THE IMPACTS OF MULTILATERAL AND BILATERAL TRADE AGREEMENTS ON AGRICULTURE TRADE IN SACU

by

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May God Bless Us All!!!

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DEPARTMENT	:	**AGRICULTURAL ECONOMICS**
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ABSTRACT

International markets for agricultural products were characterised by, amongst others, quantitative restrictions, tariff-based protection, border protection, non-tariff barriers, etc before 1995. Likewise, agricultural sector in South Africa (SA) was also faced by similar trade distorting measures during the post-apartheid era. In response to globalisation challenges, SA committed to move from protective to liberal trade regime in the agricultural sector, as witnessed by its trade diplomacy engagements with the international community in the context of multilateral, bilateral and/or regional approaches.

At the multilateral level, SA has successfully implemented its commitments as negotiated in terms of the Agreement on Agriculture (AoA) during the Uruguay Round (UR) of General Agreement on Tariffs and Trade (GATT) negotiations that gave birth to the World Trade Organization (WTO). At the bilateral level SA has signed a Preferential Trade Agreement (PTA) with the European Union (EU) called the Trade, Development and Co-operation Agreement (TDCA) (better known as the EU-SA TDCA and includes a Free Trade Agreement). At the regional level, the Southern African Customs Union (SACU) member states including SA have signed a Protocol on Trade or a Regional Trade Agreement (RTA) with the non-SACU countries of the Southern African Development Community (SADC).

The main objective of the study was to measure the impact of trade agreements on the agricultural trade between SA and its trading partners. A gravity model using panel data was

employed to analyze the ex-post impacts of the implementation of the trade treatments, i.e. WTO AoA, EU-SA TDCA and SADC Trade Protocol on agricultural trade flows between SA and its agricultural trading partners. Various statistical tests were undertaken to select the suitable models for the datasets of total agricultural and selected agricultural products trade flows between SA and its agricultural trading partners.

After the statistical tests were undertaken, 189 feasible models in total were selected, of which 161 were dynamic models and 28 were static models. Furthermore, 152 Fixed Effects (FE), 2 Random Effects (RE) and 7 pooled Ordinary Least Squares (OLS) estimators were found to be efficient and suitable for the dynamic models; and 14 FE and 14 RE estimators were found to be efficient and suitable for the static models. The highest number of selected dynamic models suggested that passed trade is the predictor for current trade. The per capita GDPs of SA and of its trading partners, the real effective exchange rates and distance have also played a significant and expected role in influencing agricultural trade flows between SA and its agricultural trading partners.

The results of the study have indicated that agricultural trade flows between SA and its agricultural trade partners have responded positively to the implementation of WTO AoA. The implementation of EU-SA TDCA and SADC Trade Protocol during the first five years (for the period 2000 – 2004) have not delivered the expected results, as the majority of agricultural trade flows between SA and EU countries as well as between SA and SADC countries were not affected and some of the agricultural trade flows between SA and EU countries as well as between SA and SADC countries were negatively affected. While the majority of agricultural trade flows between SA and EU countries as well as between SA and SADC countries were still not affected during the second five-year term (for the period 2005 – 2009), there were some improvements due to the significant positive effects of the EU-SA TDCA implementation on three agricultural trade flows (i.e. total agricultural trade, total cut flowers trade and total preserved fruits and nuts trade) as well as the significant positive effects of the SADC Trade Protocol implementation on four agricultural trade flows (i.e. total agricultural exports, total agricultural trade, total cut flowers trade and total fruits and vegetable juices trade). However, the number of agricultural trade flows between SA and ROW countries that have improved significantly for both periods were more than those of the EU and SADC countries, even though ROW countries did not have a trade agreement with SA.

The implementation of the EU-SA TDCA and SADC Trade Protocol have created room for potential increases of all the agricultural trade flows between SA and EU countries as well as between SA and SADC countries for both periods. However, some of these potential increases for the period 2000 – 2004 were diverted to the other markets. On average, during the implementation of the EU-SA TDCA for the period 2000 – 2004, about 0.44% of agricultural exports, 0.96% of cut flowers exports and 0.77% of wine exports from SA destined for EU were diverted to other markets Furthermore, about 2.01% of SA's wine imports that were supposed to have been sourced from the EU countries came from SA's other wine trading partners; as well as the diversion of about 0.73% of total wine trade from the SA and EU market to either SA and other wine trading partner market or EU and other wine trading partner market. Similarly, the implementation of the SADC Trade Protocol led to diversion of agricultural exports (about 0.43%), cut flowers exports (about 0.93%), total cut flowers trade (about 0.92%), wine exports (about 0.73%), wine imports (about 1.45%) and total wine trade (about 0.35%) during the same period.

With regard to the implementation of the EU-SA TDCA and SADC Trade Protocol during the period 2005 – 2009, there was no proof of trade diversion for all agricultural trade flows, except that the was a trade creation for some of the agricultural trade flows between SA and EU countries as well as between SA and SADC countries. In the case of the EU-SA TDCA, there was trade creation on total agricultural exports, total agricultural trade, total preserved fruits and nuts trade and total wine trade. In the case of the SADC Trade Protocol, there was trade creation on total agricultural trade, cut flowers exports and preserved fruits and nuts exports. In conclusion, these findings have clearly shown that tariff reductions alone are not panacea to improve agricultural trade between SA and its major trading partners given the fact that EU-SA TDCA and SADC Trade Protocol were mainly characterized by tariff phase down schedules.

TABLE OF CONTENTS

CONTENT	PAGE
Acknowledgements	i
Abstract	ii
Table of Contents	v
List of Tables	xiv
List of Figures	xvii
Acronyms	xx

CHAPTER 1

INTRODUCTION

1.1	Background of the study	1
1.2	Problem Statement	4
1.3	Research objectives	7
1.4	Outline of the Study	8

CHAPTER 2

TRADE AGREEMENTS AND THE AGRICULTURAL TRADE LIBERALIZATION POLICY REFORM IN SOUTH AFRICA

2.1 Introduction ... 9

2.2 A multilateral approach of South Africa's trade liberalization policy ... 10

2.3 A bilateral approach of South Africa's trade liberalization policy ... 12

2.4 A regional approach of South Africa's trade liberalization policy ... 15

2.5 Summary ... 18

CHAPTER 3

LITERATURE REVIEW OF THE IMPACTS OF TRADE AGREEMENTS ON THE ECONOMIES OF DEVELOPED AND DEVELOPING COUNTRIES

3.1 Introduction ... 20

3.2 Implications of the World Trade Organization Agreement on Agriculture ... 20

3.3 Implications of the EU-SA Trade, Development and Cooperation Agreement ... 32

3.4 Implications of the SADC Trade Protocol on the Trade ... 35

3.5 Implications of the Selected Trade Agreements in the World ... 38

3.6 Summary ... 47

CHAPTER 4
METHODOLOGY OF THE STUDY

4.1 Introduction....49

4.2 Market equilibrium models....49

4.2.1 Partial models....49

4.2.1.1 AGLINK model....50

4.2.1.2 Country-Link System....50

4.2.1.3 European Simulation model....51

4.2.1.4 World Food Model....52

4.2.1.5 FAPRI model....53

4.2.1.6 GAPsi model....53

4.2.1.7 SWOPSIM model....54

4.2.1.8 WATSIM model....54

4.2.1.9 ATPSM model....56

4.2.1.10 CAPRI model....56

4.2.2 Economy-wide models....57

4.2.2.1 G-cubed model....58

4.2.2.2 GTAP model....59

4.2.2.3 GREEN model....60

4.2.2.4 INFORUM model....60

4.2.2.5 MEGABARE model....61

4.2.2.6 MICHIGAN BDS model....61

4.2.2.7 RUNS model....62

4.2.2.8 WTO housemodel....63

4.3 Single equation econometric models 63

4.3.1 Import demand models 63

4.3.1.1 Almost Ideal Demand System (AIDS) model 65

4.3.1.2 Rotterdam Demand System (RDS) model 68

4.3.2 Gravity model 69

4.4 Model consideration and motivation 71

4.5 Theoretical framework and specification of gravity model 72

4.6 Data requirements and sources 82

4.7 Summary 83

CHAPTER 5

IMPACTS OF TRADE AGREEMENTS ON THE AGRICULTURAL TRADE FLOWS BETWEEN SOUTH AFRICA AND ITS AGRICULTURAL TRADING PARTNERS

5.1 Introduction....................84

5.2 Statistical tests and selection of the suitable models....................85

5.3 Effects of the control explanatory variables on agricultural trade flows....................90

5.3.1 Gross Domestic Product per Capita (GDPPC)....................90

5.3.2 Real Effective Exchange Rates (REER)....................93

5.3.3 Distance (DIST)....................95

5.4 The impacts of the WTO AoA on selected agricultural trade flows between South Africa and its world agricultural trading partners....................97

5.4.1 Aggregate agricultural trade flows between South Africa and the world....................97

5.4.2 Cheese trade flows between South Africa and the world....................98

5.4.3 Cut flowers trade flows between South Africa and the world....................99

5.4.4 Frozen fruits and nuts trade flows between South Africa and the world....................100

5.4.5 Preserved fruits and nuts trade flows between South Africa and the world....................101

5.4.6 Fruits and vegetable juices trade flows between South Africa and the world....................102

5.4.7 Wine trade flows between South Africa and the world....................103

5.5 The impacts of the implementation of EU-SA TDCA on aggregate agricultural and selected agricultural products trade flows between South Africa and the EU countries....................104

5.5.1 Agricultural trade flows between South Africa and the EU countries....................104

5.5.1.1 Agricultural exports from South Africa to the EU countries....................105

5.5.1.2 Agricultural imports from the EU countries to South Africa....................107

5.5.1.3 Agricultural trade (imports plus exports) between South Africa and the EU countries....................108

5.5.2 Cheese trade flows between South Africa and the EU countries......................110

5.5.2.1 Cheese exports from South Africa to the EU countries................................111

5.5.2.2 Cheese imports from the EU countries to South Africa 113

5.5.2.3 Cheese trade (imports plus exports) between South Africa and the EU countries 114

5.5.3 Cut flowers trade flows between South Africa and the EU countries 115

5.5.3.1 Cut flowers exports from South Africa to the EU countries.........................116

5.5.3.2 Cut flowers imports from the EU countries to South Africa 118

5.5.3.3 Cut flowers trade (imports plus exports) between South Africa and the EU countries 119

5.5.4 Frozen fruits and nuts trade flows between South Africa and the EU countries 120

5.5.4.1 Frozen fruits and nuts exports from South Africa to the EU countries 121

5.5.4.2 Frozen fruits and nuts imports from the EU countries to South Africa.........123

5.5.4.3 Frozen fruits and nuts trade (imports plus exports) between South Africa and the EU countries 124

5.5.5 Preserved fruits and nuts trade flows between South Africa and the EU countries 125

5.5.5.1 Preserved fruits and nuts exports from South Africa to the EU countries 126

5.5.5.2 Preserved fruits and nuts imports from the South Africa countries to South Africa..127

5.5.5.3 Preserved fruits and nuts trade (imports plus exports) between South Africa and the EU countries 129

5.5.6 Fruits and vegetable juices trade flows between South Africa and the EU countries 130

5.5.6.1 Fruits and vegetable juices exports from South Africa to the EU countries 132

5.5.6.2 Fruits and vegetable juices imports from the EU countries to South Africa 133

5.5.6.3 Fruits and vegetable juices trade (imports plus exports) between South Africa and the EU countries 134

5.5.7 Wine trade flows between South Africa and the EU countries 136

5.5.7.1 Wine exports from South Africa to the EU countries 137

5.5.7.2 Wine imports from the South Africa countries to SA 138

5.5.7.3 Wine trade (imports plus exports) between South Africa and the EU countries 140

5.6 The impacts of the implementation of SADC Trade Protocol (TP) on selected agricultural trade flows between SA and the SADC countries 141

5.6.1 Aggregate agricultural trade flows between South Africa and the SADC countries 141

5.6.1.1 Agricultural exports from South Africa to the SADC countries 143

5.6.1.2 Agricultural imports from the SADC countries to South Africa 144

5.6.1.3 Agricultural trade (imports plus exports) between South Africa and the SADC countries 145

5.6.2 Cheese exports from South Africa to the SADC countries 147

5.6.3 Cut flowers trade flows between South Africa and the SADC countries 148

5.6.3.1 Cut flowers exports from South Africa to the SADC countries 149

5.6.3.2 Cut flowers imports from the SADC countries to South Africa 151

5.6.3.3 Cut flowers trade (imports plus exports) between South Africa and the SADC countries 152

5.6.4 Frozen fruits and nuts exports from South Africa to the SADC countries 154

5.6.5 Preserved fruits and nuts exports from South Africa to the SADC countries ... 155

5.6.6 Fruits and vegetable juices trade flows between South Africa and the SADC countries 157

5.6.6.1 Fruits and vegetable juices exports from South Africa to the SADC countries 159

5.6.6.2 Fruits and vegetable juices imports from the SADC countries to South Africa 160

5.6.6.3 Fruits and vegetable juices trade (imports plus exports) between South Africa and the SADC countries 161

5.6.7 Wine trade flows between South Africa and the SADC countries 163

5.6.7.1 Wine exports from SA to the SADC countries 164

5.6.7.2 Wine imports from the SADC countries to South Africa 165

5.6.7.3 Wine trade (imports plus exports) between South Africa and the SADC countries 166

5.7 The response of selected agricultural trade flows between South Africa and ROW countries to the implementation EU-SA TDCA and SADC Trade Protocol.........168

5.7.1 Aggregate agricultural trade flows between South Africa and the ROW countries 168

5.7.2 Cheese trade flows between South Africa and the ROW countries 169

5.7.3 Cut flowers trade flows between South Africa and the ROW countries 170

5.7.4 Frozen fruits and nuts trade flows between South Africa and the ROW countries 171

5.7.5 Preserved fruits and nuts trade flows between South Africa and the ROW countries 172

5.7.6 Fruits and vegetable juices trade flows between South Africa and the ROW countries 173

5.7.7 Wine trade flows between South Africa and the ROW countries 174

5.8 Summary 175

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction 178

6.2 Empirical results of the study 180

6.2.1 Selected suitable models for all the agricultural trade flows datasets 180

6.2.2 Effects of the control explanatory variables on agricultural trade flows 181

6.2.3 Impacts of trade agreements on agricultural trade flows 182

6.2.3.1 Impact of the implementation of the WTO AoA 183

6.2.3.2 Impact of the implementation of the EU-SA TDCA 183

6.2.3.3 Impact of the implementation of the SADC Trade Protocol 187

6.2.3.4 Agricultural trade response between SA and ROW countries during the implementation of the EU-SA TDCA and SADC Trade Protocol 190

6.3 Conclusions of the study 191

6.4 Recommendations of the study 194

REFERENCES 196

APPENDICES 229

LIST OF TABLES

Table 2.1 Preferential tariff quotas of agricultural products under the EU-SA DCA 15

Table 2.2 Non-SACU SADC countries' offer to SACU countries Tariff phase down schedule for agricultural products under SADC Trade Protocol 18

Table 5.1 Selection of the Estimator suitable for Agricultural Exports from SA to the World 87

Table 5.2 Appendices for the statistical tests results towards the selections of the model suitable for the datasets of agricultural trade flows between South Africa and its agricultural trading partners 88

Table 5.3 Results for the selection of the model suitable for the datasets of agricultural trade flows between South Africa and its agricultural trading partners 89

Table 5.4 Results for the income effects on agricultural trade flows between South Africa and its agricultural trading partners 92

Table 5.5 Results for the exchange rates effects on agricultural trade flows between South Africa and its agricultural trading partners 94

Table 5.6 Results for the distance effects on agricultural trade flows between South Africa and its agricultural trading partners 96

Table 5.7 Results for agricultural trade flows between South Africa and the world 98

Table 5.8 Results for cheese trade flows between South Africa and the world 99

Table 5.9 Results for cut flowers trade flows between South Africa and the world 100

Table 5.10 Results for frozen fruits and nuts trade flows between South Africa and the the world 101

Table 5.11 Results for preserved fruits and nuts trade flows between South Africa and the world 101

Table 5.12 Results for fruits and vegetable juices trade flows between South Africa the world 102

Table 5.13 Results for wine trade flows between SA and the world 103

Table 5.14 Utilisation of SA's export quotas under the EU-SA TDCA 104

Table 5.15 Results for total agricultural trade flows between South Africa and the EU countries 105

Table 5.16 Results for cheese trade flows between South Africa and the EU countries 111

Table 5.17 Results for cut flowers trade flows between South Africa and the EU countries 116

Table 5.18 Results for frozen fruits and nuts trade flows between South Africa and the EU countries 121

Table 5.19 Results for preserved fruits and nuts trade flows between South Africa and the EU countries 126

Table 5.20 Results for fruits and vegetable juices trade flows between South Africa and the EU countries 131

Table 5.21 Results for wine trade flows between South Africa and the EU countries 136

Table 5.22 Results for total agricultural trade flows between South Africa and the SADC countries 142

Table 5.23 Results for cheese exports from South Africa to the SADC countries 147

Table 5.24 Results for cut flowers trade flows between South Africa and the SADC countries 149

Table 5.25 Results for frozen fruits and nuts exports from South Africa to the SADC countries 154

Table 5.26 Results for preserved fruits and nuts exports from South Africa to the SADC countries 156

Table 5.27 Results for fruits and vegetable juices trade flows between South Africa and the SADC countries 158

Table 5.28 Results for wine trade flows between South Africa and the SADC countries 163

Table 5.29 Results for agricultural trade flows between South Africa and the Rest of World 169

Table 5.30 Results for cheese trade flows between South Africa and the Rest of World 170

Table 5.31 Results for cut flowers trade flows between South Africa and the Rest of World 171

Table 5.32 Results for frozen fruits and nuts trade flows between South Africa and the Rest of World 172

Table5.33 Results for preserved fruits and nuts trade flows between South Africa and the Rest of World 173

Table 5.34 Results for fruits and vegetable juices trade flows between South Africa Rest of World 174

Table 5.35 Results for wine trade flows between South Africa and the Rest of World ... 175

Table 6.1 Impact results for the implementation of WTO AoA on agricultural trade flows between South Africa and its worldwide agricultural trading partners 183

Table 6.2 Table 6.6: Impact results for the implementation of EU-SA TDCA on agricultural trade flows between South Africa and EU countries 184

Table 6.3 Impact results for the implementation of SADC Trade Protocol on agricultural trade flows between South Africa and SADC countries 187

Table 6.4 Responsiveness results of the agricultural trade flows between South Africa and ROW countries during the of the implementation EU-SA TDCA and SADC Trade Protocol 191

LIST OF FIGURES

Figure 5.1 Average actual and potential value of agricultural exports from South Africa to the EU countries for the periods 2000 – 2004 and 2005 – 2009 106

Figure 5.2 Average actual and potential value of agricultural imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 108

Figure 5.3 Average actual and potential value of agricultural trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 119

Figure 5.4 Average actual and potential value of cheese exports from South Africa to EU countries for the periods 2000 – 2004 and 2005 – 2009 112

Figure 5.5 Average actual and potential value of cheese imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 113

Figure 5.6 Average actual and potential value of cheese trade from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 115

Figure 5.7 Average actual and potential value of cut flowers exports from SA to EU countries for the periods 2000 – 2004 and 2005 – 2009 117

Figure 5.8 Average actual and potential value of cut flowers imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 118

Figure 5.9 Average actual and potential value of cut flowers trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 120

Figure 5.10 Average actual and potential value of frozen fruits and nuts exports from South Africa to EU countries for the periods 2000 – 2004 and 2005 – 2009 122

Figure 5.11 Average actual and potential value of frozen fruits and nuts imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 124

Figure 5.12 Average actual and potential value of frozen fruits and nuts trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 125

Figure 5.13 Average actual and potential value of preserved fruits and nuts exports from South Africa to EU countries for the periods 2000 – 2004 and 2005 – 2009 127

Figure 5.14 Average actual and potential value of preserved fruits and nuts imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 128

Figure 5.15 Average actual and potential value of preserved fruits and nuts trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 130

Figure 5.16 Average actual and potential value of fruits and vegetable juices exports from South Africa to EU countries for the period 2000 to 2004 132

Figure 5.17 Average actual and potential value of fruits and vegetable juices imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 134

Figure 5.18 Average actual and potential value of fruits and vegetable juices trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 135

Figure 5.19 Average actual and potential value of wine exports from South Africa to EU countries for the periods 2000 – 2004 and 2005 – 2009 138

Figure 5.20 Average actual and potential value of wine imports from the EU countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 139

Figure 5.21 Average actual and potential value of wine trade between South Africa and the EU countries for the periods 2000 – 2004 and 2005 – 2009 141

Figure 5.22 Average actual and potential value of agricultural exports from South Africa to SADC countries for the periods 2000 – 2004 and 2005 – 2009 144

Figure 5.23 Average actual and potential value of agricultural imports from the SADC countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 145

Figure 5.24 Average actual and potential value of agricultural trade between South Africa and the SADC countries for the periods 2000 – 2004 and 2005 – 2009 146

Figure 5.25 Average actual and potential value of cheese exports from South Africa to

SADC countries for the periods 2000 – 2004 and 2005 – 2009 148

Figure 5.26 Average actual and potential value of cut flowers exports from South Africa to SADC countries for the periods 2000 – 2004 and 2005 – 2009 150

Figure 5.27 Average actual and potential value of cut flowers imports from the SADC countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 152

Figure 5.28 Average actual and potential value of cut flowers trade between South Africa and the SADC countries for the periods 2000 – 2004 and 2005 – 2009 153

Figure 5.29 Average actual and potential value of frozen fruits and nuts exports from South Africa to SADC countries for the periods 2000 – 2004 and 2005 – 2009 155

Figure 5.30 Average actual and potential value of preserved fruits and nuts exports from South Africa to SADC countries for the periods 2000 – 2004 and 200 – 2009 157

Figure 5.31 Average actual and potential value of fruits and vegetable juices exports from South Africa to SADC countries for the periods 2000 – 2004 and 2005 – 2009 159

Figure 5.32 Average actual and potential value of fruits and vegetable juices imports from the SADC countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 161

Figure 5.33 Average actual and potential value of fruits and vegetable juices trade between South Africa and the SADC countries for the periods 2000 – 2004 and 2005 – 2009 162

Figure 5.34 Average actual and potential value of wine exports from South Africa to SADC countries for the periods 2000 – 2004 and 2005 – 2009 165

Figure 5.35 Average actual and potential value of wine imports from the SADC countries to South Africa for the periods 2000 – 2004 and 2005 – 2009 166

Figure 5.36 Average actual and potential value of wine trade between South Africa and the SADC countries for the periods 2000 – 2004 and 2005 – 2009 167

ACRONYMS

AoA	: Agreement of Agriculture
ABARE	: Australian Bureau of Agricultural and Resource Economics
ACP	: African, Caribbean and Pacific
AEC	: African Economic Community
AFTA	: ASEAN Free Trade Agreement
AGE	: Applied General Equilibrium
AGOA	: Africa Growth and Opportunity Act
AIC	: Akaike Information Criteria
AIFTA	: ASEAN-India Free Trade Agreement
ATPSM	: Agricultural Trade policy Simulation Model
AU	: African Union
BLNS	: Botswana, Lesotho, Namibia and Swaziland
CAFTA	: Central America Free Trade Agreement
CAP	: Common Agricultural Policy
CDE	: Constant Differences of Elasticities
CG	: Cairns Group
CGE	: Computable General Equilibrium
CLS	: Country-Link System
COMESA	: Common Market for Eastern and Southern Africa
CUSTA	: Canada-U.S. Trade Agreement
DH	: Doha Round
DIST	: Distance
DTI	: Department of Trade and Industry
EAC	: East African Community
ECCAS	: Economic Community of Central African States
ECO	: Economic Cooperation Organization
ECOWAS	: Economic Community of West African States
EFTA	: European Free Trade Agreement
EU-SA TDCA	: European Union-South Africa Trade, Development and Co-operation Agreement
EU	: European Union
EPAs	: Economic Partnership Agreements

ERS	: Economic Research Service
ESIM	: European Simulation Model
FAO	: Food and Agriculture Organization
FAPRI	: Food and Agricultural Policy Research Institute
FDI	: Foreign Direct Investment
FE	: Fixed Effects
FTA	: Free Trade Agreement
FTAs	: Free Trade Areas
GATT	: General Agreement on Tariffs and Trade
GDPPC	: Gross Domestic Product per Capita
G.E.F	: Generalized Exponential Form
GTAP	: Global Trade Analysis Project
GMOs	: Genetically Modified Organisms
HSRC	: Human Sciences Research Council
ICA	: International Coffee Agreement
ICAC	: International Cotton Advisory Committee
IGC	: International Grains Council
IMF	: International Monetary Fund
LA-AIDS	: Linear Approximate Almost Ideal Demand System
MA	: Market Analysis
MERCOSUR	: Common Southern Market
MFN	: Most Favoured Nation
MNCs	: Multinational Corporations
MTS	: Multi Trading System
NAMC	: National Agriculture Marketing Council
NAFTA	: North American Free Trade Agreement
NEPAD	: New Partnership for Africa's Development
NTBs	: Non-Tariff Barriers
OAU	: Organization of African Unity
OIE	: Organization International des Epizooties
OECD	: Organisation for Economic Co-operation and Development
OLS	: Ordinary Least Squares
PTA	: Preferential Trade Agreement
QUAIDS	: Quadratic AIDS

REER	: Real Effective Exchange Rates
RTAs	: Regional Trade Agreements
RSDAIDS	: Restricted, Source-Differentiated Almost Ideal Demand System
RE	: Random Effects
ROW	: Rest of the World
SA	: South Africa
SACU	: Southern African Customs Union
SACU-US TIDCA	: SACU-United States Trade, Investment, Development and Co-operation Agreement
SADC	: Southern Africa Development Community
SAM	: Social Accounting Matrix
SC	: Schwarz Criterion
SDAIDS	: Source Differentiated, Almost Ideal Demand System
SMEs	: Small and Medium Enterprises
SPS	: Sanitary and Phytosanitary standards
SSA	: Sub- Saharan African
SPs	: Sensitive Products
TAs	: Trade Agreements
TBT	: Technical Barriers to Trade
TFP	: Total Factor Productivity
TIPS	: Trade and Investment Policy Strategies
TNCs	: Trans National Companies
TP	: Trade Protocol
TRQ	: Tariff Rate Quota
UNCTAD	: United Nations Conference on Trade and Development
UR AoA	: Uruguay Round Agreement on Agriculture
US	: United States
US$	: United States Dollars
WFM	: World Food Model
W&S	: Wines and Spirits
WTO	: World Trade Organization
WTO AoA	: World Trade Organization Agreement on Agriculture

CHAPTER 1

Introduction

1.1 Background of the study

South Africa is one of the founder members of the General Agreement on Tariffs and Trade (GATT). GATT was established in Geneva in 1947 to create a framework that would regulate international trade through gradual reduction of trade barriers so as to stimulate international commerce. The most important elements of the Agreement included those of non-discrimination: the Most Favoured Nation (MFN) principle; reciprocity; transparency and tariff reduction (Healy *et al*, 1998). The principal mechanisms for progress on trade liberalisation through GATT have been the measures adopted at the periodic multilateral negotiating rounds. In all, there have been nine rounds, starting with the 1947 Geneva Round which established GATT, followed by the Annecy Round of 1949, the Torguay Round of 1950, the Geneva Round of 1956, the Dillon Round of 1960-61, the Kennedy Round of 1962-67, the Tokyo Round of 1973-79, the Uruguay Round of 1986-93 and the Doha Development Round that was launched in 2001.

The primary focus of the majority of rounds has been the promotion of multilateral tariff reductions, and the extension of the agreed reductions to all members in accordance with the MFN clause. Due to reasons of national food security and the fact that agriculture is often considered a unique sector of the economy, agricultural sector trade was excluded from GATT during the early rounds until it was placed on the GATT negotiating table during the Uruguay Round that established the World Trade Organization (WTO), which is now the main multilateral trade body. However, certain agricultural products have featured in other negotiations as individual commodities. For example, the Dillon Round succeeded in cutting tariffs on soya beans, cotton, vegetables and canned fruit to very low levels, and the International Wheat Agreement and the International Dairy and Meat Agreement were negotiated under the auspices of the Kennedy Round. In general, agricultural commodities have remained off the negotiating table (Healy *et al*, 1998).

Despite GATT membership, South Africa has also engaged itself in the international economy and participates effectively in the globalisation process through its involvement in various international organisations at regional, bilateral and multilateral levels. Apart from its GATT/WTO membership, South Africa has also gained membership to the following international organisations: International Grains Council (IGC), International Cotton Advisory Committee (ICAC), International Coffee Agreement (ICA), Food and Agriculture Organization (FAO), United Nations Conference on Trade and Development (UNCTAD), World Organization for Animal Health - Organization International des Epizooties (OIE), Codex Alimentarius, Cairns Group (CG), and others. These international organisations, except the WTO, do not have trade packages but they do have an influence on trade negotiations, especially the CG lobbying group.

On the other hand, South Africa has also joined hands with its African counterparts in endeavouring to implement regional economic integration on a continental scale as initiated by the Organization of African Unity (OAU), the predecessor of the African Union (AU). The AU was launched in July 2002 in Durban, South Africa and aims at finalising the establishment of the African Economic Community (AEC) by the year 2025, as agreed to by 34 African countries in Abuja, Nigeria in 1991 (Babarinde, 1996). The AU and NEPAD (New Partnership for Africa's Development) have taken over from where the OAU ended and will continue implementing the AEC. There are several approaches or arrangements that have been developed or defined as ways of implementing the Abuja Treaty, and establishing the AEC. South Africa is highly involved in most of them. These are the:

- Establishment of customs union level of integration in Africa,
- Establishment of free trade areas (FTAs) in Africa,
- Establishment of bilateral trade agreements between African countries, and
- Establishment of common market level of integration in Africa.

Regarding regional integration, South Africa is a member of the Southern African Customs Union (SACU) and has played a leading role in the renegotiation of the SACU Agreement, which was concluded in 2001. South Africa is also a member of the Southern Africa Development Community (SADC), which established the Trade Protocol that was signed in 1999. Currently, South Africa does not hold membership in some of the established common market integration levels in Africa, such as the Common Market for Eastern and Southern Africa (COMESA), the on-off East African Community (EAC), the Economic Community of

Central African States (ECCAS) and the Economic Community of West African States (ECOWAS). These common market integration levels also have impacts on the South African economy due to co-operation agreements which South Africa has with some of the member countries who also happen to be SACU and SADC members. It should, however, be noted that there are ongoing initiatives that are structured around a possible tripartite FTA between COMESA, EAC and SADC with the objective of advancing trade integration across Africa and ensuring that African countries do not trade at a competitive disadvantage as compared to other non-African trading partners (Sandrey, 2011).

Outside of Africa, South Africa has also concluded various trade agreements with other countries or economic blocs and has also engaged in trade related negotiations with other countries. For example, South Africa signed a Trade, Development and Co-operation Agreement with the European Union (EU-SA TDCA) in 1999. In 1997, South Africa was admitted as a qualified member of the Lomé Convention which was subsequently replaced by the Cotonou Agreement, which was a co-operation agreement between the European Union (EU) countries and the African, Caribbean and Pacific (ACP) countries. However, South Africa did not qualify for all the benefits that ACP countries received under this agreement. The Cotonou Agreement expired in 2007 and was replaced by Economic Partnership Agreements (EPAs) between the EU and several developing and least developed country groupings. However, the EPA negotiations between the EU and the SADC (including South Africa) have not yet been concluded as some members of SADC have not yet signed, whereas others have. On the other hand, SACU (including South Africa) concluded a Free Trade Agreement (FTA) in 2006 with the non-EU countries which are affiliated to the European Free Trade Agreement (EFTA), namely: Switzerland, Liechtenstein, Norway and Iceland (NAMC, 2008).

Regarding America, South Africa was a beneficiary of the Africa Growth and Opportunity Act (AGOA) of the United States (US), which provided preferential access for imports from Sub-Saharan African countries into the US market. AGOA was signed in 2000 with the expiry date of September 2008, but was extended to 2015. In addition, the US and SACU negotiated the Trade, Investment, Development and Co-operation Agreement (SACU-US TIDCA) that was concluded in 2008. TIDCA established a co-operative framework to address non-tariff issues such as standards and customs procedures and also established commitments to enter into joint trade and investment promotion activities. In 2009 SACU (including South Africa) signed a Preferential Trade Agreement (PTA) with the Mercosur countries, namely: Brazil, Paraguay, Uruguay and Argentina. The SACU-MERCOSUR PTA created a legal and institutional setting for resolving any trade friction that may arise in future between the two regions, but its commercial value is limited (DTI, 2010).

With regard to Asia, South Africa has worked closely with China to develop and implement the Partnership for Growth and Development aimed at promoting value-added South African exports to China and increasing inward investment by China in projects involving mineral beneficiation. PTA negotiations with India are also currently underway. The relationship with Japan is pursued through ongoing bi-national co-operative agreements.

This study will mainly focus on the multilateral, bilateral and regional trade agreements that have been implemented in order to analyse their impacts on the agricultural sector trade between South Africa and its trading partners. The specific focus will be on the impacts of WTO, EU-SA TDCA and SADC FTA on South African agricultural trade.

1.2 Problem Statement

South Africa re-entered the international economy in the early 1990s at a time when the process of globalization was beginning to gain momentum. To share in the benefits of globalization, South Africa pursued a strategy of trade liberalization policy reform in the context of multilateral, bilateral and/or regional approaches (Kusi, 2002). The distinguishing characteristic of the reform policy was a willingness to expose the country to tariffs that were often below the bound rates which were negotiated in the Uruguay Round of GATT. Whereas agricultural trade had been managed through quantitative controls, the Marrakech Agreement called for the tariffication of all agricultural goods, and a phased reduction in the tariffs. In this process, South Africa substantially liberalised its economy through reform of the import regime and deregulation of the agricultural sector by reduction of domestic support and export subsidies, as well as by harmonisation of Sanitary and Phytosanitary (SPS) measures (Poonyth *et al*, 2002; Jooste *et al*, 2003). This led to increased trade openness in the sector owing to the substantial elimination of trade restrictions, the rationalisation and simplification of the tariff regime as well as the reduction of tariff rates (NAMC, 1999; Loots, 2002).

Historically, South Africa had been trading agricultural products long before the adoption of the trade liberalisation strategy. Given the policy reform in question, one would be interested to ascertain the influence of the trade liberalisation policy on agricultural trade between South Africa and its counterparts. To what extent do these trade agreements affect South Africa's agricultural trade, as compared to other historical trade determinants? Are these trade agreements significantly improving agricultural trade between South Africa and its trading partners? If yes, how? Have they led to the attraction of South Africa's agricultural exports to its trading partners or vice versa? Have the bilateral/regional trade agreements created or diverted South African agricultural trade? Which trade agreement is more significant than the others in terms of improving agricultural trade potential between South Africa and its counterparts?

Generally, most countries, including South Africa, have adopted trade liberalisation policies aimed at improving trade among themselves so as to improve economic growth, generate employment, improve welfare gains, and the like. As agricultural trade liberalisation is part of the trade liberalisation strategy of South Africa (DTI, 2010), it is necessary to analyse the impacts of such trade agreements on agricultural trade between South Africa and its trading partners and to compare them in order to ascertain which of these trade agreements is more beneficial than the others. This analysis will also indicate how significant these trade agreements are in terms of influencing agricultural trade between South Africa and its trading partners.

Although much research had been conducted internationally into the effects of various trade agreements on agricultural trade between different trading blocks, including developed and developing countries, inadequate research has been conducted on the South African situation. Several studies have attempted to answer the above questions, but with limited scope owing to the fact that they were based on assumptions. Most of the South African case studies have focused on the impacts of trade agreements on economic growth and welfare, but have concentrated on a single agreement without comparing it to the others that also affect trade between South Africa and its counterparts (see Davies, 1998; Penzorn and Kirsten, 1999;

Andriamananjara and Hillberry, 2001). Other studies focused on only one aspect of trade, mainly the export-side (see Kalaba, 2001; Cassim, 2001; Chauvin and Gaulier, 2002; Poonyth *et al*, 2002; Nouve and Staatz, 2003). Few studies did compare the impacts of various trade agreements on the above variables, but they were not specific to agricultural trade liberalisation (see Lewis, 2001; Sandrey, 2006). Other studies focused on the impact of tariff reductions on specific agricultural commodities (see Jooste, 1996, Jooste *et al*, 2001; Oyewumi *et al*, 2007). These studies have not addressed the questions of how, and to what extent, these trade agreements influence agricultural trade between South Africa and its counterparts, nor as to which one is more influential than the other.

It is not clear from the literature as to whether the trade agreements under review have led to the attraction of South Africa's agricultural exports to trading partners, or the attraction of South Africa's agricultural imports from such partners, or both. Therefore, it is difficult to judge and generalise as to which trade agreement is more beneficial than the others insofar as South African agricultural trade performance is concerned. Some of the agricultural products under examination have been given preferential treatment, either reciprocally or non-reciprocally, such as in-quota tariff rates and annual tariff phase-downs, effective from implementation of such trade agreements. The question is: have the signatories of such preferential trade agreements complied with what they had signed for? If they have fully complied, it is expected that the volume of trade in agricultural products between South Africa and its trading partners would have improved significantly during the implementation of such trade agreements. This would in turn have positive effects on economic growth, employment and welfare.

Therefore, there is a need to analyse the impacts of such preferential treatments on the imports and exports of benefiting agricultural products between South Africa and its trading partners. It is indeed necessary to ascertain how the trade agreements influence South Africa's agricultural trade flows, i.e. whether they influenced South Africa to export more than importing, or vice versa or both. In addressing the above questions, this study will analyse the ex-post impacts of such preferential treatments on South Africa's agricultural trade at both aggregate level (total agricultural imports and exports) and disaggregate or product level (imports and exports of specific agricultural products).

Moreover, this study will attempt to assess the impact of existing multilateral, bilateral and regional trade agreements which South Africa has signed (WTO AoA, EU-SA TDCA and SADC Trade Protocol (TP) on agricultural trade between South Africa and its trading partners. Therefore, this study will generate new knowledge in terms of measuring the compliance of the signatories to the trade agreements and will provide a useful contribution to the understanding of the likely impacts of trade agreements on the volume of trade between South Africa and its major trading partners. Furthermore, this study will also review the literature on the impacts of various trade agreements on the agricultural and other economic sectors of the developed and developing countries.

1.3 Research objectives

The overall objective of this study is to measure the impacts of the trade agreements under review on agricultural trade between South Africa and its trading partners. The following are the specific objectives:

1.3.1 To provide an overview of the trade agreements which have implications for agricultural trade in South Africa;

1.3.2 To review the impacts of agricultural trade liberalisation policies in the context of the trade agreements on the economic growth and welfare of South Africa and the Southern Africa region, as well as of its trading partners;

1.3.3 To determine whether the trade agreements have a significant influence on agricultural trade between South Africa and its trading counterparts;

1.3.4 To investigate whether the trade agreements have caused trade creation or trade diversion;

1.3.5 To estimate trade potentials between South Africa and its trading partners owing to the trade agreements.

1.4 Outline of the Study

Chapter 2 provides an overview of various trade agreements and South Africa's agricultural trade liberalisation policy, with a focus on the implemented trade agreements that South Africa has signed. These are: a multilateral trade agreement with respect to the WTO AoA, a bilateral trade agreement with respect to the EU-SA TDCA, and regional trade agreements with respect to SACU and the SADC Trade Protocol. This chapter addresses the policy issues around agricultural trade liberalisation with a view of unpacking what South Africa is offering the international community, as well as what the international community is offering South Africa in terms of agricultural trade provided by the trade agreements in question.

Chapter 3 outlines the impacts of trade liberalisation on developing countries including South Africa. This encompasses a literature review of previous studies on the impacts of the trade agreements in question on the economies of developed and developing countries, with a focus on the agricultural sector. Chapter 4 discusses the various models used in trade policy analysis and summarises the theoretical framework of the model adopted in this study. Furthermore, this chapter also discusses data requirements and provides the sources where data was collected. Chapter 5 presents the empirical results of the study at both aggregate and disaggregate levels, and Chapter 6 provides the summary, conclusions and recommendations of this study.

CHAPTER 2

TRADE AGREEMENTS AND THE AGRICULTURAL TRADE LIBERALISATION

Policy Reform in South Africa[1]

2.1 Introduction

South Africa's agricultural sector, like those in most countries, was characterised by trade distorting measures during the apartheid era, ranging from quantitative restrictions, price controls, subsidies directly related to production quantities, and the like. These interventions were aimed at supporting commercial farm incomes, promoting food self-sufficiency, and stabilising prices (Van Schalkwyk, 1997; Jooste *et al*, 2003).

To reverse the years of recession and decades of "inward industrialisation strategies" trade liberalisation became one of the central driving instruments for achieving accelerated economic growth in South Africa. South Africa has also embarked on a process of trade liberalisation policy reform in the context of multilateral, bilateral and regional approaches. In the process, South Africa substantially liberalised the economy through reform of the import regime and deregulation of the agricultural sector (Vink *et al*, 2002).

This chapter addresses the policy issues around agricultural trade liberalisation with a view of unpacking the trade benefits offered by the trade agreements under review. The following sections of this chapter provide a detailed discussion on South Africa's reaction to the globalisation policies through its engagements with the international community. Furthermore, this chapter also describes the agricultural offers provided by the multilateral, regional and bilateral trade agreements.

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[1] NB: In this study, South Africa is referred to as including the Southern African Customs Union (SACU) because the trade data of South Africa and the rest of SACU countries (i.e. Botswana, Lesotho, Namibia and Swaziland) is combined due to the common external tariff. However, South African trade (exports and imports) constitutes more than 90% of the total SACU trade (exports and imports).

2.2 A multilateral approach of South Africa's trade liberalisation policy

South Africa successfully participated in the negotiations of the Uruguay Round of GATT and became a signatory of the Marrakech Agreement in 1994. Since then, South Africa's trade regime has changed considerably as agriculture was brought under the multilateral trade rules at the conclusion of the Uruguay Round and the establishment of the WTO in 1995 (Vink *et al.*, 2002). The Uruguay Round of GATT reinforced a rules-based system of trade: it brought agriculture under the discipline of the trade rules of GATT and established a process for reductions in support of agriculture. It also entrenched tariffs, through tariffication of non-tariff barriers, as the currency of protection and it established the WTO, with the capability to enforce the discipline which the various contracting countries agreed to (Ingco and Townsend, 1998; Tsigas and Ingco, 2001).

In brief, the Uruguay Round Agreement on Agriculture (UR AoA) covers three main areas: reductions in farm export subsidies, increases in import market access and cuts in domestic producer subsidies. For example, on reductions in farm export subsidies, budget outlays of industrialised countries were to be cut by 36% in value terms (24% for developing countries), and the volume of subsidised exports for each commodity were to be reduced by 21% (14% for developing nations) over the six years from 1995 to 2000 (10 years to 2004 for developing countries) from their 1986-90 base-period averages. Moreover, no export subsidies not in place in the base year may be added. As far as cuts in domestic producer subsidies are concerned, a common measure called the "Aggregate Measure of Support", which quantifies the amount of domestic support to producers, was to be reduced by 20% (13.3% for developing countries) over the implementation period from the 1986-88 level on average. This information is obtainable from WTO website (www.wto.org).

The liberalisation of agricultural trade in South Africa started with the Marrakech Agreement in 1994 and was given greater momentum after the first democratic government in South Africa came into power in 1994, as part of the government's reorientation of the economy from import substitution to an export-led growth strategy (Vink *et al*, 2002). South Africa's agricultural offer to the WTO consisted of a five-year tariff reduction and rationalisation programme, which entailed reducing to six the number of tariff categories that had previously numbered over 100. Liberalisation of the agricultural sector first took the form of tariffication of quantitative restrictions followed by the reduction in diversity of *ad valorem* tariffs (Cassim *et al*, 2002).

As a result of these deregulation and trade liberalisation policies, South Africa committed itself to various international obligations and implemented successfully all the Uruguay Round rules on agriculture through the:

- ✓ Introduction of the new Marketing of Agricultural Products Act in 1996 that resulted in the elimination of all marketing boards, the removal of price regulation and single channel markets by the end of 1997. This led to the reduction of domestic support measures to WTO acceptable levels in 2000.
- ✓ Removal of export subsidies in July 1997 by the termination of the General Export Incentive Scheme, except for sugar. For the latter, an industry arrangement exists for local prices.
- ✓ Replacement of import permits by import duties. This has already improved access to the South African market.

South African agriculture is thus now generally free from trade distorting support measures. Apart from the fiscal constraint that limits the extent to which it can support farmers, current policy is predicated on the view that trade liberalisation will encourage efficient utilisation of our scarce resources. Government strategy for growth and distribution is based on this trade liberalisation approach. Improved market access is a key strategy for South Africa's agricultural development. South Africa's interest has shifted to actively pursuing further liberalisation of global markets and to the removal of trade distorting domestic support and export subsidies by competitors. This is necessitated by South Africa's accession of membership in the Cairns Group, which is a lobby group or informal association of agricultural exporter members of the World Trade Organisation which share the common objective of further liberalisation of global agricultural trade.

Many countries including South Africa have complied with the rules of the URAA of the WTO, but high-income economies such as the EU and the US have exploited the loopholes of the URAA, which has enabled them to provide more support while staying within their limits.

With the URAA nearly fully implemented, heterogeneous market interventions in the economies in question still distort resource allocation and trade in agriculture (Fabiosa *et al*, 2003). As a result, many developing countries became disappointed with the limited accomplishments achieved by the Marrakech Agreement. This disappointment led them to voice their concerns as largely reflected in the Doha Declaration of the WTO (WTO, 2001). Primarily, the lack of market access in high-income countries constrains trading opportunities for developing economies because of tariff rate quotas (TRQs) and other trade barriers (Martin and Winters, 1995; Anderson *et al*, 2001).

The new Doha Round of multilateral trade negotiations, as adopted in November 2001 in Qatar, builds on the previous work of the Uruguay Round and, without prejudging the outcome of the negotiations, members committed themselves to comprehensive negotiations aimed at substantial improvements in market access; the reduction of, with a view to eventually phasing out, all forms of export subsidies; and substantial reductions of trade-distorting domestic support (WTO, 2001).

2.3 A bilateral approach of South Africa's trade liberalisation policy

South Africa has signed a Trade, Development and Co-operation Agreement with the EU (better known as the EU-SA TDCA, which also includes a Free Trade Agreement). This agreement was the culmination of five years of protracted negotiations and came into force in January 2000. This reciprocal agreement entails the liberalisation of tariffs on 95% of EU imports from South Africa over a 10-year period and on 86% of tariffs on South Africa's imports from the EU over a 12-year period (Cassim *et al*, 2002). The main agricultural offers of the EU-SA TDCA are as follows (EC Council, 1999):

- **Agricultural tariff phase-down:** According to the agreement, the EU will liberalise approximately 61% of agricultural imports from South Africa over a ten-year implementation period. South Africa will liberalise approximately 83% of agricultural imports from the EU over 12 years. To achieve this, both sides have placed products in tariff phase-down groups or lists based on the sensitivity of the product or industry to tariff liberalisation. Certain sensitive products were placed on 'reserve lists'. Although tariff elimination is not envisaged for products on the reserve list, the situation will be reviewed at a later stage. It is understood that reviews will take place no later than five years after entry into force of the agreement. The EU placed beef, certain dairy products, cut flowers, certain fresh deciduous fruits, rice, maize, sugar, certain canned fruits and vegetables, certain fruit juices and wine on the reserve list. South Africa placed beef, mutton, maize, wheat, certain dairy products, and sugar on the reserve list.

- **Agricultural tariff quotas:** The EU has granted South Africa preferential tariff quotas for cheese, cut flowers (including a separate quota for proteas), frozen strawberries, canned fruit, fruit juices, sparkling wine and wine. In turn, South Africa also granted the EU preferential tariff quotas for cheese, sparkling wine and wine. These quotas make up approximately 13% of South Africa's agricultural trade with the EU. Table 1 provides detailed information about these quotas.

- **Agricultural safeguard clause (Article 16):** The agricultural safeguard clause (Article 16) written into the agreement gives South Africa the right to challenge the EU if proof can be found that increased imports of agricultural products are causing harm or threatening to cause harm to the domestic industry. It calls for consultations to address these problems, while it also allows for immediate action in cases where such action is justified.

- **Rules of origin:** The rules of origin prohibit the deflection of trade within the free trade agreement. They lay down specific criteria for imports enabling the importing country to determine whether the imported product can be considered as originating in the exporting country or not. According to the agreement, all South African exports to the EU subject to preferential treatment under the agreement will have to be accompanied by a certificate of origin certifying that the product in question meets the rules of origin. The South African Revenue Service (Customs and Excise Division) will be responsible for issuing rules of origin certificates (form EUR1).

- **Co-operation in agriculture (Article 61):** Article 61 of the agreement is aimed at the promotion of sustainable rural development in South Africa through co-operation between South Africa and the EU. Co-operation according to the article will take place through the transfer of know-how, the establishment of joint ventures, and capacity building programmes.

- **Compromise agreement on port and sherry:** A compromise agreement on port and sherry paved the way for the conclusion of the overall agreement. It contains a number of elements including a commitment from South Africa to phase out its use of the terms 'port' and 'sherry' on the international and SADC market (over five and eight years respectively) and to review its use of the terms port and sherry on the domestic market jointly with the EU no later than 10 years after the agreement is implemented.

- **Wines and Spirits Agreements:** The negotiations around the Wines and Spirits (W&S) Agreements took a long time due to disagreements about the originality of the names 'port' and 'sherry'. A political compromise was reached in March 1999, under which South Africa would phase out the names port and sherry within an agreed time period in consideration for concessions of, in addition to preferential quotas, 15 million Euros for a programme for restructuring the South African wines and spirits industry and for marketing and distribution. The Wines and Spirits Agreements were signed in January 2002 and became effective immediately. Due to this delay, both parties agreed on a formula to increase the wine quota to 42.02 million litres with effect from January 2002 which would then increase by 6.72 million litres per year until the end of the phase-down period, as a compensation mechanism to take account of the fact that the quota had not been opened in 2000 and 2001.

Historically, before the conclusion and implementation of the EU-SA TDCA, the EU had been South Africa's main trading and investment partner, accounting for over 40% of its total trade. Likewise, the EU's foreign investment in South Africa accounted for over 70% of its total foreign direct investment (FDI), a figure that is likely to grow in the light of this agreement. It is expected that the EU-SA TDCA will also strengthen and improve the access of South Africa's agricultural products into the EU market and vice versa, as a result of the tariff cuts and quota allocations committed by both parties.

Table 2.1: Preferential tariff quotas of agricultural products under the EU-SA TDCA

HS Code	Product Description	Initial Quota	Tariff Quota Duty	AGF
European Union's offer to South Africa				
0406	Cheese and curd	5 000 tons	Reduced by 100% of MFN	5%
0603	Cut flowers – roses, orchids & chrysanthemums	500 tons	Reduced by 100% of MFN	3%
	Cut flowers – proteas	990 tons	Reduced by 100% of MFN	5%
	Other cut flowers	1 100 tons	Reduced by 75% of MFN	3%
0811	Frozen fruits and nuts	250 tons	Reduced by 100% of MFN	3%
2008	Prepared or preserved fruits and nuts	60 000 tons	Reduced by 100% of MFN	3%
2009	Fruit and vegetable juices	5 700 tons	Reduced by 50% of MFN	3%
2204	Wine of fresh grapes – sparkling wine	450 000 litres	Reduced by 100% of MFN	5%
	Wine of fresh grapes – excluding sparkling wine	32 000 000 litres	Reduced by 100% of MFN	3%
South Africa's offer to the European Union				
0406	Cheese and curd	5 000 tons	Reduced by 50% of MFN	3%
2204	Wine of fresh grapes – sparkling wine	260 000 litres	Reduced by 100% of MFN	5%
	Wine of fresh grapes – excluding sparkling wine	1 000 000 litres	Reduced by 100% of MFN	5%

Source: EC Council, 1999   HS – Harmonised System   AGF – Annual Growth Factor

2.4 A regional approach of South Africa's trade liberalisation policy

South Africa is a member of the Southern African Customs Union (SACU) and played a leading role in the renegotiation of the 1969 SACU Agreement, which was concluded in 2001. The principal objective of the SACU Agreement as renegotiated is to maintain free interchange of goods between member countries and to apply the same tariff and trade regulations to imports from outside the common customs area on a basis that sustains the economic development of all the member countries. The SACU Agreement provides for a common external tariff and a common excise tariff to this common customs area. All customs and excise duties collected in the common customs area are paid into South Africa's National Revenue Fund. The revenue is shared among members according to a revenue-sharing formula as described in the agreement.

The advantage of the SACU Agreement is to ensure the easy flow of trade in the area and provide an extended market for South African goods, including agricultural products, to the BLNS (Botswana, Lesotho, Namibia and Swaziland) countries. The arrangement guarantees a substantial income for the BLNS countries and saves them the costs of administering border control and the import duties. In addition, the BLNS countries enjoy rebate facilities on the importation of certain agricultural products, i.e. maize, wheat and dairy products, from third countries. They only receive rebates on such products if their tariff rates into the customs union are high.

In addition, SACU members, i.e. South Africa and the BLNS countries, are members of the Southern Africa Development Community (SADC) and this community established the Trade Protocol that was signed in 1996 and implemented in 2000. This SADC Trade Protocol is part of a more comprehensive regional agreement for economic and political co-operation and development. This co-operation will eventually extend to the rest of the continent through NEPAD, for which South Africa has already taken the responsibility of leadership.

One of the objectives of the SADC Trade Protocol is to liberalise intra-regional trade in goods and services on the basis of fair, mutually equitable and beneficial trade arrangements, complemented by Protocols in other areas, with a view of establishing a Free Trade Area in the SADC region (SADC Secretariat, 1999). The objective target of the SADC Trade Protocol was to have 85% of all intra-SADC trade at zero tariffs by 2008 and to have the remaining 15% liberalised by 2012. In order to achieve this objective target, the main instrument of trade liberalisation is therefore the elimination of customs tariffs and non-tariff measures on substantial intra-SADC trade (Hansohm *et al*, 2004).

According to this Protocol, the elimination of import duties (tariffs) would be carried out in three categories. Category A (Elimination upon implementation), Category B (Phased elimination within eight years), and Category C (Phased elimination not extending beyond twelve years). By definition, Category A represents commodities that already attracted zero or low tariff levels; Category B represents commodities with high tariff levels that constitute significant sources of customs revenue; and Category C represents the sensitive products whose imports are considered to be sensitive to domestic industrial and agricultural activities. In this case, Categories A and B should have accounted for 85% of intra-SADC trade so that by 2008 SADC would have been regarded as a free trade area in compliance with GATT Article 24, whereas Category C is limited to a maximum of 15% of between 2008 and 2012.

The information on commodities covered under these categories is obtainable from the Tralac website (www.tralac.org)

In acceding to the Protocol, all members (except Angola, the Democratic Republic of Congo and Seychelles who were not then parties to the free trade process) tabled their implementation instruments or plans in the form of tariff phase-down schedules according to the categories in question. The country-specific offers were based on the principle of reciprocity in such a way that tariff preferences would only be extended to member states who were party to the process (Hansohm *et al*, 2004). Tariff liberalisation is based on an asymmetric offer approach, taking into account member states' levels of development, as follows:

- SACU's combined offer to non-SACU SADC member states entails five-step elimination of tariffs on all SADC imports with the first cut upon implementation of the agreement. These included a reduction of import tariffs by 60% on industrial and agricultural products imported from SADC countries. The proposed SACU offer included the following:

    - ✓ The immediate liberalisation list contains all products with tariffs rates from 1-17% so that 19.2% of all SADC imports and 19.2% of tariff lines are covered.
    - ✓ A three year linear phase down that includes products between 18-25% tariffs and covers 6.3% of SADC trade and 26.4% of tariff lines.
    - ✓ A five year linear phase down that contains 6.6% of SADC trade, 3.9% of tariffs lines and includes all products with tariffs above 25%.
    - ✓ South Africa considers the following as sensitive products: dairy, wheat and meslin, sugar and sugar confectionary, textiles, foot wear and vehicles.

- Different offers by non-SACU SADC countries to SACU countries have also been tabled. All countries committed themselves, however, to completing the elimination of tariffs on most products by the end of year eight of the implementation period and for sensitive products by the end of year 12. Table 2.2 shows various offers for specific agricultural products by non-SACU SADC countries to SACU countries.

Table 2.2: Non-SACU SADC countries' offers to SACU countries: Tariff phase-down schedule for agricultural products under SADC Trade Protocol

Commodities	Malawi	Mauritius	Mozambique	Tanzania	Zambia	Zimbabwe
Dairy	8 yrs	5 yrs except bird eggs & honey 12 yrs	12 yrs	8 yrs	12 yrs except for milk-8 yrs	8 yrs
Deciduous fruits	8 yrs	5 yrs, strawberries- 12 years	8 yrs, citrus- 12 yrs	8 yrs	8 yrs	8 yrs
Dried fruits	8 yrs	5 yrs	12 yrs	8 yrs	8 yrs	0 from year 1
Canned fruits	8 yrs	5 yrs	12 yrs	8 yrs	8 yrs	5 yrs
Fruit juices	8 yrs	5 yrs	12 yrs	12 yrs	8 yrs	8 yrs
Wines and spirits	8 yrs	12 yrs	12 yrs	12 yrs	12 yrs	8 yrs
Wool and mohair	0 from year 1	0 from year 1	0 from year 1	7 yrs	0 from year 1	8 yrs
Wheat	0 from year 1	0 from year 1	8 yrs	8 yrs	5 yrs	8 yrs
Wheat flour	8 yrs	12 yrs	8 yrs	12 yrs	12 yrs	8 yrs

Source: SADC Secretariat, 1999

In addition, core non-tariff barriers such as quantitative import and export restrictions should have been eliminated immediately. However, non-tariff barriers not related to standards, sanitary or phytosanitary requirements but solely for the purpose of managing trade had to be removed by the end of year eight. This included single channel marketing regimes, restrictive visa requirements, and others. Sanitary and phytosanitary standards (SPS) within the SADC would be harmonised. The Protocol currently provides for "one-product-multiple-rules" rules of origin, i.e. more than one rule could apply to the same product. Following the objection of SACU, which felt that these rules would create the possibility of significant trade diversion in the region, agreement was reached that product specific rules of origin should be developed on a chapter-by-chapter basis, and that the Protocol would be amended accordingly.

2.5 Summary

This chapter has provided an overview of various trade agreements that have implications for agricultural sector trade in South Africa. The overview has emphasised that South Africa has responded positively to the challenges posed by the globalisation processes. This is indeed necessitated by its engagements with the international community through its commitments to multilateralisation, bilateralisation and regionalisation processes. Its commitments to international obligations have led to a policy paradigm shift in the agricultural sector that has resulted in trade liberalisation and deregulation policies.

In the light of these developments, expectations of more open trade regimes in the agricultural sector are rising owing to eliminated and less strict trade restrictions, the rationalisation and simplification of the tariff regime, as well as the reduction of tariff rates. The next chapter provides a review of the literature on the impacts of the trade agreements on the agricultural sector and other sectors of the economy in South Africa, as well as those in other developing countries.

CHAPTER 3

Literature Review of the Impacts of Trade Agreements on the Economies of Developed and Developing Countries

3.1 Introduction

As mentioned in Chapter 1, the core objective of this study is to measure the impacts of trade agreements (as discussed in Chapter 2) on agricultural trade between South Africa and its trading partners. This chapter reviews the literature on the studies that analysed the impacts of various trade agreements on developed and developing countries. Indeed there are studies that have analysed the impacts of various trade agreements, such as the multilateral trade agreements in the context of the World Trade Organization Agreement on Agriculture (WTO AoA) as well as Regional Trade Agreements (RTAs) in the context of customs unions, preferential treatments, free-trade arrangements, etc. These studies have analysed the impact of such trade agreements on the economic growth, employment, trade and welfare of the developed and developing countries.

When reviewing the literature of above case studies, this chapter will initially focus on the implications of the WTO AoA on the economies of the developed and developing countries with reference to South Africa and the region. Furthermore, the impacts of implemented regional trade agreements between South Africa and the European Union countries (in the context of EU-SA TDCA) as well as between South Africa and SADC countries (in the context of SADC Trade Protocol) will also be reviewed. In addition, the study will also attempt to review case studies on the impacts of selected implemented and envisaged trade agreements on the economies of other countries worldwide.

3.2 Implications of the World Trade Organization Agreement on Agriculture

As elaborated in Chapter 2, the main goal of the World Trade Organization Agreement on Agriculture (WTO AoA), commonly known as the Uruguay Round Agreement on Agriculture (UR AoA), was to liberalise world trade through the creation of a framework that would regulate international trade and stimulate international commerce. The WTO AoA has been described as one of the main accomplishments of the marathon seven-year Uruguay Round. It was signed with the objective of bringing discipline into one of the most distorted sectors of international trade, by controlling the unrestricted use of production and export subsidies and reducing tariff and non-tariff barriers on imports of agricultural products.

There is a consensus view that, *ceteris paribus*, economies that are open to trade will grow faster than countries that are closed. Wang and Winters (1998) argued that this consensus is especially strong with respect to Africa, where decades of import substitution are thought to be partially responsible for the continent's dismal economic performance. Sharma *et al* (1996) state that the WTO AoA is expected to cause beneficial effects for aggregate world income, as inefficiencies in production and trade will be removed gradually, but it is generally agreed that the impact on global trade would be fairly small over the implementation period, reflecting the limited extent of the reforms achieved. However, there is also a common assertion made by the critics of globalisation that trade liberalisation increases poverty. The proliferation of low-wage jobs and higher food prices are some of the arguments brought forward in support of this argument (Hertel *et al*, 2003). The question is who is right? Various impact studies on globalisation and trade liberalisation have attempted to answer this question and a sample of them are quoted below.

Studies by Harrison *et al* (1997) and Whalley (2000) on the effects of the global trade liberalisation have found that openness is associated with more rapid growth. They estimated annual increases in global GDP due to reductions in tariff and non-tariff barriers. Moreover, most of the gains accrue to countries (including especially advanced countries) that offered the most reductions in tariff and non-tariff barriers. Detailed studies of trade liberalisation suggest that the benefits to the economy as a whole are far more than the costs (Edwards, 1989; Matusz and Tarr, 1999). However, using a gravity model, Anderson and Van Wincoop (2004) found that trade costs are large when broadly defined to include all costs involved in getting a good from producer to final user. Both international trade costs and local distribution costs are very large and together dominate the marginal cost of production. Trade costs also vary widely across countries. On average, developing countries have significantly larger trade costs.

As quoted by Jooste (2001), studies by Harrison *et al* (1995) and Hertel *et al* (1997) have shown losses amounting to 0.24 per cent and 0.13 per cent of the SSA's base GDP respectively in the year 2005 as a result of the reforms under the Uruguay Round. Harrison *et al* (1995) concluded that there exists a large potential for improvement, or even reversal, of the situation through domestic policy reforms which are stated to be necessary for taking advantage of the new trading opportunities opened up by the Uruguay Agreement. The OECD (1998a), while also recording welfare losses as a result of the implementation of the AoA, supports the view of Harrison *et al* (1995). Dimaranan *et al* (2003) also found consistent results, as they found that an across-the-board 50% cut in all domestic support for OECD agriculture leads to welfare losses for most of the developing regions, as well as for the combined total group of developing countries. The 50% cut in domestic support also results in large declines in farm incomes in Europe and, to a lesser degree, North America. They concluded that developing countries will be well advised to focus their efforts on improved market access to the OECD economies, while permitting these wealthy economies to continue – indeed even increase domestic support payments.

Goldin *et al* (1993), as quoted by Jooste (2001), have estimated worldwide benefits due to liberalisation in the order of US$190 billion with tariff reductions in the order of 30 per cent. About US$70 billion of this total would accrue to non-OECD countries. The total gains would increase to US$430 billion with full agricultural reform, with the gain for non-OECD countries in the order of US$180 billion. With the levels of tariffication agreed in the Uruguay Round agreement, the gains are much smaller, particularly for those agricultural exporters who do not subsidise their agricultural activities.

Hathaway and Ingco (1995) share his optimism by stating that despite the substantial retreat by the advocates of liberalisation, the Uruguay Round agreement on agriculture appears to hold great promise. Cognisance is taken of the fact that some of the binding powers laid down during the Uruguay Round may be weak, but the essence is that new rules have been laid down to which role players must adhere in future. This view is also supported by Ingco and Townsend (1998) who mention that several studies that have attempted to measure the impact of the Uruguay Round on agriculture have indicated their concerns about the high cost of complying with the Uruguay Round obligations and the limits these may put on developing strategies, whilst others raised concerns about the potential market losses due to the erosion in the value of preferential exports, as overall cuts in tariffs will reduce the value of the preferences.

It is well known that OECD countries afford their agricultural sectors a high degree of protection. For example, IFPRI (2003) indicated that total support to agriculture in OECD countries amounted to US$311 billion in 2001, or about US$850 million per day, dwarfing the amount those same countries give in development assistance. This protection costs developing countries about US$24 billion annually in lost agricultural and agro-industrial income. Trade distorting measures also displace more than US$40 billion of net agricultural exports per year from developing countries. IFPRI (2003) also found that elimination of protectionism and subsidies of the industrialized world's agriculture would triple developing countries' net agricultural trade. This is indeed supported by Hertel *et al* (2000) who found that agricultural liberalisation in the wake of the UR, i.e. 40% cuts in both market price support and domestic producer subsidies, could still yield substantial benefits for the global economy in 2005 and the total gains amounted to about US$70 billion. However, as Hertel and Martin (1999) have pointed out, the distribution of these gains is quite different in the sense that while the rates of protection are higher in the industrialized economies, they are the ones to capture the majority of the absolute gains from liberalisation of food markets. However, when measured relative to initial income, developing countries are also some of the biggest winners from cuts in agricultural protection.

Using a GTAP model, Diao *et al* (2001) estimated the welfare effects that would occur if OECD countries removed tariff, export subsidies, and domestic support. An interesting aspect of Diao *et al*'s paper is that they calculated the contributions of each policy reform to the overall price change. For instance, they find that the elimination of domestic support in OECD countries would account for 30% of the rise in prices that would occur if all agricultural trade distortions were removed. They also find that although the removal of OECD tariffs would create small welfare gains for developing countries, the removal of OECD domestic support and export subsidies would create a small loss for developing countries. These results are consistent with the recent study by Rae and Strutt (2003), who apply four simulations of agricultural policy reforms to an updated version of the GTAP model. For each of the three simulations that involve the reduction of domestic support, they find that this reduction contributes negatively to the overall welfare effect of that policy reform. In addition, Rae and Strutt (2003) predict that developing countries' welfare would increase by US$2 billion if developed countries increase Blue and Green Box domestic support. Taken as a group, the recent general equilibrium studies suggest that the removal of OECD agricultural tariffs would benefit developing countries, but the removal of OECD domestic support would not be beneficial.

Panagariya (2002) noted that 48 out of 63 low-income countries are net importers of food, and that 31 of the world's 46 least developed countries are net importers of both food and agricultural products. Further, of the 41 developing countries that are net exporters of agricultural products, 22 are net importers of food. If cereals prices increase, the welfare of net importers of food will decline. Given this scenario, Panagariya (2002) argues that because agricultural price increases benefit exporters but not importers, the benefits of OECD trade liberalisation would accrue to middle-income developing countries in Latin America and Asia, who are actual or potential exporters of currently-subsidized products. In contrast, least developed countries, which are more likely to be net food importers, will not as a group benefit from OECD agricultural liberalisation. The predominance of low-income and net food importing countries in Africa implies that the region would see a decrease in welfare if cereals prices increase with the reduction of OECD agricultural trade distortions.

