

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

by

**GODBERTHA K. KINYONDO**

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

**PhD (ECONOMICS)**

in the

**FACULTY OF ECONOMICS AND MANAGEMENT SCIENCES**

at the

**UNIVERSITY OF PRETORIA**

**STUDY ADVISOR: Professor. Dr. M. Chitiga**

**PRETORIA**

**JULY 2007**

## DEDICATION

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

My father: Omuhesi Johesaphat Bishashaga Kinyondo

My brother: The Honourable Sebastian Rukiza Kinyondo

My sister: Christina Kokulengya Kinyondo

My mother-in-law: Harriet Peuse

My nephew: Richard Muheleji

MAY YOUR DEAR SOULS REST IN PEACE

## APPRECIATION

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

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

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

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

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

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

Godbertha K. Kinyondo

## ABSTRACT

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

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

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

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

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

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

## TABLE OF CONTENTS

<b>CHAPTER 1</b>	<b>INTRODUCTION TO THE STUDY.....</b>	<b>1</b>
<b>1.1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>1.2</b>	<b>THE PROBLEM STATEMENT .....</b>	<b>3</b>
<b>1.3</b>	<b>OBJECTIVES OF THE STUDY .....</b>	<b>4</b>
<b>1.4</b>	<b>SOUTH AFRICAN TRADE REFORMS .....</b>	<b>5</b>
1.4.1	Introduction .....	5
1.4.2	Significance of trade reforms.....	5
1.4.3	South Africa’s progress in trade reforms .....	6
1.4.4	Progress in trade reforms .....	7
1.4.5	Exports and employment .....	8
<b>1.5</b>	<b>TRADE REFORMS IN RELATION TO AGRICULTURE.....</b>	<b>13</b>
1.5.1	The Doha Round of multilateral trade negotiations.....	13
<b>1.6</b>	<b>AGRICULTURAL TRADE REFORMS IN SOUTH AFRICA .....</b>	<b>13</b>
<b>1.7</b>	<b>SOUTH AFRICAN AGRICULTURE AND GENDER .....</b>	<b>15</b>
<b>1.8</b>	<b>GLOBALISATION: PRODUCTIVITY AND FOREIGN DIRECT INVESTMENT (FDI).....</b>	<b>17</b>
1.8.1	Productivity .....	17
1.8.2	Trends of FDI in South Africa (1993-2001) .....	20
1.8.3	Government incentives to FDI.....	21
<b>1.9</b>	<b>OVERVIEW OF THE SOUTH AFRICAN ECONOMY .....</b>	<b>21</b>
1.9.1	Growth as measured by GDP .....	23
<b>1.10</b>	<b>MACROECONOMIC POLICIES.....</b>	<b>24</b>
1.10.1	Fiscal policy .....	25
1.10.2	Monetary policy .....	25
1.10.3	Interest rates .....	26
1.10.4	Inflation .....	26
1.10.5	Current account .....	27
1.10.6	Exchange rate .....	27
1.10.7	Investment incentives.....	27
1.10.8	Trade Unions.....	28
1.10.9	Organisation of the study.....	29
<b>CHAPTER 2</b>	<b>SOUTH AFRICA AND GENDER.....</b>	<b>30</b>
<b>2.1</b>	<b>INTRODUCTION.....</b>	<b>30</b>
2.1.1	Political representation and government leadership .....	30
<b>2.2</b>	<b>EMPLOYMENT AND REMUNERATION.....</b>	<b>31</b>
2.2.1	Employment by industry.....	31
2.2.2	Employment by occupation .....	33

