unskilled, semi-skilled and skilled labour in the expanding sectors.

6.3.2.2 Results of men and women employment (SIM 1)

As with the demand for total labour, and that of all skill types, demand for men and women labour follows the direction of the output increase from various sectors. Generally, sectors that expand their output and increase their export experience a rise in employment demand for unskilled, semi-skilled and skilled men and women and vice versa. A good example of the

sector with high proportion of output exported includes gold and other mining, which includes uranium. Almost the total output (100%) of these commodities is exported.

Labour-intensive sectors, which are mostly women-intensive sectors (footwear, leather, textile, rubber, plastic, glass, and metal), see significant reduction of employment for men and women of all skill types. These sectors, which have high marginal productivity for labour, face stiff competition from imports, rendering their production inefficient. As a result, they are forced to reduce employment in order to remain profitable. Increased imports due to trade liberalisation imply competitiveness for domestic producers.

Sectors which improve and demand for men and women labour include capital-intensive (mining, transportation equipment, food, beverage and tobacco, machinery, vehicles communication equipment, scientific equipment,), intermediate-intensive (petroleum, chemicals, iron, non-ferrous), and labour-intensive (apparel, wood, furniture, and other-industries, print) sectors. The greatest rise occurs in the transportation equipment sector (unskilled men, 6.007%, unskilled women, 6.092 %; semi-skilled men, 5.976 %, semi-skilled women, 5.982%; skilled men, 5.341%, skilled women, 5.374%), gold (unskilled men 4.655%, unskilled women, 4.738%; semi-skilled men, 4.624 %, semi-skilled women, 4.630%; skilled men, 3.997%, skilled women, 4.029%), other-mining (unskilled men, 2.483%, unskilled women, 2.564 %; semi-skilled men, 2.452 %, semi-skilled women, 2.458%; skilled men, 1.838%, skilled women, 1.870 %), and communication equipment (unskilled men, 2.994%, unskilled women 3.076%; semi-skilled men, 2.963 %, semi-skilled women, 2.969%; skilled men, 2.347%, skilled women, 2.378%). The scientific equipment sector (unskilled men, 3.057%, unskilled women, 3.139%; semi-skilled men, 3.026 %, semi-skilled women, 3.032%; skilled men, 2.409%, skilled women, 2.441%), and transportation services sector (unskilled men 2.501%, unskilled women, 2.583%; semi-skilled men, 2.471%, semi-skilled women, 2.476%; skilled men, 1.857%, skilled women, 1.888%) also expand their demand fro labour. All other sectors that raise their employment demand have a range of between 0.1% and 1%. The same explanation as with the other skill types rise applies.

Trade liberalisation raises the demand for unskilled men and women in the service sectors, with a significant rise in the transportation, trade and communication services. The increased demand of employment in the service sectors is derived from an expanding economy that stimulates production in the service sector by increasing the demand of its services. Reallocation of unskilled men and women labour to the services sector is expected because the sector is the largest employer of all skill types. Most unskilled, particularly unskilled

women, encounter fewer barriers to entry in the service sector relative to other sectors, albeit at the lower level of employment (Leresche 1993; Valodia 1996). The service sector, however, is very heterogenous; while some work is labour-intensive and low-paying, other types of work are characterised as high productivity, technological innovative and high-paying work, which require higher educational levels. This is contrary to the popular belief of easy entry, especially of women into the service sectors. Making a distinction within sectors shows that easy entry only applies to certain service sectors.

The demand for semi-skilled men and women labour is similar to that of unskilled men and women. However, the results show minor differences between semi-skilled men and women labour when compared with that between unskilled men and women. This can be attributed to the differences in the initial wages accorded to men and women which tends to favour men. In addition, most women predominate in lower value-added positions in most sectors. The higher initial level of unemployment faced by women coupled with mobility allowed in the model, help to absorb them in the expanding economy.

6.3.2.3   Wages and income of factors (SIM 1)

The results show an economy-wide wage increase for skilled men (1.080%) which slightly exceeds that of skilled women (1.017%). Wages for unskilled and semi-skilled men and women labour is sectorally fixed at their base year level and therefore show no changes following the policy shock. Changes in unemployment, wages, and factor allocations affect the total income accruing to a particular factor. Figure 6.1 shows the percentage changes in earnings of capital, and that of men and women labour. The return to capital is higher (2.059%) benefiting from the increase of the value-added price of most capital-intensive sectors. This is followed by the income earnings of skilled men (1.154%) and skilled women (1.061%). Unskilled men earning rises too (1.042%) and exceeds that of unskilled women and semi-skilled men and women. This is because unskilled men obtain most of their earnings from a profitable mining sector. The income of unskilled women rises by a mere 0.028%, due to employment loss mostly in labour-intensive sectors which is not offset by employment gains in the capital-intensive sectors, other labour-intensive, intermediate-intensive and service sectors where they relocate. This is because unskilled women reallocate to low-paying positions in these sectors.

The low income for women workers has negative implications for low-income households that derive most of their earnings from unskilled women. Unskilled men are largely employed in

export-oriented sectors such as coal, gold, other mining, iron and steel, non-ferrous minerals etc., which benefit from trade liberalisation as seen by the increased value added prices leading in higher earnings for the workers.

On the other hand, skilled women benefit from trade liberalisation as their income rises and exceeds that of semi-skilled and unskilled women. Income earning for skilled men and women differs slightly and almost equalises. This reflects high payments obtained by skilled women in various sectors including the men-intensive sectors of mining where very few women hold high-paying jobs. While there appears to be an equalisation between skilled men and skilled women, there is a wider earning gap between unskilled men and unskilled women. This study concludes that in South Africa, trade liberalisation results in more positive employment benefits for skilled women than unskilled and semi-skilled women.
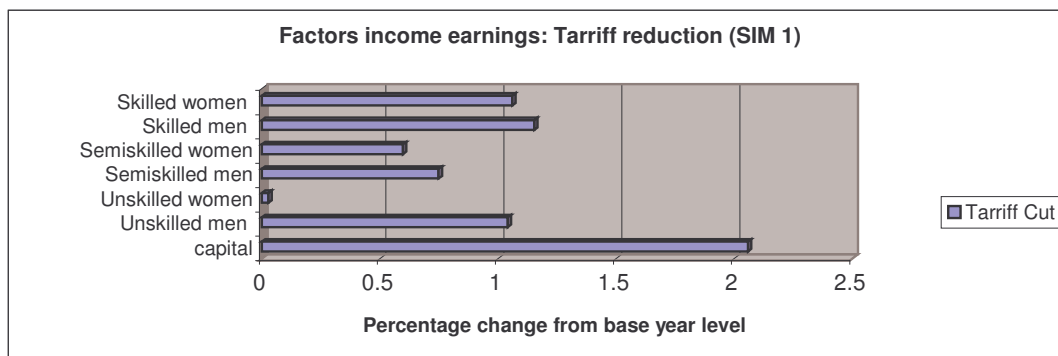
Figure 6-1 Percentage factor earnings men and women after tariff cut

Source: Simulation results

Household welfare measured by equivalent variation (EV)

In this chapter, household welfare is measured by the equivalent variation (see Chapter 5 for explanation of EV as a measure of welfare). Trade liberalisation causes varying welfare effects among households depending on the household's source of income and the type of household expenditures (see Figure 6.2). However, all households benefit due to tariff reductions, particularly middle-income to high-income households. Low-income households benefit mainly from reduced prices of the labour-intensive products which represent most of their expenditures (e.g. textile, footwear). In addition, they gain mainly from increased unskilled men's earnings from exporting sectors, and from the expansion of construction and transportation services that employ a good percentage of unskilled men. These sectors, however, utilise low levels of unskilled women labour. Therefore, low-income

households that depend mostly on unskilled women earnings benefit less than those that obtain most of their income from other types of labour. High-income households benefit the most because of better earnings from capital and skilled and semi-skilled labour. These households, however, gain less from price decline because their consumption basket includes services such as hotel and finance that did not necessarily face reduced prices due to their low initial import shares.
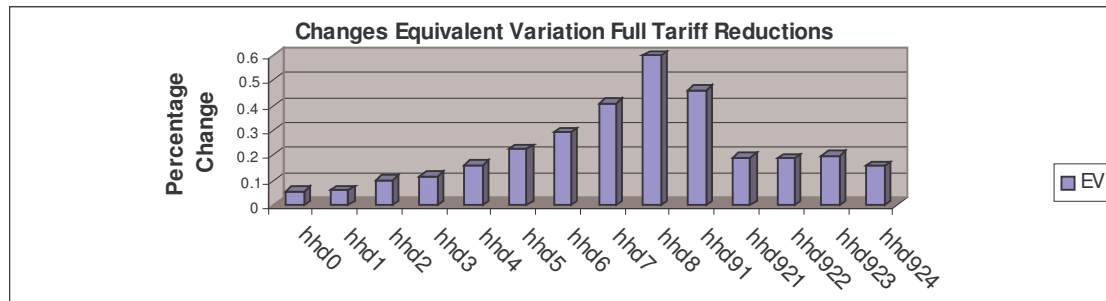
Figure 6-2 Equivalent variation (EV): fixed capital (SIM 1)

Source: Simulation results

6.3.3 Full tariff reduction: full employment and mobile factors (SIM 2)

6.3.3.1 Results (SIM 2 versus SIM 1)

Macroeconomics for SIM 2 is similar as that for SIM 1 except for the magnitudes. GDP at factor cost increases more for SIM 1 than for SIM 2 because more labour is employed in SIM 1. This follows an assumption of unemployment associated with unskilled and semi-skilled labour in SIM 1 which gets absorbed in the production process. The relatively less return for capital with SIM 2 compared with SIM 1 is based on capital mobility chasing higher returns which do not materialise.

SIM 2 imports rise but at a higher rate than with SIM 1. More imports rise with SIM 2 is due to full mobility of all factors which enables greater response (see Table 6.2 for results of 49 sectors). Imports rise in all sectors except in the export-oriented sectors of coal and gold. The greatest rise with both SIMs occurs in footwear (SIM 1, 40.631%; SIM 2, 63.09%), in paper (SIM 1, 25.348%; SIM 2, 32.08%), furniture (SIM 1, 24.788%; SIM 2, 26.13%), and rubber (SIM 1, 19.464%; SIM 2, 21.05%). Same reasons regarding the rise of imports for SIM 1 applies for SIM 2.

Both SIM 1 and SIM 2 realise import decline in export-oriented sectors and in service sectors,

with more decline occurring with SIM 2 than with SIM 1. This is due to added responses with SIM 2 made possible by full mobility of all factors of production. The exchange rate depreciates more in SIM 1 (1.4) than in SIM 2 (0.7), with subsequent greater rise of exports for SIM 1 relative to that for SIM 2. There are major differences with export performance from both simulations, for example, in textile (SIM 1, 7.071; SIM 2, -0.8); apparel (SIM 1, 7.214; SIM 2, 3.288); leather (SIM 1, 7.071; SIM 2, –9.96), and footwear (SIM 1, 19.449; SIM 2, –13.1), respectively. While SIM 1 witnesses a general rise of exports, SIM 2 realises an export fall mainly in the above-mentioned sectors together with the sectors of paper, chemical, plastic, metal product, hotel, business and finance services. SIM 2 witnesses a rise of exports only in capital-intensive sectors, unlike with SIM 1 where capital was sectorally fixed. In addition, reduced domestic production, due to high imports associated with SIM 2, reduces exports with SIM 2 in certain sectors. Similar to SIM 1 where export rises in all service sectors, SIM 2 see exports rise except for hotels, business and financial services, which are sectors with initial low export shares.

Output price falls in the agricultural and labour-intensive subsectors with both simulations causing their output to decline. Initial high protection rates, especially with labour-intensive sectors causes this. While the output of import-competing sectors falls, the production of export-oriented sectors rises. With both simulations, output holds steady or rise in the mining sectors and for only SIM 1 output also rises in all service sectors. As a result, output decline in the agricultural and labour-intensive manufacturing sectors is partially offset.

Prices of domestic commodities do not fall enough to offset the demand for relatively cheaper imports, and with both simulations domestic output demand declines. SIM 2 contracts more than SIM 1 because of full mobility of all factors that enables higher responses. Prices in the service sector rise with both SIM 1 and SIM 2 causing all service sectors' output to fall, mainly in SIM 2. With SIM 1, all other services output increases slightly by less than half a percentage point, except for transportation (0.919%) services which exceed that level. The transportation service is highly sought after by the expanding sectors which prompt its expansion.

With SIM 2, value-added prices rise in all subsectors of agriculture, in mining sectors (gold, coal and other mining), in labour-intensive sectors (apparel, leather, footwear, paper), capital intensive (chemicals, transportation equipment, and scientific equipments) and in service sectors. With SIM 2, value added falls in all service sectors except in transportation services where it rises by 1.502%. Value added rise   greatly   in   gold   3.343%,   other   mining

6.388%, and leather 24.84%. With SIM 1 value-added prices drop in labour-intensive sectors of leather, footwear, paper and chemicals which explains low factor earnings from these sectors. With SIM 1, value added slightly rises in all service sectors except in the transportation services where it rises significantly.

Expansionary sectors raise the demand for intermediate inputs in both simulations, particularly for SIM 2 compared with SIM 1, for example, machinery (SIM 1, 1.063%; SIM 2, 1.999 %), communication (SIM 1, 0.292%; SIM 2, 1.664%), electricity (SIM 1, 0.011%; SIM 2, 0.092%) and transportation services (SIM 1, 0.998%; SIM 2, 1.502%). Intermediates are needed more in the expanding sectors and this is facilitated by the mobility of capital that moves from the contracting to the expanding sectors. In addition, intermediates are needed to match the demand for value-added since they are used in the same proportions in the production process which explains similarities in their similar rising levels.

Figure 6.3 shows the difference in output between SIM 1 and SIM 2. The results are different when there is a labour surplus and the labour market is in disequilibrium as with SIM 1. The figure shows improvement in production with both SIMs because of relatively cheaper imported inputs which includes capital. However, the output of some sectors decline partially because their prices are not competitive with cheap imports. As a result, these commodities are substituted by cheap imports and lead to a reduction in the demand for labour. With full employment of all factors (SIM 2), variations in output only come from the reallocation of resources among sectors and are relatively small. However, with SIM 1, increased production is delivered from the employment of surplus unemployed labour of the unskilled and semi-skilled men and women coupled with cheap intermediates imports.
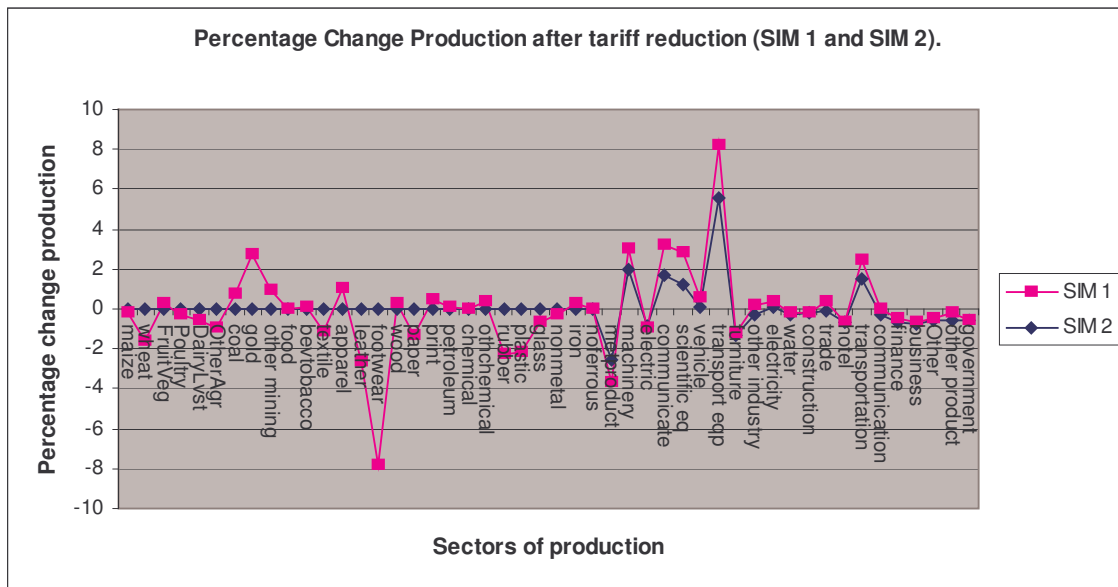
Figure 6-3 Percentage change production after tariff reduction

Source: Study simulation results

6.3.3.2   Factors of production (SIM 2)

As with SIM 1, results from SIM 2 show trade liberalisation to have a differential impact on sectoral employment, with employment opportunities created in some sectors while being lost in others. The allocation of factors follows the patterns of change in relative prices. As prices of domestic import-competing goods and output fall relative to their base-year level, their production also falls as they are substituted by imports resulting in low demand for factors.

Unlike SIM 1 where capital is sectorally fixed, with SIM 2 capital is mobile and its demand largely declines in labour-intensive sectors of leather and slightly in the capital-intensive sectors of food, beverage tobacco, paper, and chemicals (see Table 6.1 in Appendix 6). However, capital demand rises in the capital-intensive export-oriented sectors whose output has increased.

Only the service sector of electricity increases the demand for capital due to increased demand for its export. In general, the import-competing sectors reduce demand for capital, while the export-oriented sectors increase capital demand. This shows that exports are capital-intensive in South Africa. In an attempt to compete in both domestic and international markets sectors seek for the cost effective ways of production. Capital utilisation is preferred as a relatively efficient factor because of its low per unit   cost compared with labour.

132

As in SIM 1, but with lesser magnitude, SIM 2 witnesses a rise of labour in export-oriented mining sectors, except for the other-mining where SIM 2 labour demand exceeds that of SIM 1. Labour rises in these sectors to provide services due to their expansion and increased exports. Unlike with SIM 1 where labour rises in capital-intensive sectors, with SIM 2 labour declines in these sectors with the greatest decline occurring in the paper sector (SIM 1, -2.284%; SIM 2, -6.316%). The only rise occurs in the transport equipment sector; the SIM 2 rise exceeds that of SIM 1. The mobility of capital allowed with SIM 2 allows capital to replace labour in the capital-intensive sectors.

As with SIM 1, but with lesser magnitude SIM 2, witness rising demand for labour in the intermediate-intensive sectors of petroleum. As with SIM 1, but with greater magnitude, total labour declines for SIM 2 in all labour-intensive sectors except in the apparel and machinery sectors. Labour rises in the apparel sector, because it is both import-competing and exporting sector. Thus, labour decline due to increased imports of apparel is offset by increased labour demand due to its increased export demand. Labour rises in the machinery sector follow its use as an intermediate input in the expanding sectors of vehicles, transport equipment and transportation services. Both SIMs increase labour in these sectors with a large scope for SIM 2 compared with that of SIM 1 (see Figure 6.5 and 6.6). However, in the labour-intensive sectors demand in all sectors declines with SIM 2 while it rises with SIM 1. This is partially explained by the mobility of capital allowed with SIM 2, which substitutes labour in those sectors.

In terms of skills, both SIM 1 and SIM 2, but with greater magnitude for SIM 2, show a demand for unskilled labour in export-oriented sectors. Unlike SIM 1, SIM 2 slightly demands unskilled labour in capital-intensive sectors because of allowed mobility of capital with SIM 2 that displaces labour in these sectors. With SIM 2, the demand for unskilled labour falls in the intermediate-intensive sectors, unlike with SIM 1 that faces a high demand for unskilled labour. This shows the high capital intensity use in the intermediate sectors.

With both SIMs, unskilled labour falls greatly in the labour-intensive sectors which are import-competing sectors. The highest fall with both SIMs is in leather and footwear although the falling magnitude for SIM 2 exceeds that for SIM 1. With both simulations, a reallocation of workers takes place mostly from manufacturing to service sectors. The service sector expands due to trade liberalisation and during this process, women appear to be the preferred labour supply.

The growth in demand for skilled labour with SIM 2 exceeds that for unskilled and semi-skilled. It rises significantly in the transport equipment sector (5.734%), and mostly in the export-oriented sectors, chiefly in other-mining, apparel and machinery. Machinery is a highly productive sector which requires skilled labour. The reason for this phenomenon is the complementarity associated with skilled labour and capital.

With SIM 2, however, demand for skilled labour greatly declines in contracting labour-intensive sectors, particularly footwear, leather and textile.

SIM 2's results indicate the complementarities of capital and skilled labour with skilled labour rising in sectors where capital has risen and vice versa. For example, skilled labour rises more than semi-skilled and unskilled labour in export-oriented sectors which are mostly capital-intensive sectors. The increase in exports benefits skilled labour more relative to unskilled labour. This result is different from SIM 1 where the demand for unskilled labour is higher than with that of semi-skilled and skilled labour. With SIM 1, the assumption of the existence of unemployment for semi-skilled and unskilled labour enables an expanding economy to absorb the unemployed labour. SIM 1 finding reflect differing results from other studies that find trade liberalisation to have a skills bias in South Africa; results of SIM 2 supports it. SIM 2 results imply the complementarity between skills and capital.

6.3.3.3   Women and men employment (SIM 2)

Men and women employment follows the pattern of total labour in terms of effect after the shock. Both SIM 1 and SIM 2 show an increase in unskilled men and women in the export-oriented sectors of mining with growth of women demand exceeding that of men in all three mining sectors. Magnitudes for SIM 2 are lower than that of SIM 1, especially for men. This is due to the stipulation of unemployment with SIM 1, which is greater for women, hence raising their absorption in the expanding economy. With SIM 2, unlike in SIM 1, there are varying results between the demand of men and women in capital-intensive sectors. With SIM 1, all sectors see a rise in unskilled men and women labour with unskilled women rising more than men. This outcome is different from that with SIM 2 where only women unskilled labour rises while the demand for unskilled men falls, mostly in all capital-intensive sectors. The rise of unskilled women with SIM 1, generally exceeds the rise with SIM 2, due to considerations of unemployment with SIM 1. This follows more output produced when unemployed men and women are put to work.

Unlike with SIM 1, where unskilled men and   women labour increases in the intermediate-

intensive sectors, with SIM 2 unskilled men labour falls while the demand for unskilled women labour rises due to women being more affordable than unskilled men. This follows increased use of cost saving factors such as capital and unskilled women labour in the intermediate-intensive sectors.

With both SIMs, employment for both unskilled men and women falls in all labour-intensive sectors. With SIM 2, labour demand rises for unskilled women while it declines for unskilled men in sectors of apparel, electrical equipment, wood and in other industries. At the same time, these industries experience a rise of employment for both men and women with SIM 1.

Simulation results in the service sectors vary between SIM 2 and SIM 1. With SIM 1, labour rises in all service sectors, mostly in the transportation services, trade and electricity, with a slightly higher demand of women compared with men. This outcome follows the higher rate of women employment in the service sector from the base year level. With SIM 2, men and women labour falls in sectors of finance, business, hotel, while only men labour falls but women labour rises in sectors of water, trade, communication, and other-services. Both SIM 1 and SIM 2 see significant women and men labour rise in the expanded transportation service sector with a slightly higher rate for women than for men.

As with SIM 1, but with lesser magnitude, SIM 2 increases demand for semi-skilled men and women in the exporting sectors. As in SIM 1 women demand exceeds that of men. Unlike in SIM 1, where semi-skilled men and women labour rises in the capital-intensive sectors, with SIM 2 semi-skilled men and women rise in the transportation equipment; SIM 2 demand exceeds that of SIM 1. Labour rise in the intermediate sectors of iron and petroleum occurs with less magnitude in SIM 2 than with SIM 1. This is related to increased output and exports demand of these two sectors. However, SIM 2 demand exceeds demand for SIM 1 in the other intermediate-intensive sectors with a slight rise of women compared with men in all sectors.

Both SIMs show a declining demand for semi-skilled men and women labour in the labour-intensive sectors except in the apparel and machinery sectors. Due to full mobility of factors that gives greater responses, the magnitude of decline for men and women is greater for SIM 2 than with SIM 1, especially in the footwear and leather sectors. This result is the same as that of unskilled men and women in labour-intensive sectors.

Regarding skilled men and women, their labour demand falls greatly in the labour-intensive sectors, especially in footwear (skilled men 24.977%; skilled women 24.851%) leather (skilled men, 15.923%; women 15.782%), paper (skilled men 6.421%; women 6.264%),

textile (skilled men, 4.680%; women 4.520%), and slightly in wood and other industries by less than a percentage point, with women demand falling slightly less than the demand for men. However, the apparel sector see a rise of skilled men and women given the sector's increased export demand (see Table 6.1 in Appendix 6).

Skilled men and women demand rise in the capital-intensive sectors especially in the transportation equipment (skilled men, 5.716%, skilled women, 5.893 %), with significant rises in the vehicles, electrical equipment, non-ferrous, scientific equipment, and communication equipment.

There are mixed results concerning skilled labour demand in the intermediate-intensive sectors. Moderate labour demand occurs in sectors of coal and iron while rubber, metal and chemical sectors experience moderate reduction of skilled men and women labour. The contraction and expansion of sectors necessitates such a situation.

The biggest winner from trade liberalisation in terms of increased output and relative output prices are the mining sectors (gold, coal and other mining) given their strong positive export response and their large initial export shares. The losers are sectors with the original higher levels of protection which experience the brunt of price fall. These are mainly labour-intensives sectors and with mobility allowed in the model, factors of production move from contracting import-competing sectors towards the mostly expanding export-oriented sectors. Therefore, while jobs are lost due to imports, employment gains are made through exports. However, export led employment is not enough to offset the job losses mostly in the manufacturing sectors.

6.3.3.4   Wages and income of factors of production (SIM 2)

The results of the simulations on wages appear in Figure 6.4. The results show that economy-wide wages rise for all skill types of men and women, particularly wages of men. Women wages rise moderately except for unskilled women who see a negligible wage rise, because they are concentrated in low productivity and low-paying positions, and thus have low wages rises. The negligible increase of unskilled women wages widens the unskilled men-women wage gap due to a more positive effect on men real wages than on women real wages.

The expanding economy requires more factors of production which necessitates higher wages. Increased wages results in higher income earnings for all the skill types of men and women with skilled men benefiting the most. This is   despite the fact that there is more demand for

unskilled women labour. Income earnings for semi-skilled men and women and unskilled men rise, while unskilled women see insignificant income earnings. This follows the concentration of unskilled women in shrinking labour-intensive sectors and their reallocation to sectors with low value-added prices leading in low pay.

Despite significant growth in women labour demand, their earnings do not rise because they are in low-paying positions. For example, in the vehicle sector, women are located mainly in the components section which offers low pay compared with men who are located mostly in the assembly line that pays higher wages. In the service sectors, women are mostly waitresses, maids, and data entry personnel.

Unskilled men receive income from export-oriented mining sectors where there is labour demand and wage increase. Semi-skilled women and skilled women benefits from trade liberalisation because their wages and earnings increase albeit less than the increase for men. The rent for capital increases significantly (1.364%) in SIM 2. The argument that increased openness to trade will reduce wage gaps between men and women based on discrimination (Becker 1971), only works for the skilled men and women labour in South Africa.

Differences in income between SIM 1 and SIM 2 favours SIM 1 which has assumptions of unemployment. Because of the presence of initial unemployment in unskilled and semi-skilled men and women labour markets, and because the overall scenario generates a higher level of demand for unskilled labour, it thus further increases total production and wage income due to general equilibrium effects. An abundant supply of unskilled labour in the South African economy means that workers can be drawn into production with no increase in wages or prices.

Percentage changes in wages and income of men and women following full tariff reduction (SIM 1)
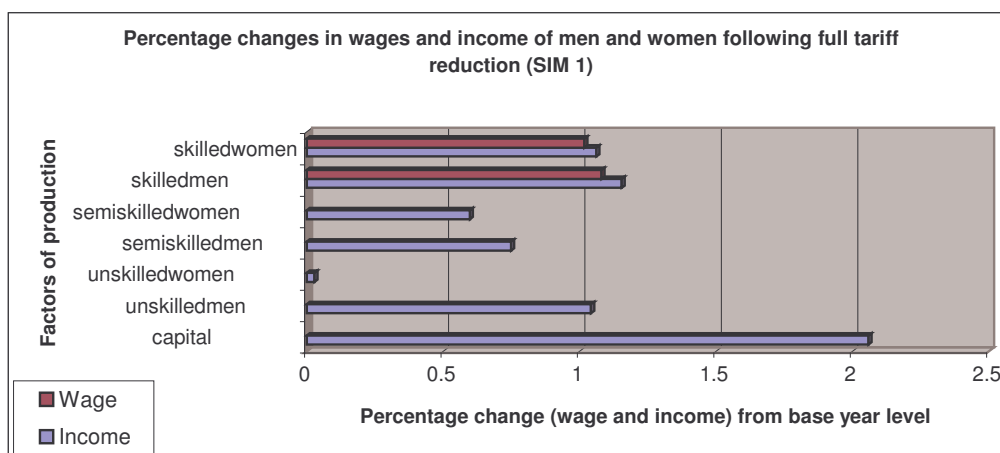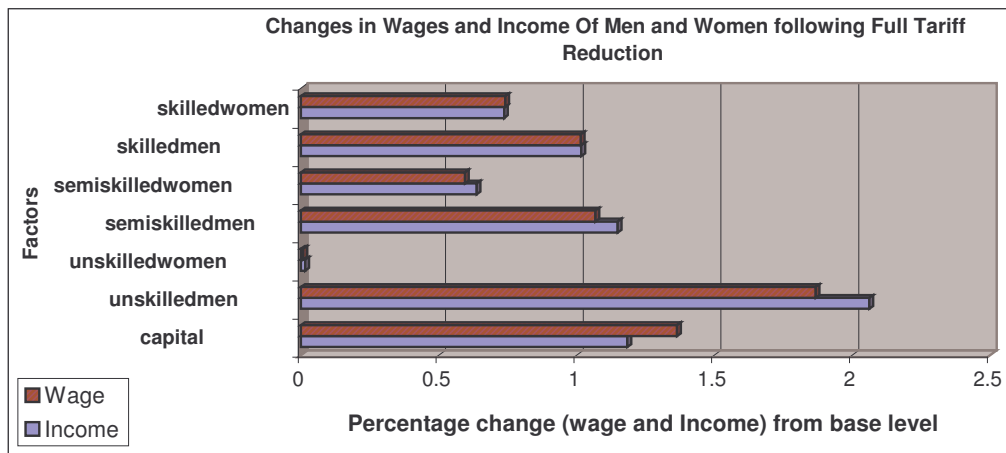
Figure 6-4 Percentage change wages and income earnings of men and women workers

Source: results from own study simulations

6.3.3.5 Household equivalent variation (EV)

As with SIM 1, SIM 2 results in improvement of household welfare as measured by the equivalent variation. The benefits, however, accrue more to low-income and middle-income households while rich households' welfare falls. This is because poor households consume most of the commodities that have experienced falling prices on the domestic market. For example, the reduction of tariffs on consumable goods such as clothing and food benefits poor households since they spend a large share of their expenditure on these goods. In addition, low-income households derive most of their income from export-oriented mining industries and basic metals which have expanded and increased exports.

The expanded transportation service sector, a highly sought-after services following improvement of the economy due to tariff reduction, also benefits low-income households which are comprised of unskilled workers who are mostly associated with the transportation service.

In addition, an economy-wide rises in income earnings due to increase in real wages of all skills except for the unskilled women labour enables increased consumption. High-income households are negatively affected by the tariff fall despite increased income. This happens because they increase personal savings due to reduced government savings brought about by loss of government revenue. This reduces consumption of high-income households in comparison with low-income households. In addition, high-income households are affected by rising prices of goods that they mostly purchase such as hotel, and transportation

services, finance, business, etc. This is because high-income households consume more of services than other types of households.

6.3.4   Comparison: Fixed factors vs. full employed and mobile factors

As shown in Figure 6.5, employment of unskilled men and women under the two simulations produces varying effects. Unskilled men and women gain employment more in SIM 1. As with SIM 1, but with lower scope in SIM 2, sectors with high export-intensity attract labour, particularly women unskilled labour. These include coal, gold, other-mining, iron and steel, transportation equipment and to some extent vehicles. With both simulations, the labour-intensive sector of apparel, print, petroleum, machinery, communication, scientific and transport increases the demand for unskilled employment given their improved export demand. Intermediates such as machinery, communication equipments, and transportation equipment raise labour demand in the same way as in SIM 1.

Concerning unskilled men and unskilled women, women labour increases while that of men falls in apparel, wood, print, petrol, other-chemical, non-metal, iron, non-ferrous, machinery, electrical machinery, furniture and other industries. However, results show job shedding in textile, leather, footwear, paper, rubber, plastic, glass for both unskilled men and women mostly with SIM 1. Employment of unskilled women increases more than that of unskilled men in communication and scientific equipments, vehicles, and transportation. Major men-women differences do not occur in SIM 1 but they are rather pronounced in SIM 2 (see Figure 6.6) because of high response. This shows the importance for taking into consideration factor mobility and unemployment when designing trade liberalisation policies.
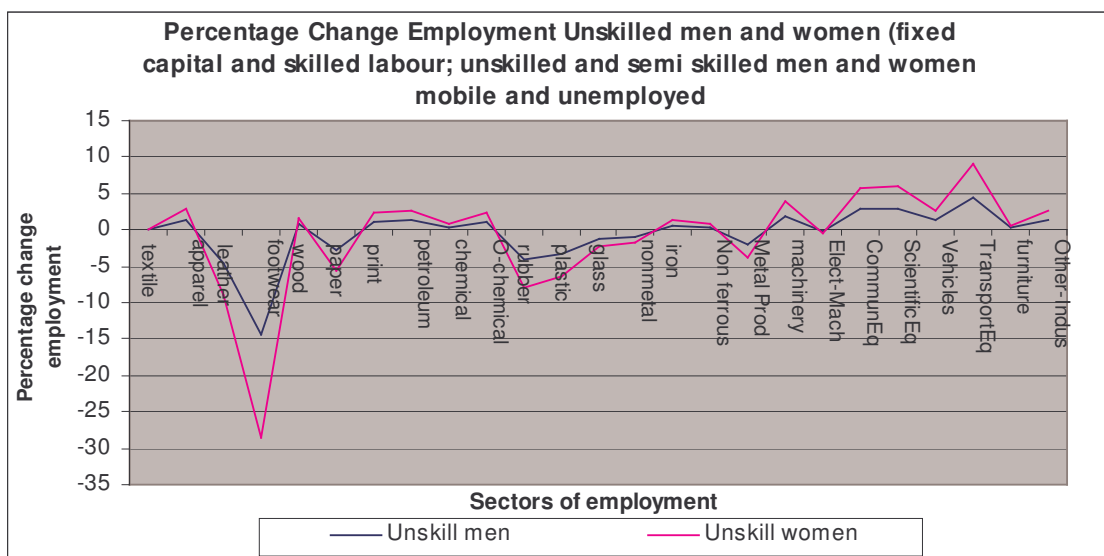
Figure 6-5 Percentage change employment unskilled men and women (SIM 1)

Source: Simulation result.
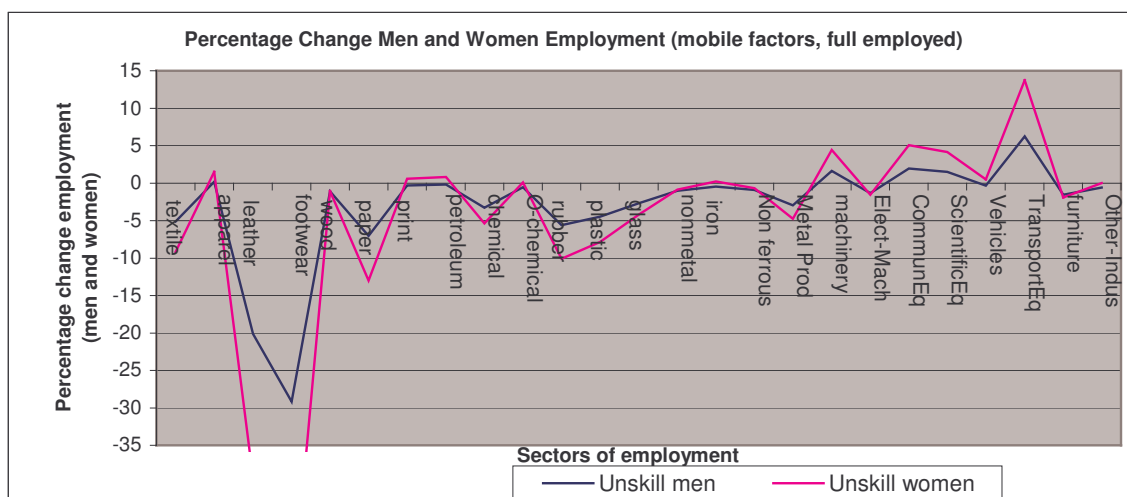
Figure 6-6 Percentage change men and women employment

Source: Simulation results.

6.4   CONCLUSION

The increase in the degree of openness of the South African economy (full trade liberalisation) generated significant changes in employment and wages. Most of the tradable good sectors lost employment, because either their activity fell, or their labour productivity had to be increased   in   order   to   face   foreign   competition. The sectors that decreased their

activity levels were those in which wages are lower and labour is generally less skilled than the average in many sectors. Men and women workers displaced in mostly labour-intensive manufacturing sectors were absorbed by other manufacturing and the service sectors such as retailing, trade, hotel and other services. The labour-intensive sector, that incorporated a significant part of the displaced workers, includes mostly women employment sectors, for example the apparel sector. Generally speaking, the women labour force seems to benefit by the trade liberalisation. Despite losing their jobs in labour-intensive sectors, some were able to regain employment in labour-intensive and in capital-intensive sectors which expanded and which increased exports. The re-allocation to service sectors is because the sector is the greatest employer of mainly unskilled men and women labour.

The results show that trade liberalisation creates winners and losers among sectors, among gender and among different type of skills. This occurs as the economy adjusts to changes in export and import prices and other trade-induced changes. All skill types except for unskilled women emerge as winners in terms of their improved earnings. Unskilled women, however, benefit the most in terms of employment after the policy change, but gain the least in terms of income earnings. This is because women job losses, mostly in labour-intensive sectors of textile, and leather are not completely offset by their job gains in low-paying positions.

The effort made by South African women to increase their skills seems to have placed them in an improved position to face the new economic challenges. The results indicate improved wages and income earnings for skilled women albeit slightly less than that of skilled men. However, the great share of unskilled and semi-skilled women groups have been adversely affected by the trade reforms. Specifically, results show sectors such as textile, footwear, leather, and plastics which are sectors employing a substantial amount of women, as having significantly contributed to the loss of employment.

Specifically, sectors that benefit due to tariff reduction are capital-intensive sectors (mineral-based processing, plastics, metal products, and transportation equipment), intermediate-intensive (iron and steel), labour-intensive sectors (apparel, furniture) and natural resources sectors of mining (coal, gold, and other mining) due to increased demand of their exports which results in increased demand for labour. The export-oriented sector of mining benefits men more than women, because the sector is highly men-intensive. Although the results show an increasing demand for women in the mining sectors, those jobs are concentrated at the low levels of clerks and general services. After disaggregating labour in the mining sector, there was no indication of women workers in the   underground mining nor are there significant

levels of skilled women labour in areas of metallurgist, mining engineers, accountants, etc. By the year 2009, however, mining sectors would be required to have a 10% level of women labour which is a requirement under the government mining charter.

The losers are import-substituting sectors, which are mainly labour-intensive sectors (textiles, footwear, leather, wood, furniture, plastics, rubber, glass); they contract because they are unable to compete with increased imports. The textile industry contributes the most to employment loss in manufacturing. The greatest reduction in employment is generated in sectors that made an import-oriented adjustment, through the displacement of domestic supply by the growth of imports.

This outcome has negative employment effects on unskilled women who are mostly employed in these sectors. This results in the loss of income by low-income households that derive most of their income from unskilled women.

The study shows variation in the labour market specification that affects the predicted impacts of a trade policy. For example, by taking into account the presence of unemployment for both unskilled and semi-skilled labour, the CGE model produces a significant impact on the results for employment and factor income earnings. Gains in employment and factor income earnings improve with the presence of unemployment, depending on the competitiveness of sectors that use unskilled and semi-skilled labour. The increase in demand for labour absorbs previously unemployed unskilled labour into the production process. The presence of initial unemployment enables trade liberalisation to increase labour in the agricultural, manufacturing and service products based on the extra advantage that the economy gains when wages are constrained by unemployment.

The sensitivity analysis suggests that models that do not acknowledge unemployment (SIM 2) in a country like South Africa, which has high levels of unemployment, understate to a significant degree gains that will be realised from competitive sectors. This potentially minimises the negative impacts on less competitive sectors.

The results from full trade liberalisation simulations show that the magnitude, and nature of employment income and GDP changes, depends on the microeconomic and macroeconomic state. Using appropriate assumptions concerning labour mobility is essential for assessing the expected gains from liberalisation. Factor mobility is a needed to achieve efficiency gains, but as SIM results show, gains do not necessarily   rise with increasing mobility.

The main findings of this study indicate an existence of a big gender gap, especially between unskilled men and women which is an adverse to women. This could be explained by the concentration of unskilled men in the major exporting sector of mining while women concentrate in low paying positions in many sectors. In addition, there are initial low levels of women in many sectors.

The wage gap between skilled men and women, albeit small, could not easily be explained, which raises the issue of wage discrimination against women. The gender composition of employment shows significant differences by sector. For example, about 70% women work in personal services and retail sectors, in contrast to only 30% of men. These sectors pay lower wages than the other sectors and, due to market segmentation, the women work in the low-wage segment while men work in the high-wage segment. On the other hand, whereas over 90% of men work in natural resource export-oriented sectors, less than 10% of women workers do so. Women thus gain less in such high paying sectors compared with men who concentrate the sector.