The empirical work by Dimaranan *et al* (2003) supported Panagariya's argument, as they applied the GTAP model to simulate various scenarios of OECD agricultural reform and predicted that Sub-Saharan Africa would lose US$126.1 million, or .42%, if OECD countries halve domestic support to agriculture. Furthermore, they suggested that this loss is due to many African countries' status as net importers of subsidized agricultural products. Instead of building from the GTAP model, Soledad Bos (2003) used a partial equilibrium approach and found that OECD subsidy reduction would lead to welfare losses in African countries. Soledad Bos (2003) also calculated changes in consumer and producer surplus that would occur in the maize markets of five African countries if OECD countries were to reduce domestic support to agriculture by 100% or 50% and found negative net welfare changes in each of the countries she studies: Uganda, Kenya, Zimbabwe, Botswana and Mozambique. Although this is an interesting result, the scope of this study is rather narrow as it was limited to five countries and one food crop.

Agriculture remains much more important in the economies of developing countries than it does in the high-income countries. According to IFPRI (2003), an agricultural-led growth strategy may produce greater multiplier effects for the rest of the economy than other alternatives in the world's poorest countries. Furthermore, increased profits from agriculture encourage expanded economic activity, causing dynamic effect in four areas, i.e. employment, land, capital and technology. Developing countries remain small net exporters of agricultural commodities. Further, consumers in developing countries spend over 30% of their incomes on food, which is almost three times the share in industrial countries, making them much more vulnerable to shocks. Agriculture's contribution to GDP in developing countries is also around three times as high as its share in industrial countries (Hertel *et al*, 2000).

The major effects of international agricultural trade liberalisation will be higher prices and an allocation shift in production. A reduction in export subsidies will also raise the prices paid by the importers (Bade, 1998). The developing countries have to open their domestic markets to price signals in the world markets as part of their overall economic policy reforms, market liberalisation, and market privatization. Therefore, they are more exposed than before to the effects of price instability in the world market (Islam, 1996). Another effect of the agreement on developing countries will be that they will be affected by a reduction in price support, which will lead to a reduction in food surpluses and stocks in developed countries, and hence, a fall in food aid availability (Karim and Kirschke, 2002).

Huber & Lehmann (2009) have analysed the consequences of world market prices for agricultural production and the land-use patterns in the Swiss lowlands using a mathematical programming model. Given a sufficient reduction in production costs, their results imply that income maximizing farmers would focus on grassland based milk production. This would only lead to a modest change in the existing landscape since their case study region was dominated by dairy farms. If production costs remain high, agricultural production would shift to more extensive production activities in order to maximize the sectoral income. However, if a certain level is exceeded, farmers would merely cease production and cultivate their land in order to get direct payments. This would change the land-use patterns considerably. The main driving forces behind this development are the implementation of the direct payment system and the farmers' possibility to reduce their production costs, in particular, by means of structural change which would result in more productive farms.

While the inclusion of agriculture into the multilateral trade rules during the Uruguay Round was one of the biggest achievements of the GATT, Ingco and Townsend (1998) argued that its impact on African countries was a subject of much controversy. Several studies raised concerns about the high costs of complying with the obligations from the Uruguay Round and the limits these may put on development strategies (UNCTAD, 1994; Weston, 1994; Konate, 1994; Greenaway, 1994). Other concerns relate to potential market losses for African countries from the erosion in the value of its preferences in its export markets as overall cuts in tariffs will reduce the value of the preferences (Davenport *et al*, 1994) and from terms-of-trade loses due to potentially higher foods prices to net importers of food (GATT, 1994) as export subsidies are reduced.

This is also supported by Peacemaker-Arrand (2004) who found that the removal of wealthy countries' subsidies would lead to welfare losses for most African countries, although the net effects are a small percentage of GDP in each country For example, the removal of developed countries' subsidies for wheat and maize is more likely to have negative rather than positive effects in most countries in sub-Saharan Africa – even for farmers. Although some countries could benefit from the removal of subsidies in certain non-food crops, such as cotton, it is not in the interest of most sub-Saharan African countries to pursue cuts in developed countries' cereals subsidies as part of the next WTO agricultural agreement. Those who have proposed cuts in developed countries' subsidies argue that because agriculture makes up a large share of developing countries' economies, and because the majority of most developing countries' populations are farmers, a decrease in wealthy countries' subsidies would benefit poor farmers and developing countries. Peacemaker-Arrand (2004) concluded that the argument for subsidy removal has two major flaws: it does not acknowledge the negative effect of agricultural price increases in net-food-importing developing countries, and it assumes that poor farmers would necessarily benefit from price increases in the goods they produce. In fact, because of the substantial margins between producer and consumer prices, households that sell a greater quantity of grain than they purchase may spend more on grain they purchase than they received in income from the grain they sold, because grain is priced higher when sold to consumers than when purchased from farmers.

However, other studies (Sorsa, 1995) have shown that the Uruguay Round is unlikely to "burden" Sub-Saharan African (SSA) countries with many new obligations and that most countries in the region did not make meaningful liberalisation commitments in the Uruguay Round. Thus, by resisting liberalisation and the opportunity to anchor domestic reform in an international framework, Sub-Saharan African countries have forgone an opportunity to reap substantial gains from the Uruguay Round (Ingco and Townsend, 1998). This is because, while the UR made significant efforts to improve market access conditions, the general consensus after the UR was that African countries did not go far enough in implementing their commitments, e.g. lowering their bound duty rates (Ingco, 1995; Harrold, 1996). According to Hoekman (2002), this is due to the fact that negotiators from the developing countries signed documents that most of them did not fully understand. As a result, not much progress was made; in particular on market access for textiles and also most of the developing countries did not anticipate the enormous burden of implementing some of the WTO agreements. Most developing countries believe that the UR did not produce fruitful results (Adhikari, 2000). This is supported by Ndirangu (2002), cited by Makhura and Mokoena (2003), who argued that the Uruguay Round does not focus on addressing the development needs and concerns of the majority of farmers in developing countries, particularly in Africa.

Ingco and Townsend (1998) have also argued that while the Uruguay Round addressed the worst distortions in world agriculture, it left many agricultural policy distortions especially in low-income African countries outside its scope. Most of the African countries do not subsidize, but tax agriculture either implicitly by giving higher protection to industry, or more explicitly by taxing exports of many commodities or by maintaining government controlled domestic prices below world prices (Schiff and Valdes, 1992). These distortions were not part of the Uruguay Round agenda, and some of them are not even covered by the GATT (examples include export taxes or domestic pricing policies that "tax" agriculture). Actual liberalisation of industrial tariffs in Africa within the Uruguay Round is also modest and did not reduce the existing bias against agriculture. African trade policies have also suffered from frequent policy reversals and from the impact of exchange restrictions on trade flows. This is because, while the UR AoA sets rules on international food trade and on domestic agriculture policy, these rules have accelerated the rapid concentration of agribusinesses and undercut the ability of the poor countries to maintain food self-sufficiency through subsistence agriculture. The UR AoA assumes that rather than being self-sufficient in food, countries will buy their food in international markets using money earned from exports. However, many less developed countries face low commodity prices for their limited range of exports. During the first four years of the existence of the WTO, the prices of agricultural commodities fell to record lows, while food prices remained high. This system hurts both farmers and consumers, and paves the way for Trans National Companies (TNCs) to dominate markets, especially in the poor countries. Therefore, the study d that rules are needed to address the rapid concentration of TNCs in agribusiness because a small handful of companies trade virtually all the world's corn, wheat and soyabeans. This increased consolidation of agribusiness in the hands of a few TNCs has led to near monopoly conditions in both the farm supply industry and in the food processing and distribution systems.

In support for above arguments, Ndirangu (2002) also d that the UR AoA tends to favour farmers in developed countries rather than in Africa. It does not allow farmers in Africa to receive any form of support other than that listed under the Green Box and the *de minimis* percentage of 10% of agricultural production. Developed countries, which provided considerable support to their farmers before the WTO was established, have continued to support them. These nations are permitted to invoke the special safeguard clause, which allows imposition of additional duties in case of increased imports without proof of injury in the domestic market, while African countries do not have such recourse as they agreed to a ceiling binding during the Uruguay Round. Agricultural trade has been more protected in the developed countries after the conclusion of the Uruguay Round negotiations, while in Africa the farm sector became more exposed to external forces and subsidized exports from developed nations. This has had adverse effects on production and food security in the African continent. This is supported by Stevens *et al* (undated) who indicated that the impact of UR AoA on food security will be negative due to fact that it will alter world market conditions for agriculture with the likelihood of provoking changes in both the level and the distribution of supply and demand. This will, in turn, alter the prices that some countries receive for their exports and pay for their imports.

Hertel *et al* (1998) evaluated the effects on Africa of tariff reductions in manufactures, textile and clothing, and agriculture tariffs agreed under the Uruguay Round. Using the GTAP data they found that the limited gains from the Uruguay Round in Africa are mainly because Africa does not ease its trade restrictions as much as other countries, and so, as they put it, world trade "bypasses the continent." Unlike textiles and clothing, which would suffer most as a result of the Uruguay Round, production of cereals, non-grain crops, forestry and fish products would expand. After simulating the domestic reforms in both trade and transportation sectors and in food grain productivity, they discovered that, in both sectors, Africa lags significantly behind other low-income countries, and institutional reforms could provide major gains at low cost. Tsigas and Ingco (2001) also used the GTAP framework to assess the implication of improvements in market access through quota expansion and lowering of in- and out-of-quota tariffs and found that policy reform agreed in the UR Agreement on Agriculture and continuation of such reforms would lead to significant gains for the world as a whole and for most regions.

This is supported by Pustovit and Schmitz (2003), who used a multi-commodity multi-country comparative static trade model to analyse the impact of agriculture protection in OECD countries on South African Agriculture. They found that developing (importing) countries could gain from liberalisation of the OECD countries' agricultural policies if the disincentive effects of production are taken into consideration and own policies are adjusted to more open markets (see also Anderson *et al*, 2001; Beghin *et al*, 2002; Diao *et al*, 2002; Hoekman and Anderson, 2000; Martin and Winters, 1996). Furthermore, they indicated that liberalizing both OECD countries' policies and South African agricultural policies could be the best way of contributing to agricultural development and avoiding poverty and hunger. In addition, industrialized countries would save money (welfare gain) which could be spend directly as development aid and concluded that South Africa could benefit a lot by liberalizing trade and agricultural policies world wide. These results are consistent with those of Chant *et al* (2001), who used a computable general equilibrium (CGE) model calibrated to a social accounting matrix (SAM) for South Africa to assess the impact of agricultural trade liberalisation on agricultural productivity growth and employment in South Africa. They found that agricultural trade liberalisation would have positive impacts upon the economy, but that the extent of the benefits is dependent on whether agriculture can remain competitive by improving productivity.

However, Roberts (2000) found that liberalisation of trade in South Africa did not yield the expected gains from incentives to export during the 1992-1997 period. Instead, while manufacturing exports and imports increased, output growth faltered in most sub-sectors and there were major reductions in employment. In many sub-sectors, improved trade performance was associated with contractions in production and employment, while trade performance deteriorated in sub-sectors with increasing employment. Furthermore, Kusi (2002) used a time series regression model to analyse the impacts of trade liberalisation on South Africa's export performance and found that there is a lack of a clear relationship between trade reforms and improved export performance of the major sectors of the economy, such as finance and insurance, agriculture, gold and uranium. In fact, external market conditions were the important determinant of export performance across all sectors during the sample period.

The study by Jooste *et al* (2001) used a spatial partial equilibrium model to analyse the effect of tariff reductions on the red meat industry in South Africa and found that the prices of livestock and meat will drop substantially, whilst increased demand will be met largely by imports. The consumers' welfare gains amounted to R2 829 million that translated to 0.49% increase in the real gross national income. However, tariff reductions led to a substantial welfare loss by producers of about R868 million that translated to about 2.71% of real gross farm income and 10.72% of real net farm income. This is supported by Oyewumi *et al* (2007) who used a partial equilibrium comparative static model to measure the welfare effects of further liberalisation in the livestock industry of South Africa, particularly in meat products using four policy scenarios. They found that a complete removal of tariffs on consumers will result in a welfare increase of R1 880.8 million, which amounts to 0.33 per cent increase in real gross national income or 0.50 per cent increase in real disposable income. Whereas on the producers side, the welfare will drop by R656.89 million, which represents a drop of 2.05 per cent in real gross farm income or 8.1 per cent in net farm income. In this case, the tariff and Tariff Rate Quota (TRQ) liberalisation will result in net welfare gains to society, but the impact on the agricultural sector would be much more substantial in relative terms. They recommended it is worth considering the effects on producers if further trade liberalisation is envisaged in the South African livestock industry.

Apart from the UR AoA, there are also several studies that predicted the potential impacts of the new Doha Round (DH) of the WTO on the economies of the developing countries and a sample of them are provided here. The study by Fabiosa *et al* (2003) used a partial equilibrium model of world agriculture to investigate the multilateral removal of all border taxes and farm programs and their distortion of world agricultural markets. They found that net agricultural and food exporters (i.e. developed countries) emerge with expanded exports, whereas net importing countries (developing countries) with limited distortions before liberalisation are penalized by higher world markets prices and reduced imports. On the other hand, Poonyth *et al* (2004) used an agricultural trade policy simulation model (ATPSM) to assess the likely impact of the draft Harbinson modalities[2] for further commitment, along with the EU proposal[3] and US proposal[4] on the agricultural sector of the SADC countries. Their results showed that SADC as a group loses in term of total welfare under all the three proposals and it is more pronounced under the Harbinson proposal. In the case of the Harbinson and EU proposal, the loss is due to decrease in consumer surplus and decrease in government revenue. Whereas in the case of the US proposal, the loss in total welfare is due to a decrease in producer surplus and in government revenue.

The above findings by Fabiosa *et al* (2003) and Poonyth *et al* (2004) supports Short (2003) who stated that "multilateral trade liberalisation is an indispensable part of development, but trade alone is not an answer to poverty reduction, however, is one key driver of economic growth". With these words, Short (2003) was trying to that without effective states with effective institutions that pursue pro-poor policies, the poor will see little benefit from the trade liberalisation of the DH and concluded that Doha Round is not only about helping the world's poor developing countries, but it is also in developed countries' own self-interest and therefore

[2] The Harbinson modalities proposed different reduction rates for developed and developing countries depending on the level of the initial tariff. On market access, the Harbinson text proposes that countries be required to cut tariffs tariffs by a simple average, except in-quota tariffs, for all agricultural products. Countries may reach this average in any way, subject to a minimum reduction per tariff line, using bound tariffs as a base. Using a banded approach, tariff reductions shall be implemented in equal annual instalments over a period of five years for developed countries and ten years for developing countries. In addition, the modalities propose the elimination of export subsidies over a period of 9 years.

[3] The key US proposal on tariff was the use of a harmonisation formula that would reduce higher tariffs more deeply than lower tariffs. For this, the Swiss formula was proposed meaning that all tariffs are reduced to below 25%. The other key proposal was to apply the formula to applied tariffs.

[4] The EU proposal was for the continuation of the UR approach, i.e. 36% average reduction of bound rates with a minimum 15% cut for each tariff line.

both developed and developing countries stand to gain from a rules-based multilateral trading system.

Surprisingly, Nyhodo *et al* (2009) used a static computable general equilibrium (CGE) model to analyse the potential impact of Doha Development Agenda on the South African economy and found that the South African economy would respond positively to world price changes, with government and macro variables showing minimal but positive responses. Furthermore, household consumption expenditures generally show positive changes, implying increased factor incomes. They concluded that the overall effect is positive even though not all sectors will be positively affected.

3.3 Implications of the EU-SA Trade, Development and Cooperation Agreement

The EU-SA TDCA is a reciprocal agreement that entails the liberalisation of tariffs on 95% of EU imports from South Africa over a 10-year period and 86% of tariffs South Africa imports from the EU over a 12-year period. There are several studies that have evaluated the impacts of the EU-SA TDCA on trade, economic growth, employment, welfare, etc. For example, Davies (1998) simulated a Free Trade Agreement (FTA) between the EU and South Africa using the GTAP model and found a strong potential for trade diversion following an FTA. His study showed that the FTA would cause a switch from cheaper sources to less-efficient EU products.

However, Laaksonen (2008) argued that there were no very strong signs of trade diversion to trade between the EU and South Africa on the cost of trade with the rest of the world because the significance of free trade between South Africa and the EU was difficult to pinpoint in the overall trade picture during the early years of the new century, since there have been many other very significant changes in the operating environment, including the economic rise of Asia and the increase in raw material and energy prices. Laaksonen's argument lacked substance as it was not supported by any substantial evidence. In fact, some studies found that both South Africa's agricultural exports to the EU as well as EU's agricultural exports to South Africa for the period 2000 and 2009 have done well and concluded that the EU-SA TDCA has been a factor towards this success (Sandrey, 2010).

Mokoena *et al* (2007) found consistent results with those of Davies (1998) as they also found that the implementation of EU-SA TDCA resulted in the diversion of South Africa's agricultural exports to other markets by about 0.51% due to negative response of South Africa's agricultural exports to the EU during the early stage of the EU-SA TDCA's implementation, but concluded that the EU-SA TDCA has created a room for potential increase of the South African agricultural exports in the EU market. This is in line with the findings of Sandrey (2006) who found that while TDCA increased South Africa's imports from the EU by some R4.3 billion, about R2.7 million was trade diverted from other sources.

Furthermore, Mokoena *et al* (2008) used a gravity model to analyse the impacts of the EU-SA TDCA's reciprocal preferential tariff quotas on cheese and wine trade flows and still found a trade diversion on all wine trade flows, i.e. about 0.8% of exports, 2% of imports and 2.3% of the total trade were diverted during the wine tariff quota implementation. However, there was no proof of trade creation and diversion on both cheese imports and exports, except that there was a diversion of about 4.1% of the total cheese trade. In addition, their results showed that South Africa's cheese exports to the EU and total cheese trade between the parties had declined during the implementation of cheese tariff quotas. South Africa's wine exports to the EU and South Africa's wine imports from the EU had also declined during the implementation of the wine tariff quotas. However, the effects were insignificant on South Africa's cheese imports from the EU and total wine trade between the two parties.

In contrast, Andriamananjara and Hillberry (2001) also applied the GTAP framework to analyse the EU-South Africa FTA and found trade creation as the net effect as both South Africa's exports and imports increased. In addition, their study incorporates dynamic effects of trade and growth, adding estimates of the links between trade openness and total factor productivity (TFP) shocks for South Africa. They found that the trade-induced growth is two percent of total growth over the phase-in period. Also using the GTAP model, Penzhorn and Kirsten (1999) analysed the impacts of the EU-SA TDCA on South African agriculture and found that both South Africa and the EU will experience welfare gains as a result of the agreement. Furthermore, they determined that the exports of dairy products to the EU would increase by another 35% while exports of vegetables and fruit, and other agricultural products will also increase by 25% and close to 30%, respectively.

Similarly, Kalaba (2001) also analysed the effects of the EU-SA FTA on South Africa agriculture with special reference to the competitiveness of fruits (i.e. grapes, pears and apples) in the EU market using a source differentiated, almost ideal demand system (SDAIDS) model and found that South African fruit exports to the EU are at least competitive among the selected suppliers, i.e. US, Chile, Turkey and New Zealand. In addition, there was evidence of complementary relationships between South African apples and those from the US, and that South Africa faces strong competition in grapes from Chile and the US. However, South Africa's trade liberalisation appears to have increased the exports of grapes to the EU. This was also supported by Gay (2004) who used a trade simulation model to analyse the implications of the EU-SA TDCA on the fruit trade and found that the EU-SA TDCA had a slight beneficial effect for South African orange producers due to the small tariff cut for fresh oranges.

At the regional level, McDonald and Walmsley (2001) used the GTAP framework to analyse the impacts of the EU-SA FTA on Botswana and they found that while the FTA may substantially benefit the signatories, there are appreciable negative impacts for other states, especially South Africa's immediate neighbours. Moreover, the reluctance of the EU to fully liberalise trade in food and agriculture commodities results in a major reduction in the benefits for South Africa without ameliorating substantively the adverse implications for other nations. Similarly, Tsolo *et al* (2010) examined the impact of the EU-SA TDCA on trade patterns between the South Africa and Botswana, Lesotho, Namibia and Swaziland (BLNS) using a random effects model and found that the demand for imports by the BNLS countries is income elastic and price inelastic implying that the imported goods from South Africa are necessary and consumers and producers of the BLNS countries depend on them. Furthermore, they found that the EU-SA TDCA brought about increased imports to the BLNS countries and that the volume of exports to South Africa from the BLNS countries had increased after the agreement. These findings implied that imports could have led to a crowding out of domestic production as a result of the EU-SA TDCA as well as that the EU-SA TDCA could have benefited the BLNS countries by increasing their exports.

3.4 Implications of the SADC Trade Protocol on Trade

The main objective of the SADC Protocol on Trade is to liberalise intra-regional trade in goods and services on the basis of fair, mutually equitable and beneficial trade arrangements with a view of establishing a Free Trade Area in the SADC region. There are several studies that have evaluated the impacts of the SADC FTA on trade, economic growth, employment, welfare, etc. Using a cross section econometric gravity model, Cassim (2001) looked at the potential for trade among SADC countries and found that specific areas where potential trade is less than actual trade are mostly South African and Zimbabwean exports to the region. In case of South Africa, in all instances, its potential exports are significantly lower than its actual exports.

Chauvin and Gaulier (2002) also used the gravity approach and found consistent results with that of Cassim (2001) in the sense that they found that South Africa's actual exports are all above potential exports with other SADC countries. Nevertheless, even though other SADC countries' combinations show some potential trade higher than actual trade, they seem nevertheless smaller compared to Cassim's results. Surprisingly, findings by Poonyth *et al* (2002) are inconsistent with the above. They also used the gravity model to evaluate the potential for trade integration in the context of both the structural factors and growth behaviour of the region. They found that South Africa's potential exports to selected SADC countries (i.e. Mauritius, Mozambique, Malawi, Tanzania, Zambia and Zimbabwe) are significantly higher than its actual exports due to the SADC FTA and concluded that there is room for improvement in the trade gap between South Africa and its SADC partners.

A study by Diao and Robinson (2003) showed that the elimination of agricultural tariffs among SADC countries would benefit real agricultural GDP in the region, national income and agricultural output. Studies by Lewis (2001) and by Lewis *et al* (2002) using computable general equilibrium (CGE) modelling examined the impact of a FTA on SADC economies. They concluded that the gains that can be achieved through trade expansion are limited given SADC's small size relative to the global economy and the trade imbalances among its members. Nin-Pratt *et al* 2008) added that the largest share of the gains would go to Zimbabwe, SACU, Malawi, Mauritius and Tanzania, while Angola and the DRC would be negatively affected by the agreement. In addition they found that countries that benefit the most are those with a comparative advantage for agriculture in the region (e.g. Zimbabwe), while still being inefficient producers of regionally traded commodities. The inefficiency of the main regional exporters also explains the negative welfare impacts of the agreement on countries with comparative disadvantage in the region (net importers), like Angola and the DRC. This is because the elimination of tariffs on regional imports in these countries would increase imports of wine, beer, meal and flour of wheat; preparation of cereals, sugar and bakery products from inefficient regional producers, with trade diversion dominating trade creation. It means inefficient agricultural producers with a regional comparative advantage for agriculture would benefit from trade creation with the rest of the world and as a result regional importers would be faced with negative welfare effects because of increased imports from inefficient regional producers.

Evans (2001) assesses trade options for SADC countries namely, an FTA, a Customs Union, or open regionalism, by which SADC countries extend tariff reductions to all countries on a most favoured nation (MFN) basis and concluded that trade creation dominates trade diversion in an FTA as intra-SADC trade increases by 9 percent while trade with the rest of the world (ROW) hardly changes. With free trade, trade creation was observed as SADC trade expanded by almost 7 percent, but with potential terms of trade costs. These results concur with the findings by Nin-Pratt *et al* (2008) who estimated a total value of trade creation of $157 million or 0.92 per cent of annual agricultural trade (from 2000 to 2005) of SADC countries, and a net effect between trade creation and trade diversion of $129 million or 0.75 per cent of total agricultural trade.

In contrast, Mokoena *et al* (2007) analysed the ex-post impacts of the implementation of SADC FTA on South Africa's total agricultural exports to SADC countries for the period 2000 to 2004 using a gravity model and found that the implementation of the SADC FTA resulted in the diversion of South Africa's agricultural exports to other markets by about 0.5% Furthermore, their results indicated that South Africa's agricultural exports responded negatively to the implementation of the SADC FTA from 2000 to 2004, but concluded that the FTA has created a room for potential increase of the South African agricultural exports in SADC market. These results are similar to the findings by Holden (1996) who indicated that regional trading blocs such as SADC encourage import substitution industrialisation and suggested that South Africa's participation in a FTA would lead to trade diversion.

A study by Lewis *et al* (1999), cited in Poonyth *et al* (2002), concluded that the SADC FTA in conjunction with the EU-SACU FTA improves welfare of all SADC countries. This is consistent with the findings of Nin-Pratt *et al* (2008) who assessed the potential welfare impacts of a free trade agreement (FTA) on the agricultural sector of Southern African countries and found that the overall welfare effects of a FTA would be positive but small in most countries. At the country level, they estimated that two-thirds of region-wide welfare gains from agricultural trade liberalisation would go to low-income countries while almost one-third would go to SACU. However, it should be noted that there are some complications brought about by the overlapping nature of FTAs in the Southern African region, for example the EU-South Africa FTA has put a strain on initiatives under way to form a free trade area within SADC and also puts into question the continuing viability of SACU (Lewis, 2001). Added to this, Tsikata (1999) found that the overlapping nature of membership of Southern African countries in many other schemes raises questions over the consistency and feasibility of satisfying the conflicting obligations and tensions among various institutions and their members.

In analysing the possible impact of various preferential trade agreements on South Africa and the rest of SADC, Lewis (2001) concluded that while promotion of a SADC FTA will yield benefits to all participants, SADC's small size relative to the global economy and the trade imbalances among its members will likely limit the medium-term scope for trade expansion. However, he observed that South Africa gains more from the FTA with the EU than it will from a SADC FTA, and for the rest of SADC, the gains from greater access to the EU are proportionately even larger. In a similar vein, Holden (1996) observed that South Africa has little incentive to seek preferential treatment in the region, largely because of the economic divergence between it and other countries in the region and because South Africa's share of regional exports remains small relative to its exports to the rest of the world. Various studies using a gravity model have also shown that the implementation of the FTA in SADC would have favourable effects on bilateral trade (Longo and Sekkat 2001; Subramanian and Tamirisa, 2001).

In addition, Lewis (2001) also used a World Bank database on tariff schedules for ten SADC members, namely, SACU members, Malawi, Mauritius, Tanzania, Zambia and Zimbabwe, to evaluate the possible impact of the proposed SADC FTA from the point of view of tariff harmonisation and fiscal effects. The results indicated that fiscal considerations are likely to be important in any form of SADC FTA and concluded with an observation that any regional trade arrangement will involve differential benefits and losses among the individual countries, suggesting that redistributive issues such as unemployment and income distribution should be dealt with as first priority to increase chances of a viable arrangement.

Studies have also argued that the limited role that the SADC FTA could play in the region results from the fact that tariffs are not the only obstacle to increased regional trade. To explain low trade in Southern Africa several studies have stressed the importance of transport and transaction costs, inadequate infrastructure, lack of diversification in sources of comparative advantage and underdeveloped production structures (see for example, Cassim 2000; Chauvin and Gaulier 2002; Davies 1996; Geda and Kibret 2002; Goldstein 2004; Holden 1996; Jenkins *et al*, 2000; Longo and Sekkat 2001; Nyirabu 2004; Radelet 1997). Furthermore, Nin-Pratt *et al* (2008) suggested that the SADC region should be looking at regional policies and interventions beyond trade arrangements, such as those targeting investment, agricultural productivity and diversification in order to enhance benefits of regional trade liberalisation.

3.5 Implications of the Selected Trade Agreements in the World

Since early 1990s, Regional Trade Agreements (RTAs) have gained momentum and became a very prominent feature of the Multilateral Trading System (MTS). As of 15 May 2011, about 489 RTAs were notified to the GATT/WTO of which 358 RTAs were notified under Article XXIV of the GATT 1947 or GATT 1994; 36 under the Enabling Clause; and 95 under Article V of the GATS. At the same date, 297 agreements were in force. Of these RTAs, Free Trade Agreements (FTAs) and partial scope agreements account for 90%, while customs unions account for 10% (WTO website, 2011). This section reviews the literature on trade and welfare impacts of selected RTAs.

Fulponi *et al* (2011) analysed the treatment of agriculture by RTAs and found that almost 60% of the RTAs prohibit agricultural export subsidies and indicated that this should be seen as going beyond the WTO-AoA commitments, thus making them "WTO-plus". Furthermore, they found that countries which do not currently use export subsidies were a significant portion of those prohibiting them in their RTAs. Overall, the RTAs examined do provide for increased trade liberalisation compared to commitments under the WTO AoA, as evidenced by tariff elimination, commitments on export subsidy elimination and sunset clauses on special agricultural safeguards. However, few concrete commitments are found with respect to non-tariff measures such as Sanitary and Phyto-sanitary (SPS) and Technical Barriers to Trade (TBT) measures.

On the other hand, Wainio *et al* (2011) examined the implications of selected trade agreements (TAs) on U.S. agricultural trade with reference to recently concluded TAs between ASEAN (Southeast Asia) countries and China and Australia/New Zealand, as well as pending TAs between the United States and Korea, Colombia, and Panama. Their results suggest that TAs between ASEAN countries and China and ASEAN countries and Australia/ New Zealand would result in moderate losses to U.S. agricultural exports of about $350 million to those countries, but losses would be partially offset by gains in other markets. U.S. agricultural exports to Korea would expand by an estimated $1.9 billion per year if the US-Korea TA were implemented. The US-Colombia TA would result in an estimated $370 million in additional US exports per year. US exports would realize smaller gains of about $50 million per year under the pact with Panama. Empirical results confirm theoretical findings that trade created under TAs exceeds trade diverted, but that results depend on the specific circumstances of each agreement. This study finds that in the case of the recently implemented FTAs between the ASEAN countries and China, Australia, and New Zealand, the potential for U.S. agricultural exporters to be affected as a result of trade diversion is modest. This is because a large portion of U.S. exports to these countries already faces duty-free or minimal tariffs. Where tariffs are significant, the United States often faces only minimal competition from FTA members.

In contrast, the analysis of the pending U.S. trade agreement with Colombia reveals a different story. Colombia has been active in negotiating additional FTAs with some key U.S. competitors. One of these FTAs, with the four members of MERCOSUR, has already had significant effects on U.S. agricultural exports and market shares in the Colombian market. A majority of U.S. agricultural exports to Colombia compete head-to-head with exports from MERCOSUR countries. The U.S. market position in Colombia could soon be further eroded if the Canada-Colombia FTA and the EU-Colombia FTA enter into force and competing exports from these countries receive duty-free treatment. Duty-free access to the Colombian market would help maintain and improve the competitive position of U.S. producers (Wainio *et al*, 2011).

Reeder, Torene, Jabara and Babula (2005) analysed the effects of the ANDEAN and MERCOSUR pacts on the Venezuelan soybean trade and U.S. exports. They formulated a partial equilibrium, deterministic, and Armington-type model of the Venezuelan market for soybeans and meal by combining tariffs and the Andean price band variable levy into a single price wedge. Their model results suggest that a combined MERCOSUR and Andean customs union under either a high or a low world soybean product price scenario would noticeably benefit MERCOSUR suppliers at the expense of the United States as well as adversely affect domestic Venezuelan producers (soybean processors) and fellow Andean member Bolivia.

The study by Zahniser and Link (2002) analysed the impact of North American Free Trade Agreement (NAFTA) and found that U.S. agricultural trade with Canada and Mexico has nearly doubled since the implementation of NAFTA. While only a portion of this overall increase can be attributed solely to the agreement, NAFTA has allowed competitive market forces to play a more dominant role in determining agricultural trade flows among the three countries. By dismantling numerous trade barriers, the agreement has contributed to an expansion in U.S. agricultural exports and increased the domestic availability of various farm and food products. In addition, NAFTA has established rules and institutions that mitigate potential trade frictions and promote foreign direct investment. Conversely, many of the initial trepidations that were voiced concerning declining agricultural employment and environmental degradation have not materialized. They concluded that NAFTA should be judged not just in the context of the trade gains associated with the agreement's agricultural provisions, but also in terms of the benefits derived from "locking in" key trade, investment, and institutional reforms in an increasingly integrated North American market.

Yeboah *et al*(2009) analysed the trade effects of MERCOSUR and the Andean Community on U.S. cotton exports to CBI countries using an import demand model on panel data for eight cotton importing CBI countries from the US with annual observations from 1989-2007. Their results indicated the elimination of tariffs by the eight CBI countries would increase U.S. cotton exports by $2.3 million. About 88 percent of the increased U.S. cotton exports are due to trade creation, and the remaining 12 percent is due to trade diversion. Trade creation effects are substantially greater than trade diversion effects. The favorable trade creation effects indicate that the U.S. - CBI agreement has been lucrative with respect to U.S. cotton exports to the region for the period 1989 – 2007. The insignificant trade diversion effects on U.S. cotton exports to the top eight CBI importers indicates that MERCOSUR and the ANDEAN Community have not significantly interfered with U.S. cotton imports to the CBI. The insignificant trade diversion effects on U.S. exports, indicates that MERCOSUR and the Andean Community pose an insubstantial threat to U.S. exports to the top eight importing CBI countries. This study finds that the trade creation effects of the U.S. – CBI agreement would be greater than the trade diversion effects of MERCOSUR and the Andean Community. These results are congruent with the empirical findings of other researchers; for example, Burfisher and Jones (1998) found that the regional free trade agreements have both trade creation and trade diversion effects in agriculture, but trade creation dominates in most regional agreements.

Cafferata and Segura (2007) examined the possible economic impact of the Peru- United States Trade Promotion Agreement (TPA) on Peruvian agriculture from the global and sectoral perspectives, as well as from the point of view of products or agro-production chains. They concluded that the elimination of tariffs on imports from the United States would have a limited impact on the competitive position of most agricultural products on the domestic market, basically due to the fact that most of the opening of trade in many agricultural subsectors involves relatively low tariffs, and high protection is circumscribed, involving three lines of products (rice, sugar and dairy products). IFPRI (2007) analysed the impacts of the US-Middle East Free Trade Initiative on US trade with Jordan and Morocco and found that the effect of the US-Jordan FTA will be small because Jordan's level of protection is already low and because US-Jordan trade is small, while the effect of the US-Morocco FTA will be larger because

Moroccan trade barriers are higher. Of particular importance, Morocco's wheat tariffs will be phased out over ten years.

Using a Calculated General Equilibrium (CGE) model, Jansen *et al* (2007) analysed the impact of the Central America Free Trade Agreement (CAFTA) on Agriculture and the Rural Sector in Five Central American Countries focusing on the effects of tariff reductions and quotas under CAFTA on macroeconomic indicators (economic growth, employment, imports, exports, etc.), sector behaviour, income distribution and poverty. They found that the impact of CAFTA's rules regarding tariff reduction on the quotas for strategic (sensitive) products is small in the short or medium term. Although small, the impact of CAFTA's trade liberalisation on economic growth is positive. The simulation results also indicate that CAFTA does not increase poverty but rather leads to a slight poverty reduction. The impact of tariff reductions under CAFTA on agricultural sector growth is very small, but positive in Honduras and El Salvador, and negative in Nicaragua and Costa Rica; while the impacts of increased quotas is significant and positive only in the case of Nicaragua.

Korinek and Melatos (2009) used a gravity model to analyse the trade impacts of selected Regional Trade Agreements (RTAs) in Agriculture and these are the ASEAN Free Trade Agreement (AFTA), the Common Market for Eastern and Southern Africa (COMESA) and the Southern Cone Common Market (MERCOSUR). Their gravity estimates indicated that the creation of AFTA, COMESA and MERCOSUR have increased trade in agricultural products between their member countries. There was no robust indication of trade diversion with respect to imports from outside the region. The agreements are therefore net trade creating. There was no robust indication however that there has been strong trade creation with non-members in the case of any of the RTAs under study. In some cases, lack of transport and communications infrastructure, in addition to supply constraints, lessens the effect of the RTA on trade flows. Trade costs such as transport and logistics seem to remain important factors in determining agricultural trade flows. In some RTAs, countries have a comparative advantage in exporting many of the same agricultural products, thereby decreasing the impact of the preferential market access.

Regarding the RTAs with the EU, the study by Henry *et al* (2006) analysed the impacts of the EU-MERCOSUR trade agreement on agriculture competitiveness in Argentina and Brazil. They found that the imports of cereals rise as a consequence of the partial liberalisation by nearly two hundred and fifty thousand (250 000) tons or 0.8%. With producer prices dropping by -0.3%, EU production decreases slightly. Exports increase slightly following the price reduction which increases competitiveness of European production. Despite the price decrease total demand decreases as well, which can mainly be attributed to less demand for feeding. Changes on oilseeds markets can only be explained by cross effects from other markets, because in the scenario no changes for oilseeds where specified. However, imports and producer prices decrease slightly, and net production and exports increase. Imports of meat increase due to the expansion of TRQs, and the producer price falls by -0.4%. Production of meat as an aggregate is unaffected, however, production of beef and poultry decrease by -0.2% and -0.1% respectively. That decrease is offset by higher production of pig meat. Demand is unaffected in percentage whereas the EU can increase its exports slightly due to lower prices. On dairy markets, there are hardly any changes in percentage terms, only exports of the EU and the producer price increase slightly.

Using a computable general equilibrium (CGE) model (nicknamed MIRAGE), Boumellassa *et al* (2006) analysed the economic impact of a potential free trade agreement (FTA) between the European Union and ASEAN. They found that the gains accruing to ASEAN members are very large, adding up to more than 2% of GDP in 2020. Accordingly, this potential agreement would have an enormous impact on trade, production and welfare, as compared to other episodes of trade liberalisation. The bulk of the gains (actually three quarter of the gains accruing to the ASEAN) are associated with the liberalisation in services. All scenarios, including a liberalisation in services, are associated with welfare gains shared by all countries taking part in the agreement. The introduction of a list of sensitive products, as a result of political economy constraints, will increase the overall expected welfare gains for the ASEAN and the EU.

Similarly, using a sample of 36 ACP countries, Morrissey and Zgovu (undated) estimated the impact of Economic Partnership Agreements (EPAs) on ACP countries' agriculture trade (i.e. imports), welfare and revenue effects assuming the elimination of tariffs on agricultural imports from the EU under EPAs. They found that over half of ACP countries are likely to experience welfare gains even when assuming 'immediate' complete elimination of all tariffs on agriculture imports from the EU and when excluding up to 20% of imports as sensitive products,. However, although most LDCs gain (10 out of 13), most non-LDCs (about 60%) lose. The overall welfare effect relative to GDP tends to be very small, whether positive or negative. While potential tariff revenue losses were negligible, given that countries have at least ten years in which to implement the tariff reductions, there is scope for tax substitution. They concluded that an important issue is identifying the sensitive products (SPs) to be excluded because the exclusion of SPs reduced the welfare gain (or increased the welfare loss) compared to estimates where no products were excluded. Furthermore, Zgovu and Kweka (2006) applied a partial equilibrium model covering all import products using 2003 trade data and examined the six-digit HS trade, tariff revenue and net welfare effects of Malawi and Tanzania reciprocating EU's preferential tariff treatment under the EU-ACP EPA. Their findings show that there will be welfare enhancing consumption and trade creation effects but these will be swamped by strong welfare-lowering trade diversion and tariff revenue losses leading to non-negligible net welfare losses.

With regard to RTAs in Asia and Oceania, Francis (2011) analysed in impacts of ASEAN-India Free Trade Agreement (AIFTA) and established that ASEAN countries will gain significantly increased market access in India in several semi-processed or processed agricultural products. The reduced demand for local agricultural products as well as the increased imports of close substitutes could lead to a fall in the prices of local crops and thus adversely affecting the domestic agricultural sector. Further, Indian small and medium enterprises (SMEs) in agriculture-related products and food products, as well as in some intermediate goods and light manufacturing products are also likely to be negatively affected by the drastic tariff liberalisation under the AIFTA, as average percentage tariff drops in Malaysia, Indonesia and Thailand's Normal Track products are much lower than India's. However, import liberalisation in intermediate goods will impel multinational corporations (MNCs) to undertake production rationalisation across the region, particularly in the transport equipment and machinery sectors.

Similarly, the Centre for International Economics (2004) analysed the economic effects of the Australia– Thailand Free Trade Agreement and found that the trade liberalisation undertaken as a result of the Agreement will deliver economic benefits to both Australia and Thailand. The gains to Thailand are larger than for Australia due to Thailand having higher barriers to trade, and, therefore, a less efficient economy, than Australia. This result also reflects the greater relative importance of bilateral trade to Thailand than to Australia. Trade liberalisation improves efficiency in the domestic sectors, and as a result both countries experience an increase in real investment. In Australia, investment peaks at 0.1 per cent above the baseline in 2007 and stays at 0.02 per cent above the baseline after 2020. In Thailand, investment increases to a peak of 0.38 per cent higher above the baseline in 2013, and then reduces to 0.22 per cent above the baseline in 2026. At the sectoral level, all sectors in both countries experience an increase in output. The lowering of trade barriers is associated with more efficient domestic industries, while improving access to markets of the bilateral trading partner. Domestic industries in both countries expand their output as they move to meet increased consumption, export and investment demand.

Furthermore, using advanced econometric models (i.e. error-correction model), Victorio and Rungswang (2008) analysed the effects of a free-trade agreement on Thailand's agricultural imports from New Zealand and found that the FTA has increased the quantity of agricultural products imported by Thailand from New Zealand. The empirical results of this study have shown that higher relative prices for Thai agricultural products enticed more imports and the theoretical influence of GDP was supported in sign, though not in terms of statistical significance. Evidence was also found in support of the idea that any short-run disequilibrium is returned to a long-run equilibrium and furthermore, that the FTA significantly influenced the process of return. All of the findings corroborated economic predictions concerning the effects upon trade of changes in commodity prices and of the dismantling of trade barriers.

In addition, a study by Toosi *et al* (2009) analysed the effect of regionalism on Iran's agricultural trade with special reference to the Economic Cooperation Organization (ECO) region. They estimated both standard and generalized gravity model to determine the effective factors on Iran agricultural exports to ECO member countries and found that the ECO region could have a positive effect on Iran agricultural trade because of very high similarity between Iran and the other ECO members in religion, border, ethnic and language in relation to the other chosen trade partners of Iran. By making a comparison between standard and generalized gravity model estimates, the results showed that a considerable share of the variability in the ECO agricultural trade flows refers to uneconomic factors. This study also showed that Tajikistan, Pakistan, Kazakhstan and Azerbaijan in ECO region are more interested in importing agricultural products from Iran and therefore concluded that these similarities amongst the ECO members might put Iran in an advantageous position of expanding its agricultural exports by gradually reducing its trade barriers in the ECO region.

Regarding RTAs in Africa, Sandrey and Jensen (2009) used the GTAP model to assess the welfare and trade gains for the BLNS (Botswana, Lesotho, Namibia and Swaziland) from envisaged FTAs between SACU and China as well as SACU and India. The results for a SACU/China FTA show that there are comfortable welfare gains to South Africa, but negating these are the labour market-related losses where employment falls by 0.13% and the real wage declines by 0.19%. Scrutinising the production and trade results reveals that South Africa gains modestly in the agricultural sector, but the big action is in the manufacturing sector. Both Botswana and the rest of SACU (Lesotho, Namibia and Swaziland as one region) gain modestly in terms of enhanced welfare of a little over one half of a percent of real GDP. Gains in the production value of 'other agriculture', 'other meats', textiles and non-ferrous metals (NFM) are recorded, while exports overall decline to South Africa but increase to both China and the rest of the world. Overall imports into the rest of SACU increase by more than exports, with big increases in textile imports from China leading the way.

For the Indian FTA, it was found that a simulation of comprehensive tariff reform in India is dominated by the massive effects on South Africa's gold sector, and given the implausibility of this they have opted for an alternative simulation that holds the Indian non-ferrous metal (gold) tariffs at their initial value. Following declines in the exports of all manufacturing sectors except non-ferrous metals, the relatively small changes show an overall reduction, while for Botswana's import profile modest increases from India and the rest of the world more than displace South African imports, with the latter leading to an overall decline in imports. Changes for trade in the rest of SACU are even more modest, with slightly increased exports to India and a richer South Africa just ahead of declines to the rest of the world. The direct effects of these FTA results are modest, with most of the changes coming about as the BLNS trade with South Africa changes at the margin (Sandrey and Jensen, 2009).

Sandrey and Jensen (2009) also used the GTAP model to analyse the implication of the SACU/MERCOSUR FTA on BLNS countries and found that there are comfortable welfare gains to South Africa, while the rest of SACU (i.e. BLNS countries) had imperceptible welfare gains. However, the production and trade results revealed that South Africa loses in agricultural production due to increased agricultural imports from MERCOSUR countries that lead to a marginal reduction in the prices of all agricultural products (and a decreased value of agricultural output. They d that, while this is bad news for farmers, it translates into good news for consumers as the reduced agricultural prices across the board are enough to marginally reduce the consumer price index and therefore contributing positively to the overall welfare gains for South Africa.

3.6 Summary

This chapter reviewed the literature on the impacts of various trade agreements on the economies of the developed and developing countries including South Africa and the African region with focus on the implications of the multilateral trade agreement in the context of the WTO AoA as well as bilateral trade agreements in the context of the RTAs. Generally, there is a consensus view that trade liberalisation benefits are far more than the costs, except that more benefits were realised by the high income developed countries more especially in the context of the WTO AoA. However, the majority of studies on the effects of the WTO AoA concluded that international agricultural trade liberalisation resulted in high prices and in some instances this led to shifts in production.

With regard to bilateral trade agreements, most of these studies indicated that RTAs resulted in positive contributions to the economies of the developing countries, especially in improving their welfare gains and expanding trade. Most studies have found that trade creation effects were substantially greater than trade diversion effects due to the implementation of various RTAs worldwide, and therefore concluded that the need for RTAs is thus greatest if the multilateral negotiations do not manage to facilitate trade on a broader scale. However, given the principal objective of bilateral and regional free trade agreements to secure trade liberalisation and expand market access for members, some studies have felt that the discriminatory nature of FTAs may result in FTA members expanding their trade at the expense of non members who may become less competitive purely on the basis of facing a higher tariff than the members.

Apart from reviewing trade and welfare of the trade agreements in question, this chapter has also highlighted various models that were used to undertake such exercises. Gravity and CGE models were the most commonly used models in the studies reviewed. Having learnt various methods that were used in the impact studies of trade agreements, the next chapter provides a detailed description of various models used in trade policy analysis with a view of selecting the suitable model for the study.

CHAPTER 4

METHODOLOGY OF THE STUDY

4.1 Introduction

Investigation into the impact of trade policies and/or trade agreements on the economic sector in a country or a country as a whole requires sophisticated modelling frameworks. Such models include market equilibrium models (such as partial equilibrium and economy-wide models) and single equation econometric models (such as import demand and gravity models). These models have been used by many researchers to analyse the impacts of international trade policies. The next sections of this chapter provide an overview of selected models of trade policy analysis focusing on their uses, strengths and weaknesses with an ultimate objective of selecting the suitable model for the study. Furthermore, the chapter provides the motivation why the model has been considered as well as a detailed discussion on the theoretical framework and specification of the model. Finally, the data requirements of the model and the sources of the data are described.

4.2 Market equilibrium models

Many researchers have used market equilibrium models to address issues in international trade. These models are used for the determination of equilibrium prices and quantities on sets of markets in order to analyse the impacts of trade on various economic indicators such as economic growth, welfare, employment, etc (see Tongeren and Van Meijl, 1999). They also contain the response (behaviour) of economic agents to changes in prices; and prices adjust so as to clear markets. There are two types of market equilibrium models, partial and economy-wide models, which are discussed in detail below.

4.2.1 Partial models

These models treat international markets for a selected set of traded goods, e.g. agricultural goods. In this case the agricultural system is considered as a closed system without linkages with the rest of the economy. The main area of application of partial equilibrium models is detailed trade policy analysis to specific products. Partial models may be single- or multi-product (see Francois and Reinert, 1997). The following list paraphrases the summary by Tongeren and Van Meijl (1999) of global partial equilibrium models adapted to agricultural trade:

4.2.1.1 AGLINK model

The AGLINK model is a recursive dynamic supply and demand model of world agriculture, which uses (Nerlovian) partial adjustment relationships. AGLINK was developed by OECD in co-operation with its member countries, and is presently used by government services of OECD member countries. The model is used for analysis of the impacts of agricultural policies and for forecasting the medium term development in supply, demand and prices for the principal agricultural commodities produced, consumed and traded in member countries. One of the main strengths of the AGLINK model is that the model structure closely represents the agricultural situation in member countries. Hence, it has the ability to capture interactions between commodities and between countries since it not only provides indications of directional flows/impact, but also information on the magnitude of these impacts (Jooste, 2001).

Von Lampe (1999) states that a major shortcoming of the AGLINK model is its inflexibility and inability to differentiate current regional aggregates embedded in the model further, namely the rest of the OECD and the Rest of the World. He states that in aggregating important developing countries such as China, India and the African Rim within a single region makes it difficult to reflect the impact of the considerable changes in those regions on the world market. Another shortcoming is the absence of important food crops in many southern hemisphere countries and in Asia, since the substitution of these products in favour of higher-quality food cannot be modelled.

4.2.1.2 Country-Link System

The Country-Link System (CLS) of the Economic Research Service (ERS) of the USDA is used to conduct global supply, demand and trade projections in general, whilst different scenarios, such as the Asian crisis, could also be modelled. It also allows for individual country analyses. It is a decentralised system that is linked to expertise based in different regions. Regional models are then linked to each other to form a complete system capable of simultaneous multi-commodity, multi-region solutions within the partial equilibrium framework over the medium and long term. Another distinguishing feature of the CLS is that it has the capability to analyse bilateral trade flows with the Armington facility (Landes, 1998).

Jooste (2001) paraphrased a number of major strengths of the CLS model. Firstly, the model has broad coverage of the countries and commodities. Secondly, the model has established linkages to regional and commodity expertise, supported by an appropriate software interface, since analysts in different countries do not use the same software for model construction. Thirdly, the model exhibits multi-commodity and multi-region consistency through a simultaneous solution framework. Finally, the model can be adapted with relative speed as far as "non-model" approaches are concerned.

Jooste (2001) also identified a number of weaknesses associated with the model as follows: Firstly, the non-standardised modelling format slows the process of linking models and theoretical consistency cannot always be enforced in all models. Secondly, a lack of regional expertise exists in some areas, whilst some models are also poorly maintained. Thirdly, some key areas are not modelled endogenously. Finally, the model is not suitable for short-term forecasting. According to Von Lampe (1999), the Country-Link system, in addition to including several policy measures such as tariffs, quotas, etc., also considers a number of other exogenous variables, i.e. changes in population, income and exchange rates, etc. He also regards the absence of a number of products, such as pulses and various starchy products that are particularly important for developing countries, as a minor disadvantage of the CLS.

4.2.1.3 European Simulation model

The European Simulation Model (ESIM) was initially developed co-operatively between the USDA/ERS, Stanford University and Göttingen University. ESIM is designed to forecast the consequences of accession of the Central and Eastern European countries to the EU (see

Tangerman and Josling, 1994). Besides EU enlargement ESIM is used to analyse the effects of CAP (e.g. Agenda 2000) and WTO policies on agricultural markets and budgetary expenditure.

The major strengths of the ESIM model include a broad coverage of agricultural commodities and the fact that it guarantees the theoretical conditions of homogeneity and symmetry. However, the model also has some weaknesses which include limited coverage of region or countries as well as the fact that it is a static model, and therefore cannot be used to model the dynamics of trade.

4.2.1.4 World Food Model

The World Food Model (WFM) is a multi-product, dynamic partial equilibrium model and was developed by the Food and Agriculture Organization (FAO). The model is designed to obtain medium- and/or long-term projections (e.g. used in outlook of FAO on agricultural commodity markets) and to simulate impacts of policy changes on prices, production, consumption and trade of the most important agricultural products (FAO, 1993, 1994, 1998).

One of the major strengths of the WFM is that it is a dynamic model because it allows for the outcome of one year or a sequence of years to influence the outcome of future years. According to Von Lampe (1999), this enables the model to capture the adjustment paths of the market after the introduction of certain shocks. It is a world model and, therefore, the regional coverage is broad.

The main weakness of the model is that it does not satisfy all the laws of demand and supply (i.e. homogeneity, additivity, symmetry and negativity). It is basically a determinist model and does not contain stochastic elements. In principle, the WFM was not designed to simulate policy, but rather concentrated on making projections of the world food situation. However, modifications were made to the WFM to simulate the impact of trade liberalisation scenarios, more specifically the impact of the Uruguay Round commitments. It covers only measurable Uruguay Round commitments that encompass bound tariffs and their reductions, minimum access and limits on subsidised exports. In essence, the model aims to examine the impact of production shocks on world price stability in order to verify if tariffication and reduction of tariffs have the expected effect (FAO, 1998).

4.2.1.5 FAPRI model

The FAPRI model is a neoclassical, econometric partial and recursive dynamic model developed by the Food and Agricultural Policy Research Institute (FAPRI) at Iowa State University. It is basically an integrated set of models used to 'provide quantitative evaluations of national and international agricultural policies and other exogenous factors that affect US and world agriculture' (Devadoss *et al*, 1993). FAPRI has been used for several years in conducting US policy evaluations. The set of models involves domestic livestock models, domestic crop models, government cost and farm income models for the US linked to some world trade models.

The main strength of the model is that it has introduced the dynamics on both supply and demand functions in a naïve adjustment model for most of the functions. It also includes projection functions to generate projection of the exogenous variables for the next ten years. In addition, it covers major agricultural and processed commodities. Its main weakness is that it does not report information on sensitivity analyses.

4.2.1.6 GAPsi model

GAPsi, Gemeinsame AgrarPolitik – Simulation (Common Agricultural Policy Simulation), is a partial multi-sector, multi-region, recursive dynamic equilibrium model developed and used at the Institute of Market Analysis and Agricultural Trade Policy (MA) of the Federal Agricultural Research Centre (see Salamon, 1998). This model is designed to evaluate EU agricultural policies (e.g. CAP reform, Agenda 2000).

The model's strength is that it is used for providing both a baseline projection and the calculation of alternative policy agreements. In addition, quantity instruments (such as quota and budget restriction) are modelled explicitly. It is also dynamic in nature. However, the regional and commodity coverage is limited.

4.2.1.7 SWOPSIM model

The SWOPSIM (Static World Policy Simulation Model) is a standard multi-commodity, multi-region partial equilibrium model originally developed by Roningen (1986) at the USDA to study the impact of the GATT Uruguay Round. SWOPSIM models are designed to simulate the effects of changes in producer and consumer support policies on production, consumption, and trade' (Roningen, 1986). Generally, the framework has been employed to analyse the effect of policy changes on agricultural activity and trade. Applications of the SWOPSIM modelling framework have included: WTO trade liberalisation (e.g. the Uruguay Round); effects on agriculture from EU enlargement and potential Eastern European EU membership; agricultural policy reform (e.g. CAP); free trade hypotheses versus supply control; trade prospects and the opening up of Asian markets; environmental change and global warming; the impacts of crop disease; trade liberalisation impacts on production factor demand and the gains from trade (and comparative advantage); effects of protection and exchange rate policies on agricultural trade; and welfare analysis.

The advantage of the model is that it has been extended to capture trade flows using an Armington-type specification (Dixit and Roningen, 1986), to include the permanent impact on derived demand for factors following policy shifts (Liapsis, 1990) and to include medium and long term projections (e.g. Roningen et al., 1990). In addition, the regional and commodity coverage is broad and some of its applications provide the information on sensitivity analysis. Its main weakness is that it does not include dynamics of trade.

4.2.1.8 WATSIM model

The WATSIM (World Agricultural Trade Simulation Model) is global-multi-region, multi-commodity partial equilibrium model developed by the University of Bonn (Von Lampe, 1998). WATSIM focuses on three target periods with different aims: Short-term shock analysis, medium-term projections and policy analysis, and long-term projections and analysis of various shift factors (e.g. income in Asia, productivity in transition countries). According to Von Lampe (1999), the WATSIM includes a broad set of policy measures that influence domestic and world markets by altering price, production, demand and trade quantities. The model focuses mainly on those key factors that will influence supply and demand prospects, for example, socio-economic and natural variables that have a direct impact on supply and demand, urbanisation, changes in real per capita income, etc. Von Lampe (1999), as quoted by Jooste (2001), summarised the main strengths of the WATSIM model, which are paraphrased as follows:

- **It is partial equilibrium in nature.** In other words, the WATSIM does not account endogenously for the linkages between other sectors and the agricultural sector, nor does it account for the interrelationship with macro-economic conditions. Information and data on the macro-economic environment are, however, introduced exogenously.
- **It is multi-regional with multi-products.** The multi-regional with multi-product approach entails that the interaction between different regions and different products are captured simultaneously if different scenarios are modelled. The model covers broadly the regions and products.
- **It is deterministic in nature.** In other words, uncertainty and risk associated with, for example variability in weather conditions, are not accounted for. Average conditions are assumed for particular target years. Endogenous changes in stock levels are furthermore only accounted for when stock levels react to politically determined prices and when limited export possibilities exist. Private stocks are assumed to be zero but could be included exogenously.
- **It is non-spatial.** The WATSIM model does not account for trade flows or bilateral exchanges of products, whilst traded commodities are assumed perfect substitutes in that no differentiation can be made between the imports and exports of a region's foreign trade regime.
- **It is synthetic.** The behavioural parameters, i.e. income elasticities and price elasticities of demand and supply are not estimated endogenously in the model, but are sourced from the literature and other models.

The WATSIM model does, however, also have some weaknesses. Firstly, due do the lack of data on agricultural policies in many developing countries, changes in policies of these countries cannot be simulated, and hence it is assumed that price incentives from the world market to domestic producers in such countries are transmitted fully. Secondly, issues such as market access commitments and import tariffs applicable to net-exporting regions are not properly represented in the model. Finally, it does not include dynamics of trade.

4.2.1.9 ATPSM model

The ATPSM (Agricultural Trade Policy Simulation Model) is a comparative-static, synthetic, multi-commodity, multi-region partial equilibrium world trade model for agricultural products, developed jointly by FAO and UNCTAD. ATPSM model is designed primarily for simulating agricultural trade policies, notably in the context of the WTO Agreement on Agriculture (see Poonyth and Sharma, 2003; Pustovit and Schmitz, 2003).

The main strengths of the model include the fact that it is synthetic and covers a broad spectrum of regions and commodities. It has special features for modelling the Harbinson modalities along with the EU and US proposals in the context of the WTO. Its main weakness is that it is static in nature and cannot model the dynamics.

4.2.1.10 CAPRI model

The CAPRI (Common Agricultural Policy Regional Impact) model is a comparative static equilibrium model, developed by the University of Bonn and funded by the European Commission. The CAPRI model, commonly known as an EU-wide economic modelling system, is designed to evaluate the regional and aggregate impacts of the Common Agricultural Policy (CAP) and trade policies on production, income, markets, trade and the environment (see Britz and Heckelei, 1997; Loehe and Britz, 1997; Heckelei *et al*, 1998)

The main strengths of the CAPRI model relate to the fact that it can simultaneously analyse the effect of commodity market and policy developments in the individual regions of the EU as well as the feedback from the regions to the EU and world markets. The special feature of the model is that it is solved by iterating a supply module (which consists of individual programming models for about 200 regions) and a market module (which follows the tradition of multi-commodity models). Based on aggregated supply quantities from regional models, the market model returns market clearing prices. This means that an iterative process between the supply and market components ultimately achieves a comparative static equilibrium. The main weaknesses of model relate to the limited regional coverage as well as the fact that it is static in nature and cannot model the dynamics.

4.2.2 Economy-wide models

These models capture implications of international trade for the economy as a whole, covering the circular flow of income and expenditure and taking care of inter-industry relations. The models have become a useful tool in analysing a number of varied trade policy issues, i.e. to study the economic effects of trade policies such as tariffs and non-tariff barriers in a variety of settings. Some are multi-country models that focus on analyzing the effects of global trade policies or policy changes. Others focus on analyzing commercial policies of a single country, where depending on whether the country is a developed or developing economy, the modelled trade issues and policies can be quite diverse.

There are three broad classes of economy-wide models: macro-econometric models, input-output models and applied general equilibrium (AGE) models. Macro-econometric models are concerned with macro-economic phenomena such as inflation and exchange rates. Input-output models provide a comprehensive description of inter-industry linkages and a full accounting of primary incomes earned in production activities. AGE models do also usually contain full Input-Output detail, but on top of that they contain equations that describe the behavioural response of producers, consumers, importers and exporters and possibly other agents in the economy (Francois and Reinert, 1997; Tongeren and van Meijl, 1999).

AGE models are specifically concerned with resource allocation issues, that is, where the allocation of production factors over alternative uses is affected by certain policies or exogenous developments. International trade is typically an area where such induced effects are important consequences of policy choices. Needless to say, such induced effects are not visible in partial models. In the face of changing international prices, resources will move between alternative uses within the domestic economy, or even between economies if production factors are internationally mobile. Only if a complete description of the multi-sectoral nature of the economy is provided, can such developmental issues be analysed. Tongeren and van Meijl (1999) also paraphrased a list of various types of economy-wide models as follows:

4.2.2.1 G-cubed model

The G-cubed (Global Computable General Equilibrium Growth) model is a dynamic inter-temporal general equilibrium and macroeconomic model initiated by McKibbin and Wilcoxen (1999). The G-cubed model aims at contributing to the ongoing policy debate on environmental policy and international trade, with a focus on global warming policies. The model is a 'third generation' model that combines insights from modern macroeconomics with typical multi-sectoral resource allocation aspects. Key applications are economy-wide impacts of global warming policies, and impacts of global macroeconomic shocks. It combines a conventional AGE model representing the real sectors in a disaggregated way and a representation of financial and capital assets and flows.

The main strength of the G-Cubed model is that it has sectoral detail and clear macroeconomic structure, thus designed to provide a bridge between computable general equilibrium (CGE) models that traditionally ignore the adjustment path between equilibria and macroeconomic models that ignore individual behaviour and the sectoral composition of economies. The model allows for analysis of the short-run dynamics and adjustment paths to a long run steady state. The model employs full short run and long run macroeconomic closure with macro-dynamics at an annual frequency around a long run Solow/Swan neo-classical growth model. The main weakness of the model is that it does not have a specific agricultural focus because of its concentration on macroeconomic phenomena (Tongeren *et al*, 2001). In addition, while covering the regions broadly, the commodity coverage is limited.

4.2.2.2 GTAP model

The GTAP (Global Trade Analysis Project) model is a multi-region applied general equilibrium model developed by Purdue University and IMPACT Project. The focus of the GTAP model is directed towards the analysis of agricultural policy and trade (Francois *et al*, 1995; Hertel *et al*, 1995), although there have been GTAP related applications in non-agricultural trade-related issues (McDougall and Tyers, 1994) as well as environmental policy analysis (Perroni and Wigle, 1997). European interest in GTAP has also grown, with a steady increase in the literature examining the impacts of European enlargement to the East and CAP compatibility under the Uruguay Round commitments (Hertel *et al*, 1997; Jensen *et al*, 1998), and modelling applications based on the Agenda 2000 reform proposals (Blake et al, 1999). More recently, database development and modelling have also expanded in the direction of energy usage, climate change and genetically modified organisms (GMOs).

The major strengths of the model include, among others, a broad coverage of regions and commodities and the fact that the model has a global closure with respect to savings and investments, which are treated in an analogous manner to all other goods and services. It has a special feature of modelling consumption expenditures through a non-homothetic Constant Differences of Elasticities of substitution (CDE) demand system (Hanoch, 1975, Surry 1989), which allows budget shares to vary with income. The model has versions that allow recursive and dynamic analysis and also allow sensitivity analysis depending on the modeller.

Furthermore, the model allows one region to be singled out for analysis by declaring the 'Rest of World' as exogenous. GTAP is supported by a strong group of institutional stakeholders which puts high requirements on the quality, timeliness and documentation of the data. However, the weakness of the model is associated with the fact that it does not link individual country models which are known to capture more regional economic and institutional details and, therefore, the GTAP framework enforces uniform standards on regional and trade data.

4.2.2.3 GREEN model

The GREEN (GeneRal Equilibrium ENvironmental) model is a relatively standard time-recursive AGE model with global coverage. It was developed at the OECD Secretariat and used for the assessment of policies that affect carbon emissions. The model has recently extensively been used to assess implications of the Kyoto protocol on global climate change. The model incorporates policy instruments such as ceilings (quotas) on emissions and tradable emission permits.

The major strengths of the model include, amongst others, its broad coverage of regions as well as its ability to model dynamics and conduct sensitivity analysis. However, the fact that the model does not give special attention to the agricultural sector and specific polices related to agriculture could be regarded as a major weakness. In addition the dataset of the model is not publicly available and its commodity coverage is limited.

4.2.2.4 INFORUM model

The INFORUM (INterindustry FORecasting at the University of Maryland) model was founded by Professor Clopper Almon in 1967. INFORUM models are internationally linked, dynamic macroeconomic models with inter-industry linkages, and are used to produce annual forecasts for a variety of industry indicators. The basic approach of INFORUM models is described by Almon (1991). The INFORUM system can be used to study the industrial and aggregate impacts of macroeconomic developments such as changes in exchange rates, trade policy, and government policy. Applications of INFORUM models to trade policy are relatively limited and tend to focus on North America. The Canadian, Mexican and USA models were used by the Canadian government (Department of External Affairs) in a study of the impacts of alternative free trade agreements between the U.S. and Canada on the Canadian economy and later a similar study was completed looking at the recently completed NAFTA accord (Almon *et al*, 1991). Richter (1994) has examined the consequences of the full participation of Austria in the European Union. Christou and Nyhus (1994) have examined broader aspects of European policy.

The main strength of the model is that it treats a regional subset of economies because it has features that link individual/single country models to a system. It covers a wide-range of commodities that varies by country. The model can handle dynamics. One of the major weaknesses of the model is that even though individual country models can capture more regional economic and institutional detail, there are clear difficulties with this approach in terms of consistency and maintenance. Indeed, the linked country models approach seems to be less sustainable, and their contribution to global trade analysis has been rather limited. It is not a global model, hence has limited regional coverage. Finally, the sensitivity analysis is not systematically reported in the model.

4.2.2.5 MEGABARE model

The MEGABARE and its successor GTEM are recursive dynamic AGE models of the world economy, which share their basic structure with the GTAP model, developed at the Australian Bureau of Agricultural and Resource Economics (ABARE). These models build on the GTAP model and database. The focus for the development of MEGABARE was to create a dynamic general equilibrium model of the global economy suitable for analysis of international greenhouse policy, but its scope includes broader issues relating to international trade policy, especially agricultural trade reform.

The main strength of the model is that it is based on the GTAP model and therefore has a broad coverage of regions and commodities. The model is well documented and publicly available. In addition, it is theoretically consistent with the general equilibrium framework and can handle dynamics. However, the sensitivity analysis is not reported in the model.

4.2.2.6 MICHIGAN BDS model

The MICHIGAN BDS (Brown-Deardorff-Stern) model, developed by Michigan State University, is aptly described as a comparative static 'second generation' model, with monopolistic competition in manufacturing sectors modelled in the Dixit-Stiglitz fashion. It evolved from earlier work in the mid 1970s on the Tokyo Round of Multilateral Trade Liberalisation. The

BDS model has been used to analyse the economic effects of the Canada-U.S. Trade Agreement (CUSTA) and later to analyse NAFTA (Brown *et al*, 1992a, b, 1996), the extension of the NAFTA to some major trading countries in South America, the formation of an East Asian trading bloc, and the potential effects of integrating Czechoslovakia, Hungary, and Poland into the EU (Brown et al, 1996). Besides regional integration issues the model has been used to analyse liberalisation of trade in services by Brown *et al* (1995) and by Brown *et al* (1996).

