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,

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.

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[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 4.1Schematic gendered social accounting matrix (SAM)

		EXPENDITURE								
R		Activities	Commodities	Gendered I	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	Inves tment	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	Househ old 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	Inves tment	Foreign exchange inflow	

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 Penetratio	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 Penetratio	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
Transportatior	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
Communicatir	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

	Capita	% 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	Capit	Low -skilled labo		Middle-skilled labou		Skilled labour		Total Labour		
	All	Men	Wome	Men	Women	Mer	Wome	Men	Wome	
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/tobacc	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

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

	199	199	199	199	199	199	200	200	200	200	200
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)