All types of households show welfare improvement especially for high-income households that derive most of their income from capital and skilled and semi-skilled labour. This is particularly true for men who benefit from sectors that expand and increase exports. Low-income households benefit from increased employment of unskilled labour, which earns income derived from expanding sectors of construction, transportation services, and export sectors such as mining. The presence of additional productive factors increases production and income and in turn improves households welfare.

Table 6.1 Percentage change factors: all factors full employed and mobile (SIM 2)

	Capital	Total labour	Unskilled labour	Semiskilled labour	Skilled labour	Unskilled Men labour	Unskilled Women	Semiskilled men	Semiskilled men	Skilled men	Skilled wome
Maize	-0.346	-0.056	-0.177	-0.008	0.014	0.537	0.806	-0.062	0.205	-0.017	0.151
Wheat	-3.559	-3.208	-3.247	-3.194	-3.183	-3.743	-2.443	-3.284	-3.025	-3.241	-3.078
Fruit vegetables	-0.698	-0.371	-0.378	-0.357	-0.337	-0.889	0.451	-0.415	-0.148	-0.370	-0.203
Poultry	-0.805	-0.559	-0.686	-0.412	-0.424	-0.995	0.342	-0.522	-0.256	-0.477	-0.31
Dairy livestock	-1.608	-1.386	-1.549	-1.298	-1.225	-1.797	-0.470	-1.328	-1.063	-1.283	-1.117
Other agriculture	-3.025	-2.467	-2.314	-2.686	-2.657	-3.210	-1.903	-2.748	-2.487	-2.704	-2.541
Coal	0.491	0.552	0.323	0.799	0.844	0.298	1.654	0.777	1.048	0.823	0.992
Gold	3.383	3.326	3.23	3.691	3.739	3.185	4.579	3.678	3.956	3.725	3.899
Other-mining	6.381	6.402	6.263	6.702	6.743	6.177	7.611	6.684	6.97	6.732	6.911
Food	-0.029	0.020	-0.093	0.121	0.126	-0.418	0.928	0.058	0.326	0.103	0.271
BeverageTobacco	-0.431	-0.32	-0.532	-0.207	-0.198	-0.750	0.591	-0.276	-0.009	-0.231	-0.064
Textile	-4.829	-4.787	-4.859	-4.582	-4.644	-5.176	-3.895	-4.723	-4.468	-4.680	-4.520
Apparel	0.158	0.691	0.73	0.616	0.576	-0.034	1.317	0.444	0.713	0.489	0.658
Leather	-16.20	-15.71	-15.59	-15.86	-15.86	-16.36	-15.23	-15.96	-15.74	-15.92	-15.78
Footwear	-25.012	-24.71	-24.6	-24.9	-24.92	-25.37	-24.36	-25.01	-24.81	-24.98	-24.85
Wood	-0.791	-0.744	-0.865	-0.59	-0.548	-1.104	0.232	-0.632	-0.366	-0.587	-0.42
Paper	-6.813	-6.316	-6.222	-6.404	-6.354	-6.908	-5.650	-6.463	-6.213	-6.421	-6.264
Print	-0.894	-0.655	-0.786	-0.646	-0.61	-1.194	0.141	-0.722	-0.456	-0.677	-0.510
Petroleum	-0.103	0.128	-0.027	0.172	0.209	-0.329	1.018	0.147	0.415	0.192	0.360
Chemical	-2.83	-2.584	-2.789	-2.509	-2.492	-3.016	-1.705	-2.553	-2.291	-2.508	-2.345
Other-chemical	-0.519	-0.152	-0.136	-0.160	-0.158	-0.710	0.632	-0.236	0.032	-0.190	-0.023
Rubber	-5.386	-4.934	-4.74	-5.137	-5.106	-5.635	-4.360	-5.184	-4.930	-5.141	-4.982
Plastic	-4.22	-3.799	-3.692	-3.903	-3.921	-4.466	-3.175	-4.009	-3.752	-3.966	-3.805
Glass	-2.192	-2.095	-2.305	-1.894	-1.883	-2.422	-1.104	-1.956	-1.693	-1.911	-1.747
Non-metal	-0.973	-0.563	-0.577	-0.546	-0.549	-1.089	0.248	-0.616	-0.350	-0.571	-0.404
Iron	-0.053	-0.029	-0.305	0.153	0.263	-0.362	0.984	0.114	0.382	0.159	0.327

	Capital	Total labour	Unskilled labour	Semiskilled labour	Skilled labour	Unskilled Men labour	Unskilled Women	Semiskilled men	Semiskilled men	Skilled men	Skilled wome
Non ferrous	-0.446	-0.421	-0.671	-0.228	-0.221	-0.758	0.583	-0.284	-0.017	-0.239	-0.071
Metal-product	-2.636	-2.569	-2.785	-2.325	-2.279	-2.823	-1.510	-2.359	-2.097	-2.314	-2.150
Machinery	1.958	2.009	1.844	2.094	2.111	1.551	2.922	2.035	2.309	2.082	2.253
Electric machine	-1.083	-0.706	-0.678	-0.709	-0.747	-1.273	0.061	-0.801	-0.536	-0.756	-0.591
Com equipment	1.283	1.791	1.905	1.695	1.672	1.089	2.454	1.571	1.844	1.618	1.788
ScienceEquipmt	0.953	1.365	1.347	1.432	1.336	0.762	2.121	1.241	1.513	1.287	1.457
Vehicles	0.056	0.182	0.181	0.171	0.194	-0.341	1.006	0.135	0.404	0.181	0.349
Trans equipment	5.479	5.571	5.351	5.702	5.734	5.166	6.587	5.668	5.951	5.716	5.893
Furniture	-1.369	-1.304	-1.441	-1.113	-1.103	-1.646	-0.317	-1.176	-0.911	-1.131	-0.965
Other industry	-0.548	-0.153	-0.173	-0.144	-0.131	-0.739	0.602	-0.265	0.002	-0.219	-0.052
Electricity	-0.015	0.283	0.148	0.342	0.326	-0.207	1.142	0.271	0.539	0.315	0.484
Water	-0.452	-0.121	-0.18	-0.089	-0.109	-0.641	0.701	-0.167	0.101	-0.121	0.046
Construction	-0.246	-0.145	-0.291	0.065	0.096	-0.437	0.908	0.038	0.306	0.084	0.251
Trade	-0.357	0.071	0.305	0.021	0.024	-0.547	0.796	-0.073	0.195	-0.027	0.141
Hotel	-0.773	-0.38	-0.451	-0.368	-0.376	-0.963	0.375	-0.490	-0.224	-0.445	-0.278
Transport	1.397	1.632	1.286	1.717	1.769	1.202	2.572	1.686	1.958	1.732	1.902
Communication	-0.437	-0.069	-0.286	-0.011	-0.085	-0.628	0.715	-0.153	0.115	-0.108	0.062
Finance	-0.853	-0.466	-0.45	-0.457	-0.488	-1.043	0.294	-0.571	-0.304	-0.525	-0.358
Business	-0.904	-0.498	-0.298	-0.475	-0.529	-1.094	0.242	-0.622	-0.355	-0.577	-0.412
OtherManufactu	-0.863	-0.361	-0.01	-0.405	-0.433	-1.053	0.284	-0.58	-0.314	-0.535	-0.368
Other production	-0.321	0.051	-0.063	0.077	0.080	-0.512	0.832	-0.037	0.231	0.009	0.176
Government	-0.252	0.108	-0.084	0.119	0.119	-0.444	0.902	0.032	0.301	0.077	0.245

Table 6.2 Percentage change prices and output: all factors full employed and mobile (SIM 2)

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QV
maize	0.133	-1.269	1.252	1.174	-0.420	-0.397	-4.399	6.306	-0.420	-0.397	maize	-0.227	-0.286	1.578	-0.286
wheat	0.335	-3.436	1.274	0	-0.550	0.047	-8.729	41.021	-0.551	0.047	wheat	-0.313	-3.482	1.54	-3.482
FruitVegetable	0.621	-0.930	1.252	1.782	0.339	-0.373	-2.698	5.943	0.339	-0.373	Fruit vegetable	-0.318	-0.571	1.44	-0.571
Poultry	0.287	-0.642	1.239	0.012	0.004	-0.195	-3.436	5.541	0.004	-0.195	Poultry	-0.353	-0.647	1.377	-0.647
Dairy livestock	0.736	-1.535	1.251	0.003	0.371	-0.963	-4.057	6.432	0.371	-0.963	Dairylivestock	-0.059	-1.546	1.573	-1.546

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QV
Other agriculture	0.432	-2.721	1.337	0.011	-0.260	-1.650	-7.376	10.69	-0.260	-1.650	Other agricultu	-0.047	-2.754	1.136	-2.754
Coal	0.472	-0.090	1.341	1.494	0.498	-0.117	1.182	-0.807	0.498	-0.117	Coal	-0.031	0.520	1.643	0.520
Gold	-0.722	0.020	1.351	4.010	-0.680	0.000	1.081	-0.875	-0.682	0,001	Gold	-0.094	3.343	1.781	3.343
Other mining	-1.097	1.522	1.558	6.630	0.808	-0.445	1.024	-0.664	0.808	-0.445	Other mining	0.282	6.388	1.687	6.388
Food	0.243	-0.338	1.262	2.324	-0.330	0.082	-4.125	3.002	-0.331	0.082	Food	-0.151	-0.001	1.416	-0.001
Beverage tobacco	0.621	-0.607	1.481	1.068	0.448	-0.207	-1.347	4.074	0.448	-0.207	Beverage tobac	0.048	-0.397	1.549	-0.397
Textile	-0.429	-5.079	1.291	-0.801	-2.220	-0.109	-6.542	13.44	-2.222	-0.109	Textile	-0.882	-4.796	1.351	-4.796
Apparel	0.281	-0.666	1.294	3.288	-0.130	0.349	-2.615	6.815	-0.131	0.349	Apparel	-1.218	0.619	0.771	0.619
Leather	-4.662	-20.78	1.315	-9.960	-6.870	-12.17	-10.462	4.469	-6.872	-12.17	Leather	-1.046	-15.87	0.901	15.87
Footwear	-2.439	-22.76	1.315	-13.111	-6.731	4.897	-12.590	63.09	-6.731	4.897	Footwear	-2.944	-24.84	0.886	24.84
Wood	0.101	-1.213	1.256	1.309	-0.762	-0.625	-5.724	2.941	-0.763	-0.625	Wood	-0.408	-0.758	1.453	0.758
Paper	-1.071	-7.436	1.339	-2.391	-2.600	-1.990	-10.223	32.08	-2.601	-1.99	Paper	-1.157	-6.579	1.278	6.579
Print	-0.067	-1.166	1.317	1.882	-0.350	-0.255	-1.575	3.749	-0.351	-0.255	Print	-1.115	-0.711	1.154	0.711
Petroleum	0.976	-0.223	1.283	0.399	0.862	-0.051	-0.099	1.422	0.862	-0.051	Petroleum	0.562	-0.064	1.61	0.064
Chemical	-0.155	-3.171	1.371	-0.321	-0.850	-2.139	-2.003	-0.367	-0.85	-2.139	Chemical	0.060	-2.73	1.494	2.73
Other chemical	0.218	-0.758	1.286	1.921	-0.312	0.032	-1.636	2.115	-0.300	0.032	Other chemical	-0.283	-0.272	1.199	-0.272
Rubber	-0.171	-5.295	1.282	-2.112	-5.780	3.294	-15.243	21.05	-5.780	3.294	Rubber	-0.376	-5.057	0.892	-5.057
Plastics	-0.559	-3.788	1.251	-0.021	-2.661	-0.661	-10.862	13.35	-2.660	-0.661	Plastics	-0.909	-3.843	0.789	-3.843
Glass	-0.021	-2.063	1.275	0.907	-3.442	-0.104	-14.39	6.989	-3.440	-0.104	Glass	-0.529	-2.12	1.485	-2.12
Non-metal	0.576	-1.028	1.312	0.419	-0.991	-0.137	-8.190	4.253	-0.990	-0.137	Non-metal	0.078	-0.815	1.436	-0.815
iron	0.187	-1.084	1.308	1.272	-0.332	-0.649	-4.582	3.067	-0.332	-0.649	iron	0.271	-0.041	1.556	-0.041
Non-ferrous	0.708	-0.797	1.283	0.291	0.354	-0.502	-0.676	0.367	0.354	-0.502	Non-ferrous	0.486	-0.44	1.636	-0.44
Metal product	0.084	-2.644	1.451	-0.18	-1.383	-0.079	-7.694	12.34	-1.381	-0.079	Metal product	-0.325	-2.591	1.606	-2.591
Machinery	0.002	0.255	1.287	3.505	-0.100	0.304	-0.147	0.328	-0.121	0.304	Machinery	-0.317	1.999	1.277	1.999
Electric machinery	-0.247	-1.285	1.269	2.275	-2.351	0.302	-6.893	3.955	-2.351	0.302	Electrimachinery	-0.783	-0.876	1.277	-0.876
Comm. equipment	-1.295	-0.315	1.470	5.787	-2.361	0.500	-2.682	0.747	-2.362	0.511	Comm. equip	-1.447	1.664	0.94	1.664
Science equipment	0.312	-0.237	1.407	3.503	0.284	-0.211	0.271	-0.197	0.284	-0.211	Science equip	-0.586	1.268	1.07	1.268
Vehicle	-1.759	-1.393	1.239	5.731	-2.210	0.54	-2.852	3.415	-2.210	0.541	Vehicle	-1.917	0.128	1.319	0.128
Transport equipmet	-0.248	3.200	1.239	6.618	0.252	1.026	0.412	0.341	0.252	1.026	Transport equip	-0.261	5.562	1.346	5.562
Furniture	-0.093	-2.264	1.239	2.216	-1.631	1.274	-10.58	26.131	-1.632	1.274	Furniture	-0.981	-1.321	1.469	-1.321
Other industry	0.343	-1.399	1.239	1.281	-1.652	0.493	-5.176	4.022	-1.651	0.493	Other industry	-0.150	-0.312	1.22	-0.312
Electricity	0.958	0.071	1.239	0.629	0.961	0.07	1.181	-0.039	0.961	0.071	Electricity	0.143	0.092	1.484	0.092

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QV
Water	0.594	-0.334	1.239	0.947	0.604	-0.339	1.141	-0.604	0.604	-0.339	Water	0.216	-0.324	1.443	-0.324
Construction	0.131	0.004	1.239	2.232	0.141	-0.001	1.198	-0.525	0.141	-0.001	Construction	-0.439	-0.185	1.577	-0.185
Trade	0.914	-0.173	1.239	0.471	0.915	-0.173	1.188	-0.308	0.915	-0.173	Trade	0.497	-0.124	1.228	-0.124
Hotel	0.921	-0.820	1.239	-0.211	0.994	-0.856	1.211	-0.962	0.994	-0.856	Hotel	0.170	-0.676	1.502	-0.676
Transportation	0.768	1.367	1.239	2.316	0.862	1.201	1.239	0.529	0.862	1.201	Transportation	0.078	1.502	1.49	1.502
Communication	0.767	-0.337	1.239	0.599	0.799	-0.353	1.211	-0.555	0.799	-0.353	Communication	-0.011	-0.289	1.399	-0.289
Finance	1.181	-0.708	1.239	-0.591	1.182	-0.709	1.239	-0.737	1.182	-0.709	Finance	0.854	-0.701	1.39	-0.701
Business	1.153	-0.800	1.239	-0.630	1.155	-0.801	1.211	-0.828	1.155	-0.801	Business	0.549	-0.778	1.442	-0.778
Other services	0.679	-0.637	1.239	0.470	0.696	-0.645	1.201	-0.894	0.696	-0.645	Other services	0.263	-0.605	1.174	-0.605
Other producers	0.729	-0.334	1.239	0.677	0.750	-0.344	1.211	-0.571	0.751	-0.344	Other producers	-0.079	-0.007	1.065	-0.007
Govt. services	0.941	-0.014	1.239	0.578	0.941	-0.014	1.119	-0.102	0.941	-0.014	Govt. services	-0.019	-0.014	1.216	-0.014

Table 6.3 Percentage change output and prices: SIM 1 fixed capital, skilled: mobile& full employed; unskilled and semi-skilled labour mobile but unemployed

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QVA
Maize	0.701	-0.879	1.689	1.078	0.121	0.039	-4.070	7.105	1.099	-0.091	Maize	-0.106	-0.092	2.750	-0.092
Wheat	-2.579	-1.831	1.023	0.021	-3.117	0.367	-8.430	25.768	-2.844	-1.831	Wheat	-0.431	-1.856	-7.218	-1.856
FruitVegetables	0.517	-0.328	1.731	4.650	0.274	0.157	-2.358	5.630	0.667	0.340	FruitsVegetables	-0.372	0.342	1.419	0.342
Poultry	0.191	-0.239	1..101	0.001	-0.058	0.157	-3.101	5.224	0.148	-0.239	Poultry	-0.191	-0.241	0.766	-0.241
Dairy livestock	0.470	-0.566	1.431	0.025	0.153	-0.062	-3.727	6.442	0.451	-0.566	Dairy livestock	0.065	-0.571	0.837	-0.571
Other agriculture	-0.494	-1.071	1.421	0.003	-1.067	-0.155	-7.068	10.332	-0.596	-1.071	Other agriculture	0.010	-1.084	-1.538	-1.084
Coal	0.754	0.236	1.688	2.100	0.783	0.207	1.533	-0.553	1.115	0.954	Coal	0.031	0.954	2.289	0.954
Gold	-0.162	0.017	1.663	3.707	-0.129	1.325	1.312	-0.714	1.413	3.197	Gold	-0.205	3.283	2.482	3.283
Other mining	1.261	0.303	1.686	1.089	1.391	0.170	1.405	0.155	1.665	1.047	Other mining	0.437	1.030	2.704	1.030
Food	0.835	-0.204	1.853	1.731	0.229	0.242	-3.818	3.346	0.993	0.021	Food	-0.299	0.024	5.300	0.024
Beverage tobacco	0.645	-0.209	1.857	2.265	0.498	0.133	-1.032	3.777	0.775	0.104	Beverage	-0.036	0.103	2.044	0.103
Textile	-1.769	-2.397	1.877	6.710	-3.057	1.295	-6.241	11.275	-1.927	-1.110	Textile	-1.244	-1.207	-2.535	-1.207
Apparel	-0.224	0.242	2.278	7.494	-0.523	0.991	-2.352	5.745	-0.909	0.898	Apparel	-1.795	1.299	0.345	1.299
Leather	-5.565	-11.486	1.708	3.555	-7.275	-4.059	-10.142	10.194	-2.098	-4.050	Leather	-0.911	-4.192	-3.342	-4.192
Footwear	-6.157	-9.989	2.130	16.015	-8.556	7.341	-12.335	43.023	-9.283	-8.466	Footwear	-3.378	-9.423	-17.526	-9.423

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QVA
Wood	0.081	-0.259	1.761	3.246	-0.727	0.298	-5.395	3.672	0.305	0.313	Wood	-0.638	0.353	1.924	0.353
Paper	-2.912	-3.945	1.770	6.703	-4.043	0.271	-9.907	26.337	-2.303	-1.668	Paper	-1.805	-1.748	-2.459	-1.748
Print	-0.564	0.212	1.809	5.453	-0.690	0.619	-1.234	2.399	-0.584	0.554	Print	-1.715	0.661	0.968	0.660
Petroleum	1.313	0.043	1.810	0.565	1.198	0.216	0.233	1.694	1.610	0.171	Petroleum	0.909	0.172	2.287	0.170
Chemical	-0.211	-1.288	1.697	2.610	-0.743	-0.480	-1.637	0.906	0.359	-0.071	Chemical	0.171	-0.088	0.533	-0.088
Other Chemical	-0.001	0.055	1.855	4.268	-0.367	0.619	-1.317	2.102	0.003	0.511	Other Chemical	-0.358	0.602	1.003	0.602
Rubber	-1.340	-3.851	1.814	3.080	-6.373	4.006	-14.947	20.122	-1.106	-2.748	Rubber	-0.504	-2.918	-2.217	-2.918
Plastics	-1.457	-2.557	1.749	4.152	-3.292	0.230	-10.529	12.634	-1.369	-2.133	Plastics	-1.054	-2.750	-0.626	-2.750
Glass	-0.902	-1.114	1.915	4.998	-4.030	0.710	-14.096	7.276	-0.856	-0.634	Glass	-0.742	-0.811	-0.531	-0.811
Non-metal	-0.297	-0.555	1.753	3.720	-1.646	0.222	-7.857	4.017	-0.235	-0.294	Non-metal	0.116	-0.313	-0.658	-0.313
Iron	0.806	-0.558	1.746	1.281	0.254	-0.097	-4.250	3.850	1.217	0.232	Iron	0.500	0.258	2.985	0.258
Non-ferrous	1.256	-0.276	1.687	0.541	0.857	0.056	-0.303	1.037	1.438	0.048	Non-ferrous	0.804	0.028	2.372	0.028
Metal product	-1.038	-1.807	1.732	4.064	-2.211	0.288	-7.360	10.363	-0.863	-1.177	Metal product	-0.124	-1.304	-1.174	-1.304
Machinery	0.701	0.129	1.801	2.333	0.361	0.296	0.190	0.380	1.142	1.012	Machinery	-0.181	1.241	3.404	1.241
Electrical machine	-0.763	-0.843	1.797	4.938	-2.594	0.551	-6.575	3.748	-0.684	-0.115	Electrical	-0.785	-0.151	-0.031	-0.151
Comm. equipment	-1.146	-0.014	1.749	6.626	-2.056	0.682	-2.330	0.893	-0.501	1.962	Comm. quipment	-1.416	2.113	1.541	2.113
Science equipment	0.257	0.410	2.072	5.228	0.459	0.213	0.567	0.111	0.268	1.542	Science uipment	-0.687	2.170	1.553	2.170
Vehicle	-1.476	-0.994	1.755	6.357	-1.899	0.834	-2.510	3.553	-1.086	0.501	Vehicle	-1.849	0.553	2.640	0.553
Transport equipment	0.151	2.915	1.722	6.294	0.628	0.858	0.780	0.209	0.941	4.664	Transport ipment	-0.165	5.186	2.784	5.186
Furniture	-0.563	-1.408	2.109	5.799	-1.983	1.911	-10.327	25.048	-0.688	0.082	Furniture	-1.137	0.138	0.492	0.138
Other industry	0.288	-0.671	1.987	3.160	-1.582	1.113	-4.889	4.436	0.652	0.476	Other industry	0.003	0.690	1.108	0.690
Electricity	1.112	0.308	1.663	1.405	1.118	0.305	1.535	0.099	1.133	0.349	Electricity	0.109	0.349	1.733	0.349
Water	0.553	0.221	1.663	2.446	0.570	0.213	1.445	-0.221	0.562	0.239	Water	0.174	0.239	1.417	0.239
Construction	-0.619	0.069	1.663	4.717	-0.596	0.057	1.572	-1.016	-0.613	0.080	Construction	-0.880	0.002	0.103	0.002
Trade	0.675	0.500	1.663	2.483	0.677	0.498	1.551	0.065	0.678	0.506	Trade	0.272	0.532	0.984	0.532
Hotel	1.063	-0.259	1.663	0.930	1.199	-0.326	1.602	-0.524	1.251	0.113	Hotel	0.177	0.089	1.659	0.089
Transportation	1.295	1.062	1.663	1.798	1.368	0.933	1.663	0.411	1.347	1.166	Transportation	0.057	1.166	2.464	1.166
Communication	0.615	0.245	1.663	2.345	0.685	0.209	1.601	-0.243	0.669	0.353	Communication	-0.048	0.353	1.209	0.353
Finance	0.833	0.160	1.663	1.816	0.862	0.145	1.663	-0.250	0.883	0.260	Finance	0.561	0.260	1.078	0.260
Business	0.790	0.082	1.663	1.824	0.814	0.070	1.601	-0.318	0.807	0.117	Business	0.336	0.118	1.028	0.118
Other manufacture	0.542	0.136	1.663	2.382	0.575	0.120	1.578	-0.375	0.575	0.202	Other Manuf	0.109	0.202	1.087	0.202

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QVA
Other product	0.288	0.350	1.663	3.121	0.343	0.322	1.599	-0.300	0.331	0.437	Other product	-0.195	0.627	0.536	0.627
Govt. services	0.396	0.006	1.663	2.546	0.397	0.006	1.397	-0.489	0.397	0.007	Govt. services	-0.141	0.007	0.551	0.007

KEY TO SYMBOLS: PD:domestic price; QD: domestically demanded commodity; PE: price of exports; QE: exports; PQ:composite good Price; QQ: composite good; PM: price of imports; QM: imports; PX: producer price; QX: domestically produced output; PINT:price of intermediates; QINT: intermediates; PVA: value-added price; QV: value added.

Table 6.4 Percentage change factors : capital fixed and full employed, skilled labour mobile and full employed, unskilled and semi-skilled labour mobile with unemployment (SIM 1)

Sectors	Total labour	Unskilled labour	Semi skilled labour	Skilled labour	Unskilled men	Unskilled women	Semi-killed men	Semi-skilled women	Skilled men	Skilled women
Maize	1.168	1.390	1.339	0.736	1.368	1.448	1.338	1.343	0.731	0.762
Wheat	-5.564	-5.347	-5.402	-5.96	-5.376	-5.3	-5.404	-5.398	-5.971	-5.941
FruitVeg	1.118	1.177	1.117	0.517	1.146	1.227	1.116	1.122	0.510	0.542
Poultry	0.046	0.253	0.207	-0.386	0.234	0.314	0.204	0.21	-0.396	-0.365
Dairy and livestock	-0.134	-0.047	-0.091	-0.679	-0.062	0.018	-0.092	-0.086	-0.69	-0.659
Other agriculture	-1.843	-1.702	-1.784	-2.365	-1.756	-1.678	-1.785	-1.78	-2.373	-2.343
Coal	2.064	2.200	2.169	1.560	2.199	2.280	2.168	2.174	1.556	1.588
Gold	4.601	4.657	4.624	3.999	4.655	4.738	4.624	4.630	3.997	4.029
Other mining	2.391	2.488	2.452	1.84	2.483	2.564	2.452	2.458	1.838	1.870
Food	0.534	0.686	0.638	0.038	0.666	0.746	0.636	0.642	0.034	0.065
Beverage and tobacco	0.511	0.755	0.714	0.115	0.742	0.822	0.712	0.718	0.109	0.14
Textile	-1.460	-1.363	-1.409	-1.996	-1.383	-1.304	-1.412	-1.406	-2.003	-1.972
Apparel	1.512	1.615	1.542	0.947	1.569	1.65	1.539	1.545	0.93	0.962
Leather	-5.826	-5.666	-5.744	-6.298	-5.718	-5.643	-5.746	-5.741	-6.311	-6.282
Footwear	-14.386	-14.269	-14.344	-14.847	-14.321	-14.253	-14.346	-14.341	-14.859	-14.833
Wood	0.623	0.720	0.676	0.079	0.705	0.785	0.675	0.681	0.072	0.103
Paper	-3.258	-3.085	-3.155	-3.724	-3.128	-3.051	-3.157	-3.151	-3.737	-3.707
Print	0.875	1.165	1.112	0.517	1.141	1.221	1.111	1.116	0.505	0.536
Petroleum	1.004	1.297	1.249	0.645	1.278	1.359	1.248	1.254	0.642	0.673

Sectors	Total labour	Unskilled labour	Semi skilled labour	Skilled labour	Unskilled men	Unskilled women	Semi-killed men	Semi-skilled women	Skilled men	Skilled women
Chemical	-0.005	0.286	0.243	0.355	0.272	0.352	0.242	0.248	-0.358	-0.327
Other chemical	0.924	1.235	1.172	0.57	1.201	1.281	1.170	1.176	0.564	0.596
Rubber	-3.904	-3.709	-3.791	-4.362	-3.763	-3.687	-3.792	-3.786	-4.368	-4.338
Plastics	-3.055	-2.871	-2.944	-3.52	-2.918	-2.84	-2.947	-2.941	-3.528	-3.498
Glass	-1.043	-0.872	-0.907	-1.497	-0.879	-0.800	-0.909	-0.903	-1.502	-1.472
Non-metal	-0.774	-0.601	-0.659	-1.252	-0.631	-0.552	-0.661	-0.655	-1.256	-1.225
Iron	0.501	0.663	0.630	0.046	0.659	0.739	0.629	0.635	0.026	0.058
Non-ferrous	0.217	0.389	0.355	-0.244	0.384	0.464	0.354	0.360	-0.247	-0.216
Metal product	-1.907	-1.790	-1.821	-2.403	-1.793	-1.714	-1.822	-1.816	-2.410	-2.380
Machinery	1.549	1.755	1.708	1.103	1.737	1.818	1.707	1.713	1.098	1.129
Electrical machinery	-0.255	-0.037	-0.100	-0.699	-0.072	0.007	-0.102	-0.096	-0.701	-0.67
Comm. equipment	2.831	3.043	2.966	2.357	2.994	3.076	2.963	2.969	2.347	2.378
Science equipment	2.877	3.092	3.030	2.418	3.057	3.139	3.026	3.032	2.409	2.441
Vehicle	1.011	1.244	1.184	0.579	1.213	1.294	1.183	1.189	0.577	0.608
Transport equipmet	5.786	6.018	5.976	5.344	6.007	6.092	5.976	5.982	5.341	5.374
Furniture	0.239	0.355	0.314	-0.283	0.342	0.422	0.312	0.318	-0.288	-0.258
Other industry	1.194	1.376	1.314	0.721	1.342	1.422	1.311	1.317	0.705	0.736
Electricity	1.006	1.331	1.281	0.675	1.31	1.391	1.280	1.286	0.673	0.704
Water	0.734	1.070	1.013	0.409	1.042	1.122	1.012	1.017	0.407	0.438
Construction	0.020	0.156	0.118	-0.48	0.147	0.227	0.117	0.123	-0.483	-0.452
Trade	0.931	1.172	1.092	0.494	1.121	1.201	1.090	1.096	0.485	0.516
Hotel	0.865	1.041	0.983	0.388	1.010	1.090	0.980	0.986	0.375	0.406
Transportation	2.360	2.506	2.471	1.864	2.501	2.583	2.471	2.476	1.857	1.888
Communication	0.889	1.073	1.026	0.422	1.053	1.133	1.023	1.028	0.418	0.449
Finance	0.686	0.929	0.866	0.266	0.893	0.974	0.863	0.869	0.259	0.290
Business	0.393	0.774	0.699	0.102	0.726	0.806	0.696	0.702	0.093	0.124
Other manufacturing	0.454	0.902	0.813	0.225	0.839	0.920	0.809	0.815	0.206	0.237
Other product	0.744	1.018	0.963	0.369	0.990	1.071	0.960	0.966	0.356	0.387
Govt. services	0.019	0.398	0.348	-0.247	0.376	0.456	0.346	0.352	-0.255	-0.224

APPENDIX 6 (B)

MACROECONOMIC VARIABLES

Table 6.5 Percentage changes (macroeconomic variables)

Variable	Base level	Fixed capital, Skilled labour mobile, fully employed, unskilled & semiskilled labour mobile with unemployment	All factors mobile
Total Real Absorption	891.2	0.4	0.161
Household consumption	558.4	0.6	-0.1
Nominal Govt consumption	205.338	0.397	0.941
Real GDP	900.124	0.170	0.161
Private Consumption	558.420	0.520	0.001
Total Real Export	224.2	2.5	2.8
Total Real Import	275.2	3.2	3.4
Real Exchange Rate	91.4	1.4	0.7
Exchange rate	100.1	1.7	1.2
Trade Deficit	5.5	-0.7	-0.7
Investment	13.8	-0.1	-0.1
Private Savings	16.2	0.7	1.0
Governement income	217.516	-3.341,	-3.883
Governmet Savings	-1.9	-0.8	-1.1
Import Tax	1.0	-1.0	-1.0
Equivalent Variation			
Household decile 0	8.9	0.062	0.067
Household decile 1	12.0	0.065	0.062
Household decile 2	16.0	0.112	0.128
Household decile 3	20.4	0.130	0.133
Household decile 4	26.0	0.183	0.155
Household decile 5	32.9	0.255	0.228
Household decile 6	45.5	0.333	0.199
Household decile 7	63.9	0.471	0.221
Household decile 8	95.5	0.708	0.282
Household decile 91	74.7	0.551	0.115
Household decile 921	26.6	0.228	0.114
Household decile 922	31.1	0.218	-0.05
Household decile 923	34.9	0.230	-0.140
Household decile 924	70.1	0.149	-1.307
Total	558.4	0.5	
Factor Earnings			
Capital	396.041	2.059	1.492
Unskilled men	73.599	1.042	2.317
Unskilled women	26.711	0.028	-0.707
Semiskilled men	113.619	0.749	1.169
Semiskilled women	57.550	0.598	0.583
Skilled men	114.417	1.154	1.010
Skilled women	40.357	1.061	0.651

Source: Study simulation results

CHAPTER 7

THE IMPACT OF A PRODUCTIVITY RISE ON SOUTH AFRICAN GENDER AND ECONOMY

7.1   INTRODUCTION

This chapter focuses on the effects of an increase in factor productivity on gender in terms of employment, wages, earnings and household welfare. Low levels of domestic savings and a high rate of unemployment, which are partially attributed to low levels of investment, have forced the government of South Africa to promote the inflows of highly-technological foreign investment (FDI). This is done in various ways for example, by providing grants for equipment transportation and other special support programs (see Chapter 1). According to GEAR, a macroeconomic policy, FDI is a source of investment that produces spillovers resulting in job creation. GEAR assumed that FDI would register a ninefold increase to enable its employment targets to be met. FDI is also a vital external capital inflow which is needed to finance the current account deficit. However, inflow of FDI in South Africa has been modest. This is attributed to uncertainty over exchange rate movements, a mismatch between productivity and remuneration levels, and concerns over violent crime. As a result, a high unemployment rate still exists in South Africa despite efforts by the government.

FDI improves productivity through the introduction of advanced technology, adoption of better management methods, better workers' training, and other related skills. Studies show FDI to be a more comprehensive source of productivity since it packages and integrates various methods (Lim & Fong 1982; Johansson & Nilsson 1997; Klein et al. 2000:3-4; and see Chapter 3 on FDI). However, as stated before, productivity emanates from various sources, although the evidence is overwhelming that productivity is in part FDI induced.

As stated in chapter 1, productivity has been growing in the agricultural, manufacturing and service sectors of South Africa. According to the 2000 gendered SAM which is used in the current study, higher productivity is found in such sectors as machinery, plastics, print, electrical machinery, and non-ferrous. The lowest level of productivity is found in the labour-intensive sectors of textiles, furniture and in government services. The accompanying rise in productivity, however, has caused unemployment, especially that of unskilled women. As productivity has grown, labour's share of gross output has been shrinking while capital's

share has been rising (see Chapter 4). This reflects increasing wealth among owners of capital. This is rather alarming, especially in the South African case, given the high rates of unemployment and underemployment of unskilled labour. Regarding gender, the 2000 gendered SAM, shows very low shares of women participation in the high productivity sectors. Most women tend to be concentrated in low productivity sectors, which partly explain their low wages, and hence low-income earnings received by them. Does an economy-wide productivity improvement spur job creation for both men and women in South Africa? Alternatively, is productivity growth in a few state-of-the-art technological enhanced sectors the answer for employment creation?

The structure of the chapter is arranged as follows. The next section describes the model policy simulations. The third section gives the results of the simulations—where the first one examines economy-wide increases in productivity, while the second one examines productivity increases on few selected sectors. The last section comments on the implications of productivity, development prospects and policy in South Africa.

7.2   THE MODEL POLICY SIMULATIONS

The first simulation (SIM1) involves a 1% economy-wide (all sectors) rise of total factor productivity (TFP), while (SIM2) involves a TFP rise of 1% in few selected sectors. Selected sectors are: food, beverage and tobacco, textile, apparel, leather, footwear, chemical, other-chemical, metal products, electrical machinery, machinery products, communication equipment, scientific equipment, and vehicles.

The first five sectors were selected because they have attracted the most FDI into South Africa. The selection of other sectors was based on their current or potential employment for women. With both simulations, a 1% productivity (TFP) increase is modelled as an increase of an 'exogenous' source of the technological parameter of each sector. The 1% productivity increase is justifiable, given the modest inflow of FDI in South Africa and following empirical observations by Yin-Chyi and Lin (1999). The higher productivity level of 3.5 is used for sensitivity analysis in order to ascertain the robustness of the model results.

7.3   SIMULATION RESULTS OF ECONOMY-WIDE FACTOR PRODUCTIVITY RISE

7.3.1 Macroeconomic results: factor productivity rise economy-wide (SIM 1)

Following the productivity shock, output increases and domestic prices drop in all sectors, reflecting more efficiency and lower costs per unit of output. Greater efficiency increases output in all sectors resulting in increased real GDP by nearly 1.2%. Given constant real government expenditure, GDP boosts government revenue (1.4%) which raises government savings (0.8%). The higher level of real GDP allows consumers to enjoy a higher level of consumption. As a result, South Africa increases imports (1.4%) compared with the baseline level. Increased imports create a demand for foreign currency and raise the domestic currency (rand) price of foreign currency which causes a depreciation of the currency.   The depreciation raises exports (1.3%), which partially finance and discourage imports. Tariff revenue, indirect taxes and the government's total revenues all improve with productivity rise.

Economy-wide productivity is expansionary as witnessed by a significant increase of more than one percent in domestic output in all sectors except in construction (0.1%) and government (0.1%) because the two sectors' products are not required as intermediates in other sectors. Imports rise mostly in the sectors with high import shares in the base year level. For example, imports rise in labour-intensive sectors (leather, 1.2%; apparel, 1.7%; scientific equipments, 1.5%) and in capital-intensive (chemical, 1.5%; vehicles, 1.4% and communication, 0.7%).

The depreciation of the real exchange rate improves exports with a significant rise in apparel (2.3%), scientific equipment (2.0%), communication equipment (2.0%), metal products (1.9%), electrical machinery (1.9%), machinery (1.5%), and vehicles (1.3%) exports. The presence of intra-industry trade in the economy allows sectors such as apparel and scientific equipment to have both export-orientation and import-competing characteristics.

7.3.2   Employment changes due to factor productivity rise

Results of economy-wide productivity rise show output having a significant positive impact on employment. The expansionary economy coupled with rising export demand raises the demand for factors of production. Figure 4 shows a general rise of sectoral employment by

skills type with skilled labour benefiting more than other skill types in all sectors. The results support observations that find productivity to raise the demand for skilled labour relative to unskilled labour in South Africa (Edwards 2001; Pretorius 2002:17). The greatest rise of unskilled employment occurs in mining (gold, coal, other-mining), other-chemicals, apparel, footwear and scientific equipment because these sectors increased exports. Slight employment rise occurs in metal products, machinery, iron and steel, non-ferrous, communication equipments, and food, because these sectors are highly capital-intensive. Unskilled labour demand holds steady in the leather sector with a slight rise of less than 0.10%. Sectoral demand for semi-skilled labour is similar to that of unskilled labour except in leather and electrical machinery where its demand falls reflecting their low output gain. As a result of productivity rise, all sectors, including those that are export-oriented, realise higher demand of skilled labour than that of semi-skilled and unskilled labour.
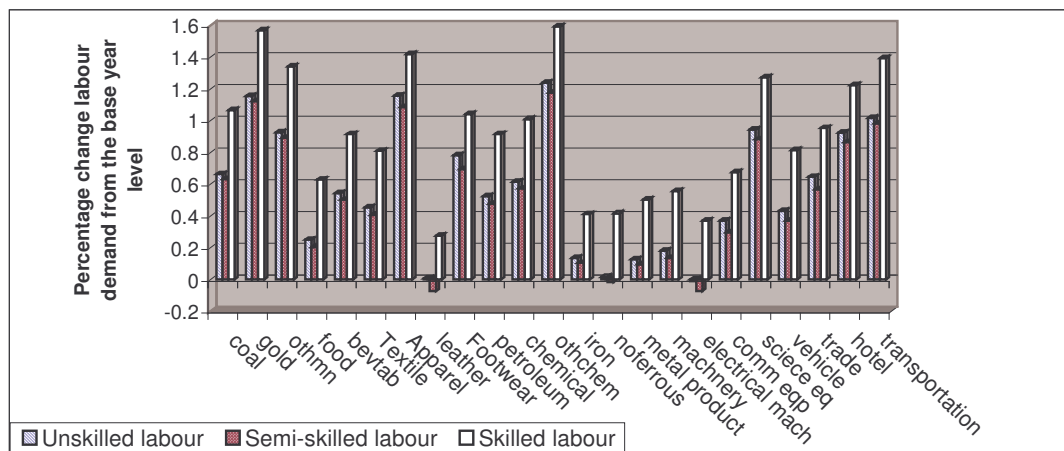
Figure 7-1 Percentage change labour demand: economy-wide productivity rise

7.3.3   Gender Employment changes due to economy-wide factor productivity rise

An economy-wide productivity increase raises employment of unskilled men and women in the apparel sector (unskilled women 1.2%; unskilled men 1.1%), in chemicals (unskilled women 0.78%; unskilled men 0.6%), and scientific equipment (unskilled women 1.0%; unskilled men 0.9%). The slightly increased demand for unskilled women relative to that of men is partially explained by the lower wages associated with women when compared with that of men so that more of their labour implies a cost advantage for a sector. In the short run, therefore, the expansion of firms has a trigger effect on retaining and increasing employment

of unskilled women. However, the current static model cannot predict the sustainability of increased unskilled women jobs.

The outcome of the productivity increase for semi-skilled men and semi-skilled women shows slight differences between genders, although the trend favours semi-skilled women relative to semi-skilled men. Significant differences, showing more gain for semi-skilled women, occur in women-intensive sectors of food, apparel and communication equipments.