The main strength of model is that it incorporates firm-level product differentiation and economies of scale by default and therefore makes it possible to model imperfect competition. It also covers regions and commodities very broadly. It is static in nature and therefore cannot model dynamics. It does not report sensitivity analysis.

4.2.2.7 RUNS model

The RUNS (Rural Urban North South) model is a relatively standard time-recursive AGE model, developed at the Free University of Brussels during the eighties by Burniaux (1987). RUNS2 has subsequently been integrated into the OECD Development Centre's programme on Developing Country Agriculture and International Economic Trends. The model is not currently in use at OECD, but RUNS results are still likely to be referenced to date. The main goal of the model was agricultural policy analysis, especially analysis of the impact of the common agricultural policy (CAP) on developing countries and assessment of the Uruguay Round of multilateral trade liberalisation.

The major strength of the model is its special feature of the Rural-Urban distinction, which is represented by imperfect domestic factor mobility between rural and urban sectors. It is a recursive dynamic model with broad coverage of regions and commodities. However, the sensitivity analysis is not reported in the model. While the model is well documented, it is not publicly available.

4.2.2.8 WTO housemodel

The WTO housemodel is a standard AGE model, developed by Francois *et al* (1995). The model was constructed to evaluate the results of the Uruguay Round of Multilateral trade liberalisation and to support the WTO Secretariat in its preparations for the next round of negotiations. The basic WTO model is a 'first generation' model, but various aspects of imperfect competition have been added to it. The basic data as well as elasticity estimates are taken from the GTAP dataset. The WTO housemodel exists in different versions. These are the basic version, which is the standard perfect competition, constant returns, comparative static model with Armington assumption for international trade; as well as an amended version, which assumes monopolistic competition and scale economies internal to each firm.

The major advantage of this model is that it exists in different versions. The basic version is the standard perfect competition, constant returns, comparative static model with Armington assumption for international trade. The amended version assumes monopolistic competition and scale economies internal to each firm, thus allowing modeling of imperfect competition. Quotas (MFA and minimum market access) are modelled explicitly as inequality constraints. It is a global model providing broad coverage of commodities and regions. It also reports sensitivity analysis. The main weakness of model is that it cannot handle dynamics.

4.3 Single equation econometric models

The single equation econometric models, such as import demand and gravity models, are mainly used to examine trade determinants, to predict trade potentials, to examine competitiveness and responsiveness. They are commonly used in empirical studies of bilateral trade flows.

4.3.1 Import demand models

Estimation of demand functions consistent with economic theory has been a highly published area in the last forty years. The majority of the papers follows the adoption of flexible functional forms and relies heavily on duality theory. The Generalized Leontief (Diewert, 1971), the translog (Christensen *et al*, 1975), the Rotterdam Demand System (Theil, 1965, 1975 and Barten, 1964, 1968) and the Almost Ideal Demand System or AIDS (Deaton and Muellbauer, 1980) are examples of popular demand models. Their functional forms are locally flexible, that is, they do not put a priori restrictions on the possible elasticities. Instead, they possess enough parameters to approximate any elasticity at a given point. These locally flexible functional forms often exhibit small regular regions. Thus, a number of alternative flexible functional forms with larger regular regions have been developed. Examples include the Quadratic AIDS model (QUAIDS) (Banks *et al*, 1997), the Laurent model (Barnett, 1983, 1985; Barnett and Lee, 1985; and Barnett et *al*, 1985) and the Generalized Exponential Form (GEF) (Cooper and McLaren, 1996).

The literature in applied economics shows that the AIDS and the Rotterdam models are frequently used demand specifications (see Deaton and Muellbauer, 1980; Eales and Unnevehr, 1988; Lee, Seale and Jierwiriyapant, 1990; Alston *et al*, 1990; Sparks *et al*, 1990; Hayes *et al*, 1990; Green and Alston, 1990; Yang and Koo, 1994; Mixon and Henneberry, 1996; Kalaba, 2001). These models are product-specific, data-sensitive and static in nature and were used in the above studies to estimate the responsiveness of consumers to certain imported goods as well as to examine the price competitiveness of such goods from various suppliers (exporting countries) in an importing country.

The success of the AIDS and Rotterdam models, according to Barnett and Seck (2008), is partly due to the possibility of estimating some of their specifications without relying on procedure of nonlinear estimation. In addition, theoretical restrictions can be imposed and tested with ease. The AIDS model has a particularly attractive feature: the properties of the preference relations that generate it are known. The AIDS is derived from a known cost function with the desired properties. Studies that confront these two models have been rather rare, even though Deaton and Muellbauer (1980) pointed out the striking similarity between these two models, after identifying that the AIDS model with linear price (LA-AIDS) can be rewritten in difference form so that it has the same dependent variables as the Rotterdam model in absolute price. Alston and Chalfand (1993) developed a statistical test for the AIDS versus Rotterdam model using the approximation expressing the AIDS in difference form and with approximately the same right hand side variables.

According to Kalaba (2001), the AIDS model and its rival Rotterdam model are similar in many respects. Both have flexible functional forms, identical data requirements, are parsimonious with respect to number of parameters, and are linear in parameters. Economic theory does not provide a basis for choosing between the two models. Most researchers arbitrarily pick one model or the other, but recent interest has focused on developing proper non-nested tests of the two demand systems. Two prominent studies have presented techniques to select between the AIDS and the Rotterdam demand systems (Alston and Chalfant, 1993; LaFrance, 1998). Alston and Chalfant (1993) used a compound-model approach to select between the First Difference Almost Ideal Demand System (FDAIDS) and the Rotterdam models, using U.S. meat demand data (beef, pork, chicken, and fish). They found support for the Rotterdam model.

However, LaFrance (1998) pointed out that the least squares approach used by Alston and Chalfant (1993) was biased and inconsistent because they had not considered endogeneity of budget shares and their prices were not mean scaled in the Stone's index. Using the same data, he conducted both a Lagrange multiplier test and a likelihood ratio test and failed to reject either demand system. Compound model approaches typically have correct asymptotic size, but low power (Pesaran, 1974). Thus, the failure to reject either null hypothesis may simply be the result of using a test with low power. Most of the previous non-nested tests have been developed for models that have the same dependent variables (see Pesaran, 1974). Coulibaly and Brorsen (1999) show that a Cox's non-nested test based on the parametric bootstrap has high power, is relatively easy to use, and is applicable to any model that can be simulated. The approach appears promising as a method for selecting among functional forms in demand systems.

4.3.1.1 Almost Ideal Demand System (AIDS) model

Since its introduction by Deaton and Muellbauer (1980), the AIDS model has been widely used in demand analysis. The majority of empirical applications follows Deaton and Muellbauer's lead and replaces the translog price index with Stone's index to deflate income. This generates the linear approximate almost ideal demand system (LA-AIDS), which is linear in the unknown parameters and therefore simpler to estimate. Deaton and Muellbauer (1980) cautioned against imposing symmetry on the LA-AIDS, and avoided doing so. They interpreted Stone's index as an approximation to the ''true'' translog index. Nevertheless, most applications of the LA-AIDS test for and impose symmetry of the matrix of log-price coefficients (e.g. Anderson and Blundell, 1983; Moschini and Meilke, 1989). There really can be only one explanation for this practice; the LA-AIDS is presumed to be the ''true'' model and symmetry of the matrix of log price coefficients is presumed to be the correct way to obtain Slutsky symmetry and economic rationality of the demand equations that are estimated.

The LA-AIDS has been criticized for reasons other than its failure to be consistent with economically rational consumer choices. Eales and Unnevehr (1988) point out that budget shares appear on both sides of the regression equations, producing simultaneity problems. Pashardes (1993) and Buse (1998) criticize the errors in variables problem created by using of Stone's index rather than the ''true'' translog price index on the right-hand-side of the regression equations. Moschini (1995) argues that Stone's index is not a proper price index at all and that without some mechanism to scale prices (e.g. at sample means), Stone's index leads to biased and inconsistent parameter estimates.

It is also possible to use the AIDS model to analyse the import demand for products differentiated by sources and this generates a restricted, source-differentiated almost ideal demand system (RSDAIDS). According to Armington (1969), the problem of source differentiated AIDS (SDAIDS) is the systematic simplifying of the product demand function to a point where it is relevant to practical purposes of estimation. For example, the general Marshallian model runs through a sequence of progressively restrictive assumptions, leading to a specification of product demand function that preserves the relationship between demand, income, and prices. The fundamental modification of the basic Marshallian model is the assumption of independence. This assumption states that buyers' preferences for different products of any kind are independent of their purchases of products of another kind. For example, an increase in purchases of Chilean grapes does not change buyers' relative evaluation of New Zealand's apples (Kalaba, 2001).

Another assumption of the SDAIDS model, as paraphrased by Kalaba (2001), is that the country's market share is unaffected by changes in the size of the market as long as relative prices in that market are unchanged. The size of the market is a function of money income and prices of various goods. Therefore, demand for a product is a function of money income, the price of each good and the price of product relative to prices of other products in the same market. The growth in market share depends on the change in the product's price relative to average change in prices in the market. Growth of the market depends mainly on changes in income and income elasticities of demand for the respective product. Although the AIDS model has been criticized for its weakness, several studies preferred this model among others with similar characteristics. The Armington model assumes that import demands are homothetic and separable among import sources. Thus, within a market, trade patterns change only with relative price changes, and elasticities of substitution between all pairs of products are identical and constant. These are strong restrictions on demand and were rejected by several studies that have tested these assumptions using alternative models (Winters, 1984; Alston *et al*, 1990; Lee and Brorsen, 1993). Winters suggested AIDS as an alternative to the Armington model. Alston *et al* (1990) also presented the double log model and AIDS model as possible alternatives to the Armington model.

Lee and Brorsen (1993) concluded that the Armington assumptions are inappropriate for modelling agricultural import demands. The Armington restrictions had already been rejected by Alston *et al* (1990) who used world cotton and wheat trade data. These restrictions also cause specification errors by omitting relevant explanatory variables, like import prices from competing sources within a group. The tests for non-nested models of AIDS and the double model log for source differentiated U.S. beef import demands by Lee and Brorsen (1993) showed that both the double-log import model and the AIDS model were appropriate for import demand. However, the estimated elasticities using the AIDS model were more plausible than those from the double-log model. In addition, the AIDS model permitted imposing the theoretical properties of demand, while the double-log model only allowed homogeneity.

Empirical applications of the AIDS model to import demand have frequently assumed either product aggregation or block separability (Yang and Koo, 1994). Under the product aggregation assumption, products are not differentiated by sources and are perceived as the same (Hayes *et al*, 1990). Moreover, the block separability assumption among goods allows estimation of share equations for goods from different origins (Alston *et al*, 1990). For products that are similar and competing in the same market, the RSDAIDS is preferred. The RSDAIDS model is a more general model and does not impose perfect substitutability assumptions.

4.3.1.2 Rotterdam Demand System (RDS) model

The Rotterdam model involves a nonlinear transformation of quantity on the left-hand side of the demand equation (Kastens and Brester, 1996). Analysis by Barnett and Seck (2008) has shown that the Rotterdam model is comparable to other popular flexible functional demand specifications like the Almost Ideal Demand System. A Rotterdam specification was developed to show how preference variables affect demand through their impacts on marginal utilities. A change in a preference variable was viewed as resulting in changes in adjusted prices which were decomposed into actual price changes minus preference-variable-induced changes in marginal utilities. Restrictions on preference variables were considered through adjusted prices by imposing restrictions on the marginal utility elasticities with respect to the preference variables (Brown and Lee, 2002).

The Rotterdam model was widely used to examine advertising and/or habit formation effects on import demand. It is consistent with demand theory (Theil 1965; Barnett, 1979); it is as flexible as any other local approximating form (Mountain, 1988); it lends itself to advertising applications (e.g., Brown and Lee 1993; Duffy 1987, 1990); and prior testing indicated that the estimated advertising effects from the Rotterdam model were similar to those obtained from its major rival, the (linear approximate) Almost Ideal Demand System, and from a double-log specification (Xiao, 1997).

Several approaches have been used to augment the Rotterdam specification to include advertising effects. The most common approach, suggested by Theil (1980), is to view advertising as a "taste shifter" that affects marginal utility. In this formulation, advertising enters the model as a price deflator (e.g., Duffy 1987; Brown and Lee 1993). An alternative approach, advocated by Stigler and Becker (1977), is to view advertising (or other information sources) as an input in the household production function. In this formulation, advertising enters the (derived) demand function for market goods as a separate shift variable along with prices and income (e.g.

Kinnucan *et al*, 1997). Testing the simple-shift specification against the taste-shift specification using citrus data, Brown and Lee (1993) found them to be statistically equivalent.

Xiao *et al* (1998) also used both forms of the Rotterdam model to determine the sensitivity of parameter estimates to model specification. The four-equation system consisted of demand equations for fluid milk, fruit juices (chiefly orange and apple), soft drinks, and coffee and tea. They treated the weak separability of the non-alcoholic drink group as a maintained hypothesis and total group expenditure was used in place of income in the absolute-price form of the Rotterdam model. In all four equations, advertising effects were statistically significant.

On the other hand, the Rotterdam model was used to model the various categories of apparel demand by using habit formation models of the sort conceived by Manser (1976), Pollak and Wales (1969), Blanciforti and Green (1983), Pollak and Wales (1992), and Holt and Goodwin (1997), among others. In this case, the habit formation model was applied to a variant of the differential demand system, otherwise known as the Rotterdam demand system, as introduced originally by Barten (1964) and Theil (1965). The model is similar to that advocated by Theil (1980) and employed by, among others, Brown and Lee (1997) for examining the stock effects of advertising on consumption in a differential demand system context. Holt and Goodwin (1997) were the first to incorporate a dynamic habit stock characterization into a system of differential demand equations. The basic assumption is that habit stocks affect the marginal utility associated with consuming each apparel item in the group and then showed how habit stock effects on utility can be translated into effects on demand, and also showed that that habit formation may be viewed as changing the perceived prices for all apparel items in the group.

4.3.2 Gravity model

The gravity model, developed in the 1960s, is a standard empirical framework for investigating patterns of bilateral trade. It is derived as a reduced form of a broader class of structural models (Anderson, 1979 and Bergstrand, 1986), as one of the popular tools in empirical studies addressing issues in international trade (ITC, 2000; Bun and Klaassen, 2002; Nouve and Staatz, 2003). It has been used in pioneering works by Tinbergen (1962) and Pöynöhen (1963), who suggest the use of the Newtonian gravity concept to explain bilateral trade (attraction) by the national incomes of the trading countries and the distance between them.

On this basis, a large number of studies were undertaken. Within this mushrooming literature, gravity equations share a common design that can be customized for different purposes, which are paraphrased by ITC (2000) as follows:

- **Firstly**, a gravity equation is *bilateral.* It explains a trade-related dependent variable, by the combination of macroeconomic variables (size, income, exchange rates, prices, etc) for both countries. Indicators of transportation costs between the two countries and more generally market access variables are added.
- **Secondly**, a gravity equation *may be used in order to estimate either determinants of the volume or determinants of the nature of trade flows.*
- **Thirdly**, *theory* definitively *provides strong foundations to a modelling based on rough indicators*, which is quite useful when the purpose is to integrate a large number of countries in the sample or when the statistical background for (developing) countries is limited.
- **Fourthly**, there is inevitably a discrepancy between the theoretical model and the ideal equation that would fit the data well. Border trade, seasonal trade, trade preferences or regional integration may be controlled for with specific effects by pair of country; such a solution however jeopardizes any attempt to use the model for forecasting purposes. This justifies the *introduction of cultural, historical or institutional determinants* in equations designed for an applied purpose.
- **Lastly**, given the type of variables under consideration, gravity-type econometric models are *estimated using rather aggregated data.* Numerous studies have been running equations on total exports.

A gravity model is a widely used method to explain trade patterns between countries using each country's measures of "mass" and geographical distance between countries to assess changes in trade flows (Otsuki *et al*, 2001). Initially, gravity models were developed on a mostly empirical basis, with researchers emphasizing that country size and transportation costs between countries were good predictors of trade volumes. And results were indeed positive, since such equations fit the data quite well. However, the lack of theoretical foundations rapidly led scholars to skepticism, and Anderson (1979), Helpman and Krugman (1985) and Bergstrand (1989) provided the missing theoretical basis. While Bergstrand (1989) built a general equilibrium model of world trade from which reduced equations may be derived, Helpman and Krugman (1985) showed that the combination of comparative advantages and monopolistic competition provided a coherent conceptual framework for empirical analysis.

Deardorff and Stern (1994), Engel and Rogers (1997), Frankel and Stein (1994) and Frankel *et al.* (1995, 1996, 1997) and Wei and Parsley (1995) have found strong linkages between bilateral trade and the proximity of its trading partners, where proximity is represented by distance, adjacency and common language to reflect cultural similarities. It postulates that the volume of trade between two countries is proportional to their economic sizes (capacity to supply exports and to absorb imports) and inversely proportional to costs of trading. The distance between the two trading units has traditionally served as a proxy for trading costs (Lairds and Yeats, 1990). In a nutshell, the gravity model has the ability to predict patterns of bilateral trade with the expectations that trade will increase with the economic mass of the countries but decrease with distance that separates them (Poonyth *et al*, 2002).

4.4 Model consideration and motivation

Given the nature of this study and the types of research questions that need to be addressed, the study will apply an econometric approach using the gravity model. The gravity trade econometric model was considered in this study because of the following reasons: **Firstly**, the gravity equation makes use of raw data without reliance on prior estimation of various elasticities, etc. **Secondly**, the gravity equation can readily exploit panel data, and thereby capture dynamic aspects of trade policy impacts. **Lastly**, the gravity equation singles out distance between countries as a significant explanatory variable, which is desirable given South Africa's location relative to its main trading partners.

Gravity models have been used by many researchers to examine the impact of the factors influencing trade performance, to examine whether a trade agreement led to trade creation or trade conversion between trading partners, as well as to estimate trade potentials (see Tinbergen, 1962; Pöynöhen, 1963; Anderson, 1979; Bergstrand, 1986; Deardorff and Stern, 1994; Engel and Rogers, 1997; Frankel and Stein, 1994; Frankel et al, 1995, 1996, 1997; Wei and Parsley, 1995; Cassim, 2001; Poonyth *et al*, 2002; Chauvin and Gaulier, 2002; Bun and Klaassen, 2002; Nouve and Staatz, 2003; Mokoena *et al*, 2008).

Gravity econometric equations are not sensitive to data, and hence could be estimated using various types of data, i.e. cross-section, time-series and panel data, depending on the type of research question to be addressed, and are applicable to both static or dynamic modelling (see Bun and Klaassen, 2002). These equations can use various combinations of macro-economic variables, such as gross domestic products and populations with geographic distance, etc; to predict or forecast trade potentials. Hence, gravity equations have extensively been used in the empirical literature on international trade (Havrylyshin and Pritchett, 1991; Frankel and Wei, 1993; Bayoumi and Eichengreen, 1995). The related econometric models can also be used to predict trade patterns at the industry level (Bergstrand, 1989). In this case, the elasticities vary across industries for a given macro-economic variable; and these elasticities are those which help to predict future paths of specialization.

4.5 Theoretical framework and specification of gravity model

Gravity models have strong theoretical foundations both in traditional and in the new trade theories (Wall, 1999; Cheng and Wall, 1999; Rose 2002; Evenett and Keller, 2002). The lack of rigorous theoretical underpinning has traditionally been the major criticism against gravity models. However, Wall (1999) indicates that such criticism has been weakened since Deardorff (1998) established a consistency between gravity models and variants of traditional trade theories, such as the Ricardian and Heckschser-Ohlin models. Wall (1999) also points to "earlier works by Anderson (1979) and Bergstrand (1986) who derived gravity equations from trade models with product differentiation and increasing returns to scale" (Wall, 1999), suggesting that gravity models may also be consistent with the new trade theory.

Although early studies used cross-section analysis to estimate gravity models (Aitken, 1973; Bergstrand, 1986), the analysis cannot answer a policy-related question of the impact of changes in relative market size (or income) of countries on changes in the pattern of bilateral trade over time (Kim *et al*, 2003). Temporal effects can be answered by using cross sectional time series analysis, as discussed by Mátyás (1997); De Grauwe and Skudelny (2000); Wall (2000); Glick and Rose (2001). One reason is that the extra time series observations result in more accurate estimates.

Using panel data models, Mátyás (1997) and Wall (2000) stressed the importance of including country-pair specific effects, but ignored one potentially important aspect of trade, namely dynamics. For countries that have traded a lot in the past, businesses have set up distribution and service networks in the partner country. In addition, consumers have grown accustomed to the partner country's products (habit formation). It is therefore very likely that current bilateral trade between those countries is also high (Eichengreen and Irwin, 1997). Hence, passed trade affects current trade. Ignoring this may lead to incorrect inference. Eichengreen and Irwin (1997) and De Grauwe and Skudelny (2000) therefore added lagged trade as a regressor to their gravity model and showed that lagged trade is indeed important. This implies that the estimate for lagged trade represents not only dynamic effects, but also the impact of unobserved country-pair specific time invariant factors, as these factors are present in both current and lagged trade.

Initially, gravity models were developed on a mostly empirical basis, with researchers emphasising that country size and distance between countries were good predictors of trade volumes. However, Anderson and van Wincoop (2003) argued that this commonly used remoteness variable, which relies solely on distance, does not capture the entire range of factors affecting bilateral trade flows and concluded that such gravity models suffer from an omitted variable bias (see also Baldwin and Taglioni, 2006). To remedy this problem, Anderson and Van Wincoop (2003) modified McCallum's (1995) gravity equation (in which bilateral trade flows between two regions depend on the output of regions, their bilateral distance and whether they separated by a border) by adding multilateral resistance variables, which consist of country specific price indices. Since the multilateral resistance variables as proposed by Anderson and Van Wincoop (2003) are not observable, these authors propose, among others, the simultaneous use of both importer and exporter fixed effects to replace the resistance variables, yielding coherent results (see Rose and van Wincoop, 2001; Eaton and Kortum, 2002). The use of both exporter and importer fixed effects is supported by Helpman *et al* (2007) and Zwinkels and Beugelsdijk (2010), as they have argued that the inclusion of exporter and importer fixed effects allows for unbalanced bilateral trade flows even when all bilateral trade barriers are symmetric. Furthermore, Süleyman (2010) proposed several extensions of the standard gravity model and modified the traditional gravity equations by adding competitiveness that was composed of a general and bilateral component and account for a flexible income response.

In this study, the gravity model is used to determine the impacts of bilateral and multilateral trade agreements on trade flows of selected agricultural products as well as of aggregated agricultural trade flows between South Africa and its trading partners. The estimated gravity equation in this study is similar to that of Mátyás (1997) and Wall (2000), but was extended to incorporate the work done by Eichengreen and Irwin (1997) and De Grauwe and Skudelny (2000) so that it takes into account the importance of both dynamics as well as controlling the country-pair specific effects and/or the unobserved multilateral resistance variables. This gravity equation is then expressed as follows:

$$\ln Y_{ijt} = \alpha_0 + \alpha_{ij} + \beta_n X_n + \varepsilon_{ijt} \quad \cdots\cdots (1)$$

lnY_{ijt} is the dependent variable, which the natural logarithms of real values of agricultural trade flows between countries i and j (in all cases "i" denotes South Africa) and country j (in all cases "j" denotes South Africa's trading partner) in year t. The values of all trade flows variables are expressed in constant 2000 United States dollars (US$). Symbol β_n represents vector coefficients associated with explanatory variables (X_n), as described in models below, whereas **α's** and ε_{ijt} represent the intercepts and error term respectively. The model has two types of intercepts, i.e. one common to all years and country pairs (α_0) and one specific to the country pairs and common to all years (α_{ij}). It is assumed that the error term is normally distributed with zero mean and constant variance for all observations and that the disturbances are pair-wise uncorrelated.

For each trade flow, six models will be estimated with each model being estimated two times, firstly assuming the dynamic equation (i.e. includes the lagged dependent variable and secondly assuming the static equation (i.e. excludes the lagged dependent variable), because there is no economic justification for *a priori* selection criteria between the two models. Furthermore, the gravity equation will be estimated using three models. The first and second models estimate the period impacts (i.e. jointly from 2000 to 2004 and from 2005 to 2009 for EU-SA TDCA and SADC Trade Protocol as well as jointly from 1995 to 1999 for WTO AoA) and the individual yearly impacts (i.e. on annual basis from 2000 to 2004 and from 2005 to 2009 for EU-SA TDCA and SADC Trade Protocol as well as on annual basis from 1995 to 1999 for WTO AoA). The third model estimates the trade direction impacts, i.e. whether the implementation of the EU-SA TDCA and SADC Trade Protocol have created exports from South Africa to the EU and the SADC countries respectively or diverted exports to other trading partners of South Africa. These gravity equations are expressed as follows:

Models	Explanatory Variables (X_n)
Dynamic Period Impact	lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D0004; $lnDIST_{ij}$ lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D0509; $lnDIST_{ij}$ lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D9599; $lnDIST_{ij}$
Static Period Impact	$lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D0004; $lnDIST_{ij}$ $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D0509; $lnDIST_{ij}$ $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D9599; $lnDIST_{ij}$
Dynamic Yearly Impact	lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D00; D01; D02; D03; D04; $lnDIST_{ij}$ lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D05; D06; D07; D08; D09; $lnDIST_{ij}$ lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D95; D96; D97; D98; D99; $lnDIST_{ij}$
Static Yearly Impact	$lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D00; D01; D02; D03; D04; $lnDIST_{ij}$ $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D05; D06; D07; D08; D09; $lnDIST_{ij}$ $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; D95; D96; D97; D98; D99; $lnDIST_{ij}$
Dynamic Trade Direction Impact	lnY_{ijt-P}; $lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; PTA_{yes}; PTA_{no}; $lnDIST_{ij}$
Static Trade Direction Impact	$lnGDPPC_{it}$; $lnGDPPC_{jt}$; $lnREER_t$; PTA_{yes}; PTA_{no}; $lnDIST_{ij}$

Where:

lnY_{ijt-p} The p-year lags of the dependent variables. The lag length of the dependent variable was determined using the Akaike Information Criteria (AIC) and Schwarz Criterion (SC) procedures. An ad hoc approach looking at the significance and sign of the new lags was also followed in deciding the lag length in case where AIC and SC approaches recommends more than a one-year lag. As a result, a one-year lag was determined because, in all models, lags beyond the first one did not add to the predictive power of the model meaning that the second and further lags were not statistically significant.

This variable has been included because, as mentioned in the introduction, historically before the conclusion and implementation of the EU-SA TDCA, the EU has been South Africa's main trading and investment partner accounting for over 40% of its total trade. For countries that have traded a lot in the past, businesses have set up distribution and service networks in the partner country. In addition, consumers have grown accustomed to the partner country's products (habit formation). It is therefore very likely that current bilateral trade between those countries is also high (Eichengreen and Irwin, 1997). Hence, passed trade affects current trade. Ignoring this may lead to incorrect inference. Eichengreen and Irwin (1997) and De Grauwe and Skudelny (2000) therefore added lagged trade as a regressor to their gravity model and showed that lagged trade is indeed important. This implies that the estimate for lagged trade represents not only dynamic effects, but also the impact of unobserved country-pair specific time invariant factors, as these factors are present in both current and lagged trade.

$\ln GDPPC_{it}$ and $\ln GDPPC_{jt}$ The logarithms of the real per capita gross domestic products for countries i and j in year t respectively. The values of GDPPCs variables are also expressed in constant 2000 United States dollars (US$). As the mass of two bodies determines the force of attraction between them, as stated in the law of gravity, GDPPC of the trading countries represents both the productive and consumption capacity that heavily determine the trade flow between them. Many studies have included both the GDP and Population (POP) as explanatory variables for bilateral trade flows with GDP serving as a proxy for output capacity of the exporting country and for absorptive capacity of the importing country; whereas POP of the exporting country serve as proxy for factor endowments (production capacity and POP of the importing country as a proxy for market size (Dascal, Mattas and Tzouvelekas, 2002). In this study, the GDP and POP were not included in the models separately due to the fact that they are highly correlated. Furthermore, De Blasi, Seccia, Carlucci and Santeramo (undated) argued that while the total GDP is appropriate for studies using aggregated data, in the case of a specific agro-food product, this variable would overestimate the country's output capacity and therefore emphasised the use of GDP per capita.

Given the fact this study focuses on the aggregate agriculture and individual agro-food products, which are regarded as subset of the total economy, the GDPPC is a stronger variable explaining the income effect, as it serves as proxy for purchasing power of the exporting and importing countries. GDP per capita has also been very commonly employed (Sanso, Cuairan, and Sanz, 1993; Tamirisa, 1999). Gros and Gonciarz (1996) argued that the per capita output is used to take into account the idea that as income increases, the share of tradables in overall income might increase; i.e. for a given overall income a country with a higher income per capita would trade more intensively (have more exports and imports) than a poorer country. Therefore, it is expected that GDPPC would be positively related to both exports and imports of agro-food products.

$\ln REER_{it}$ The logarithm of the real effective exchange rate of South African Rand to the base year 2000, which is an index measured as one rand (R1.00) to a basket of 15 major currencies in the world. Generally, it is expected that an appreciation of the importing country's currency against trading partners' currencies would impact positively on imports because imports become less expensive, whereas depreciation would affect imports negatively since they become more expensive. On the other hand, a depreciation of the exporting country's currency against trading partners' currencies means that its exports become cheaper in the world markets, thus impacting positively on exports (Bergstrand, 1986; Koo, Karemera and Taylor, 1994). Thus, the sign of the REER coefficient will depend on the depreciation or appreciation of the South African Rand against trading partners' currencies.

D0004/ D0509 The joint dummy variable for the periods 2000-2004 and 2005-2009, which firstly signifies the implementation of the EU-SA TDCA and secondly the implementation of the SADC Trade Protocol. This variable takes the value of 1 for the period of implementation of the EU-SA TDCA between South Africa and the EU countries or 0 otherwise, as well as the value of 1 for the period of implementation of the SADC Trade Protocol between South Africa and the SADC countries or 0 otherwise.

D00, D01, D02, D03 and **D04 D05, D06, D07, D08** and **D09**	The individual annual dummy variables for the implementation of EU-SA TDCA and SADC Trade Protocol, which take the values of ones for the implementation or zeros otherwise.
D9599	The joint dummy variable for the period 1995-1999, which signifies the implementation of the WTO URAA between South Africa and all its trading partners, which takes the value of 1 for the period 1995-1999 or 0 otherwise
D95, D96, D97, D98 and **D99**	The individual annual dummy variables for the implementation of WTO URAA, which take the values of ones for the implementation or zeros otherwise.
$\mathbf{PTA_{yes}}$ and $\mathbf{PTA_{no}}$	The dummy variables that are introduced when analysing trade creation and diversion. **Firstly,** PTA_{yes} represents the "both in" scenario, i.e. both South Africa and EU countries are in the agreement, whereas PTA_{no} represents the "in out" (otherwise) scenario, i.e. South Africa in and EU countries out. **Secondly,** PTA_{yes} represents the "both in" scenario, i.e. both South Africa and SADC countries are in the agreement, whereas PTA_{no} represents the "in out" (otherwise) scenario, i.e. South Africa in and SADC countries out. In other words, PTA_{yes} is the same as D0004 and D0509, as it takes the value of 1 for the implementation of the EU-SA TDCA and SADC Trade Protocol, i.e. from 2000 to 2004 and from 2005 to 2009, and 0 otherwise (other trading partners). However, for EU-SA TDCA, PTA_{no} takes the value of 1 for the periods 2000 to 2004 and 2005 to 2009 between South Africa and other trading partners and 0 otherwise (EU countries). Whereas for SADC Trade Protocol, PTA_{no} takes the value of 1 for the periods 2000 to 2004 and 2005 to 2009 between South Africa and other trading partners and 0 otherwise (SADC countries). **In analysing the trade direction, the *a priori* criteria states that if the parameter estimate for PTA_{yes} («both in») is positive and significant, there is trade creation due to regionalism. In contrast, if the parameter estimate for PTA_{no} («in out») is negative and significant, there is trade diversion (International Trade Centre, 2000).**
$\mathbf{lnDIST_{ij}}$	The logarithm of a geographic distance between country i and country j in kilometres and serves as a proxy for transportation costs. As a proxy for transportation costs, countries with short distance between each other are expected to trade more than those who are far apart due to lower transaction cost. Distance can also be used as a proxy for the risks associated with the quality of some of the perishable goods and the cost of personal contact between managers and customers (ITC, 2000; Cheng and Wall, 2005; Gebrehiwet *et al*, 2007).

The reason for the use of different dummy variables for trade agreements is that the implementation of the EU-SA TDCA and SADC Trade Protocol started in 2000, while the implementation of the WTO AoA, as concluded during the Uruguay Round negotiations, started in 1995 and expired in 1999. It was expected that the new WTO AoA to be concluded during Doha Round negotiations would be implemented with effect from 2000, but the negotiations collapsed. However, the EU-SA TDCA and SADC Trade Protocol, dummy variables were introduced for two periods of implementation, i.e. from 2000 to 2004 and from 2005 to 2009. This is because both agreements were implemented effective from 2000 and normally the first five years of implementation are characterised by too many administrative matters, i.e. putting systems in place, and as a result the benefits of the trade agreements are not fully utilized. It is expected that after five years of implementation, the businesses would have been well set-up as traders between the trading partners would have developed relationships. The other reason for separating the two periods is that some of the models could not accommodate more than 5 year dummies in addition to the control explanatory due to fact that the available data did not cover longer period and as a result the degrees of freedom were insufficient.

The various forms of estimators were used when estimating these gravity equations, i.e. the pooled ordinary least squares (OLS), fixed effects (FE) and random effects (RE). The **pooled OLS** impose the restrictions that the unobserved factors are the same across country pairs, meaning that $\alpha_{ij} = 0$. The **fixed effects** model, also known as the unobserved effects model or the within transformation model, allows the unobserved country specific effects (e.g. language) to differ according to the direction of trade, i.e. $\alpha_{ij} \neq \alpha_{ji}$ by assuming that the independent variables are correlated with the unobserved country specific factors (α_{ij}). Therefore, the fixed effects model is a classical regression model that can be estimated using LSDV (least squares with a dummy variable for each of the country pairs).

The **random effects** model assumes that the unobserved country specific factors (α_{ij}) are not correlated with the explanatory variables and α_{ij} is subsumed into the error term to form a composite error term as $v_{ijt} = \alpha_{ij} + \varepsilon_{ijt}$. The ideal assumptions of random effects model include all of the fixed effects assumptions plus the additional requirement that α_{ij} is independent of all explanatory variables in all time periods. However, due to the fact that α_{ij} is in the composite error in each time period, the v_{ijt} are expected to be serially correlated across time. The feasible generalised least squares (FGLS) transformation will therefore be used to eliminate the serial correlation in the errors (Wooldridge, 2002).

After the various models had been estimated, tests for autocorrelation were conducted using the Durbin-H (in the case of dynamic models) and Durbin Watson (in the case of static models) statistics. Where necessary, the Cochrane-Orcutt procedure was used to correct the autocorrelation problem as follows: Firstly, equation 1 was estimated in order to obtain ε_{ijt}. Secondly ε_t was then regressed on ε_{ijt-1} in order to estimate the rho (ρ) as follows:

$$\varepsilon_{ijt} = \rho\varepsilon_{ijt-1} + \mu_{ijt} \quad \cdots\cdots(2)$$

Thirdly, the original variables in equation 1 were transformed using the estimated rho to create a new estimating equation to be used for the creation of pseudo-GLS estimator. In this case equation 1 was multiplied by ρ to obtain:

$$\rho Y_{ijt} = \rho\alpha_0 + \rho\alpha_t + \rho\alpha_{ij} + \rho\beta_{ijt} X_{ijt} + \rho\varepsilon_{ijt}, \cdots\cdots (3)$$

One time period lag was introduced to equation 3 as follows:

$$\rho Y_{ijt-1} = \rho\alpha_0 + \rho\alpha_t + \rho\alpha_{ij} + \rho\beta_{ijt} X_{ijt-1} + \rho\varepsilon_{ijt-1}, \cdots\cdots (4)$$

Equation 4 was then subtracted from equation 1 to obtain:

$$(Y_{ijt-1} - \rho Y_{ijt-1}) = (1-\rho)\alpha_0 + (1-\rho)\alpha_t + (1-\rho)\alpha_{ij} + \beta_{ijt}(X_{ijt} - \rho X_{ijt-1}) + (\varepsilon_{ijt} - \rho\varepsilon_{ijt-1}) \cdots\cdots (5)$$

A serially correlated error term is eliminated by substituting ε_{ijt} by $\varepsilon_{ijt-1} - \mu_{ijt}$ **(see equation 2 above)** in equation 5 as follows:

$$(Y_{ijt-1} - \rho Y_{ijt-1}) = (1-\rho)\alpha_0 + (1-\rho)\alpha_t + (1-\rho)\alpha_{ij} + \beta_{ijt}(X_{ijt} - \rho X_{ijt-1}) + \mu_{ijt}, \cdots\cdots (6)$$

Equation 6 is then simplified by redefining each transformed variable as follows:

$$Y^*_{ijt} = \alpha_0 k^* + \alpha_t k^* + \alpha_{ij} k^* + \beta_{ijt} X^*_{ijt} + \mu_{ijt}, \quad t = 1.......T, \cdots\cdots (7)$$

In this case, $Y^*_{ijt} = Y_{ijt-1} - \rho Y_{ijt-1}$; $X^*_{ijt} = (X_{ijt} - \rho X_{ijt-1}$; and $k^* = 1-\rho$. Therefore, in equation 7, the first-order autocorrelation problem is corrected. All forms of gravity equations, as described above, were estimated in the form of equation 7.

Once all the models are estimated, a number of statistical tests were undertaken to test the efficiency of all the estimators. In a nut-shell these tests were used to select the best estimator suitable for the data. The following steps were followed: In step one, the poolability tests using the Wald statistic were conducted to test the significance of country-specific effects jointly on trade flows. The Wald test is distributed like the F-statistic as follows:

$$F_0 = \frac{(e_R'e_R - e'e)/(N-1)}{e'e/(NT-N-K)} \approx F_{(N-1),(NT-N-K)} \cdots\cdots (8)$$

In this case, $e_R'e_R$ stands for the restricted residual sum of squares in a least squares regression, i.e. constrained by H_0. Whereas, $e'e$ stands for the unrestricted residual sum of squares in a least squares regression, i.e. unconstrained by H_0 (see Baltagi, 1995; Green, 2000; Wooldridge, 2002). The null and alternative hypotheses of the F-test are as follows:

H_0: $\alpha_{ij} = 0$, i.e. country specific effects are jointly insignificant

H_1: $\alpha_{ij} \neq \alpha_{ji} \neq 0$, country specific effects are jointly significant

If the joint null that the coefficients are insignificant is rejected, a choice between the fixed effect and random effects models was made in step two by applying the Hausman's test (Greene, 2000; Wooldridge, 2003). The Hausman test is distributed like Chi-square statistic as follows:

$$\chi^2[K] = [\hat{\beta}_{FE} - \hat{\beta}_{RE}]'\hat{\Sigma}^{-1}[\hat{\beta}_{FE} - \hat{\beta}_{RE}] \cdots\cdots (9)$$

In this case, $\chi^2[K]$ stands for the chi-square with K degrees of freedom whereas $\hat{\beta}_{FE}$ and $\hat{\beta}_{RE}$ are the estimated coefficients of the fixed effects and random effects models respectively. The symbol $\hat{\Sigma}$ represents the estimated covariance matrices of the slope estimator in the fixed effects model minus estimated covariance matrices of the slope estimator in the random effects model, excluding the constant term. In a nut-shell $\hat{\Sigma}$ is the covariance matrix of the difference vector ($\hat{\beta}_{FE} - \hat{\beta}_{RE}$). The null and alternative hypotheses of the Chi-square test are as follows:

H_0: unobserved effects are uncorrelated with other regressors in the model

H_1: unobserved effects are correlated with other regressors in the model

The choice between the dynamic and static models was made by looking whether the lagged variable is significant or not. The suitable model will then be used to calculate the agricultural trade flow potentials with countries between which trade is supposed to have reached its potential during the periods 2000 to 2004 and 2005 to 2009, i.e. agricultural imports, agricultural exports and agricultural trade (imports plus exports). In this case, this is between South Africa and EU countries as well as South Africa and SADC countries due to the implementation of the EU-SA TDCA and SADC Trade Protocol respectively.

The calculation is done in the following three steps, as outlined by the International Trade Centre (2000). **Firstly**, the model is simulated to obtain the unadjusted simulated values of agricultural trade flows. **Secondly**, the unadjusted simulated values of agricultural trade flows are corrected for overall deviation to obtain the adjusted simulated values of agricultural trade flows. **Thirdly**, the agricultural trade flow potentials are then obtained by taking the normal average of the unadjusted simulated and adjusted simulated values of agricultural trade flows. In summary, after estimating the unadjusted simulated values of agricultural trade flows using equation 1, they are corrected in equation 10 as follows:

$$Y_{ij}^{*} = \hat{Y}_{ij} \bullet \frac{\sum_{k,k \neq j} Y_{ik}}{\sum_{k,k \neq j} \hat{Y}_{ik}} \quad \cdots\cdots (10)$$

Where:

Y_{ij}^{*} = Adjusted simulated values of agricultural trade flows between countries i and j.

$\hat{Y}_{ij}$ = Unadjusted simulated values of agricultural trade flows between countries i and j.

$\frac{\sum_{k,k \neq j} Y_{ik}}{\sum_{k,k \neq j} \hat{Y}_{ik}}$ = Correction factor with the numerator and denominator representing the sum of observed or actual and the sum of the unadjusted simulated bilateral agricultural trade flows respectively to a group countries of which the agricultural trade flows should have reached a potential due to regional integration, excluding the residual associated with the destination market.

The agricultural trade flow potentials are then calculated by taking the average on the adjusted and unadjusted simulated bilateral values of agricultural trade flows as follows:

$$\tilde{Y}_{ij} = \frac{Y_{ij}^{*} + \hat{Y}_{ij}}{2} \quad \cdots\cdots (11)$$

4.6 Data requirements and sources

In order to estimate the above gravity trade equations, secondary data were required. These data included both time-series and cross-sectional dimensions, thus permitting a special econometric technique adapted to panel data modelling. South Africa's agricultural trading partners, i.e. countries, were the cross-sectional units whereas the time series dimension were the years. The datasets of total agricultural trade flows and the selected agricultural products trade flows between South Africa and its agricultural trading partners for WTO models covered the period 1994 to 2004, whereas for EU-SA TDCA and SADC Trade Protocol models covered the period 1994 to 2009. The reasons for the different periods of datasets for WTO models compared to EU-SA TDCA and SADC Trade Protocol models have already been stated above when substantiating the use of different dummy variables for trade agreements. The WTO datasets could have covered the period 1994 to 1999, but the datasets for some of the agricultural trade flows could not allow the model estimation due to insufficient degrees of freedom. Therefore, the datasets were extended with five more years to 2004 in order to improve the degrees of freedom.

The gravity model required data on imports, exports, countries' per capita incomes (GDPPCs), real effective exchange rates (REER) and distances. The imports and exports data on selected agricultural products were obtained from the trade databases of the Trade and Investment Policy Strategies (TIPS) and Eurostat of the European Commission. GDPPCs were obtained from the World Development Indicators database of the World Bank, International Financial Statistics Database of the International Monetary Fund (IMF) as well as from United Nations Statistical Database. REER was obtained from the South African Reserve Bank. Geographical distances between South Africa and its trading partners (i.e. city to city distance in kilometres) were obtained from GIS Centre of the Human Sciences Research Council (HSRC) and also from the Bali and Indonesian website (www.indo.com/distances).

4.7 Summary

This chapter provided a detailed review of models of trade policy analysis. These models included among others market equilibrium models, i.e. partial equilibrium and economy-wide models, as well as single equation econometric models, i.e. import demand and gravity models. While providing an overview of these models, emphasis was given on describing the strengths and the weaknesses of the models with an objective of identifying the suitable model for this study.

Having identified the gravity model as the suitable one for the study, this chapter, furthermore, provided a detailed theoretical framework and the specifications of the gravity model. The next chapter provides the empirical results of the study on the impacts of trade agreements on South Africa's agricultural trade flows at both aggregate level (sector level imports and exports) and disaggregate level (product level imports and exports), obtained from estimating the model in question.

CHAPTER 5

IMPACTS OF TRADE AGREEMENTS ON THE AGRICULTURAL TRADE FLOWS BETWEEN SOUTH AFRICA AND ITS AGRICULTURAL TRADING PARTNERS

5.1 Introduction

This chapter presents the empirical results of the impacts of the trade agreements, which were discussed in Chapter 2, on the agricultural trade flows between South Africa and its agricultural trading partners at both aggregate and disaggregate levels. The aggregate level of analysis focuses on the total agricultural trade flows, i.e. total agricultural exports from South Africa to its trading partners; total agricultural imports from South Africa's trading partners to South Africa; as well as total agricultural trade (imports plus exports) between South Africa and its trading partners. The disaggregate level of analysis focuses on the trade flows of selected agricultural products, which are cheese and curd[5] (HS0406), cut flowers (HS0603), frozen fruits and nuts (HS0811), preserved fruits and nuts (HS2008), fruits and vegetable juices (HS2009) and wines (HS2204)[6]. These products were selected because they were given preferential treatment in the trade agreements under analysis.

The following sections of this chapter provide detailed discussion of the results of the impacts of trade agreements on South Africa's agricultural trade flows at the aggregate and disaggregate levels. The trade agreements covered are the WTO AoA, EU-SA TDCA and SADC Trade Protocol (TP) respectively. The impact results focus on the responsiveness of the aggregate and disaggregate agricultural trade flows between South Africa and its agricultural trading partners due to the implementation of the trade agreements in question. That is, whether the implementation of the trade agreements has had significant effects on agricultural trade flows between South Africa and its agricultural trading partners or not. The analysis goes further in estimating the trade potentials arising from the implementation of the trade agreements. Further analysis investigates whether the implementation of the trade agreements has led to trade creation or trade diversion, with emphasis on EU-SA TDCA and SADC Trade Protocol. That is whether the implementation of the EU-SA TDCA and SADC Trade Protocol created agricultural trade (imports, exports and total trade) between South

[5] In the rest of the study, this product is referred to as "cheese".
[6] In the rest of the study, this product is referred to as "wine".

Africa and the EU and SADC countries or diverted agricultural trade to other South African trading partners?

The results are set out as follows:

- section 5.2 presents the statistical test results for the selection of the suitable models for the dataset of each trade flow;
- section 5.3 discusses the effects of the control explanatory variables (i.e. income, exchange rates and distance) on agricultural trade flows.

The impact results based on the selected suitable models, which cover the period and yearly impacts as well as the trade direction and trade potential results in the case of EU-SA TDCA and SADC Trade Protocol, are presented as follows:

- section 5.4 presents WTO's AoA impact results for the period 1995–1999;
- section 5.5 presents EU-SA TDCA impact results for the periods 2000–2004 and 2005–2009;
- section 5.6 presents SADC Trade Protocol impact results for the periods 2000–2004 and 2005–2009; and
- section 5.7 presents the responsiveness of agricultural trade flows between South Africa and rest of the world (non-EU and non-SADC countries) during the implementation of the EU-SA TDCA and SADC Trade Protocol, for the periods 2000–2004 and 2005–2009.

5.2 Statistical tests and selection of the suitable models

This section discusses the procedure followed when selecting the suitable models for all the trade flows covered in this study. As discussed in Chapter 4, tests for autocorrelation were conducted on the estimated various models using the Durbin-H (in the case of dynamic models) and Durbin-Watson (in the case of static models) statistics. Where necessary, the Cochrane-Orcutt procedure was used to correct autocorrelation problems. A number of statistical tests were undertaken to test the efficiency of the estimators for all the models in order to select the best estimator suitable for the data of each trade flow.

The following steps were followed: In step one, the poolability tests, using the Wald statistic, were conducted to test the significance of country-specific effects jointly on trade flows. Where the joint null hypothesis that the coefficients are insignificant was rejected, a choice between the dynamic FE model or dynamic RE model and a choice between the static FE model or static RE model were made in step two by applying Hausman's tests (Greene, 2000). In step three, a choice between the dynamic model or the static model was made by looking at the significance level of the lagged dependent variable, i.e. if significant, then the dynamic model was preferred or otherwise the static model was preferred, if insignificant.

Using the dataset of South Africa's total agricultural exports to all South Africa's world agricultural trading partners from 1994 to 2004 as an example, the results of the above statistical tests for the selection of the suitable model are presented in Table 5.1 below (which is also set out in **Appendix 5A**). The results show that the poolability tests, which are based on the Wald statistic, have proved that country-specific effects are important in determining the total agricultural export from South Africa to all South Africa's agricultural trading partners in the world. This means that the hypothesis that country effects are jointly insignificant is to be rejected and has, therefore, led to the conclusion that the pooled OLS estimator was inefficient.

The autocorrelation tests on the dynamic models for South Africa's agricultural exports to all world agricultural trading partners have proved that there were no first-order autocorrelation problems in both FE and RE estimators in all models (i.e. period impact and yearly impact). However, the autocorrelation tests on the static models have detected first-order autocorrelation problems in both FE and RE estimators for period impact and yearly impact models. After correction, using the Cochrane-Orcutt procedure, the autocorrelation problem disappeared only in the FE estimators, while the problem was still present in the RE estimators.

Table 5.1: Selection of the Estimator suitable for Agricultural Exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1190	5	3.69*	OLS	*No*	1309	4	22.44*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	1190	9	3.67*	OLS	*No*	1309	8	22.76*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1190	5	-0.62	FE-no auto	*Yes*	1309	4	1.46	FE-no auto	*No*
		-	-	-	FE-auto	-	1190	4	1.89**	FE-auto	*Yes*
		1190	6	-1.31	RE-no auto	*Yes*	1309	6	1.21	RE-no auto	*No*
		-	-	-	RE-auto	-	1190	6	1.81	RE-auto	*No*
	Yearly Impact	1190	9	-0.56	FE-no auto	*Yes*	1309	8	1.46	FE-no auto	*No*
		-	-	-	FE-auto	-	1190	8	1.92**	FE-auto	*Yes*
		1190	10	-1.34	RE-no auto	*Yes*	1309	9	1.22	RE-no auto	*No*
		-	-	-	RE-auto	-	1190	9	1.84	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	5	471.79*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-
	Yearly Impact	N/A	9	464.07*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Source: Author's calculations

The tests for unobserved effects, based on the Hausman statistics, in all the dynamic models have proved that the hypothesis, that unobserved country specific effects are uncorrelated with explanatory variables, cannot be accepted at the 99% level, and therefore indicate that the FE estimators were efficient. However, due to the insignificant autocorrelation tests on the static RE estimators for both periods, the Hausman statistics were not calculated and in this case only the FE estimators for static period and yearly impact models were selected. The statistical tests results which established the selection of the suitable models, as well as the selected suitable dynamic and static models for all agricultural trade flows (exports, imports and trade) between South Africa and its agricultural trading partners, are presented in their respective **Appendices** as shown in Table 5.2 below.

Table 5.2: Appendices for the statistical tests results towards the selection of the model suitable for datasets of agricultural trade flows between South Africa and its agricultural trading partners

Trade Flows	WTO AoA Appendices	EU-SA TDCA Appendices	SADC TP Appendices	ROW Appendices
Agric X	5A and 5B	5AQ and 5AR	5DB and 5DC	5EU and 5EV
Agric M	5C and 5D	5AT and 5AU	5DE and 5DF	5EW and 5EX
Agric T	5E and 5F	5AW and 5AX	5DH and 5DI	5EY and 5EY
HS0406 X	5G and 5H	5AZ and 5BA	5DK and 5DL	5FA and 5FB
HS0406 M	5I and 5J	5BC and 5BD	-	5FA and 5FB
HS0406 T	5K and 5L	5BF and 5BG	-	5FC and 5FD
HS0603 X	5M and 5N	5BI and 5BJ	5DN and 5DO	5FE and 5FF
HS0603 M	5O and 5P	5BL and 5BM	5DQ and 5DR	5FG and 5FH
HS0603 T	5Q and 5R	5BO and 5BP	5DT and 5DU	5FI and 5FJ
HS0811 X	5S and 5T	5BR and 5BS	5DW and 5DX	5FK and 5FL
HS0811 M	5U and 5V	5BU and 5BV	-	5FM and 5FN
HS0811 T	5W and 5X	5BX and 5BY	-	-
HS2008 X	5Y and 5Z	5CA and 5CB	5DZ and 5EA	5FO and 5FP
HS2008 M	5AA and 5AB	5CD and 5CE	-	5FQ and 5FR
HS2008 T	5AC and 5AD	5CG and 5CH	-	5FS and 5FT
HS2009 X	5AE and 5AF	5CJ and 5CK	5EC and 5ED	5FU and 5FV
HS2009 M	5AG and 5AH	5CM and 5CN	5EF and 5EG	5FW and 5FX
HS2009 T	5AI and 5AJ	5CP and 5CQ	5EI and 5EJ	5FY and 5FZ
HS2204 X	5AK and 5AL	5CS and 5CT	5EL and 5EM	5GA and 5GB
HS2204 M	5AM and 5AN	5CV and 5CW	5EO and 5EP	5GC and 5GD
HS2204 T	5AO and 5AP	5CY and 5CZ	5ER and 5ES	5GE and 5GF

NB: X, M and T stand for exports, imports and trade. AGRIC – Total agriculture, HS0406 – Cheese & curd, HS0603 – Cut flowers, HS0811 – Frozen fruits & nuts, HS2008 – Preserved fruits & nuts, HS2009 – Fruits & vegetable juices, & HS2204 – Wines.

Source: Author's calculations

The results of the selected suitable models are presented in Table 5.3 below. These results have shown that 189 models, in total, were found to be efficient and suitable for the datasets of the selected agricultural trade flows, of which 161 were dynamic models and 28 were static models. With regard to the dynamic models; 152 FE, 2 RE and 7 pooled OLS estimators were found to be efficient and suitable; whereas 14 FE and 14 RE estimators were found to be efficient and suitable for the static models.

Furthermore, 42 estimators were found to be suitable for the selected WTO AoA models, which consisted of 38 dynamic models (with 38 FE estimators selected as efficient and suitable) and 4 static models (with 2 FE and 2 RE estimators selected as efficient and suitable). Regarding the selected ROW models, 38 dynamic FE estimators were found to be efficient and suitable. With regard to the selected EU-SA TDCA models, 63 estimators were found to be suitable and consisted of 53 dynamic models (with 51 FE and 2 OLS estimators selected as efficient and suitable) and 10 static models (with 7 FE and 3 RE estimators selected as efficient and suitable). With regard to the selected models for the SADC Trade

Protocol, 46 estimators were found to be suitable, which consisted of 32 dynamic models (with 25 FE, 2 RE and 5 OLS estimators selected as efficient and suitable) and 14 static models (with 5 FE and 9 RE estimators selected as efficient and suitable).

Table 5.3: Results for the selection of the model suitable for datasets of agricultural trade flows between South Africa and its agricultural trading partners

Trade Flows	Period Impact Model				Yearly Impact Model				Direction Impact Model	
	WTO AoA	EU-SA TDCA	SADC TP	ROW	WTO AoA	EU-SA TDCA	SADC TP	ROW	EU-SA TDCA	SADC TP
Detailed results										
Agric X	DFE	DFE	SFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE
Agric M	DFE	DFE	DFE	DFE	DFE	DFE	SRE	DFE	DFE	DFE
Agric T	DFE	DFE	DFE	DFE	DFE	DFE	DRE	DFE	DFE	DFE
HS0406 X	DFE	DFE	DOLS	DFE	DFE	DFE	DOLS	DFE	DFE	DFE
HS0406 M	DFE	DFE	-	DFE	DFE	DFE	-	DFE	DFE	-
HS0406 T	DFE	DFE	-	-	DFE	DFE	-	-	DFE	-
HS0603 X	DFE	DFE	SFE	DFE	DFE	DFE	SFE	DFE	DFE	DFE
HS0603 M	DFE	SRE	DFE	DFE	DFE	SRE	DFE	DFE	DFE	DFE
HS0603 T	DFE	DOLS	SRE	DFE	DFE	DOLS	SRE	DFE	DFE	DFE
HS0811 X	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE
HS0811 M	DFE	DFE	-	DFE	DFE	DFE	-	DFE	DFE	-
HS0811 T	DFE	SFE	-	-	DFE	SFE	-	-	DFE	-
HS2008 X	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE	DFE
HS2008 M	DFE	SFE	-	DFE	DFE	SFE	-	DFE	DFE	-
HS2008 T	SRE	DFE	-	DFE	SRE	DFE	-	DFE	SRE	-
HS2009 X	DFE	DFE	DOLS	DFE	DFE	DFE	DOLS	DFE	DFE	DFE
HS2009 M	DFE	DFE	SRE	DFE	DFE	DFE	SRE	DFE	DFE	DFE
HS2009 T	SFE	DFE	DOLS	DFE	SFE	DFE	SFE	DFE	SFE	SFE
HS2204 X	DFE	DFE	DFE	DFE	DFE	DFE	DRE	DFE	DFE	DFE
HS2204 M	DFE	SFE	SRE	DFE	DFE	SFE	SRE	DFE	DFE	DFE
HS2204 T	DFE	DFE	SRE	DFE	DFE	DFE	SRE	DFE	DFE	DFE

Summarised results						
DATASETS FOR:	DFE	DRE	DOLS	SFE	SRE	TOTAL
WTO AoA Trade Flows	38	0	0	2	2	**42**
ROW Trade Flows	38	0	0	0	0	**38**
EU-SA TDCA Trade Flows	51	0	2	7	3	**63**
SADC TP Trade Flows	25	2	5	5	9	**46**
TOTAL	**152**	**2**	7	**14**	**14**	**189**
	161			**28**		

NB: X, M and T stand for exports, imports and trade. AGRIC – Total agriculture, HS0406 – Cheese & curd, HS0603 – Cut flowers, HS0811 – Frozen fruits & nuts, HS2008 – Preserved fruits & nuts, HS2009 – Fruits & vegetable juices, & HS2204 – Wines. DFE, DRE, DOLS stand for dynamic fixed effects, dynamic random effects and dynamic ordinary least squares; whereas SFE and SRE stand for static fixed effects and static random effects.

Source: Author's calculations

The dominance of the dynamic models has justified the importance of dynamics in trade and supports many economic arguments which have suggested that past trade is the predictor for current trade. This means that the historical relationships between South Africa and its trading partners have played a significant role in determining the majority of current agricultural trade flows between South Africa and its agricultural trading partners. Furthermore, the poolability tests have indicated that the joint country-pair specific effects were not important in the majority of selected models. These findings conform to the expectations of De Grauwe and Skudelny (2000) and Eichengreen and Irwin (1997), as they have found that both the dynamics (or past trade) and the unobserved country-pair specific effects were indeed important in determining the majority of current agricultural trade flows between South Africa and its agricultural trading partners.

For example, using the results for agricultural trade flows between South Africa and the world as presented in Table 5.7, these results showed that the previous year's total agricultural exports (i.e. $\ln Y_{ijt-1}$) had significantly improved the current total agricultural exports from South Africa to the world by 0.34%. Similarly, the current total agricultural imports from the world to South Africa as well as the current total agricultural trade (exports plus imports) between South Africa and the world have also improved significantly by 0.17% and 0.33% respectively owing to the importance of dynamics in trade. The results of dynamic effects on all agricultural trade flows between South Africa and its trading partners should be interpreted in a similar manner as above.

5.3 Effects of the control explanatory variables on agricultural trade flows

The control explanatory variables that were included when estimating models are: per capita Gross Domestic Products of South Africa and of its trading partners (GDPPCs); real effective exchange rates (REER); and geographic distances between South Africa and its trading partners (DIST). Their effects on agricultural trade flows between South Africa and its agricultural trading partners are discussed in the following subsections.

5.3.1 Gross Domestic Product per Capita (GDPPC)

The results for the income effects on the agricultural trade flows between South Africa and its agricultural trading partners are presented in Table 5.4 below. In total, 56 agricultural trade flows between South Africa and its agricultural trading partners were positively affected by the income and 5 of them were negatively affected by income. However, 68 agricultural trade flows between South Africa and its agricultural trading partners were not affected by the income. The per capita GDP of South Africa ($GDPPC_I$) had positively affected 12 agricultural export flows and 12 agricultural import flows between South Africa and its agricultural trading partners, but had negatively affected 2 agricultural export flows. On the other hand, the per capita GDP of South Africa's trading agricultural partners ($GDPPC_J$) had positively affected 9 agricultural export flows and 20 agricultural imports flows between South Africa and its agricultural trading partners. Similarly, the sum of per capita GDPs of South Africa and its agricultural trading partners ($GDPPC_{IJ}$) had also positively affected 12 total agricultural trade (exports plus imports) flows between South Africa and its agricultural trading partners and negatively affected 2 total agricultural trade flows.

The results of the total agricultural trade flows between South Africa and the world as presented in Table 5.7 indicate that the per capita GDPs have played a significant positive role in determining agricultural trade flows between South Africa and the world. On average, a 1% increase in South Africa's GDP per capita led to an increase of between 11.83% and 12.66% in South Africa's agricultural exports to the world; as well as an increase of between 16.39% and 16.47% in South Africa's agricultural imports from the world. The results have also shown that a 1% increase in per capita GDPs of South Africa's agricultural trading partners in the world led to a 0.4% increase in South Africa's agricultural exports to the world. In cases where the coefficient of the GDPPC is significantly negative, it shows that a 1% increase in South Africa's GDP per capita led to a decrease of such trade flow between South Africa and its trading partners. For example, an examination of the results of the cut flowers trade flows between South Africa and the EU countries as presented in Table 5.17 shows that the percentage increase in the sum of per capita GDPs of South Africa and EU countries had negatively affected total cut flowers trade between South Africa and the EU countries. On average, a 1% increase in the sum of per capita GDPs of South Africa and EU countries led to decrease of between 5.99% and 6.05% in total cut flowers trade between South Africa and the EU countries. The coefficients of the GDPPCs for other agricultural trade flows should be interpreted similarly as above, taking into account that insignificant coefficient means percentage increase in GDPPC had no effects on such agricultural trade flow between South Africa and its agricultural trading partners.

Table 5.4: Results for the income effects on agricultural trade flows between South Africa and its agricultural trading partners

Trade Flows	$GDPPC_I$ (South Africa)				$GDPPC_J$ (Trading Partners)				$GDPPC_{IJ}$ (South Africa + Trading Partners)			
	World	EU	SADC	ROW	World	EU	SADC	ROW	World	EU	SADC	ROW
Detailed results												
Agric X	+	+	0	+	+	+	0	0	na	na	Na	Na
Agric M	+	0	+	+	+	+	+	+	na	na	Na	Na
Agric T	na	na	na	Na	na	na	Na	na	+	+	0	+
HS0406 X	0	0	0	–	0	0	0	+	na	na	Na	Na
HS0406 M	0	+	na	+	0	0	Na	0	na	na	Na	Na
HS0406 T	na	na	na	Na	na	na	Na	na	0	0	Na	Na
HS0603 X	0	0	+	–	0	0	0	0	na	na	Na	Na
HS0603 M	0	0	+	0	0	+	0	+	na	na	Na	Na
HS0603 T	na	na	na	na	na	na	Na	na	+	–	+	+
HS0811 X	0	0	0	0	0	+	0	0	na	na	Na	Na
HS0811 M	0	0	na	0	+	0	Na	+	na	na	Na	Na
HS0811 T	na	na	na	na	na	na	Na	na	0	0	Na	Na
HS2008 X	0	+	0	0	0	0	0	+	na	na	Na	Na
HS2008 M	0	0	na	+	+	0	Na	0	na	na	Na	Na
HS2008 T	na	na	na	na	+	na	Na	na	0	–	na	0
HS2009 X	+	+	+	+	+	0	+	+	na	na	na	na
HS2009 M	+	0	+	+	0	0	+	0	na	na	na	na
HS2009 T	na	na	na	na	na	na	Na	na	+	0	0	+
HS2204 X	0	+	+	+	0	+	+	0	na	na	na	na
HS2204 M	0	0	+	+	na	+	0	0	na	na	na	na
HS2204 T	na	na	na	na	na	na	Na	na	+	+	+	+

Summarised results						
EFFECTS	**$GDPPC_I$ - X**	**$GDPPC_I$ - M**	**$GDPPC_J$ - X**	**$GDPPC_J$ - M**	**$GDPPC_{IJ}$ – T**	**TOTAL**
Positive effects	12	12	9	11	12	**56**
Negative effects	2	0	1	0	2	**6**
No effects	14	13	18	14	9	**68**

NB: X, M and T stand for exports, imports and trade respectively. AGRIC – Total agriculture, HS0406 – Cheese & curd, HS0603 – Cut flowers, HS0811 – Frozen fruits & nuts, HS2008 – Preserved fruits & nuts, HS2009 – Fruits & vegetable juices, & HS2204 – Wines. + means positive effects, and – means negative effects, and 0 means no effects. na means not applicable

Source: Author's calculations

The results have clearly shown that agricultural exports, imports and total trade flows between South Africa and its agricultural trading partners are income-elastic. Therefore, these results support the *a priori* expectation that countries with a higher income per capita would trade more intensively (have more exports and imports) than a poorer country because the per capita incomes of the trading countries reflect in both the productive and consumption capacity which heavily determine the trade flow between them. In some cases where the income effects are negative, the reason may be that the majority of countries included were poorer and therefore might have spent much of their increased extra income on internal developmental programs such as infrastructural development projects rather than increasing their imports from South Africa and other countries. Thus, South Africa's exports to these poorer countries had declined even though their income had increased. Alternatively, these poorer countries might have decided to purchase agricultural products locally in order to boost their local economies.

5.3.2 Real Effective Exchange Rates (REER)

The results for the real effective exchange rates effects on the agricultural trade flows between South Africa and its agricultural trading partners are presented in Table 5.5 below. In total, 13 agricultural trade flows between South Africa and its agricultural trading partners were positively affected by the exchange rates and 11 of them were negatively affected. On the other hand, 52 agricultural trade flows between South Africa and its agricultural trading partners were not affected by the exchange rates. The results have indicated that the real effective exchange rates had positively affected 4 agricultural export flows, 7 agricultural import flows and 2 total agricultural trade (exports plus imports) flows between South Africa and its agricultural trading partners. However, they had negatively affected 7 agricultural export flows and 4 total agricultural trade (exports plus imports) flows between South Africa and its agricultural trading partners.

It should be noted that during the period under review the exchange value of the South Africa currency (Rand) had been appreciating against a basket of currencies in real terms (Motsumi *et al*, 2008). Using the results of the total agricultural trade flows between South Africa and the world as presented in Table 5.7, South Africa's total agricultural exports to the world had declined by about 0.6% owing to the appreciation in the real effective exchange rate. On the other hand, the total agricultural imports and aggregate agricultural trade between South Africa and its agricultural trading partners had not been affected by the appreciation of the real effective exchange rate. An examination of the results of the cut flowers trade flows between South Africa and the EU countries as presented in Table 5.17, shows that the appreciation of the real effective exchange rate had increased South Africa's cut flowers imports from the EU countries by between 6.39% and 7.7%. In this case, exports suffered while imports gained owing to the appreciation of the South Africa Rand against a basket of currencies. The effects of exchange rates on the total agricultural trade flows (imports plus exports) might take any direction depending on which trade flow dominates this variable, i.e.

whether the import value is higher than the export value or vice versa. For example, the results presented in Table 5.17 show that South Africa's total cut flowers trade with the EU countries had declined by between 0.69% and 0.72% owing to the appreciation of the real effective exchange rate. In contrast, the results presented in Table 5.33 show that South Africa's total cut flowers trade with the ROW countries had increased by 1.23% owing to the appreciation of the real effective exchange rate.