2.2.3	Remuneration .....	35
<b>2.3</b>	<b>EDUCATION .....</b>	<b>36</b>
<b>2.4</b>	<b>TRADE UNIONS .....</b>	<b>39</b>
<b>CHAPTER 3 LITERATURE REVIEW.....</b>		<b>40</b>
<b>3.1</b>	<b>INTRODUCTION.....</b>	<b>40</b>
<b>3.2</b>	<b>AGRICULTURE TRADE POLICY (CGE) MODELS .....</b>	<b>41</b>
3.2.1	The Doha Round .....	41
3.2.2	Effects of the Doha Round on agriculture: CGE analysis .....	42
3.2.3	CGE models: Trade policy in economic sectors and gender .....	44
3.2.4	Partial equilibrium models and trade policy.....	45
3.2.5	Trade policy and wages .....	47
3.2.6	Trade policy and skills.....	49
<b>3.3</b>	<b>FOREIGN DIRECT INVESTMENT (FDI) .....</b>	<b>50</b>
3.3.1	Importance of productivity .....	50
3.3.2	Determinants of total factor productivity .....	52
3.3.3	Theoretical framework of FDI.....	53
3.3.4	Literature on FDI and productivity.....	53
3.3.5	FDI in relation to wages, skills and employment.....	55
<b>3.4</b>	<b>SUMMARY .....</b>	<b>57</b>
<b>CHAPTER 4 DATABASE DEVELOPED FOR THE GENDERED CGE MODEL.....</b>		<b>58</b>
<b>4.1</b>	<b>INTRODUCTION.....</b>	<b>58</b>
<b>4.2</b>	<b>THE SOCIAL ACCOUNTING MATRIX (SAM).....</b>	<b>58</b>
<b>4.3</b>	<b>THE 2000 SOCIAL ACCOUNTING MATRIX FOR SOUTH AFRICA.....</b>	<b>59</b>
4.3.1	The contents of the 2000 South African gendered SAM .....	61
4.3.2	Commodities demanded by household and government .....	62
<b>4.4</b>	<b>DISAGGREGATION OF AGRICULTURE INTO SUB-SECTORS .....</b>	<b>77</b>
4.4.1	Data requirements .....	77
4.4.2	Intermediate inputs.....	78
4.4.3	Capital and labour data .....	79
4.4.4	Agricultural imports tariffs and export subsidies .....	80
4.4.5	Data on elasticities of substitution in agriculture .....	80
<b>4.5</b>	<b>BALANCING THE SAM.....</b>	<b>82</b>
4.5.1	RAS Approach to estimating micro SAM.....	82
<b>APPENDIX 4.....</b>		<b>83</b>
<b>CHAPTER 5 THE SOUTH AFRICA COMPUTABLE GENERAL EQUILIBRIUM (CGE) MODEL.....</b>		<b>86</b>
<b>5.1</b>	<b>INTRODUCTION.....</b>	<b>86</b>

<b>5.2</b>	<b>THE CGE MODEL STRUCTURE .....</b>	<b>86</b>
<b>5.3</b>	<b>THE STRUCTURE OF THE SOUTH AFRICAN CGE MODEL .....</b>	<b>89</b>
5.3.1	Modifications to the standard conventional South African model .....	89
<b>5.4</b>	<b>THE MODEL EQUATIONS.....</b>	<b>92</b>
5.4.1	Price equations .....	92
5.4.2	Production and trade block .....	95
5.4.3	The institution block .....	100
5.4.4	Factor income earnings.....	100
5.4.5	The macroconstraint block .....	103
<b>5.5</b>	<b>GENERAL MACROECONOMIC BALANCE.....</b>	<b>108</b>
<b>5.6</b>	<b>THE CLOSURE RULES FOR THE GENDERED MODEL.....</b>	<b>109</b>
5.6.1	Analysing the simulation results.....	111
<b>APPENDIX 5.....</b>		<b>114</b>
<b>CHAPTER 6 A CGE ANALYSIS: EFFECTS OF TRADE LIBERALISATION ON THE ECONOMY AND GENDER: FACTOR MOBILITY CONSIDERATIONS.....</b>		
		<b>118</b>
<b>6.1</b>	<b>INTRODUCTION.....</b>	<b>118</b>
<b>6.2</b>	<b>STUDY POLICY SIMULATIONS.....</b>	<b>119</b>
<b>6.3</b>	<b>SIMULATIONS RESULTS: FULL TRADE LIBERALISATION (SIM 1) .....</b>	<b>120</b>
6.3.1	Government and macroeconomic results (SIM 1) .....	120
6.3.2	General simulation results (SIM 1) .....	121
6.3.3	Full tariff reduction: full employment and mobile factors (SIM 2).....	129
6.3.4	Comparison: Fixed factors vs. full employed and mobile factors .....	139
<b>6.4</b>	<b>CONCLUSION.....</b>	<b>140</b>
<b>APPENDIX 6 (A) .....</b>		<b>144</b>
<b>APPENDIX 6 (B) .....</b>		<b>151</b>
<b>CHAPTER 7 THE IMPACT OF A PRODUCTIVITY RISE ON SOUTH AFRICAN GENDER AND ECONOMY 152</b>		
<b>7.1</b>	<b>INTRODUCTION.....</b>	<b>152</b>
<b>7.2</b>	<b>THE MODEL POLICY SIMULATIONS .....</b>	<b>153</b>
<b>7.3</b>	<b>SIMULATION RESULTS OF ECONOMY-WIDE FACTOR PRODUCTIVITY RISE .....</b>	<b>154</b>
7.3.1	Macroeconomic results: factor productivity rise economy-wide ( SIM 1) .....	154
7.3.2	Employment changes due to factor productivity rise.....	154
7.3.3	Gender Employment changes due to economy-wide factor productivity rise .....	155
7.3.4	Change in wages and factor earnings due to factor productivity rise.....	156
7.3.5	Results of factor productivity rise in selected sectors (SIM 2).....	157
7.3.6	Employment changes due to factor productivity rise in selected sectors .....	158
7.3.7	Gender employment changes due to factor productivity rise in selected sectors.....	159