In terms of high skills, increased productivity raises the economy-wide demand for skilled men more than for skilled women (see Figure 7.2). This happens in both traditional and non-traditional women-intensive sectors, for example, apparel (skilled women, 1.3%, skilled men 1.6%), footwear (skilled women, 0.9%; skilled men, 1.2%), textile (skilled women 0.6%; skilled men 0.9%), and in leather (skilled women, 0.2%; skilled men, 0.4%), respectively. This indicates a bias against skilled women in women-intensive sectors. The apparel sector, with a general higher concentration of women (72%) at the base level, experiences a higher increase in skilled men relative to skilled women. Gender economists term such occurrence as the 'defeminisation' through technology in both higher and in less value-added manufacturers (Elson 2000).
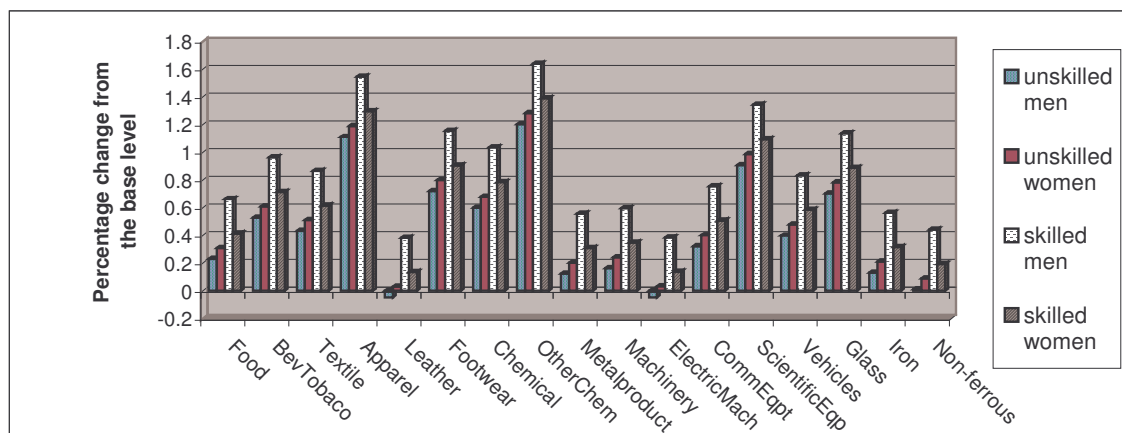
Figure 7-2   Percentage change employment by skills and gender: economy-wide productivity rise

7.3.4   Change in wages and factor earnings due to factor productivity rise

Capital's earnings rise (1.2%) more than other factors based on its higher productivity. Under the assumption of flexible supply of unskilled and semi-skilled labour (elastic supply), the

increased demand for such skills type raises their supply, while their nominal wages remain fixed at the base year level. Economy-wide rise of employment of men and women leads to an increase of their income earnings (see Figure 7.3). The income earnings of unskilled and semi-skilled women are slightly greater than that of unskilled and semi-skilled men because of higher increased demand for women's labour as compared to that of men of the same skill. On the other hand, hiring is higher for skilled men than skilled women leading to greater earnings for skilled men compared to skilled women workers. Nevertheless, there is almost equalization of skilled men and women earnings which explain higher earnings associated with skilled women.
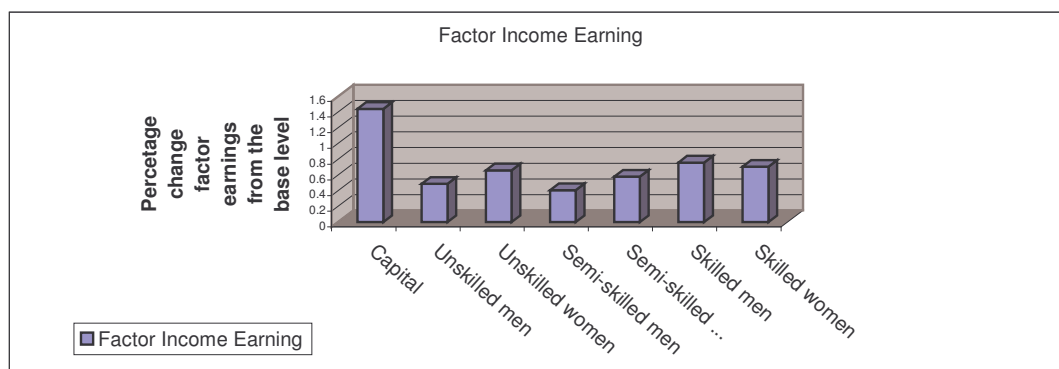
Figure 7-3 Percentage change factor income: economy-wide productivity rise

7.3.5   Results of factor productivity rise in selected sectors (SIM 2)

South Africa's productivity, which generally is concentrated in selected sectors, has been growing at the rate of 3.2% per year, but this has not led to job creation (South Africa Department of Labour 2006). This finding is consistent with other studies on employment, that find productivity to be a major factor associated with reduced levels of employment in South Africa (Jenkins and Thomas 2002; Edwards 2001). This section aims to analyse the economy-wide effects of a productivity rise in a few selected sectors.

Macroeconomic results: Factor productivity rise in selected sectors

Except for lower magnitudes, macroeconomic results for SIM 2 are similar to those for SIM 1. Increased factor earnings and increased consumption due to reduced commodity prices raise household welfare especially for low-income households.

7.3.6 Employment changes due to factor productivity rise in selected sectors

The direct effect of productivity increase in selected sectors is the reduction of employment in these sectors, albeit slightly by less than a percentage point (see Figure 7.4). Efficiency gains due to improved productivity enable sectors to switch their production process by reducing employment demand of all skill types. Skilled labour in labour-intensive sectors is mostly negatively affected because of its substantial higher wages which raises its marginal productivity, for example, skilled labour in the scientific equipment decline more than other skill types (unskilled 0.7%, semi-skilled, 0.7% and skilled, 0.9%). The negative employment outcome differs from that of SIM 1 where employment rises significantly in all sectors. The fall in employment is effected by increased efficiency which enables profit-maximising producers to expand by employing fewer resources, particularly labour, due to its risen marginal productivity. Despite shedding jobs, all productivity-raised sectors expand their output.

Sectors with initial low productivity levels, which include the women-intensive sector of apparel witness the worst of employment contraction. Sectors such as non-ferrous, metal products, transport equipment, other-industries, and furniture, which have strong linkages with policy-affected sectors, respond by slightly reducing their demand for employment as they are forced to become efficient in order to stay in business.

A certain amount of labour, which is released from the efficient sectors, relocates mostly to service sectors of trade (unskilled 0.5%; semi-skilled 0.6%) and water (unskilled 0.5 %; semi-skilled: 0.6%) (see Figure 7.4). Other service sectors such as communication, finance and business, also see a slight rise of such labour. The influx of women into the trade sector is mostly in subsectors such as retail which is due to easy entry as it relates to low skills requirements.

Despite employment downturns in sectors where a productivity rise began, the relocation of labour from such efficient sectors to other sectors has economy-wide positive employment effects. A similar outcome has been observed in South Africa. For example, using a CGE model to study the effects of productivity rise on agriculture, Punt *et al* (2003) found a productivity rise in agriculture to reduce employment sectorally while increasing it economy-wide in an expanding economy. This outcome shows that efficiency gains in few sectors have economy-wide positive employment effect based on intersectoral linkages. The direct

and indirect economy-wide employment effects are more easily captured with the use of CGE models than with partial equilibrium models which focus mostly on direct effects.
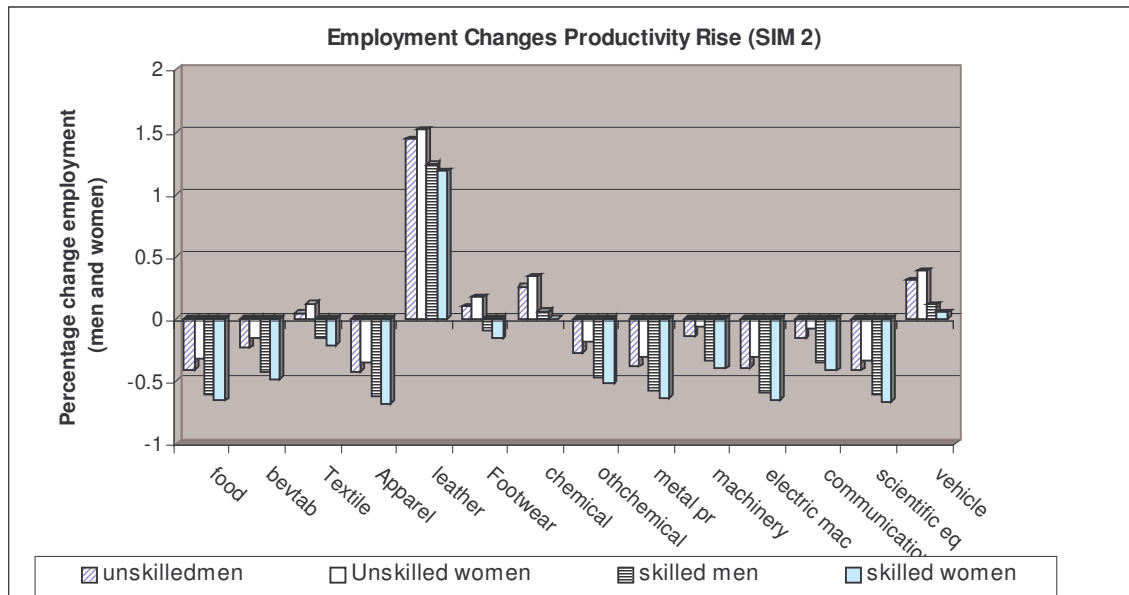
Figure 7-4 Percentage change employment due to selected productivity rise

7.3.7 Gender employment changes due to factor productivity rise in selected sectors

Figure 7.5 shows, for the shocked sectors, a decline of all skill types for men and women employment due to productivity rise in selected sectors. Unskilled men labour drops more, than unskilled women labour because of unskilled men's higher marginal productivity when compared with unskilled women who receive lower wages. However, compared to skilled men, skilled women employment declines more in all sectors that reduce employment due to efficiency rises. This is due to the higher initial levels of skilled men in such sectors. The full employment assumption associated with skilled labour requires displaced men and women to obtain employment in other sectors. As such, the results show labour increases in sectors such as trade, etc, which are sectors that were not directly affected by productivity increase. As seen in Figure 7.5, skilled men employment exceeds that of skilled women in those sectors. Sectors such as other mining, leather, paper, print and petroleum witness a fall of women labour while men labour demand rises. This is partly due to initial higher levels of men in such sectors when compared with initial levels of women. In sectors where employment rises, which are leather and vehicles, the rate of rise for skilled men exceeds that of skilled

159

women. These two sectors increase men and women employment because of their increased demand by other expanding sectors, for example, leather in vehicles (car seats), and vehicles in expanded transportation services.

The negative employment effects associated with skilled women when compared to skilled men supports the observation that productivity is associated with competitive skills, which are mostly possessed by men. This limits the benefits of productivity in terms of job creation, particularly for skilled women who mostly possess skills that are different from those of men in most sectors. However, in reality, there is no guarantee that all retrenched employees, particularly unskilled labour will be absorbed in other sectors. Bezuidenhout, Khunou, Mosoetsa, Sutherland, and Thoburn (2006) found most retrenched workers in the textile sector to have difficulties finding new employment in other sectors because of non-transferable skills. They found, however, that retrenched men were able to obtain employment faster than retrenched women.
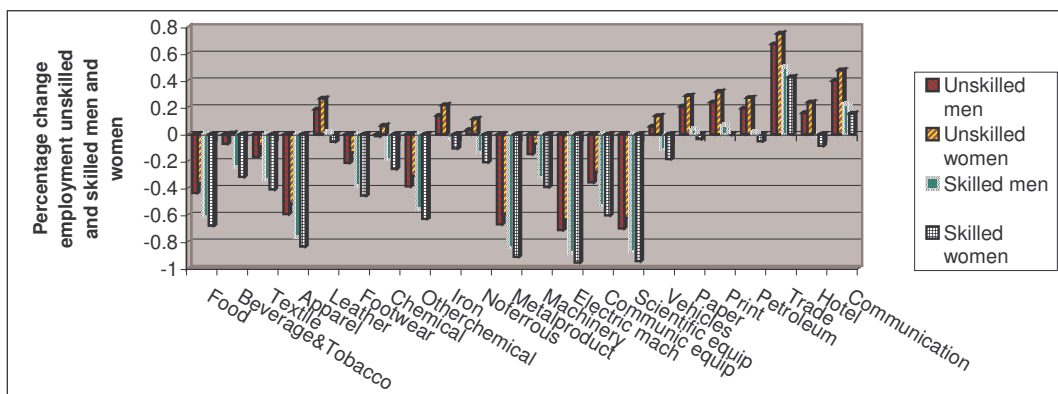
Figure 7-5 Percentage change unskilled gender: productivity rise selected sectors

7.3.8 Wages and factor earnings changes due to factor productivity rise

Figure 7.6 shows changes associated with capital rent and wages for men and women that occurred due to a selected sector productivity rise. Wages of unskilled and semi-skilled workers are fixed at their base level, and hence do not vary, while capital's rent and skilled labour wages vary in order to balance the employment requirements. Results show productivity increasing wages for skilled men and women labour.

The differing effects (expansion and contraction) in sectors of all skill types lead to an overall

rise in their labour earnings. All factors, except unskilled women and men, see an increase in their earnings, among labour, skilled men benefit the most. Semi-skilled women earnings increase more, relative to earnings of semi-skilled men because of their economy-wide increased demand. The earnings for the skilled men and women labour increase with the earning of skilled men increasing more than that of the skilled women due to men's higher initial wages. Several studies find higher wages to be associated with FDI, which is a major source of productivity (Braunstein 2000). However, economy-wide earnings of unskilled women and men decline, with that of men declining more than that of unskilled men following their employment loss in the efficient sectors, which outweighs the rate on which they are absorbed in other sectors which are mainly low paying sectors. For example, the movement of unskilled men and women workers in the service sector does not guarantee increased earnings. This is because the service sector is heterogeneous where certain work is labour intensive with low pay and other types are characterised by high productivity and technological innovation with high pay.
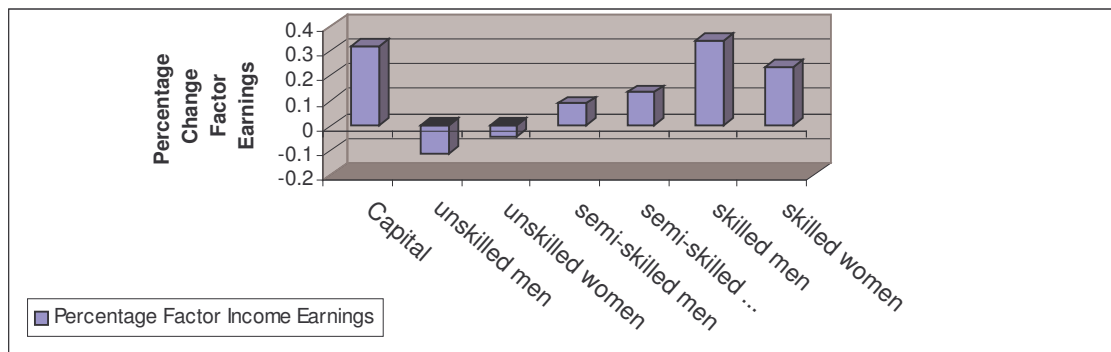
Figure 7-6 Percentage change earnings: Productivity rise selected sectors

7.4   EQUIVALENT VARIATION: FACTOR PRODUCTIVITY RISE (SIM 1 AND SIM 2)

In this study as in the previous chapter, household welfare is measured by the equivalent variation (EV) methodology. Figure 7.7 shows the improvements of welfare for all the households with higher magnitudes for SIM 1 when compared with that for SIM 2 based on higher responses for SIM 1. With both simulations, the shift in relative income across the household deciles favours high-income households. These households derive most of their income from increased capital earnings and   from increased earnings of skilled labour.

The improvement in regular wages coupled with falling commodity prices due to rising cheap imports, which is induced by the efficiency rise, makes commodities affordable especially for low-income households who respond by increasing consumption. Low-income households spend a large share of their expenditure on consumables (textile, footwear etc.,) whose price has fallen. Due to concentration of men workers relative to women workers in higher-income households, a productivity rise that benefits high-income households tends to favour those men over women. Women, particularly unskilled women, are concentrated in low-income households and, as such, their welfare improves less than that of skilled men and women in high-income households.
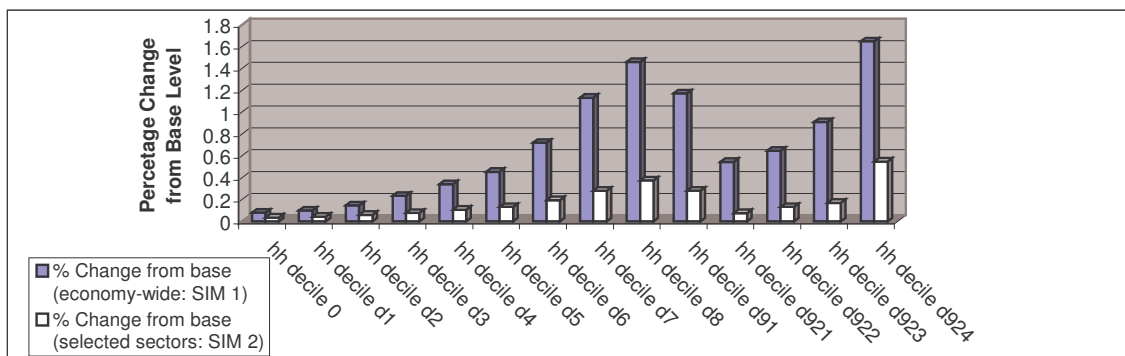
Figure 7-7 Percentage change equivalent variation (SIM 1 and SIM 2)

7.4.1   Conclusion

This chapter analysed impacts of productivity on South African economy and gender by means of a CGE model. The results show that factor productivity rise results in gains from a more efficient usage of resources, which increases GDP and improves the government budgetary position. In addition, productivity generates direct welfare benefits to households by lowering domestic commodity prices, and by increased earnings for factors, especially for skilled men and women.

An economy-wide productivity increase creates jobs for all skill types of men and women, through an economy-wide rise in output. However, productivity benefits skilled men more than other skill types of men and women. In most instances, skilled labour is preferable due to its appropriate training and expertise that enable the absorption and adaptation of technology. On the other hand, unskilled and semi-skilled women labour benefit more from

162

economy-wide productivity rise than unskilled and semi-skilled men because women earn lower wages than men. This outcome differs from that for skilled women who obtain higher wages from the base year level.

Unlike economy-wide productivity rise, a direct effect of a partial productivity rise is efficiency gain resulting in job losses in productivity-raised sectors and in sectors in which they have strong linkages. Unskilled women labour falls less than unskilled men while skilled women labour falls more than that of skilled men. Displaced workers, both skilled, semi-skilled and unskilled men and women, switch to export-oriented, labour-intensive and capital-intensive sectors which have expanded resulting in economy-wide job creation. This model assumes no relocation costs. However, in reality, relocation will be required to find alternative employment, increasing the time required and other costs to find new work. Adjustment costs may be severe and long lasting for the poorest member of households, particularly unskilled women due to low levels of education and skills, and limited savings that could be used to finance relocation or retraining.

The indirect effect of job creation through intersectoral linkages is overlooked in many partial equilibrium studies, which conclude that productivity leads to job losses. While partial productivity directly reduces levels of employment in the affected sectors, it also creates employment in sectors that provide goods and services to efficient sectors. This type of analysis explains the importance of looking at both direct and indirect economy-wide effects.

From a gender perspective the increase in productivity creates challenges for women seeking employment. Lack of appropriate skills for women has the potential of promoting gender inequality in South Africa by keeping women in low paying positions. Economy-wide productivity raises the employment demand and earnings of unskilled women from their baseline level. However, productivity within selected sectors sheds employment mostly in women intensive sectors. Although retrenched men and women relocate to other sectors, earnings of unskilled women drop because their job losses are outweighed by their job gains mostly in low-paying positions. This has an implication on the welfare improvement of low-income households which derive most of their income from unskilled women.

As jobs and wages improve in quality, women tend to be excluded from them, therefore, they need to acquire skills in areas of science, engineering and IT to gain from rising productivity.

Economy-wide productivity rise

Table 7.1 (a): Employment changes due to economy-wide productivity rise

Sectors	Capital	Total Labour	Unskilled Labour	Semi-Skille Labour	Skilled labour	Unskilled Men	Unskilled Women	Semi – Skilled Men	Semi- Skilled Women	Men skilled	Women Skilled
Maize	0.421	0.620	0.531	0.475	0.891	0.504	0.583	0.474	0.480	0.937	0.688
Fruit vegetables	0.152	0.800	0.790	0.729	1.143	0.757	0.837	0.728	0.734	1.192	0.942
Coal	0.021	0.730	0.660	0.632	1.065	0.661	0.741	0.632	0.638	1.096	0.846
Gold	0.175	1.180	1.150	1.122	1.568	1.151	1.231	1.122	1.128	1.588	1.337
Other mining	0.318	0.980	0.931	0.891	1.340	0.920	1	0.890	0.896	1.355	1.105
Food	0-.613	0.311	0.250	0.203	0.629	0.231	0.310	0.201	0.207	0.663	0.415
Beverage/tobacco	0-.081	0.672	0.540	0.502	0.915	0.530	0.610	0.501	0.507	0.964	0.715
Textiles	0-.172	0.501	0.450	0.407	0.809	0.433	0.512	0.403	0.409	0.866	0.617
Apparel	0-.050	1.182	1.160	1.085	1.418	1.111	1.191	1.081	1.087	1.547	1.297
Leather	-0.600	0.053	0.010	-0.074	0.275	-0.047	0.032	-.077	-0.071	0.384	0.136
Footwear	-0.190	0.812	0.780	0.694	1.041	0.720	0.800	0.691	0.697	1.155	0.905
Wood	-0.290	0.134	0.100	0.055	0.457	0.084	0.163	0.054	0.060	0.515	0.267
Paper	-0.373	1.124	1.080	1.011	1.367	1.038	1.118	1.008	1.015	1.474	1.224
Print	-0.041	1.221	1.110	1.057	1.421	1.085	1.165	1.055	1.061	1.521	1.271
Petroleum	0.003	0.681	0.520	0.477	0.915	0.505	0.585	0.476	0.482	0.939	0.690
Chemical	-0.142	0.770	0.620	0.572	1.009	0.601	0.680	0.571	0.577	1.035	0.785
Other chemical	-0.051	1.380	1.240	1.176	1.592	1.204	1.284	1.174	1.180	1.640	1.390
Rubber	-0.131	1.601	1.530	1.447	1.859	1.476	1.556	1.446	1.452	1.914	1.662
Plastic	-0.091	0.490	0.430	0.354	0.744	0.381	0.461	0.352	0.358	0.814	0.566
Glass	-0.121	0.800	0.710	0.676	1.096	0.704	0.784	0.675	0.681	1.139	0.889
Non-metal	-0.021	-0.540	-0.610	-0.669	-0.246	-0.641	-0.563	-0.671	-0.665	-0.213	-0.459
Iron	0.017	0.190	1.140	0.104	0.411	0.132	0.211	0.103	0.109	0.564	0.316
Non-ferrous	-0.022	0.110	0.020	-0.017	0.416	0.011	0.090	-0.019	-0.013	0.442	0.195
Metal products	-0.033	0.184	0.130	0.096	0.503	0.125	0.204	0.095	0.101	0.557	0.309
onsumpti	0.027	0.273	0.180	0.136	0.556	0.164	0.243	0.135	0.141	0.596	0.348
Electric machinery	-0.020	0.092	-0.01	-0.073	0.371	-0.046	0.033	-0.075	-0.069	0.385	0.138

Sectors	Capital	Total Labour	Unskilled Labour	Semi-Skille Labour	Skilled labour	Unskilled Men	Unskilled Women	Semi – Skilled Men	Semi- Skilled Women	Men skilled	Women Skilled
Commun equipment	0.012	0.439	0.370	0.296	0.675	0.322	0.402	0.293	0.299	0.755	0.507
Scientific equipment	-0.070	1.025	0.940	0.883	1.272	0.908	0.988	0.879	0.885	1.344	1.094
Vehicles	-0.03	0.539	0.430	0.371	0.813	0.4	0.479	0.371	0.377	0.833	0.585
Transport equipment	-0.14	1.371	1.252	1.212	1.652	1.241	1.321	1.211	1.217	1.677	1.427
Furniture	-0.139	0.871	0.821	0.781	1.202	0.809	0.889	0.779	0.786	1.244	0.994
Other industry	-0.053	1.366	1.320	1.261	1.592	1.288	1.368	1.258	1.264	1.725	1.474
Electricity	-0.022	0.552	0.380	0.328	0.773	0.356	0.435	0.326	0.332	0.788	0.541
Water	-0.072	1.717	1.543	1.487	1.934	1.515	1.595	1.485	1.491	1.953	1.701
Construction	-0.032	0.026	-1.551	-1.589	-1.154	-1.561	-1.483	-1.591	-1.584	-1.136	-1.380
Trade	0.059	0.693	0.650	0.567	0.953	0.595	0.675	0.565	0.571	1.029	0.780
Hotel	-0.173	0.947	0.924	0.865	1.223	0.892	0.972	0.862	0.868	1.327	1.077
Transportation	0.218	1.071	1.022	0.983	1.394	1.012	1.092	0.982	0.988	1.448	1.198
Communication	-0.010	1.096	1.040	0.989	1.416	1.015	1.095	0.985	0.992	1.451	1.201
Finance	-0.022	1.534	1.471	1.409	1.819	1.437	1.517	1.407	1.413	1.874	1.623
Business	-0.011	1.788	1.662	1.585	1.978	1.611	1.692	1.582	1.588	2.050	1.798
Other services	-0.063	2.044	1.922	1.834	2.144	1.860	1.941	1.830	1.836	2.299	2.047
Other producers	0	0.364	1.600	1.548	1.906	1.576	1.656	1.546	1.552	2.014	1.762
Government	-0.023	0.008	-1.032	-1.591	-1.198	-1.562	-1.485	-1.591	-1.586	-1.138	-1.382

Table 7.2 Quantity and price changes due to economy-wide productivity rise (SIM)

Commodity	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QVA
Maize	0.072	1.194	-0.345	0.206	0.023	1.273	-0.348	1.875	-0.051	0.797	Maize	-0.290	0.796	0.227	0.796
Fruit vegetable	-0.163	1.334	-0.343	0.511	-0.179	1.365	-0.348	1.709	-0.164	1.223	Fruit vegetable	-0.283	1.225	-0.118	1.225
Coal	-0.489	1.225	-0.345	1.521	-0.484	1.221	-0.348	1.078	-0.434	1.339	Coal	-0.350	1.339	-0.532	1.339
Gold	-1.412	0.012	-0.346	2.187	-1.388	1.246	-0.352	-0.520	-0.493	1.885	Gold	-0.404	1.899	-0.661	1.899
Other mining	-0.453	1.345	-0.345	1.566	-0.358	1.293	-0.347	1.235	-0.352	1.555	Other mining	-0.343	1.552	-0.440	1.552
Food	0.588	1.203	-0.337	-1.350	0.468	1.447	-0.349	1.907	0.799	0.909	Food	0.150	0.905	2.771	0.905
Bev / tobacco	0.154	1.344	-0.337	-0.162	0.112	1.673	-0.349	2.539	0.317	1.155	Bevtabacco	-0.017	1.154	0.755	1.154
Textile	-0.095	1.473	-0.336	0.756	-0.165	1.871	-0.348	2.201	-0.031	1.374	Textile	-0.131	1.357	0.097	1.357
Apparel	-0.470	1.912	-0.319	2.282	-0.454	1.393	-0.350	1.607	-0.484	1.945	Apparel	-0.172	2.024	-0.985	2.024
Leather	-0.146	1.078	-0.344	0.639	-0.216	1.714	-0.347	1.983	-0.232	0.866	Leather	0.058	0.835	-0.945	0.835
Footwear	-0.238	1.455	-0.325	1.041	-0.275	1.077	-0.349	2.229	-0.132	1.432	Footwear	-0.189	1.401	0.046	1.401
Wood	-0.249	1.067	-0.341	0.841	-0.263	1.644	-0.348	1.136	-0.247	1.031	Wood	-0.121	1.010	-0.395	1.013
Paper	-0.070	1.495	-0.341	0.835	-0.112	1.867	-0.348	2.534	-0.084	1.357	Paper	-0.114	1.336	-0.047	1.336
Print	-0.393	1.895	-0.339	1.989	-0.384	1.102	-0.348	1.748	-0.382	1.901	Print	-0.207	1.928	-0.578	1.928
Petroleum	-0.386	1.108	-0.339	1.157	-0.382	1.388	-0.348	1.051	-0.358	1.122	Petrol	-0.356	1.117	-0.237	1.117
Chemical	-0.245	1.329	-0.344	1.109	-0.283	1.811	-0.347	1.488	-0.269	1.261	Chemical	-0.216	1.229	-0.437	1.229
Other-chemical	-0.383	1.825	-0.337	1.880	-0.374	2.161	-0.349	1.771	-0.361	1.831	Otherchemical	-0.300	1.914	-0.589	1.914
Rubber	-0.271	2.120	-0.339	1.925	-0.298	1.241	-0.348	2.238	-0.259	2.090	Rubber	-0.260	2.137	-0.351	2.137
Plastics	-0.806	1.374	-0.342	2.371	-0.719	1.506	-0.347	0.674	-0.797	1.436	Plastic	-0.305	1.435	-1.254	1.435
Glass	-0.448	1.519	-0.335	1.751	-0.425	0.666	-0.348	1.461	-0.439	1.537	Glass	-0.264	1.571	-0.696	0.571
Non metal	-1.008	0.733	-0.342	2.172	-0.892	1.079	-0.347	0.352	-1.003	0.822	Non metal	-0.334	0.778	-1.896	0.778
Iron	-0.382	1.082	-0.342	1.148	-0.379	1.063	-0.348	1.052	-0.361	1.111	Iron	-0.354	1.107	-0.287	1.107
Non-ferrous	-0.307	1.055	-0.345	0.971	-0.317	0.907	-0.347	1.088	-0.319	1.021	Non ferrous	-0.365	1.005	-0.179	1.005
Metal products	-0.751	1.035	-0.343	1.917	-0.679	0.830	-0.347	0.314	-0.729	1.129	Metal product	-0.360	1.117	-1.157	1.117
Machinery	-0.642	0.927	-0.342	1.668	-0.446	0.869	-0.348	0.781	0.558	1.223	Machinery	-0.351	1.228	-0.905	1.228
Electricmac	-0.748	0.963	-0.340	1.915	-0.624	0.801	-0.348	0.659	-0.748	1.082	Electric mach	-0.379	1.041	-1.345	1.041
Comm equip	-0.763	1.044	-0.342	2.019	-0.444	1.548	-0.347	0.727	-0.678	1.331	Comm eqp	-0.383	1.335	-1.194	1.335
Scientific equip	-0.478	1.632	-0.328	2.023	-0.393	1.325	-0.349	1.506	-0.475	1.722	Science eqp	-0.301	1.773	-0.893	1.773
Vehicles	-0.335	1.303	-0.342	1.255	-0.340	1.003	-0.348	1.357	-0.323	1.293	Vehicle	-0.361	1.292	-0.148	1.292
Transport equip	-0.606	1.856	-0.343	2.430	-0.410	1.655	-0.347	0.734	-0.478	2.152	Trasport eqp	-0.343	2.252	-0.863	2.252

Commodity	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QVA
Furniture	-0.255	1.626	-0.326	1.221	-0.268	1.832	-0.349	1.847	-0.168	1.544	Furniture	-0.279	1.609	-0.047	1.609
Other industry	-0.295	1.813	-0.332	1.585	-0.314	1.162	-0.349	1.866	-0.253	1.745	Other indusry	-0.316	1.799	-0.198	1.799
Electricity	-0.687	1.164	-0.346	1.860	-0.682	1.632	-0.348	0.992	-0.674	1.190	Electricity	-0.485	1.192	-0.844	1.190
Water	0.133	1.627	-0.346	0.658	0.124	0.166	-0.349	1.873	0.129	1.620	Water	-0.086	1.623	0.604	1.621
Construction	-1.315	0.171	-0.346	2.149	-1.305	1.399	-0.347	-0.320	-1.313	0.176	Construction	-0.699	0.081	-2.469	0.081
Trade	-0.451	1.400	-0.346	1.615	-0.451	1.929	-0.348	1.347	-0.451	1.460	Trade	-0.027	1.408	-0.799	1.408
Hotel	0.734	1.791	-0.346	-0.380	0.460	1.655	-0.347	2.341	0.411	1.117	Hotel	0.095	1.113	0.378	1.111
Transportation	-0.268	1.627	-0.346	1.469	-0.284	1.472	-0.346	1.767	-0.279	1.604	Transportation	-0.186	1.604	-0.360	1.604
Communication	-0.130	1.464	-0.346	1.026	-0.145	1.703	-0.347	1.574	-0.141	1.441	Communicatio	-0.267	1.441	-0.033	1.441
Finance	0.438	1.689	-0.346	0.109	0.411	1.575	-0.346	2.089	0.391	1.595	Finance	0.274	1.595	0.498	1.595
Business	0.657	1.560	-0.346	-0.450	0.628	2.059	-0.347	2.071	0.638	1.521	Business	-0.046	1.552	0.931	1.552
Other business	0.154	2.051	-0.346	1.035	0.139	2.024	-0.347	2.307	0.140	2.022	Other business	-0.189	2.022	0.493	2.022
Other producer	-0.524	2.028	-0.346	2.395	-0.517	0.070	-0.347	1.937	-0.519	2.040	Other produce	-0.105	2.441	-0.885	2.441
Government	-2.029	0.071	-0.346	3.540	-2.028	-0.090	-0.350	-0.780	-2.029	0.072	Government	-0.544	0.072	-2.454	0.072

Table 7.3 Percentage change factors of production (capital and labour) selected sectors

SECTOR	Total labour	Un skilled	Semi skilled	Skilled	Unskille men	Unskilled men	Semi Skille men	Semi skilled wome	Unskilled men	Unskilled women
Maize	-0.077	0.005	-0.045	-0.202	-0.016	0.063	-0.046	-0.04	-0.188	-0.263
FruitVegetables	0.159	0.185	0.127	-0.032	0.155	0.234	0.125	0.131	-0.018	-0.090
Coal	0.012	0.055	0.024	-0.128	0.053	0.132	0.024	0.030	-0.119	-0.191
Gold	0.012	0.028	-0.004	-0.152	0.025	0.104	-0.004	0.002	-0.147	-0.219
Othermining	0.200	0.231	0.197	0.051	0.226	0.305	0.197	0.203	0.054	-0.018
Food	-0.477	-0.420	-0.467	-0.62	-0.439	-0.361	-0.469	-0.463	-0.610	-0.682
Bev-tobacco	-0.143	-0.059	-0.111	-0.258	-0.072	0.007	-0.101	-0.095	-0.244	-0.316
Textile	-0.184	-0.148	-0.194	-0.356	-0.168	-0.089	-0.197	-0.191	-0.339	-0.411
Apparel	-0.595	-0.550	-0.62	-0.802	-0.594	-0.516	-0.624	-0.618	-0.765	-0.837
Leather	0.166	0.242	0.160	-0.017	0.187	0.267	0.158	0.164	0.015	-0.057
Footwear	-0.216	-0.154	-0.24	-0.419	-0.214	-0.135	-0.244	-0.238	-0.386	-0.458
Wood	0.008	0.047	0.004	-0.156	0.033	0.112	0.003	0.009	-0.139	-0.211
Paper	0.169	0.251	0.180	0.005	0.208	0.287	0.178	0.185	0.036	-0.036
Print	0.148	0.263	0.211	0.038	0.239	0.318	0.209	0.215	0.067	-0.006
Petroleum	0.112	0.210	0.163	0.012	0.192	0.271	0.162	0.168	0.019	-0.053
Chemical	-0.095	-0.009	-0.042	-0.193	-0.014	0.065	-0.043	-0.037	-0.186	-0.258
Otherchemical	-0.468	-0.355	-0.417	-0.574	-0.389	-0.310	-0.418	-0.412	-0.562	-0.632
Rubber	0.397	0.483	0.399	0.239	0.427	0.507	0.398	0.404	0.254	0.182
Plastic	0.356	0.434	0.36	0.194	0.387	0.466	0.357	0.363	0.214	0.142
Glass	0.433	0.491	0.456	0.299	0.484	0.564	0.455	0.461	0.312	0.239
Nonmetal	0.077	0.142	0.084	-0.071	0.111	0.191	0.082	0.088	-0.061	-0.133
Iron	0.079	0.142	0.111	-0.078	0.139	0.218	0.109	0.115	-0.033	-0.105
Nonferrous	-0.018	0.041	0.006	-0.145	0.034	0.114	0.005	0.011	-0.138	-0.209
Metalproduct	-0.711	-0.669	-0.699	-0.857	-0.671	-0.592	-0.700	-0.694	-0.842	-0.913
Machinery	-0.206	-0.132	-0.177	-0.333	-0.149	-0.07	-0.179	-0.173	-0.321	-0.393
Electricmach	-0.758	-0.679	-0.742	-0.889	-0.715	-0.636	-0.744	-0.738	-0.885	-0.957
Communicate eq	-0.398	-0.313	-0.386	-0.554	-0.360	-0.281	-0.389	-0.383	-0.531	-0.603
Scientific eqp	-0.75	-0.669	-0.728	-0.894	-0.703	-0.624	-0.732	-0.726	-0.874	-0.945
Vehicles	0.006	0.091	0.031	-0.119	0.059	0.138	0.030	0.036	-0.113	-0.185
Transport eqp	-0.223	-0.151	-0.190	-0.34	-0.161	-0.082	-0.190	-0.184	-0.333	-0.404
Furniture	-0.05	-0.007	-0.048	-0.203	-0.020	0.06	-0.049	-0.043	-0.191	-0.263
Other industry	-0.071	0.011	-0.051	-0.234	-0.024	0.055	-0.054	-0.048	-0.196	-0.268
Electricity	0.367	0.474	0.425	0.276	0.453	0.532	0.423	0.429	0.280	0.208
Water	0.547	0.662	0.606	0.456	0.634	0.714	0.605	0.611	0.461	0.389
Construction	0.026	0.071	0.033	-0.115	0.062	0.141	0.033	0.039	-0.11	-0.182
Trade	0.609	0.723	0.644	0.477	0.672	0.752	0.642	0.648	0.499	0.426
Hotel	0.103	0.191	0.133	-0.043	0.159	0.239	0.130	0.136	-0.013	-0.085
Transportation	0.228	0.285	0.252	0.092	0.280	0.360	0.251	0.257	0.108	0.036
Communication	0.342	0.419	0.372	0.216	0.399	0.478	0.369	0.375	0.226	0.154
Finance	0.317	0.427	0.364	0.203	0.391	0.471	0.362	0.368	0.219	0.146
Business	0.395	0.553	0.479	0.312	0.505	0.585	0.476	0.482	0.332	0.260
Other business	0.353	0.548	0.460	0.269	0.486	0.566	0.456	0.462	0.313	0.241
Other production	0.364	0.475	0.421	0.245	0.448	0.528	0.419	0.425	0.276	0.203
Government serv	0.018	0.155	0.106	-0.057	0.133	0.212	0.104	0.110	-0.039	-0.111

Table 7.4 Quantity and price changes selected sectors

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QV
Maize	-0.231	0.512	-0.142	0.855	-0.212	0.481	-0.064	0.244	-0.243	0.650	Maize	-0.049	0.651	-0.522	0.651
FruitVegetable	-0.466	0.762	-0.162	2.312	-0.433	0.696	-0.068	-0.04	-0.491	0.969	FruitVegetable	-0.064	0.972	-0.814	0.972
Coal	0.023	0.114	-0.141	-0.190	0.019	0.117	-0.065	0.204	-0.046	-0.010	Coal	-0.017	-0.01	-0.071	-0.01
Gold	-0.166	0.002	-0.129	0.076	-0.161	-	0.043	-0.100	-0.134	0.066	Gold	0.023	0.058	-0.251	0.058
Othermining	-0.156	0.196	-0.140	0.280	-0.098	0.137	-0.092	0.130	-0.143	0.276	Othermining	0.010	0.277	-0.288	0.277
Food	-0.065	0.470	-0.221	0.433	-0.062	0.468	-0.045	0.455	-0.205	0.465	Food	-0.079	0.461	-0.534	0.461
Beverage tobbaco	-0.421	0.768	-0.223	1.832	-0.389	0.690	-0.04	-0.130	-0.680	0.902	Beveragetobbaco	-0.196	0.903	-1.236	0.903
Textile	-0.235	0.741	-0.233	1.116	-0.184	0.595	-0.048	0.210	-0.393	0.793	Textile	-0.051	0.816	-1.163	0.816
Apparel	-0.126	0.449	-0.428	0.844	-0.109	0.405	2E-04	0.132	-0.606	0.484	Apparel	-0.065	0.472	-1.316	0.472
Leather	-0.181	0.841	-0.151	0.967	-0.144	0.683	-0.078	0.388	-0.183	0.902	Leather	-0.027	0.914	-0.634	0.914
Footwear	-0.162	0.721	-0.356	0.898	-0.119	0.425	-0.033	-0.170	-0.438	0.731	Footwear	-0.066	0.793	-1.208	0.793
Wood	0.184	0.061	-0.176	-0.630	0.147	0.087	-0.07	0.236	0.113	-0.05	Wood	-0.062	-0.080	0.485	-0.080
Paper	0.212	0.054	-0.181	-0.690	0.171	0.203	-0.07	1.092	0.116	-0.100	Paper	0.028	-0.110	0.360	-0.110
Print	0.153	0.136	-0.20	-0.520	0.112	0.266	-0.065	0.833	0.105	0.094	Print	0.069	0.105	0.122	0.105
Petroleum	0.179	0.181	-0.20	-0.46	0.155	0.219	-0.051	0.535	0.042	0.025	Petroleum	-0.008	0.021	0.181	0.021
Chemical	-0.297	0.621	-0.145	0.986	-0.220	0.503	-0.09	0.303	-0.27	0.734	Chemical	-0.011	0.875	-0.958	0.875
Other-chemical	-0.293	0.581	-0.222	1.124	-0.225	0.476	-0.046	0.201	-0.462	0.639	Other chemical	-0.069	0.664	-1.286	0.664
Rubber	0.127	0.368	-0.202	-0.23	0.059	0.471	-0.071	0.667	0.048	0.275	Rubber	-0.041	0.255	0.199	0.255
Plastic	-0.006	0.369	-0.171	0.079	-0.021	0.392	-0.086	0.49	-0.035	0.351	Plastic	-0.080	0.308	-0.017	0.308
Glass	0.192	0.432	-0.251	-0.421	0.132	0.464	-0.067	0.578	0.142	0.364	Glass	0.091	0.292	0.321	0.292
Non-metal	0.011	0.102	-0.173	-0.223	-0.005	0.112	-0.083	0.156	-0.02	0.083	Non-metal	0.025	0.017	-0.019	0.017
Iron	0.234	0.402	-0.169	-0.380	0.201	0.429	-0.069	0.658	0.054	0.067	Iron	-0.009	0.048	0.287	0.048
Non-ferrous	0.156	0.222	-0.141	-0.363	0.093	0.275	-0.091	0.43	0.035	-0.01	Non-ferrous	0.101	-0.020	-0.028	-0.020
Metalproduct	-0.532	0.413	-0.162	1.300	-0.451	0.272	-0.082	-0.38	-0.554	0.507	Metal product	0.072	0.506	-1.536	0.506
Machinery	-0.477	0.368	-0.196	1.470	-0.197	0.229	-0.056	0.16	-0.522	0.809	Machinery	-0.020	0.836	-1.514	0.836
Electrical mach	-0.535	0.442	-0.194	1.471	-0.389	0.331	-0.064	0.087	-0.638	0.57	Electrical mach	-0.060	0.567	-1.742	0.567
Communic eq	-0.481	0.416	-0.171	1.334	-0.171	0.182	-0.077	0.111	-0.490	0.686	Communic eq	-0.086	0.701	-1.301	0.701
Scientific eq	-0.123	0.309	-0.328	0.971	-0.053	0.245	-0.018	0.212	-0.579	0.463	Scientific eq	-0.019	0.402	-1.396	0.402
Vehicles	-0.284	0.878	-0.174	1.301	-0.198	0.509	-0.070	-0.040	-0.340	0.963	Vehicles	-0.155	0.989	-0.979	0.989
Transport eqp	-0.036	-0.031	-0.158	-0.190	-0.071	0.120	-0.082	0.167	-0.117	-0.110	Transport eqp	-0.019	-0.200	-0.151	-0.200
Furniture	0.183	0.135	-0.346	-0.720	0.156	0.196	-0.019	0.602	-0.006	-0.040	Furniture	0.022	-0.070	-0.015	-0.070
Other-Industry	0.137	0.220	-0.286	-0.430	0.078	0.277	-0.031	0.379	-0.058	0.027	Other-Industry	-0.003	-0.060	-0.109	-0.060

Commodities	PD	QD	PE	QE	PQ	QQ	PM	QM	PX	QX	Sectors	PINT	QINT	PVA	QV
Electricity	0.329	0.156	-0.129	-0.760	0.323	0.159	-0.066	0.354	0.312	0.122	Electricity	0.039	0.122	0.474	0.122
Water	0.396	0.178	-0.129	-0.870	0.388	0.182	-0.022	0.387	0.392	0.169	Water	0.233	0.169	0.742	0.169
Construction	-0.068	0.023	-0.129	-0.100	-0.069	0.023	-0.084	0.031	-0.069	0.022	Construction	-0.047	0.005	-0.073	0.005
Trade	0.351	0.374	-0.129	-0.580	0.349	0.375	-0.074	0.587	0.348	0.371	Trade	0.233	0.358	0.438	0.358
Hotel	0.358	0.207	-0.129	-0.760	0.242	0.264	-0.099	0.435	0.206	-0.100	Hotel	0.021	-0.100	0.330	-0.100
Transportation	0.051	0.273	-0.129	-0.090	0.015	0.337	-0.129	0.595	0.025	0.222	Transportation	0.136	0.222	-0.071	0.222
Communication	0.263	0.175	-0.129	-0.610	0.237	0.188	-0.098	0.357	0.243	0.135	Communication	0.122	0.135	0.340	0.135
Finance	0.362	0.174	-0.129	-0.810	0.345	0.182	-0.129	0.420	0.333	0.115	Finance	0.312	0.115	0.365	0.115
Business	0.475	0.165	-0.129	-1.040	0.458	0.173	-0.099	0.452	0.463	0.141	Business	0.205	0.117	0.590	0.117
Other business	0.298	0.175	-0.129	-0.681	0.286	0.181	-0.087	0.368	0.286	0.151	Other business	0.105	0.151	0.483	0.151
Otherproduction	0.113	0.309	-0.129	-0.181	0.104	0.313	-0.098	0.414	0.105	0.294	Otherproduction	0.114	0.307	0.096	0.307
Government serv	0.060	0.006	-0.129	-0.372	0.060	0.006	0.001	0.036	0.060	0.006	Government	0.033	0.006	0.067	0.006

KEY to headings

Prices and output

PD: Domestic price	PE: Export Prices	PQ: Composite Good Price	PM: Import Price	PX: Domestic Price	PINT: Price of Intermediates	PVA: Price Value Added
QD: Domestic quantity	QE: Export	QQ: Composite Good	QM: Imports	QX: Domestic Output	QINT: Quantity Intermediate	QV: Value Added.