Table 5.5: Results for the exchange rates effects on agricultural trade flows between South Africa and its agricultural trading partners

Trade Flows	World	EU	SADC	ROW
Detailed results				
Agric X	–	+	0	–
Agric M	0	0	0	0
Agric T	0	0	0	–
HS0406 X	–	0	0	–
HS0406 M	+	0	Na	+
HS0406 T	0	0	Na	Na
HS0603 X	0	0	0	–
HS0603 M	0	+	+	0
HS0603 T	0	–	–	+
HS0811 X	–	0	0	0
HS0811 M	0	+	na	0
HS0811 T	0	0	na	Na
HS2008 X	0	+	+	0
HS2008 M	0	0	na	0
HS2008 T	0	0	na	0
HS2009 X	0	0	0	0
HS2009 M	0	0	0	0
HS2009 T	0	0	0	0
HS2204 X	–	0	+	–
HS2204 M	+	0	0	+
HS2204 T	+	0	0	0
Summarised results				
EFFECTS	**Exports (X)**	**Imports (M)**	**Trade (T)**	**TOTAL**
Positive effects	4	7	2	**13**
Negative effects	7	0	4	**11**
No effects	16	18	18	**52**
NB: **X**, **M** and **T** stand for exports, imports and trade respectively. **+** means positive effects, and **–** means negative effects, and **0** means no effects. **na** means not applicable				

Source: Author's calculations

Certain research findings by Bergstrand (1985) and Koo *et al* (1994) have shown that an appreciation of the importing country's currency against its trading partners' currencies would impact positively on imports because imports become less expensive, whereas depreciation would affect imports negatively since they become more expensive. On the other hand, a depreciation of the exporting country's currency against its trading partners' currencies means that its exports become cheaper in the world markets, thus impacting positively on exports. Given these findings, these results have clearly shown that the effects of the real effective exchange rates on the majority of these agricultural trade flows have met the *a priori* expectations. However, there are few cases were the effects of the real effective exchange rate on exports flows did not met the expectations, for example, total agricultural exports and preserved fruits and nuts exports to the EU countries as well as preserved fruits and nuts exports and wine exports to the SADC countries. The coefficients of the REER for other agricultural trade flows should be interpreted similarly as above.

5.3.3 Distance (DIST)

The results for the distance effects on the agricultural trade flows between South Africa and its agricultural trading partners are presented in Table 5.6 below. Owing to the fact that FE estimators were suitable and efficient for the majority of selected models as shown in Table 5.3 above, the distance factor was eliminated in these models. As a result, only 11 selected models had a distance included as one of the explanatory variables. The results have shown that, in total, the distance had negatively affected 8 agricultural trade flows between South Africa and its agricultural trading partners, but only 1 agricultural trade flow was positively affected. However, 2 agricultural trade flows were not affected by distance. For example, the results of cheese exports from South Africa to the SADC countries as presented in Table 5.25, show that the distance between South Africa and SADC countries contributed to the significant decrease of cheese exports from South Africa to the SADC countries by 0.41%. Furthermore, an examination of the results of the cut flowers trade flows between South Africa and the SADC countries as presented in Table 5.26, shows that the distance between South Africa and SADC contributed to a significant decrease of total cut flowers trade between South Africa and the SADC countries of between 3.03% and 3.15%. The coefficients of the DIST for other agricultural trade flows should be interpreted in this manner.

The overall effects of distance on agricultural trade flows between South Africa and its agricultural trading partners were in line with the *a priori* expectations because distance between trading partners is regarded as a proxy for transportation costs, meaning that countries with short distances between each other are expected to trade more than those which are far apart owing to lower transaction cost. Furthermore, distance can also be used as a proxy for the risks associated with the quality of some perishable goods and for the cost of personal contact between managers and customers (ITC, 2000; Cheng and Wall, 2005; Gebrehiwet *et al*, 2007). Given the geographic location of South Africa in relation to its major trading partners, as well as the fact that most of the agricultural products traded are perishable, it was expected that distance would have negative effects on South Africa's exports and imports of agricultural products.

Table 5.6: Results for the distance effects on agricultural trade flows between South Africa and its agricultural trading partners

Trade Flows	World	EU	SADC	ROW
		Detailed results		
Agric X	na	na	Na	na
Agric M	na	na	Na	na
Agric T	na	na	–	na
HS0406 X	na	na	–	na
HS0406 M	na	na	na	na
HS0406 T	na	na	na	na
HS0603 X	na	na	na	na
HS0603 M	na	–	na	na
HS0603 T	na	+	–	na
HS0811 X	na	na	na	0
HS0811 M	na	na	na	na
HS0811 T	na	na	na	na
HS2008 X	na	na	na	na
HS2008 M	na	na	na	na
HS2008 T	na	na	na	na
HS2009 X	na	na	–	na
HS2009 M	na	na	–	na
HS2009 T	na	na	–	na
HS2204 X	na	na	–	na
HS2204 M	na	na	0	na
HS2204 T	na	na	na	na
		Summarised results		
EFFECTS	**Exports (X)**	**Imports (M)**	**Trade (T)**	**TOTAL**
Positive effects	0	0	1	1
Negative effects	3	2	3	8
No effects	1	1	0	2

NB: X, M and T stand for exports, imports and trade respectively. AGRIC – Total agriculture, HS0406 – Cheese & curd, HS0603 – Cut flowers, HS0811 – Frozen fruits & nuts, HS2008 – Preserved fruits & nuts, HS2009 – Fruits & vegetable juices, & HS2204 – Wines. + means positive effects, and – means negative effects, and 0 means no effects. **na** means not applicable

Source: Author's calculations

5.4 The impacts of the WTO AoA on selected agricultural trade flows between South Africa and its world agricultural trading partners

This section discusses the impacts of the multilateral trade agreement, the Agreement of Agriculture (AoA) of the World Trade Organization (WTO), on the total agricultural trade flows and the selected agricultural products trade flows between South Africa and the world (i.e. all South Africa's agricultural trading partners including the EU and SADC member states). In this case, the datasets cover all the trade flows (i.e. exports, imports and total trade) of the total agriculture and all the selected agricultural products.

5.4.1 Aggregate agricultural trade flows between South Africa and the world

The results for total agricultural trade flows[7] (exports, imports and trade) between South Africa and the world are presented in Table 5.7 below. As shown in this table, the cross-sections information refers to the number of countries that traded agricultural products with South Africa during the period under review (1994 to 2004), which are referred to as South Africa's agricultural trading partners in the rest of this study. For example, this table shows that South Africa exported agricultural products to 119 countries in the world and imported agricultural products from 127 countries during the period under analysis. Furthermore, South Africa traded agricultural products with 109 countries in the world, i.e. during this period South Africa exported agricultural products to these countries and also imported agricultural products from them during the same period. All the adjusted R^2 values confirm that the predictive power of the selected models is good, i.e. the selected variables "best fit" the model. The cross-sections information as well as the adjusted R^2 estimates for all the other selected agricultural trade flows, as presented in their respective Tables below, should be interpreted similarly as above.

The results from the period impact model indicate that during the implementation of the WTO's AoA from 1995 to 1999, South Africa's agricultural exports to the world had significantly increased by 0.44%. On annual basis, the most significant increase in South Africa's agricultural exports to the world occurred in 1999 by 0.42%. On the other hand, total agricultural trade (imports plus exports) between South Africa and the world had significantly

[7] Note: In interpreting all the results, exports refer to the value of exports, imports refer to the value of imports and trade refers to the value of trade.

declined by 0.23% and on annual basis, significant decreases occurred in 1998 and 1999 by 0.27% and 0.22% respectively. However, the results showed that South Africa's agricultural imports from the world did not respond significantly to the implementation of the WTO's AoA.

Table 5.7: Results for agricultural trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-	-	-	-
lnY_{ijt-1}	0.34*	0.17*	0.33*	0.34*	0.17*	0.33*
$lnGDPPC_{it}$	12.66*	16.39*	-	11.83*	16.47*	-
$lnGDPPC_{jt}$	0.40***	0.05	-	0.38	0.03	-
$lnGDPPC_{ijt}$	-	-	-0.02	-	-	-0.04
$REER_t$	-0.60**	0.46	-0.15	-0.14	0.72	-0.22
D9599	0.44*	-0.25	-0.23**	-	-	-
D95	-	-	-	-0.08	-0.34	-0.23
D96	-	-	-	0.36	-0.53	-0.21
D97	-	-	-	0.16	-0.31	-0.06
D98	-	-	-	0.18	-0.42	-0.27**
D99	-	-	-	0.42**	-0.18	-0.22**
$lnDIST_{ij}$	-	-	-	-	-	-
Adjusted R^2	0.82	0.75	0.88	0.82	0.75	0.88
Observations	1190	1270	1090	1190	1270	1090
Cross-Sections	119	127	109	119	127	109

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.4.2 Cheese trade flows between South Africa and the world

The results for all cheese trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.8 below. The results from the period impact model indicate that during the implementation of the WTO's AoA for the period 1995 to 1999, South Africa's cheese exports to the world had significantly increased by 1.23% and, on annual basis, the most significant increase in South Africa's cheese exports to the world occurred in 1997 by 2.08%. Surprisingly, while the joint period effect of the implementation of the WTO's AoA on total cheese trade (imports plus exports) was insignificant, the individual yearly significant positive effects were observed in 1996 and 1997, as total cheese trade between South Africa and its cheese trading partners in the world had improved by 1.11% and 0.93% respectively during these years. However, the results showed that South Africa's cheese imports from the world did not respond significantly to the implementation of the WTO's AoA.

Table 5.8: Results for cheese trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-15.15	-	-	-
$\ln Y_{ijt-1}$	0.30*	0.38*	-	0.31*	0.38*	-
$\ln GDPPC_{it}$	-1.41	31.18**	-	-8.10	16.61	-
$\ln GDPPC_{jt}$	-0.43	1.00	-	-0.49	1.03	-
$\ln GDPPC_{ijt}$	-	-	8.74*	-	-	4.61
$REER_t$	-3.67*	3.82*	1.50	-4.12**	3.58***	0.80
D9599	1.23***	-0.10	0.45	-	-	-
D95	-	-	-	1.31	-1.37	-0.02
D96	-	-	-	0.57	0.08	1.11**
D97	-	-	-	2.08**	0.03	0.93***
D98	-	-	-	0.81	-0.21	0.06
D99	-	-	-	1.21	-1.18	0.10
$\ln DIST_{ij}$	-	-	-7.43**	-	-	-
Adjusted R^2	0.67	0.76	0.47	0.67	0.76	0.83
Observations	320	240	100	320	240	110
Cross-Sections	32	24	10	32	24	10

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.4.3 Cut flowers trade flows between South Africa and the world

The results for all cut flowers trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.9 below. The results from the period impact model indicate that during the implementation of the WTO's AoA over the period 1995 to 1999, South Africa's cut flowers exports to the world had significantly increased by 0.92% and, on annual basis, the significant increase in South Africa's cut flowers exports to the world occurred only in 1999 by 1.15%.

Surprisingly, while the joint period effect of the implementation of the WTO's AoA on cut flowers imports was insignificant, the individual yearly significant negative effects were observed in 1996 and 1997, when South Africa's cut flowers imports had declined by 2.78% and 1.89% respectively. However, the results showed that total cut flowers trade between South Africa and its worldwide cut flowers trading partners did not respond significantly to the implementation of the WTO's AoA.

Table 5.9: Results for cut flowers trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-	-	-	-
$\ln Y_{iit-1}$	0.34*	0.18*	0.24*	0.33*	0.17*	0.20*
$\ln GDPPC_{it}$	7.81	5.78	-	8.89	12.59	-
$\ln GDPPC_{it}$	1.46**	0.98	-	1.41***	0.64	-
$\ln GDPPC_{iit}$	-	-	4.32	-	-	2.45
$REER_t$	-1.69*	1.74	-0.23	-1.10	4.81*	0.66
D9599	0.92*	-0.55	0.36	-	-	-
D95	-	-	-	0.52	-2.15	-0.82
D96	-	-	-	0.73	-2.78**	-0.21
D97	-	-	-	0.61	-1.89***	0.07
D98	-	-	-	0.45	-1.08	-0.14
D99	-	-	-	1.15*	-0.22	0.24
$\ln DIST_{ij}$	-	-	-	-	-	-
Adjusted R^2	0.77	0.57	0.80	0.77	0.58	0.80
Observations	560	260	220	560	260	220
Cross-Sections	56	26	22	56	26	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.4.4 Frozen fruits and nuts trade flows between South Africa and the world

The results for all frozen fruits and nuts trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.10 below. The results from the period impact model indicate that the implementation of the WTO's AoA over the period 1995 to 1999 had no effects on all frozen fruits and nuts trade flows (exports, imports and trade) between South Africa and the world. Similar results were observed from the yearly impact model with the exception of total frozen fruits and nuts trade (imports plus exports) where the individual yearly significant positive effects were observed in 1997 when total frozen fruits and nuts trade between South Africa and its frozen fruits and nuts trading partners in the world improved by 3.78%.

Surprisingly, while the joint period effect of the implementation of the WTO's AoA on cut flowers imports was insignificant, the individual yearly significant negative effects were observed in 1996 and 1997, when South Africa's cut flowers imports had declined by 2.78% and 1.89% respectively. However, the results showed that total cut flowers trade between South Africa and its worldwide cut flowers trading partners did not respond significantly to the implementation of the WTO's AoA.

Table 5.10: Results for frozen fruits and nuts trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	53.36	-	-	81.07	-
$\ln Y_{ijt-1}$	0.15*	0.48*	0.29*	0.18*	0.49*	0.30*
$\ln GDPPC_{it}$	7.16	-7.48	-	-1.81	-10.19	-
$\ln GDPPC_{jt}$	-0.32	-0.44	-	-0.26	-0.42***	-
$\ln GDPPC_{ijt}$	-	-	1.19	-	-	3.93
$REER_t$	-1.83	3.52	0.35	-4.20***	2.05	-2.46
D9599	0.11	-1.07	0.52	-	-	-
D95	-	-	-	1.93	-0.34	2.60
D96	-	-	-	0.00	-1.34	1.43
D97	-	-	-	2.24	0.03	3.78**
D98	-	-	-	-0.20	1.98	1.51
D99	-	-	-	0.38	-2.52	0.34
$\ln DIST_{ij}$	-	-0.18	-	-	-0.15	-
Adjusted R^2	0.41	0.27	0.41	0.42	0.29	0.42
Observations	210	230	110	210	230	110
Cross-Sections	21	23	11	21	23	11

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.4.5 Preserved fruits and nuts trade flows between South Africa and the world

The results for all preserved fruits and nuts trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.11 below.

Table 5.11: Results for preserved fruits and nuts trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-	-	-	0.96
$\ln Y_{ijt-1}$	0.27*	0.30*	-	0.27*	0.28*	-
$\ln GDPPC_{it}$	15.53**	25.96**	-	19.10**	26.57***	-
$\ln GDPPC_{jt}$	3.36*	1.98	-	3.49*	1.31	-
$\ln GDPPC_{ijt}$	-	-	3.32	-	-	3.28*
$REER_t$	-0.29	0.33	-0.60	-0.80	5.23*	-0.92
D9599	0.38	0.15	0.18	-	-	-
D95	-	-	-	1.15	-3.53*	0.46
D96	-	-	-	0.75	-3.30*	0.23
D97	-	-	-	0.53	-2.53**	0.02
D98	-	-	-	0.72	-0.58	-0.17
D99	-	-	-	0.55	-0.69	-0.20
$\ln DIST_{ij}$	-	-	-	-	-	-1.62*
Adjusted R^2	0.67	0.55	0.73	0.67	0.57	0.74
Observations	850	380	352	850	380	320
Cross-Sections	85	38	32	85	38	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

The results from the period impact model indicate that the implementation of the WTO's AoA during the period 1995 to 1999 had no effects on all preserved fruits and nuts trade flows (exports, imports and trade) between South Africa and the world. Similar results were observed from the yearly impact model with the exception of frozen fruits and nuts imports where individual yearly significant negative effects were observed in 1995, 1996 and 1997, as South Africa's preserved fruits and nuts imports from its frozen fruits and nuts trading partners in the world had declined by 3.53%, 3.30% and 2.53% in 1995, 1996 and 1997 respectively.

5.4.6 Fruits and vegetable juices trade flows between South Africa and the world

The results for all fruits and vegetable juices trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.12 below. The results from the period and yearly impact models indicate that the implementation of the WTO's AoA over the period 1995 to 1999 had no effects on fruits and vegetable juices exports and imports between South Africa and the world.

Table 5.12: Results for fruits and vegetable juices trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-	-	-	-
$\ln Y_{iit-1}$	0.21*	0.21*	0.09***	0.21*	0.20*	0.09***
$\ln GDPPC_{it}$	13.82***	28.64**	-	8.37	43.48*	-
$\ln GDPPC_{it}$	2.00**	2.20	-	2.43*	1.97	-
$\ln GDPPC_{iit}$	-	-	3.83**	-	-	4.27**
$REER_t$	0.35	-0.17	0.71	-1.92***	1.34	-0.33
D9599	-0.31	0.44	-0.54***	-	-	-
D95	-	-	-	1.12	0.12	0.19
D96	-	-	-	0.91	-0.27	-0.08
D97	-	-	-	0.86	-0.45	0.35
D98	-	-	-	0.27	1.38	-0.11
D99	-	-	-	-0.61	0.87	-0.65**
$\ln DIST_{ij}$	-	-	-	-	-	-
Adjusted R^2	0.66	0.56	0.65	0.67	0.56	0.66
Observations	860	410	400	860	410	400
Cross-Sections	86	41	40	86	41	40

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

However, the total fruits and vegetable juices trade (imports plus exports) had significantly declined by 0.54% during the implementation period and the individual yearly significant negative effects were observed in 1999, when total fruits and vegetable juices trade between

South Africa and its fruits and vegetable juices trading partners in the world declined by 0.65%.

5.4.7 Wine trade flows between South Africa and the world

The final results for all wine trade flows (exports, imports and trade) between South Africa and the world are presented in Table 5.8 below. The results from the period impact model indicate that the implementation of the WTO's AoA from 1995 to 1999 had significantly improved all the wine trade flows between South Africa and the World. For example, South Africa's wine exports to the world significantly increased by 0.75% during the implementation period and on annual basis, the significant increase in South Africa's wine exports to the world occurred in 1999, at 0.71%.

Table 5.13: Results for wine trade flows between South Africa and the world, 1994-2004

Variables	Period Impact Model			Yearly Impact Model		
	Exports	Imports	Trade	Exports	Imports	Trade
Constant	-	-	-	-	-	-
$\ln Y_{iit-1}$	0.28*	0.12*	0.36*	0.27*	0.13*	0.37*
$\ln GDPPC_{it}$	25.83*	25.94*	-	23.77*	28.25*	-
$\ln GDPPC_{it}$	0.73	0.74	-	0.64	0.70	-
$\ln GDPPC_{iit}$	-	-	6.88*	-	-	7.39*
$REER_t$	-0.95***	1.28	0.13	0.18	-0.18	-0.90
D9599	0.75**	1.39*	0.43***	-	-	-
D95	-	-	-	-0.35	2.37*	1.09**
D96	-	-	-	-0.09	2.25*	1.12*
D97	-	-	-	0.37	1.95*	1.27*
D98	-	-	-	0.23	2.12*	0.82**
D99	-	-	-	0.71***	1.33**	0.31
$\ln DIST_{ij}$	-	-	-	-	-	-
Adjusted R^2	0.73	0.76	0.84	0.73	0.76	0.84
Observations	1020	430	420	1020	430	420
Cross-Sections	102	43	42	102	43	42

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

Furthermore, South Africa's wine imports from the world significantly increased by 1.39% and on annual basis, significant increases occurred in all years by 2.37%, 2.25%, 1.95%, 2.12% and 1.33% in 1995, 1996, 1997, 1998 and 1999 respectively. Similarly, total wine trade (imports plus exports) between South Africa and the world significantly increased by 0.43% and on annual basis significant increases occurred in 1995, 1996, 1997 and 1998 by 1.09%, 1.12%, 1.27% and 0.82% respectively.

5.5 The impacts of the implementation of EU-SA TDCA on aggregate agricultural and selected agricultural products trade flows between South Africa and the EU countries

This section discusses the impacts of the bilateral trade agreement between South Africa and the EU countries (i.e. EU-SA TDCA) on the total agricultural trade flows and the selected agricultural products trade flows (which had received preferential tariff quotas as noted in Chapter 2) between South Africa and the EU countries for the period 1994-2009. These are cheese and curd (HS0406), cut flowers (HS0603), frozen fruits and nuts (HS0811), preserved fruits and nuts (HS2008), fruits and vegetable juices (HS2009) and wines (HS2204). Table 5.14 below shows the utilisation of quotas for these products by South Africa exporters to the EU market on annual basis from 2000 to 2009 as well as the average quota utilisation for the periods 2000–2004 and 2005–2009. Neither the official information on the utilisation of cheese export quotas, nor the import quotas of cheese and wines, have been published at the time of writing.

Tablê 5.14: Utilisation of South Africa's export quotas under the EU-SA TDCA

Year	HS0603	HS0811	HS2008	HS2009	HS2204
2000	29.25%	25.00%	46.33%	70.35%	1.55%
2001	54.87%	32.37%	50.48%	100.00%	6.39%
2002	62.65%	38.22%	58.97%	75.20%	30.55%
2003	61.21%	62.82%	61.79%	54.97%	60.36%
2004	68.88%	54.75%	59.14%	41.41%	68.53%
2005	65.25%	3.00%	53.00%	22.50%	48.00%
2006	55.25%	0.00%	53.67%	58.50%	65.50%
2007	53.00%	0.00%	57.00%	21.50%	60.00%
2008	53.25%	0.00%	45.87%	58.20%	56.49%
2009	47.28%	0.00%	46.33%	37.00%	74.00%
2000 – 2004	**55.37%**	**42.63%**	**55.34%**	**68.39%**	**33.48%**
2005 – 2009	**54.81%**	**0.60%**	**51.17%**	**39.54%**	**60.80%**

Source: EC Taric Website (http://ec.europa.eu/taxation_customs)

5.5.1 Aggregate agricultural trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA on South Africa's agricultural exports to the EU countries; South Africa's agricultural imports from the EU countries; as well as total agricultural trade (import plus exports) between South Africa and EU countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.15 below.

Table 5.15: Results for total agricultural trade flows between South Africa and the EU countries

Models	Variables	Exports 2000 - 2004	Exports 2005 - 2009	Imports 2000 - 2004	Imports 2005 - 2009	Trade 2000 - 2004	Trade 2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.46*	0.46*	0.28*	0.28*	0.43*	0.43*
	$\ln GDPPC_{it}$	1.15	1.15	1.57	1.57	-	-
	$\ln GDPPC_{jt}$	2.12*	2.12*	2.40***	2.40***	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	1.50*	1.50*
	$REER_t$	0.15	0.15	0.30	0.30	0.03	0.03
	D0004 / D0509	-0.24**	0.24	-0.01	0.49	0.66*	0.66*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.96	0.96	0.86	0.86	0.96	0.96
	Observations	225	225	225	225	225	225
	Cross-Sections	15	15	15	15	15	15
Yearly Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.47*	0.47*	0.29*	0.29*	0.45*	0.45*
	$\ln GDPPC_{it}$	5.84*	5.84*	4.74	4.74	-	-
	$\ln GDPPC_{jt}$	2.01*	2.01*	2.31***	2.31***	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	1.65*	1.65*
	$REER_t$	0.43**	0.43**	0.47	0.47	0.09	0.09
	D00 / D05	-0.20***	-0.21	-0.13	0.18	-0.07	0.74*
	D01 / D06	-0.18	-0.94**	-0.38	-0.35	-0.13	0.32**
	D02 / D07	-0.05	-0.89***	-0.82	-0.18	-0.15	0.61*
	D03 / D08	0.28	-0.95***	-0.65	-0.39	0.32**	0.61*
	D04 / D09	0.18	-0.76	-0.64	-0.17	0.30**	0.71*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.97	0.97	0.86	0.86	0.96	0.96
	Observations	225	225	225	225	225	225
	Cross-Sections	15	15	15	15	15	15
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.38*	0.38*	0.23*	0.23*	0.37*	0.37*
	$\ln GDPPC_{it}$	2.06**	2.06**	5.39**	5.39**	-	-
	$\ln GDPPC_{jt}$	0.03	0.03	0.80*	0.80*	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	0.46*	0.46*
	$REER_t$	-0.54*	-0.54*	-0.32	-0.32	-0.48*	-0.48*
	PTA_{yes}	-0.46***	0.52***	0.01	0.03	0.16	0.93*
	PTA_{no}	-0.44*	0.60**	0.33	-0.22	0.23**	0.94*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.86	0.86	0.76	0.76	0.89	0.89
	Observations	1785	1785	1905	1905	1635	1635
	Cross-Sections	119	119	127	127	109	109

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.1.1 Agricultural exports from South Africa to the EU countries

The results show that agricultural exports from South Africa to the EU countries had significantly declined by 0.24% during the implementation of the EU-SA TDCA over the period 2000–2004 and on annual basis, the significant decrease occurred in 2000 by 0.2%. While the joint period effect of the implementation of the EU-SA TDCA on South Africa's agricultural exports to the EU countries was insignificant for the period 2005–2009, the individual yearly significant negative effects were observed in 2006, 2007 and 2008, when agricultural exports from South Africa to the EU countries significantly declined by 0.94%, 0.89% and 0.95% respectively during these years. On average, 0.44% of South Africa's agricultural exports destined for the EU market were diverted to other agricultural trading partners of South Africa over the period 2000–2004. In contrast, for the period 2005–2009, the implementation of the EU-SA TDCA led to the creation of 0.52% of South Africa's agricultural exports market in the EU countries. The results for the average actual and potential agricultural exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.1** in log values, and the dollar values are presented in **Appendix 5AS.**

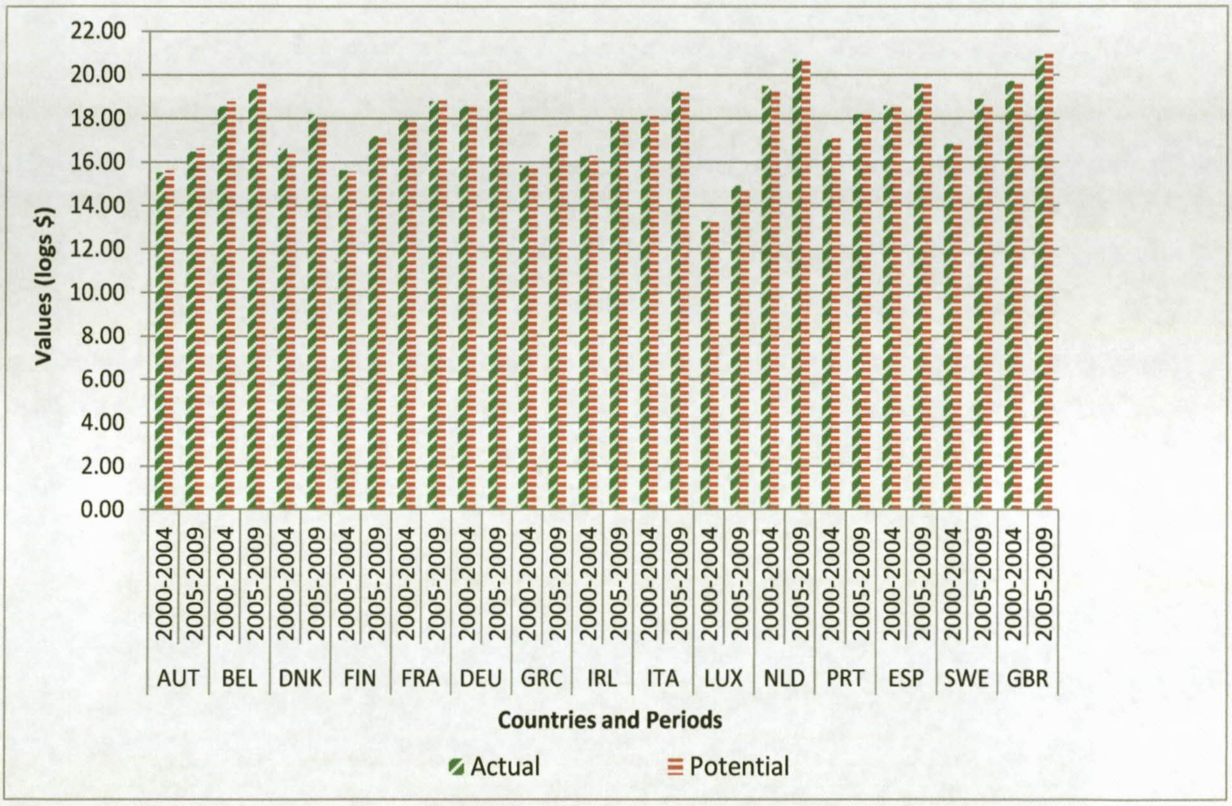

Figure 5.1: Average actual and potential value of agricultural exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009

The results show that South African agricultural exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural exports in Denmark, Finland, France, Greece, the Netherlands, Spain and Sweden; but had under-scored or underachieved in Austria, Belgium, Germany, Italy, Ireland, Luxembourg, Portugal and the

United Kingdom for the period 2000–2004. For the period 2005–2009, South African agricultural exporters still outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural exports in Denmark, Finland, Italy, Ireland, Luxembourg, the Netherlands, and Sweden; whereas they under-scored in Austria, Belgium, France, Germany, Greece, Portugal, Spain and the United Kingdom.

5.5.1.2 Agricultural imports from the EU countries to South Africa

The results indicate that the implementation of the EU-SA TDCA for both periods had no effects on the agricultural imports from the EU countries to South Africa. The results also show no proof of creation or diversion of South Africa's agricultural exports from either the EU countries or South Africa's other agricultural trading partners.

The results for the average actual and potential agricultural imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.2** in log values, and the dollar values are presented in **Appendix 5AV**. The results show that South African agricultural importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural imports from Austria, Italy, Luxembourg and Spain; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's agricultural imports from Belgium, Denmark, France, Finland, Germany, Greece, Ireland, the Netherlands, Portugal, Sweden and the United Kingdom for the period 2000–2004.

During the period 2005–2009, South African agricultural importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural imports from Austria, Belgium, Germany, Italy, France, Luxembourg, the Netherlands, Portugal and Spain, whereas they under-scored or underachieved the estimated potential capacity for the absorption of South Africa's agricultural imports from Denmark, Finland, Greece, Ireland, Sweden, and the United Kingdom.

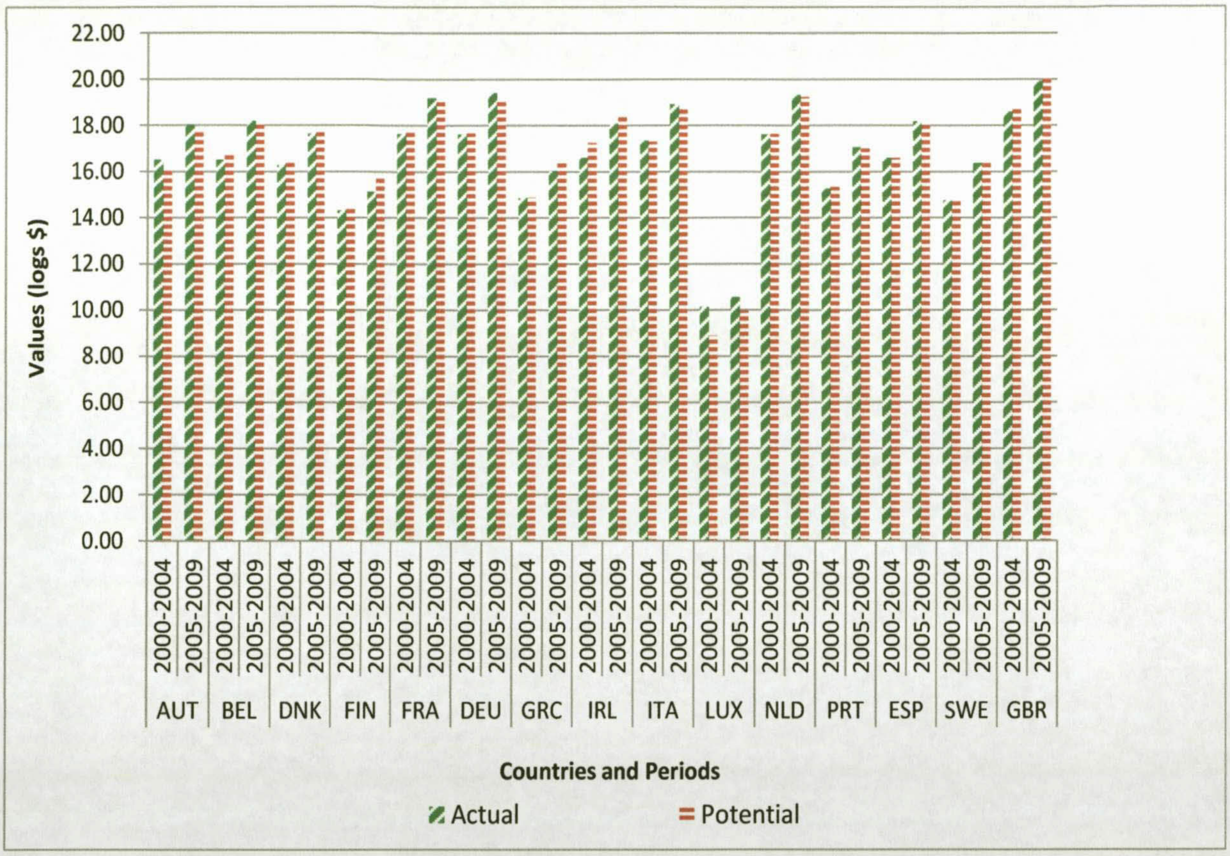

Figure 5.2: Average actual and potential value of agricultural imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

5.5.1.3 Agricultural trade (imports plus exports) between South Africa and the EU countries

The results show that total agricultural trade between South Africa and the EU countries had significantly improved by 0.66% during the implementation of the EU-SA TDCA over the period 2005–2009. On annual basis, significant increases occurred in all years as follows: 0.74% in 2005, 0.32% in 2006, 0.61% in both 2007 and 2008, and 0.71% in 2009. Surprisingly, while the joint period effect of the implementation of the EU-SA TDCA on total agricultural trade between South Africa and the EU countries was insignificant for the period 2000–2004, individual yearly significant positive effects were observed in 2008 and 2009, when total agricultural trade between South Africa and the EU countries significantly increased by 0.32% and 0.3% respectively. On average, the implementation of the EU-SA TDCA led to the creation of 0.93% of total agricultural trade between South Africa and the EU countries for the period 2005–2009. However, there was no proof of creation or diversion of total agricultural trade between South Africa and the EU countries to other agricultural trading partners of South Africa or EU countries. The results for the average actual and potential total agricultural trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.3** in log values, and the dollar values are presented in **Appendix 5AY**.

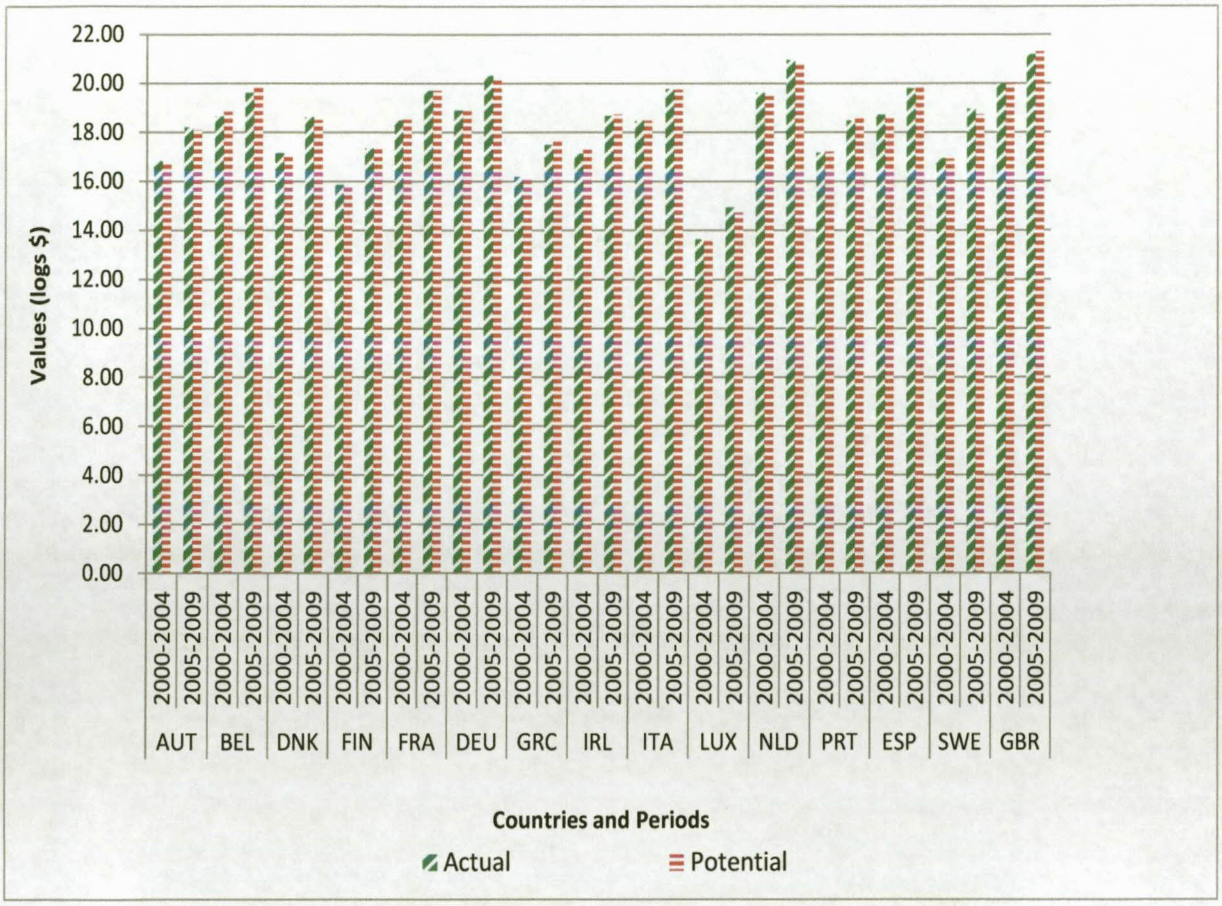

Figure 5.3: Average actual and potential value of agricultural trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's agricultural traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total agricultural trade in the South Africa-Austria, South Africa-Denmark, South Africa-Finland, South Africa-Greece, South Africa-Netherlands, South Africa-Spain and South Africa-Sweden markets. On the other hand, they under-scored or underachieved in the South Africa-Belgium, South Africa-France, South Africa-Germany, South Africa-Ireland, South Africa-Luxembourg, South Africa-Portugal and South Africa-United Kingdom markets over the period 2000–2004. For the period 2005–2009, South Africa's agricultural traders (importers and exporters) outperformed and exhausted the estimated potential capacity for the absorption of total agricultural trade in the

South Africa-Austria, South Africa-Denmark, South Africa-Germany, South Africa-Italy, South Africa-Luxembourg, South Africa-Netherlands, and South Africa-Sweden markets; whereas they under-scored or underachieved in the South Africa-Belgium, South Africa-Finland, South Africa-France, South Africa-Greece, South Africa-Ireland, South Africa-Portugal, South Africa-Spain and South Africa-United Kingdom markets.

5.5.2 Cheese trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA's reciprocal cheese in-quota tariff preferences on South Africa's cheese exports to the EU countries; South Africa's cheese imports from the EU countries; as well as total cheese trade (import plus exports) between South Africa and EU countries for the periods 2000-2004 and 2005–2009. The results are presented in Table 5.16.

Table 5.16: Results for cheese trade flows between South Africa and the EU countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.28**	0.28**	0.30*	0.30*	0.26**	0.26**
	$\ln GDPPC_{it}$	6.00	6.00	-2.10	-2.10	-	-
	$\ln GDPPC_{it}$	7.90	7.90	3.72	3.72	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	0.85	0.85
	$REER_t$	2.49	2.49	0.84	0.84	0.39	0.39
	D0004 / D0509	-3.53***	-2.89	0.59	-0.08	-0.88	0.20
	$\ln DIST_{ii}$	-	-	-	-	-	-
	Adjusted R^2	0.40	0.40	0.67	0.67	0.77	0.77
	Observations	90	90	195	195	90	90
	Cross-Sections	6	6	13	13	6	6
Yearly Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.30**	0.30**	0.35*	0.35*	0.28**	0.28**
	$\ln GDPPC_{it}$	-10.86	-10.86	33.60**	33.60**	-	-
	$\ln GDPPC_{it}$	7.05	7.05	-3.02	-3.02	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	-0.64	-0.64
	$REER_t$	1.07	1.07	1.28	1.28	0.05	0.05
	D00 / D05	-3.90	-1.55	-0.13	-3.63***	0.29	0.61
	D01 / D06	-6.23***	2.06	-0.38	-4.82***	1.99	0.72
	D02 / D07	-5.56	2.53	-0.82	-5.84***	6.41*	0.91
	D03 / D08	-7.27	0.51	-0.65	-6.71***	2.24	1.20
	D04 / D09	-10.57***	0.55	-0.64	-12.16*	1.79	-1.24
	$\ln DIST_{ii}$	-	-	-	-	-	-
	Adjusted R^2	0.39	0.39	0.76	0.76	0.78	0.78
	Observations	90	90	195	195	90	90
	Cross-Sections	6	6	13	13	6	6
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.40*	0.40*	0.32*	0.32*	0.23***	0.23***
	$\ln GDPPC_{it}$	-7.72	-7.72	6.85	6.85	-	-
	$\ln GDPPC_{it}$	1.09	1.09	0.89	0.89	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	2.49	2.49
	$REER_t$	-1.88**	-1.88**	1.91***	1.91***	0.87	0.87
	PTA_{yes}	-2.37*	1.19	0.91	-1.55	-0.56	-0.06
	PTA_{no}	-0.96	2.01***	-0.74	-1.66	-0.16	-2.09**
	$\ln DIST_{ii}$	-	-	-	-	-	-
	Adjusted R^2	0.70	0.70	0.64	0.64	0.68	0.68
	Observations	480	480	360	360	150	150
	Cross-Sections	32	32	24	24	10	10

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.2.1 Cheese exports from South Africa to the EU countries

The results indicate that cheese exports from South Africa to the EU countries had significantly declined by 3.53% during the implementation of the EU-SA TDCA for the period 2000–2004 and on annual basis, significant decreases occurred in 2001 and 2004 by 6.23% and 10.57% respectively. However, the effects of the implementation of the EU-SA

TDCA on South Africa's cheese exports to the EU countries for the period 2005–2009 were insignificant. There was no proof of trade creation or diversion of South Africa's cheese exports to the EU during the implementation of the EU-SA TDCA over both periods.

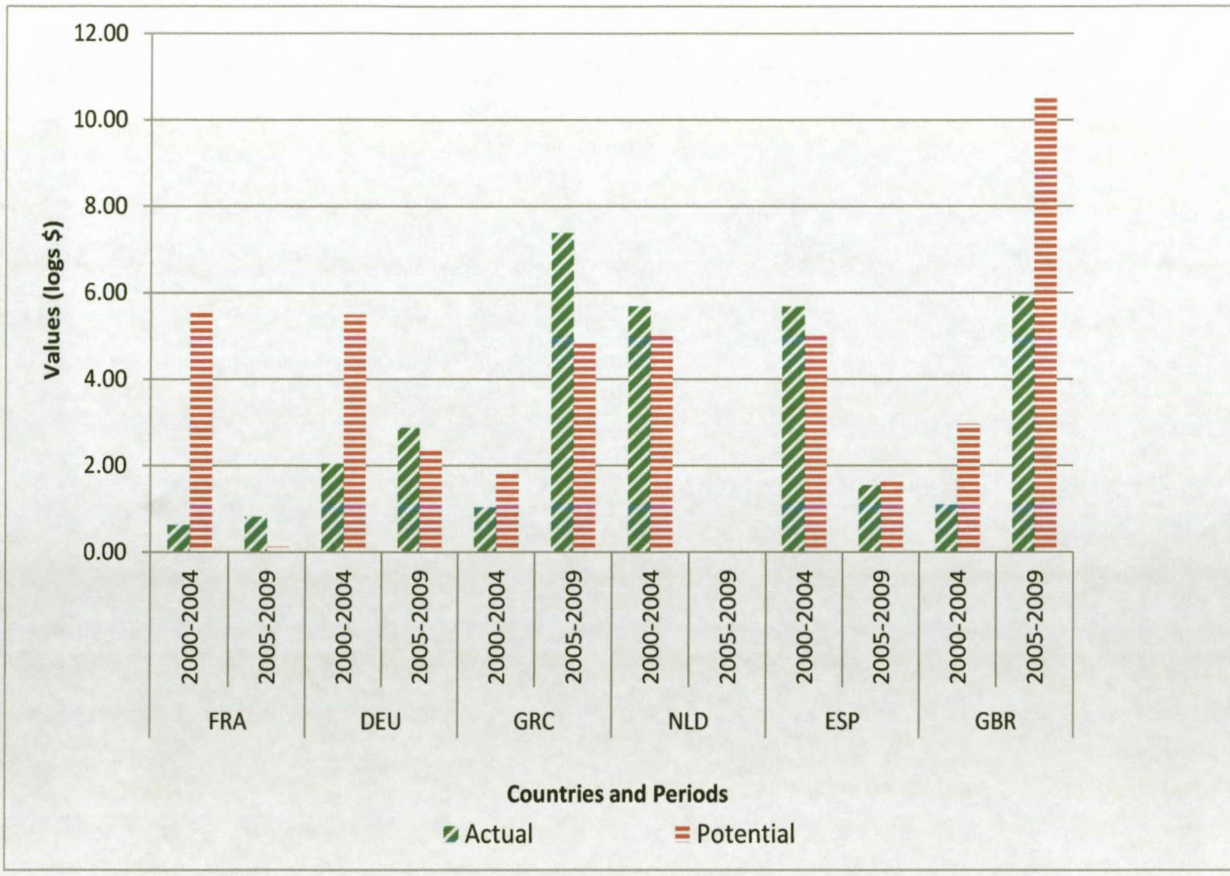

Figure 5.4: Average actual and potential value of cheese exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009

The results for the average actual and potential cheese exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.4** in log values, and the dollar values are presented in **Appendix 5BB**. The results show that South Africa's cheese exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese exports in the Netherlands and Spain, but had under-scored or underachieved in France, Germany, Greece and the United Kingdom over the period 2000–2004. For the period 2005–2009, South African cheese exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese exports in France, Germany and Greece; whereas they under-scored or underachieved in Spain and the United Kingdom.

5.5.2.2 Cheese imports from the EU countries to South Africa

The results show that the implementation of the EU-SA TDCA over both periods had no joint period effects on South Africa's cheese imports from the EU countries, but on annual basis, there were significant decreases in South Africa's cheese imports from the EU countries which occurred in all years over the period 2005–2009, as follows: 3.63% in 2005, 4.82% in 2006, 5.84% in both 2007, 6.71% in 2008 and 12.16% in 2009. However, there was no proof of creation or diversion of South Africa's cheese imports from the EU countries. The results of the average actual and potential cheese imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.5** in log values, and the dollar values are presented in **Appendix 5BE**.

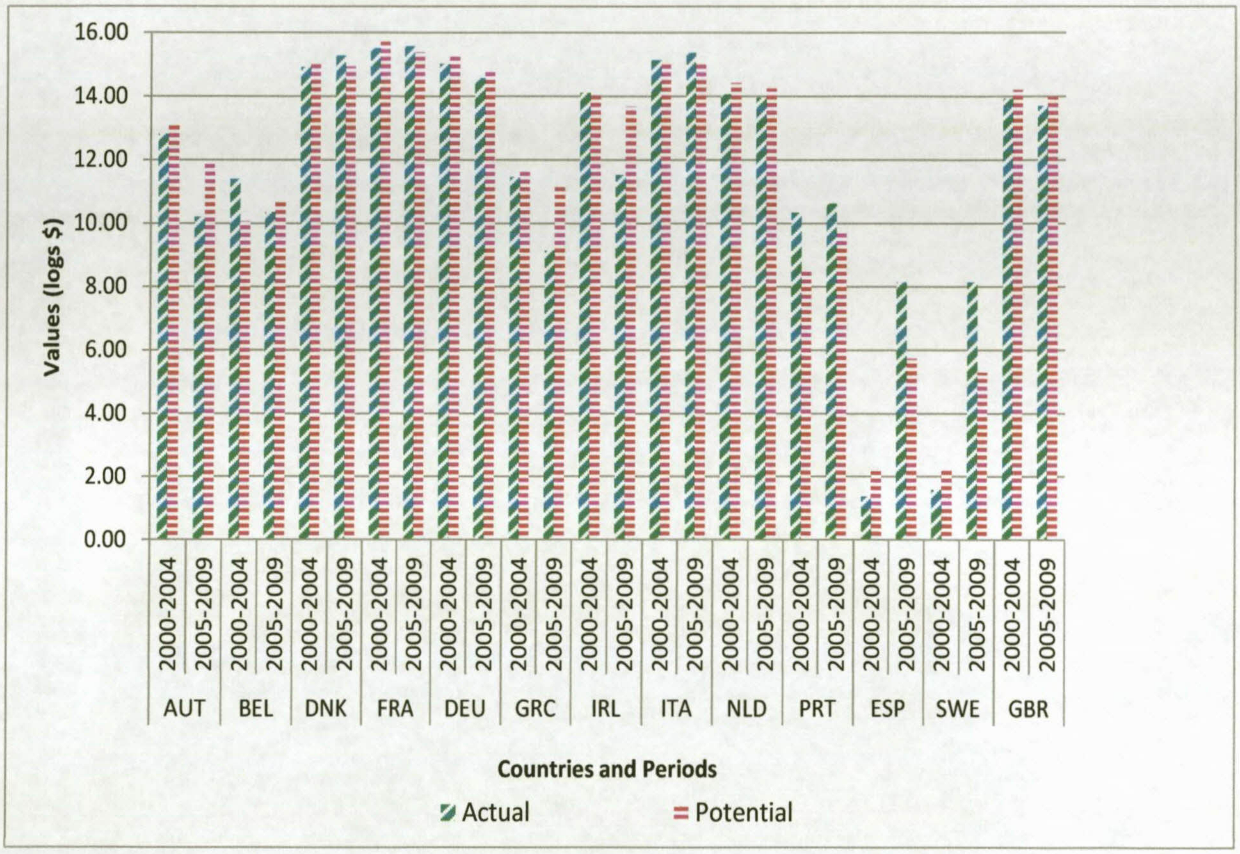

Figure 5.5: Average actual and potential value of cheese imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

The results show that South Africa's cheese importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese imports from Belgium, Italy, Ireland and Portugal; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's cheese imports from Austria, Denmark, France, Germany, Greece, the Netherlands, Spain, Sweden and the United Kingdom over the period 2000–2004.

During the period 2005–2009, South Africa's cheese importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese imports from Denmark, France, Italy, Portugal, Spain and Sweden; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's cheese imports from Austria, Belgium, Germany, Greece, Ireland, the Netherlands and the United Kingdom.

5.5.2.3 Cheese trade (imports plus exports) between South Africa and the EU countries

The results show that the implementation of the EU-SA TDCA over both periods had no joint period effects on total cheese trade between South Africa and the EU countries, but on annual basis there was a significant increase in total cheese trade between South Africa and the EU countries which occurred in 2002 by 6.41%. On average, for the period 2005–2009, the implementation of the EU-SA TDCA led to the diversion of total cheese trade between South Africa and the EU countries to other cheese trading partners of South Africa or EU countries by 2.09%. However, there was no proof of creation or diversion of total cheese trade between South Africa and the EU countries over the period 2000–2004.

The results for the average actual and potential total cheese trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.6** in log values, and the dollar values are presented in **Appendix 5BH**. The results show that South Africa's cheese traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total cheese trade in the South Africa-France market, South Africa-Germany market, South Africa-Greece market, South Africa-Netherlands market and South Africa-United Kingdom, but had under-scored or underachieved in the South Africa-Spain market over the period 2000–2004.

In contrast, for the period 2005–2009, South Africa's cheese traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total cheese trade in the South Africa-Spain market, but had under-scored or underachieved in the South Africa-France market, South Africa-Germany market, South Africa-Greece market and South Africa-United Kingdom market.

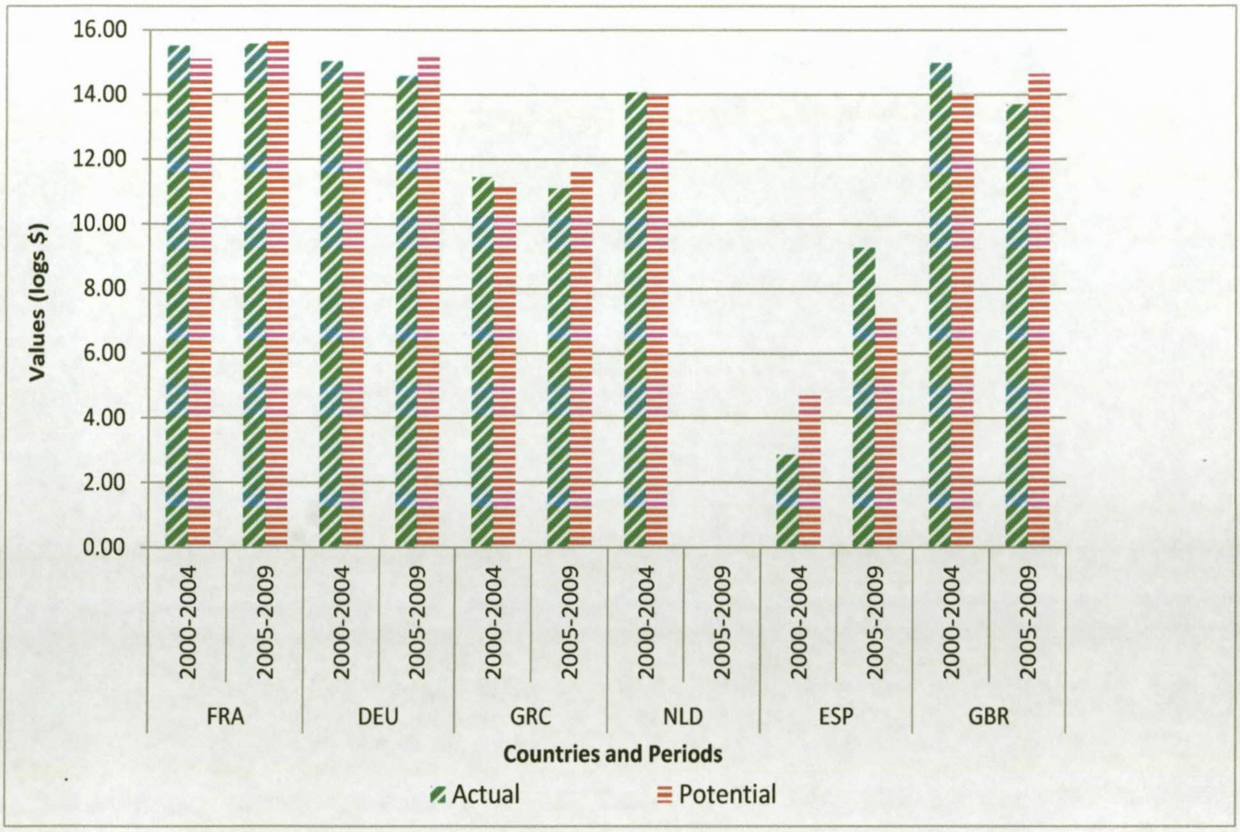

Figure 5.6: Average actual and potential value of cheese trade from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

5.5.3 Cut flowers trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA's non-reciprocal cut flowers in-quota tariff preferences on South Africa's cut flowers exports to the EU countries; South Africa's cut flowers imports from the EU countries; as well as total cut flowers trade (import plus exports) between South Africa and EU countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.7 below.

Table 5.17: Results for cut flowers trade flows between South Africa and the EU countries

Models	Variables	Exports 2000 - 2004	Exports 2005 - 2009	Imports 2000 - 2004	Imports 2005 - 2009	Trade 2000 - 2004	Trade 2005 - 2009
Period Impact Model	Constant	-	-	1276.5**	1276.5**	-253.34*	-253.34*
	$\ln Y_{iit-1}$	0.51*	0.51*	-	-	0.75*	0.75*
	$\ln GDPPC_{it}$	-1.56	-1.56	-13.69	-13.69	-	-
	$\ln GDPPC_{it}$	-2.00	-2.00	40.63*	40.63*	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	-6.05*	-6.05*
	$REER_t$	-0.40	-0.40	7.70**	7.70**	-0.69***	-0.69***
	D0004 / D0509	-0.51	0.41	2.24***	-2.83	-0.42***	1.05*
	$\ln DIST_{ij}$	-	-	-176.47*	-176.47*	35.35*	35.35*
	Adjusted R^2	0.83	0.83	0.31	0.31	0.96	0.96
	Observations	210	210	105	105	105	105
	Cross-Sections	14	14	7	7	7	7
Yearly Impact Model	Constant	-	-	1460.7**	1460.7**	-246.26*	-246.26*
	$\ln Y_{iit-1}$	0.52*	0.52*	-	-	0.76*	0.76*
	$\ln GDPPC_{it}$	5.99	5.99	-38.35	-38.35	-	-
	$\ln GDPPC_{it}$	-2.95	-2.95	41.00*	41.00*	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	-5.99*	-5.99*
	$REER_t$	-0.27	-0.27	6.39**	6.39**	-0.72***	-0.72***
	D00 / D05	0.73	-0.58	0.88	0.06	-0.49**	1.22*
	D01 / D06	1.09	-0.76	-0.60	3.04	-0.47	0.99*
	D02 / D07	3.37***	-0.61	-3.20	2.76	-0.01	1.12*
	D03 / D08	2.94**	-1.87	-1.03	4.82	0.42	1.00*
	D04 / D09	3.05	-1.35	-2.12	2.95	-0.24	0.89*
	$\ln DIST_{ij}$	-	-	-174.80**	-174.80**	34.51*	34.51*
	Adjusted R^2	0.83	0.83	0.34	0.34	0.96	0.96
	Observations	210	210	105	105	105	105
	Cross-Sections	14	14	7	7	7	7
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.49*	0.49*	0.26*	0.26*	0.33*	0.33*
	$\ln GDPPC_{it}$	-4.03	-4.03	4.11	4.11	-	-
	$\ln GDPPC_{it}$	0.56	0.56	0.71	0.71	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	3.44***	3.44***
	$REER_t$	-0.60	-0.60	0.58	0.58	0.44	0.44
	PTA_{yes}	-1.62*	0.51	-0.36	-1.82	-0.70	-0.25
	PTA_{no}	-0.59***	1.38**	1.00	-0.61	-0.25	0.32
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.78	0.78	0.62	0.62	0.81	0.81
	Observations	840	840	390	390	330	330
	Cross-Sections	56	56	26	26	22	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.3.1 Cut flowers exports from South Africa to the EU countries

The results show that the implementation of the EU-SA TDCA over both periods had no joint period effects on South Africa's cut flowers exports to the EU countries, but on annual basis there were significant increases in South Africa's cut flowers exports to the EU countries which occurred in 2002 and 2003, at 3.37% and 2.94% respectively. On average, for the period 2000–2004, the implementation of the EU-SA TDCA led to the diversion of South Africa's cut flowers exports destined for the EU countries to other South African cut flowers trading partners by 0.59%. However, the results show no proof of creation or diversion of South Africa's cut flowers exports to the EU countries over the period 2005–2009. The results for the average actual and potential cut flowers exports from South Africa to the EU countries over the periods 2000–2004 and 2005–2009 are presented in **Figure 5.7** in log values, and the dollar values are presented in **Appendix 5BK**.

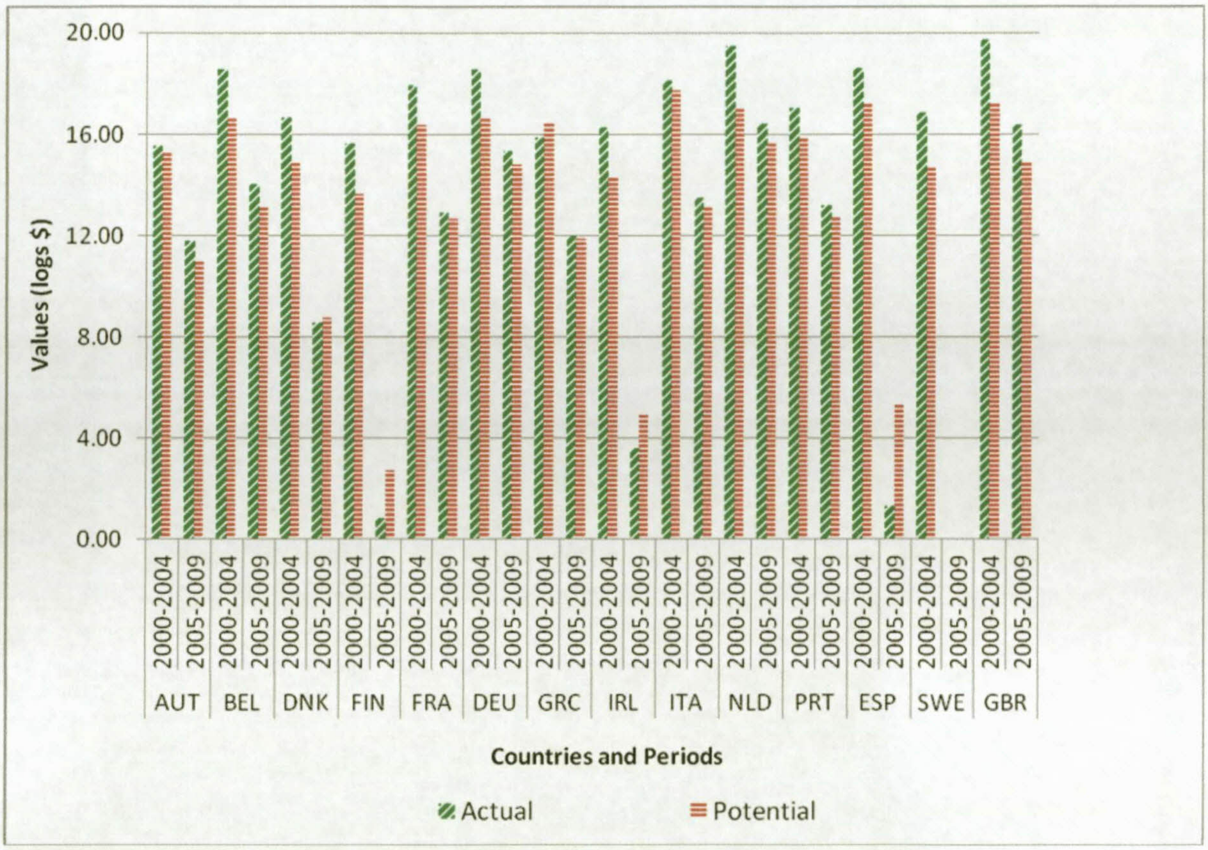

Figure 5.7: Average actual and potential value of cut flowers exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's cut flowers exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers exports in Austria, Belgium, Denmark, Finland, France, Germany, Italy, Ireland, the Netherlands, Portugal, Spain, Sweden and the United Kingdom; but had under-scored or underachieved in Greece over the period 2000–2004. During the period 2005–2009, South Africa's cut flowers exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers exports in Austria, Belgium, Germany, Greece, Italy, Ireland, the

Netherlands, Portugal, and the United Kingdom; whereas they under-scored or underachieved in Denmark and Finland.

5.5.3.2 Cut flowers imports from the EU countries to South Africa

The results show that the implementation of the EU-SA TDCA over both periods had no effects on the cut flowers imports from the EU countries to South Africa and that there was no proof of creation or diversion of South Africa's cut flowers imports from either the EU countries or South Africa's other cut flowers trading partners. The results for the average actual and potential cut flowers imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.8** in log values, and the dollar values are presented in **Appendix 5BN.**

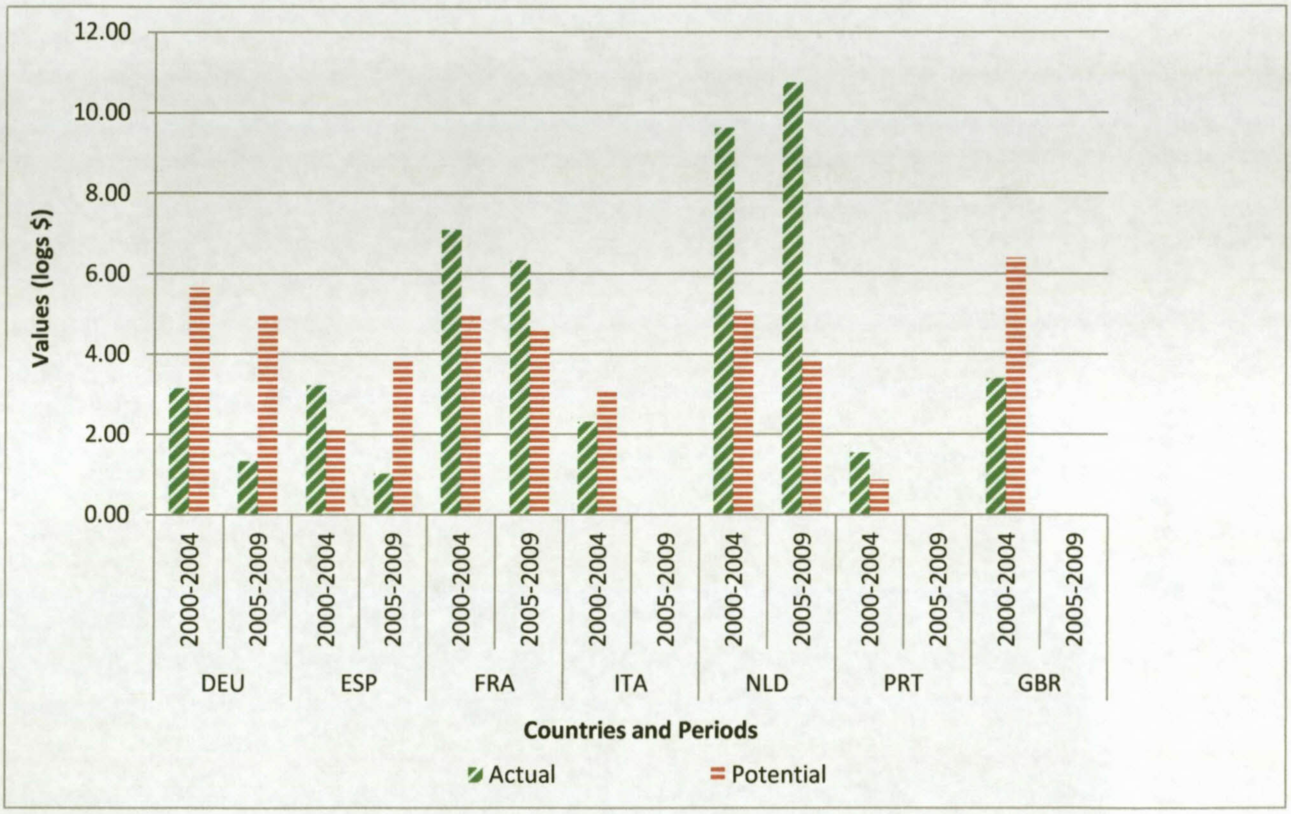

Figure 5.8: Average actual and potential value of cut flowers imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

The results show that South Africa's cut flowers importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers imports from France, Portugal, the Netherlands and Spain; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's cut flowers imports from Germany, Italy and the United Kingdom over the period 2000–2004. In contrast, over the period 2005–2009, South Africa's cut flowers importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers imports from France and the Netherlands; but under-scored or underachieved the estimated potential capacity for the absorption of South Africa's cut flowers imports from Germany and Spain.