7.3.8	Wages and factor earnings changes due to factor productivity rise .....	160
<b>7.4</b>	<b>EQUIVALENT VARIATION: FACTOR PRODUCTIVITY RISE (SIM 1 AND SIM 2) .....</b>	<b>161</b>
7.4.1	Conclusion.....	162
<b>APPENDIX 7 A.....</b>		<b>164</b>
<b>APPENDIX 7(B) .....</b>		<b>171</b>
<b>CHAPTER 8 THE DOHA ROUND AND ITS EFFECTS ON AGRICULTURAL SUB SECTORS AND GENDER IN SOUTH AFRICA.....</b>		<b>172</b>
<b>8.1</b>	<b>INTRODUCTION.....</b>	<b>172</b>
<b>8.2</b>	<b>SIMULATIONS: THE IMPLEMENTATION OF THE DOHA ROUND .....</b>	<b>172</b>
<b>8.3</b>	<b>RESULTS AND DISCUSSIONS OF MODEL SIMULATION.....</b>	<b>173</b>
8.3.1	Results of a joint policy simulation (tariff reduction and rises in world prices) .....	173
8.3.2	Factor of production changes.....	176
<b>8.4</b>	<b>SINGLE POLICY SIMULATION .....</b>	<b>181</b>
8.4.1	The effects of tariff reduction on agricultural commodities .....	181
8.4.2	Factors of production: tariff reduction .....	184
<b>8.5</b>	<b>EFFECTS OF WORLD PRICE OF AGRICULTURE IMPORTS RISE.....</b>	<b>188</b>
<b>8.6</b>	<b>EFFECTS OF WORLD PRICE OF AGRICULTURAL EXPORTS RISE.....</b>	<b>190</b>
<b>8.7</b>	<b>CONCLUSION.....</b>	<b>194</b>
<b>APPENDIX 8.....</b>		<b>197</b>
<b>APPENDIX 8 (B) MACROECONOMIC VARIABLES .....</b>		<b>204</b>
<b>CHAPTER 9 WOMEN’S ECONOMIC WELL-BEING .....</b>		<b>205</b>
<b>9.1</b>	<b>INTRODUCTION.....</b>	<b>205</b>
<b>9.2</b>	<b>BACKGROUND TO THE STUDY .....</b>	<b>206</b>
<b>9.3</b>	<b>THEORETICAL MODEL .....</b>	<b>206</b>
<b>9.4</b>	<b>SURVEY DATA.....</b>	<b>208</b>
<b>9.5</b>	<b>GENERAL CHARACTERISTICS OF SURVEY RESPONDENTS.....</b>	<b>209</b>
<b>9.6</b>	<b>SPECIFIC SURVEY RESULTS.....</b>	<b>213</b>
9.6.1	Breakdown position .....	213
<b>9.7</b>	<b>AUTONOMY .....</b>	<b>214</b>
9.7.1	Decision making in the household.....	216
9.7.2	Perceived contribution .....	218
9.7.3	Perceived self-interest.....	219
<b>9.8</b>	<b>CONCLUSION.....</b>	<b>221</b>
<b>APPENDIX 9.....</b>		<b>223</b>
<b>CHAPTER 10 SUMMARY AND CONCLUSION .....</b>		<b>243</b>