Factors of production:

CAP:	LAB:	LAB1:	LAB2	LAB3	lablomn	lablofm	labmedmn	labmedfm	labhimn	Labhifm
Ccapital	Total labour	skilled	Semi- skilled	Skilled labour	skilled men	Unskilled women	Semi-skilled men	Semi-skilled women	Skilled men	Skilled women

Appendix 7(B)

MACROECONOMIC VARIABLES: PRODUCTIVITY RISE

Table 7.5 Macroeconomic results (base year and percentage changes from base)

Variable	Base year level	Selected sectors	Economy-wide (all sectors)
Total Real Absorption	891.2	0.2	1.4
Real household consumption	558.4	0.4	2.0
Total real export	224.2	0.2	1.2
Total real imports	275.2	0.2	1.4
Real exchange rage	91.4	-0.2	0.1
Private savings as % of GDP	16.2	-0.1	-0.7
Government savings as % of GDP	-1.9	0.1	0.5
Household Welfare (EV)			
Household decile 0	8.9	0.035	0.080
Household decile 1	12.0	0.043	0.099
Household decile 2	16.0	0.060	0.146
Household decile 3	20.4	0.077	0.234
Household decile 4	25.9	0.107	0.341
Household decile 5	32.8	0.133	0.454
Household decile 6	45.4	0.195	0.719
Household decile 7	63.8	0.280	1.131
Household decile 8	95.4	0.375	1.460
Household decile 91	74.7	0.282	1.171
Household decile 921	26.5	0.076	0.245
Household decile 922	31.0	0.132	0.647
Household decile 923	34.9	0.170	0.909
Household decile 924	70.1	0.547	3.748
GDP and national accounts			
Private Consumption	558.420	0.387	1.955
Fixed Investment	127.779	-0.116	0.761
Government consumption	205.338	0.060	2.028
GDP market prices value added	922.773	0.249	0.583
Net indirect taxes	100.477	0.335	1.171
GDP at factor cost	822.296	0.239	0.511
Percentage change Government come	217.532	0.387	1.593
Factors of production earnings			
Capital	396.042	0.383	1.44
Unskilled men	73.599	-0.127	0.485
Unskilled women	26.711	-0.106	0.659
Semiskilled men	113.619	0.098	0.407
Semiskilled women	57.550	0.156	0.579
Skilled men	114.418	0.203	0.756
Skilled women	40.357	0.328	0.706

CHAPTER 8

THE DOHA ROUND AND ITS EFFECTS ON AGRICULTURAL SUB SECTORS AND GENDER IN SOUTH AFRICA

8.1 INTRODUCTION

This chapter presents results from the 2000 gendered CGE model that was employed to explain the effects of the implementation of the Doha Round of Multilateral Trade Negotiations (referred hereafter as the Doha Round) on selected agricultural subsectors, on the macroeconomic and on gender. Specifically, this chapter examines the effects of the Doha Round on agricultural subsectors in relation to skills, employment, wages, earnings, and welfare from a gender perspective. The model was first solved without introducing any policy changes and it reproduced the base year solution of the system. This validated the model results.

The simulations performed include domestic policy and an international policy. The domestic policy change was based on the South African government's general commitment to the WTO requirement of removing agricultural trade distortations. The South African government is engaged on agricultural tariff reductions on selected agricultural commodities as per the government's commitment to fulfil the WTO requirements. The government had previously dismantled its policies of agricultural domestic support and subsidies.

The international policy follows the anticipated changes for agricultural world price following the implementation of the Doha Round, after price distorting countries remove their trade obstacles. The world price changes involve both an increase in world prices of imports and exports for selected agricultural products.

This chapter is arranged as follows: Section 2 begins by listing the different types of simulations performed for this study. Section 3 follows and gives the analysis of simulated results, while section 4 presents conclusions and recommendations of the study results.

8.2 SIMULATIONS: THE IMPLEMENTATION OF THE DOHA ROUND

Simulation 1 (Joint policies --combination of simulation 2 and 3 below)

Simulation 2 (Tariff reduction): 100% cut in   tariffs with flexible government savings and

172

mobile labour while capital is fixed sectorally. The rate of agricultural tariff reduction was set at 100% considering the prevailing low rates of protection given to the agricultural commodities in South Africa (see chapter 2).

Simulation 3 (Changes in agricultural world price of imports and exports): Introduction of potential price changes with endogenous foreign exchange rate and fixed current account balance. This study did not calculate the predicted world price rise for agricultural commodities, but rather obtained the rates from literature search (See Table 8.1) and entered them into the model exogenously. The rate of price rise used in this study ranges from 4-16% depending on the subsector.

The combination of policies (simulation 1) reflects a country's position in which it faces simultaneous multiple policy shocks, which are both domestic and foreign oriented. For example, after joining the WTO in 1995, South Africa committed itself to the implementation of the WTO requirements of tariff reforms. The government continues to pursue the full implementation of the Doha Round (foreign) through dialogue and negotiations with the developed countries. Several analysts have predicted an increase of world prices of agricultural commodities to accompany the implementation of the Doha Round. As a 'small country' case or a price taker, South Africa is expected to face higher world prices of agricultural imports and exports following the implementation of the Doha Round.

Table 8.1 indicates agricultural subsectors selected for simulation in this study which include commodities most likely to be affected by the Doha Round. These commodities are maize, wheat, fruits and vegetables, poultry, livestock and diary, and other-agriculture (an aggregation of all other non-selected agricultural commodities).

8.3   RESULTS AND DISCUSSIONS OF MODEL SIMULATION

8.3.1   Results of a joint policy simulation (tariff reduction and rises in world prices)

The results of rise in world prices for agricultural exports lead to a slight GDP increase of less than a percentage (0.1%) point. The increase is partially due to increased imports (0.3%) and slight increases in exports (0.031%), mainly agricultural exports. Although rise in world prices for agricultural exports reduce imports, the effects of the concurrent policy of agricultural tariff reduction raise imports, which outweighs imports fall. Increased economy-

wide imports slightly raise nominal private consumption (0.006%) while real consumption and private savings drops by (-0.001%) and (-0.1%) respectively. Increased imports imply slight reduction of government revenue (-0.036%) resulting in falling government expenditure (-0.094%), and consumption (-0.114%). Fall in private savings is offset by slight rise in government savings. While agricultural exports increase based on higher export prices, economy-wide exports fall due to the appreciation of the exchange rate (-0.2%) brought about by imports. From the macroeconomic results, if the implementation of Doha Round raises world prices from 6-15% as predicted by the current model, and the country continues to liberalise agriculture, there will be minimal positive effects at the aggregate level. The results also reflect the small contributions of agriculture in the South African economy. However, the welfare of low-income households declines because of reduced commodity demand due to higher prices, particularly for maize, which is a staple food (see Table 8.7)

General results

The policy changes affect the demand and supply in the market, forcing prices to adjust in order to restore equilibrium in the related markets. While the effect of tariff reduction is to raise imports, a rise in world prices has an opposite effect on domestic production by encouraging exports and discouraging imports. The combination of these two policies induce a substantial expansion in some of the South Africa agricultural subsectors' output and exports, leading to increased employment demand.

Significant domestic production expansion occurs in the maize subsector (2.552%), followed by fruit and vegetables (2.465%). Other subsectors' production declines slightly by less than a percentage point. For example, poultry production declines by 0.510%, livestock production by -0.600%, while other agriculture declines by -0.390% (see Table 8.3 in Appendix 8). Related sectors, such as food processing, contract (-0.708%) due to rising prices of agricultural commodities which are used as intermediates in food production. In the non-agricultural sectors of manufacturing, production contracts marginally while production in the service sectors holds steady, with only marginal expansion based on the extent of linkage with agriculture. The changes in agricultural production are consistent with changes in the sectoral value added price. This follows the model assumption that producers maximise their profits based on the value added prices for their products. Table 8.3 shows a rise in value-added prices in almost all subsectors, particularly in the maize sector. However,

value-added prices of non-agricultural sectors falls, resulting in output contraction.

The domestic price of agricultural imports, which depends partly on the world prices and partly on changes in tariff, falls greatly following the policy shock, which results in imports rise. Under this scenario, the impact related to tariff reduction offsets the effect related to increase in world prices. This makes imports more attractive to domestic consumers, who respond by increasing imports demand while switching from domestic sources of supply which are now relatively expensive. The greatest import rise occurs in wheat (3.637%), other agriculture (1.966%), maize (1.591%), dairy livestock (1.492%) and modestly in poultry. The outcome reflects the greater weight of full tariff reduction which outweighs the effects of world price rise of these commodities. This outcome indicates that the level of world price changes used in the model is not big enough to counterbalance the effects of the simulated tariff reduction changes which affects producers in the maize, wheat, and other agriculture. Imports of other non-agricultural commodities rise except for other mining, iron and non-ferrous which have low import shares. This follows the depreciation of the exchange rate induced by tariff reduction coupled with lower prices relative to those of agricultural commodities. If reductions in world agricultural production and export subsidies lead to an increase in world prices, as expected in the short and medium term, South Africans will pay more for their agricultural imports. South Africa, however, is a net exporter of agricultural and food products.

As the export price of maize, fruit and vegetables rises, domestic producers see an opportunity to export in the market with relatively higher prices as seen by increased domestic price of exports, hence increased exports (see Table 8-3). Other-agricultural subsector exports increase modestly due to low export shares from the base year level. Non-agricultural sectors of manufacturing experience a drop in exports while export-oriented sectors of other-mining, non-ferrous and iron, South African biggest exporters see slight increases in their exports (see Table 8.3 Appendix 8). Food (2.652%), beverage (1.380%) and most of the labour-intensive sectors incur the greatest drop in exports based on their linkage with agriculture.

Increase in world prices under the Doha Round leads to decreased consumption of agricultural commodities while increasing consumption of non-agricultural commodities. The decline in domestic consumption of agricultural commodities, while the domestic consumption of non-agricultural commodities increases. This situation can be explained in terms of the

comparative price advantage of non-agricultural goods over goods of the agricultural sectors. Greater consumption decline is experienced in the maize and vegetables and fruits sectors while other agriculture declines less.

8.3.2 Factor of production changes

The increase in domestic agricultural production and exports following the policy shock induces an increase in demand for factors of production. Capital is sectorally fixed, rendering no mobility across sectors, while its sector specific returns adjust in order to maintain the sectoral employment level in equilibrium. Despite the substantial utilisation of labour, the agricultural sector in South Africa is largely a capital-intensive sector. Capital use is considerably higher in the maize, fruit, and vegetables, while it has a moderate use in the wheat, other agriculture, poultry, and livestock and dairy subsectors.

The policy change induces demand for employment, especially in the maize and fruit and vegetables subsectors by 15.861% and 6.888%, respectively. Employment declines significantly, however, in the wheat subsector (-1.765%), while declining slightly in the other agriculture (-0.423%), in the poultry (-0.364%), and in dairy and livestock (-0.207%) (see Table 8.4). Employment rises slightly by less than a percentage point in the non-policy affected sectors of apparel, water and in service sectors of communication, finance and business. As the agricultural subsectors expand, they require services from the above-mentioned sectors which expand, hence increasing their employment demand. Apparel is linked with agriculture through cotton (aggregated in the other agriculture subsector). If, for example, the price of cotton goes up, apparel's output rises prompting demand for labour.

The agricultural sector, which has become more profitable, attracts labour from non-agricultural sectors of mining, manufacturing and service sectors. This is facilitated by the mobility that is allowed in the model. Labour demand declines significantly in non-agricultural sectors of leather (-1.443%), transport equipment (-0.919%), food (-0.777%), paper (-0.625%), beverage and tobacco, footwear, iron, wood, and transportation services. Due to transferable skills, most workers that are released from these sectors relocate to the more productive agricultural subsectors such as maize.

Most of the non-agricultural sectors in both manufacturing and service sectors, which faced decline in exports, incur a reduction in employment demand (see Table 8.4).

According to skill types (i.e. skilled, semi-skilled and unskilled), the Doha Round leads to a rise in demand of all skill types of labour in the maize and fruit and vegetables subsectors. The maize sector sees the greatest rise followed by the fruit and vegetables sectors. Employment falls moderately in the wheat and other agricultural sector and slightly in the poultry and dairy livestock subsectors. The non-agricultural sectors that demand unskilled labour include apparel, chemical, construction, and the water utility. The service sectors of communication, finance, business and government also see rise of unskilled labour for the same reasons as explained.

The demand for semi-skilled labour is slightly less than the demand for unskilled and skilled labour in all sectors. However, the extent of semi-skilled demand is similar as that for the unskilled labour both in the agricultural and non-agricultural sectors.

Skilled labour employment rises significantly in the maize sector by 15.826%, fruit and vegetables (6.823%) while declining in the wheat (-1.795%) and other-agriculture (-0.484%) subsectors. In non-agricultural sectors, skilled labour is demanded mostly in the export-oriented sector of mining and in certain service sectors, which are the greatest employers of skilled labour from the base year level.

Other non-agricultural sectors, which were not directly subjected to policy change, incur concurrent declines in exports and skilled labour employment albeit slightly by less than a percentage point. Although the present macro-environment in South African agriculture favours unskilled labour-saving technology, which demands skilled labour to augment such technology, unskilled labour is still utilised significantly in certain areas of agriculture.

Gender Employment

Figure 8.1 presents changes in gender employment. Agricultural subsectors increase demand for skilled, semi-skilled and skilled men and women workers. The demand for unskilled and semi-skilled women exceeds that of unskilled and semi-skilled men. The employment demand increases in maize (unskilled men, 15.876%, unskilled women 15.952%), fruit and vegetables (unskilled men 6.869%; unskilled women, 6.957%), wheat (unskilled men, -

1.756%; unskilled women, -1.675%), in the dairy and livestock (unskilled men, –0.198%; unskilled women, -0.116%), in the other-agriculture (unskilled men, -0.448%; unskilled women, -0.361%), and poultry (unskilled men, -0.359%; unskilled women, -0.276%). The results show the demand for unskilled women to slightly exceed that for unskilled men in all agricultural subsectors (see Figure 8.1). This follows the high initial levels of unemployment associated with unskilled women when compared with that of unskilled men, which leads to a greater employment response (Savoulet 1995). However, the demand for skilled men exceeds that of skilled women. Historically, South African agriculture is capital-intensive sector requiring skilled men workers. However, as seen in Chapter 4, the agricultural sector is the second largest employer of unskilled men and women next only to the service sector.

All non-agricultural sectors, except the other-mining, apparel, and chemical sector's which are sectors with linkages to the agricultural subsectors, experience decline of employment of both men and women. The greatest fall occurs in the leather (men by 1.579%, women by – 1.381%) and the transport equipment sectors (men by -0.963%, women by –0.802%), paper (men by 0.629%, women by –0.547%), and food (men by -0.772%, women by -0.690%) while other declines slightly generally by less than half of a percentage point. The biggest decline in the non-agricultural sectors is that of men workers who subsequently get absorbed in the agricultural subsectors, mainly in maize and fruit and vegetables (see Table 8.4. Appendix 8). The employment demand for semi-skilled men and semi-skilled women follows that of the unskilled men and women with the extent of demand being greater for the semi-skilled women in all sectors. However, the demand for skilled men exceeds that of the skilled women in all sectors. This is partially explained by the assumption of full employment of skilled men and skilled women while the assumption of unskilled men and women was that of mobility and unemployment.
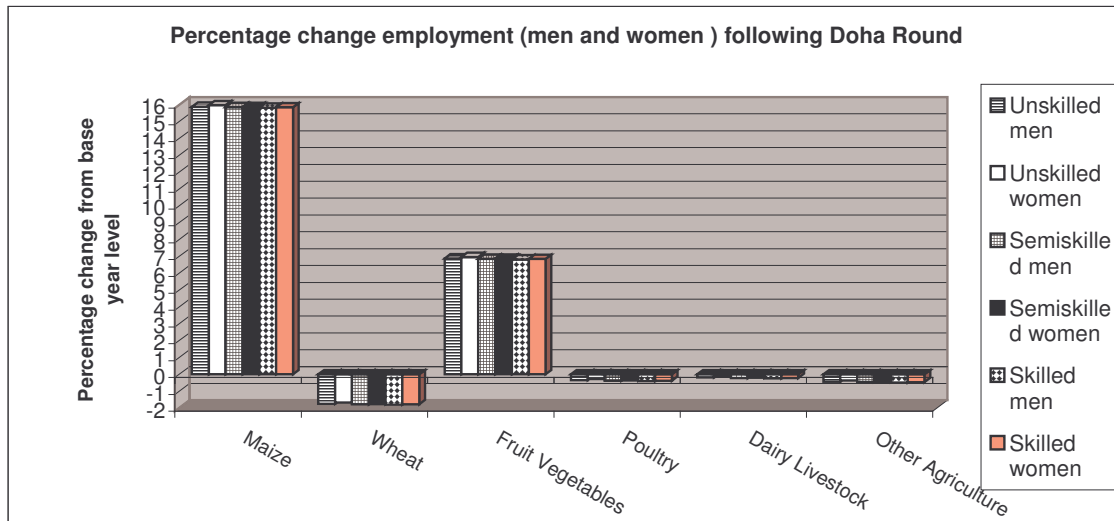
Figure 8-1 Changes in employment men and women: Doha Round implementation

Factor income earnings

The overall policy scenario does not generate a higher level of demand for agricultural men and women labour of all skill types who are needed to generate further increases in total production and wage income due to general equilibrium effects. As a result, the economy-wide returns to unskilled men and women decline, with returns of men dropping more than that of unskilled women because of their higher initial levels. Through a joint policy, tariff reduction raises income of skilled men labour. However, the outcome is outweighed by the economy-wide decline of skilled men's income due to increase in world price of imports and exports. Economy-wide income of women of all skill types declines, but by less than the decline of the skill types of men. This reflects the increased demand, especially for the unskilled and semi-skilled women labour, when compared with the same skill types of men. Percentage changes in factor incomes are summarised in Table 8.7.

The increased employment demand for unskilled men and unskilled women in the agricultural subsectors leads to improved income for workers employed in such sectors. Wages for unskilled and semi skilled labour do not increase because of it abundant supply. However, economy-wide earnings of men and women fall because of declining employment in many sectors, which moves to a profitable agricultural sector (see Figure 8.1). This drives down returns to workers in those sectors. This outweighs the gains made by unskilled men and women in the agricultural sector. Therefore, the economy-wide returns to unskilled men and

179

women decline, with returns of women dropping more than that of men. This is due to higher levels of men employed in agriculture when compared to the levels of women.
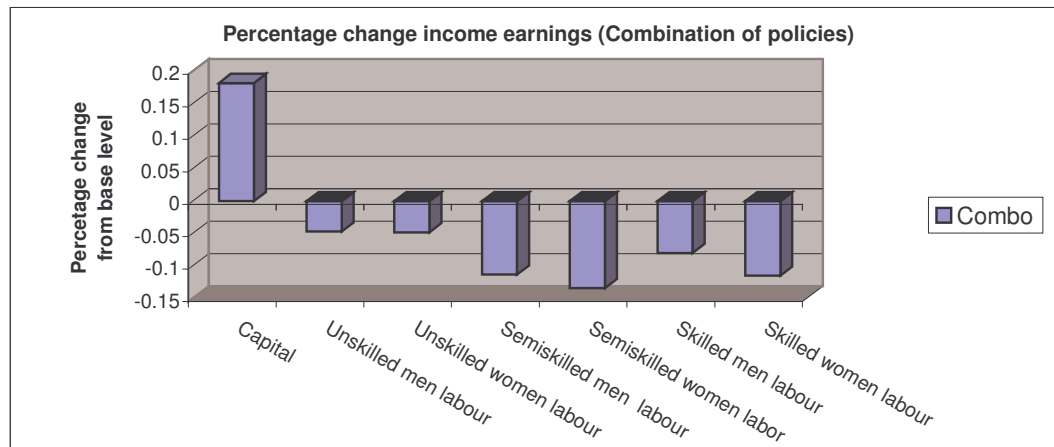
Figure 8-2 Percentage change incomes for men and women after price rises

Source: Results from the model simulation

The increased employment demand for unskilled men and unskilled women in the agricultural subsectors leads to improved income for workers employed in such sectors. Wages for unskilled and semi skilled labour do not increase because of it abundant supply. However, economy-wide earnings of men and women fall because of declining employment in many sectors, which moves to a profitable agricultural sector. This drives down returns to workers in those sectors. This outweighs the gains made by unskilled men and women in the agricultural sector. Therefore, the economy-wide returns to unskilled men and women decline, with returns of women dropping more than that of men. This is due to higher levels of men employed in agriculture when compared to the levels of women.

Household welfare measured by equivalent variation (EV)

The outcome of policy change raises the level of consumption, particularly of high-income households, because such households derive their income from capital whose economy-wide earnings has increased. Low-income households also benefit through improved earnings from supplying labour to agricultural sectors that have improved production and exports. However, increased earnings are offset by economy-wide contraction of employment following increased imports. Although non-agricultural imports improve household welfare, higher

prices of agricultural commodities counteract such improvement mainly for low-income households, which proportionally consume relatively more of such commodities than wealthier households. The combination of tariff reduction and world price rise has negligible positive implications for the welfare of low-income households as seen in Figure 8.3. This outcome suggests that suggests that the low-income households may not actually benefit from an increase in the world price of agriculture.
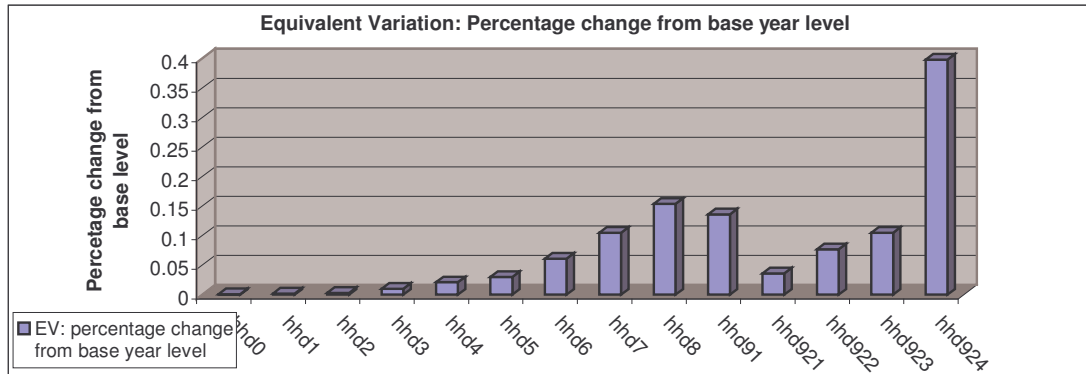
Figure 8-3   Equivalent variation : Percentage change after Doha Round policy simulation

Source: Results from the model simulation

8.4   SINGLE POLICY SIMULATION

This section considers the effects of each individual policy which differs from the first policy simulation that introduced two policies simultaneously. Under this simulation, each policy (i. tariff reduction and ii. world price (import and export) changes) is performed as before only on selected agricultural subsectors and excludes non-agricultural sectors. Each single policy is simulated separately in order to isolate its effects upon the various components of the policy changes. This is because the previous simulation, which is a combination of policies, does not give information about the partial effects of these policies.

8.4.1   The effects of tariff reduction on agricultural commodities

The overall effects of a tariff cut in agriculture leads to a slight increase in GDP which is boosted by exports generated by the exchange rate depreciation and the relatively lower prices of imported inputs. Improved GDP leads to employment demand hence growth in real returns

of capital and skilled labour. This improves savings slightly, which helps to slightly raise investment share of absorption. Increased savings reduce consumption spending of high-income households more than that of low-income households based on their low saving rates. The increase in total real household consumption stems from a combination of the increased employment demand and the growth in real returns of capital and skilled labour.

Government revenue declines slightly, which has negative implications for poor people, particularly women, who depend on government transfers. Regarding the government account, the loss of import duties implies a slight increase in the government deficit. However, the expansion of the government deficit is not balanced by an increase in foreign or private savings, because it is fixed in this model. Instead, there is a crowding-out of investment. The closure used for this simulation implies both fixed wages (unskilled and semi-skilled) and a flexible exchange rate while investment is free to adjust following the changes in savings. Trade liberalisation implies a decrease in the consumer price, which translates into more demand for unskilled and semi-skilled since their wages are fixed.

Tariff reductions on agricultural subsectors induce falls in prices of imported agricultural commodities relative to domestic commodities, which stimulates imports. The highest rise of imports occurs in poultry, dairy, and livestock by 3.89% and 3.03% respectively. Other significant import rises occur in other-agricultural (1.89%), fruits and vegetables (1.09%), and maize subsectors (1.22%) (see Table 8-5 in Appendix 6). The varying levels of change are attributable to the degree of substitution between domestic production and imports, coupled with initial tariff levels of different commodities. The prices of poultry, dairy, and livestock fall more than the prices of crops, because of their relatively higher tariff rates in the base year level. The low import associated with maize is not surprising considering low import shares and the fact that South Africa is a net exporter of maize. A policy change in the agricultural sector has indirect impact on the non-agricultural sector. For example, import rises in most non-agricultural sectors while declining slightly by less than a tenth of a percentage point in plastics, glass, chemical, food, other mining, gold, construction and trade.

In order to maintain a balanced current account, exports rise in order to compensate for the increase in imports. The exports of maize, fruit, and vegetables, however, decline due to the rise in the price of domestic intermediate goods and due to the increase in imports. Other agricultural subsectors experience no change in exports due to their low export-intensities

from the base level. Exports increase in the non-agricultural export intensive sectors of gold, other-mining, iron, coal, non-ferrous, leather, chemicals, and furniture due to increase in export price coupled with a slight depreciation of the exchange rate. Exports demand together with reduced price of imported intermediate inputs, help to increase domestic production.

Tariff reduction exposes the agricultural industry and places it under competitive pressures, thus ensuring efficiency and perfectly competitive prices. Such a pricing system leads to welfare-enhancing effects of agricultural commodity consumers. Faced with competition from imports, domestic agricultural producers respond by reducing their production, with the rate of reduction governed by the substitutability between domestic goods and imports. The most significant reduction in production occurs in wheat followed by other agriculture, while production declines slightly by less than a percentage point in the maize, dairy/livestock and poultry subsectors.

Apart from direct policy effects, the model indicates economy-wide indirect effects on sectors that were not subjected to tariff reduction. For example, due to agricultural linkages with other sectors, the tariff reduction on agricultural subsectors leads to output contraction in the food sector which utilises agricultural products in its production. Other output declines occur in water, a major agricultural input used for irrigation purposes, and in the chemical sector which provides herbicides in agricultural production. Other declines, which are related to rising imports, occur in beverage and tobacco (-0.017%), textile (-0.002%), leather (-0.350%), footwear, nonferrous (-0.009%), wood, paper (-0.107%), and chemical sectors (-0.048%). In the services sectors, output decline occurs only in the hotel services (-0.116%) while other services rise slightly or hold steady.

The rise in output in some sectors following tariffs reduction is partly due to the rise in exports, which benefit from the depreciation of the exchange rate induced by increased imports. Significant increase in production occurs mainly in gold, other mining, leather, and transport equipment, which are commodities with higher relative prices, thus higher output, and consist of large export shares in the base year levels. These sectors are mostly non-importing, particularly gold and other mining. The relocation of labour from these sectors to agriculture does not deter production because these sectors use more capital relative to labour in their production process.

Table 8.1 Percentage changes quantity and price following tariff reduction

Sector	Output	Price output	Import	Price imports	Domestic sales	Prices of Domestic sale	Export	Price of export	Intermediate	Price of intermediate
Maize	-0.494	-0.33	7.554	-0.33	-0.949	-0.506	0.201	0.016	-0.496	-0.662
Wheat	-2.271	-3.819	27.735	-3.819	-2.254	-3.542	0	0	-2.298	-10.197
Fruit /veg	-0.245	-0.306	6.94	-0.306	-0.436	-0.335	1.088	0.023	-0.245	-0.463
Poultry	-0.62	0.021	7.098	0.021	-0.606	0.012	0	0	-0.623	0.03
Dairy/Lvstk	-0.673	0.093	8.262	0.093	-0.66	0.079	0	0	-0.676	0.242
Other/Agricul	-1.034	-0.714	12.74	-0.714	-1.033	-0.666	0	0	-1.044	-1.642

Source: study policy simulation results

The changes in commodity production are determined by the variations in exports and domestic commodities. A further decline of the domestic commodity production is offset by the rise in the exports of non-agriculture such as other mining, gold, food, transport equipment, and leather. Except for poultry, diary and livestock, domestic consumption of other agricultural, manufacturing and services output rises with tariff cut. This follows the enhanced consumers' budget through improved real purchasing power due to rise in imports.

8.4.2   Factors of production: tariff reduction

The allocation of capital and labour follows changes in their relative prices. Producers, facing lower net prices, prefer to produce fewer import-competing goods (i.e. agriculture) and to produce more of manufacturing and services goods. The agricultural tariff cut policy reallocates resources from exports to more imports, which results in a larger composite goods supply. An improved composite goods supply (although smaller with less than a percentage point in all agricultural subsectors and non-agricultural sectors) helps the economy become more efficient in consumption and production.
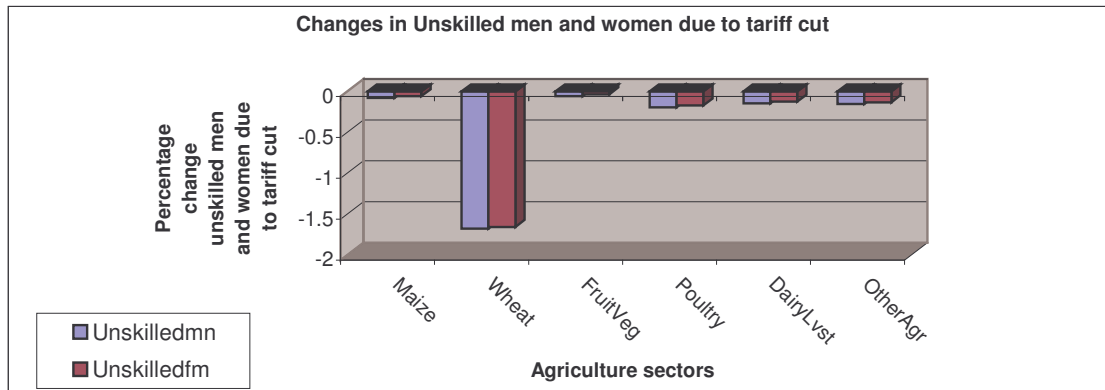
Figure 8-4 Percentage change in the unskilled men and women due to tariff cut

Source: results of model simulation

Employment in agricultural subsectors declines following a tariff cut, most notably in the wheat sector (-2.888%) and slightly by less than a tenth of a percentage point in the maize, fruits and vegetables, poultry and other agriculture sectors. The employment decline is due to the contracting sectors brought about by increased imports in the economy.   The indirect effect of a tariff cut on selected agricultural subsectors is the slight reduction of employment in the non-agricultural sectors of food, textile, wood, leather, paper, non-ferrous, chemical, water, and service sectors of hotel and trade, which are sectors that have increased imports. Employment, however, increases although slightly in all other mining, manufacturing and service sectors which have increased their exports.   This supports the conventional international trade theory which states that trade liberalisation shifts the structure of employment away from import-competing sectors towards export-competing sectors.

A tariff reduction induces a drop of all types of skills employed in agricultural subsectors, in particular the wheat sector (see Table 8.2), because of reduced domestic demand due to higher imports levels. All skill types of labour declines in non-agricultural sectors of food, leather and trade. However, skilled labour declines in these and in many other sectors such as food, beverage and tobacco, textile, apparel, leather, footwear, wood, paper, print, chemical, other chemical, rubber, plastic, glass, nonferrous, metal product, scientific, metals, transport, and furniture. These are mostly labour-intensive sectors that utilise more of the unskilled labour. Some of the labour that is released from agricultural sectors relocates to other sectors and results show increased labour demand of all skill types with unskilled labour benefiting more

than other types of skills in most of the non-agricultural manufacturing and service sectors. Exporting sectors especially mining, attract unskilled workers which offsets the employment decline in above-mentioned sectors.

Table 8.2 Factor of production (labour: men and women)

	Labour Total	Unskilled labour	Semi-skill labour	Skilled labour	Unskilled men	Unskilled women	Semiskille men	Semiskille women	Skilled men	Skilled women
Maize	-0.767	-0.72	-0.761	-0.823	-0.742	-0.66	-0.763	-0.751	-0.825	-0.816
Wheat	-7.355	-7.306	-7.351	-7.41	-7.335	-7.259	-7.355	-7.343	-7.412	-7.405
Fruit Vegetables	-0.377	-0.36	-0.41	-0.473	-0.392	-0.309	-0.413	-0.4	-0.474	-0.466
Poultry	-0.541	-0.505	-0.54	-0.604	-0.524	-0.442	-0.545	-0.532	-0.606	-0.598
Dairy Livestock	-0.484	-0.456	-0.492	-0.552	-0.472	-0.39	-0.493	-0.48	-0.555	-0.546
Other Agriculture	-1.763	-1.72	-1.795	-1.856	-1.776	-1.695	-1.798	-1.785	-1.858	-1.85

Source: Simulation results

With regards to gender, a tariff reduction reduces the demand for unskilled men and women in the agricultural subsectors. Women's employment, of all skill types, declines slightly relative to the decline of men's labour (see Table 8.2). This is partially due to higher initial levels of unskilled men employment relative to women in the agricultural subsectors. The greatest fall is that of skilled men followed by skilled women while the smallest fall is with the unskilled women. In the non agricultural sectors, the highest rise is that of unskilled women mostly in the mining, coal, gold, when compared with skill rises in the manufacturing and service sectors. The reduction of tariffs on agricultural goods raises the average demand of labour in most women-intensive sectors which leads to the economy-wide rise in the demand for women labour and which rises more than the demand for men labour. However, the increased participation of unskilled women workers in manufacturing and service employment is partly offset by the decline for women employment in agricultural production.

The reallocation of women employment from agriculture to the manufacturing sector, though small, is a positive effect, because the non-agricultural sectors generally provide better working conditions than the agricultural sector (Fontana & Wood 2000). The economy-wide rise of employment of unskilled women exceeds that for semi-skilled and skilled women indicating variations between different women categories. The gender impact of tariff reduction appears to be more positive for South African manufacturing and service sectors than in agriculture. Women, especially unskilled women, generally gain in terms of relatively increased employment in the manufacturing sectors.
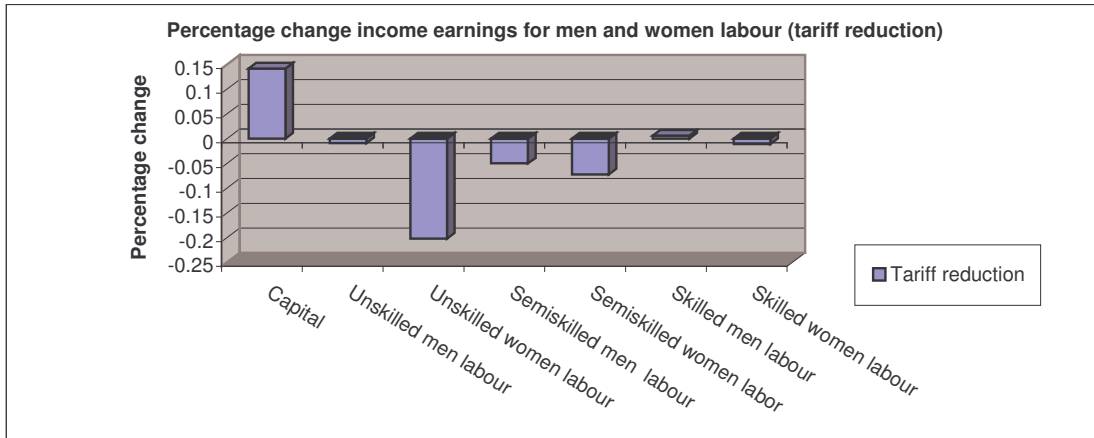
Figure 8-5 Percentage change earning tariff reduction selected agricultural sectors

Source: Model simulation

With tariff reduction, factor returns to capital increase economy-wide. On the other hand, earnings for all skill types of men and women slightly decline with women of all skill types losing the most than men of the same skills. This follows the fact that agriculture employs a substantial number of men than women. Although both men and women obtain employment in non-agricultural sectors after job losses in the agricultural sectors, such gains do not outweigh losses incurred in the agricultural sector. The loss of income earnings incurred by men and women labour is partly explained by the contraction of their employment in the agricultural sectors, due to decreased production.