5.5.3.3 Cut flowers trade (imports plus exports) between South Africa and the EU countries

The results show that total cut flowers trade between South Africa and the EU countries had significantly declined by 0.42% during the implementation of the EU-SA TDCA over the period 2000–2004 but on annual basis, a significant increase occurred in 2000 by 0.49%. In contrast, for the period 2005–2009, the implementation of the EU-SA TDCA had significantly increased the total cut flowers trade between South Africa and the EU countries by 1.05%. On annual basis, significant increases occurred in all years as follows: 1.22% in 2005, 0.99% in 2006, 1.12% in 2007, 1% in 2008 and 0.89% in 2009. The results show no proof of trade creation or diversion of cut flowers trade between South Africa and the EU countries to the other markets.

The results for the average actual and potential total cut flowers trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.9** in log values, and the dollar values are presented in **Appendix 5BQ**. The results show that South Africa's cut flowers traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total cut flowers trade in the South Africa-Italy, South Africa-Netherlands, South Africa-Portugal and South Africa-United Kingdom markets; but had under-scored or underachieved in the South Africa-France, South Africa-Germany and South Africa-Spain markets over the period 2000–2004.

Over the period 2005–2009, South Africa's cut flowers traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total cut flowers trade in the South Africa-

Germany, South Africa-Netherlands and South Africa-Spain markets, but had under-scored or underachieved in the South Africa-France market.

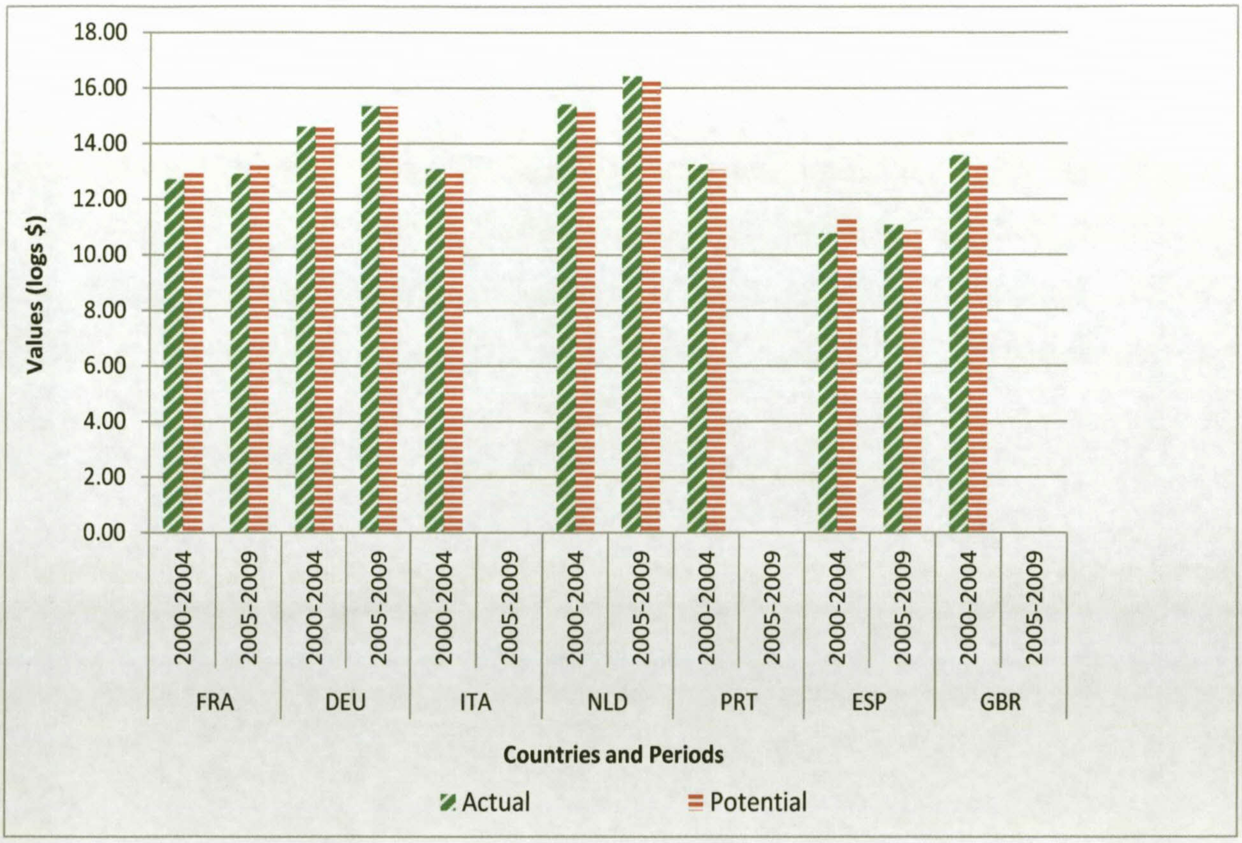

Figure 5.9: Average actual and potential value of cut flowers trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

5.5.4 Frozen fruits and nuts trade flows between South Africa and the EU countries

This sub-section provides the results of the impacts of the implementation of the EU-SA TDCA's non-reciprocal frozen fruits and nuts in-quota tariff preferences on South Africa's frozen fruits and nuts exports to the EU countries; South Africa's frozen fruits and nuts imports from the EU countries; as well as total frozen fruits and nuts trade (import plus exports) between South Africa and EU countries over the periods 2000–2004 and 2005–2009. The results are presented in Table 5.18.

Table 5.18: Results for frozen fruits and nuts trade flows between South Africa and the EU countries

Models	Variables	Exports 2000 - 2004	Exports 2005 - 2009	Imports 2000 - 2004	Imports 2005 - 2009	Trade 2000 - 2004	Trade 2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.28*	0.28*	0.25**	0.25**	-	-
	$\ln GDPPC_{it}$	-14.70	-14.70	16.68	16.68	-	-
	$\ln GDPPC_{it}$	20.32	20.32	10.82	10.82	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	1.46	1.46
	$REER_t$	1.64	1.64	5.12***	5.12***	1.06	1.06
	D0004 / D0509	-3.56***	0.24	1.47	-4.97	-1.07	0.32
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.55	0.55	0.25	0.25	0.40	0.40
	Observations	105	105	105	105	90	90
	Cross-Sections	7	7	7	7	6	6
Yearly Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.29*	0.29*	0.27*	0.27*	-	-
	$\ln GDPPC_{it}$	-21.98	-21.98	58.31	58.31	-	-
	$\ln GDPPC_{it}$	17.16	17.16	7.09	7.09	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	6.72	6.72
	$REER_t$	0.71	0.71	6.70**	6.70**	0.96	0.96
	D00 / D05	-10.55*	2.09	-0.07	-9.12	-0.93	0.70
	D01 / D06	-17.98*	1.68	2.45	-13.79***	0.23	-1.75
	D02 / D07	-26.85*	2.57	-0.05	-12.12	5.06	0.29
	D03 / D08	-18.31*	4.01	1.21	-15.59***	1.96	-0.39
	D04 / D09	-25.85*	0.58	-1.62	-15.20***	0.30	0.35
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.54	0.54	0.26	0.26	0.28	0.28
	Observations	105	105	105	105	90	90
	Cross-Sections	7	7	7	7	6	6
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.40*	0.40*	0.25*	0.25*	0.42*	0.42*
	$\ln GDPPC_{it}$	3.00	3.00	-2.79	-2.79	-	-
	$\ln GDPPC_{it}$	0.32	0.32	8.17*	8.17*	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	-8.84	-8.84
	$REER_t$	-1.86***	-1.86***	2.49	2.49	-2.28	-2.28
	PTA_{yes}	-0.77	-0.60	1.39	-0.41	-0.57	1.70
	PTA_{no}	0.22	0.77	0.41	-1.74	-0.48	0.29
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.57	0.57	0.35	0.35	0.47	0.47
	Observations	315	315	345	345	165	165
	Cross-Sections	21	21	23	23	11	11

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.4.1 Frozen fruits and nuts exports from South Africa to the EU countries

The results show that frozen fruits and nuts exports from South Africa to the EU countries had significantly declined by 3.26% during the implementation of the EU-SA TDCA over the period 2000–2004. On annual basis, significant decreases occurred in all years as follows: 10.55% in 2000, 17.98% in 2001, 26.85% in 2002, 18.31% in 2003 and 25.85% in 2004.

However, the implementation of the EU-SA TDCA over the period 2005–2009 had no effects on South Africa's frozen fruits and nuts exports to the EU countries. Furthermore, there was no proof of creation in South Africa's frozen fruits and nuts exports market in the EU countries or diversion of South Africa's frozen fruits and nuts exports destined for the EU market to other South African frozen fruits and nuts trading partners for both periods The results for the average actual and potential frozen fruits and nuts exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.10** in log values, and the dollar values are presented in **Appendix 5BT**.

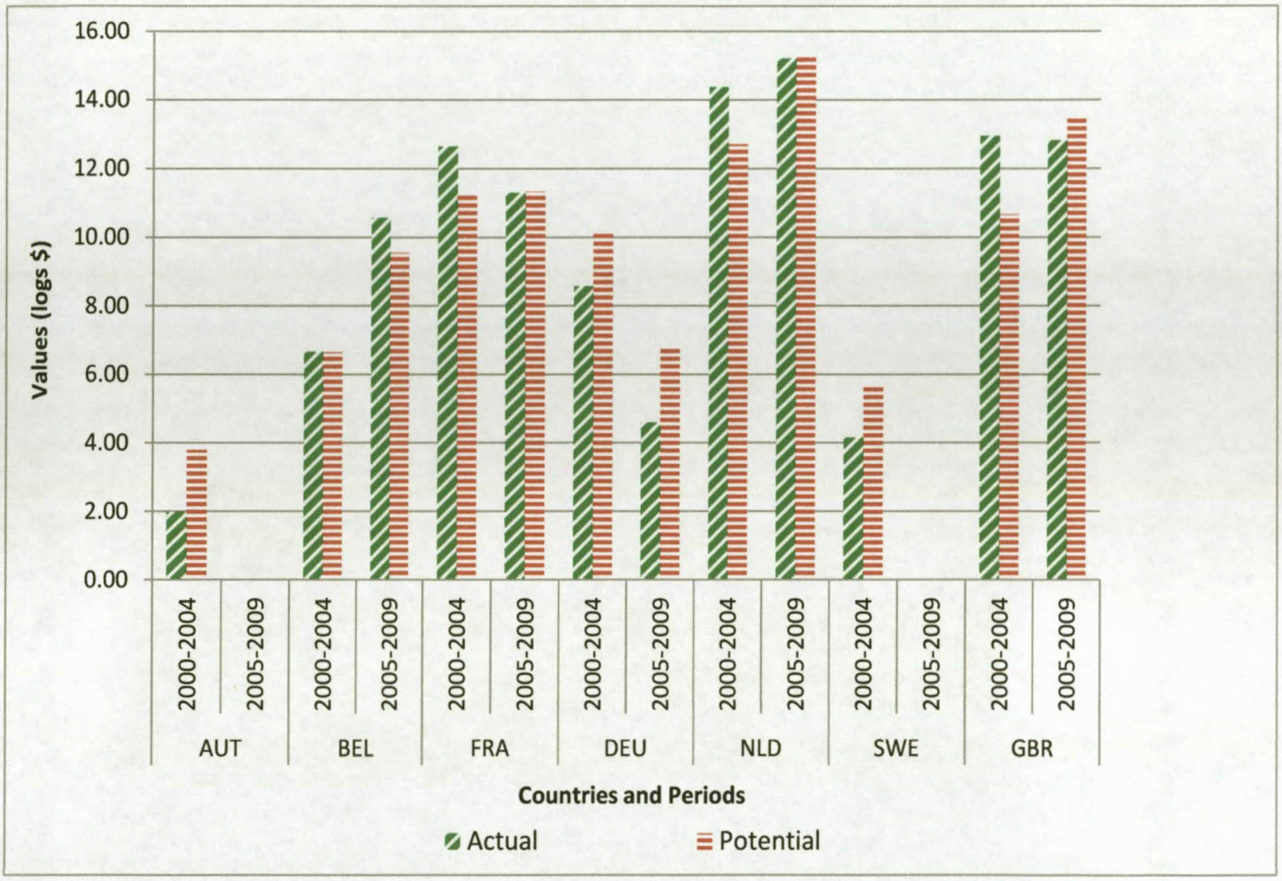

Figure 5.10: Average actual and potential value of frozen fruits and nuts exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's frozen fruits and nuts exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts exports in Belgium, France, the Netherlands and the United Kingdom; but had under-scored or underachieved in Austria, Germany and Sweden for the period 2000–2004. For the period 2005–2009, South Africa's frozen fruits and nuts exporters continued to outperform and exhaust the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts exports in Belgium; but they under-scored or underachieved in France, Germany, the Netherlands and the United Kingdom.

5.5.4.2 Frozen fruits and nuts imports from the EU countries to South Africa

The results show that the implementation of the EU-SA TDCA for both periods had no joint period effects on the frozen fruits and nuts imports from the EU countries to South Africa and also show no proof of creation or diversion of South Africa's frozen fruits and nuts imports from either the EU countries or South Africa's other frozen fruits and nuts trading partners. However, on an annual basis, negative effects of the implementation of the EU-SA TDCA on South Africa's frozen fruits and nuts imports from the EU countries were detected in 2006 (13.79%), 2008 (15.59%) and 2009 (15.2%).

The results for the average actual and potential frozen fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.11** in log values, and the dollar values are presented in **Appendix 5BW**. The results show that South Africa's frozen fruits and nuts importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts imports from Belgium, Denmark, Greece and the Netherlands; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts imports from France, Germany and the United Kingdom over the period 2000–2004.

In contrast, for the period 2005–2009, South Africa's frozen fruits and nuts importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts imports from Belgium and the Netherlands, but under-scored or underachieved the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts imports from Denmark, Germany, Greece and the United Kingdom.

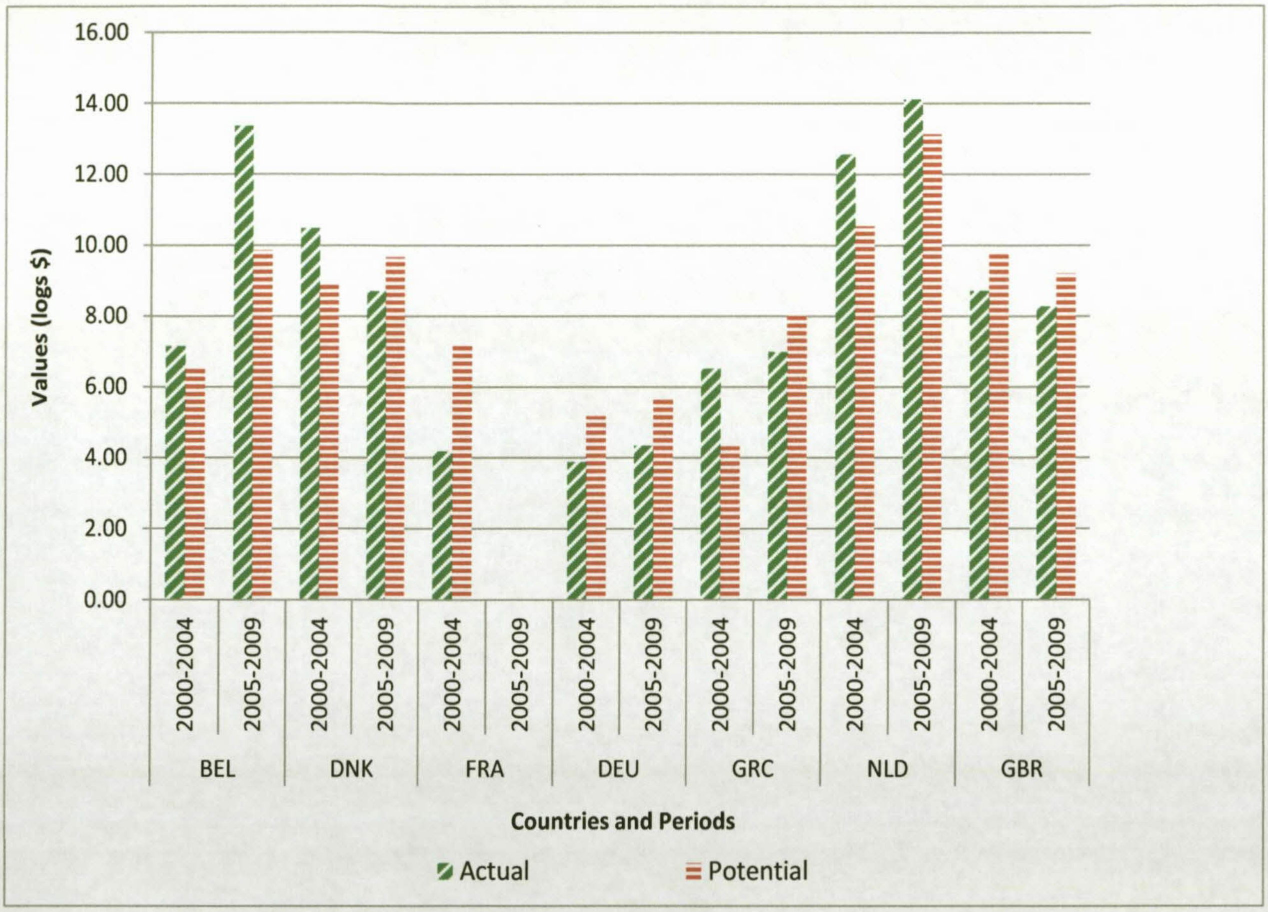

Figure 5.11: Average actual and potential value of frozen fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

5.5.4.3 Frozen fruits and nuts trade (imports plus exports) between South Africa and the EU countries

The results show that the implementation of the EU-SA TDCA had no effects on total frozen fruits and nuts trade between South Africa and the EU countries and also show no proof of trade creation or diversion during both periods. The results for the average actual and potential total frozen fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.12** in log values, and the dollar values are presented in **Appendix 5BZ**.

The results show that South Africa's frozen fruits and nuts traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total frozen fruits and nuts trade in the South Africa-France, South Africa-Netherlands and South Africa-United Kingdom markets; but had under-scored or underachieved in the South Africa-Austria, South Africa-Belgium and South Africa-Germany markets over the period 2000–2004. Over the period 2005–2009, South Africa's frozen fruits and nuts traders (importers and exporters) outperformed and exhausted the estimated potential capacity for the absorption of total frozen fruits and nuts trade in the South Africa-Belgium and South Africa-Netherlands markets; whereas they under-scored or underachieved in the South Africa-Germany and South Africa-United Kingdom markets.

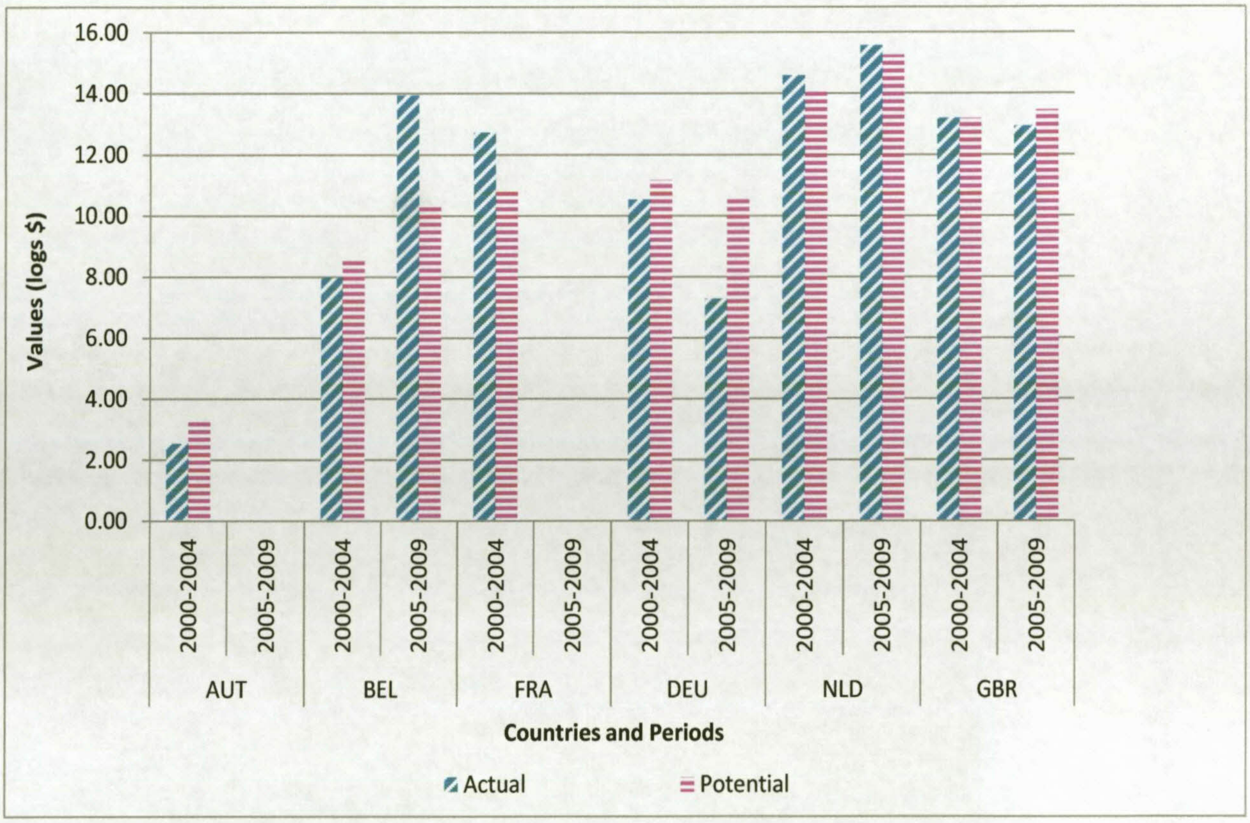

Figure 5.12: Average actual and potential value of frozen fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

5.5.5 Preserved fruits and nuts trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA's non-reciprocal preserved fruits and nuts in-quota tariff preferences on South Africa's preserved fruits and nuts exports to the EU countries; South Africa's preserved fruits and nuts imports from the EU countries; as well as total preserved fruits and nuts trade (import plus exports) between South Africa and EU countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.19 below.

Table 5.19: Results for preserved fruits and nuts trade flows between South Africa and the EU countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.18**	0.18**	0.15**	0.15**	0.39*	0.39*
	$\ln GDPPC_{it}$	0.76	0.76	4.17	4.17	-	-
	$\ln GDPPC_{jt}$	-0.54	-0.54	0.57	0.57	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	-1.74***	-1.74***
	$REER_t$	1.09**	1.09**	0.06	0.06	-0.40	-0.40
	D0004 / D0509	-0.04	0.34	-0.91	0.97	-0.17	0.72*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.68	0.68	0.61	0.61	0.88	0.88
	Observations	225	225	135	135	135	135
	Cross-Sections	15	15	9	9	9	9
Yearly Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.17**	0.17**	0.15**	0.15**	0.42*	0.42*
	$\ln GDPPC_{it}$	10.92***	10.92***	4.32	4.32	-	-
	$\ln GDPPC_{jt}$	-1.37	-1.37	0.16	0.16	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	-1.76***	-1.76***
	$REER_t$	1.49**	1.49**	-0.05	-0.05	-0.43	-0.43
	D00 / D05	-0.50	-0.81	-0.47	0.93	-0.33**	0.91*
	D01 / D06	-0.56	-1.48	-2.51***	1.09	-0.10	0.55**
	D02 / D07	-1.53	-1.79	-5.26**	1.32	0.24	0.75*
	D03 / D08	0.26	-2.08	-2.49	0.81	0.44**	0.71*
	D04 / D09	-0.68	-2.18	-2.55	0.85	0.32	0.59*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.68	0.68	0.60	0.60	0.88	0.88
	Observations	225	225	135	135	135	135
	Cross-Sections	15	15	9	9	9	9
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.46*	0.46*	0.35*	0.35*	0.18*	0.18*
	$\ln GDPPC_{it}$	-4.66	-4.66	7.47	7.47	-	-
	$\ln GDPPC_{jt}$	0.83	0.83	3.07***	3.07***	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	1.10	1.10
	$REER_t$	-0.63	-0.63	-0.45	-0.45	-0.08	-0.08
	PTA_{yes}	-1.21**	1.11	-0.37	-0.51	-0.23	0.43***
	PTA_{no}	-0.21	0.82	0.69	-0.20	0.59**	0.85*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.68	0.68	0.57	0.57	0.81	0.81
	Observations	1275	1275	570	570	480	480
	Cross-Sections	85	85	38	38	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.5.1 Preserved fruits and nuts exports from South Africa to the EU countries

The results show that the implementation of the EU-SA TDCA had no effects on preserved fruits and nuts exports from South Africa to the EU countries and also show no proof of trade creation or diversion. The results for the average actual and potential preserved fruits and nuts exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.13** in log values, and the dollar values are presented in **Appendix 5CC**. The results show that South Africa's preserved fruits and nuts exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts exports in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal and the United Kingdom; but had under-scored or underachieved in Ireland, Spain and Sweden over the period 2000–2004.

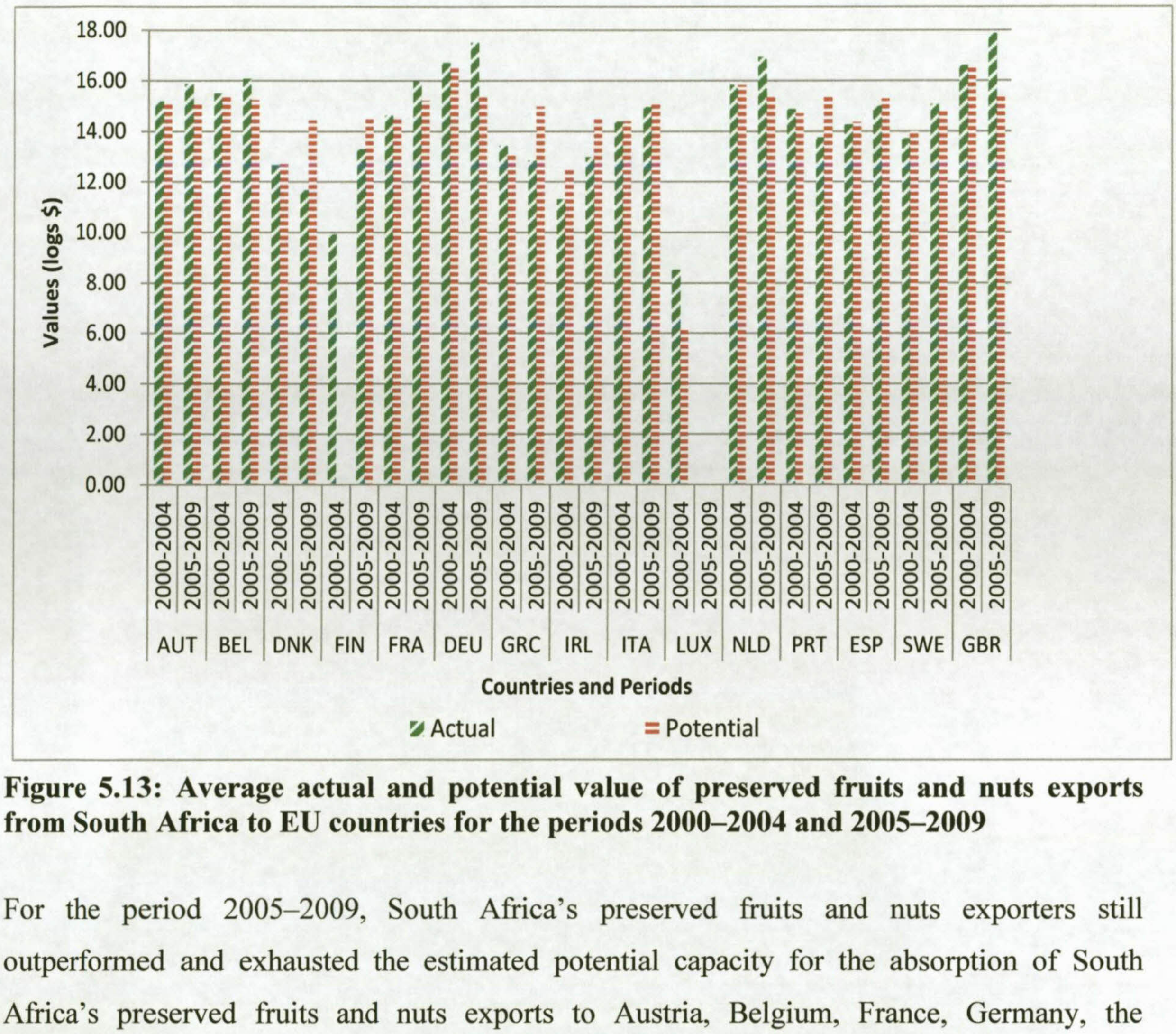

Figure 5.13: Average actual and potential value of preserved fruits and nuts exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009

For the period 2005–2009, South Africa's preserved fruits and nuts exporters still outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts exports to Austria, Belgium, France, Germany, the Netherlands, Sweden and the United Kingdom; whereas they under-scored or underachieved in Denmark, Finland, Greece, Italy, Ireland, Portugal and Spain.

5.5.5.2 Preserved fruits and nuts imports from the EU countries to South Africa

The results show that the implementation of the EU-SA TDCA over both periods had no joint effects on the preserved fruits and nuts imports from the EU countries to South Africa.

However, on an annual basis, there were significant declines in South Africa's preserved fruits and nuts imports from the EU countries by 2.51% and 5.26% in 2001 and 2002 respectively. The results have also shown no proof of creation or diversion of South Africa's preserved fruits and nuts imports from either the EU countries or South Africa's other preserved fruits and nuts trading partners during the implementation of the EU-SA TDCA for both periods. The results of the average actual and potential preserved fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.14** in log values, and the dollar values are presented in **Appendix 5CF**.

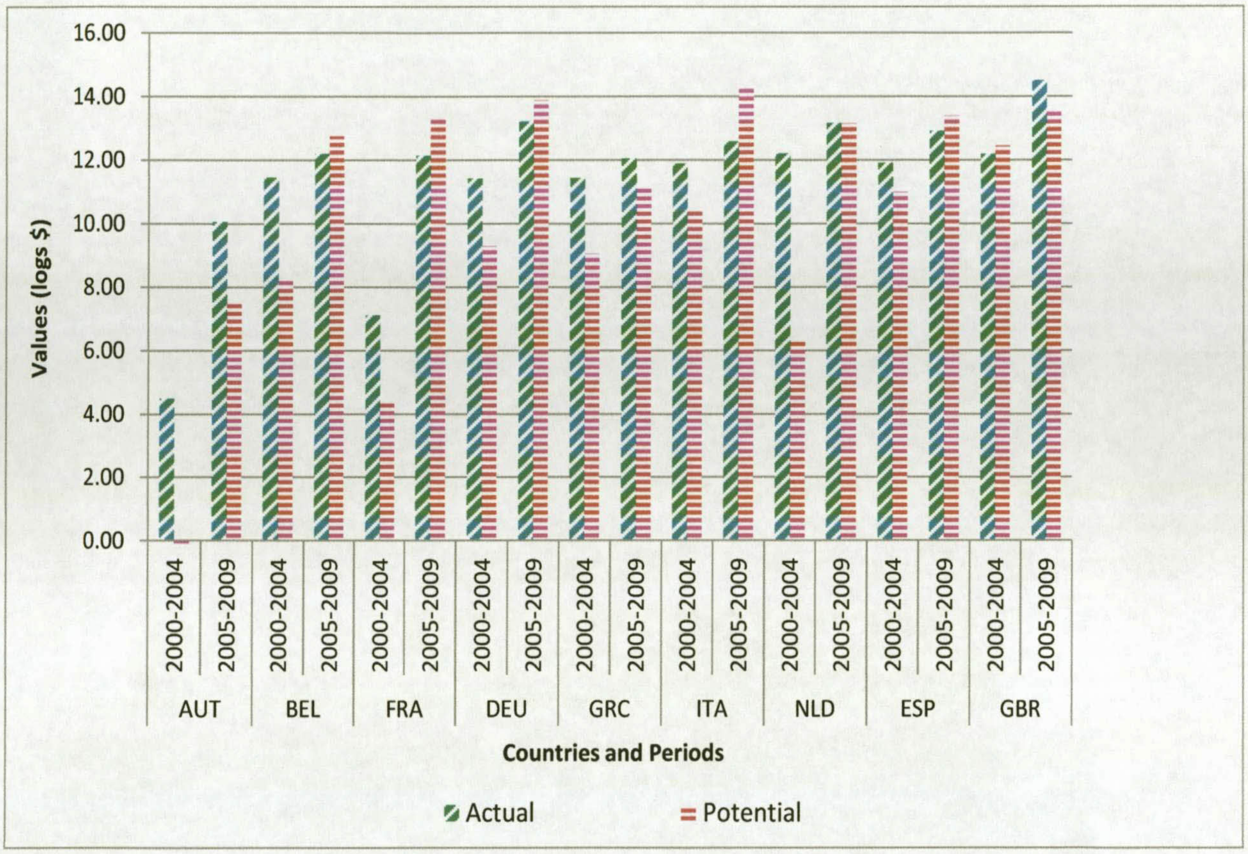

Figure 5.14: Average actual and potential value of preserved fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

The results show that South Africa's preserved fruits and nuts importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts imports from Austria, Belgium, France, Germany, Greece, Italy, the Netherlands and Spain; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts imports from the United Kingdom for the period 2000–2004. In contrast, over the period 2005–2009, South

Africa's preserved fruits and nuts importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts imports from Austria, Greece, the Netherlands and the United Kingdom; but under-scored or underachieved the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts imports from Belgium, France, Germany, Italy and Spain.

5.5.5.3 Preserved fruits and nuts trade (imports plus exports) between South Africa and the EU countries

The results show that the total preserved fruits and nuts trade between South Africa and the EU countries had significantly improved by 0.72% during the implementation of the EU-SA TDCA over the period 2005–2009. On an annual basis, significant increases occurred in all years as follows: 0.91% in 2005, 0.55% in 2006, 0.75% in 2007, 0.71% in 2008 and 0.59% in 2009. Surprisingly, while the joint period effect of the implementation of the EU-SA TDCA on total preserved fruits and nuts trade between South Africa and the EU countries was insignificant for the period 2000–2004, the individual yearly significant negative and positive effects were observed in 2000 and 2003 respectively. In 2000, the total preserved fruits and nuts trade between South Africa and the EU countries significantly declined by 0.33%, but increased by 0.44% in 2003. Furthermore, on average, the implementation of the EU-SA TDCA led to the creation of 0.43% in the total preserved fruits and nuts trade between South Africa and the EU countries over the period 2005–2009. However, there was no proof of creation or diversion of total preserved fruits and nuts trade between South Africa and the EU countries to other preserved fruits and nuts trading partners of South Africa or EU countries during the period 2000–2004.

The results for the average actual and potential total preserved fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.15** in log values, and the dollar values are presented in **Appendix 5CI**. The results show that South Africa's preserved fruits and nuts traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total preserved fruits and nuts trade in the South Africa-Belgium, South Africa-France and South Africa-Greece markets; but had under-scored or underachieved in the South Africa-Austria, South Africa-Germany, South Africa-Italy, South Africa-Netherlands, South Africa-Spain and South Africa-United Kingdom markets over the period 2000–2004. During the period 2005–2009, South Africa's preserved fruits and nuts traders (importers and exporters) outperformed and exhausted the estimated potential capacity for the absorption of total preserved fruits and nuts trade in the South Africa-France, South Africa-Germany, South Africa-Netherlands and South Africa-United Kingdom markets; whereas they under-scored or underachieved in the South Africa-Austria, South Africa-Belgium, South Africa-Greece, South Africa-Italy and South Africa-Spain markets. However, the differences between the actual and the potential values were small.

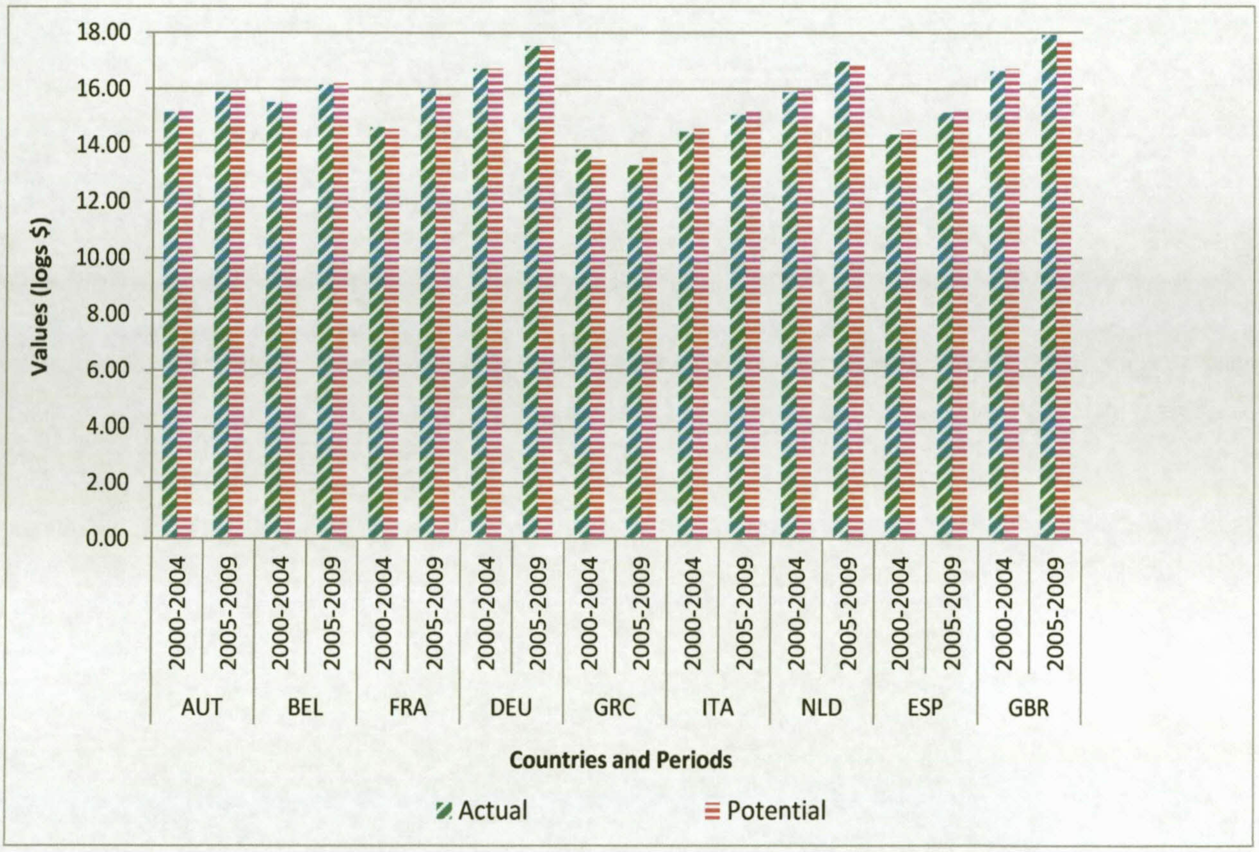

Figure 5.15: Average actual and potential value of preserved fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

5.5.6 Fruits and vegetable juices trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA's non-reciprocal fruits and vegetable juices in-quota tariff preferences on South Africa's fruits and vegetable juices exports to the EU countries; South Africa's fruits and vegetable juices imports from the EU countries; as well as total fruits and vegetable juices trade (import plus exports) between South Africa and EU countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.20 below.

Table 5.20: Results for fruits and vegetable juices trade flows between South Africa and the EU countries

Models	Variables	Exports 2000-2004	Exports 2005-2009	Imports 2000-2004	Imports 2005-2009	Trade 2000-2004	Trade 2005-2009
Period Impact Model	Constant	-	-	-	-	-	-
	lnY_{iit-1}	0.11***	0.11***	0.36*	0.36*	0.17**	0.17**
	$lnGDPPC_{it}$	16.92**	16.92**	9.11	9.11	-	-
	$lnGDPPC_{jt}$	1.53	1.53	5.74	5.74	-	-
	$lnGDPPC_{ijt}$	-	-	-	-	4.55	4.55
	$REER_t$	1.10	1.10	1.74	1.74	0.45	0.45
	D0004 / D0509	-0.97	-2.55	-1.25	-1.81	-0.29	-0.10
	$lnDIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.70	0.70	0.63	0.63	0.56	0.56
	Observations	210	210	195	195	195	195
	Cross-Sections	14	14	13	13	13	13
Yearly Impact Model	Constant	-	-	-	-	-	-
	lnY_{iit-1}	0.11***	0.11***	0.36*	0.36*	0.16**	0.16**
	$lnGDPPC_{it}$	16.94	16.94	-0.59	-0.59	-	-
	$lnGDPPC_{jt}$	0.96	0.96	5.88	5.88	-	-
	$lnGDPPC_{ijt}$	-	-	-	-	4.05	4.05
	$REER_t$	0.93	0.93	1.22	1.22	0.61	0.61
	D00 / D05	0.07	-2.41	-1.42	-0.48	-0.31	-1.37***
	D01 / D06	0.48	-2.55	-0.28	0.06	-0.09	0.25
	D02 / D07	1.66	-2.01	-0.55	0.52	0.17	0.10
	D03 / D08	2.41	-2.52	-1.30	1.05	0.25	0.90
	D04 / D09	1.60	-2.84	-1.05	-0.05	-0.22	0.08
	$lnDIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.69	0.69	0.63	0.63	0.58	0.58
	Observations	210	210	195	195	195	195
	Cross-Sections	14	14	13	13	13	13
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	lnY_{iit-1}	0.27*	0.27*	0.24*	0.24*	0.20*	0.20*
	$lnGDPPC_{it}$	8.29**	8.29**	13.86**	13.86**	-	-
	$lnGDPPC_{jt}$	2.17*	2.17*	1.32	1.32	-	-
	$lnGDPPC_{ijt}$	-	-	-	-	4.29*	4.29*
	$REER_t$	-0.33	-0.33	-0.39	-0.39	-0.09	-0.09
	PTA_{yes}	-0.44	-1.04	-1.60***	-1.90	-0.23	-0.08
	PTA_{no}	0.45	-0.44	-0.39	-0.49	0.67**	0.75*
	$lnDIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.65	0.65	0.62	0.62	0.68	0.68
	Observations	1290	1290	645	645	630	630
	Cross-Sections	86	86	43	43	42	42

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.6.1 Fruits and vegetable juices exports from South Africa to the EU countries

The results show that the implementation of the EU-SA TDCA for both periods had no effects on South Africa's fruits and vegetable juices exports to the EU countries. Furthermore, the results show no proof of creation in South Africa's fruits and vegetable juices exports market in the EU countries or diversion of South Africa's fruits and vegetable juices exports destined for the EU market to other South African fruits and vegetable juices trading partners for both periods. The results for the average actual and potential fruits and vegetable juices exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.16** in log values, and the dollar values are presented in **Appendix 5CL**.

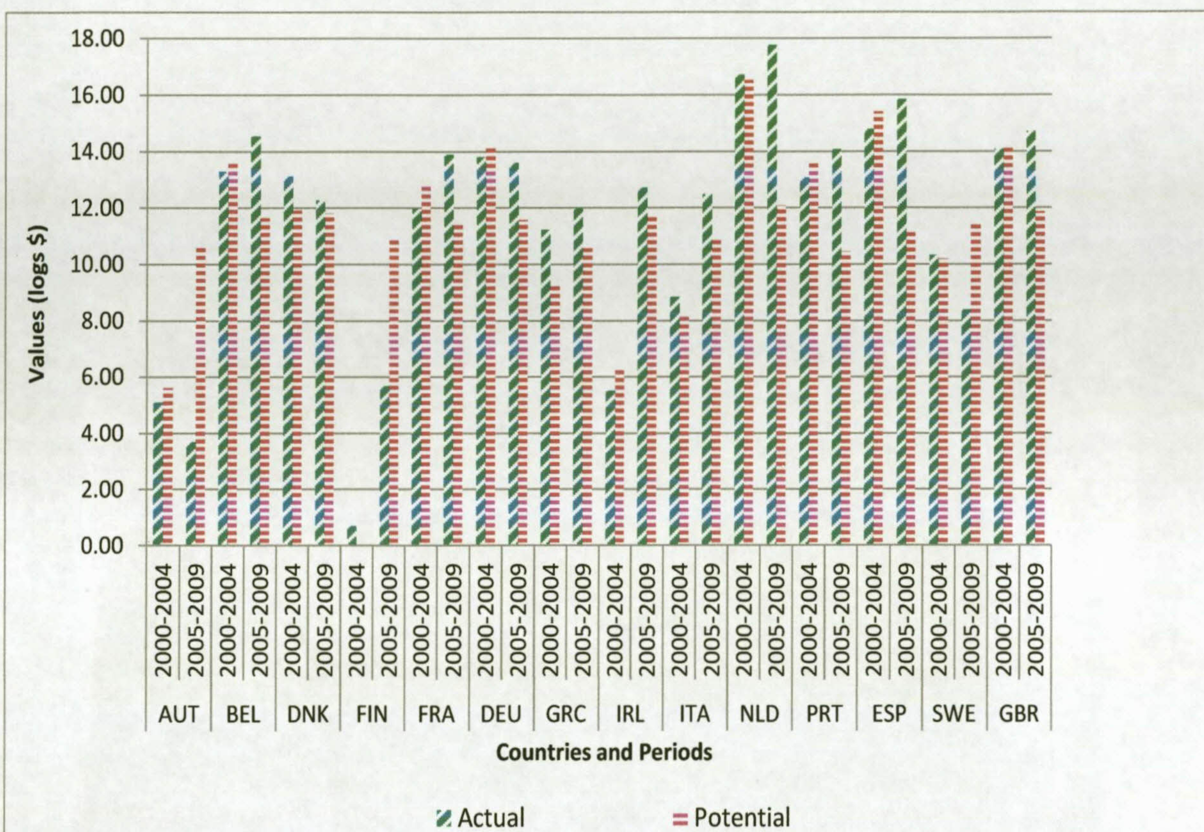

Figure 5.16: Average actual and potential value of fruits and vegetable juices exports from South Africa to EU countries for the period 2000 to 2004

The results show that South African fruits and vegetable juices exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices exports in Denmark, Finland, Greece, Italy, the Netherlands and Sweden; but had under-scored or underachieved in Austria, Belgium, France, Germany, Ireland, Portugal, Spain and the United Kingdom over the period 2000–2004. For the period 2005–2009, South Africa's fruits and vegetable juices exporters continued to outperform and exhaust the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices exports in Belgium, Denmark, France, Germany, Italy, Ireland, the Netherlands, Portugal, Spain and the United Kingdom; whereas they under-scored or underachieved in Austria, Finland and Sweden.

5.5.6.2 Fruits and vegetable juices imports from the EU countries to South Africa

The results also show that the implementation of the EU-SA TDCA over both periods had no effects on the fruits and vegetable juices imports from the EU countries to South Africa. Furthermore, the results show no proof of creation in South Africa's fruits and vegetable juices import market from the EU countries or diversion of South Africa's fruits and vegetable juices import market from the EU countries to other South African fruits and vegetable juices trading partners.

The results for the average actual and potential fruits and vegetable juices imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.17** in log values, and the dollar values are presented in **Appendix 5CO**. The results show that South Africa's fruits and vegetable juices importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Austria, Belgium, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Sweden and the United Kingdom; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Denmark, France and Spain over the period 2000–2004.

For the period 2005–2009, South Africa's fruits and vegetable juices importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Belgium, France, Ireland, Italy, Portugal, Sweden and Spain; but under-scored or underachieved the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Austria, Denmark, Germany, Greece, the Netherlands and the United Kingdom.

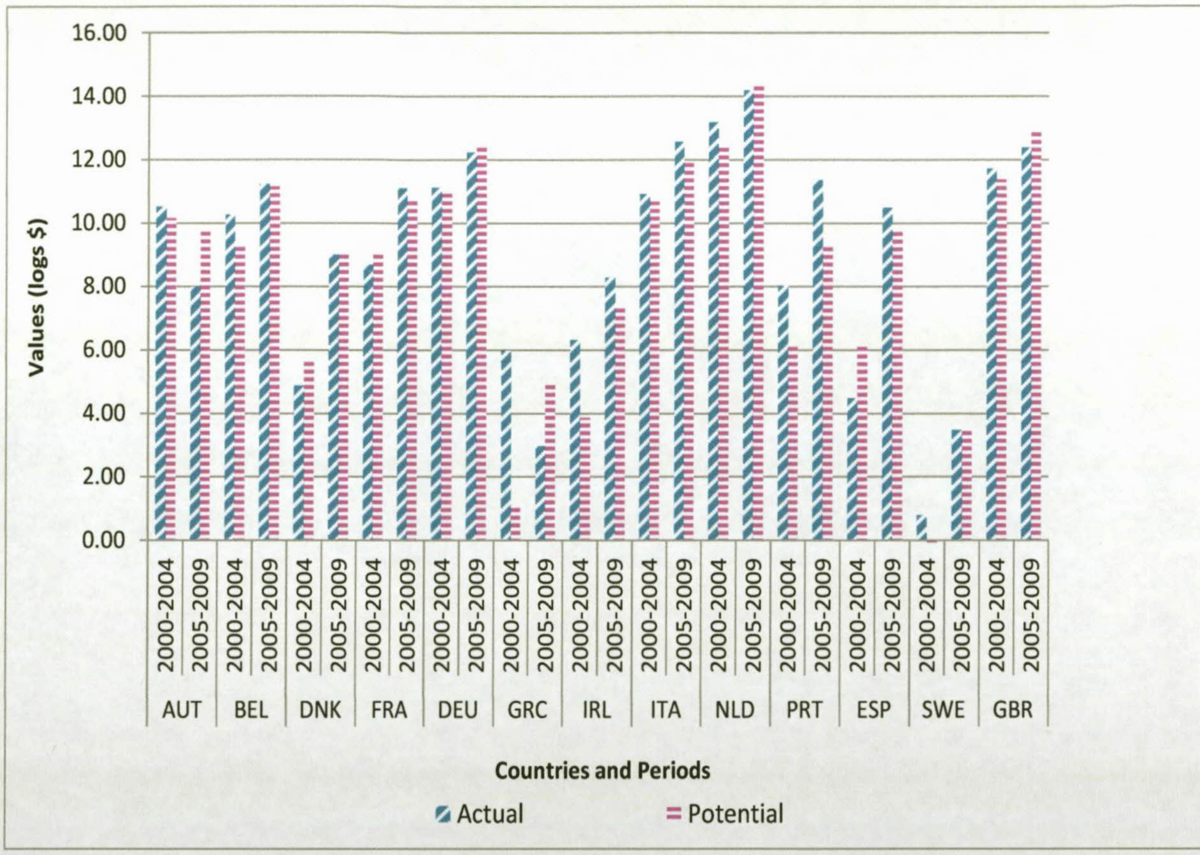

Figure 5.17: Average actual and potential value of fruits and vegetable juices imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

5.5.6.3 Fruits and vegetable juices trade (imports plus exports) between South Africa and the EU countries

The results show that the implementation of the EU-SA TDCA over both periods had no joint effects on the total fruits and vegetable juices trade between South Africa and the EU countries, but there was a significant decline of 1.37% which occurred in 2000. However, there was no proof of creation or diversion of total fruits and vegetable juices trade between South Africa and the EU countries to other fruits and vegetable juices trading partners of South Africa or EU countries.

The results for the average actual and potential total fruits and vegetable juices trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.18** in log values, and the dollar values are presented in **Appendix 5CR**. The results show that South Africa's fruits and vegetable juices traders (importers and exporters) operating between South Africa and EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total fruits and vegetable juices trade in the

South Africa-Denmark, South Africa-Greece, South Africa-Italy and South Africa-Netherlands markets; but had under-scored or underachieved in the South Africa-Austria, South Africa-Belgium, South Africa-France, South Africa-Germany, South Africa-Ireland, South Africa-Portugal, South Africa-Spain, South Africa-Sweden and South Africa-United Kingdom markets over the period 2000–2004.

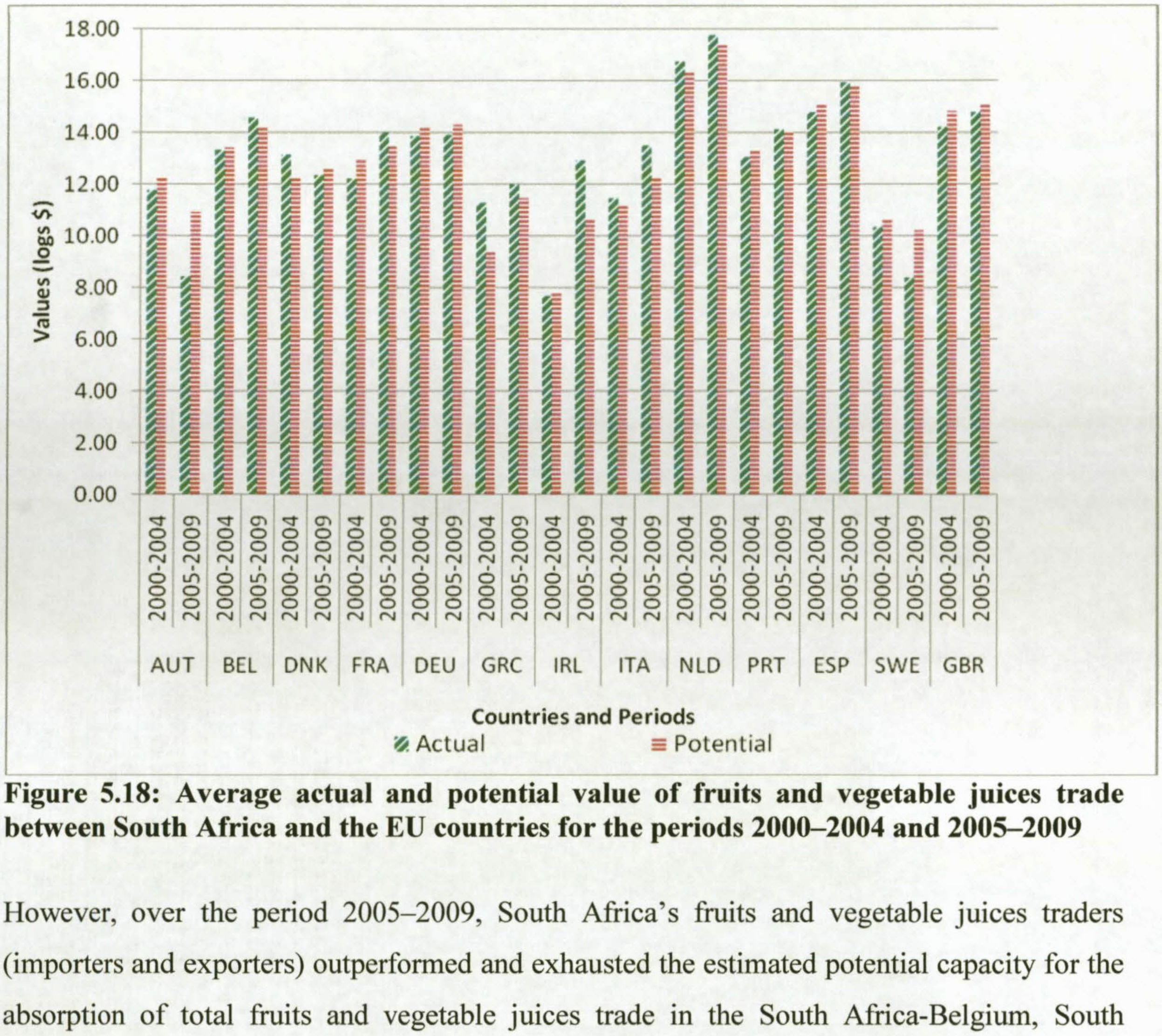

Figure 5.18: Average actual and potential value of fruits and vegetable juices trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

However, over the period 2005–2009, South Africa's fruits and vegetable juices traders (importers and exporters) outperformed and exhausted the estimated potential capacity for the absorption of total fruits and vegetable juices trade in the South Africa-Belgium, South Africa-France, South Africa-Greece, South Africa-Ireland, South Africa-Italy, South Africa-Netherlands, South Africa-Portugal and South Africa-Spain markets; whereas they under-scored or underachieved in the South Africa-Austria, South Africa-Denmark, South Africa-Germany, South Africa-Sweden and South Africa-United Kingdom markets.

5.5.7 Wine trade flows between South Africa and the EU countries

This subsection provides the results of the impacts of the implementation of the EU-SA TDCA's reciprocal wine in-quota tariff preferences on South Africa's wine exports to the EU countries; South Africa's wine imports from the EU countries; as well as total wine trade (import plus exports) between South Africa and EU countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.21.

Table 5.21: Results for wine between South Africa and the EU countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.37*	0.37*	-	-	0.62*	0.62*
	$\ln GDPPC_{it}$	3.72***	3.72***	-2.04	-2.04	-	-
	$\ln GDPPC_{it}$	3.80*	3.80*	6.17*	6.17*	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	3.13*	3.13*
	$REER_t$	0.01	0.01	1.11	1.11	0.31	0.31
	D0004 / D0509	-0.44**	0.02	-1.69*	0.84	0.07	0.24
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.95	0.95	0.81	0.81	0.96	0.96
	Observations	225	225	240	240	225	225
	Cross-Sections	15	15	15	15	15	15
Yearly Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.34*	0.34*	-	-	0.64*	0.64*
	$\ln GDPPC_{it}$	12.96*	12.96*	8.90	8.90	-	-
	$\ln GDPPC_{it}$	3.85*	3.85*	5.27**	5.27**	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	3.41*	3.41*
	$REER_t$	0.54	0.54	1.56	1.56	0.38	0.38
	D00 / D05	-0.50	-1.05***	-1.80**	-0.19	-0.06	0.46**
	D01 / D06	-0.58	-1.99**	-3.30*	-1.54	-0.09	-0.12
	D02 / D07	-0.78	-2.22**	-3.92**	-1.06	-0.02	0.11
	D03 / D08	-0.16	-2.43**	-2.04	-1.85	0.28	0.06
	D04 / D09	-0.45	-1.73***	-1.96	-1.97	0.31	0.32
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.95	0.95	0.81	0.81	0.96	0.96
	Observations	225	225	240	240	225	225
	Cross-Sections	15	15	15	15	15	15
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{iit-1}$	0.30*	0.30*	0.13*	0.13*	0.50*	0.50*
	$\ln GDPPC_{it}$	3.58	3.58	4.40	4.40	-	-
	$\ln GDPPC_{it}$	0.32	0.32	1.62**	1.62**	-	-
	$\ln GDPPC_{iit}$	-	-	-	-	3.95*	3.95*
	$REER_t$	-1.19*	-1.19*	1.95*	1.95*	0.39***	0.39***
	PTA_{yes}	-0.67	0.79	-0.69	0.06	-0.24	0.33***
	PTA_{no}	-0.77**	1.04***	-2.01*	-0.81	-0.51***	0.34***
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.74	0.74	0.75	0.75	0.87	0.87
	Observations	1530	1530	675	675	660	660
	Cross-Sections	102	102	45	45	44	44

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.5.7.1 Wine exports from South Africa to the EU countries

The results show that wine exports from South Africa to the EU countries had significantly declined by 0.44% during the implementation of the EU-SA TDCA for the period 2000–2004. Surprisingly, the joint period effect of the implementation of the EU-SA TDCA on South Africa's wine exports to the EU countries was insignificant for the period 2005–2009, but the individual yearly significant negative effects were observed in all years as wine exports from South Africa to the EU countries had significantly declined by 1.05%, 1.99%, 2.22%, 2.43% and 1.73% respectively during these years. On average, 0.77% of the South Africa's wine exports destined for the EU market were diverted to other wine trading partners of South Africa over the period 2000–2004. However, there was no proof of creation of South Africa's wine exports market in the EU countries or diversion of South Africa's wine exports destined for the EU countries to other of South Africa's wine trading partners.

The results for the average actual and potential wine exports from South Africa to the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.19** in log values, and the dollar values are presented in **Appendix 5CU**. The results show that South Africa's wine exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine exports in Austria, Denmark, Finland, Germany, Luxembourg, the Netherlands and Portugal; but had underscored or underachieved in Belgium, France, Greece, Italy, Ireland, Spain and Sweden and the United Kingdom for the period 2000–2004. For the period 2005–2009, South Africa's wine exporters still outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine exports in Denmark, Germany, Greece, Italy, Luxembourg, Spain and Sweden; whereas they under-scored or underachieved in Austria, Belgium, Finland, France, Ireland, the Netherlands, Portugal and the United Kingdom.

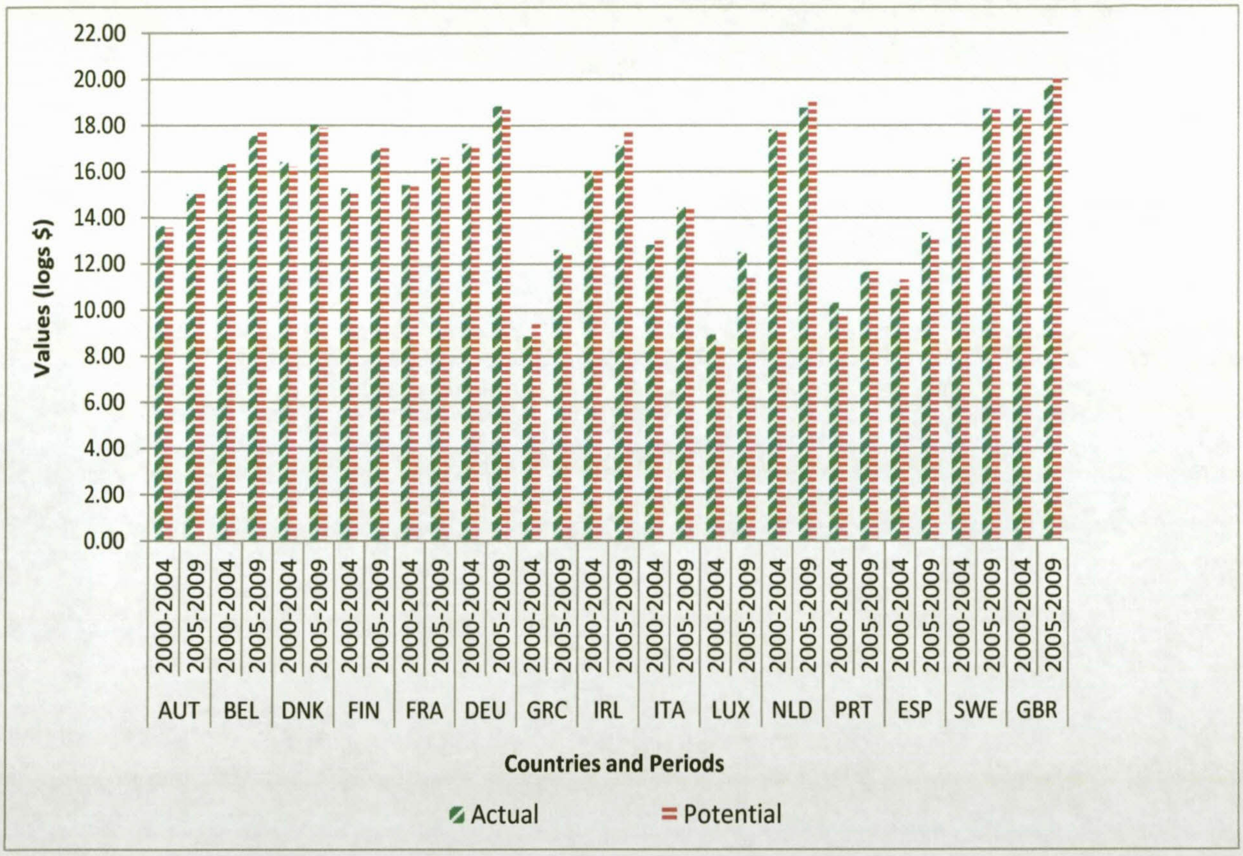

Figure 5.19: Average actual and potential value of wine exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009

5.5.7.2 Wine imports from the EU countries to South Africa

The final results for South Africa's wine imports from the EU countries are presented in Table 5.29 below. The results show that South Africa's wine imports from the EU countries had significantly declined by 1.69% during the implementation of the EU-SA TDCA over period 2000–2004. On an annual basis, these decreases occurred in 2000, 2001 and 2002 by 1.8%, 3.3% and 3.92% respectively. Furthermore, the implementation of the EU-SA TDCA over the period 2000–2004 led to a diversion of South Africa's wine imports, which were ordinarily sourced from the EU countries, by 2.01%. However, the implementation of the EU-SA TDCA over period 2005–2009 had no effects on South Africa's wine imports from the EU countries and there was no proof of creation in South Africa's wine import market from the EU countries or diversion of South Africa's wine import market from the EU countries to other South African wine trading partners.

The results for the average actual and potential wine imports from the EU countries to South Africa over the periods 2000–2004 and 2005–2009 are presented in **Figure 5.20** in log values, and the dollar values are presented in **Appendix 5CX**.

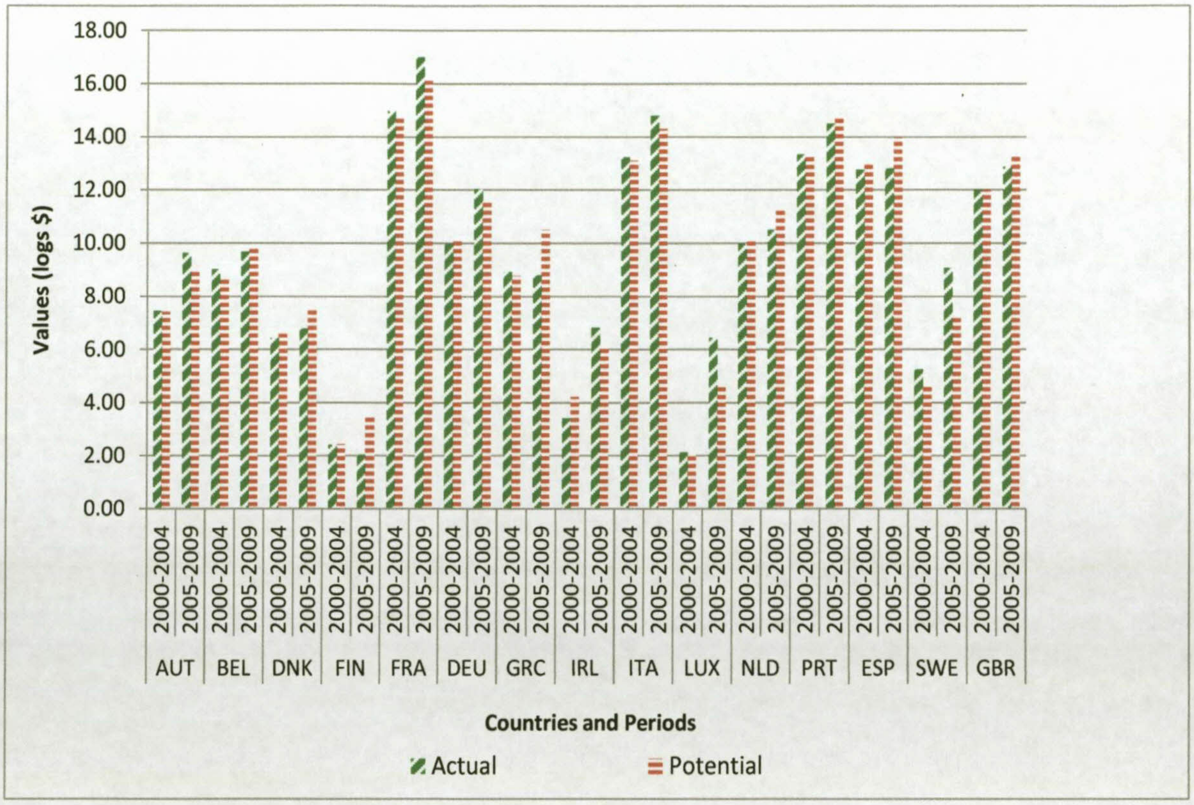

Figure 5.20: Average actual and potential value of wine imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009

The results show that South Africa's wine importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine imports from Austria, Belgium, France, Greece, Italy and Sweden; but had under-scored or underachieved the estimated potential capacity for the absorption of South Africa's wine imports from Denmark, Finland, Germany, Ireland, the Netherlands, Portugal and Spain over the period 2000–2004. However, the actual and potential of South Africa's wine imports from Luxembourg and the United Kingdom were close to equal.