<b>10.1</b>	<b>INTRODUCTION.....</b>	<b>243</b>
<b>10.2</b>	<b>IMPACTS OF FULL TRADE LIBERALISATION: VARYING FACTOR MOBILITY .....</b>	<b>245</b>
<b>10.3</b>	<b>IMPACTS RELATED TO PRODUCTIVITY INCREASE (FDI) .....</b>	<b>249</b>
<b>10.4</b>	<b>IMPACTS RELATED TO THE DOHA ROUND .....</b>	<b>251</b>
<b>10.5</b>	<b>SUGGESTIONS FOR FURTHER RESEARCH.....</b>	<b>255</b>
	<b>REFERENCES .....</b>	<b>258</b>



## LIST OF TABLES

Table 1.1 The 1996 and 2000 average import-weighted tariffs .....	7
Table 1.2 Tariffs as of July 2000 and March, 2001 .....	8
Table 1.3 Export performance 1991-2000 .....	8
Table 1.4 Domestic support reduction: Aggregate measure of support (AMS) .....	14
Table 1.5 Productivity in South African sectors.....	18
Table 1.6 Sector Productivity between men and women workers (value added) .....	19
Table 1.7 Macroeconomic indicators for South Africa (1997-2004) .....	24
Table 2.1 Percentage workers (Employees and self-Employed): by main industry and gender: all sectors.....	32
Table 2.2 Occupations of men and women in various sectors. ....	34
Table 2.3 Remuneration of Men and Women in 51 different Sectors of South Africa .....	35
Table 2.4 Official unemployment rate 2000-2003.....	37
Table 4.1 Schematic gendered social accounting matrix (SAM) .....	59
Table 4.2 Summary of data Sources used to construct the 2000 SAM .....	60
Table 4.3 Trade: Import and export shares year 2000 .....	61
Table 4.4 Consumption of commodities and services: household and government.....	63
Table 4.5 Production structure (year 2000) .....	65
Table 4.6 Description of the SAM men and women labour categories .....	66
Table 4.7 Shares of factors (capital, men and women workers) across sectors .....	69
Table 4.8 Factor shares within sector.....	71
Table 4.9 Percentage share of capital.....	72
Table 4.10 Share of domestic institution (HH) in income of factor (F).....	76
Table 4.11 Trade elasticities.....	80
Table 4.12 Import and export elasticities and possible world price rise due to Doha Round .....	81
Table 4.13 Summary of data sources used to construct the gendered SAMs .....	81
Table 4.14 SAM activity and commodity descriptions .....	83
Table 4.15 Household categories in SA SAM from (SA SAM 2000) .....	84
Table 4.16 South Africa's tariff phase-down under the WTO .....	85
Table 5.1 Sets, variables and parameters of the CGE model .....	114
Table 5.2 Parameters appearing in model equations .....	114
Table 5.3 Exogenous model variables .....	115
Table 5.4 Model endogenous variables.....	116
Table 6.1 Percentage change factors: all factors full employed and mobile (SIM 2).....	144
Table 6.2 Percentage change prices and output: all factors full employed and mobile (SIM 2).....	145
Table 6.3 Percentage change output and prices: SIM 1 fixed capital, skilled: mobile & full employed; unskilled and semi-skilled labour mobile but unemployed .....	147
Table 6.4 Percentage change factors : capital fixed and full employed, skilled labour mobile and full employed, unskilled and semi-skilled labour mobile with unemployment (SIM 1).....	149
Table 6.5 Percentage changes (macroeconomic variables) .....	151
Table 7.1 (a): Employment changes due to economy-wide productivity rise.....	164
Table 7.2 Quantity and price changes due to economy-wide productivity rise (SIM ) .....	166
Table 7.3 Percentage change factors of production (capital and labour) selected sectors.....	168
Table 7.4 Quantity and price changes selected sectors.....	169
Table 8.1 Percentage changes quantity and price following tariff reduction.....	184
Table 8.2 Factor of production (labour: men and women).....	186
Table 8.3 Percentage change prices and quantities (combination of policies) with fixed capital; skilled labour full employed and mobile while unskilled and semi-skilled labour mobile and unemployed.....	197
Table 8.4 Percentage change of employment (combination policies): fixed capital; mobile, fully employed... ..	198
Table 8.5 Percentage change quantities and prices due to tariff cut: fixed capital; mobile skilled men and women .....	200
Table 8.6 Percentage change employment due tariff cut, fixed capital; skilled labour mobile, fully employed; other labour mobile and unemployed.....	202
Table 8.7 Percentage changes (macroeconomic variables) .....	204
Table 9.1 Kinship and general characteristics .....	210
Table 9.2 Employment characteristics for working women.....	211
Table 9.3 Working women and ownership of assets .....	214
Table 9.4 Measurement of working women's autonomy .....	214
Table 9.5 Location related to working women's residence.....	215
Table 9.6 Decisions made by working women related to employment and children .....	216
Table 9.7 Decision made by working women as economic authority in the household.....	217