What Elson (1995) terms "*male breadwinner*" syndrome could explain the income gap between men and women with the same skills, for example, men income fall less compared with that of women due to tariff reduction. The male breadwinner syndrome justifies low pay for women, because women pays are regarded as supplement to that of men, who are widely regarded as family breadwinners.

A tariff fall leads to a decline in the relative prices of composite goods due to increased cheap imports, which benefits most households in terms of increased consumption. This is given by positive equivalent variations for households. In addition, the rise in income earnings for capital improves consumption mainly for high-income households. The price and income effects of trade liberalisation improve welfare of both low and high-income households.
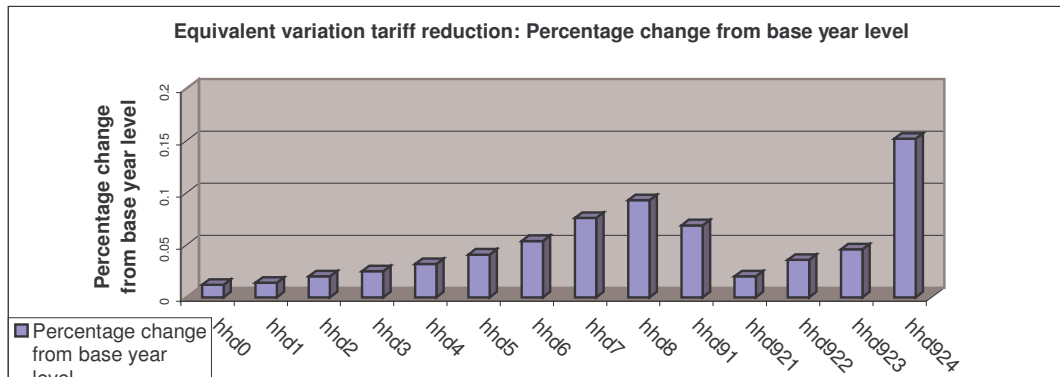
Figure 8-6 Results of equivalent variation: tariff reduction

Source: Policy simulation

8.5   EFFECTS OF WORLD PRICE OF AGRICULTURE IMPORTS RISE

The rise in the world price of agricultural imports reduces imports (-0.2%), resulting in the slight fall of GDP due to expensive imports needed in the production process and for consumption. Reduced imports, particularly consumables, lead to decrease in total household consumption (-0.1%). As imports of agricultural fall, the agricultural import bill slightly increases, forcing a slight appreciation (-0.1%) of the currency. As a result, exports also fall slightly (-0.043%). Government revenue falls slightly (-0.110%) because of exports decline which slightly reduces government expenditure (-0.111%) and consumption share of absorption (-0.002 %).

The rise in the world price of imports reduces the imports of all agricultural commodities considerably. For example, great declines occur in wheat (-18.733%), in maize (-14.243%), in fruit and vegetables (-12.996%), in other agriculture (-9.888%), in poultry (-6.916%), and in dairy and livestock (-5.995 %). The effects of agricultural world imports price rise induce indirect effects in non-agricultural sectors. For example, imports decline in food, apparel, chemicals and water which are sectors with close linkage with agriculture.

Rising prices of imports force domestic consumers to switch from agricultural imports to relatively cheaper domestically produced sources of supply. The increased demand for domestically produced products leads to an increase in domestic production which raises output. The output rises significantly in the agricultural subsector of maize (1.043%), while

188

rising slightly in wheat (0.645%), other-agriculture (0.632%) and fruit and vegetables (0.218%). Other subsectors such as dairy and livestock (-0.314%) and poultry (-0.075%) experience output declines. The differences reflect shifting of resources towards profitable commodities of maize and fruit and vegetables. The increase in domestic demand leads to rise of prices for maize and wheat. The rise of agricultural commodity prices, especially maize, has negative consumption effects for many households who use maize as their staple food. The indirect effects of increased prices of agricultural imports are felt in linked non-agricultural sectors. For example, domestic sales improve in petroleum and in the scientific and communication equipment sectors. Transportation is the service that experiences increased demand after the policy change. Some of these commodities are used as intermediates in the agricultural subsectors.

Exports of maize and fruits and vegetables fall by a significant amount that affects South Africa negatively because the country is a net exporter of agricultural commodities. The labour-intensive sectors of leather, footwear, wood, print, and rubber experience export falls based on their low export shares and their increased domestic demand as they are substituted for expensive agricultural imports. The increase in domestic demand leads to increase in imports in many of the non-agricultural manufacturing sectors while falling in food, apparel, chemical, plastic, glass, non-metal and all of the service sectors due to low import levels and their linkages with the agricultural sector. Export rises in the export-oriented sectors of mining and other manufacturing sectors.

The increase in the price of agricultural imports increases the relative demand for labour by stimulating import-substituting production in agriculture. However, improved employment demand in agriculture is offset by employment fall in manufacturing and services sectors as seen in sectors such as food, beverages and tobacco, textiles, leather, footwear, wood, paper, printing, rubber, plastic, glass, chemicals, vehicle, transport equipment, furniture, construction, trade services, non-ferrous, hotel and communication service. Exports fall in these sectors. In addition, these sectors tend to utilise the same type of labour as with the agricultural-subsectors and, therefore, they incur employment declines as labour relocates to agriculture. Labour increases in the export oriented sectors of mining and in other manufacturing sectors (not mentioned above) together with service sectors where output and exports have risen.

The extent of increased demand for labour in the agricultural subsectors follows the rate of output increase in such subsectors. For example, improved expansion in the wheat sector realises greater increase in labour, while labour rises by less than a percentage point in other-agriculture and in the maize sector following their moderate rise of output.

The demand for unskilled labour exceeds that of semi-skilled and skilled labour in all the agricultural subsectors. Employment demand of unskilled, semi-skilled and skilled women labour slightly exceeds that of unskilled, semi-skilled and skilled men in all of the agricultural sectors after the policy changes. Increased demand for unskilled women follows lower wages associated with such skills from the base year level. In addition, most unskilled women are employed in supporting positions which are highly sought after as production and output rise.

Economy-wide income of all factors, including returns for capital fall because of economy-wide employment fall which offsets income increase due to employment rise in the agricultural subsectors. The loss of income due to declining employment, especially in the manufacturing and service sectors, follows their declining output.

The rise of agricultural imports leads to low-income earnings for the workers, especially the unskilled women labour whose income drops more than that of other skill types. This is because women labour increase in the import substituting production is offset by economy-wide employ losses in the manufacturing and service sectors. The income for the skilled men declines less than that of other skill types indicating their higher initial wages level. This counteracts the falling income from job reductions in the manufacturing and services sectors. The rate of income fall for skilled men is similar to that of skilled women reflecting wage equalisation between skilled men and women.

8.6 EFFECTS OF WORLD PRICE OF AGRICULTURAL EXPORTS RISE

The increase in world price of agricultural exports slightly boosts GDP (0.082%), prompted by slightly increase of imports (0.342%) and rising agricultural exports although economy-wide exports drop (-0.214%) because increase in world price of agricultural exports yield a slight appreciation of the exchange rate.

Imports rise mitigates the pressure of the currency appreciation. However, as the world price of agricultural exports rises, the world price of imports rise too, thus putting downward

pressure on the domestic demand for agricultural imports which exerts more pressure for the exchange rate to appreciate.

Agricultural output improves, and domestic producers shift from production for the domestic market towards exports, which improves the trade balance, leading to exchange rate appreciation. As imports of non-agricultural commodities increase, private consumption rises (0.043%) due to the income effect. The increase of agricultural world price raises government income (0.061%), supported by increase in private consumption and declining government consumption (-0.081%) due to high commodity prices. Revenue for government rises slightly based on rising world price of exports compared with government revenue rise due to world price of import rises.

Despite the shared forces of increase in world price of exports and imports, the overall outcome related to the agricultural world trade price increase is smallest, because the real magnitude of the world price changes is quite small, as seen by a slight exchange appreciation

The outcome related to agricultural world price rises exerts pressure on demand for domestically produced commodities, as reflected by the increase in production of exportable agricultural commodities. The results show substantial increased exports for maize (9.900%) and fruit and vegetables (26.975%). These two crops have high initial export shares compared with other commodities. Non-agricultural commodities with initial high export shares such as iron, non-ferrous and other mining also witness their exports rise while the exports of other manufacturing fall significantly. For example, food export falls by –2.564% and leather –1.609%, resulting in overall economy-wide decline in exports. Imports of maize (9.426%) and fruits and vegetables (5.908%) rise, while import of other crops rise by less than a percentage point. In addition, imports for manufacturing and service sectors increase greatly and, as expected, imports in export-oriented sectors of mining, iron and non-ferrous falls or remain steady. Increased imports are partly due to increased demand as domestic demander substitute expensive agricultural commodities to cheaper imports.

An increase in the world price of exports encourages producers to shift output towards the exports and away from sale to the domestic output market. As a result, domestic market sales in the agriculture and in most of the manufacturing decline. For example, food production drops by -0.68% while leather falls significantly by –1.223%. The results show substantial improved production for commodities with   higher export price such as maize (2.547%)

and fruit and vegetables (2.309%) while production of other agricultural subsectors declines. However, production increases in the other mining, non-metal, metal products, electrical machinery, communication machinery, machinery, scientific, other industry, water and in most of the service sectors, except for trade, finance and hotel which are the major labour employing service sectors. This causes the trade balance to improve, leading to an exchange rate appreciation.

The decline in domestic demand for all-agricultural subsector commodities has a negative effect on domestic consumption although this is small due to the small income effect. Domestic demand falls also in the food, beverage and tobacco, leather, wood, paper, chemical, plastic, glass, non-ferrous, electricity, water, and trade. This is partly due to the reallocation of resources from these sectors to the exportable agriculture. Increased domestic demand occurs in the other manufacturing and services sectors albeit slightly, specifically in leather, mining, apparel, petrol, non metal, irons and in service sectors. This is partly due to increased exports of these sectors based on slightly increased intermediate imports.

In general, a rise in world prices of agriculture exports reduces consumption of agricultural commodities and related sector's products such as food. However, composite commodities increases in some manufacturing and services sectors which restore consumption by households.

The growth in production affects positively on employment in the agricultural and food industries, with factor demand increasing marginally. Labour increases greatly in the agricultural subsectors of maize (15.239%), fruits and vegetable (6.454%), and slightly decline in dairy livestock, in the wheat and in the poultry sectors because of their low export shares. Factor demand in manufacturing and service either remains unchanged or decreases marginally because of the negative welfare effects associated with costly imported commodities. The non-agricultural sectors that reduce labour considerably include gold, leather and paper. This is because the type of labour they utilize the most is the most easily transferable to the agricultural sector. For example, labour declines by –0,733% in food and by –0.572% in beverage and tobacco; the only sector that witnesses labour increase is the apparel. Factor demand in other industries either remains unchanged or declines marginally as a result of the positive welfare effects associated with cheaper imported commodities. Manufacturing and service sectors lose their employment to the expanding exporting

192

agricultural sector. Thus, there is reallocation of resources from other sectors to the expanding agriculture sector. Employment rises in services sectors except in the hotel where it drops. This is related to increased prices of agricultural commodities, which are inputs in the hotel sector. Agriculture does not indicate high levels of demand for transportation service despite its growth, which indicates low domestic demand levels.

Rise in world prices of exports increases all type of skills in maize and fruit and vegetables, respectively, but reduces it in other sub-agricultural sectors. The unskilled labour benefits the most in terms of employment demand. Indirect employment effect occurs in the service sectors of finance, communication, business and other services due to their association with the expanding agricultural sector.

Unskilled women benefit more than unskilled and semi-skilled men. However, the growth in employment demand of skilled men exceeds that of skilled women in all sectors. This is associated with high capital use levels in the agricultural sector that need to be complemented with the use of skilled labour particularly skilled men.

Capital is sectorally fixed while its returns adjust in order to maintain the employment levels in equilibrium. Capital income rises by (0.228%) because of agricultural exports that utilises a substantial amount of capital. All skill types of labour see their income-earning decline due to an economy-wide decline of their employment demand which is not offset by their increased demand in agriculture. The income of semi-skilled and skilled men and women fall by a small margin relative to that of other skill types.

Figure 8.7 shows the well being of households as measured by equivalent variation. The figure indicates that households benefit due to tariff reduction and the increase in world export prices, while their welfare declines with the increase in world price of imports. The world price of exports rise benefits high and middle-income households while hurting low-income household which depends on agricultural commodities for their consumption. Higher prices associated with agricultural prices reduce domestic demand of agricultural prices and thus raises domestic prices particularly of the maize commodity. On the other hand, high-income households benefit from increased returns from capital coupled with improved imports of commodities and services, which takes a substantial amount of their expenditure.

In conclusion, an increase in world prices of both imports and exports has a very limited

effect on the domestic economy. Production levels in the food and agricultural sectors increase, leading to a rise in the demand for factors in these sectors. However, most of these gains are offset by decreases in production and hence factor demand in other industries. As a result, the welfare effects of the simulations are very small, with the only real benefit going to producers who can export goods at a higher price.
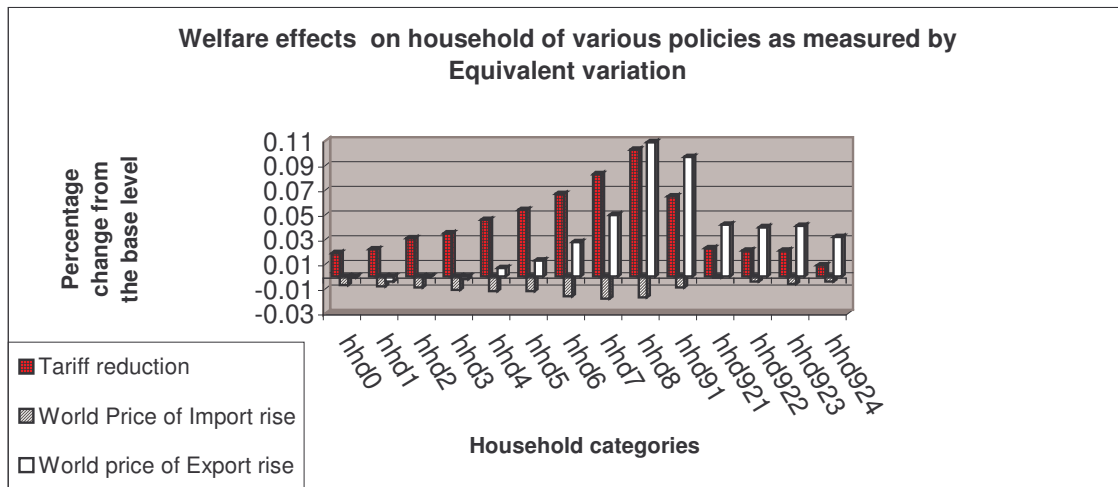
Figure 8-7 Equivalent variation (tariff cut, world price of import and export rise

Source: Simulation study results

8.7   CONCLUSION

South African agricultural producers will likely benefit from the Doha Round of Multilateral Trade Negotiations. Export subsidy reductions by major subsidising countries will raise the export prices of certain agricultural products in South Africa. However, this will have a relatively small effect at aggregate level, with small changes in GDP and exchange rates. This is because of the small contribution of agriculture to GDP. In agriculture, however, sectoral changes in output, trade and employment will be significant if world prices increase and tariffs are reduced simultaneously. In particular, the output of maize and fruits and vegetables, being supported by export growth, will increase significantly.

Expansion of these commodities will absorb workers dropped from other agricultural sectors such as poultry and livestock subsectors. However, the increase in price of maize implies that household resources would have to be diverted away from other expenditure items

towards maize commodity purchase, thus worsening their welfare. For example, low expenditure on consumable goods such as clothing but also capability-building expenditure such as health and education. Maize is the staple food for many households in South Africa and its demand is inelastic so that households cannot easily substitute it for alternative foodstuffs. The rising price of maize thus could have detrimental effects, mainly for the welfare of poor families who spend a great share of their expenditure on maize which is their staple food.

In terms of gender, the study shows that the Doha Round will have positive effects on the promotion of employment of men and women mainly in the subsectors of maize, fruit and vegetables and in the manufacturing and service sectors such as transportation. Employment of unskilled women benefits more than other type of skills of both men and women in both the manufacturing and service sectors. This is due to initial high unemployment levels of women when compared with that of men coupled with low wages from the base year level.

The expansion of fruit and vegetables (horticulture) under Doha Round is expected to benefit unskilled women because of their great concentration in the subsector, for example, a big share of women working in the grapes fields and in small-scale vegetable production. This could enhance their livelihoods.

However, in order to realise benefits, results indicate that higher world prices changes are needed in order to offset the negative effects of the domestic agricultural policy such as tariff reduction on agriculture. As a result, most consumers, especially low-income households which comprise a big percentage of women, will be negatively affected by the increase in world price of maize. These households spend a great share of their income on food, particularly maize for their household (IES 2000). This outcome could threaten the food security, especially for those who do not produce their own food.

Despite anticipated gains from the agricultural trade reforms, there remain gender-biased distortations in the agricultural market and in its distribution of benefits to women. The ability of women producers and workers in South Africa to benefit from the Doha Round depends largely on domestic agricultural policies, which often place them at a disadvantage. For example, high use of capital does not favour women workers.

There is evidence of bias towards capital-using technology with labour and intermediate

goods saving in the South African agriculture. Thus, while trade liberalisation turns agriculture into an efficient sector, the sector exhibits a bias towards capital intensity, which has negative implications for unskilled men and women workers in agriculture. Although the sector is not a greatest employer of men and women, it has multiplier effects across economy.

The limitation for this study is that it does not explicitly model the poorest men and women who are involved in subsistence farming. Since the micro and household enterprises such as subsistence farming for own household consumption are not market-oriented, they are explicitly not captured in the 2000-gendered SAM. The SAM, therefore, shows extremely low extent of women participation in agriculture because it reflects only formal agriculture. This is contrary with the known high level of women involvement in agricultural production particularly in the rural areas. The non-market work, such as subsistence production for home consumption, which is mostly performed by women, in principle could be marketed and included in the measurement of the gross national product (GNP). However, in practice, it is frequently omitted because statistical surveys do not properly count it.

Table 8.3 Percentage change prices and quantities (combination of policies) with fixed capital; skilled labour full employed and mobile while unskilled and semi-skilled labour mobile and unemployed

Commodities	PD	QD	PE	QE	PM	QM	PQQ	QQ	PX	QX	Sectors	PIN	QIN	PV	QV
Maize	7.944	-1.963	15.102	9.100	5.562	1.591	7.660	-1.549	11.594	2.552	Maize	0.171	2.579	27.392	2.579
Wheat	-0.695	-0.993	0.000	0.000	-1.823	3.637	-0.789	-0.615	-0.732	-0.993	Wheat	-0.175	-0.997	-1.695	-0.997
Fruit vegetable	3.701	-1.227	10.545	25.702	3.698	-1.222	3.700	-1.227	5.038	2.465	Fruit vegetable	0.202	2.484	8.558	2.484
Poultry	0.079	-0.510	0.000	0.000	-0.258	0.028	0.055	-0.470	0.105	-0.510	Poultry	0.097	-0.508	0.132	-0.508
Dairy livestock	0.285	-0.600	0.000	0.000	-0.931	1.355	0.195	-0.457	0.327	-0.600	Dairy livestock	0.043	-0.599	0.638	-0.599
Other agriculture	-0.197	-0.390	0.000	0.000	-1.649	1.966	-0.319	-0.196	-0.194	-0.390	Other agriculture	-0.122	-0.386	-0.284	-0.386
Coal mining	-0.266	-0.034	-0.411	-0.323	-0.381	0.084	-0.270	-0.030	-0.322	-0.145	Coal mining	-0.190	-0.145	-0.455	-0.145
Gold mining	-0.247	-0.001	-0.406	-0.320	-0.338	0.044	-0.249	0.104	-0.384	-0.276	Gold mining	-0.130	-0.297	-0.530	-0.297
Other-Mining	-0.482	0.088	-0.411	0.257	-0.392	-0.005	-0.401	0.005	-0.415	0.248	Other-Mining	-0.234	0.253	-0.561	0.253
Food	0.380	-0.473	-0.442	-2.511	-0.373	0.083	0.283	-0.402	0.474	-0.708	Food	0.826	-0.713	-0.802	-0.713
Bev / tobacco	0.005	-0.134	-0.443	-1.231	-0.371	0.747	-0.027	-0.058	0.039	-0.272	Bev / tobacco	1.211	-0.271	-1.835	-0.271
Textiles	-0.162	-0.125	-0.447	-0.741	-0.374	0.474	-0.220	0.039	-0.181	-0.211	Textiles	-0.125	-0.219	-0.271	-0.219
Clothing	-0.165	0.039	-0.523	-0.825	-0.354	0.512	-0.191	0.104	-0.129	-0.038	Clothing	-0.104	-0.001	-0.200	-0.001
Leather	-0.078	-0.810	-0.415	-1.497	-0.386	0.548	-0.186	-0.337	-0.236	-1.142	Leather	0.016	-1.172	-0.755	-1.172
Footwear	-0.189	-0.261	-0.495	-0.920	-0.368	0.961	-0.249	0.147	-0.182	-0.298	Footwear	-0.019	-0.316	-0.505	-0.316
Wood	0.165	-0.103	-0.425	-1.353	-0.383	0.274	0.085	-0.048	0.103	-0.305	Wood	0.276	-0.316	-0.284	-0.316
Paper	-0.078	-0.321	-0.427	-1.059	-0.383	0.800	-0.122	-0.160	-0.133	-0.475	Paper	-0.003	-0.489	-0.404	-0.489
Print	-0.139	-0.113	-0.434	-0.729	-0.381	0.661	-0.185	0.031	-0.145	-0.153	Print	-0.102	-0.137	-0.212	-0.137
Petroleum	-0.259	0.073	-0.434	-0.259	-0.375	0.252	-0.271	0.092	-0.309	-0.008	Petroleum	-0.290	-0.007	-0.293	-0.007
Chemicals	-0.268	-0.088	-0.413	-0.375	-0.391	0.100	-0.313	-0.019	-0.314	-0.177	Chemicals	-0.214	-0.213	-0.345	-0.213
Other -chem	-0.141	-0.009	-0.443	-0.671	-0.373	0.348	-0.205	0.090	-0.147	-0.079	Other -chem	-0.168	-0.055	-0.135	-0.055
Rubber	-0.041	-0.077	-0.435	-0.924	-0.383	0.438	-0.159	0.100	-0.077	-0.210	Rubber	-0.001	-0.218	-0.267	-0.218
Plastic	-0.175	-0.140	-0.423	-0.641	-0.389	0.181	-0.216	-0.079	-0.188	-0.171	Plastic	-0.169	-0.159	-0.213	-0.159
Glass	-0.188	-0.082	-0.454	-0.624	-0.381	0.029	-0.232	-0.056	-0.203	-0.124	Glass	-0.200	-0.136	-0.166	-0.136
Non-metal	0.008	0.199	-0.423	-0.696	-0.388	0.426	-0.062	0.239	-0.003	0.145	Non-metal	-0.163	0.178	0.211	0.178
Iron/steel	-0.392	0.008	-0.422	-0.013	-0.382	0.000	-0.391	0.007	-0.416	-0.001	Iron/steel	-0.289	0.000	-0.687	0.000
Non-ferrous	-0.415	-0.017	-0.411	0.003	-0.391	-0.038	-0.409	-0.022	-0.417	-0.009	Non-ferrous	-0.272	-0.009	-0.617	-0.009

Commodities	PD	QD	PE	QE	PM	QM	PQQ	QQ	PX	QX	Sectors	PIN	QIN	PV	QV
Metal product	-0.211	0.044	-0.419	-0.376	-0.388	0.358	-0.242	0.100	-0.232	0.000	Metal product	-0.282	0.004	-0.147	0.004
Machinery	-0.157	0.260	-0.432	-0.340	-0.377	0.369	-0.304	0.333	-0.252	0.021	Machinery	-0.235	0.026	-0.281	0.026
Electrical Machine	-0.124	0.172	-0.432	-0.486	-0.380	0.366	-0.204	0.232	-0.144	0.091	Electrical Machine	-0.207	0.112	-0.039	0.112
Comm.Equipment	-0.189	0.203	-0.423	-0.280	-0.386	0.351	-0.340	0.317	-0.253	0.061	Comm.Equipment	-0.255	0.067	-0.183	0.067
Scientific equipment	-0.108	0.097	-0.484	-0.947	-0.362	0.338	-0.276	0.256	-0.082	-0.146	Scientific equipment	-0.014	-0.191	-0.258	-0.191
Vehicles	-0.276	-0.028	-0.424	-0.311	-0.383	0.429	-0.319	0.156	-0.311	-0.085	Vehicles	-0.262	-0.084	-0.414	-0.084
Transport Equipmet	-0.179	-0.504	-0.418	-0.991	-0.387	0.385	-0.338	0.171	-0.299	-0.755	Transport equipmet	-0.149	-0.834	-0.514	-0.834
Furniture	-0.074	0.020	-0.491	-1.026	-0.363	0.687	-0.112	0.107	-0.072	-0.193	Furniture	-0.019	-0.183	-0.227	-0.183
Other /Manufacture	-0.173	0.025	-0.468	-0.626	-0.367	0.210	-0.242	0.091	-0.239	-0.168	Other /Manufacture	-0.195	-0.166	-0.314	-0.166
Electricity	-0.187	-0.022	-0.406	-0.460	-0.381	0.076	-0.190	-0.020	-0.196	-0.038	Electricity	-0.135	-0.038	-0.215	-0.038
Water	-0.090	-0.017	-0.406	-0.649	-0.364	0.121	-0.095	-0.014	-0.092	-0.022	Water	-0.151	-0.022	0.036	-0.022
Construction	0.081	0.461	-0.406	-0.515	-0.389	0.698	0.076	0.464	0.080	0.459	Construction	-0.078	0.483	0.393	0.483
Trade	-0.227	-0.043	-0.406	-0.402	-0.384	0.035	-0.228	-0.043	-0.228	-0.045	Trade	-0.131	-0.037	-0.305	-0.037
Hotels	-0.026	0.037	-0.406	-0.723	-0.394	0.222	-0.119	0.083	-0.144	-0.200	Hotels	0.112	-0.202	-0.269	-0.202
Transport service	-0.326	0.106	-0.406	-0.056	-0.406	0.250	-0.342	0.134	-0.337	0.083	Transport service	-0.180	0.083	-0.473	0.083
Communicate.service	-0.114	0.024	-0.406	-0.501	-0.394	0.150	-0.162	0.033	-0.157	-0.003	Communicate.servi	-0.217	-0.003	-0.111	-0.003
Financial service	-0.068	0.030	-0.406	-0.646	-0.406	0.200	-0.080	0.036	-0.089	-0.011	Financial service	-0.095	-0.011	-0.074	-0.011
Business service	-0.006	0.015	-0.406	-0.785	-0.394	0.210	-0.017	0.021	-0.013	0.000	Business service	-0.111	0.016	0.027	0.016
Other service	-0.038	0.021	-0.406	-0.716	-0.390	0.197	-0.049	0.026	-0.049	-0.001	Other service	-0.112	-0.001	0.021	-0.001
Other producers	-0.079	0.017	-0.406	-0.637	-0.394	0.175	-0.093	0.024	-0.089	-0.003	Other producers	-0.122	0.078	-0.103	0.078
Government	-0.107	0.001	-0.406	-0.598	-0.354	0.125	-0.107	0.001	-0.107	0.001	Government	-0.157	0.001	-0.093	0.001

Table 8.4 Percentage change of employment (combination policies): fixed capital; mobile, fully employed skilled while unskilled and semi-skilled mobile with unemployment

Sectors	Total labour	Unskilled labour	Semiskilled labour	Skilled Labour	Unskilled men	Unskilled women	Semiskilled men	Semiskilled women	Skilled men	Skilled women
Maize	15.861	15.902	15.854	15.826	15.876	15.972	15.851	15.866	15.821	15.848
Wheat	-1.765	-1.725	-1.773	-1.795	-1.756	-1.675	-1.778	-1.765	-1.804	-1.780
Fruit Vegetables	6.888	6.903	6.849	6.823	6.869	6.957	6.846	6.860	6.818	6.843
Poultry	-0.364	-0.339	-0.375	-0.399	-0.359	-0.276	-0.380	-0.367	-0.406	-0.383

Sectors	Total labour	Unskilled labour	Semiskilled labour	Skilled Labour	Unskilled men	Unskilled women	Semiskilled men	Semiskilled women	Skilled men	Skilled women
Dairy Livestock	-0.207	-0.182	-0.218	-0.238	-0.198	-0.116	-0.220	-0.207	-0.246	-0.222
Other Agriculture	-0.423	-0.387	-0.462	-0.484	-0.443	-0.361	-0.465	-0.452	-0.491	-0.468
Coal mining	-0.302	-0.287	-0.309	-0.334	-0.289	-0.206	-0.310	-0.297	-0.337	-0.313
Gold mining	-0.481	-0.474	-0.498	-0.523	-0.477	-0.395	-0.499	-0.486	-0.525	-0.501
Other mining	0.049	0.061	0.035	0.009	0.056	0.139	0.034	0.047	0.008	0.032
Food processing	-0.777	-0.752	-0.790	-0.816	-0.772	-0.690	-0.793	-0.780	-0.819	-0.796
Beverage / tobacco	-0.667	-0.638	-0.669	-0.694	-0.651	-0.569	-0.673	-0.660	-0.699	-0.675
Textiles	-0.228	-0.214	-0.249	-0.277	-0.234	-0.152	-0.256	-0.243	-0.282	-0.258
Clothing	0.009	0.030	-0.030	-0.053	-0.017	0.066	-0.038	-0.026	-0.065	-0.041
Leather product	-1.443	-1.407	-1.478	-1.500	-1.463	-1.381	-1.484	-1.471	-1.510	-1.487
Footwear	-0.396	-0.365	-0.442	-0.465	-0.428	-0.346	-0.449	-0.437	-0.476	-0.452
Wood prod	-0.332	-0.315	-0.349	-0.372	-0.330	-0.248	-0.351	-0.339	-0.378	-0.354
Paper prod	-0.625	-0.584	-0.647	-0.666	-0.629	-0.547	-0.650	-0.637	-0.676	-0.653
Printing	-0.165	-0.120	-0.164	-0.184	-0.146	-0.063	-0.167	-0.155	-0.194	-0.170
Petroleum	-0.078	-0.040	-0.079	-0.105	-0.059	0.024	-0.080	-0.068	-0.107	-0.083
Chemicals	-0.322	-0.287	-0.321	-0.347	-0.301	-0.219	-0.323	-0.310	-0.349	-0.325
Other chemical	-0.052	-0.003	-0.057	-0.082	-0.039	0.044	-0.060	-0.047	-0.087	-0.063
Rubber product	-0.250	-0.205	-0.282	-0.305	-0.263	-0.180	-0.284	-0.271	-0.311	-0.287
Plastic prod	-0.169	-0.130	-0.196	-0.221	-0.180	-0.098	-0.202	-0.189	-0.228	-0.204
Glass product	-0.144	-0.124	-0.150	-0.176	-0.132	-0.049	-0.153	-0.140	-0.180	-0.156
Non-metal	0.412	0.443	0.393	0.366	0.411	0.494	0.389	0.402	0.363	0.386
Iron & steel	-0.047	-0.031	-0.054	-0.068	-0.035	0.048	-0.056	-0.043	-0.083	-0.059
Non-ferrous	-0.051	-0.030	-0.054	-0.081	-0.036	0.047	-0.057	-0.044	-0.084	-0.060
Metal product	0.003	0.017	-0.005	-0.028	0.015	0.098	-0.007	0.006	-0.033	-0.009
Machinery	0.013	0.044	0.007	-0.018	0.026	0.108	0.004	0.017	-0.022	0.001
Electrical machinery	0.176	0.214	0.160	0.130	0.177	0.260	0.155	0.168	0.129	0.153
Communication. equipmen	0.069	0.109	0.044	0.019	0.060	0.142	0.038	0.051	0.012	0.035
Scientific equipment	-0.234	-0.199	-0.247	-0.276	-0.235	-0.152	-0.256	-0.244	-0.283	-0.259
Vehicles	-0.134	-0.095	-0.147	-0.173	-0.127	-0.044	-0.148	-0.136	-0.175	-0.151
Transport equi	-0.919	-0.893	-0.923	-0.949	-0.903	-0.822	-0.925	-0.912	-0.951	-0.927
Furniture	-0.198	-0.18	-0.212	-0.237	-0.193	-0.111	-0.215	-0.202	-0.241	-0.217

Sectors	Total labour	Unskilled labour	Semiskilled labour	Skilled Labour	Unskilled men	Unskilled women	Semiskilled men	Semiskilled women	Skilled men	Skilled women
Other manufacture	-0.239	-0.204	-0.255	-0.275	-0.239	-0.157	-0.261	-0.248	-0.287	-0.263
Electricity; gas	-0.082	-0.039	-0.079	-0.108	-0.061	0.021	-0.083	-0.070	-0.109	-0.085
Water	0.060	0.109	0.063	0.034	0.081	0.163	0.059	0.072	0.033	0.056
Construction	0.758	0.775	0.745	0.719	0.766	0.849	0.744	0.757	0.717	0.741
Trade services	-0.117	-0.052	-0.122	-0.146	-0.105	-0.022	-0.127	-0.114	-0.153	-0.129
Hotels	-0.266	-0.220	-0.267	-0.29	-0.252	-0.169	-0.273	-0.260	-0.300	-0.276
Transport service	-0.089	-0.065	-0.090	-0.113	-0.070	0.013	-0.091	-0.079	-0.118	-0.094
Comm. service	0.010	0.048	0.012	-0.018	0.026	0.109	0.005	0.018	-0.022	0.002
Financial service	0.014	0.074	0.021	-0.006	0.037	0.120	0.015	0.028	-0.011	0.013
Business service	0.087	0.163	0.099	0.073	0.114	0.197	0.092	0.105	0.066	0.090
Other services	0.080	0.159	0.081	0.061	0.094	0.177	0.073	0.085	0.046	0.070
Other producer	0.095	0.138	0.094	0.073	0.111	0.193	0.089	0.102	0.062	0.086
Government	0.010	0.076	0.021	-0.003	0.039	0.122	0.017	0.030	-0.009	0.015

Table 8.5 Percentage change quantities and prices due to tariff cut: fixed capital;mobile skilled men and women

Unskilled and semi-skilled mobile with unemployment

Commodities	PD	QD	PE	QE	PM	QM	PQQ	QQ	PX	QX	Sectors	PINT	QINT	PVA	QVA
Maize	-0.506	-0.949	0.016	0.201	-5.516	7.554	-1.116	0.017	-0.330	-0.494	Maize	-0.084	-0.496	-0.662	-0.496
Wheat	-3.542	-2.254	0.000	0.000	-9.787	27.735	-4.121	0.113	-3.819	-2.271	Wheat	-0.286	-2.298	-10.197	-2.298
Fruit vegetable	-0.335	-0.436	0.023	1.088	-3.839	6.940	-0.633	0.149	-0.306	-0.245	FruitVegetable	-0.088	-0.245	-0.463	-0.245
Poultry	0.012	-0.606	0.000	0.000	-4.567	7.098	-0.337	-0.064	0.021	-0.620	Poultry	0.02	-0.623	0.03	-0.623
Dairy lvst	0.079	-0.660	0.000	0.000	-5.179	8.262	0.583	-0.033	0.093	-0.673	DairyLvst	-0.04	-0.676	0.242	-0.676
Other agr	-0.666	-1.033	0.000	0.000	-8.454	12.740	-1.351	0.066	-0.714	-1.034	OtherAgriculture	-0.094	-1.044	-1.642	-1.044
Coal mining	-0.030	0.033	0.016	0.121	-0.006	0.018	-0.029	0.043	-0.011	0.078	Coal Mining	-0.072	0.078	0.058	0.078
Gold mining	-0.187	0.002	0.012	0.424	-0.037	-0.073	-0.183	0.013	-0.015	0.345	Gold Mining	-0.033	0.342	-0.007	0.342
Other-Ming	-0.121	0.127	0.016	0.391	0.002	0.027	-0.011	0.040	0.009	0.418	Other-Mining	-0.062	0.418	0.065	0.418
Food	0.164	-0.171	0.042	-0.600	-0.012	-0.060	0.142	-0.173	0.230	-0.239	Food	-0.575	-0.241	2.944	-0.241
Bev / tobacco	0.024	-0.008	0.043	-0.082	-0.013	0.063	0.021	-0.016	0.072	-0.032	Bev / Tobbaco	-0.19	-0.032	0.465	-0.032
Textiles	0.018	0.000	0.046	-0.018	-0.011	0.071	0.010	0.013	0.053	-0.012	Textiles	-0.043	-0.019	0.262	-0.019

Commodities	PD	QD	PE	QE	PM	QM	PQQ	QQ	PX	QX	Sectors	PINT	QINT	PVA	QVA
Clothing	-0.088	0.115	0.110	0.492	-0.025	-0.059	-0.080	0.077	-0.063	0.133	Clothing	-0.02	0.154	-0.141	0.154
Leather	0.109	-0.181	0.019	-0.388	-0.002	0.305	0.070	-0.014	0.072	-0.283	Leather	0.066	-0.295	0.11	-0.295
Footwear	-0.004	0.010	0.087	0.082	-0.015	0.073	-0.008	0.024	0.050	0.004	Footwear	-0.035	-0.011	0.239	-0.011
Wood	0.059	0.025	0.028	-0.062	-0.005	0.084	0.050	0.046	0.067	0.025	Wood	-0.287	0.022	0.728	0.022
Paper	0.046	-0.027	0.029	-0.108	-0.005	0.155	0.039	-0.005	0.059	-0.048	Paper	-0.099	-0.052	0.43	-0.052
Print/pub	-0.027	0.053	0.035	0.151	-0.006	-0.023	-0.023	0.031	-0.013	0.050	Print/pub	-0.014	0.055	-0.007	0.055
Petroleum	-0.012	0.014	0.036	0.039	-0.010	0.015	-0.011	0.017	0.024	0.024	Petroleum	-0.024	0.024	0.097	0.024
Chemicals	-0.001	-0.056	0.018	-0.031	0.001	-0.058	0.000	-0.055	0.008	-0.045	Chemicals	-0.027	-0.069	0.109	-0.069
Other Chemic	-0.038	0.044	0.043	0.162	-0.011	-0.007	-0.031	0.022	-0.013	0.047	OtherChem	-0.029	0.06	0.01	0.06
Rubber	-0.090	0.145	0.036	0.392	-0.004	0.008	-0.061	0.093	-0.070	0.177	Rubber	-0.134	0.183	0.096	0.183
Plastic	-0.102	0.042	0.026	0.300	0.000	-0.106	-0.083	0.018	-0.095	0.063	Plastic	-0.04	0.08	-0.128	0.08
Glass	-0.022	0.000	0.052	0.129	-0.006	-0.005	-0.018	0.003	-0.008	0.015	Glass	-0.008	0.008	-0.005	0.008
Non-metal	-0.034	0.023	0.027	0.144	-0.001	0.053	-0.028	0.069	-0.026	0.079	Non-metal	-0.044	0.09	-0.002	0.09
Iron/steel	0.019	0.050	0.025	0.037	-0.005	0.101	0.016	0.083	0.030	0.074	Iron/steel	-0.021	0.073	0.163	0.073
Non-ferrous	0.039	0.014	0.016	-0.045	0.001	0.069	0.029	0.046	0.033	0.016	Non-Ferro	0.001	0.007	0.086	0.007
Metal prod	-0.040	0.041	0.023	0.162	-0.001	0.003	-0.033	0.059	-0.029	0.083	Metal prod	-0.003	0.083	-0.058	0.083
Machinery	-0.035	0.037	0.034	0.151	-0.008	0.083	-0.017	0.087	0.004	0.135	Machinery	-0.016	0.143	0.027	0.143
Electrical Ma	-0.040	0.042	0.034	0.174	-0.006	0.070	-0.029	0.087	-0.021	0.110	ElectricaM	-0.023	0.111	-0.018	0.111
Comm.Equipt	-0.066	0.069	0.026	0.247	-0.002	0.070	-0.017	0.081	-0.035	0.169	Comm.Equ	-0.014	0.173	-0.09	0.173
Scientific Equi	-0.080	0.096	0.077	0.375	-0.019	0.057	-0.040	0.076	-0.029	0.179	ScienceEq	-0.07	0.211	0.012	0.211
Vehicles	-0.004	0.033	0.027	0.064	-0.004	0.049	-0.004	0.047	0.014	0.052	Vehicles	-0.024	0.05	0.146	0.05
Transport Eq	-0.045	0.237	0.022	0.364	-0.001	0.075	-0.012	0.119	-0.008	0.323	TranspoEq	-0.042	0.348	0.037	0.348
Furniture	-0.022	0.046	0.083	0.151	-0.019	0.038	-0.021	0.044	0.040	0.066	Furniture	-0.045	0.069	0.21	0.069
Other /Manuf	-0.048	0.080	0.064	0.243	-0.016	0.039	-0.036	0.058	0.002	0.121	Other //Manuf	-0.038	0.131	0.107	0.131
Electricity / gas	0.037	0.035	0.012	-0.020	-0.006	0.057	0.037	0.036	0.036	0.034	Electricity /	-0.026	0.034	0.075	0.034
Water	0.039	-0.008	0.012	-0.067	-0.018	0.014	0.038	-0.015	0.039	-0.015	Water	0.016	-0.015	0.091	-0.015
Construction	-0.050	0.004	0.012	0.144	0.000	0.069	-0.050	0.094	-0.050	0.095	Construction	-0.027	0.097	-0.099	0.097
Trade	-0.096	0.031	0.012	0.241	-0.003	-0.014	-0.096	0.032	-0.096	0.033	Trade	-0.009	0.034	-0.165	0.034
Hotels / Cater	0.124	-0.042	0.012	-0.280	0.004	-0.002	0.094	-0.047	0.089	-0.131	Hotels	-0.03	-0.137	0.139	-0.137
Transport serv	-0.120	0.155	0.012	0.414	0.012	-0.076	-0.093	0.112	-0.101	0.196	TransportSe	-0.008	0.196	-0.181	0.196
Comm. servi	-0.009	0.034	0.012	0.069	0.004	0.021	-0.008	0.027	-0.008	0.030	Comm.Service	-0.023	0.03	0.003	0.03