In contrast, during the period 2005–2009, South Africa's wine importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine imports from Austria, France, Germany, Italy, Ireland, Luxembourg and Sweden; but under-scored or underachieved the estimated potential capacity for the absorption of South Africa's wine imports from Belgium, Denmark, Finland, Greece, the Netherlands, Portugal, Spain and the United Kingdom.

5.5.7.3 Wine trade (imports plus exports) between South Africa and the EU countries

The results show that the implementation of the EU-SA TDCA for both periods had no joint effects on the total wine trade between South Africa and the EU countries, but there was a significant decline of 0.46% that occurred in 2005. The implementation of the EU-SA TDCA during the period 2000–2004 led to a diversion of 0.51% of the total wine trade between South Africa and the EU countries to either South Africa and its other wine trading partners or to EU countries and their other wine trading partners. However, the implementation of the EU-SA TDCA led to the creation of 0.93% of total wine trade between South Africa and the EU countries over the period 2005–2009.The results for the average actual and potential total wine trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.21** in log values, and the dollar values are presented in **Appendix 5DA**.

The results show that South Africa's wine traders (importers and exporters) operating between South Africa and the EU countries had outperformed and exhausted the estimated potential capacity for the absorption of total wine trade in the South Africa-Austria, South Africa-Belgium, South Africa-Denmark, South Africa-Finland, South Africa-Germany, South Africa-Luxembourg, South Africa-Netherlands and South Africa-United Kingdom markets; but had under-scored or underachieved in the South Africa-France, South Africa-Greece, South Africa-Ireland, South Africa-Italy, South Africa-Portugal and South Africa-Spain markets over the period 2000–2004. However, the actual and potential total wine trade between South Africa and Sweden was closer to equal. Over the period 2005–2009, South Africa's wine traders (importers and exporters) outperformed and exhausted the estimated potential capacity for the absorption of total wine trade in the South Africa-Austria, South Africa-Denmark, South Africa-France, South Africa-Germany, South Africa-Italy, South Africa-Luxembourg and South Africa-Sweden markets; whereas they under-scored or underachieved in the South Africa-Belgium, South Africa-Finland, South Africa-Greece, South Africa-Ireland, South Africa-Netherlands, South Africa-Portugal, South Africa-Spain and South Africa-United Kingdom markets.

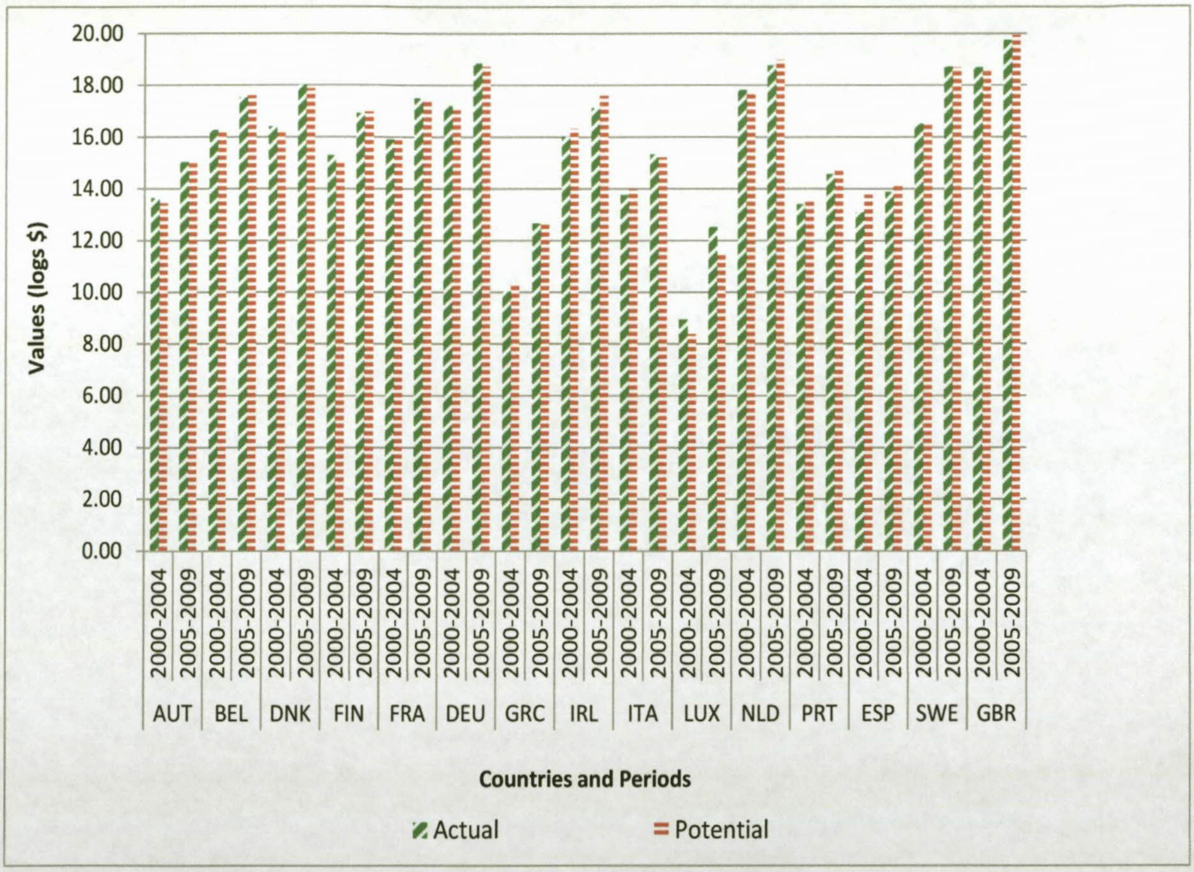

Figure 5.21: Average actual and potential value of wine trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009

5.6 The impacts of the implementation of SADC Trade Protocol (TP) on selected agricultural trade flows between South Africa and the SADC countries

This section discusses the impacts of the SADC Trade Protocol regional trade agreement on the total agricultural trade flows and the selected agricultural products trade flows between South Africa and the SADC countries for the periods 2000-2004 and 2005-2009. The selected agricultural products include cheese and curd (HS0406), cut flowers (HS0603), frozen fruits and nuts (HS0811), preserved fruits and nuts (HS2008), fruits and vegetable juices (HS2009) and wines (HS2204).

5.6.1 Aggregate agricultural trade flows between South Africa and the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's agricultural exports to the SADC countries; South Africa's agricultural imports from the SADC countries; as well as total agricultural trade (import plus exports) between South Africa and SADC countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.22.

Table 5.22: Results for agricultural trade flows between South Africa and the SADC countries

Models	Variables	Exports 2000 - 2004	Exports 2005 - 2009	Imports 2000 - 2004	Imports 2005 - 2009	Trade 2000 - 2004	Trade 2005 - 2009
Period Impact Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.26*	0.26*	0.48*	0.48*	0.30*	0.30*
	$\ln GDPPC_{it}$	1.02	1.02	3.19	3.19	-	-
	$\ln GDPPC_{it}$	-0.17	-0.17	0.40***	0.40***	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	0.65	0.65
	$REER_t$	-0.25	-0.25	-0.26	-0.26	-0.21	-0.21
	D0004 / D0509	-0.56*	0.84**	0.01	0.23	-0.20**	0.87*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.87	0.87	0.93	0.93	0.92	0.92
	Observations	90	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Yearly Impact Model	Constant	-	-	-	-	15.40*	15.40*
	$\ln Y_{ijt-1}$	0.34*	0.34*	0.49*	0.49*	0.38*	0.38*
	$\ln GDPPC_{it}$	-0.98	-0.98	9.17**	9.17**	-	-
	$\ln GDPPC_{it}$	-0.19	-0.19	0.47**	0.47**	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	0.20	0.20
	$REER_t$	-0.27	-0.27	0.06	0.06	-0.17	-0.17
	D00 / D05	-0.53*	1.25*	0.08	-0.70	-0.20**	0.98*
	D01 / D06	-0.89*	0.93	0.27	-0.74	-0.28**	0.68*
	D02 / D07	-1.00*	0.78	0.91**	-0.97	-0.03	0.63*
	D03 / D08	-0.69*	1.64**	1.30*	-1.64	0.10	1.15*
	D04 / D09	-0.89*	1.30***	0.78***	-1.33	0.06	0.91*
	$\ln DIST_{ij}$	-	-	-	-	-0.72*	-0.72*
	Adjusted R^2	0.89	0.89	0.93	0.93	0.87	0.87
	Observations	90	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.38*	0.38*	0.23*	0.23*	0.37*	0.37*
	$\ln GDPPC_{it}$	2.06**	2.06**	5.39**	5.39**	-	-
	$\ln GDPPC_{it}$	0.03	0.03	0.80*	0.80*	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	0.46*	0.46*
	$REER_t$	-0.54*	-0.54*	-0.32	-0.32	-0.48*	-0.48*
	PTA_{yes}	-0.69**	0.45	0.01	0.04	-0.01	0.83*
	PTA_{no}	-0.43*	0.59**	0.31	-0.20	0.24**	0.95*
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.86	0.86	0.76	0.76	0.89	0.89
	Observations	1785	1785	1905	1905	1635	1635
	Cross-Sections	119	119	127	127	109	109

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.6.1.1 Agricultural exports from South Africa to the SADC countries

The results show that agricultural exports from South Africa to the SADC countries had significantly declined by 0.56% during the implementation of the SADC Trade Protocol over the period 2000–2004. On an annual basis, these significant decreases occurred in all years as follows: 0.53% in 2000, 0.89% in 2001, 1% in 2002, 0.69% in 2003, and 0.89% in 2004. On the other hand, during the implementation of the SADC Trade Protocol over the period 2005–2009, the agricultural exports from South Africa to the SADC countries had significantly improved by 0.84% and on annual basis, the significant increases occurred in 2005 by 1.25%, in 2008 by 1.64%, and in 2009 by 1.3%. On average, 0.69% of South Africa's agricultural exports destined for the SADC market were diverted to other agricultural trading partners of South Africa for the period 2000–2004. However, for the period 2005–2009, the implementation of the SADC Trade Protocol led to the creation of about 0.59% of South Africa's agricultural exports market in the SADC countries.

The results for the average actual and potential agricultural exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.22** in log values, and the dollar values are presented in **Appendix 5DD**. The results show that South Africa's agricultural exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural exports in Malawi, Mauritius, Mozambique and Zambia; but had under-scored or underachieved in Tanzania and Zimbabwe for the period 2000–2004. In contrast, for the period 2005–2009, South Africa's agricultural exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural exports in Mauritius, Zambia and Zimbabwe; whereas they under-scored or underachieved in Malawi, Mozambique and Tanzania. However, the differences between the actual and the potential values were small.

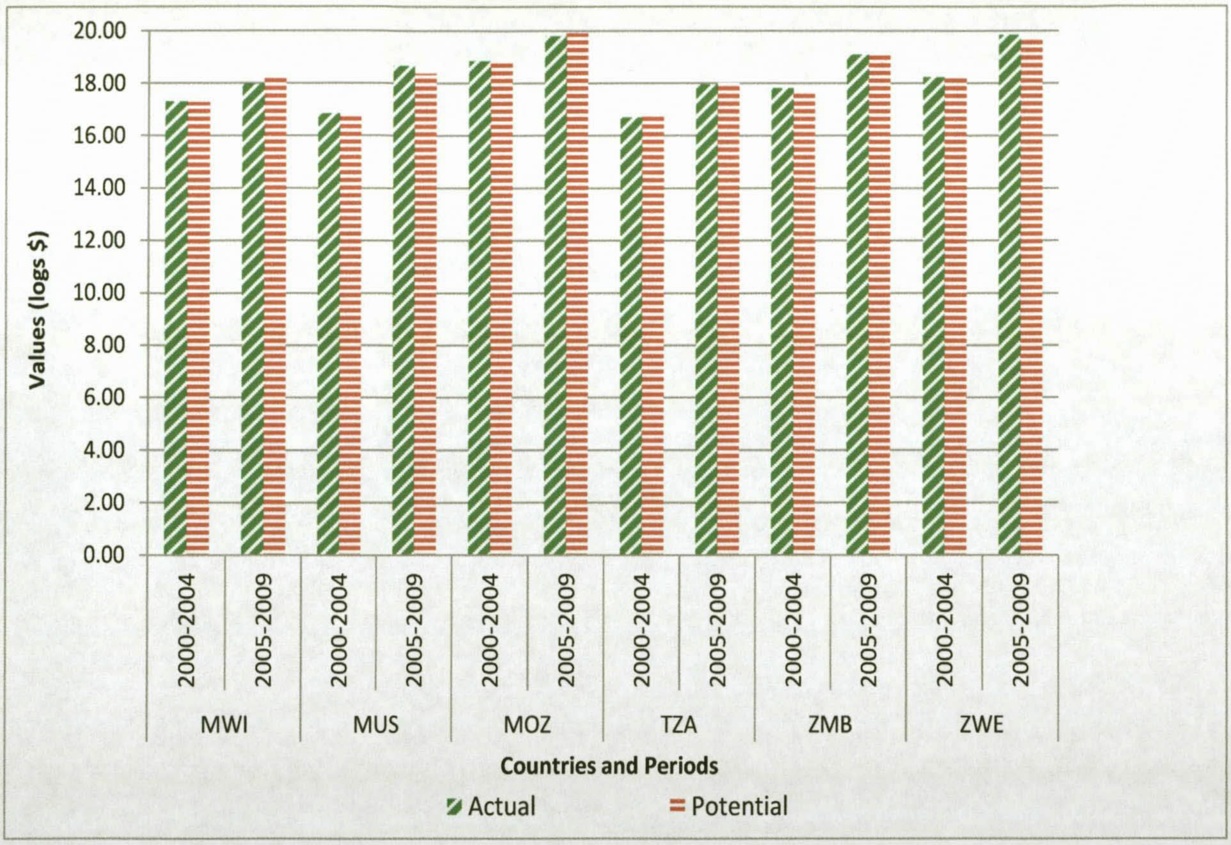

Figure 5.22: Average actual and potential value of agricultural exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

5.6.1.2 Agricultural imports from the SADC countries to South Africa

The results show that the implementation of the SADC Trade Protocol had no joint period effects on the agricultural imports from the SADC countries to South Africa for both periods and show no proof of creation or diversion of South Africa's agricultural imports from either the SADC countries or South Africa's other agricultural trading partners. However, on an annual basis, the individual yearly positive effects were observed in 2002, 2003 and 2004, when the agricultural imports from the SADC countries to South Africa increased by 0.91%, 1.3% and 0.78% respectively during those years.

The results for the average actual and potential agricultural imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.23** in log values, and the dollar values are presented in **Appendix 5DG**. The results show that South Africa's agricultural importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural imports from Malawi, Tanzania, Zambia and Zimbabwe; but had under-scored or underachieved in Mauritius and Mozambique over the period 2000–2004. In contrast, for the period 2005–2009 South Africa's agricultural importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's agricultural imports from Mauritius, Tanzania and Zambia, but had under-scored or underachieved in Malawi, Mozambique and Zimbabwe.

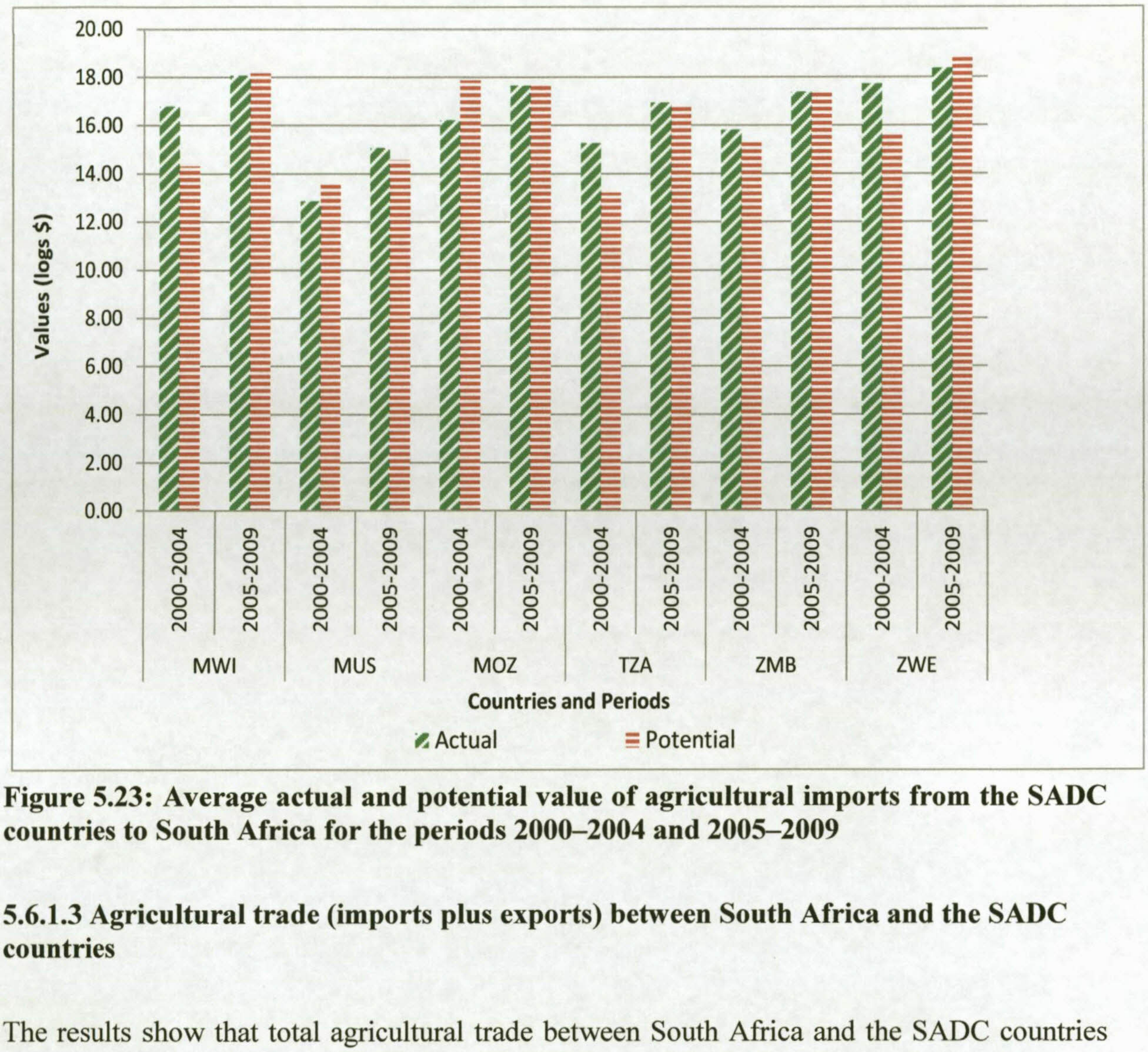

Figure 5.23: Average actual and potential value of agricultural imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009

5.6.1.3 Agricultural trade (imports plus exports) between South Africa and the SADC countries

The results show that total agricultural trade between South Africa and the SADC countries had significantly declined by 0.2% during the implementation of the SADC Trade Protocol over the period 2000–2004 and on an annual basis, significant decreases occurred in 2000 and 2001 by 0.2% and 0.28% respectively. However, the implementation of the SADC Trade Protocol for the period 2005–2009 contributed to a 0.87% increase in total agricultural trade between South Africa and the SADC countries and on an annual basis, significant increases occurred in all years as follows: 0.98% in 2005, 0.68% in 2006, 0.63% in 2007, 1.15% in

2008, and 0.91% in 2009. On average, the implementation of the SADC Trade Protocol led to the creation of 0.83% in total agricultural trade between South Africa and the SADC countries over the period 2005–2009. However, there was no proof of creation or diversion of total agricultural trade between South Africa and the SADC countries to other agricultural trading partners of South Africa or SADC countries during the period 2000–2004. The results for the average actual and potential total agricultural trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.24** in log values, and the dollar values are presented in **Appendix 5DJ**.

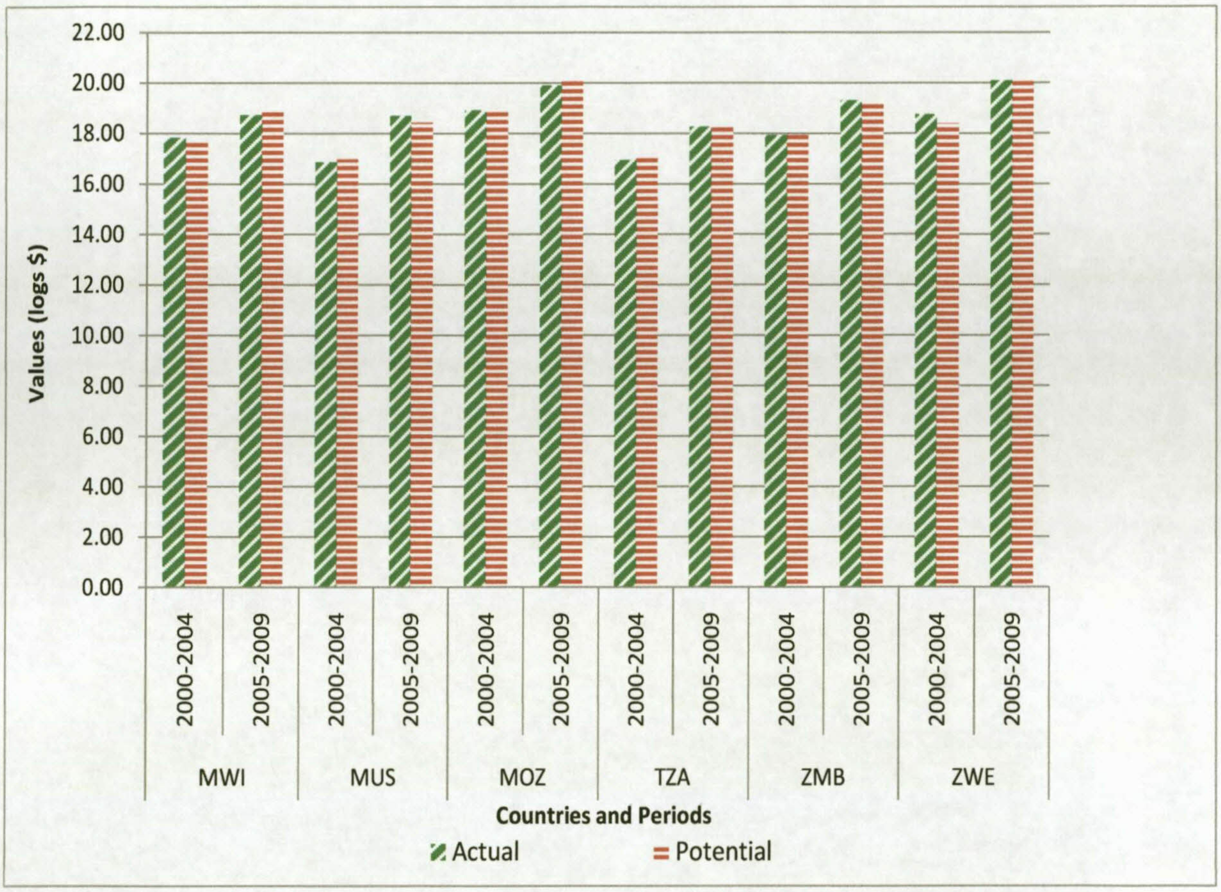

Figure 5.24: Average actual and potential value of agricultural trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's agricultural traders (importers and exporters) operating between South Africa and the SADC countries had outperformed and exhausted the estimated potential capacity for the absorption of total agricultural trade in the South Africa-Malawi, South Africa-Zambia and South Africa-Zimbabwe markets; but had under-scored or underachieved in the South Africa-Mauritius, South Africa-Mozambique and South Africa-

Tanzania markets for the period 2000–2004. Over the period 2005–2009 South Africa's agricultural traders (importers and exporters) operating between South Africa and the SADC countries had outperformed and exhausted the estimated potential capacity for the absorption of total agricultural trade in the South Africa-Mauritius, South Africa-Zambia and South Africa-Zimbabwe markets; whereas they had under-scored or underachieved in the South Africa-Malawi, South Africa-Mozambique and South Africa-Tanzania markets.

5.6.2 Cheese exports from South Africa to the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's cheese exports to the SADC countries for the periods 2000-2004 and 2005-2009. South Africa did not import cheese from the SADC countries during these periods. The final results for cheese exports from South Africa to the SADC countries are presented in Table 5.23 below. The results show that the implementation of the SADC Trade Protocol had no effects on South Africa's cheese exports to the SADC countries and show no proof of creation of South Africa's cheese exports market in the SADC countries or diversion of South Africa's cheese exports destined for the SADC market to other South African cheese trading partners for either period.

Table 5.23: Results for cheese exports from South Africa to the SADC countries

Variables	Period Impact Model		Yearly Impact Model		Export Direction Model	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	21.36	21.36	-6.95	-6.95	-	-
lnY_{ijt-1}	0.70*	0.70*	0.71*	0.71*	0.40*	0.40*
$lnGDPPC_{it}$	-1.90	-1.90	1.51	1.51	-7.72	-7.72
$lnGDPPC_{jt}$	-0.01	-0.01	-0.01	-0.01	1.09	1.09
$REER_t$	0.12	0.12	0.33	0.33	-1.88**	-1.88**
D0004 / D0509	-0.10	0.65	-	-	-	-
D00 / D05	-	-	-0.12	0.37	-	-
D01 / D06	-	-	-0.24	-0.24	-	-
D02 / D07	-	-	-0.15	-0.07	-	-
D03 / D08	-	-	0.51	-0.11	-	-
D04 / D09	-	-	0.10	-0.31	-0.34	2.02
PTA_{yes}	-	-	-	-	0.33	1.84
PTA_{no}	-	-	-	-	-	-
$lnDIST_{ij}$	-0.41**	-0.41**	-0.41**	-0.41**	-	-
Adjusted R^2	0.78	0.78	0.77	0.77	0.70	0.70
Observations	90	90	90	90	480	480
Cross-Sections	6	6	6	6	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

The results for the average actual and potential cheese exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.25** in log values, and the dollar values are presented in **Appendix 5DM**. The results show that South Africa's cheese exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese exports in Zambia and Zimbabwe; but had under-scored or underachieved in Malawi, Mauritius, Mozambique and Tanzania over the period 2000–2004. In contrast, during the period 2005–2009 South Africa's cheese exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cheese exports in Malawi, Mozambique and Tanzania; whereas they had under-scored or underachieved in Mauritius, Zambia and Zimbabwe

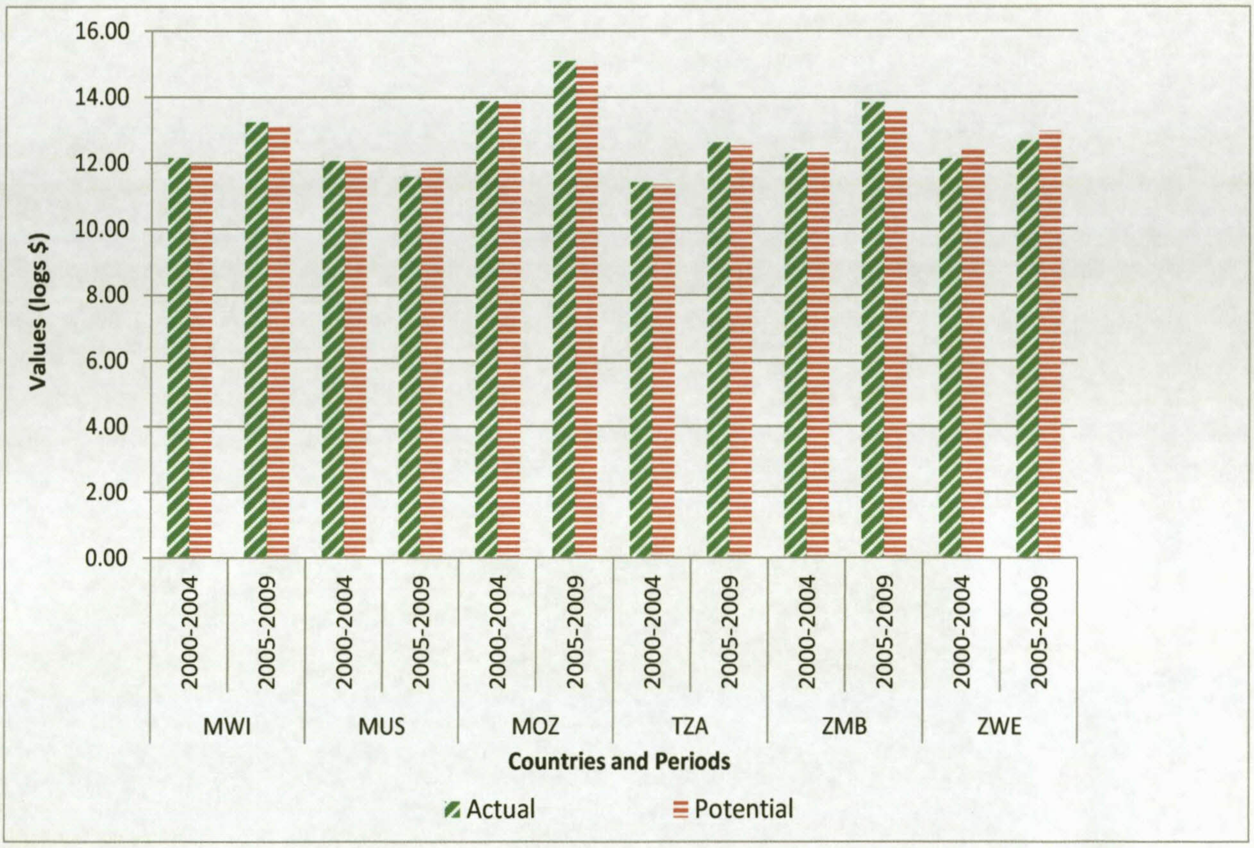

Figure 5.25: Average actual and potential value of cheese exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

.5.6.3 Cut flowers trade flows between South Africa and the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's cut flowers exports to the SADC countries; South Africa's cut flowers imports from the SADC countries; as well as total cut flowers trade (import plus exports) between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.24.

Table 5.24: Results for cut flowers between South Africa and the SADC countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	Constant	-	-	-	-	-0.53	-0.53
	$\ln Y_{ijt-1}$	-	-	0.33*	0.33*	-	-
	$\ln GDPPC_{it}$	14.65***	14.65***	18.97	18.97	-	-
	$\ln GDPPC_{jt}$	1.11	1.11	0.50	0.50	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	4.64*	4.64*
	$REER_t$	-1.40	-1.40	0.87	0.87	-1.24***	-1.24***
	D0004 / D0509	-0.43	-1.88	0.09	-2.60	0.70	1.41*
	$\ln DIST_{ij}$	-	-	-	-	-3.03*	-3.03*
	Adjusted R^2	0.64	0.64	0.72	0.72	0.44	0.44
	Observations	96	96	90	90	96	96
	Cross-Sections	6	6	6	6	6	6
Yearly Impact Model	Constant	-	-	-	-	-2.36	-2.36
	$\ln Y_{ijt-1}$	-	-	0.30*	0.30*	-	-
	$\ln GDPPC_{it}$	11.16	11.16	69.18*	69.18*	-	-
	$\ln GDPPC_{jt}$	1.03	1.03	1.04	1.04	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	4.69*	4.69*
	$REER_t$	-1.63	-1.63	3.86**	3.86**	-0.80	-0.80
	D00 / D05	1.47**	-1.35	-4.69***	-9.18**	0.51	1.15**
	D01 / D06	-0.47	-1.56	-10.78*	-12.11*	-1.50***	1.67*
	D02 / D07	-0.04	-1.12	-15.89*	-14.39*	-1.28	1.80*
	D03 / D08	-0.62	-1.22	-8.64***	-16.06*	0.33	1.56**
	D04 / D09	-2.42	-0.40	-18.39*	-14.28*	0.21	1.76*
	$\ln DIST_{ij}$	-	-	-	-	-3.15*	-3.15*
	Adjusted R^2	0.63	0.63	0.73	0.73	0.63	0.63
	Observations	96	96	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.49*	0.49*	0.26*	0.26*	0.33*	0.33*
	$\ln GDPPC_{it}$	-4.03	-4.03	4.11	4.11	-	-
	$\ln GDPPC_{jt}$	0.56	0.56	0.71	0.71	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	3.44***	3.44***
	$REER_t$	-0.60	-0.60	0.58	0.58	0.44	0.44
	PTA_{yes}	-0.85	1.38**	1.73***	0.86	0.20	0.59
	PTA_{no}	-0.93*	1.14**	0.30	-1.59	-0.65***	-0.44
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.78	0.78	0.62	0.62	0.81	0.81
	Observations	840	840	390	390	330	330
	Cross-Sections	56	56	26	26	22	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.6.3.1 Cut flowers exports from South Africa to the SADC countries

The results show that the implementation of the SADC Trade Protocol had no joint effects on South Africa's cut flowers exports to the SADC countries over both periods; but on an annual basis, the average South African cut flowers exports to the SADC countries had significantly increased by 1.47% in 2000. On average, 0.93% of South Africa's cut flowers exports destined for the SADC market were diverted to other cut flowers trading partners of South Africa for the period 2000–2004. Over the period 2005–2009, the implementation of the SADC Trade Protocol led to the creation of 1.38% in South Africa's cut flowers exports market in the SADC countries. The results for the average actual and potential cut flowers exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.26** in log values, and the dollar values are presented in **Appendix 5DP**.

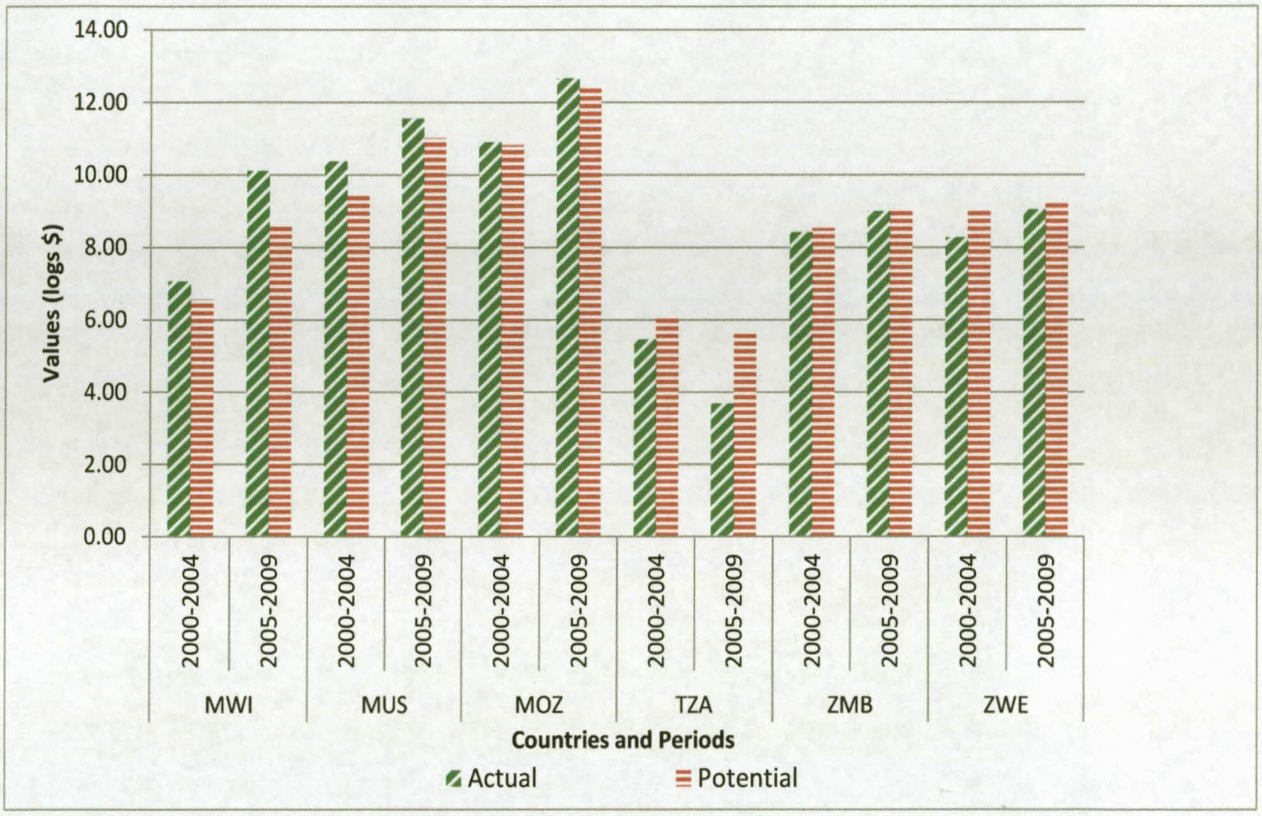

Figure 5.26: Average actual and potential value of cut flowers exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's cut flowers exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers exports in Malawi, Mauritius and Mozambique; but had under-scored or underachieved in Tanzania, Zambia and Zimbabwe over the period 2000–2004. Similarly, for the period 2005–2009, South Africa's cut flowers exporters had also outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers exports in Malawi, Mauritius and Mozambique; but had under-scored or underachieved in Tanzania, Zambia and Zimbabwe.

5.6.3.2 Cut flowers imports from the SADC countries to South Africa

The results show that the implementation of the SADC Trade Protocol had no joint period effects on the cut flowers imports from the SADC countries to South Africa for both periods. Surprisingly, on an annual basis, the individual yearly negative effects were observed in all years as follows: 4.69% in 2000, 10.78% in 2001, 15.89% in 2002, 8.64% in 2003, and 18.39% in 2004; and then 9.18% in 2005, 12.11% in 2006, 14.39% in 2007, 16.06% in 2008, and 14.28% in 2009.

The implementation of the SADC Trade Protocol during the period 2000–2004 led to the creation of 1.73% in South Africa's cut flowers import market from the SADC countries. However, for the period 2005–2009, there is no proof of creation in South Africa's cut flowers import market from the SADC countries or diversion of South Africa's cut flowers import market from the SADC countries to other South African cut flowers trading partners owing to the implementation of the SADC Trade Protocol.

The results for the average actual and potential cut flowers imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.27** in log values, and the dollar values are presented in **Appendix 5DS**. The results show that South Africa's cut flowers importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers imports from Malawi, Tanzania, Zambia and Zimbabwe; but had under-scored or underachieved in Mauritius and Mozambique over the period 2000–2004. For the period 2005–2009, South Africa's cut flowers importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's cut flowers imports from Malawi, Tanzania and Zambia; whereas they under-scored or underachieved in Mauritius, Mozambique and Zimbabwe.

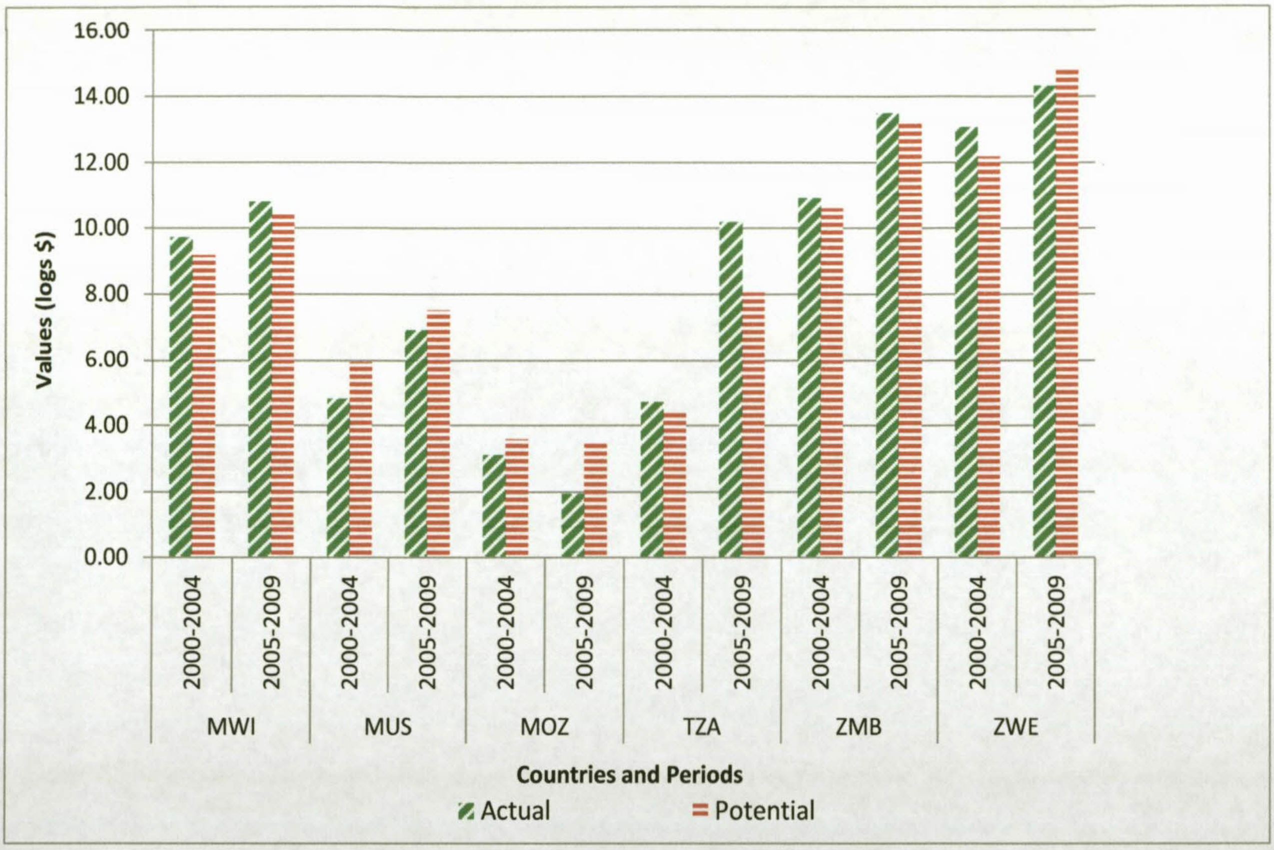

Figure 5.27: Average actual and potential value of cut flowers imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009

5.6.3.3 Cut flowers trade (imports plus exports) between South Africa and the SADC countries

The results show that total cut flowers trade between South Africa and the SADC countries had significantly increased by 1.41% during the implementation of the SADC Trade Protocol over the period 2005–2009. On an annual basis, these significant increases occurred in all years as follows: 1.15% in 2005, 1.67% in 2006, 1.8% in 2007, 1.56% in 2008, and 1.76% in 2009. However, there were no joint effects during the implementation of the SADC Trade Protocol over the period 2000–2004; but there was a significant decrease of total cut flowers trade between South Africa and the SADC countries that occurred in 2001 by 1.5%. On average, the implementation of the SADC Trade Protocol led to the diversion of 0.65% of total cut flowers trade between South Africa and the SADC countries to either South Africa's other cut flowers trading partners or to the SADC countries' other cut flowers trading partners for the period 2000–2004. However, there was no proof of creation or diversion of total cut flowers trade between South Africa and the SADC countries to other cut flowers trading partners of South Africa or of the SADC countries during the implementation of the SADC

Trade Protocol over the period 2005–2009.The results for the average actual and potential total cut flowers trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.28** in log values, and the dollar values are presented in **Appendix 5DV**.

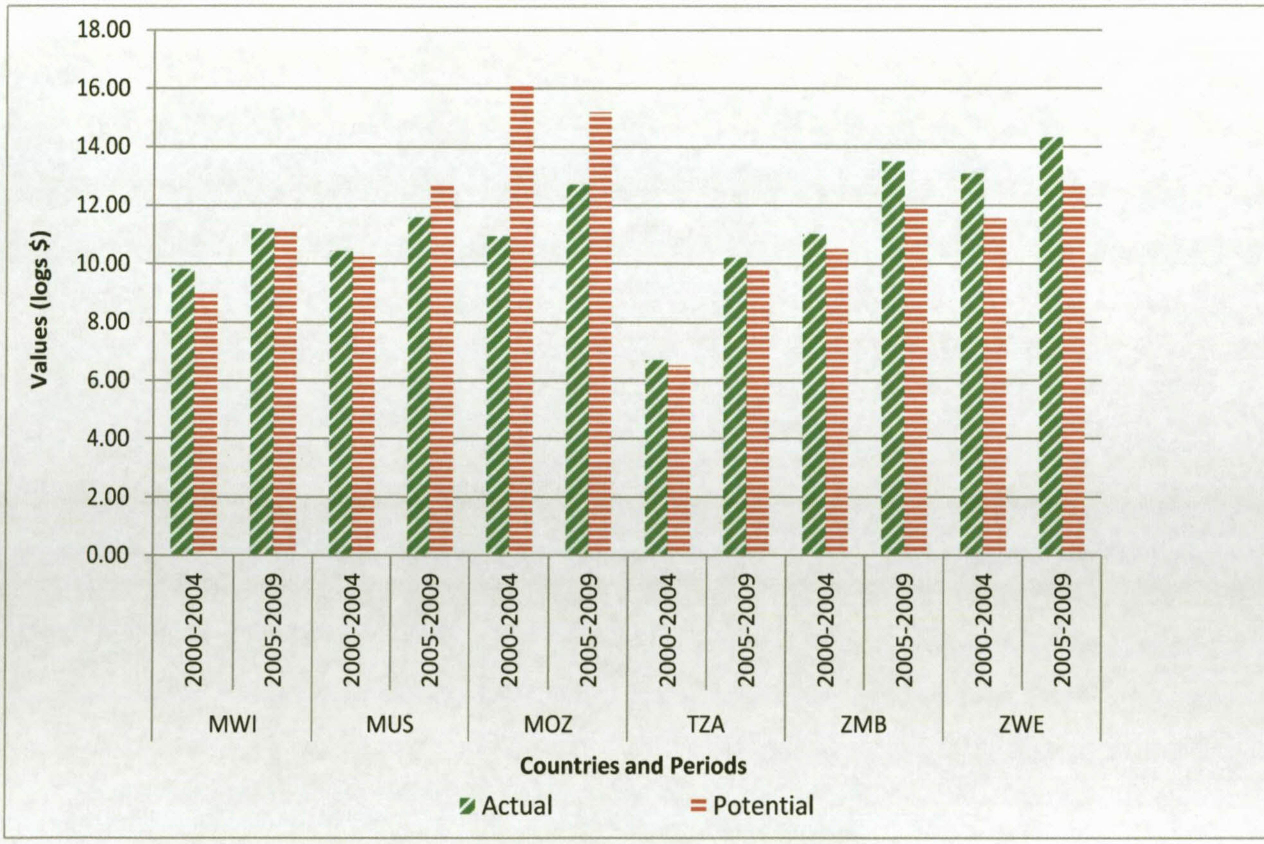

Figure 5.28: Average actual and potential value of cut flowers trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's cut flowers traders (importers and exporters) operating between South Africa and the SADC countries had outperformed and exhausted the estimated potential capacity for the absorption of total cut flowers trade in the South Africa-Malawi, South Africa-Mauritius, South Africa-Tanzania, South Africa-Zambia and South Africa-Zimbabwe markets; but had under-scored or underachieved only in the South Africa-Mozambique market for the period 2000–2004. For the period 2005–2009, they had outperformed and exhausted the estimated potential capacity for the absorption of total cut flowers trade in the South Africa-Tanzania, South Africa-Zambia and South Africa-Zimbabwe markets; whereas they had under-scored or underachieved in the South Africa-Mauritius and South Africa-Mozambique markets. However, South Africa's cut flowers traders (importers and exporters) operating between South Africa and the SADC countries had nearly matched the potential in the South Africa-Malawi market.

5.6.4 Frozen fruits and nuts exports from South Africa to the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's frozen fruits and nuts exports to the SADC countries for the periods 2000-2004 and 2005-2009. South Africa did not import frozen fruits and nuts from SADC countries in either period. The results for frozen fruits and nuts exports from South Africa to the SADC countries are presented in Table 5.25 below. The results show that the implementation of the SADC Trade Protocol had no effects on South Africa's frozen fruits and nuts exports to the SADC countries in either period. Furthermore, the results show no proof of creation of South Africa's frozen fruits and nuts exports market in the SADC countries or diversion of South Africa's frozen fruits and nuts exports destined for the SADC market to other South African frozen fruits and nuts trading partners in either period.

Table 5.25: Results for frozen fruits and nuts exports from South Africa to the SADC countries

Variables	Period Impact Model		Yearly Impact Model		Export Direction Model	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-
lnY_{iit-1}	0.38*	0.38*	0.37*	0.37*	0.40*	0.40*
$lnGDPPC_{it}$	1.68	1.68	10.60	10.60	3.00	3.00
$lnGDPPC_{jt}$	-0.80	-0.80	-0.71	-0.71	0.32	0.32
$REER_t$	-1.28	-1.28	1.03	-0.76	-1.86***	-1.86***
D0004 / D0509	-1.89	1.62	-	-	-	-
D00 / D05	-	-	1.05	0.57	-	-
D01 / D06	-	-	0.08	-0.37	-	-
D02 / D07	-	-	4.57	-0.36	-	-
D03 / D08	-	-	1.93	-0.80	-	-
D04 / D09	-	-	3.06	-0.43	-	-
PTA_{yes}	-	-	-	-	0.44	1.09
PTA_{no}	-	-	-	-	0.70	0.10
$lnDIST_{ij}$	-	-	-	-	-	-
Adjusted R^2	0.70	0.70	0.69	0.69	0.57	0.57
Observations	90	90	90	90	315	315
Cross-Sections	6	6	6	6	21	21

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

Source: Author's calculations

The results for the average actual and potential frozen fruits and nuts exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.29** in log values, and the dollar values are presented in **Appendix 5DY**. The results show that South Africa's frozen fruits and nuts exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts exports in Mauritius, Zambia and Zimbabwe but had under-scored or underachieved in Malawi and Mozambique and over the period 2000–2004. However, over the period 2005–2009 South Africa's frozen fruits and nuts exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's frozen fruits and nuts exports in Malawi, Mozambique, Tanzania and Zambia whereas they had under-scored or underachieved in Mauritius and Zimbabwe.

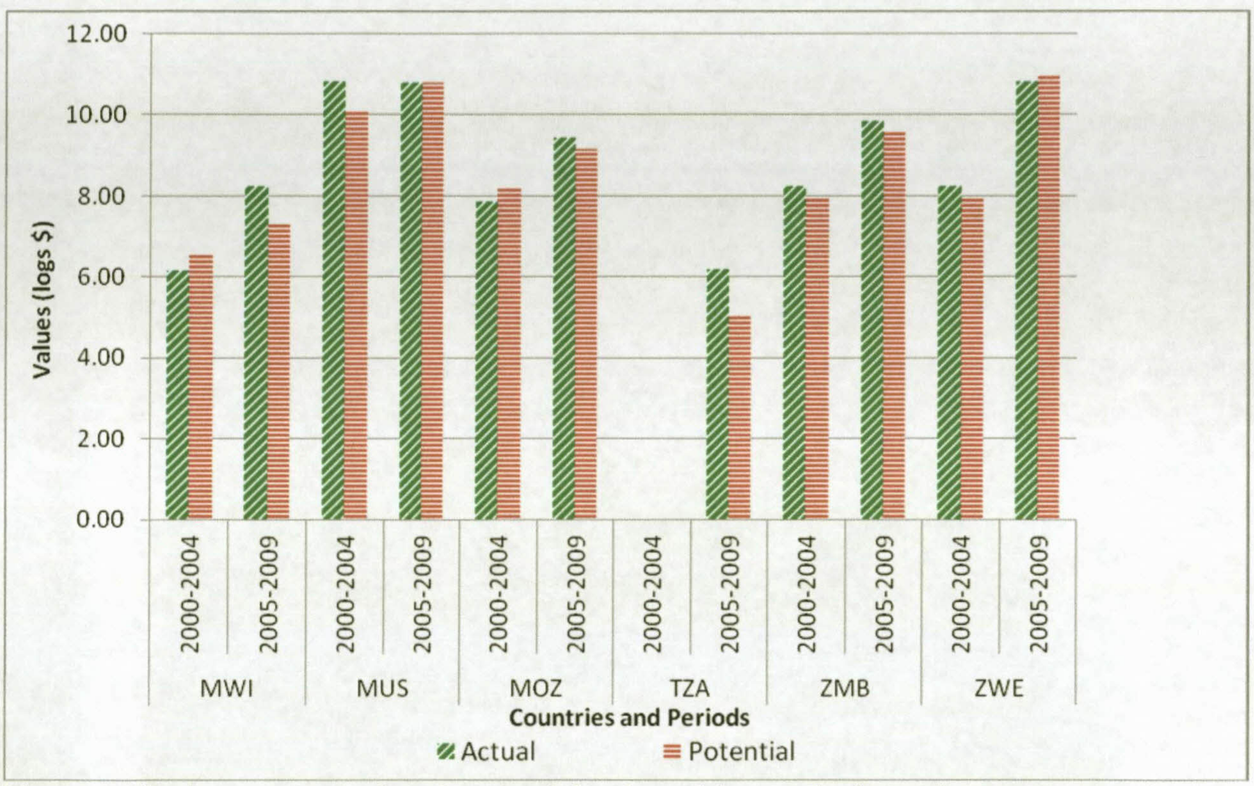

Figure 5.29: Average actual and potential value of frozen fruits and nuts exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

5.6.5 Preserved fruits and nuts exports from South Africa to the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's preserved fruits and nuts exports to the SADC countries for the periods 2000-2004 and 2005-2009. South Africa did not import preserved fruits and nuts from the SADC countries in either period. The results for preserved fruits and nuts exports from South Africa to the SADC countries are presented in Table 5.26 below. The results show that the implementation of the SADC Trade Protocol had no joint effects on South Africa's preserved fruits and nuts exports to the SADC countries in either period, but there were significant positive increases of South Africa's preserved fruits and nuts exports to the SADC countries which occurred on annual an basis as follows: 1.07% in 2001, 1.76% in 2002, 1.86% in 2003, and 1.91% in 2004.

Table 5.26: Results for preserved fruits and nuts exports from South Africa to the SADC countries

Variables	Period Impact Model		Yearly Impact Model		Export Direction Model	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-
lnY_{ijt-1}	0.39*	0.39*	0.37*	0.37*	0.46*	0.46*
$lnGDPPC_{it}$	2.37	2.37	4.83	4.83	-4.66	-4.66
$lnGDPPC_{jt}$	-0.04	-0.04	-0.04	-0.04	0.83	0.83
$REER_t$	-0.94**	-0.94**	-0.79	-0.79	-0.63	-0.63
D0004 / D0509	0.28	0.58	-	-	-	-
D00 / D05	-	-	0.36	0.27	-	-
D01 / D06	-	-	1.07***	0.13	-	-
D02 / D07	-	-	1.76**	-0.23	-	-
D03 / D08	-	-	1.86*	0.03	-	-
D04 / D09	-	-	1.91**	0.22	-	-
PTA_{yes}	-	-		-	-0.03	1.81**
PTA_{no}	-	-		-	-0.41	0.79
$lnDIST_{ij}$	-	-		-	-	-
Adjusted R^2	0.86	0.86	0.85	0.85	0.68	0.68
Observations	90	90	90	90	1275	1275
Cross-Sections	6	6	6	6	85	85

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

On average, the implementation of the SADC Trade Protocol during the period 2005–2009 led to the creation of 1.81% in South Africa's preserved fruits and nuts exports market in the SADC countries. However, the results show no proof of creation of South Africa's preserved fruits and nuts exports market in the SADC countries or diversion of South Africa's preserved fruits and nuts exports destined for the SADC market to other South African preserved fruits and nuts trading partners over the period 2000–2004.

The results for the average actual and potential preserved fruits and nuts exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.30** in log values, and the dollar values are presented in **Appendix 5EB**. The results show that South Africa's preserved fruits and nuts exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts exports in Malawi and Zambia but had under-scored or underachieved in Mauritius, Mozambique, Tanzania and Zimbabwe over the period 2000–2004. During the period 2005–2009, South Africa's preserved fruits and nuts exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's preserved fruits and nuts exports in Malawi, Tanzania, Zambia and Zimbabwe whereas they under-scored or underachieved in Mauritius and Mozambique.

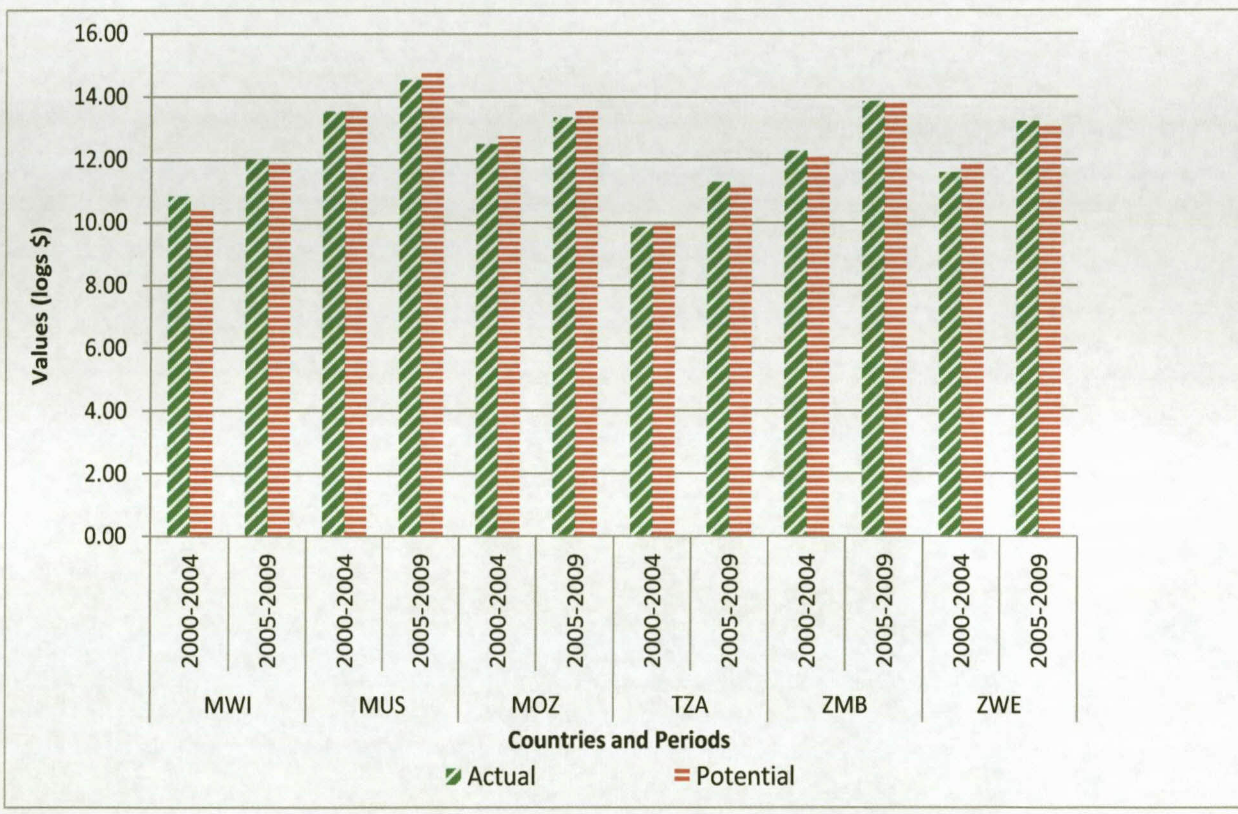

Figure 5.30: Average actual and potential value of preserved fruits and nuts exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

5.6.6 Fruits and vegetable juices trade flows between South Africa and the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's fruits and vegetable juices exports to the SADC countries; South

Africa's fruits and vegetable juices imports from the SADC countries; as well as total fruits and vegetable juices trade (import plus exports) between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.27.

Table 5.27: Results for fruits and vegetable juices trade flows between South Africa and the SADC countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	**Constant**	-16.60	-16.60	-190.8***	-190.8***	2.08	2.08
	InY_{iit-1}	0.72*	0.72*	-	-	0.75*	0.75*
	$InGDPPC_{it}$	2.69	2.69	24.79***	24.79***	-	-
	$InGDPPC_{it}$	0.13***	0.13***	1.40*	1.40*	-	-
	$InGDPPC_{iit}$	-	-	-	-	0.43	0.43
	$REER_t$	-0.01	-0.01	0.09	0.09	-0.13	-0.13
	D0004 / D0509	0.15	0.15	-3.37	-3.37	0.00	0.61*
	$InDIST_{ii}$	-0.23**	-0.23**	-2.01**	-2.01**	-0.21***	-0.21***
	Adjusted R^2	0.91	0.91	0.15	0.15	0.91	0.91
	Observations	90	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Yearly Impact Model	**Constant**	-68.93**	-68.93**	-434.3**	-434.3**	2.07	2.07
	InY_{iit-1}	0.72*	0.72*	-	-	0.75*	0.75*
	$InGDPPC_{it}$	9.01*	9.01*	54.99**	54.99**	-	-
	$InGDPPC_{it}$	0.13***	0.13***	1.56*	1.56*	-	-
	$InGDPPC_{iit}$	-	-	-	-	0.42	0.42
	$REER_t$	0.38	0.38	1.14	1.14	-0.12	-0.12
	D00 / D05	-0.15	-0.58	-1.31	-5.98	-0.03	0.76*
	D01 / D06	-0.64***	-1.28***	-4.46	-8.70***	-0.02	0.35***
	D02 / D07	-0.53	-1.35***	-1.02	-10.17***	0.79***	0.66*
	D03 / D08	-0.59	-1.57***	-4.19	-9.72	0.43	0.59*
	D04 / D09	-0.95	-1.18	-1.03	-13.23**	0.43	0.70*
	$InDIST_{ii}$	-0.23**	-0.23**	-2.50***	-2.50***	-0.20	-0.20
	Adjusted R^2	0.92	0.92	0.19	0.19	0.91	0.91
	Observations	90	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Trade Flow Direction Model	**Constant**	-	-	-	-	-	-
	InY_{iit-1}	0.27*	0.27*	0.24*	0.24*	0.20*	0.20*
	$InGDPPC_{it}$	8.29**	8.29**	13.86**	13.86**	-	-
	$InGDPPC_{it}$	2.17*	2.17*	1.32	1.32	-	-
	$InGDPPC_{iit}$	-	-	-	-	4.29*	4.29*
	$REER_t$	-0.33	-0.33	-0.39	-0.39	-0.09	-0.09
	PTA_{yes}	0.05	-0.64	0.22	-1.87	0.33	0.62
	PTA_{no}	0.33	-0.54	-0.87	-0.83	0.57***	0.39
	$InDIST_{ii}$	-	-	-	-	-	-
	Adjusted R^2	0.65	0.65	0.62	0.62	0.68	0.68
	Observations	1290	1290	645	645	630	630
	Cross-Sections	86	86	43	43	42	42

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.6.6.1 Fruits and vegetable juices exports from South Africa to the SADC countries

The results show that the implementation of the SADC Trade Protocol had no joint effects on South Africa's fruits and vegetable juices exports to the SADC countries in either period, but there were significant decreases in South Africa's fruits and vegetable juices exports to the SADC countries that occurred on an annual basis as follows: 0.64% in 2001, 1.28% in 2006, 1.35% in 2007, and 1.57% in 2008. The results show that there was no proof of creation of South Africa's fruits and vegetable juices exports market in the SADC countries or diversion of South Africa's fruits and vegetable juices exports destined for the SADC market to other South African fruits and vegetable juices trading partners in either period. The results for the average actual and potential fruits and vegetable juices exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.31** in log values, and the dollar values are presented in **Appendix 5EE**.

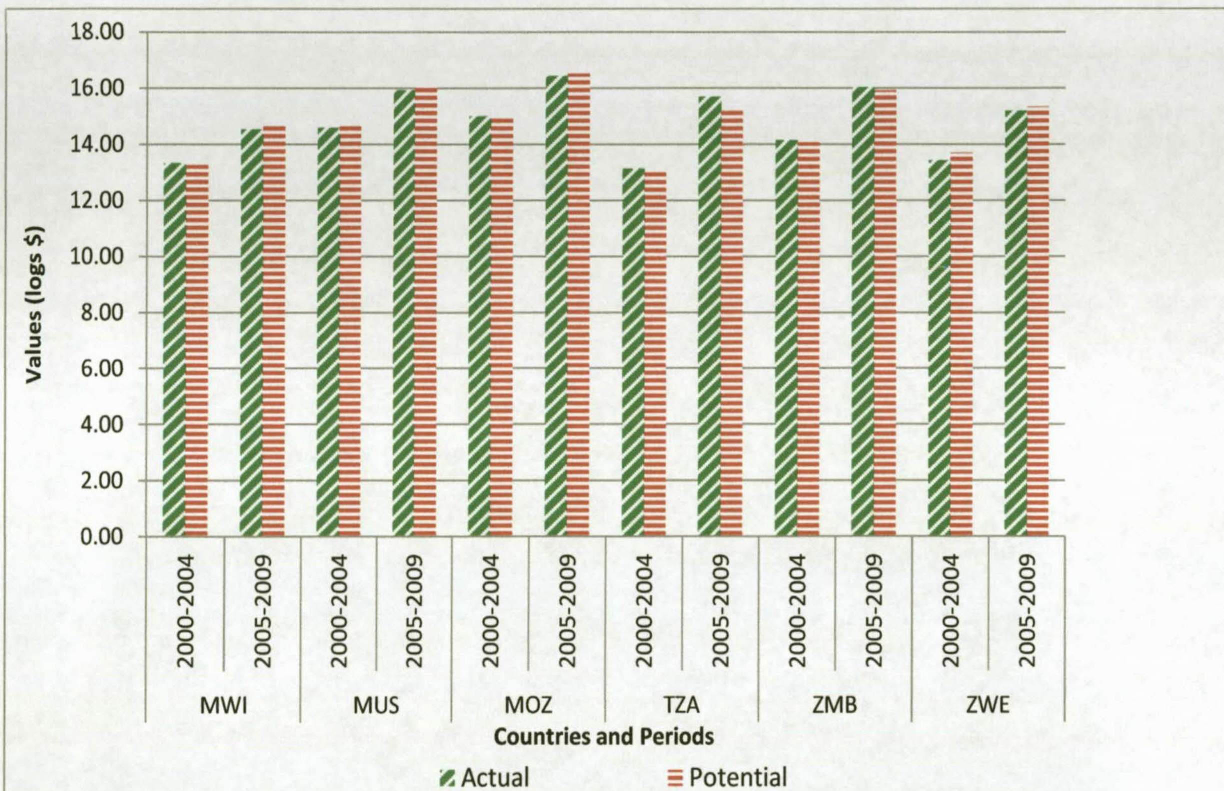

Figure 5.31: Average actual and potential value of fruits and vegetable juices exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's fruits and vegetable juices exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices exports in Mauritius and Zambia but had under-scored or underachieved in

Malawi, Mozambique and Zimbabwe over the period 2000–2004. During the period 2005–2009 South Africa's fruits and vegetable juices exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices exports in Tanzania and Zimbabwe whereas they under-scored or underachieved in Malawi, Mauritius, Mozambique and Zambia.