Table 9.8 Economic authority in the household .....	218
Table 9.9 Contribution to household duties .....	219
Table 9.10 Contribution in income .....	219
Table 9.11 Perceived self-interest .....	219
Table 9.12 Opinions concerning women's self-interest .....	220
Table 9.13 Significancy levels : married and single working women .....	223

## LIST OF FIGURES

Figure 1-1 Export performance 1980-2005 .....	9
Figure 1-2 Annual percentage growth of labour force 1980-2005.....	11
Figure 1-3 Annual percentage growth different skill types of labour .....	12
Figure 1-4 Skilled Men and Women (2003) .....	12
Figure 1-5 Low skilled men and women (2003).....	12
Figure 1-6 Import and Export of Agricultural Sector (1998-2004).....	15
Figure 1-7 Value-added share by men and women in South African agriculture.....	16
Figure 1-8 Foreign direct investment, net inflows (% of GDP), 1980-2004 .....	20
Figure 1-9 Investment (stock) 2001 .....	20
Figure 1-10 South African economic growth: GDP growth (1998-2005) .....	23
Figure 1-11 Percentage contribution of sectors to GDP in the year 2000.....	24
Figure 2-1 Employment of men and women in 51 sectors.....	33
Figure 2-2 Remuneration of men and women in 51 different sectors of South Africa .....	35
Figure 2-3 official unemployment 1995 and 1999 rates disaggregated by education level and gender .....	37
Figure 2-4 University enrolment: classification of educational category .....	38
Figure 2-5 Official unemployment rate by education level and gender: 1995 and 1999 .....	38
Figure 5-1 Various levels within the production process .....	91
Figure 6-1 Percentage factor earnings men and women after tariff cut .....	128
Figure 6-2 Equivalent variation (EV): fixed capital (SIM 1) .....	129
Figure 6-3 Percentage change production after tariff reduction.....	132
Figure 6-4 Percentage change wages and income earnings of men and women workers .....	138
Figure 6-5 Percentage change employment unskilled men and women (SIM 1).....	140
Figure 6-6 Percentage change men and women employment .....	140
Figure 7-1 Percentage change labour demand: economy-wide productivity rise .....	155
Figure 7-2 Percentage change employment by skills and gender: economy-wide productivity rise .....	156
Figure 7-3 Percentage change factor income: economy-wide productivity rise.....	157
Figure 7-4 Percentage change employment due to selected productivity rise .....	159
Figure 7-5 Percentage change unskilled gender: productivity rise selected sectors.....	160
Figure 7-6 Percentage change earnings: Productivity rise selected sectors .....	161
Figure 7-7 Percentage change equivalent variation (SIM 1 and SIM 2).....	162
Figure 8-1 Changes in employment men and women: Doha Round implementation.....	179
Figure 8-2 Percentage change incomes for men and women after price rises .....	180
Figure 8-3 Equivalent variation : Percentage change after Doha Round policy simulation.....	181
Figure 8-4 Percentage change in the unskilled men and women due to tariff cut .....	185
Figure 8-5 Percentage change earning tariff reduction selected agricultural sectors .....	187
Figure 8-6 Results of equivalent variation: tariff reduction .....	188
Figure 8-7 Equivalent variation (tariff cut, world price of import and export rise .....	194

## ABBREVIATIONS

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