Commodities	PD	QD	PE	QE	PM	QM	PQQ	QQ	PX	QX	Sectors	PINT	QINT	PVA	QVA
Financial servi	0.028	0.032	0.012	-0.011	0.012	0.027	0.027	0.019	0.027	0.017	Finance serv	0.02	0.017	0.035	0.017
Business serv	0.050	0.028	0.012	-0.059	0.004	0.043	0.048	0.021	0.049	0.019	Business	-0.007	0.018	0.075	0.018
Other serv	0.019	0.014	0.012	-0.009	0.000	0.000	0.018	-0.009	0.019	-0.010	Other serv	-0.02	-0.01	0.06	-0.01
Other proders	-0.035	0.073	0.012	0.158	0.003	0.041	-0.033	0.060	-0.033	0.063	Ot/produce	-0.015	0.107	-0.06	0.107
Government	-0.043	0.001	0.012	0.106	-0.025	-0.008	-0.043	0.001	-0.043	0.001	Governent	-0.021	0.001	-0.049	0.001

Table 8.6 Percentage change employment due tariff cut, fixed capital; skilled labour mobile, fully employed; other labour mobile and unemployed

Sector	Total Labour	Unskilled labour	Semi-skilled labour	Skilled labour	Unskilled Men	Unskilled women	Semiskilled men	Semiskilled women	Skilled men	Skilled women
Maize	-0.767	-0.720	-0.761	-0.823	-0.742	-0.660	-0.763	-0.751	-0.825	-0.816
Wheat	-7.355	-7.306	-7.351	-7.410	-7.335	-7.259	-7.355	-7.343	-7.412	-7.405
Fruit Vegetables	-0.377	-0.360	-0.410	-0.473	-0.392	-0.309	-0.413	-0.400	-0.474	-0.466
Poultry	-0.541	-0.505	-0.540	-0.604	-0.524	-0.442	-0.545	-0.532	-0.606	-0.598
Dairy Livestock	-0.484	-0.456	-0.492	-0.552	-0.472	-0.390	-0.493	-0.480	-0.555	-0.546
Other Agriculture	-1.763	-1.720	-1.795	-1.856	-1.776	-1.695	-1.798	-1.785	-1.858	-1.850
Coal mining	0.170	0.193	0.170	0.109	0.191	0.274	0.169	0.182	0.108	0.116
Gold mining	0.417	0.426	0.403	0.341	0.424	0.507	0.402	0.415	0.340	0.349
Other mining	0.524	0.541	0.515	0.453	0.536	0.619	0.514	0.527	0.452	0.461
Food processing	0.063	0.097	0.058	-0.005	0.077	0.159	0.055	0.068	-0.007	0.002
Beverage / tobacco	0.102	0.145	0.113	0.050	0.132	0.214	0.110	0.123	0.048	0.057
Textiles	0.025	0.045	0.009	-0.057	0.024	0.106	0.002	0.015	-0.059	-0.051
Clothing	0.188	0.215	0.155	0.089	0.168	0.251	0.146	0.159	0.085	0.093
Leather product	-0.145	-0.099	-0.172	-0.235	-0.156	-0.073	-0.177	-0.165	-0.239	-0.230
Footwear	0.123	0.162	0.084	0.019	0.099	0.181	0.077	0.090	0.015	0.024
Wood product	0.144	0.167	0.132	0.071	0.152	0.235	0.130	0.143	0.069	0.077
Paper product	0.302	0.353	0.289	0.228	0.307	0.390	0.286	0.299	0.224	0.232
Printing	0.085	0.147	0.104	0.042	0.121	0.204	0.100	0.113	0.038	0.047
Petroleum	0.109	0.163	0.124	0.062	0.145	0.227	0.123	0.136	0.061	0.070
Chemicals	0.033	0.084	0.050	-0.013	0.070	0.152	0.048	0.061	-0.013	-0.005

Sector	Total Labour	Unskilled labour	Semi-skilled labour	Skilled labour	Unskilled Men	Unskilled women	Semiskilled men	Semiskilled women	Skilled men	Skilled women
Other chemical	0.119	0.185	0.131	0.067	0.149	0.232	0.128	0.140	0.066	0.074
Rubber product	0.300	0.357	0.279	0.217	0.298	0.381	0.277	0.289	0.215	0.223
Plastic product	0.099	0.147	0.081	0.017	0.098	0.180	0.076	0.089	0.014	0.023
Glass product	0.050	0.079	0.053	-0.010	0.072	0.154	0.050	0.063	-0.011	-0.003
Non-metal	0.183	0.222	0.172	0.108	0.190	0.273	0.169	0.182	0.107	0.115
Iron & steel	0.097	0.124	0.101	0.042	0.121	0.203	0.099	0.112	0.037	0.046
Non-ferrous	0.025	0.055	0.030	-0.033	0.049	0.132	0.028	0.040	-0.034	-0.026
Metal product	0.120	0.141	0.119	0.057	0.139	0.222	0.117	0.130	0.056	0.064
Machinery	0.157	0.199	0.163	0.099	0.181	0.264	0.160	0.173	0.098	0.106
Electrical machine	0.174	0.224	0.169	0.104	0.186	0.269	0.165	0.178	0.103	0.111
Comm. Equipment	0.210	0.262	0.197	0.132	0.213	0.295	0.191	0.204	0.129	0.138
Scientific equipment	0.291	0.338	0.289	0.221	0.302	0.385	0.280	0.293	0.218	0.227
Vehicles	0.102	0.153	0.101	0.039	0.121	0.204	0.100	0.112	0.038	0.046
Transport equipment	0.382	0.421	0.390	0.328	0.410	0.493	0.389	0.401	0.327	0.335
Furniture	0.145	0.169	0.137	0.074	0.156	0.239	0.134	0.147	0.073	0.081
Other manufacture	0.259	0.305	0.254	0.191	0.270	0.352	0.248	0.261	0.186	0.195
Water	0.077	0.143	0.097	0.032	0.115	0.197	0.093	0.106	0.031	0.040
Construction	0.117	0.141	0.112	0.049	0.132	0.215	0.110	0.123	0.049	0.057
Trade services	0.013	0.089	0.019	-0.044	0.036	0.119	0.015	0.027	-0.047	-0.039
Hotels	-0.007	0.048	0.001	-0.063	0.016	0.099	-0.005	0.008	-0.067	-0.058
Transport service	0.164	0.195	0.170	0.109	0.190	0.273	0.169	0.181	0.107	0.115
Comm. service	0.091	0.137	0.101	0.034	0.116	0.199	0.095	0.107	0.033	0.041
Financial service	0.084	0.156	0.103	0.038	0.119	0.202	0.097	0.110	0.036	0.044
Business service	0.093	0.189	0.125	0.059	0.140	0.223	0.118	0.131	0.057	0.065
Other services	0.063	0.170	0.092	0.027	0.105	0.188	0.083	0.096	0.022	0.030
Other produce	0.130	0.190	0.146	0.082	0.162	0.245	0.140	0.153	0.079	0.087
Government	0.010	0.083	0.044	-0.020	0.061	0.144	0.039	0.052	-0.022	-0.014

APPENDIX 8 (B) MACROECONOMIC VARIABLES

Table 8.7 Percentage changes (macroeconomic variables)

Variable	Base level	Tariff cut	Price world import	Price world exports	COMBO
Total Real Absorption	891.2		-0.1	0.1	0.1
Real Consumption	558.4		-0.1	0.2	0.1
Total Real Export	127.7	0.2		-0.1	0.1
Total Real Import	205.1	0.2	-0.2	0.4	0.3
Real Exchange Rate	224.2		-0.1	-0.3	-0.1
Exchange rate	275.2	0.1	-0.1.2	-0.4	-0.4
Investment GDP	13.8		0.2	0.1	0.1
Private Savings GDP	16.2			-0.1	-0.1
Terms of trade	100.0		-0.1	0.3	0.2
Government Savings	-1.9				0.3
Import tax	109.5		-0.1		0.1
Household Welfare (Equivalent variation)					
Household hhd0	0.018	0.018	-0.004	0.004	-0.004
Household hhd1	0.023	0.011	-0.005	0.005	-0.004
Household hhd2	0.030	0.015	-0.006	0.009	0.003
Household hhd3	0.035	0.020	-0.005	0.014	0.006
Household hhd4	0.046	0.025	-0.007	0.024	0.014
Household hhd5	0.053	0.033	-0.006	0.033	0.021
Household hhd6	0.070	0.070	-0.007	0.056	0.039
Household hhd7	0.087	0.094	-0.006	0.089	0.065
Household hhd8	0.109	0.117	-0.009	0.131	0.097
Household hhd91	0.074	0.085	-0.004	0.112	0.086
Household hhd921	0.025	0.028	-0.002	0.036	0.027
Household hhd922	0.027	0.029	0.0000	0.057	0.046
Household hhd923	0.030	0.049	0.001	0.073	0.060
Household hhd924	0.048	0.129	0.016	0.222	0.196
GDP and national accounts					
Real GDP	900.106	0.015	-0.125	0.082	0.007
Private Consumption	558.539	0.021	-0.128	0.043	0.006
Investment	127.642	0.083	0.098	0.729	0.442
Stock change	8.587	-0.007	-3.195	-3.057	-3.648
Govt Consumption	205.339	-0.043	-0.127	-0.081	-0.107
Export	245.219	0.189	-0.119	-0.057	0.018
Imports	-222.571	0.207	-0.121	-0.018	0.061
GDP Market prices	922.754	0.015	-0.124	0.069	-0.003
Net Income Tax	100.474	-0.267	-0.123	-0.017	-0.356
GDP factor cost	822.280	0.049	-0.124	0.080	0.040
Percentage Change Government Income					
DPI	1.001	0.015	-0.064	0.007	0.113
Government savings	-17.210	0.660	0.046	-1.741	0.255,
Investment share of absorption	0.151	0.063	0.015	0.407	0.178
Government income	217.536	-0.016	-0.123	0.061	-0.121
Government expenditure	234.728	-0.038	-0.111	-0.071	-0.094
Percentage Change Factor Income					
Capital	396.041	0.142	0.046	0.228	0.182
Unskilled men labour	73.588	-0.009	-0.035	-0.024	-0.047
Unskilled women labour	26.679	-0.202	-0.209	-0.024	-0.048
Semiskilled men labour	113.642	-0.050	-0.092	-0.087	-0.113
Semiskilled women labor	57.557	-0.072	-0.117	-0.106	-0.134
Skilled men labour	114.435	0.006	-0.048	-0.028	-0.080
Skilled women labour	40.363	-0.011	-0.072	-0.066	-0.115

Source: Study simulation results

CHAPTER 9

WOMEN'S ECONOMIC WELL-BEING

9.1   INTRODUCTION

The understanding of complex issues related to gender requires use of various methodologies. Sen (2000) recommends a combination of quantitative and qualitative research methods. Combining methodologies enhances each other. For example, the use of qualitative methods can provide an understanding of the outcome of a quantitative analysis, such as statistical outliers (Kanbur 2001). The CGE methodology used in the previous chapters identified women who are likely to benefit from globalisation policies in terms of acquiring employment. However, the analysis does not provide insight on how these women's well-being is affected. For such reason, gender economists advocate use of both quantitative and qualitative methods in order to provide a more comprehensive picture of gender impacts from the macro-level to the micro-level (Fontana 2001; Berenia 2003; Elson 2000; Cagatay 2000).

Until the development of appropriate methodological analyses, combinations of qualitative and quantitative methods are advocated. An example of a new methodology is the pioneering work of Fontana and Wood (2000) who included the element of time use in the CGE model. The combination can take various forms, for example, in some cases, it might be preferable to use different methods simultaneously, but separately, while in other instances a full combination of approaches can be more effective. Devarajan and Robinson (2002) argue that verifying model results with studies using other methods can significantly strengthen their influence on policy.

This chapter examines the extent to which globalisation has affected working women's autonomy and bargaining power in their households. According to the extended bargaining model (Sen 1990), a woman's well-being depends on the type of decisions she can make in the household, her personal autonomy, her control and ownership of resources, the contributions she can make to the household, and her ability to meet perceived self-interests.

As such, this chapter augments the previous ones by attempting to ascertain the well-being of working women at household level. The previous chapters described sectors/subsectors of the economy that provide women with greater economic opportunities under globalisation. This chapter attempts to ascertain whether these   opportunities lead to improved well-being of

women at the household level. The following section gives a background to the study. Section 9.3 provides a theoretical underpinning of the model. Section 9.4 gives the data used in this study. Sections 9.5-9.7 follows by presenting the results of the survey, and section 9.8 concludes the chapter.

9.2 BACKGROUND TO THE STUDY

Globalisation has contributed to an increase in employment of women, particularly in the manufacturing sectors (Cagatay, Elson & Grown 1995; Seguino 2000a and 2000b; Posel 2002; LFS: 2000-2006). Chapter six of this study has indicated rises in unskilled women labour in the service sectors and in the export-oriented sectors due to trade liberalisation. The results of Chapter 7 also indicated increased women labour demand brought about by increased productivity in sectors. The increase in women's employment, however, is often concentrated in low-skill labour-intensive sectors that usually pay low wages. As a result, the increase in women labour market participation has been associated with the willingness of women to accept jobs at lower wages (Tzannatos 1999; Seguino 2000a and 2000b). However, as shown in the chapter 7, productivity induced by globalisation (through openness/FDI etc.) has increased both the demand and wages for skilled women labour, implying that all types of women are not identically affected by globalisation policy changes.

It is argued that, despite the increase in women labour participation rates, women remain economically disempowered (Chambers 2000). In addition, women workers often have little control over the spending of their income. Male family members, such as husbands, fathers, fathers-in-law, brothers and uncles, frequently determine how the woman's income will be used (Elson 2000). Elson further observes that the key responsibility for unpaid household work remains with women, even in households where women are the main income earners.

9.3 THEORETICAL MODEL

The household model commonly used to represent the traditional household is known as the unitary model. This model considers the household to be a single entity with individuals in it sharing a single preference ordering. The new household economic model, which garnered Becker a Nobel Prize (Becker 1981), is the most well-known model of this kind. A major limitation of this model is that it assumes 'income pooling' and does not take into account which household member controls which portion of the income (Beneria 2003; Kanbur &

Haddad 1994; Chiapori 1992). The model assumes that a spouse does not impose his or her preference on the partner and that the power that comes with having earned a larger amount of the pooled income is not a factor.

Gender research findings in less-developed-countries (Thomas 1992; Cagatay & Elson 2000) have challenged this model. These researches highlight the need to utilise a model that takes into account asymmetric power relations and the conflict of preferences between partners in the household. Most economists have tried to find alternative models that will fit well into the household situation. Sen (1990) proposes that the relationship between men and women in a household should be conceptualised as consisting of both co-operation and conflict. He recommends the use of a 'cooperative conflict' bargaining model to analyse intra-household behaviour.

In the traditional bargaining models, the bargaining power depends on the individuals' respective breakdown positions (Nash 1950). A breakdown position refers to the point at which there is a breakdown of co-operation. It represents the strength or weakness of a person in the bargaining process. It is the point at which a person will accommodate the other person's interest in order to save the negotiation from breaking down. The weaker the breakdown position of an individual, the weaker will be her/his bargaining power.

Sen (1990) argues that, in the context of traditional societies, the traditional bargaining model of the household ought to be expanded to include a person's *perceived* contribution to the household. For example, although the objective reality is that women usually work hard and for long hours on many different household tasks, they often do not perceive themselves (and neither are they perceived by others) as making a significant contribution to the family. As long as such perception exists within society, which is often internalised by women, they will continue to be in a weak bargaining position. Their bargaining position is further undermined by their distorted perception of self-interest. Women fail to take their self-interest seriously, psychologically putting themselves in a secondary position to men who have superior status in a patriarchal culture. As women internalise the norms of discrimination against themselves, they deny their own self-interest. There has been support for women's work from progressive men leaders such as the first president of Tanzania, Mwalimu Nyerere. In 1967, the president acknowledged the tedious and continuous work done by women every day including Sundays and public holidays. (UNCTAD 1999).

In Sen's (1990) extended version of the bargaining model, the relative well-being of men and women depends on three determinants of bargaining power: (a) their objective breakdown position, (b) their perceived contribution to the family, and (c), their perceived self-interest. As such, any intervention, which increases a woman's perceived contribution to the household, will strengthen her bargaining power. The increased participation of women in the job market in response to new economic opportunities of globalisation is precisely such an intervention.

It is hypothesised that income earning which is made possible by globalisation opportunities should strengthen all three determinants of the working woman's bargaining power —which include her objective breakdown position through the income she earns, a greater sense of self-interest, and enhanced perception of making a contribution to the family.

9.4 SURVEY DATA

The Department of Trade and Industry maintains an electronic database of foreign direct investment (FDI) that benefited from its incentive programme as explained in Chapter 1. The database was used to draw up the sampling frame for women working in such sectors. A survey was conducted using a structured questionnaire of 77 questions, which investigated several aspects of womens' well-being, including their ability to make decisions on the use of their income. Some are standard questions used in studies related to gender and autonomy (see Rahman & Rao 2004). Data were collected from 131 women working in the manufacturing sector. The firms selected were all foreign companies that have benefited from two of the government's investment grants, the Foreign Investment Grant (FIG) and the Special Support Program (SSP).

The survey was to be conducted in all nine provinces of South Africa but responses came only from seven provinces. The total sample consisted of two sub-groups: (i) working women who were married or living with a spouse or partner and (ii) a control group consisting of working women who were single and had neither been married, are divorced, widowed, or separated from their spouses. The key characteristic of this group was their ability to make decisions independently of a spouse, partner, or ex-partner.

Some studies (Ghuman, Lee & Smith 2000) have found that the perceptions of men and women differ greatly about who makes the most important decisions in the household. In

some instances, women will try to protect husbands and husbands will lie so as to be seen as if they are making all-important decisions in order to conform to cultural norms. Therefore, the comparison between married and single working women was used to determine if there were any significant differences between these two groups. However, this type of analysis is debatable because it has the potential of introducing bias into the assessment of subjective variables. Despite the problem of subjectivity, women are the only suited candidates to give views concerning their own well-being. This approach is supported by Kabeer (1997; 1998) who argues that it is valid to focus exclusively on the subjectivity of women's perception of their own reality.

Two indicators were used to determine a woman's perceived contribution to the family. One was their perceived contribution in terms of household workload; the other was their perceived contribution to the overall income and welfare of the family.

Following the example of Agarwal (1994), the presence of a father, mother, brother, brother-in-law, uncle, aunt, sister, and sister-in-law and measures of household wealth were taken in account in order to capture factors that might be associated with the perceptions of the women. Data on public services such as educational institutions and maternity or family healthy clinics were also gathered. Other variables collected include faith (religion), race, and their place of residence. Geographic factors were also considered, such as the location of residence (urban or rural), quality of roads, availability of public transportation, and distance to the nearest town as they might affect women's mobility and degree of remoteness.

9.5   GENERAL CHARACTERISTICS OF SURVEY RESPONDENTS

Table 9-1 presents the general characteristics of the married women (N=64) and the single women (N=67). The average age of both groups was nearly the same, with married women averaging 36 years of age and single women having an average age of 34 years. In some respects, the two groups were also similar in terms of education. Approximately one half of both groups had a secondary education and approximately 10% of both groups had tertiary education. However, more married women had a post-secondary diploma (married: 37.1%, single: 19.7%), while more single women had a post-secondary degree (married: 1.61%, single: 6.06%).

The majority of both groups were black, with more being in the single category (71%) than in

209

the married category (63%). Likewise, coloureds were about the same percentage in both groups — married (6.25%) and single (5%). There were more whites in the married group (31.25%) than in the single group (17.91%). While there were no Asians in the married group, nearly 6% of the single group was Asian.

Table 9.1 Kinship and general characteristics

	Married Working Women N=64	Single Working Women N=67
Age	**36**	**34**
Religion (%)		
Christian (%)	73.02	61.54
Born-again Christian (%)	14.29	24.62
Muslim (%)	0.00	6.15
African religion (%)	11.11	7.69
Other (%)	1.59	0.00
Race: (%)		
Asian (%)	0.00	5.97
Black (%)	62.50	71.64
Coloured (%)	6.25	4.48
White (%)	31.25	17.91
Schooling (%)		
Primary school (%)	3.23	12.12
Secondary school (%)	48.39	51.52
Post-secondary diploma (%)	37.10	19.70
Post-secondary degree (%)	1.61	6.06
Tertiary (%)	9.68	10.61
Living with (%)		
Brother (%)	8.00	19.28
Sister (%)	9.27	18.07
Uncle (%)		2.41
Aunt (%)		2.01
Brother-in-law (%)	8.00	
Sister-in-law (%)	4.00	1.20
Father (%)	1.14	6.43
Mother (%)	4.57	11.24
Father-in-law (%)	4.00	
Mother-in-law (%)	5.14	
Children (%)	20.57	7.23
Other relatives, friends (%)	34.86	32.13

Source: Analysis of own surveyed data

The overwhelming majority of both groups were Christian (married 87.31%; single 86.16%). African religion ranked a distant second (married 11.11%; single 7.69%). Only among single women were there Muslims (6.15%).

About one third of both married and single women were living with other relatives or friends.

This reflects a common African cultural practice of living with other family members, especially younger relatives, who help with the household chores. About one fifth of the single women were living with a brother(s) and/or a sister(s). They were also living with a mother (11.24%) and/or a father (6.43%).

Table 9.2 Employment characteristics for working women

Employment Characteristics For Working Women.		
	Married Working Women (%)	Single Working Women (%)
Wages per month (%)		
R1 to R100 (%)	0	1.56
R101 to R1,000 (%)	29.51	45.31
R1001 to R3,000 (%)	36.07	20.31
R3,001 to R5,000 (%)	3.28	10.94
R5,001 to R10,000 (%)	18.03	14.06
More than R10,000 (%)	13.11	7.81
Type of work (%)		
Part time (%)	3.13	6.15
Contract (%)	25.00	38.46
Full time (%)	71.88	55.38
Nature of the work (%)		
Repetitive	54.44	58.54
Supervisory	25.45	22.34
Management	17.44	16.34

Source: Analysis of own surveyed data

Forty-five (45) percent of the single women were earning between R101-R1 000 per month, while about 30% of married women were earning this amount. In contrast, about 36% of the married women were earning between R1 001-R3 000 per month, while the proportion of single women earning that amount was 20%. The percentage of married and single women at the R5 001-R10 000 level was similar, but the proportion of married women earning more than R10 000 per month exceeded that of single women.

Fifteen (15.1) percent of the married women said that their income was supplementary to that of their husbands. The majority of the married women pooled their money with their husbands (56.67%). Thirty (30) percent maintained a separate account from the husband, while a few (11.67%) had a partial and joint account. The majority of the single women maintained separate accounts (60.61%), although nearly one third (30%) of the single women held a partial and separate account with another person.

The high percentage of pooled income tends to support the unitary model. However, more than 40% of married women did not pool their income with their spouses. Some studies in South Africa have found that even where there is no outright conflict, different members of a

household might have different priorities. Men and women, elders and juniors, have at least partially separate expenditure responsibilities (Buijs & Atherfold 1995). These authors found that men in the Eastern Cape, were not willing to give detailed information on their income to either their wives or girlfriends. This supports contentions that income-sharing is not a general South African household practice (Buijs & Atherfold 1995:73-4).

Research in a range of countries has shown that women are more likely to spend the money over which they have control on the basic needs of themselves and their families such as school uniforms and clothing. For example, the Income and Expenditure Survey (2000), shows that women spend a great share of their income on goods such as food, clothing and footwear. There is extensive work that indicates that, if female wages increase, the situation of females and children in households improves (Haddad,1994; Haddad, Hoddinott & Alderman 1997; Quisimbing 2003).

A focus on women wages is therefore an important dimension of any comprehensive analysis of how females are affected by economic reform.

A larger percentage of single women were on contract (38%) than were married women (25%), and conversely more married women were employed full-time (72%) than single women (55%). The reason given for women working under contract was a lack of permanent positions. Many expressed the opinion that unemployment gave employers a ready and continuous supply of labour, and hence these employers could easily employ workers on a non-permanent basis with low wages and fewer benefits. They also noted that most of the permanent positions required skills that they did not possess.

On the other hand, legislation enacted through the influence of labour unions such as COSATU, is viewed by employers and investors as a deterrent to hiring permanent labour. It is alleged that small firms, in particular, which tend to be more labour-intensive, are hard-pressed to meet the requirements under these acts. COSATU has had an influence on important labour legislation such as the Labour Relations Act, the Basic Conditions of Employment Act, and the Equal Employment Opportunity Act. While protecting those who have jobs, the legislation makes it more difficult for outsiders to obtain jobs and is seen as contributing to continued inequality. Nattrass and Seeking (2000) argue that the labour market rigidities make South Africa especially poorly placed to deal with globalisation.

9.6 SPECIFIC SURVEY RESULTS

9.6.1 Breakdown position

As shown in Table 9-2, 65.58% of the married women were earning between R101-R3 000 per month, and 65.62% of single women were earning that amount. Asked whether they could support themselves and their families if they were left alone without a spouse or relative (single women), 57.50% of the married women in this income group said that they could. A larger percentage (87.87%) of single women in this income group felt confident of caring for themselves without the assistance of someone else. More than one third of married women (37.50%) in this income group felt that they would not be able to support themselves and their families. A significant percentage of both married and single working women therefore expressed confidence in sustaining their livelihood independently of the support of a partner.

The majority of married women had joint ownership with their husbands of major assets (furniture 68.25%, equipment 67.19%, house 40.63%). Almost 41% of the married women jointly owned the land with their husbands, and 20% of the married women indicated that others owned the land. One fifth (20.31%) of married women independently owned the furniture, 19.05% owned the equipment (e.g. kitchen appliances), 7.81% owned the house, and 6.45% owned the land. More than one half (54.05%) owned their own car. Because most women live and work in urban areas, none answered that they owned domestic animals such as cattle, sheep and goats.

A smaller proportion of single women owned a car (45.95%). More than one half (51.52%) of them owned furniture, 53.03% owned equipment, 35.82% owned the house, and 31.25% owned the land. Between 15-25% of the single women were in possession of major assets that were owned by their fathers or mothers. Parents play a significant role in the lives of single working women. In comparison with single working women, working married women appear to have notable bargaining power.

Table 9.3 Working women and ownership of assets

	Most furniture		Equipment		House		Land		Car	
	Married	Single	Married	Single	Married	Single	Married	Single	Married	Single
I own it	19.05	51.52	20.31	53.03	7.81	35.82	6.45	31.25	54.05	45.95
My husband or partner only	6.35		6.25		14.06		11.29	0.00		
My husband or partner and myse	68.25		67.19		40.63		38.71	0.00		
My brother		3.03		1.52		1.49				
My sister		3.03		4.55		1.49	0.00	1.56		
My uncle						1.49	1.61	1.56		
My aunt		1.52								
My brother-in-law			4.69			2.99	0.00	3.13		
My sister-in-law			1.56							
My father		19.7		13.64	1.56	23.88	3.23	25.00		
My mother	4.76	18.18		22.73	4.69	19.4	4.84	15.63		
My father-in-law	1.59				9.38		9.68	0.00		
My mother-in-law					1.56					
Others		1.52		1.52	17.19	8.96	19.35	17.19		

Source: Analysis of own surveyed data

9.7   AUTONOMY

Table 9.4 shows responses to questions posed to ascertain the amount of autonomy the women have. Only 4.84% of married women said they were in a position to make the final decision about whether they can take a job outside the household; the overwhelming majority (95.16%) of married women had to defer to someone else. In contrast, almost three quarters of single women (71.64%) reported that they make those decisions.

Table 9.4 Measurement of working women's autonomy

	Married women		Single women	
	I do	Others	I do	Others
Labour force participation				
Do you or others make the final decision about who can work outside the house? (%)	4.84	95.16	71.64	28.36
Do you need permission:	Yes	No	Yes	No
To give gifts or loans to friends from pooled resources? (%)	32.26	67.74	44.39	55.61
To lend money to a friend or relative without permission of husband or relative? (%)	25.00	75.00	55.36	44.64
Mobility				
To go outside the house or compound at any time? (%)	54.84	45.16	63.49	36.51
To travel alone to visit a friend or relative within the area? (%)	81.25	18.75	89.55	10.45
To travel alone to the local health centre or clinic? (%)	95.24	4.76	97.01	2.99
To travel alone to the local market? (%)	95.24	4.76	98.51	1.49

Source: Analysis of own surveyed data

However, more than one quarter of single women (28.36%) reported that the final decision concerning employment outside the house rested with someone else.

Nearly all the married and single women can go to the local market or health centre alone without seeking permission, reflecting their accepted social role in the "care economy." More than one-third of the single women (36.51%) stated that they could not go outside the house at any time without permission and could not visit a friend or relative without prior permission (10.45%). More than one half (55.61%) of the single women indicated that they would need permission to give gifts or loans to relatives or friends and 44.64% would have to get permission to lend money.

The extent to which single women appear dependent on another authority is striking. The fact that so many single women needed to acquire permission regarding a job, financial matters, and mobility demonstrates the social rigidities they face. As noted above in Table 9-2, many of the single women were living with brothers, sisters, other family members and, to a lesser extent, mothers and fathers — all of whom can act as monitors of the single woman's behaviour. Single women still need to seek permission concerning their participation in the workforce and other areas such as going outside the household or visiting friends. This shows the existence of cultural norms that still hinder women's autonomy. Such constraints faced by women might hinder their access to market opportunities created by globalisation.

The existence of the high incidence of violence in South Africa, however, might be a factor in terms of relatives of women putting restrictions on their movements (Bollen, Artz, Vetten, and Louw 1999). Another factor might be living in a poor neighbourhood without public infrastructure such as street lighting and well-maintained roads. In order to test this, the women were asked questions related to area infrastructure shown in Table 9-5 below. Roughly one half of the respondents indicated good infrastructure while the other half indicated a lack of good infrastructure. The data indicate that the two groups of married and single women shared common characteristics in terms of their living environment.

Table 9.5 Location related to working women's residence

	Married Working Women (%)		Single Working Women (%)	
	Yes	No	Yes	No
Residence (%)				
Rural (%)	32.26	67.74	37.88	62.12
Urban (%)	67.74	32.26	59.09	40.91

	Married Working Women (%)		Single Working Women (%)	
	Yes	No	Yes	No
Informal settlement (%)	0		3.03	96.97
Area infrastructure				
Well-maintained roads (%)	55.56	44.44	44.44	55.56
Health Unit or Clinic (%)	44.83	55.17	54.02	45.98
Street lights (%)	50	50	50	50
Running water in the home (%)	48.28	51.72	51.72	48.28
Flush water toilet (%)	52.63	47.37	47.37	52.63
Easy access to public transport (%)	46.84	53.16	53.16	46.84
Easy access to public schools (%)	45.88	54.12	54.12	45.88

Source: Analysis of own surveyed data

9.7.1   Decision making in the household

As shown in Table 9.6, while only 4.84% of the married women can independently make the decision to work outside the home, 71.64% of the single women do so. The majority (74.19%) of married women make this decision jointly with their husband, while nearly 9% of the single women rely on their fathers, and 6% rely on their mothers to make such a decision.

In terms of the number of children to have, 78.13% of the married women indicated that it is a joint decision with spouses, while 14.06% of the married women reported that they were the major decision-maker in this regard. Almost 68% of the single women reported that they were in control of the decision to have children, while nearly 10% suggested that this decision was out of their control.

Table 9.6 Decisions made by working women related to employment and children

	Work outside the home		Number of children to have		How much schooling	
	Married	Single	Married	Single	Married	Single
I decide this by myself	4.84	71.64	14.06	67.74	9.52	63.49
My husband or partner only	8.06		1.56		4.76	
My husband or partner and myself	74.19		78.13		74.6	
My brother		1.49				3.17
My sister		1.49		3.23		3.17
My uncle						1.59
My father		8.96		3.23		7.94
My mother	4.84	5.97		3.23		1.59
My father-in-law						
My mother-in-law			1.56			
I do no make decisions	8.06	7.46	3.13	9.68	6.35	7.94
Others		2.99	1.56	12.9	4.76	11.11

Source: Analysis of own surveyed data

216

Approximately 75% of the married women reported deciding with their husband how much schooling a child would have, while 9.52% reported being able to decide this on their own.

As indicated in Table 9.7, nearly 61% of married women make decisions on which type of food to purchase and prepare, and nearly 27% do this with their husbands or partners. Almost 77% of single women purchase food by themselves, while 10.45% do this with their mothers. The higher percentage of married women making decisions concerning food preparation is different from other decisions which they mostly make with their spouses. This mirrors the traditional responsibility of women in such areas as the preparation of food.

In regard to paying school fees, caring for ill children and buying medicine, roughly one third of the married women do this alone, while approximately half do this jointly with their husband or partner. The majority of single women (78-87%) do these activities by themselves. Three to four percent of single women do these activities with their mothers.

Table 9.7 Decision made by working women as economic authority in the household

Decision made by working women as economic authority within the household								
	Purchase food		Pay school fees		Care for ill child		Buy medicine	
	Married	Single	Married	Single	Married	Single	Married	Single
I do this by myself	60.94	76.12	36.51	78.79	33.33	87.30	35.94	84.85
My husband or partner only	6.25		7.94		4.76		6.25	
My husband or partner and myself	26.56		49.21		55.56		54.69	
My brother				4.55			0.00	1.52
My sister		5.97		3.03		1.59	0.00	3.03
My uncle							0.00	1.52
My aunt						1.59		
My brother-in-law								
My sister-in-law								
My father		1.49	0	1.52	0	1.59		
My mother	1.56	10.45	0	4.55	3.17	3.17	0.00	9.09
My father-in-law								
My mother-in-law								
I do not make decisions	3.13	4.48	1.59		1.59		3.13	
Others	1.56	1.49	4.76	7.58		4.76		

Source: Analysis of own surveyed data

As shown in Table 9.8, when major purchases or financial decisions are to be made, married women have much less influence. Only 26.56% may purchase a radio or TV by themselves, 14.06% may acquire or dispose of household items, 24.19% may settle debts, and 26.56% may make a decision to improve the structure of their dwelling. About 76-86%

of single women do these activities on their own, with mothers or fathers involved in these decisions for 3.12% of the single women.

Table 9.8 Economic authority in the household

	Buy radio, TV		Acquire/dispose household items		Settle financial debts		Improve dwelling structure	
	Married	Single	Married	Single	Married	Single	Married	Single
I do this by myself	26.56	86.36	14.06	76.92	24.19	80.6	26.56	82.09
My husband or partner only	10.94	0	3.13	0	8.06	0	7.81	0
My husband or joint (partner and myself)								
My brother	0.00	1.52	0	3.08	3.23	1.49	0	2.99
My sister	0.00	1.52	0	1.54	50	1.49	0	1.49
My uncle								
My aunt								
My brother-in-law								

Source: Analysis of own surveyed data

In summary, married women, as Sen (1990) observed, exist in relationships characterised by co-operation and conflict. But in the light of the social constraints the single working women apparently faces, married women are faring quite well. While married women need to engage in collaborative decision-making with their husbands, they nonetheless demonstrate appreciable bargaining power when compared with their single counterparts.

9.7.2   Perceived contribution

Married women were asked about their perceived contributions in terms of (a) household chores and (b) income. The women were allowed to respond to more than one item in Table 9.9. Fewer married women than single women felt that they are making little contribution to household duties and fewer felt guilty about their limited participation in household chores. This relatively more positive perception among married women prevails even though more single women reported helping with the housework.   The perceived contribution is the contentious issue which many analysts find hindering women's participation in the labour force or which affects their health as they juggle both market work and household work, thus overburdening women. However, most women interviewed said they get help from spouses, household family members and domestic workers to carry on household chores.

Table 9.9 Contribution to household duties

Contribution to household duties	Married working women frequency	Single working women frequency
I make little contribution because I have a paid job outside the household	8	16
I perform household chores together with my paying market job	21	26
I have family members helping with household chores	23	30
My husband /partner helps with the household chores	25	0
I can afford to hire the household helper who performs the chores	11	9
I feel guilt because I should be staying home and participating more in household chores	2	7

Source: Analysis of own surveyed data

Nearly one fifth of the married women reported that they are the sole breadwinners (see Table 9.10). Almost one half (46.33%) of the married women stated that their income is insufficient to contribute to the family's income needs (see Table 9.10).

Table 9.10 Contribution in income

Contribution in Income	Total women	Married working women (%)	Single working men (%)
My income supports all of the household members	19.84	19.05	51.52
My income is not enough to enable me to contribute sufficiently to my family	46.83	20.31	53.03
My income is supplementary to my husband, who is a breadwinner	15.87	70.81	35.82
I only use my income for my personal use	8.73	6.41	31.25
My contribution is very significant	7.94	54.05	45.95

Source: Analysis of own surveyed data

9.7.3 Perceived self-interest

Table 9.11 shows the results to the question: "Do you agree that women receive a smaller share of household resources such as food, healthcare and education?" More married women disagreed than agreed with the statement (disagreed 48.44%, agreed 34.38%) in contrast to single women, more of whom agreed than disagreed (disagreed 36.51%; agreed 42.86%).

Table 9.11 Perceived self-interest

Perceived Self-Interest	Married (%)	Single (%)
Yes	34.38	42.86
No	48.44	36.51
I don't know	17.19	19.05
Other	0.00	1.59

Source: Analysis of own surveyed data

Table 9.11 shows the results when asked to   respond to statements about women's self-

interests, for example, whether women should be given the opportunity to work outside their homes. The overwhelming majority (married, 81%; single 89%) strongly agreed that women should be given an opportunity to work outside their homes.

Most women were cognisant that many of their gender were employed in jobs that are less than ideal. The majority (married 88.64%; single, 86.68%) perceived that women work long hours for low salaries and wages. Married women were somewhat more convinced than single women (married 90.71%; single 77.59%) that women often work in non-professional, repetitive jobs.

Just over one half (54.84%) of married women and almost two thirds (63.33%) of single women disagreed with the proposition that woman who could afford it should not work outside their homes. In responding to the proposition that women with jobs do not need to get married because they can support themselves financially, the majority again disagreed (married 68.85; single 72.13%). In other words, even if women did not need the money, they should still work outside the home and pursue married life.

Table 9.12 Opinions concerning women's self-interest

Sta=strongly agree; Sla=slightly agree; Sld=disagree; Std=strongly disagree	Married (%)				Single (%)			
	Sta (%)	Sla (%)	Sld (%)	Std (%)	Sta (%)	Sla (%)	Sld (%)	Std (%)
Women should be given the opportunity to work outside their homes	80.95	12.70	4.76	1.59	88.52	11.48	0.00	0.00
Women usually work long hours for small salaries/wages	46.77	33.87	11.29	8.06	68.85	18.03	4.92	8.20
Women mostly work in non-professional, repetitive jobs	53.57	32.14	3.57	10.71	50.00	27.59	6.90	15.52
If women can afford it they should not work outside their homes	22.58	22.58	11.29	43.55	23.33	13.33	20.00	43.33
Women with jobs do not need to get married because they can support themselves	16.39	14.75	16.39	52.46	16.39	11.48	24.59	47.54
Women who are financially independent can make decisions regarding financial matters/expenditures.	66.13	22.58	3.23	8.06	74.19	12.90	6.45	6.45
Some imported goods compete with goods produced by women; this is a threat to women's jobs	33.33	36.67	23.33	6.67	45.16	22.58	17.74	14.52
Some imported goods can be bought more cheaply that those produced by women in South Africa	37.70	26.23	22.95	13.11	50.82	21.31	18.03	9.84
Companies establishing themselves in South Africa provide employment for women.	41.94	40.32	14.52	3.23	46.67	33.33	8.33	11.67

Source: Analysis of own surveyed data

Two thirds of married women (66.13%) and three quarters of single women (74.19%) accepted the notion that financial independence enables a woman to make more financial decisions.

When asked whether some imported goods   compete   with   goods   that   are   primarily

220

produced mostly by women and therefore are a threat to their jobs, the majority of respondents agreed (married 70%; single 67.74%). However, the majority (married 63.93%; single 72.13%) also agreed that they are able to buy some imported goods more cheaply than domestically produced goods.

On the other hand, a larger majority (married 82.26%; single 80%) agreed that the companies establishing themselves in South Africa are providing employment for women.

The above finding mirrors to some extent what Kudat (1989) found in Tanzania. He reports that the most important impact associated with women wage employment in public works programmes appeared to be the enjoyment of personal decision-making. Women who obtained wages from the programmes were able to decide alone on the use of their earnings and this gave them a sense of power, which they had not enjoyed before. The women reported that work gave them a sense of increased self-fulfilment, which they could not realise by limiting themselves to staying at home to take care of the household.

9.8 CONCLUSION

The women who participated in the survey expressed their appreciation at being able to work outside the home, although many complained about the low pay which they receive from employers. Both single and married women shared a firm sense of self-interest as members of a household and the larger economic community.

When compared with single women, married women displayed a more positive sense of contribution to the welfare of the household. They paid school fees and contributed to the purchase of household assets. With the help of others (e.g. relatives, domestic workers, spouses) married women still ensured that household duties would be carried out in their absence. As a result, they felt that they were able to fulfil their responsibilities at home and still participate in the commercial market economy.