5.6.6.2 Fruits and vegetable juices imports from the SADC countries to South Africa

The results show that the implementation of the SADC Trade Protocol had no joint period effects on the fruits and vegetable juices imports from the SADC countries to South Africa in either period. However, on an annual basis, the individual annual negative effects were observed in 2006, 2007 and 2009, when the fruits and vegetable juices imports from the SADC countries to South Africa decreased by 8.7%, 10.17% and 13.23% respectively during those years. The results also indicate there was no proof of creation of South Africa's fruits and vegetable juices import market from the SADC countries or diversion of South Africa's fruits and vegetable juices import market from the SADC countries to other South African fruits and vegetable juices trading partners owing to the implementation of the SADC Trade Protocol.

The results for the average actual and potential fruits and vegetable juices imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.32** above in log values, and the dollar values are presented in **Appendix 5EH**. The results show that South Africa's fruits and vegetable juices importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Mauritius and Zambia; but had under-scored or underachieved in Mozambique and Zimbabwe over the period 2000–2004. During the period 2005–2009, South Africa's fruits and vegetable juices importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's fruits and vegetable juices imports from Mauritius and Zimbabwe; whereas they under-scored or underachieved in Malawi, Mozambique and Tanzania.

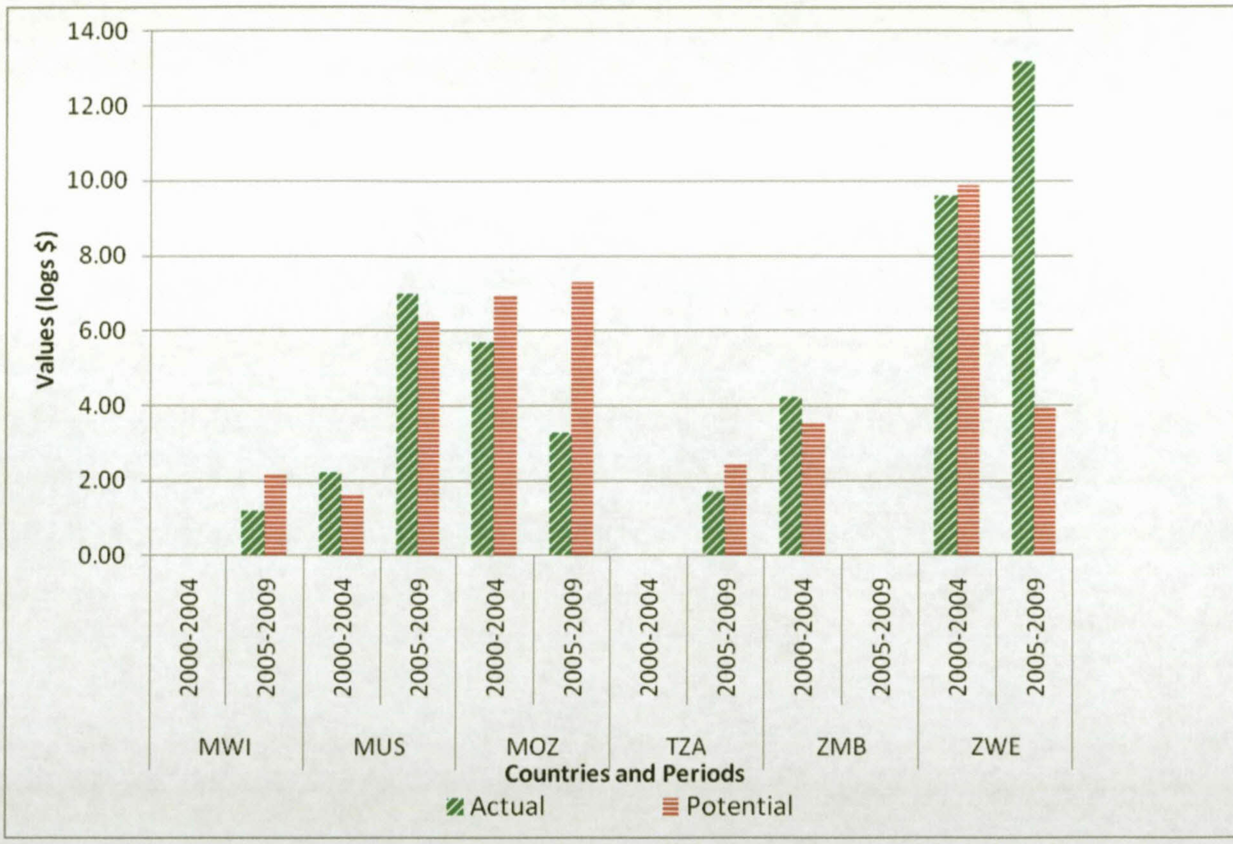

Figure 5.32: Average actual and potential value of fruits and vegetable juices imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009

5.6.6.3 Fruits and vegetable juices trade (imports plus exports) between South Africa and the SADC countries

The results show that the total fruits and vegetable juices trade between South Africa and the SADC countries had significantly increased by 0.61% during the implementation of the SADC Trade Protocol over the period 2005–2009 and on annual basis this significant increase occurred in all years as follows: 0.76% in 2005, 0.35% in 2006, 0.66% in 2007, 0.59% in 2008, and 0.7% in 2009. However, the implementation of the SADC Trade Protocol had no joint effects on total fruits and vegetable juices trade between South Africa and the SADC countries over the period 2004–2004, whereas a significant increase of 0.79% occurred in 2002. However, the results show no proof of creation or diversion of total fruits and vegetable juices trade between South Africa and the SADC countries to other fruits and vegetable juices trading partners of South Africa or SADC countries during the period 2005–2009.

The results for the average actual and potential total fruits and vegetable juices trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.33** in log values, and the dollar values are presented in **Appendix 5EK**. The results show that South Africa's fruits and vegetable juices traders (importers and exporters) operating between South Africa and the SADC countries had under-scored or underachieved the estimated potential capacity for the absorption of total fruits and vegetable juices trade in all markets; i.e. the South Africa-Mauritius, South Africa-Mozambique, South Africa-Zambia and South Africa-Zimbabwe markets, meaning that no market was exhausted over the period 2000–2004. Similarly, no market was exhausted during the period 2005–2009, as South Africa's fruits and vegetable juices traders (importers and exporters) operating between South Africa and the SADC countries had also under-scored or underachieved in all markets, i.e. the South Africa-Malawi, South Africa-Mauritius, South Africa-Mozambique, South Africa-Tanzania and South Africa-Zimbabwe markets.

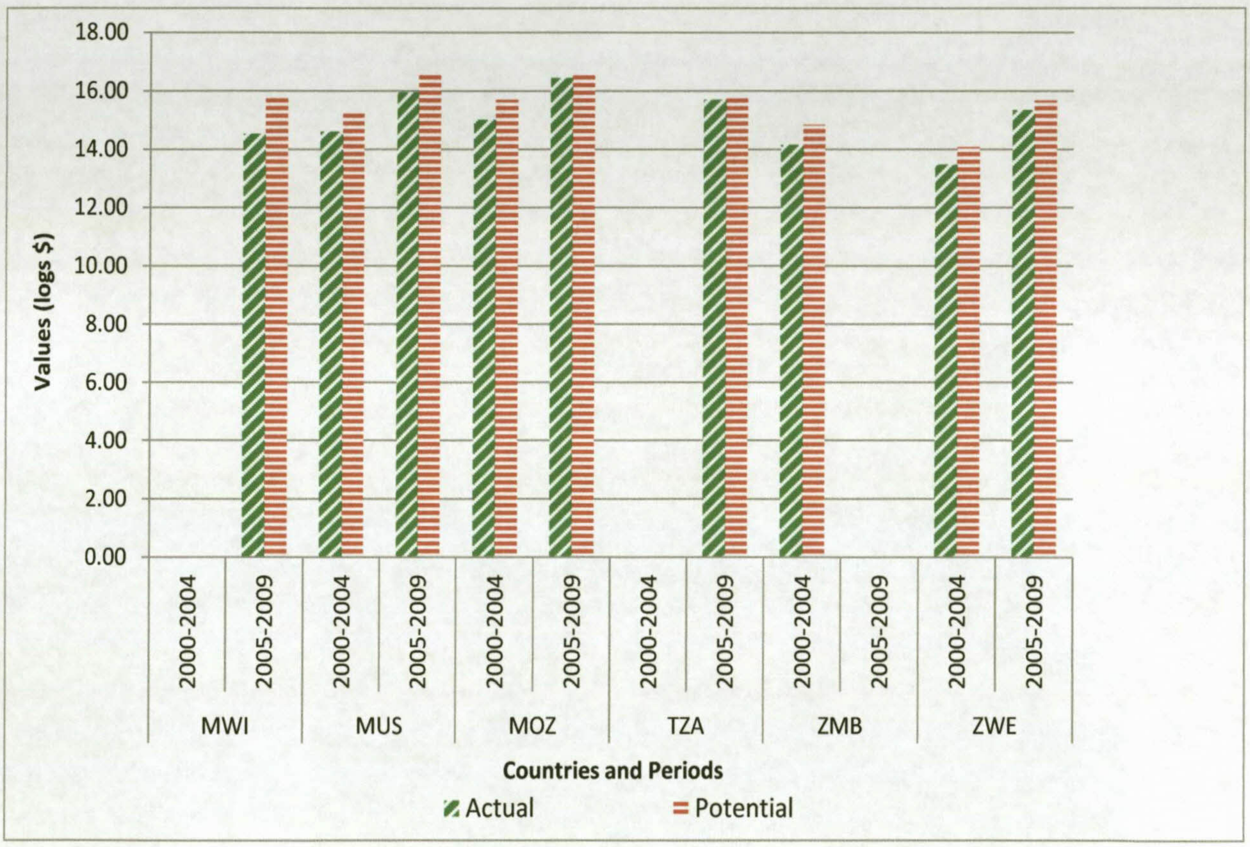

Figure 5.33: Average actual and potential value of fruits and vegetable juices trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009

5.6.7 Wine trade flows between South Africa and the SADC countries

This subsection provides the results of the impacts of the implementation of the SADC Trade Protocol on South Africa's wine exports to the SADC countries; South Africa's wine imports from the SADC countries; as well as total wine trade between South Africa and SADC countries for the periods 2000–2004 and 2005–2009. The results are presented in Table 5.28.

Table 5.28: Results for wine trade flows between South Africa and the SADC countries

Models	Variables	Exports		Imports		Trade	
		2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Period Impact Model	Constant	-	-	-185.70***	-185.70***	-	-
	$\ln Y_{ijt-1}$	0.38*	0.38*	-	-	0.36*	0.36*
	$\ln GDPPC_{it}$	1.38	1.38	21.58***	21.58***	-	-
	$\ln GDPPC_{it}$	0.32***	0.32***	-0.26	-0.26	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	2.78**	2.78**
	$REER_t$	-0.04	-0.04	3.50	3.50	0.09	0.09
	D0004 / D0509	-0.16	0.58***	-0.41	-4.06	0.13	0.37
	$\ln DIST_{ij}$	-	-	0.40	0.40	-	-
	Adjusted R^2	0.53	0.88	0.58	0.58	0.88	0.88
	Observations	60	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Yearly Impact Model	Constant	-72.56*	-72.56*	-114.92	-114.92	-	-
	$\ln Y_{ijt-1}$	0.55*	0.55*	-	-	0.47*	0.47*
	$\ln GDPPC_{it}$	9.72*	9.72*	13.87	13.87	-	-
	$\ln GDPPC_{it}$	0.25**	0.25**	0.03	0.03	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	3.85*	3.85*
	$REER_t$	0.50**	0.50**	3.04	3.04	0.15	0.15
	D00 / D05	-0.15	-0.44	-0.83	-3.74	0.20	0.60**
	D01 / D06	-0.36***	-1.49*	1.83	-0.76	-0.13	-0.22
	D02 / D07	-0.26	-1.62**	1.56	-2.31	0.07	-0.07
	D03 / D08	-0.27	-1.86**	1.88	-3.27	0.08	-0.17
	D04 / D09	-0.60	-1.44**	-0.49	-2.24	0.16	-0.03
	$\ln DIST_{ij}$	-0.37**	-0.37**	-0.77	-0.77	-	-
	Adjusted R^2	0.57	0.84	0.58	0.58	0.90	0.90
	Observations	60	90	90	90	90	90
	Cross-Sections	6	6	6	6	6	6
Trade Flow Direction Model	Constant	-	-	-	-	-	-
	$\ln Y_{ijt-1}$	0.30*	0.30*	0.13*	0.13*	0.50*	0.50*
	$\ln GDPPC_{it}$	3.58	3.58	4.40	4.40	-	-
	$\ln GDPPC_{it}$	0.32	0.32	1.62**	1.62**	-	-
	$\ln GDPPC_{ijt}$	-	-	-	-	3.95*	3.95*
	$REER_t$	-1.19*	-1.19*	1.95*	1.95*	0.39***	0.39***
	PTA_{yes}	-1.20***	0.20	-2.31*	0.53	-0.15	-0.04
	PTA_{no}	-0.73**	1.05**	-1.45*	0.93**	-0.47***	0.39**
	$\ln DIST_{ij}$	-	-	-	-	-	-
	Adjusted R^2	0.74	0.74	0.75	0.75	0.87	0.87
	Observations	1530	1530	675	675	660	660
	Cross-Sections	102	102	45	45	44	44

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively

Source: Author's calculations

5.6.7.1 Wine exports from South Africa to the SADC countries

The results show that wine exports from South Africa to the SADC countries had significantly increased by 0.58% during the implementation of the SADC Trade Protocol over the period 2005–2009. Surprising, on an annual basis South Africa's wine exports to the SADC countries had significantly declined by 1.49% in 2006, 1.62% in 2007, 1.86% in 2008, and 1.44% in 2009. However, the implementation of the SADC Trade Protocol had no joint effects on South Africa's wine exports to the SADC countries over the period 2004–2004, but there was a significant decrease of 0.36% that occurred in 2001. On average, 0.73% of South Africa's wine exports destined for the SADC market were diverted to other wine trading partners of South Africa over the period 2000–2004. The results show no proof of creation in South Africa's wine exports market in the SADC countries or diversion of South Africa's wine exports destined for the SADC market to other South African wine trading partners during the period 2005–2009.

The results for the average actual and potential wine exports from South Africa to the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.34** in log values, and the dollar values are presented in **Appendix 5EN**. The results show that South Africa's wine exporters had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine exports in Mauritius, Mozambique and Tanzania; but had under-scored or underachieved in Malawi, Zambia and Zimbabwe over the period 2000–2004. Similarly, over the period 2005–2009 South Africa's wine exporters outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine exports in Mauritius, Tanzania, and Zambia, whereas they under-scored or underachieved in Malawi, Mozambique and Zimbabwe.

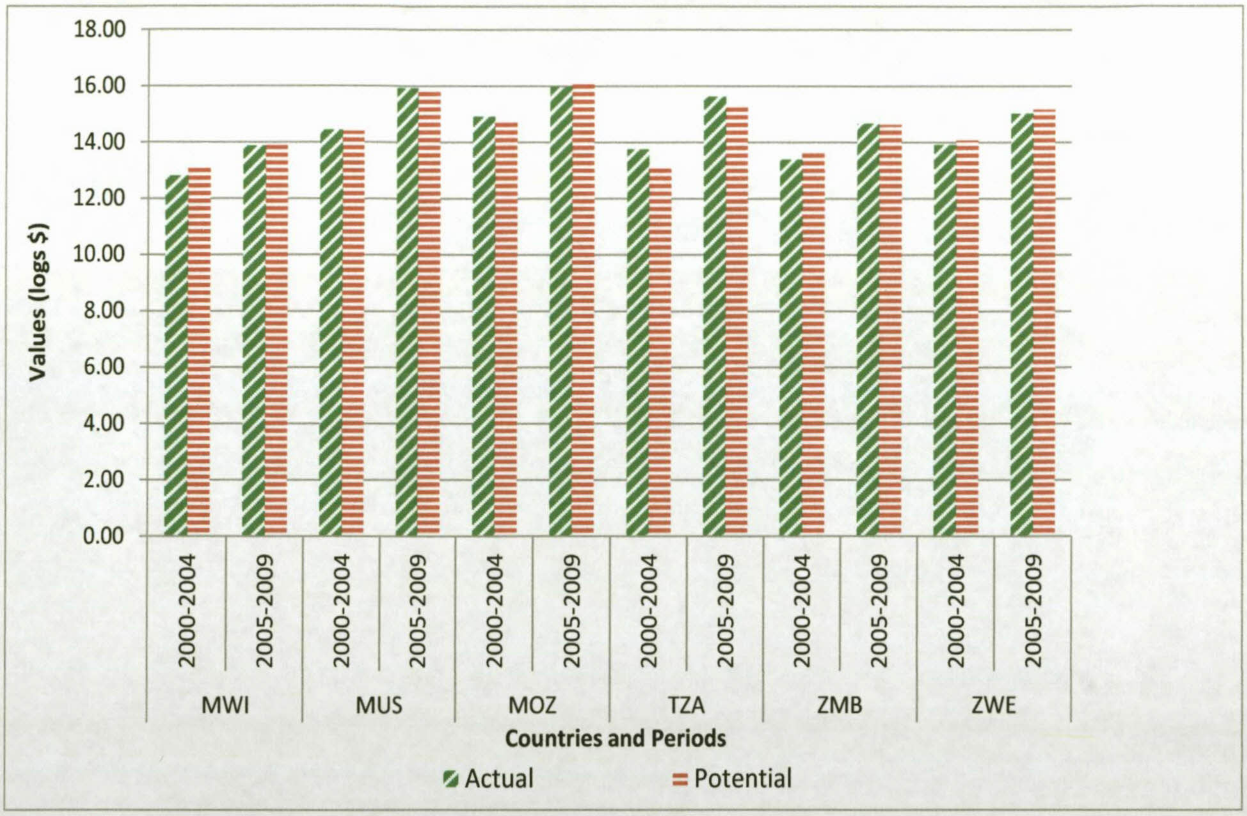

Figure 5.34: Average actual and potential value of wine exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009

5.6.7.2 Wine imports from the SADC countries to South Africa

The results show that the implementation of the SADC Trade Protocol had no effects on the wine imports from the SADC countries to South Africa in either period. The implementation of the SADC Trade Protocol during the period 2000–2004 had led to the diversion 1.45% of South Africa's wine import market from the SADC countries to other South African wine trading partners. However, for the period 2005–2009 the results show no proof of creation of South Africa's wine import market from the SADC countries or diversion of South Africa's wine import market from the SADC countries to other South African wine trading partners owing to the implementation of the SADC Trade Protocol.

The results for the average actual and potential wine imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.35** above in log values, and the dollar values are presented in **Appendix 5EQ**. The results show that South Africa's wine importers had outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine imports from Mauritius and Zimbabwe; but had under-scored or underachieved South Africa's wine imports from Malawi and Zambia over the period 2000–2004. For the period 2005–2009, South Africa's wine importers outperformed and exhausted the estimated potential capacity for the absorption of South Africa's wine imports from Malawi and Mauritius but they under-scored or underachieved South Africa's wine imports from Mozambique, Tanzania and Zimbabwe.

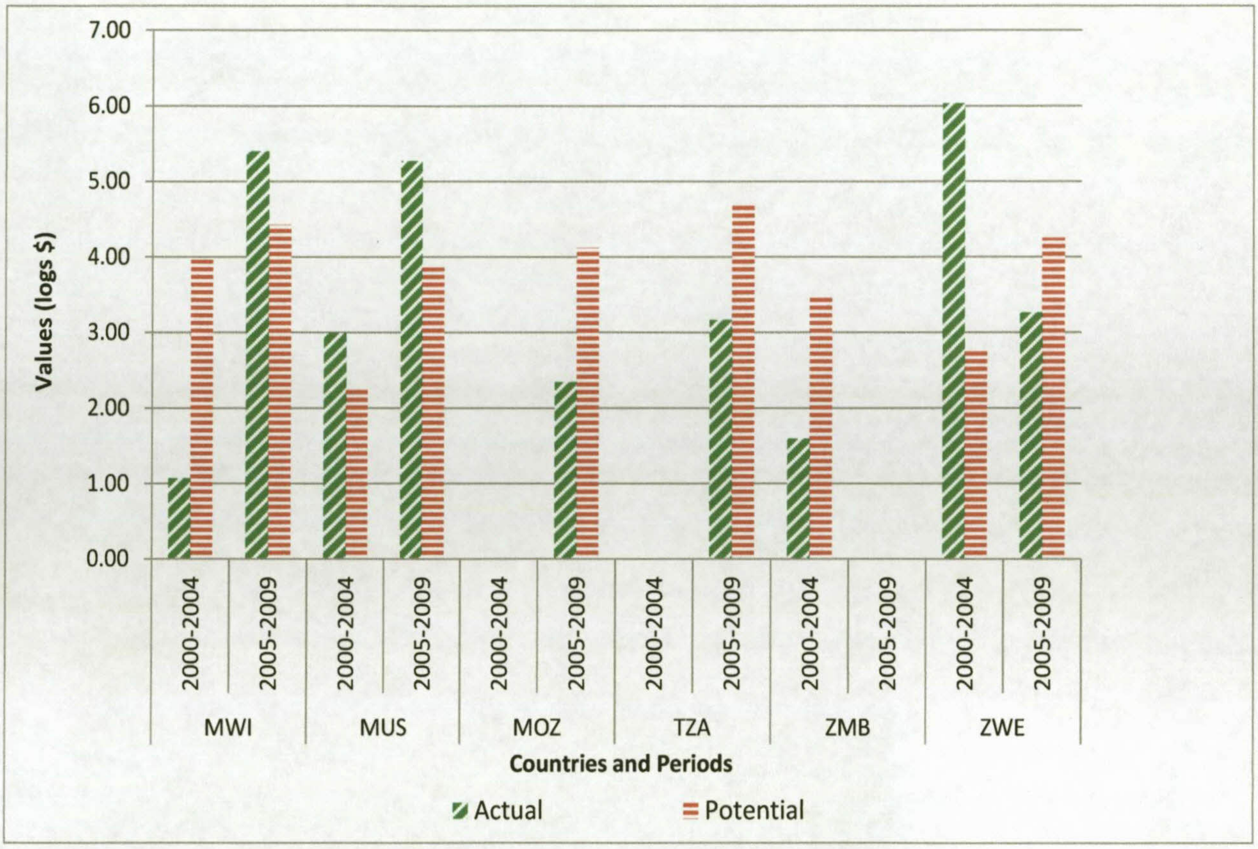

Figure 5.35: Average actual and potential value of wine imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009

5.6.7.3 Wine trade (imports plus exports) between South Africa and the SADC countries

The results show that the implementation of the SADC Trade Protocol had no joint period effects on total wine trade between South Africa and the SADC countries in either period, but a significant increase of total wine trade between South Africa and the SADC countries was observed in 2005 by 0.6%. On average, the implementation of the SADC Trade Protocol led to the diversion of 0.65% of total wine trade between South Africa and the SADC countries to either South Africa's other wine trading partners or to the SADC countries' other wine trading partners over the period 2000–2004. The results for the average actual and potential total wine trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 are presented in **Figure 5.36** in log values, and the dollar values are presented in **Appendix 5ET**.

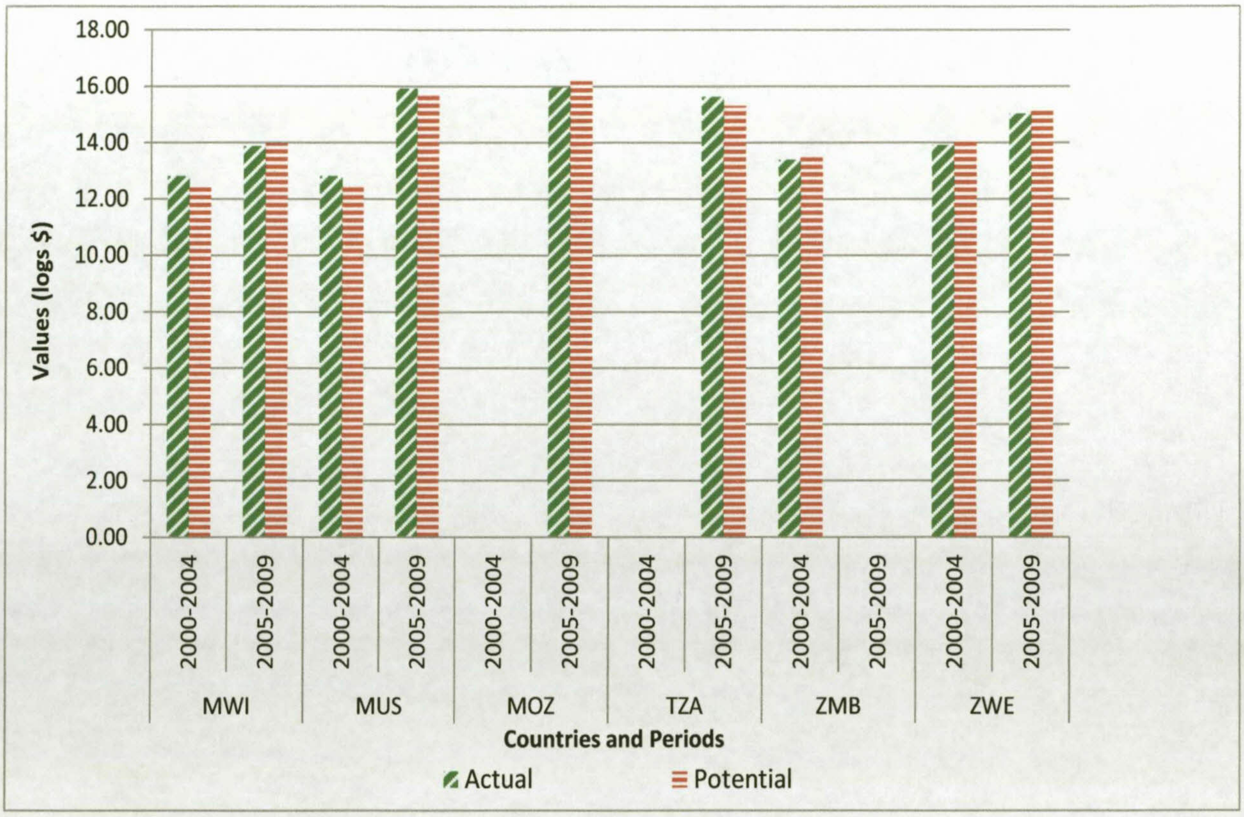

Figure 5.36: Average actual and potential value of wine trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009

The results show that South Africa's wine traders (importers and exporters) operating between South Africa and the SADC countries had outperformed and exhausted the estimated potential capacity for the absorption of total wine trade in the South Africa-Malawi market; but under-scored or underachieved in the South Africa-Mauritius, South Africa-Zambia and South Africa-Zimbabwe markets over the period 2000–2004. For the period 2005–2009, South Africa's wine traders (importers and exporters) operating between South Africa and the SADC countries had outperformed and exhausted the estimated potential capacity for the absorption of total wine trade in the South Africa-Mauritius and South Africa-Tanzania markets; whereas they had under-scored or underachieved in the South Africa-Malawi, South Africa-Mozambique and South Africa-Zimbabwe markets.

5.7 The response of selected agricultural trade flows between South Africa and ROW countries to the implementation EU-SA TDCA and SADC Trade Protocol

This section discusses various responses of total agricultural trade flows and the selected agricultural products trade flows between South Africa and the ROW countries (non-EU and non-SADC countries) for the periods 2000–2004 and 2005–2009. During these periods, the EU-SA TDCA and the SADC Trade Protocol were implemented and therefore this section reports on how South Africa's agricultural trade flows with non-EU and non-SADC countries performed, given that during these periods South Africa's agricultural trade flows were given preferential access in the EU and SADC markets through tariff phase-down schedules and in-quota tariff preferences. Therefore, this section will examine the datasets of all the trade flows (i.e. exports, imports and total trade) of total agriculture and all the selected agricultural products between South Africa and the ROW countries.

5.7.1 Aggregate agricultural trade flows between South Africa and the ROW countries

The results for all agricultural trade flows (exports, imports and trade) between South Africa and the ROW countries are presented in Table 5.29 below. The results show that, during the period 2000–2004, South Africa's total agricultural exports to the ROW countries had significantly declined by 0.48%, and on an annual basis significant decreases occurred in all years as follows: 0.8% in 2000, 0.85% in 2001, 1.49% in 2002, 0.81% in 2003, and 1.28% in 2004. However, during the period 2005–2009, South Africa's total agricultural exports to the ROW countries had significantly increased by 0.59%.

Surprisingly, on an annual basis the results provide a contrasting picture as there were significant declines in South Africa's total agricultural exports to the ROW countries that occurred in 2006, 2007, 2008 and 2009 by 1.07%, 1.3%, 1.32% and 1.18% respectively. There were no joint period effects on South Africa's total agricultural imports from the ROW countries in either period, but there were significant individual yearly effects for the period 2005–2009 that were observed in all years as follows: 2.02% in 2005, 3.16% in 2006, 3.62% in 2007, 4.04% in 2008, and 3.27% in 2009.

Table 5.29: Results for agricultural trade flows between South Africa and the ROW countries

Variables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
lnY_{ijt-1}	0.38*	0.38*	0.23*	0.23*	0.36*	0.36*	0.38*	0.38*	0.22*	0.22*	0.37*	0.37*
$lnGDPPC_{it}$	2.20	2.20	5.73**	5.73**	-	-	9.85*	9.85*	19.54*	19.54*	-	-
$lnGDPPC_{jt}$	0.02	0.02	0.81*	0.81*	-	-	0.02	0.02	0.81*	0.81*	-	-
$lnGDPPC_{ijt}$	-	-	-	-	0.45*	0.45*	-	-	-	-	0.46*	0.46*
$REER_t$	-0.59*	-0.59*	-0.37	-0.37	-0.54*	-0.54*	-0.12	-0.12	0.45	0.45	-0.52*	-0.52*
D0004 / D0509	-0.48**	0.59**	0.32	-0.31	0.25**	0.95*	-	-	-	-	-	-
D00 / D05	-	-	-	-	-	-	-0.80*	-0.29	0.29	-2.02**	0.09	1.10*
D01 / D06	-	-	-	-	-	-	-0.85*	-1.07**	0.24	-3.16*	0.13	0.78*
D02 / D07	-	-	-	-	-	-	-1.49*	-1.30**	0.23	-3.62*	0.30	0.82*
D03 / D08	-	-	-	-	-	-	-0.81**	-1.32**	0.62	-4.04*	0.47**	1.04*
D04 / D09	-	-	-	-	-	-	-1.28*	-1.18**	0.42	-3.27*	0.55*	1.00*
$lnDIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.82	0.82	0.72	0.72	0.86	0.86	0.82	0.82	0.72	0.72	0.86	0.86
Observations	1470	1470	1590	1590	1320	1320	1470	1470	1590	1590	1320	1320
Cross-Sections	98	98	106	106	88	88	98	98	106	106	88	88

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

The results also show that during the period 2000–2004 the total agricultural trade between South Africa and the ROW countries had significantly improved by 0.25% and on an annual basis significant increases occurred in 2003 and 2004 by 0.47% and 0.55% respectively. Similarly, for the period 2005–2009, the total agricultural trade between South Africa and the ROW countries had significantly improved by 0.95%, and on an annual basis significant increases occurred in all years as follows: 1.1% in 2005, 0.78% in 2006, 0.82% in 2007, 1.04% in 2008, and 1% in 2009.

5.7.2 Cheese trade flows between South Africa and the ROW countries

The results for all cheese trade flows (exports and imports) between South Africa and the ROW are presented in Table 5.30 below. The results showed that during the period 2005–2009 South Africa's cheese exports to the ROW countries had significantly increased by 3.41%. There were no joint period effects on South Africa's cheese imports from the ROW countries in either period, but there were significant negative individual annual effects over these periods. For example, cheese imports from the ROW countries had declined by 6.72%

and 8.64% in 2002 and 2004 respectively as well as by 8.1% and 12.97% in 2005 and 2009 respectively.

Table 5.30: Results for cheese trade flows between South Africa and the ROW countries

ariables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
onstant	-	-	-	-	-	-	-	-	-	-	-	-
Y_{iit-1}	0.41*	0.41*	0.31*	0.31*	-	-	0.40*	0.40*	0.33*	0.33*	-	-
$GDPPC_{it}$	-15.63**	-15.63**	20.75	20.75	-	-	-12.38	-12.38	48.33***	48.33***	-	-
$GDPPC_{it}$	2.63	2.63	-1.32	-1.32	-	-	2.75***	2.75***	-1.79	-1.79	-	-
$GDPPC_{iit}$	-	-	-	-	-	-	-	-	-	-	-	-
EER_t	-3.27*	-3.27*	4.08**	4.08**	-	-	-3.10*	-3.10*	5.49**	5.49**	-	-
0004 / D0509	-1.12	3.41**	-1.01	-4.24	-	-	-	-	-	-	-	-
00 / D05	-	-	-	-	-	-	-1.34	2.81	-2.84	-8.10***	-	-
01 / D06	-	-	-	-	-	-	-0.84	3.27	-4.17	-8.35	-	-
02 / D07	-	-	-	-	-	-	-1.64	2.64	-6.72***	-9.26	-	-
03 / D08	-	-	-	-	-	-	-1.52	2.67	-2.00	-11.36	-	-
04 / D09	-	-	-	-	-	-	-1.92	2.15	-8.64**	-12.97**	-	-
$DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
djusted R^2	0.59	0.59	0.60	0.60	-	-	0.59	0.59	0.61	0.61	-	-
bservations	300	300	135	135	-	-	300	300	135	135	-	-
ross-Sections	20	20	9	9	-	-	20	20	9	9	-	-

** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.7.3 Cut flowers trade flows between South Africa and the ROW countries

The results for all cut flowers trade flows (exports, imports and trade) between South Africa and the ROW are presented in Table 5.31 below. The results show that during the period 2000–2004 South Africa's total cut flower exports to the ROW countries had significantly declined by 1.14%, and on an annual basis significant decreases occurred in all years as follows: 1.36% in 2000, 2.385% in 2001, 2.58% in 2002, 1.97% in 2003, and 2.34% in 2004.

However, during the period 2005–2009 South Africa's cut flowers exports to the ROW countries had significantly increased by 1.96% but individual yearly effects were insignificant. There were no joint period effects on cut flowers imports and total cut flowers trade between South Africa and the ROW countries in either period, but there were significant negative individual annual effects observed in certain years in both periods. For example, South Africa's cut flowers imports from the ROW countries declined by 8.38% in 2007, whereas total cut flowers trade between South Africa and the ROW countries declined by 1.41%, 1.91% and 2.67% in 2000, 2001 and 2002 respectively.

Table 5.31: Results for cut flowers trade flows between South Africa and the ROW countries

Variables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
nY_{iit-1}	0.51*	0.51*	0.19**	0.19**	0.45*	0.45*	0.50*	0.50*	0.22*	0.22*	0.45*	0.45*
$nGDPPC_{it}$	-7.18**	-7.18**	-11.68	-11.68	-	-	-2.01	-2.01	21.24	21.24	-	-
$nGDPPC_{it}$	0.72	0.72	4.04***	4.04***	-	-	0.78	0.78	3.42	3.42	-	-
$nGDPPC_{iit}$	-	-	-	-	5.16***	5.16***	-	-	-	-	7.90*	7.90*
EER_{t}	-1.09**	-1.09**	0.14	0.14	0.99	0.99	-0.83	-0.83	2.11	2.11	1.23***	1.23***
)0004 / D0509	-1.14*	1.96*	-0.14	0.80	-1.05	-0.75	-	-	-	-	-	-
)00 / D05	-	-	-	-	-	-	-1.36*	1.24	-0.28	-4.03	-1.41***	-0.35
)01 / D06	-	-	-	-	-	-	-2.38*	1.14	0.52	-4.03	-1.91***	-1.06
)02 / D07	-	-	-	-	-	-	-2.58**	1.10	-0.72	-8.38***	-2.67***	-2.06**
)03 / D08	-	-	-	-	-	-	-1.97**	0.55	-0.21	-7.19	-1.38	-1.43
)04 / D09	-	-	-	-	-	-	-2.34**	0.30	2.10	-6.29	-0.98	-2.34*
$nDIST_{ii}$	-	-	-	-	-	-	-	-	-	-	-	-
djusted R^2	0.75	0.75	0.52	0.52	0.73	0.73	0.75	0.75	0.53	0.53	0.74	0.74
)bservations	540	540	195	195	135	135	540	540	195	195	135	135
Cross-Sections	36	36	13	13	9	9	36	36	13	13	9	9

, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.7.4 Frozen fruits and nuts trade flows between South Africa and the ROW countries

The results for all frozen fruits and nuts trade flows (exports and imports) between South Africa and the ROW are presented in Table 5.32 below. The results show that there were no joint period effects or individual yearly effects on all frozen fruits and nuts trade flows between South Africa and the ROW countries in either period.

Table 5.32: Results for frozen fruits and nuts trade flows between South Africa and the ROW countries

Variables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
$\ln Y_{iit-1}$	0.43*	0.43*	0.24*	0.24*	-	-	0.43*	0.43*	0.25*	0.25*	-	-
$\ln GDPPC_{it}$	7.16	7.16	-13.89	-13.89	-	-	2.57	2.57	-39.46	-39.46	-	-
$\ln GDPPC_{jt}$	2.75	2.75	8.45*	8.45*	-	-	2.73	2.73	8.66*	8.66*	-	-
$\ln GDPPC_{ijt}$	-	-	-	-	-	-	-	-	-	-	-	-
$REER_t$	-1.58	-1.58	1.35	1.35	-	-	-1.93	-1.93	0.07	0.07	-	-
D0004 / D0509	1.09	-0.70	0.35	0.54	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-	-	0.98	-0.53	0.66	5.59	-	-
D01 / D06	-	-	-	-	-	-	3.37	0.49	-1.22	2.24	-	-
D02 / D07	-	-	-	-	-	-	5.02	0.48	-0.16	7.31	-	-
D03 / D08	-	-	-	-	-	-	2.10	-0.47	-3.60	8.33	-	-
D04 / D09	-	-	-	-	-	-	-1.77	1.38	-1.73	6.01	-	-
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.53	0.53	0.36	0.36	-	-	0.52	0.52	0.38	0.38	-	-
Observations	135	135	210	210	-	-	135	135	210	210	-	-
Cross-Sections	9	9	14	14	-	-	9	9	14	14	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.7.5 Preserved fruits and nuts trade flows between South Africa and the ROW countries

The results for all preserved fruits and nuts trade flows (exports, imports and trade) between South Africa and the ROW are presented in Table 5.33 below. The results show that the total preserved fruits and nuts trade between South Africa and the ROW countries had significantly increased by 0.69% during the period 2000–2004 and by 0.75% during the period 2005–2009. Furthermore, on an annual basis the significant increases occurred in 2004 by 1.33%, in 2005 by 0.93%, in 2006 by 0.74%, in 2007 by 0.67% and in 2008 by 0.89%.

However, there were no joint period effects on either preserved fruits and nuts exports or imports between South Africa and the ROW countries for both periods, but there were significant positive and negative individual yearly effects that occurred in both periods. For example, in 2007 and 2009 South Africa's preserved fruits and nuts exports to the ROW countries increased by 3.73% and 3.5% respectively. On the other hand, South Africa's preserved fruits and nuts imports from the ROW countries declined by 3.59% and 5.8% in 2001 and 2002 respectively.

Table 5.33: Results for preserved fruits and nuts trade flows between South Africa and the ROW countries

ariables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
onstant	-	-	-	-	-	-	-	-	-	-	-	-
nY_{iit-1}	0.46*	0.46*	0.20*	0.20*	0.17*	0.17*	0.45*	0.45*	0.20*	0.20*	0.17*	0.17*
$nGDPPC_{it}$	-7.24	-7.24	15.86***	15.86***	-	-	11.87	11.87	35.25**	35.25**	-	-
$nGDPPC_{jt}$	1.80***	1.80***	0.34	0.34	-	-	1.73	1.73	0.15	0.15	-	-
$nGDPPC_{ijt}$	-	-	-	-	1.76	1.76	-	-	-	-	1.89	1.89
EER_t	-0.94	-0.94	-1.20	-1.20	-0.16	-0.16	0.21	0.21	-0.09	-0.09	-0.15	-0.15
00004 / D0509	-0.56	1.03	-0.28	-0.22	0.69***	0.75*	-	-	-	-	-	-
00 / D05 –	-	-	-	-	-	-	-0.49	-1.28	-1.18	-2.72	0.47	0.93*
01 / D06	-	-	-	-	-	-	0.61	-2.73	-3.59**	-3.83	0.04	0.74***
02 / D07	-	-	-	-	-	-	1.03	- 3.73***	-5.80**	-4.80	0.54	0.67***
03 / D08	-	-	-	-	-	-	1.13	-3.68	-2.03	-5.30	1.12	0.89**
04 / D09	-	-	-	-	-	-	0.97	- 3.50***	-3.39	-4.63	1.33***	0.35
$nDIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
djusted R^2	0.63	0.63	0.53	0.53	0.78	0.78	0.64	0.64	0.53	0.53	0.78	0.78
bservations	960	960	390	390	300	300	960	960	390	390	300	300
ross-Sections	64	64	26	26	20	20	64	64	26	26	20	20

, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.7.6 Fruits and vegetable juices trade flows between South Africa and the ROW countries

The final results for all fruits and vegetable juices trade flows (exports, imports and trade) between South Africa and the ROW are presented in Table 5.34 below. The results show that the total fruits and vegetable juices trade between South Africa and the ROW countries had significantly increased by 0.81% during the period 2000–2004 and, on an annual basis the significant increases occurred in 2000, 2001, 2003 and 2004 by 0.95%, 2.22%, 2.23% and 1.43% respectively.

Similarly, the results also show that the total fruits and vegetable juices trade between South Africa and the ROW countries had significantly increased by 0.66% during the period 2005–2009 and, on an annual basis significant increases occurred in 2005 by 0.63% and by 0.93% in 2008 and 2009. However, there were no joint period effects on both fruits and vegetable juices exports and imports between South Africa and the ROW countries in either period. However, on an annual basis there were significant increases of South Africa's fruits and vegetable juices exports to the ROW countries in 2000, 2001, 2002 and 2004 by 1.06%, 1.34%, 3.22% and 2.51% respectively.

Table 5.34: Results for fruits and vegetable juices trade flows between South Africa and the ROW countries

Variables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.30*	0.30*	0.20*	0.20*	0.21*	0.21*	0.29*	0.29*	0.20*	0.20*	0.21*	0.21*
$\ln GDPPC_{it}$	5.43	5.43	15.86***	15.86***	-	-	16.03***	16.03***	35.25**	35.25**	-	-
$\ln GDPPC_{jt}$	3.16*	3.16*	0.34	0.34	-	-	3.10*	3.10*	0.15	0.15	-	-
$\ln GDPPC_{ijt}$	-	-	-	-	4.74*	4.74*	-	-	-	-	4.52*	4.52*
$REER_t$	-0.62	-0.62	-1.20	-1.20	-0.25	-0.25	0.01	0.01	-0.09	-0.09	-0.21	-0.21
D0004 / D0509	0.62	-0.09	-0.40	-0.22	0.81***	0.66**	-	-	-	-	-	-
D00 / D05	-	-	-	-	-	-	1.06***	-1.44	-0.63	-2.72	0.95**	0.63***
D01 / D06	-	-	-	-	-	-	1.34***	-2.11	-1.20	-3.83	0.71	0.52
D02 / D07	-	-	-	-	-	-	3.22*	-2.63	-2.02	-4.80	2.22*	0.56
D03 / D08	-	-	-	-	-	-	2.51*	-2.80	1.22	-5.30	2.23*	0.93**
D04 / D09	-	-	-	-	-	-	0.97	-2.61	1.45	-4.63	1.43**	0.93**
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.61	0.61	0.53	0.53	0.73	0.73	0.61	0.61	0.53	0.53	0.73	0.73
Observations	990	990	360	360	345	345	990	990	360	360	345	345
Cross-Sections	66	66	24	24	23	23	66	66	24	24	23	23

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.7.7 Wine trade flows between South Africa and the ROW countries

The results for all wine trade flows (exports, imports and trade) between South Africa and the ROW are presented in Table 5.35 below. The results show that during the period 2000–2004 South Africa's wine exports to the ROW countries had significantly declined by 0.92%. On an annual basis, these significant decreases occurred in all years as follows: 1.22% in 2000, 2.4% in 2001, 2.98% in 2002, 1.75% in 2003, and 2.77% in 2004. However, during the period 2005–2009 South Africa's wine exports to the ROW countries had significantly increased by 1.15%. Surprisingly, on an annual basis the results provide a contrasting picture as there were significant declines in South Africa's wine exports to the ROW countries that occurred in 2008 and 2009 by 3.12% and 3.04% respectively.

Furthermore, results also show that South Africa's wine imports from the ROW countries had significantly declined by 1.57% over the period 2000–2004 and on an annual basis, this significant decrease occurred only in 2000 by 1.34%. Similarly, during the period 2000–

2004, the total wine trade between South Africa and the ROW countries had significantly declined by 1.57% and on an annual basis this significant decrease occurred only in 2000 by 0.93%. However, there were significant joint period effects and individual yearly effects on both South Africa's wine imports from the ROW countries and the total wine trade between South Africa and the ROW countries during the period 2005–2009.

Table 5.35: Results for wine trade flows between South Africa and the Rest of World

Variables	Period Impact Model						Yearly Impact Model					
	Exports		Imports		Trade		Exports		Imports		Trade	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
lnY_{ijt-1}	0.30*	0.30*	0.21*	0.21*	0.48*	0.48*	0.30*	0.30*	0.21*	0.21*	0.47*	0.47*
$lnGDPPC_{it}$	3.52	3.52	4.26	4.26	-	-	19.54*	19.54*	13.40	13.40	-	-
$lnGDPPC_{it}$	0.26	0.26	0.79	0.79	-	-	0.28	0.28	0.68	0.68	-	-
$lnGDPPC_{ijt}$	-	-	-	-	4.29*	4.29*	-	-	-	-	4.13*	4.13*
$REER_t$	-1.35*	-1.35*	2.45*	2.45*	0.54	0.54	-0.42	-0.42	2.98*	2.98*	0.56	0.56
D0004 / D0509	-0.92**	1.15***	-1.57**	-0.76	-0.86***	0.40	-	-	-	-	-	-
D00 / D05	-	-	-	-	-	-	-1.22*	-0.92	-1.34***	-2.03	-0.93***	0.34
D01 / D06	-	-	-	-	-	-	-2.40*	-1.86	-0.91	-2.41	-0.66	0.37
D02 / D07	-	-	-	-	-	-	-2.98*	-2.26	0.34	-3.06	0.89	0.52
D03 / D08	-	-	-	-	-	-	-1.75**	-3.12**	1.00	-3.33	0.18	0.57
D04 / D09	-	-	-	-	-	-	-2.77*	-3.04**	-0.48	-2.51	0.63	0.41
$lnDIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.67	0.67	0.69	0.69	0.80	0.80	0.67	0.67	0.69	0.69	0.80	0.80
Observations	1215	1215	360	360	345	345	1215	1215	360	360	345	345
Cross-Sections	81	81	24	24	23	23	81	81	24	24	23	23

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively.

Source: Author's calculations

5.8 Summary

This chapter has presented empirical results of the ex-post impacts of the implementation of the trade agreements under analysis, namely WTO AoA, EU-SA TDCA and the SADC Trade Protocol, on agricultural trade flows between South Africa and its agricultural trading partners. Various statistical tests were undertaken to select the suitable models for the datasets of total agricultural and selected agricultural products trade flows between South Africa and its agricultural trading partners. In total, 189 models were selected, of which 161 were dynamic models (which comprised 152 FE, 2 RE and 7 OLS estimators) and 28 were static models (which comprised 14 FE and 14 RE estimators). The higher number of selected dynamic models with FE estimators justified the importance of dynamics as well as the importance of the unobserved country-pair specific effects in trade analysis. The per capita

GDPs of South Africa and of its trading partners, the real effective exchange rates and distance have also played a significant and expected role in influencing agricultural trade flows between South Africa and its agricultural trading partners.

The agricultural trade flows between South Africa and its agricultural trade partners have responded positively to the implementation of the WTO AoA. However, the implementation of the EU-SA TDCA and SADC Trade Protocol during the first five years (for the period 2000–2004) have not delivered the expected results, as some of the agricultural trade flows between South Africa and EU countries as well as between South Africa and SADC countries were negatively affected. The majority of agricultural trade flows between South Africa and EU countries as well as between South Africa and SADC countries were not affected. Similarly, the majority of agricultural trade flows between South Africa and EU countries as well as between South Africa and SADC countries were not affected during the second five-year term (for the period 2005–2009), but there were some improvements owing to the significant positive effects of the EU-SA TDCA implementation on three agricultural trade flows (i.e. total agricultural trade, total cut flowers trade and total preserved fruits and nuts trade) as well as the significant positive effects of the SADC Trade Protocol implementation on four agricultural trade flows (i.e. total agricultural exports, total agricultural trade, total cut flowers trade and total fruits and vegetable juices trade). Surprisingly, the number of agricultural trade flows between South Africa and ROW countries that have improved significantly for both periods were greater than those of the EU and SADC countries, even though ROW countries did not have trade agreements with South Africa.

The implementation of the EU-SA TDCA and SADC Trade Protocol had created room for potential increases in all agricultural trade flows between South Africa and EU countries, as well as between South Africa and SADC countries, for both periods under review. Despite this possibility, some increases were instead diverted to the other markets, more especially during the period 2000–2004. On average, during the implementation of the EU-SA TDCA for the period 2000–2004, 0.44% of agricultural exports, 0.96% of cut flowers exports and 0.77% of wine exports from South Africa ordinarily destined for EU countries were diverted to other markets. Furthermore, 2.01% of South Africa's wine imports ordinarily sourced from EU countries came from South Africa's other wine trading partners. Moreover, 0.73% of the total wine trade from the South Africa-EU markets was diverted to either the South Africa and other wine trading partner market or to the EU and other wine trading partner market. The implementation of the SADC Trade Protocol also led to the diversion of agricultural exports (0.43%), cut flowers exports (0.93%), total cut flowers trade (0.92%), wine exports (0.73%), wine imports (1.45%) and total wine trade (0.35%) during the period 2000–2004.

However, the implementation of the EU-SA TDCA and SADC Trade Protocol during the period 2005–2009 led to trade creation in some of the agricultural trade flows between South Africa and the EU countries, as well as between South Africa and the SADC countries. With regard to the EU-SA TDCA implementation, trade creation was observed in total agricultural exports, total agricultural trade, total preserved fruits and nuts trade and total wine trade. Similarly, for the SADC Trade Protocol implementation, trade creation was also observed in total agricultural trade, cut flowers exports and preserved fruits and nuts exports.

These findings have clearly shown that tariff reductions alone are not a panacea for improving agricultural trade between South Africa and its major trading partners, given the fact that the EU-SA TDCA and the SADC Trade Protocol were mainly characterised by tariff phase down schedules. These findings are supported by the underutilisation of preferential tariff rate quotas under the EU-SA TDCA, as shown in Table 5.9, where some of the qualified agricultural products' tariff rates were discounted by 50% and others were zero-rated (i.e. 100% discount).

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The agricultural sector in South Africa had been characterised during the apartheid era by trade distorting measures, such as quantitative restrictions, price controls, subsidies directly related to production quantities, and the like. During the early 1990s, South Africa embarked on a process of trade liberalisation policy reform with an objective of improving trade with its trading partners in order to improve economic growth, generate employment, improve welfare gains, and gain other benefits. In the process, South Africa substantially liberalised the economy through reform of the import regime and deregulation of the agricultural sector. South Africa's commitment to move from a protective to a liberal trade regime in the agricultural sector has been witnessed by its trade diplomacy engagements with the international community through commitments to the globalisation policies in the context of multilateralisation, bilateralisation and regionalisation processes.

At the multilateral level, South Africa has successfully implemented its commitments as negotiated in terms of the World Trade Organisation Agreement on Agriculture (WTO AoA) during the Uruguay Round (UR) of the General Agreement on Tariffs and Trade (GATT) negotiations. At the bilateral level, South Africa has signed a Preferential Trade Agreement (PTA) with the European Union (EU) called the Trade, Development and Co-operation Agreement (TDCA) (better known as the EU-SA TDCA) which also includes a Free Trade Agreement. At the regional level, South Africa is a member of the Southern African Customs Union (SACU) and Southern African Development Community (SADC). SACU member states have signed a Protocol on Trade and a Regional Trade Agreement (RTA) with non-SACU SADC countries to establish a Free Trade Agreement (FTA) in the SADC region.

Some of the agricultural products which have been examined have been given certain preferential treatments both reciprocally and non-reciprocally, such as in-quota tariff rates and annual tariff phase-down, effective from implementation of the abovementioned trade agreements. Given the fact that agricultural trade liberalisation was part of the trade liberalisation strategy of South Africa, it is necessary to analyse the impacts of these trade agreements on the agricultural trade between South Africa and its trading partners. Therefore, this study has endeavoured to assess the impacts of these multilateral, bilateral and regional trade agreements which South Africa has signed (WTO AoA, EU-SA TDCA and SADC Trade Protocol) on agricultural trade flows between South Africa and its trading partners. These impacts have been examined at both the aggregate level (total agricultural imports, exports and total trade) and the disaggregate or product level (imports, exports and total trade of selected agricultural products which benefited from the preferential treatments under these agreements).

The overall objective of this study has been to measure the impacts of these trade agreements on the agricultural trade between South Africa and its trading partners. The specific objectives were as follows:

(i) to provide an overview of the trade agreements that have implications for agricultural sector trade in South Africa;

(ii) to review the impacts of agricultural trade liberalisation policies in the context of the trade agreements on the economic growth and welfare of South Africa and the Southern Africa region as well as of its trading partners;

(iii) to determine whether the trade agreements have a significant influence on agricultural trade between South Africa and its trading counterparts;

(iv) to investigate whether the trade agreements have caused trade creation or trade diversion; and

(v) to estimate trade potentials between South Africa and its trading partners owing to the trade agreements.

Several studies have attempted to answer the above questions, but with limited scope. Most of the South African case studies have focused on the impacts of trade agreements on economic growth and welfare, but have concentrated on a single agreement without comparing it to the others which also affect trade between South Africa and its counterparts. A review of the literature has revealed that only very limited research has been conducted on this issue over recent years. In addition, the research efforts were mainly conducted early during the implementation phases of the various agreements and were not always in agreement on the potential impacts the agreements might have.

After reviewing various models that are used to analyse the impact of trade policies and/or trade agreements, the gravity model was selected in view of the types of research questions that this study attempts to answer. The gravity model was previously used by researchers to analyse the impact of the factors influencing trade performance in order to examine whether a trade agreement led to trade creation or trade diversion between trading partners, as well as to estimate trade potentials resulting from the implementation of such trade agreements.

6.2 Empirical results of this study

The results of this study are divided into three sections as follows:

- the results of the suitable model selection exercise for the agricultural trade flows (exports, imports and total trade) between SA and its agricultural trading partners;
- the results of the effects of the control explanatory variables on agricultural trade flows between SA and its agricultural trading partners; and
- the results of the impacts of the trade agreements on the agricultural trade flows between SA and its agricultural trading partners.

The main findings are summarised below in the following subsections.

6.2.1 Selected suitable models for all the agricultural trade flows datasets

Various statistical tests were undertaken to select the suitable models for the datasets of total agricultural and selected agricultural products trade flows between South Africa and its agricultural trading partners. After the statistical tests were undertaken, the results have shown that 189 models, in total, were found to be efficient and suitable for the datasets of the selected agricultural trade flows, of which 161 were dynamic models and 28 were static models. Of the selected dynamic models; 152 FE, 2 RE and 7 pooled OLS estimators were found to be efficient and suitable; while 14 FE and 14 RE estimators were found to be efficient and suitable for the selected static models. The dominance of the dynamic models over static models has shown that past trade is the predictor for current trade. The dominance of FE estimators over RE and OLS estimators has indicated that the joint country-pair specific effects were not important in determining the majority of agricultural trade flows between SA and its agricultural trading partners.

6.2.2 Effects of the control explanatory variables on agricultural trade flows

The control explanatory variables that were included when estimating models are: per capita Gross Domestic Products of South Africa and of its trading partners (GDPPCs); real effective exchange rates (REER); and geographic distances between South Africa and its trading partners (DIST). The results indicated that 56 agricultural trade flows between South Africa and its agricultural trading partners were positively affected by the income and 5 of them were negatively affected by income. These results showed that the majority of agricultural trade flows between SA and its agricultural trading partners were elastic to income. This means that there were significant positive correlations between income and agricultural trade flows between SA and its agricultural trading partners.

Regarding the exchange rates effects, the results showed that the real effective exchange rates had positively affected 13 agricultural trade flows between South Africa and its agricultural trading partners, which were mainly dominated by import flows. Furthermore, the results showed that the real effective exchange rates had negatively affected 11 agricultural trade flows between South Africa and its agricultural trading partners, which were mainly dominated by export flows. These results have shown that the effects of the real effective exchange rates on the majority of these agricultural trade flows were as expected because the exchange value of the South African currency (Rand) had been appreciating against a basket of currencies in real terms during the period under review. As a result, it was cheaper for South Africa to import such agricultural products from the world markets whereas South Africa's exports of such agricultural products were more expensive in the world markets owing to the stronger Rand.

With respect to distance, the results showed that distance had negatively affected 8 agricultural trade flows between South Africa and its agricultural trading partners, whereas only 1 agricultural trade flow was positively affected. These results were in line with the expectations because distances between trading partners are regarded as proxies for transportation costs, proxies for risks associated with the quality of some of the perishable goods and for the cost of personal contact between managers and customers. In this case, countries with short distances between each other are expected to trade more than those which are far apart, owing to lower transaction costs. Given the geographic location of South Africa in relation to its major trading partners, as well as the fact that most of the agricultural products traded are perishable, it was expected that distance would have negative effects on South Africa's exports and imports of agricultural products.

6.2.3 Impacts of trade agreements on agricultural trade flows

This study has analysed the ex-post impact of the implementation of the WTO AoA, EU-SA TDCA and SADC Trade Protocol on agricultural trade flows between South Africa and its agricultural trading partners. The study has further analysed the responses of agricultural trade flows between South Africa and ROW (non-EU and non-SADC) countries during the implementation of the EU-SA TDCA and the SADC Trade Protocol in order to compare them with the responses of agricultural trade flows between South Africa and EU countries as well as the SADC countries.

The results are presented as follows: Firstly, the joint period effects and the individual yearly effects are shown for the impacts of all trade agreements on agricultural trade flows between South Africa and its agricultural trading partners (including the ROW countries even though they had no trade agreement with South Africa). For the WTO AoA impact analysis, the results cover the period 1995–1999, whereas for the EU-SA TDCA and SADC Trade Protocol impacts analysis, the results cover the periods 2000–2004 and 2005–2009. Similarly, for the ROW response analysis, the results cover the periods 2000–2004 and 2005–2009 as the study would benefit by comparing the response of the agricultural trade flows between South Africa and ROW countries with those between the EU and SADC countries.

Secondly, for the EU-SA TDCA and the SADC Trade Protocol, the results go further by reporting whether the implementation of these trade agreements have created or diverted the agricultural trade flows between South Africa and the EU as well as between South Africa and SADC countries for the periods 2000–2004 and 2005–2009. Finally, the results report the agricultural trade flows' potential estimates arising from the implementation of the EU-SA TDCA and SADC Trade Protocol, as well as showing whether the capacity for the absorption of agricultural trade flows between South Africa and the EU countries and South Africa and SADC countries was exhausted or underachieved for the periods 2000–2004 and 2005–2009.

6.2.3.1 Impact of the implementation of the WTO AoA

The detailed results of the exchange rates effects on the agricultural trade flows are presented in **Appendix 6.A** and a summarised version of the results is reported in Table 6.1 below. The implementation of the WTO AoA during the period 1995–1999 had significantly improved four agricultural exports flows from South Africa to its agricultural trading partners, both periodically and on annual basis, namely: the total agricultural exports, cheese exports, cut flowers exports and wine exports. Furthermore, one import trade flow (South Africa's wine imports), two total trade flows, both periodically and annually (total cheese and wine trade flows) and two total trade flows on annual basis only (total cheese trade and total fruits and nuts trade) were positively affected by the implementation of WTO's AoA.

Table 6.1: Impact results for the implementation of WTO AoA on agricultural trade flows between South Africa and its worldwide agricultural trading partners

Impact types	Exports (X)	Imports (M)	Total Trade (T = X+ M)	TOTAL
Positive joint period effects	4	1	1	**6**
Negative joint period effects	0	0	1	**1**
No joint period effects	3	6	4	**13**
Positive individual yearly effects	4	1	3	**8**
Negative individual yearly effects	0	2	2	**4**
No individual yearly effects	3	4	2	**9**

Source: Author's calculations

However, two trade flows (total agricultural and total fruits and vegetable juices) as well as two import flows (cut flowers and preserved fruits and nuts on annual basis only) were negatively affected during the WTO AoA implementation. The implementation of the WTO AoA had no joint periodic and individual effects on nine agricultural trade flows between South Africa and its agricultural trading partners.

6.2.3.2 Impact of the implementation of the EU-SA TDCA

The detailed results of the selected model for all the agricultural trade flows datasets are presented in **Appendix 6.B** and a summarised version of the results is reported in Table 6.2 below. The results show that during the implementation of the EU-SA TDCA over the period 2000–2004, four export flows from South Africa to the EU countries suffered and these are the total agricultural exports, cheese exports and frozen fruits and nuts exports (both periodically and on annual basis) and wine exports (only periodically). Similarly, one trade flow (total cut flowers trade) and one import flow (wines imports) had also decreased significantly during the implementation of the EU-SA TDCA over the period 2000–2004, both periodically and annually. Likewise, the preserved fruits and nuts imports, as well as the total preserved fruits and nuts trade, were negatively affected by the implementation of the EU-SA TDCA over the period 2000–2004, on annual basis only. On the other hand, two trade flows (total agricultural trade and total cheese trade) and one export flow (cut flowers exports) had significantly improved during the implementation of the EU-SA TDCA over the period 2000–2004, on annual basis only, while one import flow (cut flowers imports) improved periodically only. The results also show that the implementation of the EU-SA TDCA over the period 2000–2004 (both periodically and annually) had no effects on nine agricultural trade flows (i.e. two export flows; four import flows and three total trade flows) between South Africa and the EU countries.

Table 6.2: Impact results for the implementation of the EU-SA TDCA on agricultural trade flows between South Africa and EU countries

Impact types	Exports (X)		Imports (M)		Total Trade (T = X + M)	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Positive joint period effects	0	0	1	0	0	3
Negative joint period effects	4	0	1	0	1	0
No joint period effects	3	7	5	7	6	4
Positive individual yearly effects	1	0	5	0	2	4
Negative individual yearly effects	3	2	2	2	2	1
No individual yearly effects	3	5	5	5	3	2
Trade creation effects	0	1	0	0	0	3
Trade diversion effects	3	0	1	0	1	0
No trade creation and diversion effects	4	6	6	0	6	4

Source: Author's calculations

The results also show that the implementation of the EU-SA TDCA over the period 2000–2004 had led to the diversion of five agricultural trade flows between South Africa and EU countries. These are:

- total agricultural exports, cut flowers exports and wine exports from South Africa that would ordinarily have been destined for the EU market, but instead went to other South African trading partners;
- South African wine imports that would ordinarily have been sourced from the EU countries but instead came from South Africa's other wine trading partners;

- the diversion of total wine trade from the South Africa-EU market to either the South Africa and other wine trading partner market or to the EU and other wine trading partner market.

However, the results show no proof of trade creation or diversion in 16 agricultural trade flows between South Africa and EU countries during implementation of the EU-SA TDCA over the period 2000–2004.

Interestingly, the results show that the implementation of the EU-SA TDCA over the period 2000–2004 had created room for potential increases in all of South Africa's agricultural exports flows in certain EU countries; in South Africa's agricultural imports flows from certain EU countries; as well as in South Africa's total agricultural trade flows with certain EU countries. For example, on the export side, there was room for a potential increase in South Africa's total agricultural exports in eight EU countries. This indicates that the absorption capacity of South Africa's total agricultural exports in these eight EU countries had not been exhausted, meaning that South Africa's exports of agricultural products have underachieved in these eight EU countries. On the other hand, the results show that there was no room for a potential increase in South Africa's total agricultural exports in seven EU countries, meaning that the absorption capacity of South Africa's total agricultural exports in these seven EU countries had been exhausted and also that South Africa's exporters of agricultural products and these seven EU countries' importers of South Africa's agricultural products had outperformed.

On the import side, the results indicate that there was room for a potential increase in South Africa's total agricultural imports from eleven EU countries. This indicates that the absorption capacity of South Africa's total agricultural imports in these eleven EU countries had not been exhausted, meaning that imports of agricultural products from these eleven EU countries had underachieved in the South Africa market. On the other hand, the results show that there was no room for a potential increase of South Africa's total agricultural imports in four EU countries, meaning that the absorption capacity of South Africa's total agricultural imports from these four EU countries had been exhausted and that South Africa's importers of agricultural products from these four EU countries and the exporters of agricultural products from these four EU countries to South Africa had outperformed during the implementation of the EU-SA TDCA over the period 2000–2004.

On the total trade (exports plus imports) side, the result indicate that there was room for a potential increase in total agricultural trade between South Africa and eight EU countries. This indicates that the absorption capacity of total agricultural trade between South Africa and these eight EU countries had not been exhausted, meaning that the total trade of agricultural products had underachieved in both South Africa and these eight EU countries. On the other hand, the results show that there was no room for a potential increase in total agricultural trade between South Africa and seven EU countries, meaning that the absorption capacity of total agricultural trade between South Africa and these eight EU countries had been exhausted and that the agricultural products traders (exporters and importers) of South Africa and these seven EU countries had outperformed during the implementation of the EU-SA TDCA over the period 2000–2004.

With regard to the implementation of the EU-SA TDCA over the period 2005–2009, the results show that three total trade flows between South Africa and the EU countries had increased significantly, both periodically and on an annual basis: total agricultural trade, total cut flowers trade and total preserved fruits and nuts trade. The total wine trade also increased, but on annual basis only. However, two exports flows (total agricultural exports and wine exports), two imports flows (cheese imports and frozen fruits and nuts imports) and one total trade flow (total fruits and vegetable juices trade) decreased significantly during the implementation of the EU-SA TDCA over the period 2000–2004, on annual basis only. Furthermore, the results also show that the implementation of the EU-SA TDCA over the period 2005–2009 (both periodically and annually) had no effects on 12 agricultural trade flows (i.e. 5 export flows; 5 import flows and 2 total trade flows) between South Africa and the EU countries.