The study found co-operation was a critical aspect of conjugal life for married women. They deferred to their husbands about conditions relating to working outside the home, the number of children to have, the amount of schooling a child should have, and the acquisition of major assets. In addition, they pooled income with their spouses. At the same time, their ability to work outside the home allowed them to acquire substantial assets of their own. The fact that

their earned income enabled them to contribute financially towards these aspects further strengthened their breakdown position in the bargaining process in their households.

Single women, too, enjoyed the ability to work. However, they also had to accommodate social norms and the expectations of others. In addition, many of them did not have a sufficient asset base and therefore required assistance from other family members, particularly parents and brothers. Their perception of making a contribution was not as strong as that of the married women. Nonetheless, as mentioned, they shared with their married counterparts a firm sense of self-interest as women working in an increasingly globalised economy.

In short, the increase in the number of decently remunerated wage-earning opportunities resulting from a more globalised economy will likely have a positive effect on improving the well-being of women. But this will not happen quickly and without assistance from society at large. There is a need to tackle any deep-rooted obstacles that might hinder appropriate participation in the economy. In addition, women will need opportunities to upgrade their skills so that they can qualify for more permanent, higher-paying jobs most of which are stimulated by globalisation.

This study is by no means representative of the general nature of the well-being of women working in the manufacturing sector. This is due to the small sample upon which the study is based. However, the study attempts to accurately capture themes and issues of importance as raised by sample respondents in the hope that their experiences will form a useful basis from which to inform any future policy interventions related to employment and women.

Table 9.13 Significancy levels : married and single working women

	MW	TMW	%	SW	TSW	%	P1	P2	z	p-value	S
Working women as:	52	64	0.8	60	67	0.90	81.2	89.5			
Major wage earner	19	64	0.30	44	65	0.68	29.69	67.69	4.317554	1.578E-05	S
Handle monthly income	18	60	0.30	20	33	0.6	30.00	60.6	2.87281	0.004	S
Working women decision making in the household											
Buy household items	17	64	0.27	57	66	0.86	26.56	86.36	6.88387	5.859E-12	S
Improve structure of house	17	64	0.27	55	67	0.82	26.56	82.09	6.38521	1.719E-10	S
Pay school fees	23	63	0.37	52	66	0.79	36.5	78.79	4.86568	1.142E-06	S
child becomes ill	21	63	0.33	55	63	0.87	33.33	87.30	6.19116	5.996E-10	S
buy medicine	23	64	0.36	56	66	0.85	35.94	84.85	5.71006	1.132E-08	S
make contact wit relativs v	15	64	0.23	41	63	0.65	23.44	65.08	4.72573	2.295E-06	S
household assets acquird	9	64	0.14	50	65	0.77	14.06	76.92	7.16547	7.807E-13	S
settle financial debts	15	62	0.24	54	67	0.8	24.19	80.60	6.41702	1.396E-10	S
give gifts to friends	28	64	0.44	64	67	0.96	43.75	95.52	6.47791	9.345E-11	S
food to prepare for meal	39	64	0.6	51	67	0.76	60.94	76.12	1.87316	0.061045	NS
work outside the home	3	62	0.05	48	67	0.72	4.84	71.64	7.75340	9.103E-15	S
how many chldren to have	9	64	0.14	42	62	0.68	14.06	67.74	6.13710	8.437E-10	S
schooling for children	6	63	0.10	40	63	0.63	9.52	63.49	6.29129	3.162E-10	S
Working women and autonomy											
use pooled family money	20	62	0.32	15	67	0.22	32.26	22.39	1.25964	0.207798	NS
go outside family compound	34	62	0.55	40	63	0.63	54.84	63.49	0.98424	0.324993	NS
travel alone to friends home	52	64	0.8	60	67	0.90	81.25	89.55	1.34887	0.177376	NS
travel to health centre	60	63	0.95	65	67	0.97	95.24	97.0	0.52648	0.598551	NS
travel alone to market	60	63	0.95	66	67	0.99	95.24	98.5	1.07876	0.280691	NS
express opinion publicly	24	64	0.38	24	59	0.4	37.50	40.68	0.36096	0.718124	NS
lend witout husband approval	16	64	0.25	31	56	0.55	25.00	55.36	3.39879	0.000676	S
Ownership of assets in the households											
Who owns the house	5	64	0.08	24	67	0.36	7.81	35.82	3.85968	0.000113	S
Who owns the land,farm	4	62	0.06	20	64	0.31	6.45	31.2	3.54396	0.000394	S
Who owns the furniture	12	63	0.19	34	66	0.52	19.05	51.5	3.84829	0.000118	S
Who owns the equipment	13	64	0.20	35	66	0.53	20.3	53.0	3.86447	0.000111	S

Source: Calculation from own surveyed data

KEY: S: significant; NS: not significant; MW: married working women; TMW: total number married working women; SW: single working women; TSW: total number single working women; p-value: significance level comparing two proportions

The table 9.13 compares two proportions, HO: p1=p2 against H1:p1 not equal to p2. This indicates the level of significance related to married working women and single working women. After testing the hypothesis on a 5% level of significance if the item is marked with "S", the proportion of married and single working women who answered yes on a

specific issue does not differ significantly. Otherwise working and married working women differ particularly with regards to household decision making where most married women report to be making joint decisions with the spouse.

WELL-BEING QUESTIONNAIRE

SECTION 1   GENERAL

1. Which Province do you live in?

2. What racial group do you belong to?

1. Asian   2. Black   three. Coloured   4. White

3. What is your faith affiliation?

1. Christian Asian

2. Born again Christian Black

3. Muslim Coloured

4. White

5. Jewish

6. Hindu

7. African Religions

8. Other (specify):

4. What is your marital status?

1. Married and living with spouse

2. Married but separated

3. Single

4. Divorced

5. Living with a partner

6. Widow

5. Where is your place of residence located?

1. Rural area

2. Urban area

3. In an informal settlement

6. Which of the following infrastructures are available where you reside? (You may provide more than one answer)

1. Good well maintained roads

2. Health units or clinics

3. Street lights

4. Running water in your home

5. Flush water toilets

6. Easy accessible public transportation

7. Easy accessible public schools

7. What is the distance from your home to the following places? Please indicate clearly whether the distance is in kilometres or metres)

1. Health units or clinics

2. Recreational areas

3. Public transportation

4. Public schools

5. Local market

8. In respect of your home…

1. Are you renting?

2. Are you buying?

3. Have you bought?

4. Are you living with relatives or friends?

9. Besides yourself, how many family members reside with you in your home?

10. Regarding family members residing with you in your home as indicated in Question 9, please indicate the relationship of each to you and their ages in the table below.

11. What is your age in completed years? (For example 37 and not 37 and 8 months)

12. What is the level of your education?

1. None

2. Primary school

3. Secondary school

4. Trade school

5. Post-secondary, diploma

6. Post-secondary, degree

7. Post-graduate

8. Other (specify):

13. What is the level of education of your spouse or partner?

1. None

2. Primary school

3. Secondary school

4. Trade school

5. Post-secondary, diploma

6. Post-secondary, degree

7. Post-graduate

8. Other (specify)

14. Are you currently working on part time, contract or full time?

1. Part time

2. Contract

3. Full time

15. If your answer to Question 14 is "*Part time or contract*", what is the main reason for the situation?

16. What is the current type of your job?

1. Repetitive

2. Supervisory

3. Management

17. Who is the major wage/salary earner in your household?

1. I am

2. Husband / partner

3. Brother

4. Sister

5. Uncle

6. Aunt

7. Brother-in-law

8. Sister-in-law

9. Father

10. Mother

11. Father-in-law

12. Mother-in-law

13. Other: (indicate relationship)

18. If the major wage/salary earner in your household is someone other than you, please

indicate the age of that person

19. Where is the major wage earner in your home employed? (Please mark one answer only)

1. Agricultural processing
2. Mining
3. Construction
4. Manufacturing
5. Retail/wholesale
6. Transportation, Communications & Public Utilities
7. Finance, Insurance & Real Estate
8. Government (including education)
9. Services
10. Retired income

20. Where are you currently employed? (Please mark one answer only)

1. Agricultural processing
2. Mining
3. Construction
4. Manufacturing
5. Retail/wholesale
6. Transportation, Communications & Public Utilities
7. Finance, Insurance & Real Estate
8. Government (including education)
9. Services
10. Retired

21. Into which category does your monthly income fall? (Please mark one answer only)

1. Less than R100
2. R101   to R1, 000
3. R1, 001 to R3, 000
4. R3, 001 to R5, 000
5. R5, 001 to R10, 000
6. More than R10, 000

22. How many cars does your family own?

23.   Who own the family car(s)?   (You   may provide more than one answer)

1. I do

2.   My husband or partner

3.   Brother

4.   Sister

5. Uncle

6. Aunt

7. Brother-in-law

8. Sister-in-law

9. Father

10. Mother

11. Father-in-law

12. Mother-in-law

13. Other (specify):

24. How do you and your husband/partner handle your monthly income?

1. We pool it together

2. We have separate accounts

3. We have partial and separate accounts

4. Other (specify):

SECTION 2   DECISION-MAKING

This section attempts to determine your control over decision-making.

25.   In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not to buy household items like a radio, TV or furniture? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

26. If in Question 25 you marked any option from 4 to 9 or "Other", please indicate the age of that person.

27. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not to improve on the structure of your house/dwelling, such as adding rooms? (Please mark one answer only).

1. I do
2. My husband or partner only
3. My husband or partner and myself together
4. My brother
5. My sister
6. My uncle
7. My aunt
8. My brother-in-law
9. My sister-in-law
10. My father
11. My mother
12. My father-in-law
13. My mother-in-law
14. I do not make any decisions
15. Other (specify):

28. If in Question 27 you marked any option from 4 to 9 or "Other", please indicate the age of that person

29. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not money should be used to pay school fees for a child? (Please mark one answer only)

1. I do
2. My husband or partner only
3. My husband or partner and myself together
4. My brother
5. My sister
6. My uncle

7. My brother-in-law

8. My sister-in-law

9. My father

10. My mother

11. My father-in-law

12. My mother-in-law

13. I do not make any decisions

14. Other (specify):

30. If in Question 29 you marked any option from 4 to 9 or "Other", please indicate the age of that person

31. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on what to do when a child in the family becomes ill? (mark one answer only)

1. I do
2. My husband or partner only
3. My husband or partner and myself together
4. My brother
5. My sister
6. My uncle
7. My aunt
8. My brother-in-law
9. My sister-in-law
10. My father
11. My mother
12. My father-in-law
13. My mother-in-law
14. I do not make any decisions
15. Other (specify):

32. If in Question 31 you marked any option from 4 to 9 or "Other", please indicate the age of that person

33. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not to buy medicine for a person in the family who is ill? (Please mark one answer only)

1. I do
2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

34. If in Question 33 you marked any option from 4 to 9 or "Other", please indicate the age of that person

35. In your home, who makes the final decision on how often to make contact with relatives such as in-laws? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

36. If in Question 35 you marked any option from 4 to 9 or "Other", please indicate the age of that person

37. In respect of spending YOUR OWN MONEY, in your home, who makes the final

decision on whether or not household assets should be acquired and disposed of? **(Please mark one answer only)**

1. I do
2. My husband or partner only
3. My husband or partner and myself together
4. My brother
5. My sister
6. My uncle
7. My aunt
8. My brother-in-law
9. My sister-in-law
10. My father
11. My mother
12. My father-in-law
13. My mother-in-law
14. I do not make any decisions
15. Other (specify):

38. If in Question 37 you marked any option from 4 to 9 or "Other", please indicate the age of that person

39. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not financial debts should be settled? (Please mark one answer only)

1. I do, if I incurred the debt
2. I do, even if the debt was incurred by my husband or any member of household
3. My husband or partner only when he has incurred that debt
4. My husband or partner even if debt was incurred by me or a member of household
5. My husband or partner and myself together regardless who incurred it
6. My brother
7. My sister
8. My uncle
9. My aunt
10. My brother-in-law
11. My sister-in-law
12. My father
13. My mother

14. My father-in-law

15. My mother-in-law

16. I do not make any decisions

17. Other (specify):

40. If in Question 39 you marked any option from 4 to 9 or "Other", please indicate the age of that person

41. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on whether or not to give gifts from your own income to your friends or relatives? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

42. If in Question 41 you marked any option from 4 to 9 or "Other", please indicate the age of that person

43. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on what food to prepare for family meals? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

44. If in Question 43 you marked any option from 4 to 9 or "Other", please indicate the age of that person

45. In respect of spending YOUR OWN MONEY, in your home, who makes the final decision on who should or should not work outside the home?

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

46. If in Question 45 you marked any option from 4 to 9 or "Other", please indicate the age of that person

47. In your home, who makes the final decision on how many children to have?

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. I do not make any decisions

15. Other (specify):

48. If in Question 47 you marked any option from 4 to 9 or "Other", please indicate the age of that person

49. In your home, who makes the final decision on how much schooling to give to your children?

(Please mark one answer only)

1. I do
2. My husband or partner only
3. My husband or partner and myself together
4. My brother
5. My sister
6. My uncle
7. My aunt
8. My brother-in-law
9. My sister-in-law
10. My father
11. My mother
12. My father-in-law
13. My mother-in-law
14. I do not make any decisions
15. Other (specify):

50. If in Question 49 you marked any option from 4 to 9 or "Other", please indicate the age of that person

51. Apart from your earnings, do you receive money from your husband / partner when you incur household expenses?

1. Yes, he contributes to any purchase

2. He does not have to, we pool our income and use it for household expenditures

3. No, he spends all of his earnings on his private use

4. Other (specify):

SECTION 3. AUTONOMY

This section attempts to determine your ability to spend family income and move around freely.

52.   Can you use pooled family money for gifts, loans to your friends or relatives?

      1. Yes   2. No

53.   As a woman and wife are you allowed to go outside the family compound at any time you prefer?

      1. Yes   2. No

54.   Can you travel alone to the home of a relative or friend in the village, informal settlement or in town?

      1. Yes   2. No

55.   Can you travel alone to the local health centre, clinic or hospital?

      1. Yes   2. No

56.   Can you travel alone to the local market?

      1. Yes   2. No

57.   Should a wife or partner express her opinion publicly when she disagree with her husband or partner?

      1. Yes   2. No

58.   Should your friend or relative ask for monetary or other assistance, can you lend it without your husband's or partner's approval?

      1. Yes   2. No

SECTION 4. ACCESS TO RESOURCES

This section attempts to assess the impact of your   access to resources.

59. Who owns the house where you reside – who has the title deed? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. Other (specify):

60. If in Question 59 you marked any option from 4 to 9 or "Other", please indicate the age of that person

61. Who own the land, farm or plot that your house is built on? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. Other (specify):

62. If in Question 61 you marked any option from 4 to 9 or "Other", please indicate the age of that person

63. Mention different types of furniture which you have in you home?

64. Who own most of that furniture in your home? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. Other (specify):

65. If in Question 64 you marked any option from 4 to 9 or "Other", please indicate the age of that person

66. Who owns the equipment (e.g. refrigerator, cooker) and utensils in the kitchen in your home? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. Other (specify):

67. If in Question 66 you marked any option from 4 to 9 or "Other", please indicate the age of that person

SECTION 5   INDIRECT TEST TO ASSESS THE IMPACT ON WOMENS' BARGAINING POWER

(A) Breakdown position

68. Who owns the land you reside on? (Please mark one answer only)

1. I do

2. My husband or partner only

3. My husband or partner and myself together

4. My brother

5. My sister

6. My uncle

7. My aunt

8. My brother-in-law

9. My sister-in-law

10. My father

11. My mother

12. My father-in-law

13. My mother-in-law

14. It is the property of the Chief or Government

15. Other (specify):

69. If in Question 68 you marked any option from 4 to 9 or "Other", please indicate the age of that person

70. Do you think you can totally support yourself in case you are left alone without your husband's or partner's help?

1. Yes I can totally support myself

2. No, I usually rely on my husband or partner

3. It does not matter because my husband or partner never supports me

4. Other (specify):

71. Which property/properties among the following are solely registered in your own name? (You may provide more than one answer)

1. Land

2. House

3. Car

4. Television

5. Couches

6. cooker

7. Music system

8. Bedroom set

9. Cattle

10. Sheep

11. Goats

12. Chicken

13. Other (specify):

(B) Measure of perceived self-interest

72. Do you agree that women receive a smaller share of household resources such as food, healthcare and education?

1. Yes

2. No

3. I do not know

4. Other (specify):

73. If your answer to Question 72 is "Yes", how do you feel about the fact that women generally receive a smaller share of household resources such as food, healthcare and education?

1. It is justified/fair

2. It is not right

3. I do not care

4. I have never given it a thought because it is a norm

5. Other (specify):

C. Perceived contribution

74. How do you rate your household workload? (You may provide more than one answer)

1. Little contribution because I have a paying job outside the household

2. I perform household chores together with my paying market job

3. I have family members helping with household chores

4. My husband /partner helps with the household chores

5. I can afford to hire the household helper who   performs the chores

240

6. I feel guilt because I should be staying home and participating more in household

7. Other (specify):

75. To what extent does your income contribute towards your family welfare?

1. My income support all of the household members

2. My income is not enough to enable me to contribute sufficiently to my family

3. My income is supplementary to my husband, who is a breadwinner

4. I only use my income for my personal use

5. My contribution is very significant

6. Other (specify):

76. Please read each of the statements below carefully and indicate your agreement or disagreement with each using the following scale:

1	=	Strongly agree	(Sta)
2	=	Slightly agree	(Sla)
3	=	Slightly disagree	(Sld)
4	=	Strongly disagree	(Std)

Statement:

Women should be given the opportunity to work outside their homes.

Women usually work long hours for small salaries/wages.

Women mostly work in non-professional repetitive jobs.

If women can afford it, they should stay at home and take care of their families and not involve themselves in any extra work.

Women with jobs do not need to get married because they can support themselves financially.

Women who are financially independent can make decisions regarding financial matters/expenditure.

Some imported goods compete with goods produced mostly by women and this is a threat to women's' jobs.

Some of the imported goods can be bought cheaply by women.

Companies establishing themselves in South Africa provide employment for women.

Please mention anything you feel like concerning your job or household situation in the space below.

CHAPTER 10
SUMMARY AND CONCLUSION

10.1   INTRODUCTION

This thesis sought to analyse the effects of globalisation policies on (a) the South African economy, (b) gender employment, (c) skills redeployment (d) wages and factor earnings, and (e) household welfare by applying a gendered CGE model based on a 2000 gendered Social Accounting Matrix (SAM) of the South African economy. In addition, a survey using a structured questionnaire with 77 questions was administered to 131 working women employed in selected manufacturing sectors, in order to determine their well-being as workers. This study turns a one-country (South Africa) conventional CGE model into a gender-aware model by disaggregating labour in all sectors according to gender. The disaggregation of labour according to gender enables the determination as to whether globalisation policies are gender-neutral as postulated in neoclassical theories.

In applying the general equilibrium model, the South African economy is divided into 49 sectors, consisting of seven agricultural sectors (maize, wheat, fruit and vegetables, livestock and diary products, poultry, and other-agriculture), and 42 non-agricultural sectors comprising manufacturing, utilities and services. Disaggregation of the agricultural sector into subsectors aimed at identifying effects related to the implementation of the Doha Round of Multilateral Trade Negotiations. The model comprises 14 household categories, disaggregated according to income, in addition to a government, enterprises and the rest of the world accounts.

The theoretical underpinning of the employment consequences of trade liberalisation is based on the assumptions of full employment of resources and of rapidly adjusting and frictionless markets. These are strong assumptions, particularly in South Africa, where structural factors and non-price mechanisms hinder the response to changes in relative prices. For example, gender rigidities, labour laws, high levels of unemployment and underemployment of unskilled and semi-skilled labour, shortages of skills, and lack of resources for certain groups of people, segment the South African labour markets. As a result, policies affect various types of labour differently. For example, men and women labour, displaced in the sectors that contract due to policy changes, may not easily be equally re-employed in the expanding sectors given existing differences between men and women labour. This aspect is particularly

significant from a gender perspective. As Haddad et al. (1995:893) state, 'in order to participate an individual must own factors of production, or have access to them, and must be able to reallocate them in line with the new economic incentives that trade policy provides.'

Three types of globalisation policy simulations were conducted:

(1) Full trade liberalisation. This involved complete tariff removal on all sectors under differing factor mobility and employment assumption scenarios. The first assumption is that capital is fully employed, but due to rigidity related to capital stock changes in the short run, capital is assumed sector-specific, skilled labour is fully employed and mobile across sectors, and unskilled and semi-skilled labour is mobile across sectors but unemployed. The second assumption under a full trade liberalisation is that all factors (capital, skilled men and women, unskilled and semi-skilled men and women) are fully employed and mobile across sectors.

(2) One percent increase in total factor productivity (TFP) of the South African sectors under the assumption of full mobility and employment of capital and skilled labour while unskilled and semi-skilled labour is assumed mobile but unemployed. This simulation assesses results (i) on specific sectors and (ii) from an economy-wide perspective.

(3) The third simulation assesses alternative treatments of agricultural prices on subsectors under the Doha Round. This policy follows anticipated increase of world prices of selected agricultural commodities. The ongoing agricultural trade distortions carried by developed countries suppress agricultural world prices, which are anticipated to be restored by the implementation of the Doha Round. This policy is considered to be taking place jointly with the government policy of trade liberalisation in agriculture.

This thesis comprises 10 chapters. Chapter 1 includes an introduction, identifies the problem to be studied, and provides the justifications and the objectives of the study. The chapter further gives an outlook of the South African economy and provides the synopsis of the impacts of various globalisation policies that the government has introduced. Chapter 2 analyses the gender situation in the country, describes various legislation concerning gender, and examines the performance of men and women in various sectors. The literature on globalisation and gender is reviewed in Chapter 3. This establishes the base for comparing the study's findings with findings obtained elsewhere. Chapter 4 presents the database used for the study and describes the various sources of data and how the data was used in the

model. It also explains how data was handled in order to fit the requirements of the gendered SAM. Chapter 5 describes the core model applied in this study and gives all model equations, parameters and variables. Chapter 6 describes the simulations and presents results of a full tariff reduction under two differing factor closure scenarios. Chapter 7 focuses on the effects of a productivity increase on gender employment, wages and household welfare, and macroeconomic conditions. Because productivity increases has been associated with globalisation, this study examines the effects of such an increase, especially in relationship to inflows of FDI in the economy. Two simulations, one involving productivity increase on sectors economy-wide and the other involving productivity increase only in selected sectors, are carried out to assess whether the outcomes are similar or different and to what extent.

Chapter 8 performs simulations related to the implementation of the Doha Round. The policy changes stipulated by the Doha Round in relation to agricultural liberalisation are expected to have differing implications for different countries. South African agricultural producers are expected to benefit from the Doha Round when export subsidy reductions by major subsidising countries raise the export prices of certain agricultural products. These benefits are analysed by taking into consideration the effects on South African agricultural producers, due to government policies of reducing domestic protection. For example, the government abolished the export subsidies, reduced domestic support and continues reductions of tariffs on agriculture.

Chapter 9 presents the results of a survey used in the study to assess the well-being of women workers. The survey augmented the quantitative CGE by seeking to determine the qualitative aspects of globalisation on women, particularly at the household level. The survey utilises the extended bargaining model of Sen (1990) to assess the impact of globalisation on working women's autonomy, decision-making ability and possession of assets. The survey focuses solely on the perspective of married and single, working women. It purposely excludes spouses or partners (men) because only the subjective perspective of women is of interest.

10.2   IMPACTS OF FULL TRADE LIBERALISATION: VARYING FACTOR MOBILITY

The study results show trade liberalisation to induce imports and to stimulate economic growth (measured by GDP) based on the efficient reallocation of resources. Economic growth raises household incomes and hence   savings as well as government non-tariff

revenues. This offsets the government revenue loss associated with removed tariffs. In addition to income effects based on increased factor earnings, households experience improvements in their welfare through price effect, based on lower purchase prices due to cheap imports.

The decline in government revenue due to tariff reductions implies a general fall in transfers from government to certain households and a reduction in the provision of government services, which might lead to government laying-off of workers and capital. As a result, the welfare of certain households, particularly that of low-income households, rises marginally.

Trade liberalisation is characterised by the increase of relatively cheap imports, particularly of consumable goods such as textile, apparel and footwear. As a result, trade liberalisation puts downward pressure on employment by shifting down these sector's products. High initial protection rates partially explain increased imports in most of these sectors. The contracting sectors (textiles, apparel, footwear, wood) are mostly labour-intensive sectors. This has negative employment effects for men and women working in these sectors. Although this outcome displaces workers, particularly the unskilled, it has a positive effect on consumption, due to relatively lower domestic commodity prices. This is mainly crucial for low-income households that spend a big share of their expenditure on such consumable goods.

Due to increased imports, there is greater pressure on the domestic currency, which leads to the depreciation of the currency. The depreciation of the domestic currency contributes to improved competitiveness of South African exports. The absolute effect of tariffs reduction is thus an increase of both imports and exports. As a result of enhanced exports, trade balance is restored because imports are partially paid off by exports that benefit from the depreciation of the currency induced by increased imports.

Domestic producers, who face relatively low domestic prices for their products, find it profitable to switch a certain amount of their sales towards the export market. Growth in manufactured exports is mainly observed in sectors such as mining, non-ferrous metals, petroleum, and coal products, all of which are based on large-scale capital-intensive production. Other significant exports include transportation equipment, machinery and electrical machinery that see exports rise through liberalisation. Tobacco, plastics, other-manufacturing, scientific-equipment exports also improve following the policy shock.

Most of these sectors have higher initial levels of domestic production directed towards export. However, textile and apparel, which are sectors with substantial trade restrictions, improved their exports. This indicates forced efficiency by trade liberalisation in order for them to compete on international markets.

The increase in exports helps to offset the negative effects of employment demand due to influx of imports. Exports response leads to an increase in sectoral domestic production, which partly offsets the decline in domestic sales. Greater production response occurs mostly in export-oriented (coal, gold and other-mining) sectors and in service sectors. As a result of improved production and exports, growth of employment demand follows. Increase in employment demand occurs in exporting sectors because of reduced input costs based on cheap imports and output price shifts in their favour.

The analysis of the effects of trade liberalisation on labour markets and wage dispersion between men and women shows mixed results. Although the findings are mixed, there is evidence that trade liberalisation is associated with an increasing relative demand for skilled workers and with rising earning inequality between unskilled men and women. Although the increased employment demand benefits both men and women workers mostly in the export and service sectors, unskilled men who are the major workers in the export sectors (coal, gold and other-mining) gain the most. Such sectors employ low shares of unskilled women workers.

Trade liberalisation indicates an increasing demand for women employment in associated service areas of trade, finance and related mining services of nursing, teaching and clerks. The country's current mining charter, which seeks to give more mining ownership to the black majority under the black economic empowerment plan, could see other types of jobs being created for women in the mining sector. This can occur as mining companies try to meet the government's requirement to have 10% of jobs filled by women by 2009. Under the mining charter, a large share of unskilled workers and workers laid-off from the contracting and efficient sectors are set to take up positions in mining. This, however, follows the assumption that the sector has the capacity and the willingness to expand production and that adjustment for workers shifting sectors is costless.

Due to factor mobility, which is allowed in the model, some of the unskilled women workers, who lose their jobs in the import-competing   sectors, obtain employment in other sectors,

particularly agriculture and the service sectors. The service sector tends to employ a large proportion of unskilled women because of the low level of expertise required in some of its subsectors. Many women are therefore able to enter this sector with ease. As a result, employment made through exports and increased services partly match those lost due to imports. This reflects reforms of the South African economy in the face of globalisation induced competition combined with domestic policies.

However, exports-led employment is insufficient to reduce unemployment, particularly for women, because most exporting sectors are capital-intensive and favour men's labour. The shift away from labour-intensive towards capital-intensive sectors reduces the trade's capacity to generate employment. This result is different from the outcome in the emerging economies where the industrialisation has been as much women-led as it has been export-led. For example, Ozler (2000) found that the export-led industrialisation policies in Turkey increased the women intensity in the export sectors. The high levels of education among women in the emerging economies, compared with the level of education of many of the South African women, might explain this difference.

Sectors with the highest ratio of export to total sales seem to be the ones where employment levels have increased. Exports have positive effects on employment, mostly for skilled workers and unskilled men. Unskilled and semi-skilled women labour benefit from employment created mostly in service sectors which are mainly low-paying jobs. Therefore, the larger the share of exports relative to domestic sales, the higher the employment level and the more highly-skilled workers and unskilled men are employed relative to unskilled and semi-skilled women labour.

Focusing on direct labour creation alone can be misleading, because it ignores the important and, in many cases, much larger contribution by linkages among sectors in the economy. Besides sectoral linkages, other factors such as availability of skills and capital are important when considering job creation. In the short run, there are possible costs to the rest of the economy in expanding output in particular sectors.

The results show improved earnings for capital and skilled labour, which benefits high-income households that derive most of their income from ownership of such factors. On the other hand, low-income households gain from employment growth of unskilled labour in export-oriented and service sectors, and from   reduced domestic consumer prices enabled

by cheap imports. Although this study does not model consumption patterns between men and women, there is strong evidence that indicates that women spend a large share of their income on consumables such as food, footwear and clothing (IES 1995, 2000).

The effects of trade liberalisation are gender-differentiated given differences in skills between men and women coupled with the prevailing market segmentations. While some women have gained in terms of employment, others have lost their livelihood because of import competition. Exporters often are relatively skills-intensive employers, meaning that growth in exports will not necessarily produce increasing employment for the less-skilled, particularly women.

Trade liberalisation shows a declining gender earning gap between skilled men and women workers, while indicating a significant earning gap between unskilled men and women with unskilled men gaining the most. This suggests the importance of government's dealing with the skills gap between men and women. The challenge for women includes transferable skills and their reproductive roles.

10.3   IMPACTS RELATED TO PRODUCTIVITY INCREASE (FDI)

This study constructed two scenarios to ascertain the effects of a productivity increase on gender, employment, wages, and the welfare of households. The first scenario allows the productivity increase to encompass all sectors (economy-wide), while the second scenario restricts productivity increase to a few selected sectors.

The results show that productivity improves efficiency, generates direct welfare benefits, creates multiplier effects through sectoral linkages and is a step towards improved economic growth. In addition, increased production is accompanied by a decline in product prices which, coupled with increased income earnings, improves welfare of all categories of household welfare.

Economy-wide productivity expands employment and factor income of all skill types of men and women with skilled men benefiting the most in many sectors. These sectors use technologies that require skills mostly possessed by skilled men. As predicted by Pissarides (1997) and Berman and Machin (2000), productivity increases the relative demand for skilled labour by increasing the use of foreign, skills-based technologies by individual sectors and

enterprises. At the same time, economy-wide productivity results in increased demand for unskilled women workers relative to unskilled men workers. This is because, as the economy expands, extra output is generated that requires the employment of unskilled and semi-skilled women labour whose marginal productivity is low related to their lower wages from the base year level.

The lack of appropriate skills among women workers relative to men reduces the number of women benefiting from opportunities which arise from increased productivity. This is based on the disparity between men and women in acquiring skills through education. Education statistics show that, while men concentrate on scientific subjects, women concentrate in non-scientific subjects. Other factors such as gender sector segmentation, and inequalities in resources (land, credits) acquisitions, hinder most women from exploiting opportunities resulting from productivity increases.

When productivity increases only in few selected sectors, unskilled women face more of the negative effects than men. Under this scenario, a productivity rise boosts production in the selected sectors while reducing employment of unskilled women and men. This outcome implies that an increase in output does not necessarily result in job creation.

The results of the two simulations show that the key challenge in South Africa, from a gender employment perspective, is to promote productivity economy-wide rather than concentrating on a few sectors. For example, the government policy which promotes only high-technological oriented foreign firms (FDI) must be replaced by the one which promotes economy-wide FDI in order to garner maximum benefits for all.

Because South Africa has a chronic unemployment rate, particularly among women, it is expected that globalisation would reduce the relative demand for skilled labour by shifting the structure of production towards more unskilled labour-intensive sectors, as predicted by the standard Hecksher Ohlin theory. However, reductions in barriers to foreign investment increase the relative demand for skilled labour, by shifting the structure of production towards more skills-intensive sectors, as predicted by Feenstra and Hanson (1997). As a result, productivity increases raise the relative demand for skilled labour, by increasing the use of foreign, skills-technologies by individual sectors (Pissarides 1997; Berman & Machin 2000). The results of this model follow such predictions by showing complementary aspects between capital and skilled labour. For example, the sensitivity analysis carried out through

sectoral fixation of capital, indicated moderate demand and returns for skilled men and women labour. However, as capital became mobile across sectors, the growth in demand and returns for skilled labour was significant, because capital augmented skilled labour.

The study also shows that a rise of factor productivity improves household welfare mostly for higher-income households, when compared with low-income households. This is because high-income households derive their earnings from skilled labour, coupled with ownership of capital, relative to low-income households. Low-income households depend on unskilled labour earnings which are from jobs in low-paying low-productivity sectors.

The results of the study show that South Africa is losing its comparative advantage in cheap unskilled labour through the growth of capital-intensive production systems. From an employment standpoint, investing in human capital, especially for women, should be a key step in any FDI programme. Greater attention must be given to attracting women in the areas such as science, engineering, and information technology, which are associated with FDI technologies and hence high productivity. However, policy should promote FDI across the economy in order to encompass sectors which are women-intensive. If a strategic approach is not embraced, FDI and hence productivity may result in maintaining gender inequality as it has mainly in the developing world (Mitter & Rowboth 1995; Zaucher et al. 2000).

10.4   IMPACTS RELATED TO THE DOHA ROUND

The Doha Round is expected to have relatively small effects at the aggregate level, with small changes in GDP and exchange rates. This is because the South African agricultural sector plays a marginal role in terms of agricultural imports and exports and total economic output, with all shares estimated at around 4 percent. Furthermore, tariff rates for agriculture are relatively low with an average rate of 15%. However, with the implementation of the Doha Round, agricultural sectoral changes in output, trade and employment will be significant. South African agricultural producers of affected products are expected to benefit from the consequent increase in world price of these products after major subsidising countries reduce their export subsidies.

Although trade reform will bring substantial benefits to South Africa, the crucial question is: which category of households in South Africa will benefit? Many believe that all the benefits will go to large commercial farmers, thereby worsening the income distribution in South

Africa. However, the simulations conducted in this study show that the additional employment generated by the expansion of agriculture and related sectors such as food, chemicals, water and service sectors, will benefit poor households which usually comprise unskilled workers. However, the income distribution in South Africa will not improve because the sector is highly capital-intensive, which benefit owners of capital who are mainly high-income households.

In particular, South African maize, fruit and vegetables output and exports will increase substantially. Domestic production and exports of food and beverage and tobacco increase due to close linkages with the agricultural sector. While imports of fruit and vegetables fall, imports of wheat, maize, livestock, poultry and other agriculture increase. Increased imports of maize is partly explained by the increasing trade between South Africa and SADC countries, most of which countries have comparative advantage in the production of maize. In addition, South Africa has signed a free trade agreement with SADC countries whereby SADC products face limited import duties. Maize is of major importance for South Africa as it yields over 15% of the gross value of all agricultural products, while accounting for about 40% of the cultivated area in the country (World Bank 1994). In addition, maize is the largest harvested crop for local consumption and an important source of carbohydrates for humans and animals alike. Imports increase, however, in other agricultural commodities such as poultry, and "other agricultural" sectors. Imports of non-agricultural-related products, where world prices are assumed to remain the same under the simulation scenario, increase slightly by less than a percentage point except in the food and beverages, and leather and footwear which rise by a percentage point. The outcome partly reflects sectoral differences in production technologies and initial levels of protection.

Output and exports increase greatly in the maize and vegetables and fruits subsectors with the Doha Round. Increases in agriculture exports might not necessarily benefit most women farmers, because in most cases they lack ownership of land, credit, inputs, extension services and information concerning marketing in South Africa (Budlender 2000; Verhoef 1996). The livelihood of women who are engaged in the production and sale of fruit and vegetables is likely to be enhanced by the rise in world agricultural prices.

The expansion in agricultural output, supported by export growth, necessitates changes in employment especially in the maize and fruits and vegetables sectors. These sectors witness

growth in employment demand. The simulation results show the relocation of mobile factors from the non-agricultural sectors of manufacturing, mining and service sectors into the profitable sector of agriculture. The demand for labour increases by 15.861% and 6.888% in maize and vegetable and fruits, respectively, while they decline by -1.765% in the wheat sector and slightly in the range of -0.1% and -0.5%, respectively, in the other agricultural subsectors and non-agricultural sectors. In agriculture, value added at factor cost and hence factor incomes increase the most in the maize sector by 2.579% above the base-year levels.

In terms of gender, the study found positive direct effects related to increases in unskilled women employment in the expanded agricultural subsectors of maize and fruits and vegetables, while declining in the contracting subsectors. This follows high level of employment of women in the fruits and vegetable subsector. The positive indirect employment effects were also felt in some manufacturing and service sectors due to inter-sectoral linkages. However, the low rate of world price increases as used in this study and the domestic policy of full tariff reduction reduce value added in all agricultural subsectors except in maize and vegetables and fruits subsectors, which leads to declining factor income returns.

The sensitivity analysis to ascertain the robustness of the model results was carried out using high rates of world price changes and moderate tariff reduction. The results of higher world price changes show that South Africa will benefit from the implementation of the Doha Round. Under this scenario, production and exports rise in all subsectors albeit slightly in commodities with low export shares from the base year level. Imports of all agricultural subsectors decline significantly while non-agricultural imports rise, which improves household welfare.

However, in order to realise benefits, results indicate that higher world prices changes are needed in order to offset the negative effects of the domestic agricultural policy such as tariff reduction on agriculture. As a result, most consumers, especially low-income households which comprise a big percentage of women, will be negatively affected by the increase in world price of maize. These households spend a great share of their income on food, particularly maize for their household (IES 2000). This outcome could threaten the food security, especially for those who do not produce their own food.

Improved production and exports necessitate employment demand for both men and women, particularly for unskilled women and skilled   men. Improved value added leads to higher

returns for all type of skills, mostly for skilled men and slightly for unskilled women. Highest returns accrue to capital. This outcome is similar to that of Adilu et al. (2004) who found higher price changes to cause gains of agricultural producers in Canada while low price changes caused negative effects on agricultural production and trade. In South Africa, McDonald and Kirsten (1998) used varying rates (5-20%) of world price rise to model its effects on the aggregate agricultural sector. Their results show the price rise by 20% to generate an increase in intermediate input demand of 6.9% and labour demand by 1.6%.

These effects accrue to men and women who are currently participating in the agricultural market sector and exclude the majority of rural farmers who produce for their own consumption. This is because part of agriculture produced for home consumption is not included in the 2000 gendered South African SAM. According to Klasen (1999), 66% of women activities, such as subsistence agriculture, are unrecorded and hence not included in the System of National Accounts (SNA).

This study also included simulations on the effects of single trade policy changes, i.e. tariff reductions and changes in world prices of imports and exports. These policies were simulated separately in order to compare the results of combined policies (tariff reductions and world price increases). As far as domestic production is concerned, the results of the separate simulation show that agriculture is better off with world price rises than with tariff reduction. On the other hand, agricultural exports, which have positive effects on capital and labour, are more encouraged by world price rises than by tariff reductions alone.

The demand for capital and labour in agriculture is positively impacted by the rise in world prices, which improves domestic production and negatively affected by reductions in tariffs which leads to declining domestic production. Although positive income earnings is realised in the agricultural sector, economy-wide earnings for all factors drop except for capital that sees increase in its earnings. In terms of gender, a tariff reduction reduces the demand for both women and men labour except for skilled men while the world price rises improves the demand for capital, men and women labour. Overall, the Doha Round has a positive effect on the employment of men and women and mostly for women in the maize and vegetables and fruits sectors. The increased demand for women labour, relative to that of men, is due to greater employment demand in the women-intensive sectors such as fruit and vegetables – these sectors favour unskilled women labour. However, labour demand declines in all other

agricultural subsectors of wheat, livestock, poultry and other-agriculture. In contrast, employment demand increases for both capital and labour in the non-agricultural sectors due to tariff reductions while employment declines in most of the non-agricultural sectors while it increase in most of the service subsectors and in water, machinery and equipments which are needed in the production of improved agriculture.

Several features of the model used in this study contribute to the analysis of the effects of the Doha Round on agriculture and gender. First, the disaggregation of the agricultural sector into subsectors illuminates important effects. Small effects of the Doha Round on the aggregate generally consisted of large changes in the individual agricultural sub-sectors and on the food, beverage and tobacco, chemical, other-chemicals, and water sectors, which are non-agricultural, but are sectors with linkages to the agricultural sector.

10.5 SUGGESTIONS FOR FURTHER RESEARCH

The study results show that women labour participation increases after changes in globalisation policies. However, it is difficult to determine whether women-created jobs are permanent, part-time or temporary positions thus making it difficult to determine the sustainability of created jobs. This is based on the short-run nature and static comparative results of the model used for this study. Such outcome of the model in the current and in other studies, have been the basis for criticism from researchers such as Ghosh (1999) and Joekes (1999) who are sceptical about the long-term impact of globalisation-created jobs, questioning their quality and their sustainability. This would necessitates introducing dynamism in the model in order to model long-term characteristics.

Although the model has proved useful for determining the impacts of globalisation on gender and the economy in South Africa, it could be extended to determine the effects on countries that have increased their trade with South Africa. For example, assessing the impact on men and women jobs in SADC countries given their free trade agreement with South Africa while recognising the high GDP for South Africa, which accounts for more than one third of the Sub-Saharan Africa total GDP.

The current model includes only three classes of labour: skilled, semi-skilled and unskilled, without distinguishing between unskilled labour in urban and agricultural labour markets. In South Africa, however, there is a large share of the economically active population,

particularly women who are engaged in small-scale agriculture. The labour market in that sector is quite distinct from urban labour markets. To reflect this reality, disaggregating labour into agricultural labour, urban unskilled labour, urban semi-skilled labour, and urban skilled labour together with gender would enhance the model. This could help capture the characteristics of subsistence agricultural production and subsistence farmers who are currently not represented in the SAM.

South Africa has a high rate of poverty, particularly among unskilled women. It is estimated that 35% of the population survive on two US dollars (2$). It is estimated that around 70% of South African residing in the rural areas are poor and mostly women (Budlender 2000). This study would be enhanced by the introduction of the 'microsimulation' methodology to analyse the impacts on income distribution and poverty due to macroeconomic policies.

SUMMARY

Globalisation has greatly increased the employment demand for labour, especially that of unskilled women. There is, however, increased demand of skilled women who are involved in higher-skill business services, such as software design, computer programming and financial services (banking and insurance) which follows the growth of globalisation-related employment in the service sector of tourism, finance, and information processing.

However, despite the rapid increase in sectoral employment for women, occupational segregation by gender remains a social constraint. Women dominate in clerical and secretarial jobs and in low-level service occupations such as shop assistants, waitresses, maids, hairdressers, and dressmakers. Other lower-skilled level service sectors that have seen an increase of women employment include data entry (see Chapter 4 for skills identification). In high paying export-oriented mining sectors, women are most likely to be clerks, teachers or nurses. These "women occupations" generally pay less and have lesser status and advancement potential. In addition, such types of jobs are excluded from formal and informal networks, mainly men's networks, which are important for advancement within sectors.

Although women still earn less than their men counterparts for every level of educational qualification/skill in South Africa, the wage gap for more highly skilled women is getting smaller. Initial higher wages for skilled women come from improvement in higher wages that women workers have achieved in recent years, which have resulted in part from changes in

the pattern of occupational segregation, as skilled women have been recruited at higher levels. The enactments of various equal rights labour laws have also contributed to the improvement in women working conditions (see Chapter 2). The gender wage gap has shown a tendency to diminish with women's increased participation in paid work, especially for skilled women.

Globalisation appears to have been a key source of employment for women in South Africa, which has positive implications for unemployment alleviation. On contrast, globalisation has also been a key source of loss of employment for women mostly in women-intensives sectors, such as textile. These sectors face global competition from well-established and well-capitalised foreign sectors and in many cases they cannot survive. Men and women labour made redundant by cut backs in production/output is not easily absorbed, thus exacerbating the problem of long-term unemployment. In most instances, however, these job losses have been offset by the jobs which have been created mostly in highly productive sectors. These sectors, however, attract women at lower-skilled levels. As such, globalisation is credited for both creating and for shedding jobs in the South African economy.

The study results indicate that export-oriented sectors of mining (gold, coal, other-mining) and service (trade, transportation, hotel and communication) sectors which have low protection in the base year level gain the most from globalisation policies. On the other hand, textiles, footwear, leather, rubber, glass, apparel, wood, non-metal minerals, and metal products, which are sectors with initial high levels of protections (see Table 4.16), are negatively affected by globalisation policies. The service sector benefits the most compared to manufacturing in terms of employment with globalisation policies because the sector is the highest employer of all skill types from the base year level (see Chapter 4).

Paid employment is vital for women. For example, the income and expenditure survey (IES 2000) show the earnings of women to be mostly allocated to education, health and nutritional well-being of their children. Thus, any increase in women's employment and/or increases in their wages are likely to improve the quality of life in households where women work. This study has found the regularity of the wages from jobs and the location of the work outside the sphere of control of men to have empowered women, and to have increased their influence on personal and household decision-making and their autonomy. Even unskilled women, who earn less than their skilled counterparts, report greater autonomy and improved household and personal decision-making.

REFERENCES

ActionAid. 2002. Farmgate: The developmental impact of agricultural subsidies. London: ActionAid.

Adilu, S., Veeman, M. and Veeman, T. 2004. Implications of the Multilateral Trade Agreement for Canadian Agriculture. A Computable General Equilibrium Evaluation. *Staff Paper 98-04*. (Online) Available from: http://www.ifpri.org.

Adler, D N.J. and Izrael, D.N. 1994, *Competitive frontiers*: *Women managers in a global economy.* Cambridge (USA)/Oxford (England): Blackwell publishers.

Agarwal, B. 1994a. Gender and command over property: a critical gap in economic analysis and policy in South Asia, *World Development,* 22 (10).

Agarwal, B. 1994b. *A field of one's own: gender and land rights in South Asia.* Cambridge: Cambridge University Press.

Aitken, B. J. and Harrison, A.E. 1999. Do domestic firms benefit from direct foreign investiment? Evidence from Venezuela. *American Economic Review,* 89(3):605-618.

Aitken, B., Harrison, A. and Lipsey, R. 1996. Wages and foreign ownership: a comparative study of Mexico, Venezuela, and the United States. *Journal of International Economics*, 40 (3/4):345-371.

Arezki, R., Ahmed, F. and Funke, N. 2003. Foreign Direct Investment and Portifolio Flows: Is South Africa Different. *mimeo*. Washington DC. International Monetary Fund.

Armah, B. 1995. Impact of trade on service sector employment: implications for women and minorities. *Contemporary Economic Policy*, 12 (1):67-78.

Armington, P.S. 1969. A theory of demand from products distinguished by place of production. Washington, DC. *IMF Staff Paper,* 16 (1):159-178

Arndt, C. and Tarp, F. 2000. Agricultural technology, risk and gender: a CGE analysis for Mozambique. *World Development,* 28(7): 1307-1326.

Ardnt, C., Robinson, S. and Tarp, F. (2000) trade reform and gender in Mozambique.

Washington DC: International Food Policy Research Institute (IFPRI).

Artecona, R. and Cunningaham, W. 2002. *Effects of trade liberalization on the gender wage gap in Mexico*. Available: Internet: http://www.ifpri.org.

Aurora, V. and Bhundia, A. 2003. Potential output and total factor productivity growth in post-apartheid South Africa. Washigton DC. *Working Paper,* IMF 03/178.

Baldwin, R. 1995. The effect of trade and foreign direct investment on employment and relative wages. *NBER Working Paper* no. 5037, Cambridge (MA): National Bureau of Economic Research.

Barker, F. S. 1999. The South African labour market: critical issues for renaissance. Pretoria, J.L. van Schaik Publishers.

Barrel, R. and Pain, N. 1997. Foreign direct investment, technological change, and economic growth within Europe. *The Economic Journal*, 107:1770-1786.

Becker, G.S. 1971. *The economics of discrimination*. Chicago: University of Chicago

Becker, G. 1981. *A treatise on the family*. Chicago. University of Chicago Press.

Beghin, J. and Aksoy, A. 2003. Agricultural trade and the Doha Round: lessons from commodity studies. *Briefing Paper*, Center for Agricultural and Rural Development, Iowa State University. Available: www.card.iastate.edu

Beghin, C. J., Roland-Holst, D. and Van der Mensbrugghe, D. 2002. Global agricultural trade and the Doha Round: What are the implications for North and South? *Working Paper 02-WP 308,* CARD, Iowa State University.

Berik, G. 2000. Mature export-led growth and gender wage inequality in Taiwan, *Feminist Economics*, 6 (3):1-26.

Berik. G., Van der Meulen, R.Y. and Zveglich, J.E. Jr. 2002. Does trade promote gender wage equity? Evidence from East Asia. *Working Paper, No-373*. Center for economic policy analysis, New school University. Available: Internet: www.card.iastate.edu

Berik, G. 2003. Taiwan wage gap: 2000. Mature export-led growth and Taiwan. *Feminist*

Economics 6 (3):1-26.

Berman, B. and Griliches. 1994. Changes in the demand for skilled labour within U.S. manufacturing: evidence from the annual survey of manufactures. *Quarterly Journal of Economics,* 109(2): 367-397.

Berman, E. and Machin, S. 2000. Skill-Biased Technology Transfer: Evidence of Factor-*Biased Technological Change in Developing Countries*. Mimeograph, January.

Beyer, H., Rojas, P. and Rodrigo, V. 1999. Trade liberalization and wage inequality, *Journal of Development Economics,* Elsevier, 59(1):103-123.

Bezuidenhout, A., Khunou, G., Mosoetsa, S., Sutherland, K. and Thoburn, J. 2006. Globalisation and Poverty: Impacts on Households of Employment and Restructuring in the Textiles Industry of South Africa. *Journal of International Development: Forthcoming.*

Biggs, T. Shah, M. and Srivastava, P. 1995. Technological Capabilities and Learning in African Enterprises." *World Bank Technical Paper 288* (Africa Technical Department Series). Washington DC: World Bank.

Blalock, G. 2002. Technology adoption from foreign direct investment and exporting: evidence from Indonesian manufacturing, *Phd thesis*, University of California, Berkeley, Haas School of Business.

Blalock, G. and Gertler, J. 2005. Foreign direct investment and externalities: the case for public intervention. In Moran, T., Graham, E., and Blomström, M, (eds.), Institute for International Economics. Washington, D.C:

Blomström, M. and Sjöholm, F. 1999. Technology Transfer and Spillovers: Does Local Participation with Multinationals Matter?, *European Economic Review*, 43:915-23.

Bollen, S., Artz, L.,Vetten, L and Louw, A. 1999. *Violence against women in metropolitan South Africa: a study on impact and service delivery*. ISS Monograph Series No. 41. Pretoria: Institute of Security Studies.

Braunstein, E. 2000. Engendering foreign direct investment: family structure, labour markets

and international capital mobility. *World Development*, 28 (7):1157-72.

Brooke, A., Kendrick, A. and Meeraus, A. 1988. GAMS: *A User's guide*. New York: The scientific press.

Bryceson, D.F. 2002. The Scramble in Africa: Reorienting Rural Livelihoods, *World Development*, Vol. 30, No. 5, May 2002.

Budlender, D. 1996. Profiles of South African women, in: Budlender D (Ed). The Women's Budget. Cape Town: Creda Press.

Budlender, D. 1998. The third women's budget. Cape Town: IDASA, Available: Internet: www.card.iastate.edu

Budlender, D. 2000 The political economy of women's budgets in the South. *World Development,* 28(7): 1365-1378.

Budlender, D. 2002. *Women and men in South Africa.* Pretoria, *mimeo*. Statistical booklet prepared for Central Statistical Services.

Buijs, G. and Atherfold, G. 1995. *Savings and money-lending schemes: how rotating credit associations help poor families*. Co-operative Research Programme on Marriage and Family Life. Pretoria: Human Sciences Research Council.

Cagatay, N. 2001. *Trade, gender and poverty*. New York:UNDP.

Cagatay, N, Elson, D. and Grown, C. 1995. "Introduction" World Development special issue on Gender, adjustment and macroeconomics. *World Development,* 23(11).

Cagatay, N. and Ozler, S. 1995. Feminization of the Labor Force: The effects of long-term economic development and structural adjustment. *World development* 23 (8):

Casale, D. and Posel, D. 2001. Gender aggregates: Women subsistence farmers affecting the unemployment count, *Agenda*, 49: 82-88.

Casale, D. and Posel, D. 2002. The continued feminisation of the labour force in South Africa:analysis of recent data and trends. *South African Journal of Economics,* 70(1):156-184.

Cassim, R., Onyango, D. and Van Seventer, D.E.N. 2002. *The* state *of* trade policy *in South Africa*. Johannesburg: Trade and Industrial Policy Strategies (TIPS).

Central Statistical Services. 2001. Census '01: Preliminary estimates of the size of the population of South Africa. Pretoria: CSS.

Central Statistical Services. 1993. *Final Social Accounting Matrices for South Africa*, 1993. Pretoria: CSS.

Chambers, R.G. 1995. The incidence of agricultural policies. *Journal of Public Economic,* 57(2): 317-35.

Chambers, J. 2000. Gender and globalisation: trade liberalisation and gender equality, *Background paper for the DFID white paper on "Eliminating world poverty: Making globalisation work for the poor"*. Available: http://www.globalisation.gov.uk/genderChamber

Chiappori, P. A. 1992. Collective Labor Supply and Welfare, *Journal of Political Economy*, 100:437-467.

Coe, D., Helpman, E. and Hoffmaister, A. 1997. North-South R&D spillover. *The economic Journal,* 107(440):134-139.

Conningarth Consultants. 2000. Macroeconomic impact of the wine industry on the Western Cape. SAWIS.

Cotton, L. and Ramachandran, V. 2001. 'Foreign Direct Investment in Emerging Economies: Lessons from sub-Saharan Africa' *WIDER Discussion Paper* No. 2001/82. CREFSA.

Deininger, K. and May, J. 2000. Is there scope for growth with equity: An initial assessment of land reform in South Africa. Policy research working paper, No. 2451, Washington, DC, World Bank.

Djankov, S. and Hoekman, B.M. 2000. Foreign investment and productivity growth in Czech Enterprises. *World Bank Economic Review*. Oxford University Press, 14(1): January 49-64.

De Melo, J and Tarr, D. 1992. A general equilibrium analysis of U.S. foreign trade policy. Cambridge, Mass.,U.S.A and London: Massachusetts Institute of Technology Press.

Department of Welfare. 1999. South Africa's first report on the implemetation of CEDAW.

Pretoria: Department of Welfare.

Devarajan, S. and Robinson, S. 2002. The influence of computable General Equilibrium models on policy. TMD *Discussion Pa*per, No. 98. Washington, DC: International Food Policy Research Institute (IFPRI).

Dervis, K., de Melo, J. and Robinson, S. 1982. *General Equilibrium Models for development policy*. New York: Cambridge University Press.

Diao, X., Rattsø, J. and Stokke, H.E. 2005. International spillovers, productivity growth, and openness in Thailand: an intertemporal general equilibrium analysis. *Journal of Development Economics* 76:429-450.

Edwards, L. 2001. a) Globalization and the skill bias of occupational employment in South Africa, *South African journal of economics,* 69 (1):40-71.

Edwards, L. 2001 b) Globalisation and the occupational structure of employment in South Africa, *South African Journal of Economics*, 69(1).

Edwards, L. 2003. Firm level analysis of trade, technology and employment in South Africa, *Journal of International Development*, 15.

Edward, L. and Golub, S. 2002. *South Africa's international cost competitiveness and productivity: a sector analysis*. Report prepared for the South African National Treasury: USAID/Nathan Associates.

Edwards, L. and Golub, S.S. 2004. South Africa's international cost competitiveness and exports in manufacturing. *World Development*, 32(8):1323-1339.

Edwards, S. 1998. Openness, productivity and growth: what do we really know? *Economic Journal,* 108:383-398.

Elson, D. and Pearson, R. 1981. Nimble fingers make cheap workers: an analysis of women's employment in Third World export manufacturing. *Feminist Review*, 7: 87-107.

Elson, D. 1995: Gender Awareness in Modeling Structural Adjustment, *World Development*, 23(11).

Elson, D. 1996. Appraising recent developments in the world market for nimble fingers. In A. Chhachhi, & R. Pittin, Confronting state, capital and patriarchy: women organizing in the process of industrialization. Basingstoke: Macmillan.

Elson, D. and Cagatay, N. 2000. The Social Content of Macroeconomic Policies. *World Development,* 28(7).

Erturk, K. and Darity, W. 2000. Secular changes in the gender composition of employment and growth dynamics in the North and South. *World Development,* 28(7):1231–1238.

Fallon, P. and Pereira de Silva, L.1994. South Africa: Economic performance and policies. World Bank informal discussion papers on aspects of the South African economy. No. 7. The Southern Africa department, The world Bank.

FAOSTAT. 2006. Agricultural statistics data. Rome :FAO. Available: FAOSTAT@fao.org

Fedderke, J., Shin Y. and Vaze, P. 2003. *Trade and labour usage: An examination of the South African manufacturing industry*. Econometric Research Southern Africa, Johannesburg:Working Paper no. 15. University of Witwatersrand.

Fedderke, J. and Vaze, P. 2001. The nature of South Africa's trade patterns by economic sector, and the extent of trade liberalisation during the course of the 1990's, *South African Journal of Economics*, 69(3):

Fedderke, J. 2001. The contribution of growth in total factor productivity to growth in South Africa, 1970-1997, Econometric Research Southern Africa Policy Paper, University of the Witwatersrand.

Fedderke, J., Shin, Y. and Vase, P. 2003. Trade, technology and wage inequality in South Africa.

Fedderke, J. and P. Vaze. 2001. The nature of South Africa's trade patterns by economic sector, and the extent of trade liberalization during the course of the 1990s, *The South African Journal of Economics,* 69, (3):436- 473.

Feenstra, R. and. Hanson, G. 1997. Foreign direct investment and relative wages: Evidence

from Mexico's maquiladoras. *Journal of International Economics*, 42(3–4):371–393.

Finnermore, M. and Van Der Merwe. 1996. Introduction to labour relations in South Africa (4th Edition). Durban: Butterworth Publishers.

Floro, M.S. 1999. Restructuring of labour markets in the Philippines and Zambia: the Gender dimension, *the Journal of developing areas*, 33:73-98

Fofana, I., Decaluwe, B., Cockburn, J., Mabugu, R. and Chitiga, M. 2005. *Does trade liberalization leave women behind in South Africa?* Paper presented to the Poverty and Economic Policy Network, (June). Colombo, Sri Lanka:PEP.

Fofana, I., Cockburn, J. and Décaluwé, B. 2003b. *Developing country superwomen: impacts of trade liberalisation on female market and domestic work*. PEP network training material. Université Laval.

Fontana, M. and Wood, A. 2000. Modeling the effects of trade on women at work and at home. *World Development*, 28. (7): 1173-90.

Fontana, M. 2001. *Modeling the effects of trade on women: A closer look at Bangladesh*, *Working Paper 139*. Brighton :Institute of Development Studies.

Fontana, M. 2002. *Modeling the effects of trade on women: The case of Zambia*, Working Paper 155. Brighton. Institute of Development Studies

Fontana, M**.,** Jockes, S. and Masika, R. 1998. *Global trade Expansion and Liberalization: Gender Issue and Impacts*. Bridge Report No 42, IDS, Brighton.

Forteza, A. and Rama, M. 2000. Labor market 'rigidity' and the success of economic reforms across more than one hundred countries, Paper prepared for the World Bank research project on 'The Impact of Labor Market Policies and Institutions on Economic Performance'.

Fussel, E. 2000. Making Labour Flexible: The Recomposition of Tijuana's Maquiladora Female Labour force, *Feminist Economics*, 6(3)

GEAR. 1996. *Growth, employment and redistribution: a macroeconomic strategy*. Republic of South Africa, Pretoria: Government Printer.

Gelb, S. and Black, A. 2000. Foreign Direct Investment in South Africa, *Investment Strategies in Emerging Markets:* 177-212.

Ghosh, J. 1999. Economic empowerement of women. Paper presented at UN economic and social commission for Asia and the Pacific conference.

Gibson, B. and Van Seventer, D. 1996b. Trade, growth and distribution in the South African economy, *Development Southern Afric*a, 13(5):771-792.

Gibson, K.L. 2003. Armington elasticities for South Africa: long run and short-run industry level estimates. Available:http//www.tips.org.za.

Gibson, B. and van Seventer, D.E. 2000. Real wages, employment and macroeconomic policy in a structuralist model for South Africa. *Journal of African Economies* 9(4): 512-46.

Gondwe, G.E. 2001. Making globalization work in Africa. *Finance and Development*, December, 38(4):

Gouws, A. 1996. The rise of the femocrat, *Agenda* No. 30:31-43.

Graham, E. and Wada, E. 2000. Domestic reform, trade and investment liberalization, financial crisis, and foreign direct investment in Mexico, *The world economy* 23(6):777-797

Grossman, G. M. and Helpman E. 1991. *Innovation and growth in the global economy*. Cambridge MA: MIT Press.

Grossman, G. M. and Helpman, E. 1997. Innovation and Growth in the Global Economy. MIT Press: Cambridge MA.

Ghuman, J. S, Lee, J. H and Smith, H.L. 2000. Measurement of female autonomy according to women and their husbands: results from five Asian countries, mimeo, University of Pennsylvania.

Haddad, M. and Harrison, A. 1993. Are there positive spillovers from direct foreign investment?. *Journal of Development Economics*, 42:51-74.

Haddad, L., J. Hoddinott, and H. Alderman (Eds.) 1997. Intrahousehold resource allocation:

Methods, Models and Policy. Johns Hopkins University Press.

Haddad, L., Richter, A. and Smith, A. 1995. The gender dimensions of economic adjustment policies: potential interactions and evidence to date. *World Development,* 23 (6):881-96.

Harris, R. and Robinson, C. 2002. The Impact of Foreign Acquisitions on Total Factor Productivity: Plant Level Evidence from UK Manufacturing 1987–1992, Review of Economics and Statistics, Vol. 84:562–568.

Harrison, A. and Hanson, G. 1999. Who gains from trade reform?Some remaining puzzles,' *Journal of Development Economics,* Elsevier, 59(1):June 125-154.

Haskel, J., Pereira, S. and Slaughter, M. 2002. Does inward foreign investment boost the productivity of domestic firms? *Discussion Paper no.* 3384, C.E.P.R.

Hertel, T.W. 1992. Partial versus general equilibrium analysis of trade reforms. *Journal of agricultural economic resource* 44:3-15.

Hoddinot, J. and Haddad, L 1991. Household expenditures, child anthropometric status and the intra-household division of income: evidence from the Côte d'lvoire. Washington, DC: IFPRI.

Hodge, James. 2002. Liberalization of Trade in Services in Developing Countries, in Hoekman, Bernard, Aaditya Mattoo, and Philip English, 2002 eds. Development, Trade and the WTO: a Handbook. Washington DC. The World Bank.

Hoekman, B., Nicita, A. and Olarreaga, M. 2004. *Can Doha deliver the development round?* Mimeo, Washington D.C: The World Bank.

Holden, M. and Casale, D. 2002. Endogenous protection in a trade liberalising economy: the case of South Africa. *Contemporary Economic Policy*, 20 (4):479-489.

ILO. 1999. ILO Report on Social Impact of Globalisation, Geneva: ILO.

Jenkins, C. and Thomas, L. 2002. Foreign direct investment in Southern Africa: determinants, characteristics, and implications for economic growth and poverty alleviation. London:School of Economics. University of Oxford.

Joekes, S. 1999a. A gender analytical perspective on trade and sustainable development in *Trade, Sustainable Development and Gender*, New York : UNCTAD:33-59.

Joekes, S. and Weston. 1994. *Women and the new trade agenda*. New York: UNIFEM.

Johansson, H. and Nilsson, L. 1997. Export Processing Zones as Catalysts. *World Development,* 25(17): 2115-2128.

Kabeer, N. 1997. Women, wages and intrahousehold power relations in urban Bangladesh. *Development and Change*. 28:261-302.

Kabeer, N. 1999. Resources, agency, achievements: reflections on the measurement of women's empowerment, *Development and Change* 30:435–464.

Kanbur, R. 2001. Qualitative and quantitative poverty appraisal: complementarities, tensions and the way forward. workshop paper: March 15-16, 2001. New York: Cornel University.

Kanbur, R. and Haddad, L. 1994. Are better off households more unequal or less unequal?. Oxford Economic Papers, 46:.

Kassier Report. South Africa. 1992. Report of the committee for the development of a food and nutrition strategy for Southern Africa, Pretoria: Department of Agriculture.

Klein, M., Aaron, C. and Hadjimichael, B. 2000. Foreign Direct Investment and poverty reduction. World Bank. OECD.

Klasen, S. and Woolard, J. 2000. Levels, trends and consistency of measured employment and unemployment in South Africa. *Development Southern Africa,* 16:3-35.

Kilkenny, M. and Robinson, S. 1990. Computable General Equilibrium Analysis of agricultural liberalization: factor mobility and macro closure. *Journal of policy modeling.* 12(3):527–556.

Kritzinger-Van Niekerk., L.K. Eckert, J.B. and Vink, N. 1992. Toward a democratic economy in South Africa: An approach to economic restructuring. *Unpublished report*. DBSA.

Kucera, D. and Milberg, W. 2000. Gender segregation and gender bias in manufacturing trade

expansion: revisiting the 'Wood symmetry'. World Development. 28 (7):1191-1210.

Kudat A. 1989. *Participation of women in rural road maintenance in Sub-Saharan Africa.* mimeo, Washington DC:The World Bank.

Kumar, N. 1995. '*Does technology bode well for working women? An evaluation and analysis,* Discussion Paper Series. New York:The United Nations University, Institute for new Technologies (INTECH).

Kusi, N.K. (2002). Trade liberalisation and South Africa's export performance. Unpublished document, Trade and Industrial Policy Strategies (TIPS).

Leresche, A. 1993. Women obstacles and opportunities, *The Innes Labour Brief,* 4:52-61.

Lewis, J. 2001. Reform and opportunity: changing role and patterns of trade in South Africa and SADC, Africa Region *Working Paper Series* No.14, Washington DC: The World Bank.

Lewis, J. 2001. *Policies to promote growth in South Afric*a, *Discussion Paper 16*, Informal discussion papers on aspects of the South African economy, Southern Africa Department. Washington DC: The World Bank.

Lim, L. and Fong, P.E. 1982. Vertical linkages and multinational enterprises in developing countries. *World Development.* 10:585-595.

Lipton, M. and Lipton, L. 1993. Creating rural livelihood: some lessons for South Africa from experience elsewhere. *World Development Report*, 21 (9):1515-1548.

Löfgren, H., Lee Harris, R. and Robinson, S. 2001. 'A Standard Computable General Equilibrium (CGE) model in GAMS', *Discussion Paper 7*5: 8-19. Washington, D.C: IFPRI *TMD.* Available:Internet: http://www.ifpri.org.

Löfgren, H. and Robinson, S. 1997. 'The Mixed-complementarity approach to specifying agricultural supply in computable General Equilibrium Models', *TMD Discussion Paper* 20, Washington, D.C:IFPRI. Available:Internet: http://www.ifpri.org.

Mai, Y. 2003. Effects of Reducing Tariffs and Endogenous Productivity Growth *General Working Paper No. G-139 December 2003* Centre of Policy Studies, Monash University.

McKinsey Global Institute. 2003. New Horizons: Multinational Company Investment in Developing Economies. San Francisco.

Markusen, J.R. and Venables, A. 1999. Foreign direct investment as a catalyst for industrial development. *European Economic Review,* 43: 335-356.

Masson, P. 2001. Globalisation: Facts and figures, *policy discussion paper.* PDP/2001/4. IMF.

Mazumdar, Dipak, and Mazaheri, A. 2000. Wages and employment in Africa. R*egional Program on Enterprise Development Discussion Papers*. Washington DC:World Bank.

McDonald, S. and Kirsten, J. 1998. A multi-sector database for the analysis of agricultural policy reform in South Africa, *Agrekon*, 36(4):513-532.

McDougall, R. 1999. *Entropy Theory and RAS Are Friends*, Available: (http://www.sjfi.dk/papers/McDougall.pdf).

Mehra, R. and Gammage, S. 1999. 'Trends, countertrends, and gaps in women"s employment'. *World Development*, 27 (2): 533-550.

Mitter, S and Rowbotham, S. 1995. Women encounter technology: changing patterns of employment in the Third World. London: Routledge, UNU press.

Miyamoto, K. 2003. Human capital formation and foreign direct investment in developing countries, *Working Paper* No.211. OECD Development Centre.

Mohau, P. 2001. "*Gender and Trade in Africa: Has Liberalization gone too far?*". Cape Town. UNCTAD.

Molokomme, A. 2001. Gender and human development,' *African Political and Economic Monthly,* 14 (5):11-39.

Nash, J.F. 1950. The bargaining problem, *Econometrica*.

Natrass, N. and Seeking, J. 2000. Globalisation and inequality in South Africa, Paper prepared for the OECD conference on Poverty and Income Inequality in Developing Countries, Paris, OECD.

O' Rourke, K.H. and Williamson, J.G. 2000. When did globalization begin? *NBER working paper 7632*, London:Cambridge.

Onyango, S. 2000. Understanding the effects of trade policy reform: the case of South Africa. *The South African Journal of Economic*s, 4(68):607-635.

Oostendorp, R. 2004. *Globalisation and the gender wage gap.* Policy Research Working Paper 3256, Washington DC: The World Bank.

Ozler, S. 2000. Export orientation and female share of employment : Evidence from Turkey. *World Development*, 28(7), 1239-1248.

Oyugi, F. 2002. Overview of the programme on mainstreaming gender in the national budget and macroeconomic policies in Kenya. A paper presented at the Citizen's Policy and Budget Monitoring Forum Organised by CARE-Kenya at Holiday Inn, Nairobi.

Pissarides, C. 1997. Learning by trading and the returns to human capital in developing countries. *World Bank Economic Review*, 11(1): 17–32.

Pretorius, A. 2002. *How does globalisation affect income distribution in South Africa*?, a paper presented at TIPS Annual Forum, Muldersdrift, Johannesburg, TIPS.

Punt, C., Pauw, K., Van Schoor, M., Rantho, L., Gilimani, B., McDonald, S., Chant, L. and Valente, C. 2003. The welfare impacts of national and international agricultural efficiency gains-A South African Case Study. *PROVIDE* Working Paper Series, 2004:3.

Pyatt, G. and Thorbecke, E. 1976. Planning techniques for a better future, Geneva:ILO.

Quantech. 2004. *South African Standardised Industry Database,* Quantech Research. Trade and Industrial Policy Strategies. Available from:http://www.tips.org.za/data/

Quisumbing, A.R. 2003 *Household decisions, gender, and development: A Synthesis of Recent Research.* Washington, D.C: International Food Policy Research (IFPRI).

Rahman, L. and Rao, V. 2004. The determinants of gender equity in India: Examining Dyson and Moore's thesis new data *Population and Development Review,* 30(2)239-268

Rama, M. 2001. The gender implications of public sector downsizing: The reform program

of Vietnam. Policy Research Working Paper 2573, World Bank.

Ramachandran, V. and Shah, M.K. 1997. The effects of foreign ownership in Africa: evidence from Ghana, Kenya and Zimbabwe. *RPED Paper No. 81*. Washington, D.C.: World Bank.

Rangamsamy, L. and Harmse, C. 2003. Revisiting the extent of trade liberalisation in the 1990s, *South African Journal of economics*, 70(4):705-728.

Rattsø, J. 1982. Different macroclosures of the original Johansen model and their importance in policy evaluation. *Journal of policy modelling*, 4:85-98.

Rattsø, J. and H. E. Stokke. 2003. 'Learning and foreign technology spillovers in Thailand: Empirical evidence on productivity dynamics', *Nordic Journal of Political Economy* 29(1):47-66.

Republic of South Africa (RSA). RDP. 1993. *Reconstruction and development programme,* 5th *draft,* 26.11.93. Government Printer.

Republic of South Africa. 1996. The Constitution of the Republic of South Africa. *Act 108 of 1996.* Pretoria: Government Printer.

Ritchie, B.K. 2002. Foreign Direct investment and intellectual capital formation in Southeast Asia, OECD technical paper No. 194. Paris. OECD development centre.

Rivera-Batiz, L. and Romer. 1991. Economic Integration and Endogenous Growth. *The Quarterly Journal of Economics*, VCI, 106(2):531-556.

Robinson, S., Yunez-Naude, A., Hinojosa-Ojeda, R. Lewis, J.D. and Devarajan, S. 1999. From stylized to applied models: building multisector CGE models for policy analysis. *North American Journal of Economics and Finance,* 10, (1):5-38(34).

Robinson, S. 1989. Multisector models. In *Handbook of development economics*, ed. H. Chenery and T.N. Srinivasan. Amsterdam: North-Holland.

Robinson, S., A. Cattaneo, and M. El-Said. 2001. Updating and estimating a social accounting matrix using cross entropy methods, *Economic Systems Research,* 13, (1): 47-64.

Roberts, S. 2000. Understanding the effects of trade policy reform: the case of South Africa. *The South African Journal of Economic*s, 68, (4): 607-635.

Rodriguez, F. and Rodrik, D. 1999. Trade policy and economic growth: A skeptic's guide to the cross-national evidence. NBER *Working paper* 7081. Cambridge, Massachusetts: National Bureau of Economic Research.

Romer, P. 1990. Endogenous technological change. *Journal of Political Economy* 98:71-102

Romer, P. 2003. The origins of endogenous growth, *Journal of Economic Perspectives,* 8(1): 3-32.

Roningen, V. O. and Dixit, P.M. 1989. Economic implications of agricultural policy reforms in industrial market economies. USDA, ERS Staff report No. AGES 89-36.

S.M. and Upadhyay, M.P. 2000. The effects of openness, trade orientation and human capital on total factor productivity. *Journal of Development Economics* 63: 399-423.

Sachs, J and Warner, A. 1995. *Economic reform and the process of global integration.* Brookings Papers on Economic Activity 1, 1-118.

SARB. *Quarterly Bulletin*, several issues 1999-2006. Internet: http://www.reservebank.co.za

Sato, R. 1977. Homothetic and non-homothetic CES production functions, *American Economic Review*, 67(4)

Sadoulet, E. and de Janvry, A. 1995 *Quantitative development policy analysis*, The Johns Hopkins University Press.

Sen, A. 1990. Economics and the family. *Asian Development Reviews* 15-26.

Seguino, S. 1997. Gender wage inequality and export led growth in South Korea. *Journal of Development Studies*, 34(2), 102–132.

Seguino, S. 2000a. The effects of structural change and economic liberalisation on gender wage differentials in South Korea and Taiwan. *Cambridge Journal of Economics*, 24(4): 437–459.

Seguino, S. 2000. Gender inequality and economic growth: a cross-country analysis, *World Development,* 28(7): 1211-1230.

Seguino, S. 2003. *Is more mobility Good?: Mobile capital and the low wage low Productivity trap*. Paper presented at the Allied Social Science Association Meetings, San Diego, CA, 2-4 January 2004.

Shoven, J.B. and J. Whalley. 1992. *Applying General Equilibrium.* Cambridge University Press.

Sibanda, S. 2001. Land Reform and Poverty Alleviation in South Africa, Paper presented at the SARPN conference on Land Reform and Poverty in Southern Africa held at the Human Scineces Research Council Pretoria. Department of Land Affairs

Singh, A. and Zammit, A. 2000. International capital flows: identifying the gender dimension, *World Development,* 28(7):1249-1268

Sinha, A. and Sangeeta, N. 2000. Gender in a macro economic framework: a CGE Model analysis**.** Paper prepared for the Second Annual Meeting of the Gender Planning Network. Kathmandu, India Mimeo. New Delhi: NCAER.

Söderbom, M. and Teal, F. 2003. Centre for the Study of African Economies. Department of Economics. University of Oxford.

South Africa. 1997b. *Constitution of South Africa.* Pretoria

Statistics South Africa. 2003. *Final supply and use tables 2000* (report no. 04-04-01). Pretoria: Government Printers

Standing G. 1989. Global Feminization through flexible labor, *World Development,* 17(7): 1077-1095.

Standing, G., Sender, J. and Weeks, J. 1996. Restructuring the labour market: the South African challenge, An ILO Country Review, Geneva: ILO.

Standing, G. 1999. 'Global feminization through flexible labour: a theme revisited' *World Development,* 27 (3): 583-602.

The Department of Trade and Industries (the DTI, 2001): Accelerating growth and development contribution of an integrated manufacturing strategy.

Statistics South Africa, October Household Surveys, 1995 and 1998, Pretoria.

Statistics South Africa. 2000. October Household Survey, 1999 Statistical release P0317.

Statistics South Africa. 2001. Labour force survey February 2001 Statistical release P0210.

Statistics South Africa. 2002. Earning and spending in South Africa. Selected findings and comparisons from the income and expenditure surveys of October 1995 and October 2000.

Statistics South Africa. 2003. Census 2001: Census in brief. Report no 03-02-02(2001).

Stokke, H. E. 2006. 'Resource boom, productivity growth and real exchange rate dynamics: A dynamic general equilibrium analysis of South Africa', *Working Paper* No 08/2006, Department of Economics, NTNU.

Sun, H. 1998. Macro-economic impact of direct foreign investment in China: 1979-96.

Taylor, L. 1991. Income distribution, inflation, and growth: lectures on structuralist macroeconomic theory. Cambridge, MA: MIT press.

Te Velde, D.W. and Morrissey, O. 2002. 'Foreign direct investment, skills and wage Inequality in East Asia. presented at DESG annual conference, available from *www.odi.org.uk/iedg/FDI_who_gains/FDIWhoGains.html*

Te Velde, D.W and Morrissey, O. 2001. 'Foreign ownership and wages: evidence from five African countries', *CREDIT Discussion Paper 01/19,* available from www.nottingham.ac.uk/economics/research/credit).

Te Velde, D.W. 2001. 'Government policies for inward foreign direct investment in developing countries: implications for human capital formation and income inequality. paper presented at OECD Development Centre conference on FDI and human capital, OECD.

Teal, F. 2000. Real wages and the demand for skilled and unskilled male labour in Ghana's manufacturing sector: 1991-1995, *Journal of Development Economics* 61.

Thissen, M. 1998. Two decades of CGE modelling lessons from models of Egypt: SOM research report No. 99C02, University of Groningen, Groningen, The Netherlands.

Thomassin, P. and A. Andison. 1987. Agriculture Canada's Input-output Model, Part I: Disaggregation. of the Agriculture Sector of Canada: Agriculture Canada, Policy branch, working paper 6/87: Ottawa: Agriculture Canada.

Thomas, D. 1992. The distribution of income and expenditure in the household. Paper prepared for presentation at IFPRI-World Bank Conference on intrahousehold resource allocation: Policies and research methods, 12-14 February, Washington, DC. IFPRI.

Thurlow, J. 2006. Has trade liberalization in South Africa affected men and women differently? Development Strategy and Governance Division. International Food Policy Research Institute, Washington, D.C. *Discussion paper no.* 36. IFPRI.

Thurlow, J. and Van Seventer, D.E. 2002. A standard Computable General Equilibrium Model for South Africa. IFPRI. Internet: http://www.tips.org.za.

TIPS. 2002. *A review of the changing composition of the South African economy*, Report compiled by Trade and Industrial Policy Strategies. http://www.tips.org.za.

Tsikata, Y. 1999. Trade liberalization and performance in South Africa. Informal Discussion Papers on Aspects of the South African economy, No. 13, World Bank.

Tzannatos, Z. 1999. Women and labour market changes in the global economy: growth helps, inequalities hurt and public policy matters. *World Development,* 27(3), 551–570.

Tzannatos, Z, 1995. Growth, adjustment and the labour market: effects on women workers. Paper presented at the Fourth Conference of the International Association for Feminist Economics.

UNCTAD. 1999. Trade, sustainable, gender. Geneva. UNCTAD/EDM/MIS. 78.

UNDP. 1995. *Human Development Report 1995*, Oxford University Press, New York

UNDP. 2003. *Human development Report 1997,* New York, United Nations Development Programme.

Urata, S. and Kawai, H. 2000. Intrafirm technology transfer by Japanese manufacturing firms

in Asia. In Takatoshi and Krueger O., *The role of foreign direct investment in East Asian economic development*, Chicago: Chicago University Press.

Valodia, I. 2000. Economic policy and women's work in South Africa: overlooking a typical work?, University of Natal. Paper presented at the Conference of the International Association for feminists Economists (IAFFE), Turkey.   Internet: www.card.iastate.edu.

Van der Mensbrugghe, D. 1995. Technical description of the World Bank CGE of the South African economy, *Unpublished report*, OECD Development Centre, Paris. http://www.reservebank.co.za.

Van Meijl, J. and Van Tongeren, F. 2001. *Multilateral trade liberalization and developing countries: A North-South perspective on agriculture and processing sectors*. Rapport de l'Agricultural Economics Research Institute, The Hague. Internet: www.card.iastate.edu.

Van Seventer, D.E. 2001. The level and variation of tariff rates: an analysis of nominal and effective tariff Rates in South Africa for the years 2000 and 2001. Paper presented at the 2001, TIPS Annual Forum, September 2001. Internet: www.card.iastate.edu.

Vink N., Kirsten. J. and Poonyth. D. 2001. South African agriculture in transition: the 1990s, *Journal of International Development*, 13, (6): 725-740.

Van Zyl, J., Vink, N. and Kirsten, L. 2000. South African agriculture in transition: *Working paper* 2000-06. University of Pretoria. Department of agricultural economics

Verhoef, G. 1996. The role of women in the South African economy. *The South African Journal of economic,* 64(3): 216-234.

Vink, N., Kirsten, J. and Van Zyl. J. 2000. Agricultural policy: undoing the legacy of the past, in Thirtle et al. 2000.

Walker, C. 1982. Women and resistance in South Africa, London, Onyx Press.

Wood, A. 1991. North-South trade and female labour in manufacturing: an asymmetry, *Journal of Development Studies*, 27 (2):168-189.

Wood, A. 1994. North South trade, employment and inequality. Oxford University Press.

Wood, A. 1999. Openness and wage inequality in developing countries: the Latin American challenge to East Asian conventional wisdom', in (R. E. Baldwin, D. Cohen, A. Sapir and A. Venables, eds.), Market Integration, Regionalism and Global the Economy, Cambridge: Cambridge University Press.

World Bank. 2006. *World Development Indicators*. Washington DC: The World Bank. available: http://devdata.worldbank.org.

World Bank. 2006. Gender Stats-database for gender statistics, available: http://devdata.worldbank.org/genderstats.

WTO, 1998. Trade policy review: South Africa. *Report by the Government.* World Trade Organization, 25 March 1998. WT/TPR/G/34.

WTO, 1995-2002. *Trade Policy Review: South Africa,* World Trade Organisation Secretariat, Geneva, WTO.

Yamamoto, Y. 2000. Trade expansion and gender wage inequality in Japan. Paper presented at IAFFE Conference.

Zauchner, S., Korunka, C., Weiss, A and Kafika-Lutzow, A. 2000. Gender related effects of information technology implementation, *gender, work and organisation,* 7(2):119-132.

Zhao, Y. 2000. Foreign direct investment and relative wages: The case of China. *Working paper*. No. E200013, China Center for Economic Research.