The results also show proof of trade creation for four agricultural trade flows between South Africa and EU countries arising from the implementation of the EU-SA TDCA over the period 2005–2009; and these are total agricultural exports, total agricultural trade, total preserved fruits and nuts trade and total wine trade. However, the results show no proof of trade creation or diversion in 17 agricultural trade flows (i.e. 6 exports flows, 7 imports flows and 4 total trade flows) between South Africa and EU countries during implementation of the EU-SA TDCA over the period 2005–2009. Despite the EU-SA TDCA's insignificant effects on the majority of agricultural trade flows between South Africa and EU countries, the implementation of the EU-SA TDCA over the period 2005–2009 had also created room for potential increases in all South Africa's agricultural exports flows in certain EU countries; in South Africa's agricultural imports flows from certain EU countries; as well as in South Africa's total agricultural trade flows with certain EU countries. The potential effects results on all agricultural trade flows between South Africa and EU countries should be interpreted in a similar manner as above (detailed results for agricultural trade flows between South Africa and EU countries are presented in **Appendix 6B**).

6.2.3.3 Impact of the implementation of the SADC Trade Protocol

The detailed results of the selected model for all the agricultural trade flows datasets are presented in **Appendix 6.C** and a summarised version of the results is reported in Table 6.3 below. The results show that during the implementation of the SADC Trade Protocol over the period 2000–2004, total agricultural exports from South Africa to the SADC countries as well as total agricultural trade between South Africa and the SADC countries had significantly declined both periodically and annually. Furthermore, on an annual basis only, two exports flows (wine exports and fruits and vegetable juices exports), one import flow (cut flowers imports) and one trade flow (total cut flowers trade) between South Africa and the SADC countries also suffered during the implementation of the SADC Trade Protocol over the period 2000–2004.

Table 6.3: Impact results for the implementation of the SADC Trade Protocol on agricultural trade flows between South Africa and SADC countries

Impact types	Exports (X)		Imports (M)		Total Trade (T = X + M)	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Positive joint period effects	0	1	0	0	0	3
Negative joint period effects	1	1	0	0	1	0
No joint period effects	6	5	4	4	3	1
Positive individual yearly effects	2	1	1	0	1	4
Negative individual yearly effects	3	2	1	2	2	0
No individual yearly effects	2	4	2	2	1	0
Trade creation effects	4	2	1	0	2	1
Trade diversion effects	3	0	1	0	2	0
No trade creation and diversion effects	0	5	2	4	0	3

Source: Author's calculations

On the other hand, total agricultural imports, preserved fruits and nuts exports as well as total fruits and vegetable juices trade between South Africa and the SADC countries significantly increased during the implementation of the SADC Trade Protocol for the period 2000–2004. The results also show that the implementation of the SADC Trade Protocol over the period 2000–2004 (both periodically and annually) had no effects on five agricultural trade flows (i.e. five export flows and one total trade flow) between South Africa and the SADC countries.

During the implementation of the SADC Trade Protocol over the period 2005–2009, there were significant increases in total agricultural exports from South Africa to the SADC countries as well as in total trade flows of total agriculture, cut flowers and fruits and vegetable juices between South Africa and the SADC countries, both periodically and annually. Wine trade between South Africa and the SADC countries increased significantly on an annual basis only. However, wine exports from South Africa to the SADC countries decreased significantly during the implementation of the SADC Trade Protocol over the period 2005–2009, both periodically and annually. Cut flowers imports and both exports and imports of fruits and vegetable juices between South Africa and the SADC countries decreased on an annual basis only. The results also show that the implementation of the SADC Trade Protocol over the period 2005–2009 (both periodically and annually) had no effects on six agricultural trade flows (i.e. four export flows and two import flows) between South Africa and the SADC countries.

The results also show that the implementation of the SADC Trade Protocol over the period 2000–2004 had led to the diversion of six agricultural trade flows between South Africa and the SADC countries. These are:

- total agricultural exports, cut flowers exports and wine exports from South Africa that would ordinarily have been destined for the SADC market, but instead went to other South African trading partners;
- South African wine imports that would ordinarily have been sourced from the SADC countries but instead came from South Africa's other wine trading partners;
- the diversion of total cut flowers trade and total wine trade from the South Africa-SADC market to either the South Africa and other cut flowers and wine trading partner market or to the SADC and other cut flowers and wine trading partner market.

However, the results show proof of import creation for cut flowers imports from the SADC countries to South Africa during the same period. Similarly, the results of the implementation of the SADC Trade Protocol over the period 2005–2009 show proof of trade creation for three agricultural trade flows between South Africa and the SADC countries, and these are total agricultural trade, cut flowers exports and preserved fruits and nuts exports. However, the results show no proof of trade creation or diversion in 8 and 12 agricultural trade flows between South Africa and the SADC countries during implementation of the SADC Trade Protocol during the periods 2000–2004 and 2005–2009 respectively.

Furthermore, the results show that the implementation of the SADC Trade Protocol over both the 2000–2004 and 2005–2009 periods had created room for potential increases in all South Africa's agricultural exports flows in certain SADC countries; in South Africa's agricultural imports flows from certain SADC countries; as well as in South Africa's total agricultural trade flows with certain SADC countries. For example, on the export side, there was room for a potential increase in South Africa's total agricultural exports in two SADC countries. This indicates that the absorption capacity of South Africa's total agricultural exports in these two SADC countries had not been exhausted, meaning that South Africa's exports of agricultural products had underachieved in these two SADC countries. On the other hand, the results show that there was no room for a potential increase in South Africa's total agricultural exports in four SADC countries, meaning that the absorption capacity of South Africa's total agricultural exports in these four SADC countries had been exhausted and that South Africa's exporters of agricultural products and these four SADC countries' importers of South Africa's agricultural products had outperformed.

On the import side, the results show that there was room for a potential increase in South Africa's total agricultural imports from two SADC countries. This indicates that the absorption capacity of South Africa's total agricultural imports in these two SADC countries had not been exhausted, meaning that imports of agricultural products from these two SADC countries had underachieved in the South Africa market. On the other hand, the results show that there was no room for a potential increase in South Africa's total agricultural imports in four SADC countries. This means that the absorption capacity of South Africa's total agricultural exports from these four SADC countries had been exhausted and that South Africa's importers of agricultural products from these four SADC countries and the exporters of agricultural products from these four SADC countries to South Africa had outperformed during the implementation of the SADC Trade Protocol over the period 2000–2004.

On the total trade (exports plus imports) side, the results indicate that there was room for a potential increase in total agricultural trade between South Africa and three SADC countries. This indicates that the absorption capacity of total agricultural trade between South Africa and these three SADC countries had not been exhausted, indicating that the total trade of agricultural products had underachieved in both South Africa and these three SADC countries. On the other hand, the results show that there was no room for a potential increase in total agricultural trade between South Africa and three SADC countries. This indicates that the absorption capacity of total agricultural trade between South Africa and these three SADC countries was exhausted and that the agricultural products traders (exporters and importers) of South Africa and of these three SADC countries had outperformed over the implementation of the SADC Trade Protocol during the period 2000–2004. The potential effects results on other agricultural trade flows between South Africa and the SADC countries should be interpreted in a similar manner as above (detailed results for agricultural trade flows between South Africa and SADC countries are presented in **Appendix 6C**).

6.2.3.4 Agricultural trade response between South Africa and ROW countries during the implementation of the EU-SA TDCA and SADC Trade Protocol

The detailed results of the selected model for all the agricultural trade flows datasets are presented in **Appendix 6.D** and a summarised version of the results is reported in Table 6.4 below. The results show that during the period 2000–2004, only one export flow (fruits and vegetable juices on an annual basis only) and three total trade flows (total agricultural, total preserved fruits and nuts, and total fruits and vegetable juices trade flows, both periodically and annually) between South Africa and the ROW countries had significantly improved. Similarly, during the period 2005–2009, three total trade flows (total agricultural trade, total preserved fruits and nuts trade, and the total fruits and vegetable juices trade, both periodically and annually) between South Africa and the ROW countries had also increased significantly.

Furthermore, during the period 2005–2009, four export flows from South Africa to the ROW countries had also increased significantly (but periodically only) and these are the total agricultural, cheese, cut flowers and wine exports. Surprisingly, on annual basis, the total agricultural and wine exports had negatively declined in certain years during the period 2005–2009 while they were jointly significant periodically. In addition, preserved fruits and nuts exports also declined significantly on an annual basis during the same period.

Table 6.4: Responsiveness results of the agricultural trade flows between South Africa and ROW countries during the of the implementation EU-SA TDCA and SADC Trade Protocol

Impact types	Exports (X)		Imports (M)		Total Trade (T = X + M)	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Positive joint period effects	0	4	0	0	3	3
Negative joint period effects	3	0	1	1	1	0
No joint period effects	4	3	6	6	1	2
Positive individual yearly effects	1	0	0	0	3	3
Negative individual yearly effects	3	3	3	3	2	1
No individual yearly effects	3	4	4	4	0	1

Source: Author's calculations

The results also show that, during the period 2000–2004, three exports flows from South Africa to the ROW countries suffered both periodically and on an annual basis: these are the total agricultural exports, cut flowers exports and wine exports. Similarly, both periodically and annually, one import flow (wine imports) and one trade flow (total wine trade) as well as two import flows (cheese and preserved fruits and nuts imports on annual basis only) between South Africa and the ROW countries had significantly declined during the period 2000–2004. Furthermore, three import flows (cheese and cut flowers imports on an annual basis and wine imports periodically) and one trade flow (total cut flowers trade on an annual basis) between South Africa and the ROW countries had also declined significantly during the period 2005–2009. However, there were no joint periodic and individual yearly effects on seven agricultural trade flows (for the period 2000–2004) and six agricultural trade flows (for the period 2005–2009) between South Africa and ROW countries.

6.3 Conclusions of the study

The objective of this study has been to analyse the impacts of the implementation of WTO's AoA, EU-SA TDCA and SADC Trade Protocol on agricultural trade flows between South Africa and its agricultural trading partners. The results emphasise the importance of dynamics in trade analysis because more dynamic models were found to be suitable than static models. These findings support many economic arguments which have suggested that lagged trade is the predictor for current trade. This is true because, historically before the conclusion and implementation of these trade agreements, South Africa had already been trading with some of these trading partners. For example, the European Union had been South Africa's main trading and investment partner, accounting for over 40% of its total trade, before the EU-SA TDCA was implemented. Likewise, EU foreign investment in South Africa had accounted for over 70% of its total foreign direct investment (FDI).

The per capita GDPs of South Africa and of its trading partners, the real effective exchange rates and distances have also all played a significant and expected role in influencing agricultural trade flows between South Africa and its agricultural trading partners as follows:

- In the cases where income had significant effects, the majority of agricultural trade flows between South Africa and its agricultural trading partners were positively affected by percentage changes in per capita GDPs, meaning that these trade flows were income-elastic.

- In the cases where effective exchange rates had significant effects, the majority of South Africa's agricultural export flows suffered whereas all South Africa's agricultural import flows gained because the exchange value of the South Africa currency (Rand) had been appreciating against a basket of currencies of major South African trading partners in real terms over the period under review.

- In the cases where distance had significant effects, the majority of agricultural trade flows between South Africa and its agricultural trading partners were negatively affected. This shows that the distances between trading partners can indeed serve as proxies for both the transportation costs and the risks associated with the quality of some of the perishable goods. This is evident given the geographic location of South Africa in relation to its major trading partners and the fact that most of the agricultural products traded are perishable.

The overall findings indicate that agricultural trade flows between South Africa and its agricultural trade partners have responded positively to the global implementation of WTO's AoA, coupled with the implementation of the deregulation policy in South Africa. However, the unexpected outcomes of the implementation of the EU-SA TDCA and SADC Trade Protocol were that the majority of agricultural trade flows between South Africa and EU countries, as well as between South Africa and SADC countries, were not affected. During the first five years (2000–2004) of the implementation of both the EU-SA TDCA and SADC Trade Protocol, the joint period effects on all the affected agricultural trade flows between South Africa and the EU countries, as well as between South Africa and the SADC countries, were significantly negative. Compared to the ROW countries for the same period, some of the agricultural trade flows between South Africa and the ROW countries have improved significantly even though they did not have a trade agreement with South Africa.

However, during the second five-year term (2005–2009) of the implementation of the EU-SA TDCA, three agricultural trade flows (total agricultural exports, total agricultural trade and total fruits and vegetable juices trade) between South Africa and EU countries had responded positively. Similarly, during the second five-year term (2005–2009) of the implementation of the SADC Trade Protocol, four out of five of the affected agricultural trade flows (total agricultural exports, total agricultural trade, total cut flowers trade and total fruits and vegetable juices trade) between South Africa and SADC countries had improved significantly with the exception of wine exports from South Africa to SADC countries. Despite these few improvements, the majority of agricultural trade flows between South Africa and EU countries, as well as between South Africa and SADC countries, were not affected. Compared to the ROW countries for the same period, agricultural trade flows between South Africa and ROW countries were still above those of the EU and SADC countries in terms of the number of positive significant flows, as eight of them have improved during the same period. These are: total agricultural exports, total agricultural trade, cheese exports, cut flowers exports, total preserved fruits and nuts trade, total fruits and vegetable juices trade, wine exports and wine imports.

However, the implementation of the EU-SA TDCA and SADC Trade Protocol created room for potential increases in all the agricultural trade flows between South Africa and EU countries, as well as between South Africa and SADC countries, over both periods. However, some of these potential increases for the period 2000–2004 were diverted to other markets. These are: agricultural exports, cut flowers exports, wine exports, wine imports and total wine trade in the case of the EU-SA TDCA; and agricultural exports, cut flowers exports, total cut flowers trade, wine exports, wine imports and total wine trade in the case of the SADC Trade Protocol.

In conclusion, for the period 2005–2009, the results do show some proof of trade creation for certain agricultural trade flows between South Africa and EU countries, as well as between South Africa and SADC countries, owing to the implementation of the EU-SA TDCA and SADC Trade Protocol. These are: total agricultural exports, total agricultural trade, total preserved fruits and nuts trade and total wine trade in the case of the EU-SA TDCA; and total agricultural trade, cut flowers exports and preserved fruits and nuts exports in the case of the SADC Trade Protocol. However, the results show no proof of trade creation or diversion in the majority of agricultural trade flows between South Africa and EU countries, nor between South Africa and the SADC countries, for either period over the implementation of the EU-SA TDCA and SADC Trade Protocol.

6.4 Recommendations of the study

The results of this study indicate various issues for which recommendations may be made. These will be set out below.

The trade agreements which South Africa has signed with its major trading partners, i.e. the EU and SADC countries, were aimed at improving agricultural trade between the trading partners through the liberalisation of agricultural markets by phasing down tariffs as well as by the introduction of preferential tariff rate quotas for selected agricultural products. The overall findings of this study clearly indicate that the implementation of these agreements has not achieved their intended objectives. This is shown by the facts that the majority of agricultural trade flows between South Africa and its major trading partners have not improved significantly and that they have even declined significantly in some cases after the implementation of these agreements.

Given these findings, it is clear that tariff reductions alone are not a panacea for improving agricultural trade between South Africa and its major trading partners because even the trade on zero-rated agricultural products has not improved. It is clear that agricultural trade between South Africa and its major trading partners is strongly influenced by other factors such as non-tariff barriers (NTBs) and other technical barriers to trade (TBTs). These factors may have negatively affected the competitiveness of South Africa's agricultural products in the markets under review. Therefore, this study recommends that the agenda for future bilateral trade negotiations should strongly focus on the other factors that affect agricultural trade between South Africa and its trading partners. The negotiations should be geared towards the harmonisation of the standards affecting agricultural trade between South Africa and its trading partners. This recommendation is proposed in the light of the deteriorating functionality of the multilateral trade body (WTO) which has developed a framework to regulate international trade through gradual reduction of trade barriers so as to stimulate international commerce.

This study further recommends that, while trade agreements between South Africa and its major trading partners have created a conducive trade environment, trade promotions through trade fairs should be strongly emphasised as these may help to improve trade. Trade promotions play significant roles in assisting agricultural traders to better understand various agricultural markets in the world, as well as to make contacts among themselves. This is the area in which South African agri-business companies (exporters and importers), including industry and commodity organisations, should take the lead in order to continuously promote South African agricultural products in the world's markets.

This study recommends further similar studies to be undertaken in order to continuously assess the impact of trade agreements between South Africa and its major trading partners (i.e. EU and South Africa countries) on the trade flows of selected agricultural products. These studies are necessary because both the EU-SA TDCA and SADC Trade Protocol are aimed at becoming Free Trade Agreements (FTAs). Furthermore, these studies are necessitated by the expansion of these historical South African markets, given the EU's enlargement from 15 to 26 countries, as well as by the fact that some of the SADC countries which were not part of the SADC Trade Protocol are planning to join. Finally, the study recommends that further studies on the impacts of these agreements should also focus on the implications of NTBs and TBTs on the trade flows of selected agricultural products between South Africa and its major trading partners, the EU and SADC countries.

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Appendix 5A: Selection of the Estimator suitable for Agricultural Exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1190	5	3.69*	OLS	*No*		4	22.44*	OLS	*No*
					FE or RE	*Yes*	1309			FE or RE	*Yes*
	Yearly Impact	1190	9	3.67*	OLS	*No*	1309	8	22.76*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1190	5	-0.62	FE-no auto	*Yes*	1309	4	1.46	FE-no auto	*No*
		-	-	-	FE-auto	-	1190	4	1.89**	FE-auto	*Yes*
		1190	6	-1.31	RE-no auto	*Yes*	1309	6	1.21	RE-no auto	*No*
		-	-	-	RE-auto	-	1190	6	1.81	RE-auto	*No*
	Yearly Impact	1190	9	-0.56	FE-no auto	*Yes*	1309	8	1.46	FE-no auto	*No*
		-	-	-	FE-auto	-	1190	8	1.92**	FE-auto	*Yes*
		1190	10	-1.34	RE-no auto	*Yes*	1309	9	1.22	RE-no auto	*No*
		-	-	-	RE-auto	-	1190	9	1.84	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	5	471.79*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-
	Yearly Impact	N/A	9	464.07*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the South Africample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5B: Suitable equations for agricultural exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static FE	Dynamic FE	Static FE
Constant	-	-	-	-
$\ln Y_{ijt-1}$	0.34* (14.47)	-	0.34* (14.10)	-
$\ln GDPPC_{it}$	12.66* (4.39)	18.38* (6.45)	11.83* (3.63)	20.85* (6.33)
$\ln GDPPC_{jt}$	0.40*** (1.67)	0.28 (1.03)	0.38 (1.57)	0.22 (0.84)
$REER_t$	-0.60** (-2.22)	-0.79* (-3.21)	-0.14 (-0.36)	-0.73** (-2.42)
D9599	0.44* (2.79)	0.46* (3.95)	-	-
D95	-	-	-0.08 (-0.29)	0.19 (1.21)
D96	-	-	0.36 (1.57)	0.64* (4.05)
D97	-	-	0.16 (0.71)	0.56* (3.42)
D98	-	-	0.18 (0.92)	0.72* (4.66)
D99	-	-	0.42** (2.28)	0.70* (4.93)
$\ln DIST_{ij}$	-	-	-	-
Adjusted R^2	0.82	0.96	0.82	0.95
Observations	1190	1190	1190	1190
Cross-Sections	119	119	119	119

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported agricultural products to the following **119 countries in the World**: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAF, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CRI, CYP, CZE, DEU, DNK, DOM, DRC, EGY, ESP, ETH, FIN, FRA, GAB, , GBR, GHA, GIN, GMB, GNQ, , GRC, HUN, IDN, IND, IRN, IRL, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, LUX, MAR, MDA, MDG, MDV, MEX, MLI, MLT, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAK, PAN, PER, PHL, PNG, POL, PRI, PRT, PRY, ROM,

Appendix 5C: Selection of the Estimator suitable for Agricultural Imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1270	5	4.27*	OLS	*No*	1397	4	22.22*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	1270	9	4.25*	OLS	*No*	1397	8	22.38*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1270	5	0.05	FE-no auto	*Yes*	1397	4	1.71	FE-no auto	*No*
		-	-	-	FE-auto	-	1270	4	1.95**	FE-auto	*Yes*
		1270	6	-1.84***	RE-no auto	*No*	1397	6	1.13	RE-no auto	*No*
		1143	6	-0.25	RE-auto	*Yes*	1270	6	2.10**	RE-auto	*Yes*
	Yearly Impact	1270	9	0.05	FE-no auto	*Yes*	1397	8	1.70	FE-no auto	*No*
		-	-	-	FE-auto	-	1270	8	1.95**	FE-auto	*Yes*
		1270	10	-1.86**	RE-no auto	*No*	1397	9	1.13	RE-no auto	*No*
		1143	10	-0.25	RE-auto	*Yes*	1270	9	2.11**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	904.36*	FE	*Yes*	N/A	4	1.66	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	931.51*	FE	*Yes*	N/A	9	4.00	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1[st] order autocorrelation problem respectively.

Appendix 5D: Suitable equations for agricultural imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-133.44* (-3.21)	-	-148.79* (-2.89)
$\ln Y_{ijt-1}$	0.17* (6.26)	-	0.17* (6.29)	-
$\ln GDPPC_{it}$	16.39* (3.22)	19.26* (3.82)	16.47* (2.74)	21.16* (3.40)
$\ln GDPPC_{jt}$	0.05 (0.11)	0.85* (4.80)	0.03 (0.06)	0.81* (4.50)
$REER_t$	0.46 (0.97)	-0.11 (-0.24)	0.72 (1.05)	-0.11 (-0.20)
D9599	-0.25 (0.93)	0.13 (0.77)	-	-
D95	-	-	-0.34 (-0.66)	0.24 (1.07)
D96	-	-	-0.53 (-1.26)	0.00 (0.02)
D97	-	-	-0.31 (-0.78)	0.02 (0.08)
D98	-	-	-0.42 (-1.15)	0.08 (0.32)
D99	-	-	-0.18 (-0.52)	0.12 (0.52)
$\ln DIST_{ij}$	-	-1.79* (-2.66)	-	-1.74** (-2.57)
Adjusted R^2	0.75	0.49	0.75	0.48
Observations	1270	1270	1270	1270
Cross-Sections	127	127	127	127

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported agricultural products from the following **127 countries in the World**: AGO, ALB, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGD, BGR, BHR, BHS, BOL, BRA, BTN, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DMA, DNK, DOM, DRC, ECU, EGY, ESP, EST, ETH, FIN, FRA, GBR, GHA, GIN, GMB, GRC, GRD, GTM, GUY, HRV, HTI, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KGZ, KOR, KWT, LAO, LBN, LKA, LUX, MAR, MDG, MEX, MLI, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NIC, NLD, NOR, NPL, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRT, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, SLV, STP, SUR, SVK, SVN, SWE, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, TZA, UGA, UKR, URY, USA, VCT, VEN, VNM, ZMB and ZWE

Appendix 5E: Selection of the Estimator suitable for Agricultural Trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1090	4	4.60*	OLS	***No***	1199	3	37.51	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	1090	8	4.54*	OLS	***No***	1199	7	37.81	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1090	4	0.71	FE-no auto	***Yes***	1199	3	1.46	FE-no auto	***No***
		-	-	-	FE-auto	-	1090	3	1.83	FE-auto	***No***
		1090	5	0.08	RE-no auto	***Yes***	1199	4	1.33	RE-no auto	***No***
		-	-	-	RE-auto	-	1090	4	1.87	RE-auto	***No***
	Yearly Impact	1090	8	0.74	FE-no auto	***Yes***	1199	7	1.45	FE-no auto	***No***
		-	-	-	FE-auto	-	1090	7	1.84	FE-auto	***No***
		1090	9	0.04	RE-no auto	***Yes***	1199	8	1.33	RE-no auto	***No***
		-	-	-	RE-auto	-	1090	8	1.90	RE-auto	*?*
Hausman Test Statistic	Period Impact	N/A	4	462.25*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-
	Yearly Impact	N/A	8	453.22*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1[st] order autocorrelation problem respectively. ? means inconclusive.

Appendix 5F: Suitable equations for agricultural trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	?	Dynamic FE	Static RE
Constant	-	?	-	17.21* (3.30)
$\ln Y_{ijt-1}$	0.33* (14.03)	?	0.33* (13.80)	-
$\ln GDPPC_{ijt}$	-0.02 (-0.09)	?	-0.04 (-0.16)	0.46*** (1.90)
$REER_t$	-0.15 (-0.76)	?	-0.22 (-0.80)	-1.38* (-6.48)
D9599	-0.23** (-2.28)	?	-	-
D95	-	?	-0.23 (-1.23)	0.17 (1.61)
D96	-	?	-0.21 (-1.33)	0.22*** (1.81)
D97	-	?	-0.06 (-0.39)	0.40* (3.09)
D98	-	?	-0.27** (-2.08)	0.16 (1.39)
D99	-	?	-0.22** (-2.00)	0.00 (0.02)
$\ln DIST_{ij}$	-	?	-	-0.05 (-0.08)
Adjusted R^2	0.88	?	0.88	0.46
Observations	1090	?	1090	1090
Cross-Sections	109	?	109	109

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded agricultural products (imports plus exports) with the following **109 countries in the World**: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DOM, DNK, DRC, EGY, ESP, ETH, FIN, FRA, GBR, GHA, GIN, GMB, GRC, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LKA, LUX, MAR, MDG, MEX, MLI, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRT , PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SWE, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, TZA, UGA, URY, USA, VCT, VEN, VNM, ZMB and ZWE

Appendix 5G: Selection of the Estimator suitable for Cheese Exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	320	5	2.42**	OLS	***No***	352	4	7.68*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	320	9	2.39**	OLS	***No***	352	8	7.73*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	320	5	-0.10	FE-no auto	***Yes***	352	4	1.49	FE-no auto	***No***
		-	-	-	FE-auto	-	320	4	1.97**	FE-auto	***Yes***
		320	6	-1.28	RE-no auto	***Yes***	352	6	0.83	RE-no auto	***No***
		-	-	-	RE-auto	-	320	6	1.97**	RE-auto	***Yes***
	Yearly Impact	320	9	-0.06	FE-no auto	***Yes***	352	8	1.46	FE-no auto	***No***
		-	-	-	FE-auto	-	320	8	1.97**	FE-auto	***Yes***
		320	10	-1.25	RE-no auto	***Yes***	352	9	0.82	RE-no auto	***No***
		-	-	-	RE-auto	-	320	9	1.97**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	172.99*	FE	***Yes***	N/A	4	3.44	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	168.02*	FE	***Yes***	N/A	9	-15.38***	FE	***Yes***
					RE	***No***				RE	***No***
NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.											

Appendix 5H: Suitable equations for cheese exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	**Static RE**	**Dynamic FE**	**Static FE**
Constant	-	65.64 (0.63)	-	-
$\ln Y_{ijt-1}$	0.30* (5.64)	-	0.31* (5.76)	- -
$\ln GDPPC_{it}$	-1.41 (-0.12)	-3.17 (-0.25)	-8.10 (-0.59)	-8.25 (-0.64)
$\ln GDPPC_{jt}$	-0.43 (-0.36)	-0.29 (-0.99)	-0.49 (-0.41)	-1.64 (-1.04)
$REER_t$	-3.67* (-3.17)	-2.68** (-2.23)	-4.12** (-2.60)	-3.29** (-2.65)
D9599	1.23*** (1.82)	0.65 (1.45)	-	-
D95	-	-	1.31 (1.11)	0.22 (0.35)
D96	-	-	0.57 (0.59)	-0.18 (-0.27)
D97	-	-	2.08** (2.23)	1.38** (2.03)
D98	-	-	0.81 (0.96)	0.72 (1.13)
D99	-	-	1.21 (1.56)	0.93 (1.62)
$\ln DIST_{ij}$	-	-2.33** (-2.55)	-	-
Adjusted R^2	0.67	0.24	0.67	0.46
Observations	320	320	320	320
Cross-Sections	32	32	32	32
*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses				
From 1994 to 2004, SA exported cheese to the following **32 countries in the World**: AGO, ARE, BDI, CHE, CIV, CMR, COG, COM, DEU, DRC, ESP, ETH, FRA, GAB, GBR, GHA, GRC, JPN, KEN, MDG, MDV, MOZ, MUS, MWI, NGA, NLD, SYC, TZA, UGA, USA, ZMB and ZWE				

Appendix 5I: Selection of the estimator suitable for cheese imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	240	5	2.81**	OLS	*No*	264	4	15.08*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	240	9	2.85**	OLS	*No*	264	8	15.28*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	240	5	0.14	FE-no auto	*Yes*	264	4	1.33	FE-no auto	*No*
		-	-	-	FE-auto	-	240	4	1.89**	FE-auto	*Yes*
		240	6	-0.45	RE-no auto	*Yes*	264	6	0.68	RE-no auto	*No*
		-	-	-	RE-auto	-	240	6	1.97**	RE-auto	*Yes*
	Yearly Impact	240	9	0.22	FE-no auto	*Yes*	264	8	1.31	FE-no auto	*No*
		-	-	-	FE-auto	-	240	8	1.93**	FE-auto	*Yes*
		240	10	-0.50	RE-no auto	*Yes*	264	9	0.68	RE-no auto	*No*
		-	-	-	RE-auto	-	240	9	1.98**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	142.99*	FE	*Yes*	N/A	4	-2.04	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	109.53*	FE	*Yes*	N/A	9	1.61	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5J: Suitable equations for cheese imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-174.14 (-1.41)	-	-95.59 (-0.63)
$\ln Y_{ijt-1}$	0.38* (6.78)	-	0.38* (6.63)	-
$\ln GDPPC_{it}$	31.18** (2.12)	18.79 (1.23)	16.61 (0.98)	9.38 (0.50)
$\ln GDPPC_{jt}$	1.00 (0.73)	2.48* (3.29)	1.03 (0.75)	2.74* (3.55)
$REER_t$	3.82* (2.77)	4.21* (2.92)	3.58*** (1.84)	3.36** (2.02)
D9599	-0.10 (-0.13)	-0.03 (-0.06)	-	-
D95	-	-	-1.37 (0.95)	-0.28 (0.45)
D96	-	-	0.08 (0.07)	0.73 (0.97)
D97	-	-	0.03 (0.03)	0.98 (1.18)
D98	-	-	-0.21 (-0.20)	0.66 (0.84)
D99	-	-	-1.18 (-1.23)	-0.27 (-0.39)
$\ln DIST_{ij}$	-	-1.02 (-0.89)	-	-1.19 (-1.00)
Adjusted R^2	0.76	0.34	0.76	0.37
Observations	240	240	240	240
Cross-Sections	24	24	24	24

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported cheese from the following **24 countries in the World**: ARG, AUS, AUT, BEL, BGR, CAN, CHE, DEU, DNK, ESP, FRA, GBR, GRC, IRL, ITA, MOZ, NLD, NZL, NOR, POL, PRT, SWE, USA and ZWE

Appendix 5K: Selection of the estimator suitable for cheese trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	100	4	6.32*	OLS	***No***	110	3	31.86*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	100	8	6.43*	OLS	***No***	110	7	33.94*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	100	4	0.77	FE-no auto	***Yes***	110	3	1.95**	FE-no auto	***Yes***
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		100	5	-1.33	RE-no auto	***No***	110	4	1.52	RE-no auto	***No***
		-	-	-	RE-auto	***Yes***	100	4	1.97**	RE-auto	***Yes***
	Yearly Impact	100	8	1.05	FE-no auto	***Yes***	110	7	1.94**	FE-no auto	***Yes***
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		100	9	-1.36	RE-no auto	***No***	110	8	1.53	RE-no auto	***No***
		-	-	-	RE-auto	***Yes***	100	8	1.98**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	87.92*	FE	***Yes***	N/A	3	4.34	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	88.30*	FE	***Yes***	N/A	7	21.39*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5L: Suitable equations for cheese trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	**Static RE**	**Dynamic FE**	**Static FE**
Constant	-	-15.15 (-1.26)	-	-
$\ln Y_{ijt-1}$	0.05 (0.45)	-	0.05 (0.46)	-
$\ln GDPPC_{ijt}$	3.83 (0.96)	8.74* (2.92)	5.00 (1.22)	4.61 (1.34)
$REER_t$	0.83 (0.77)	1.50 (1.48)	0.11 (0.08)	0.80 (1.02)
D9599	0.35 (0.68)	0.45 (1.13)	-	-
D95	-	-	0.45 (0.45)	-0.02 (-0.04)
D96	-	-	1.50*** (1.75)	1.11** (2.29)
D97	-	-	1.26 (1.52)	0.93*** (1.94)
D98	-	-	0.29 (0.43)	0.06 (0.13)
D99	-	-	0.29 (0.51)	0.10 (0.23)
$\ln DIST_{ij}$	-	-7.43** (-2.52)	-	-
Adjusted R^2	0.83	0.47	0.83	0.83
Observations	100	100	100	110
Cross-Sections	10	10	10	10

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded cheese (imports plus exports) with the following **10 countries in the World**: CHE, FRA, DEU, ESP, FRA, GBR, GRC, MOZ, NLD, USA and ZWE

Appendix 5M: Selection of the estimator suitable for cut flowers exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	560	5	3.08*	OLS	*No*	616	4	15.90*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	560	9	2.99*	OLS	*No*	616	8	15.96*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	560	5	-0.32	FE-no auto	*Yes*	616	4	1.49	FE-no auto	*No*
		-	-	-	FE-auto	-	560	4	2.00**	FE-auto	*Yes*
		560	6	-1.03	RE-no auto	*Yes*	616	6	1.07	RE-no auto	*No*
		-	-	-	RE-auto	-	560	6	2.05**	RE-auto	*Yes*
	Yearly Impact	560	9	-0.28	FE-no auto	*Yes*	616	8	1.50	FE-no auto	*No*
		-	-	-	FE-auto	-	560	8	2.01**	FE-auto	*Yes*
		560	10	-1.18	RE-no auto	*Yes*	616	9	1.09	RE-no auto	*No*
		-	-	-	RE-auto	-	560	9	2.05**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	252.03*	FE	*Yes*	N/A	4	-3.33	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	235.35*	FE	*Yes*	N/A	9	-9.54	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5N: Suitable equations for cut flowers exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-28.55 (-0.59)	-	-52.18 (-0.90)
$\ln Y_{ijt-1}$	0.34* (9.55)	-	0.33* (8.98)	-
$\ln GDPPC_{it}$	7.81 (1.25)	5.22 (0.88)	8.89 (1.26)	8.05 (1.14)
$\ln GDPPC_{jt}$	1.46** (2.03)	1.16* (4.94)	1.41*** (1.95)	1.18* (5.26)
$REER_t$	-1.69* (-2.88)	-0.69 (-1.30)	-1.10 (-1.35)	-0.38 (-0.59)
D9599	0.92* (2.70)	0.38*** (1.81)	-	-
D95	-	-	0.52 (0.85)	-0.02 (-0.06)
D96	-	-	0.73 (1.46)	0.26 (0.85)
D97	-	-	0.61 (1.29)	0.28 (0.84)
D98	-	-	0.45 (1.05)	0.17 (0.55)
D99	-	-	1.15* (2.90)	0.72* (2.59)
$\ln DIST_{ij}$	-	-1.24** (-2.42)	-	-1.30* (-2.69)
Adjusted R^2	0.77	0.50	0.77	0.50
Observations	560	560	560	560
Cross-Sections	56	56	56	56

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported cut flowers to the following **56 countries in the World**: AGO, ARE, ARG, AUS, AUT, BEL, BGR, BHR, CAN, CHE, CHN, CIV, COG, CZE, DEU, DNK, DRC, EGY, ESP, FIN, FRA, GAB, GBR, GHA, GRC, HUN, IND, IRL, ITA, JOR, JPN, KEN, KOR, KWT, LBN, MOZ, MUS, MWI, MYS, NGA, NLD, OMN, PAK, POL, PRT, RUS, SAU, SGP, SWE, SYC, TUR, TZA, UGA, USA, ZMB and ZWE

Appendix 5O: Selection of the estimator suitable for cut flowers imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	260	5	3.14*	OLS	***No***	286	4	10.21*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	260	9	3.28*	OLS	***No***	286	8	10.39*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	260	5	-0.05	FE-no auto	***Yes***	286	4	1.74	FE-no auto	***No***
		-	-	-	FE-auto	-	260	4	1.90**	FE-auto	***Yes***
		260	6	-1.58	RE-no auto	***Yes***	286	6	0.88	RE-no auto	***No***
		-	-	-	RE-auto	-	260	6	1.95**	RE-auto	***Yes***
	Yearly Impact	260	9	-0.06	FE-no auto	***Yes***	286	8	1.74	FE-no auto	***No***
		-	-	-	FE-auto	-	260	8	1.93**	FE-auto	***Yes***
		260	10	-1.54	RE-no auto	***Yes***	286	9	0.89	RE-no auto	***No***
		-	-	-	RE-auto	-	260	9	1.96**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	156.70*	FE	***Yes***	N/A	4	-4.77	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	162.34*	FE	***Yes***	N/A	9	-0.22	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5P: Suitable equations for cut flowers imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	**Static RE**	**Dynamic FE**	**Static RE**
Constant	-	-18.27 (-0.17)	-	-101.39 (-0.77)
lnY_{ijt-1}	0.18* (2.93)	-	0.17* (2.83)	-
$lnGDPPC_{it}$	5.78 (0.43)	2.62 (0.19)	12.59 (0.79)	12.36 (0.77)
$lnGDPPC_{jt}$	0.98 (0.75)	-0.73* (-3.62)	0.64 (0.50)	-0.75* (-3.74)
$REER_t$	1.74 (1.39)	2.37*** (1.95)	4.81* (2.61)	3.55** (2.39)
D9599	-0.55 (-0.80)	-0.39 (-0.77)	-	-
D95	-	-	-2.15 (-1.57)	-0.41 (-0.63)
D96	-	-	-2.78** (-2.48)	-1.42** (-1.97)
D97	-	-	-1.89*** (-1.74)	-1.07 (-1.38)
D98	-	-	-1.08 (-1.10)	-0.45 (-0.61)
D99	-	-	-0.22 (-0.24)	0.12 (0.18)
$lnDIST_{ij}$	-	-0.25 (-0.42)	-	-0.22 (-0.38)
Adjusted R^2	0.57	0.38	0.58	0.37
Observations	260	260	260	260
Cross-Sections	26	26	26	26

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported cut flowers from the following **26 countries in the World**: BGR, BRA, CHN, DEU, ESP, FRA, GBR, IND, ISR, ITA, KEN, MOZ, MUS, MWI, NLD, PHL, PRT, SGP, SYC, THA, TUR, TZA, UGA, USA, ZMB and ZWE

Appendix 5Q: Selection of the estimator suitable for cut flowers trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	220	4	4.27*	OLS	*No*	242	3	16.95*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	220	8	4.44*	OLS	*No*	242	7	17.20*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	220	4	-0.76	FE-no auto	*Yes*	242	3	1.62	FE-no auto	*No*
		-	-	-	FE-auto	-	220	3	2.11**	FE-auto	*Yes*
		220	5	-0.88	RE-no auto	*Yes*	242	4	1.27	RE-no auto	*No*
		-	-	-	RE-auto	-	220	4	2.06**	RE-auto	*Yes*
	Yearly Impact	220	8	-0.47	FE-no auto	*Yes*	242	7	1.64	FE-no auto	*No*
		-	-	-	FE-auto	-	220	7	2.11**	FE-auto	*Yes*
		220	9	-0.85	RE-no auto	*Yes*	242	8	1.28	RE-no auto	*No*
		-	-	-	RE-auto	-	220	8	2.07**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	4	134.18*	FE	*Yes*	N/A	3	0.93	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	8	134.38*	FE	*Yes*	N/A	7	1.75	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5R: Suitable equations for cut flowers trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static FE	Dynamic FE	Static RE
Constant	-	-2.28 (-0.43)	-	-2.29 (-0.40)
$\ln Y_{ijt-1}$	0.24* (4.29)	-	0.20* (3.47)	-
$\ln GDPPC_{ijt}$	4.32 (1.48)	2.78* (4.20)	2.45 (0.80)	2.71* (3.91)
$REER_t$	-0.23 (-0.33)	-0.68 (-1.10)	0.66 (0.71)	-0.61 (-0.91)
D9599	0.36 (1.02)	0.25 (1.03)	-	-
D95	-	-	-0.82 (-1.15)	-0.11 (-0.35)
D96	-	-	-0.21 (-0.36)	0.34 (0.91)
D97	-	-	0.07 (0.12)	0.35 (0.86)
D98	-	-	-0.14 (-0.30)	0.30 (0.84)
D99	-	-	0.24 (0.63)	0.43 (1.48)
$\ln DIST_{ij}$	-	-1.09** (-2.32)	-	-1.05** (-2.38)
Adjusted R^2	0.80	0.51	0.80	0.51
Observations	220	220	220	220
Cross-Sections	22	22	22	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, , SA traded (imports plus exports) cut flowers with the following **22 countries in the World**: BGR, CHN, DEU, ESP, FRA, GBR, IND, ITA, KEN, MOZ, MUS, MWI, NLD, PRT, SGP, SYC, TUR, UGA, USA, ZMB and ZWE

Appendix 5S: Selection of the estimator suitable for frozen fruits and nuts exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	210	5	2.39**	OLS	*No*	231	4	6.25*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	210	9	2.24**	OLS	*No*	231	8	6.40*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	210	5	-0.53	FE-no auto	*Yes*	231	4	1.75	FE-no auto	*No*
		-	-	-	FE-auto	-	210	4	1.94**	FE-auto	*Yes*
		210	6	-1.86***	RE-no auto	*No*	231	6	0.85	RE-no auto	*No*
		189	6	0.31	RE-auto	*Yes*	210	6	2.15**	RE-auto	*Yes*
	Yearly Impact	210	9	-0.54	FE-no auto	*Yes*	231	8	1.70	FE-no auto	*No*
		-	-	-	FE-auto	-	210	8	1.93**	FE-auto	*Yes*
		210	10	-1.69***	RE-no auto	*No*	231	9	0.84	RE-no auto	*No*
		189	10	0.39	RE-auto	*Yes*	210	9	2.07**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	128.18*	FE	*Yes*	N/A	4	4.59	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	124.24*	FE	*Yes*	N/A	9	4.52	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5T: Suitable equations for frozen fruits and nuts exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-105.16 (-0.66)	-	37.27 (0.20)
$\ln Y_{ijt-1}$	0.15* (2.19)	-	0.18* (2.70)	-
$\ln GDPPC_{it}$	7.16 (0.37)	15.76 (0.80)	-1.81 (-0.08)	-0.95 (-0.04)
$\ln GDPPC_{jt}$	-0.32 (-0.20)	0.59 (1.44)	-0.26 (-0.16)	0.57 (1.44)
$REER_t$	-1.83 (-1.02)	-1.54 (-0.85)	-4.20*** (-1.72)	-3.75*** (-1.76)
D9599	0.11 (0.11)	0.37 (0.51)	-	-
D95	-	-	1.93 (1.07)	1.22 (1.37)
D96	-	-	0.00 (0.00)	-0.51 (-0.50)
D97	-	-	2.24 (1.57)	1.30 (1.17)
D98	-	-	-0.20 (-0.16)	-0.69 (-0.66)
D99	-	-	0.38 (0.32)	-0.22 (-0.24)
$\ln DIST_{ij}$	-	-1.41 (-1.32)	-	-1.22 (-1.18)
Adjusted R^2	0.41	0.45	0.42	0.45
Observations	210	210	210	210
Cross-Sections	21	21	21	21

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported preserved fruits and nuts to the following **21 countries in the World**: AGO, AUS, AUT, BEL, CHE, DEU, DRC, FRA, GBR, JPN, KEN, MOZ, MUS, MWI, NLD, NZL, SWE, SYC, USA, ZMB and ZWE

Appendix 5U: Selection of the estimator suitable for frozen fruits and nuts imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	230	5	1.35	OLS	*Yes*	253	4	3.86*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Yearly Impact	230	9	1.41	OLS	*Yes*	253	8	3.83*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	230	5	-1.31	OLS-no auto	*Yes*	253	4	1.50	FE-no auto	*No*
		-	-	-	FE-auto	-	230	4	2.04**	FE-auto	*Yes*
		-	-	-	RE-no auto	-	253	6	0.60	RE-no auto	*No*
		-	-	-	RE-auto	-	230	6	2.40**	RE-auto	*Yes*
	Yearly Impact	230	9	1.30	OLS-no auto	*Yes*	253	8	1.43	FE-no auto	*No*
		-	-	-	FE-auto	-	230	8	2.04**	FE-auto	*Yes*
		-	-	-	RE-no auto	-	253	9	0.57	RE-no auto	*No*
		-	-	-	RE-auto	-	230	9	2.37**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	FE	-	N/A	4	-60.17*	FE	*Yes*
					RE	-				RE	*No*
	Yearly Impact	-	-	-	FE	-	N/A	9	29.99*	FE	*Yes*
					RE	-				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5V: Suitable equations for frozen fruits and nuts imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic OLS	Static FE	Dynamic OLS	Static FE
Constant	53.36 (0.27)	-	81.07 (0.36)	-
lnY_{ijt-1}	0.48* (8.26)	-	0.49* (8.41)	-
$lnGDPPC_{it}$	-7.48 (-0.31)	-10.37 (-0.54)	-10.19 (-0.37)	-13.13 (-0.60)
$lnGDPPC_{jt}$	-0.44 (-1.83)	1.12 (0.52)	-0.42*** (-1.78)	0.77 (0.36)
$REER_t$	3.52 (1.59)	-1.04 (-0.62)	2.05 (0.64)	-1.08 (-0.50)
D9599	-1.07 (-0.90)	1.52*** (1.79)	-	-
D95	-	-	-0.34 (-0.14)	0.56 (0.46)
D96	-	-	-1.34 (-0.70)	0.34 (0.29)
D97	-	-	0.03 (0.02)	2.05** (1.74)
D98	-	-	1.98 (1.17)	3.34* (3.05)
D99	-	-	-2.52 (-1.62)	0.61 (0.60)
$lnDIST_{ij}$	-0.18 (-0.27)	-	-0.15 (-0.23)	-
Adjusted R^2	0.27	0.45	0.29	0.48
Observations	230	230	230	230
Cross-Sections	23	23	23	23

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported frozen fruits and nuts from the following **23 countries in the World**: ARG, AUS, AUT, BEL, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ECU, FRA, GBR, GRC, IND, MDG, NLD, NZL, POL, THA, USA and ZWE

Appendix 5W: Selection of the estimator suitable for frozen fruits and nuts trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	110	4	11.51*	OLS	***Yes***	121	3	5.67*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Yearly Impact	110	8	9.70*	OLS	***Yes***	121	7	5.87*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	110	4	-0.96	FE-no auto	***Yes***	121	3	1.47	FE-no auto	***No***
		-	-	-	FE-auto	-	110	3	2.13**	FE-auto	***Yes***
		110	5	-1.22	RE-no auto	-	121	4	0.68	RE-no auto	***No***
		-	-	-	RE-auto	-	110	4	2.25**	RE-auto	***Yes***
	Yearly Impact	110	8	-0.92	FE-no auto	***Yes***	121	7	1.44	FE-no auto	***No***
		-	-	-	FE-auto	-	110	7	2.17**	FE-auto	***Yes***
		110	9	-1.20	RE-no auto	-	121	8	0.68	RE-no auto	***No***
		-	-	-	RE-auto	-	110	8	2.31**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	64.30*	FE	-	N/A	3	-0.13	FE	***No***
					RE	-				RE	***Yes***
	Yearly Impact	N/A	8	62.86*	FE	-	N/A	7	1.67	FE	***No***
					RE	-				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5X: Suitable equations for frozen fruits and nuts trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic OLS	**Static RE**	**Dynamic OLS**	**Static RE**
Constant	-	20.61 (1.35)	-	29.79** (2.18)
lnY_{ijt-1}	0.29* (3.21)	-	0.30* (3.40)	-
$lnGDPPC_{ijt}$	1.19 (0.13)	1.11 (0.44)	3.93 (0.39)	0.48 (0.19)
$REER_t$	0.35 (0.15)	-0.30 (-0.13)	-2.46 (-0.84)	-2.10 (-0.86)
D9599	0.52 (0.45)	0.25 (0.33)	-	-
D95	-	-	2.60 (1.15)	1.03 (1.02)
D96	-	-	1.43 (0.74)	0.52 (0.44)
D97	-	-	3.78** (2.05)	2.40*** (1.81)
D98	-	-	1.51 (0.99)	1.29 (1.07)
D99	-	-	0.34 (0.28)	-0.26 (-0.27)
$lnDIST_{ij}$	-	-2.39 (-1.01)	-	-1.83 (-0.81)
Adjusted R^2	0.41	0.52	0.42	0.55
Observations	110	110	110	110
Cross-Sections	11	11	11	11

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded (imports plus exports) frozen fruits and nuts with the following **11 countries in the World**: AUS, AUT, BEL, CHE, DEU, FRA, GBR, NLD, NZL, USA and ZWE

Appendix 5Y: Selection of the estimator suitable for preserved fruits and nuts exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	850	5	2.75**	OLS	*No*	935	4	9.57*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	850	9	2.75*	OLS	*No*	935	8	9.56*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	850	5	-0.03	FE-no auto	*Yes*	935	4	1.53	FE-no auto	*No*
		-	-	-	FE-auto	-	850	4	1.98**	FE-auto	*Yes*
		850	6	-1.28	RE-no auto	*Yes*	935	6	0.82	RE-no auto	*No*
		-	-	-	RE-auto	-	850	6	2.06**	RE-auto	*Yes*
	Yearly Impact	850	9	-0.06	FE-no auto	*Yes*	935	8	1.53	FE-no auto	*No*
		-	-	-	FE-auto	-	850	8	1.97**	FE-auto	*Yes*
		850	10	-1.32	RE-no auto	*Yes*	935	9	0.82	RE-no auto	*No*
		-	-	-	RE-auto	-	850	9	2.05**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	461.11*	FE	*Yes*	N/A	4	14.42*	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	9	457.59*	FE	*Yes*	N/A	9	-8.68	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5Z: Suitable equations for preserved fruits and nuts exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static FE	Dynamic FE	Static FE
Constant	-	-	-	-
$\ln Y_{ijt-1}$	0.27* (8.71)	-	0.27* (8.76)	-97.25 (-1.26)
$\ln GDPPC_{it}$	15.53** (1.99)	24.34* (3.41)	19.10** (2.17)	14.29 (1.52)
$\ln GDPPC_{jt}$	3.36* (3.69)	4.07* (4.11)	3.49* (3.78)	1.59* (9.37)
$REER_t$	-0.29 (-0.40)	-1.19** (-1.97)	-0.80 (0.80)	0.09 (0.11)
D9599	0.38 (0.90)	0.68** (2.41)	-	-
D95	-	-	1.15 (1.54)	0.15 (0.47)
D96	-	-	0.75 (1.22)	0.08 (0.21)
D97	-	-	0.53 (0.89)	-0.06 (-0.15)
D98	-	-	0.72 (1.35)	0.24 (0.62)
D99	-	-	0.55 (1.11)	0.43 (1.22)
$\ln DIST_{ij}$	-	-	-	-2.33* (-3.78)
Adjusted R^2	0.67	0.75	0.67	0.53
Observations	850	850	850	850
Cross-Sections	85	85	85	85

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported preserved fruits and nuts to the following **85 countries in the World**: AGO, ARE, ARG AUS, AUT, BEL, BGD, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, COG, COM, CRI, CYP, CZE, DEU, DNK, DOM, DRC, EGY, ESP, ETH, FIN, FRA, GAB, GBR, GHA, GRC, HUN, IRL, ISL, ISR, ITA, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LUX, MAR, MDG, MDV, MLI, MLT, MOZ, MUS, MWI, MYS, NGA, NLD, NOR, NZL, OMN, PAK, PER, PHL, POL, PRI, PRT, RUS, SAU, SEN, SGP, STP, SVK, SVN, SWE, SYC, SYR, THA, TTO, TZA, UGA, URY, USA, YEM, ZMB and ZWE

Appendix 5AA: Selection of the estimator suitable for preserved fruits and nuts imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	380	5	2.05***	OLS	*No*	418	4	8.40*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	380	9	2.23**	OLS	*No*	418	8	8.79*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	380	5	-0.27	FE-no auto	*Yes*	418	4	1.51	FE-no auto	*No*
		-	-	-	FE-auto	-	380	4	1.95**	FE-auto	*Yes*
		380	6	-1.66***	RE-no auto	*No*	418	6	0.75	RE-no auto	*No*
		342	6	-0.73	RE-auto	*Yes*	380	6	2.23**	RE-auto	*Yes*
	Yearly Impact	380	9	-0.18	FE-no auto	*Yes*	418	8	1.52	FE-no auto	*No*
		-	-	-	FE-auto	-	380	8	1.97**	FE-auto	*Yes*
		380	10	-1.75***	RE-no auto	*No*	418	9	0.77	RE-no auto	*No*
		342	10	-0.52	RE-auto	*Yes*	380	9	2.24**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	123.63*	FE	*Yes*	N/A	4	1.09	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	149.02*	FE	*Yes*	N/A	9	-6.01	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AB: Suitable equations for preserved fruits and nuts imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-28.76 (-0.26)	-	-202.89 (-1.55)
$\ln Y_{ijt-1}$	0.30* (5.77)	-	0.28* (5.48)	-
$\ln GDPPC_{it}$	25.96** (2.01)	4.01 (0.30)	26.57*** (1.77)	24.76 (1.56)
$\ln GDPPC_{jt}$	1.98 (1.36)	0.75* (3.30)	1.31 (0.92)	0.74* (3.23)
$REER_t$	0.33 (0.28)	2.59** (2.06)	5.23* (3.04)	4.34* (2.99)
D9599	0.15 (0.22)	-0.82*** (-1.70)	-	-
D95	-	-	-3.53* (-2.77)	-1.54* (-2.67)
D96	-	-	-3.30* (-3.14)	-2.05* (-3.05)
D97	-	-	-2.53** (-2.50)	-1.68** (-2.26)
D98	-	-	-0.58 (-0.64)	0.13 (0.19)
D99	-	-	-0.69 (-0.82)	0.10 (0.16)
$\ln DIST_{ij}$	-	-1.56** (-2.30)	-	-1.50** (-2.21)
Adjusted R^2	0.55	0.45	0.57	0.45
Observations	380	380	380	380
Cross-Sections	38	38	38	38

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported preserved fruits and nuts from the following **38 countries in the World**: ARE, AUS, AUT, BEL, BRA, CAN, CHE, CHN, DEU, ECU, ESP, FRA, GBR, GHA, GRC, HUN, IDN, IND, ISR, ITA, JPN, KEN, LKA, MEX, MUS, MWI, MYS, NLD, NZL, PAK, PHL, POL, SAU, SGP, THA, TUR, USA and ZWE

Appendix 5AC: Selection of the estimator suitable for preserved fruits and nuts trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	320	4	5.33*	OLS	*No*	352	3	8.61*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	320	8	5.18*	OLS	*No*	352	7	8.80*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	320	4	-0.31	FE-no auto	*Yes*	352	3	1.94**	FE-no auto	*Yes*
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		320	5	-0.34	RE-no auto	*Yes*	352	4	1.50	RE-no auto	*No*
		-	-	-	RE-auto	-	320	4	1.99**	RE-auto	*Yes*
	Yearly Impact	320	8	-0.49	FE-no auto	*Yes*	352	7	1.92**	FE-no auto	*Yes*
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		320	9	-0.56	RE-no auto	*Yes*	352	8	1.49	RE-no auto	*No*
		-	-	-	RE-auto	-	320	8	1.99**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	4	1764.06*	FE	*Yes*	N/A	3	-19.94*	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	8	888.36*	FE	*Yes*	N/A	7	6.13	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AD: Suitable equations for preserved fruits and nuts trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static FE	Dynamic FE	Static RE
Constant	-	-	-	0.96 (0.24)
lnY_{ijt-1}	0.06 (1.23)	-	0.07 (1.46)	-
$lnGDPPC_{ijt}$	2.55 (1.29)	3.32 (1.63)	3.24 (1.59)	3.28* (10.15)
$REER_t$	0.87 (1.55)	-0.60 (-1.33)	0.12 (0.16)	-0.92 (-1.56)
D9599	-0.56** (-1.97)	0.18 (0.92)	-	-
D95	-	-	0.19 (0.35)	0.46 (1.49)
D96	-	-	-0.19 (-0.41)	0.23 (0.68)
D97	-	-	-0.10 (-0.21)	0.02 (0.06)
D98	-	-	-0.46 (-1.22)	-0.17 (-0.54)
D99	-	-	-0.41 (-1.29)	-0.20 (-0.77)
$lnDIST_{ij}$	-	-	-	-1.62* (-3.80)
Adjusted R^2	0.78	0.73	0.78	0.74
Observations	320	352	320	320
Cross-Sections	32	32	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded (imports plus exports) preserved fruits and nuts with the following **32 countries in the World**: ARE, AUS, AUT, BEL, BRA, CAN, CHE, CHN, DEU, ESP, FRA, GBR, GHA, GRC, HUN, ISR, ITA, JPN, KEN, MUS, MWI, MYS, NLD, NZL, PAK, PHL, POL, SAU, SGP, THA, USA and ZWE

Appendix 5AE: Selection of the estimator suitable for fruits and vegetable juices exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	860	5	3.74*	OLS	***No***	946	4	12.87*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	860	9	3.78*	OLS	***No***	946	8	12.96*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	860	5	0.00	FE-no auto	***Yes***	946	4	1.59	FE-no auto	***No***
		-	-	-	FE-auto	-	860	4	1.96**	FE-auto	***Yes***
		860	6	-1.58	RE-no auto	***Yes***	946	6	0.87	RE-no auto	***No***
		-	-	-	RE-auto	-	860	6	2.10**	RE-auto	***Yes***
	Yearly Impact	860	9	-0.04	FE-no auto	***Yes***	946	8	1.59	FE-no auto	***No***
		-	-	-	FE-auto	-	860	8	1.96**	FE-auto	***Yes***
		860	10	-1.60	RE-no auto	***Yes***	946	9	0.87	RE-no auto	***No***
		-	-	-	RE-auto	-	860	9	2.10**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	587.70*	FE	***Yes***	N/A	4	1.78	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	592.01*	FE	***Yes***	N/A	9	1.32	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AF: Suitable equations for fruit and vegetable juices exports from South Africa to the World.

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-97.70 (-1.52)	-	-44.46 (-0.57)
$\ln Y_{ijt-1}$	0.21* (6.44)	-	0.21* (6.49)	-
$\ln GDPPC_{it}$	13.82*** (1.73)	15.97** (2.04)	8.37 (0.93)	9.71 (1.03)
$\ln GDPPC_{jt}$	2.00** (2.17)	0.84* (5.94)	2.43* (2.63)	0.83* (5.75)
$REER_t$	0.35 (0.47)	-0.60 (-0.84)	-1.92*** (-1.89)	-1.43*** (-1.66)
D9599	-0.31 (-0.71)	-0.40 (-1.43)	-	-
D95	-	-	1.12 (1.49)	-0.01 (-0.04)
D96	-	-	0.91 (1.46)	-0.24 (-0.60)
D97	-	-	0.86 (1.43)	0.03 (0.06)
D98	-	-	0.27 (0.50)	-0.36 (0.87)
D99	-	-	-0.61 (-1.21)	-0.77** (-2.09)
$\ln DIST_{ij}$	-	-2.87* (-4.19)	-	-2.81* (-4.31)
Adjusted R^2	0.66	0.44	0.67	0.41
Observations	860	860	860	860
Cross-Sections	86	86	86	86

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported fruits and vegetable juices to the following **86 countries in the World**: AGO, ARE, ARG, AUS, AUT, BEL, BDI, BEN, BGD, BHR, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CYP, DEU, DNK, DRC, EGY, ESP, ETH, FIN, FRA, GAB, GBR, GHA, GIN, GRC, HUN, IDN, IND, ISL, IRL, ISR, ITA, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDG, MDV, MLI, MLT, MOZ, MUS, MWI, MYS, NGA, NLD, NOR, NZL, OMN, PAK, PHL, POL, PRT, RUS, RWA, SAU, SEN, SGP, SLE, SWE, SYC, TGO, THA, TTO, TUR, TZA, UGA, URY, USA, ZMB and ZWE

Appendix 5AG: Selection of the estimator suitable for fruits and vegetable juices imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	410	5	2.87**	OLS	*No*	451	4	9.57*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	410	9	2.96*	OLS	*No*	451	8	9.71*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	410	5	-0.08	FE-no auto	*Yes*	451	4	1.62	FE-no auto	*No*
		-	-	-	FE-auto	-	410	4	1.97**	FE-auto	*Yes*
		410	6	-1.61	RE-no auto	*Yes*	451	6	0.71	RE-no auto	*No*
		-	-	-	RE-auto	-	410	6	2.17**	RE-auto	*Yes*
	Yearly Impact	410	9	-0.02	FE-no auto	*Yes*	451	8	1.62	FE-no auto	*No*
		-	-	-	FE-auto	-	410	8	1.95**	FE-auto	*Yes*
		410	10	-1.64	RE-no auto	*Yes*	451	9	0.72	RE-no auto	*No*
		-	-	-	RE-auto	-	410	9	2.17**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	238.85*	FE	*Yes*	N/A	4	7.27	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	244.12*	FE	*Yes*	N/A	9	5.96	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AH: Suitable equations for fruit and vegetable juices imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-208.81*** (-1.82)	-	-392.31* (-2.87)
$\ln Y_{ijt-1}$	0.21* (4.43)	-	0.20* (4.17)	-
$\ln GDPPC_{it}$	28.64** (2.19)	26.41*** (1.88)	43.48* (2.85)	48.44* (2.91)
$\ln GDPPC_{jt}$	2.20 (1.51)	0.67** (2.35)	1.97 (1.36)	0.67** (2.37)
$REER_t$	-0.17 (-0.14)	0.03 (0.02)	1.34 (0.77)	1.64 (1.07)
D9599	0.44 (0.63)	-0.17 (-0.33)	-	-
D95	-	-	0.12 (0.09)	-0.41 (-0.66)
D96	-	-	-0.27 (-0.25)	-1.08 (-1.49)
D97	-	-	-0.45 (-0.44)	-1.00 (-1.27)
D98	-	-	1.38 (1.49)	0.67 (0.89)
D99	-	-	0.87 (1.02)	0.81 (1.22)
$\ln DIST_{ij}$	-	-0.14 (-0.23)	-	-0.13 (-0.21)
Adjusted R^2	0.56	0.36	0.56	0.36
Observations	410	410	410	410
Cross-Sections	41	41	41	41

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported fruits and vegetable juices from the following **41 countries in the World**: ARE, ARG, AUS, AUT, BEL, BRA, CAN, CHE, CHL, CHN, CZE, DEU, DNK, ESP, FRA, GBR, GRC, IDN, IND, IRL, ISL, ISR, ITA, JPN, KEN, LKA, MOZ, MUS, MYS, NLD, NZL, PHL, POL, PRT, SAU, SGP, SWE, THA, USA, ZMB and ZWE

Appendix 5AI: Selection of the estimator suitable for fruits and vegetable juices trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	400	4	4.52*	OLS	*No*	440	3	14.74*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	320	8	5.18*	OLS	*No*	440	7	14.98*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	400	4	0.39	FE-no auto	*Yes*	440	3	1.89**	FE-no auto	*Yes*
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		400	5	-0.83	RE-no auto	*Yes*	440	4	1.42	RE-no auto	*No*
		-	-	-	RE-auto	-	400	4	2.00**	RE-auto	*Yes*
	Yearly Impact	320	8	-0.49	FE-no auto	*Yes*	440	7	1.89**	FE-no auto	*Yes*
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		320	9	-0.56	RE-no auto	*Yes*	440	8	1.42	RE-no auto	*No*
		-	-	-	RE-auto	-	400	8	2.01**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	4	303.48*	FE	*Yes*	N/A	3	3.08	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	8	888.36*	FE	*Yes*	N/A	7	4.22	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AJ: Suitable equations for fruit and vegetable juices trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	24.96* (4.39)	-	26.90* (4.83)
$\ln Y_{ijt-1}$	0.09*** (1.85)	-	0.09*** (1.87)	-
$\ln GDPPC_{ijt}$	3.83** (1.97)	0.10 (0.25)	4.27** (2.12)	0.11 (0.30)
$REER_t$	0.71 (1.12)	-0.37 (-0.64)	-0.33 (-0.39)	-0.89 (-1.39)
D9599	-0.54*** (-1.68)	-0.39*** (-1.69)	-	-
D95	-	-	0.19 (0.31)	0.01 (0.05)
D96	-	-	-0.08 (-0.16)	-0.18 (-0.49)
D97	-	-	0.35 (0.68)	0.22 (0.56)
D98	-	-	-0.11 (-0.25)	-0.15 (-0.43)
D99	-	-	-0.65** (-1.85)	-0.59** (-2.14)
$\ln DIST_{ij}$	-	-1.39** (-2.29)	-	-1.36** (-2.39)
Adjusted R^2	0.65	0.51	0.66	0.51
Observations	400	400	400	400
Cross-Sections	40	40	40	40

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded (imports plus exports) fruits and vegetable juices with the following **40 countries in the World**: ARE, ARG, AUS, AUT, BEL, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FRA, GBR, GRC, IDN, IND, IRL, ISL, ISR, ITA, JPN, KEN, LKA, MOZ, MUS, MYS, NLD, NZL, PHL, POL, PRT, SAU, SGP, SWE, THA, USA, ZMB and ZWE

Appendix 5AK: Selection of the estimator suitable for wine exports from South Africa to the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1020	5	3.16*	OLS	*No*	1122	4	15.77*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	1020	9	3.20*	OLS	*No*	1122	8	16.01*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1020	5	-0.46	FE-no auto	*Yes*	1122	4	1.53	FE-no auto	*No*
		-	-	-	FE-auto	-	1020	4	2.08**	FE-auto	*Yes*
		1020	6	-1.78***	RE-no auto	*No*	1122	6	0.99	RE-no auto	*No*
		918	6	-0.20	RE-auto	*Yes*	1020	6	2.15**	RE-auto	*Yes*
	Yearly Impact	1020	9	-0.39	FE-no auto	*Yes*	1122	8	1.54	FE-no auto	*No*
		-	-	-	FE-auto	-	1020	8	2.10**	FE-auto	*Yes*
		1020	10	-1.78***	RE-no auto	*No*	1122	9	1.00	RE-no auto	*No*
		918	10	-0.26	RE-auto	*Yes*	1020	9	2.15**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	450.36*	FE	*Yes*	N/A	4	5.45	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	414.50*	FE	*Yes*	N/A	9	-4.18	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AL: Suitable equations for wine exports from South Africa to the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-143.92* (-3.07)	-	-183.69* (-3.26)
$\ln Y_{ijt-1}$	0.28* (9.52)	-	0.27* (8.97)	-
$\ln GDPPC_{it}$	25.83* (4.43)	21.81* (3.81)	23.77* (3.60)	26.60* (3.90)
$\ln GDPPC_{jt}$	0.73 (1.49)	0.82* (3.94)	0.64 (1.30)	0.79* (3.78)
$REER_t$	-0.95*** (-1.73)	-0.10 (-0.20)	0.18 (0.24)	0.20 (0.32)
D9599	0.75** (2.36)	0.22 (1.10)	-	-
D95	-	-	-0.35 (-0.62)	-0.28 (-1.13)
D96	-	-	-0.09 (-0.20)	-0.24 (-0.84)
D97	-	-	0.37 (0.82)	0.37 (1.16)
D98	-	-	0.23 (0.57)	0.47 (1.56)
D99	-	-	0.71*** (1.93)	0.81* (3.03)
$\ln DIST_{ij}$	-	-3.13* (-5.19)	-	-3.09* (-5.15)
Adjusted R^2	0.73	0.36	0.73	0.36
Observations	1020	1020	1020	1020
Cross-Sections	102	102	102	102

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported wine to the following **102 countries in the World**: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAN, CAF, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DNK, DRC, EGY, ESP, EST, ETH, FIN, FRA, GAB, GBR, GHA, GMB, GRC, GRD, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JPN, JOR, KEN, KOR, LBN, LKA, LUX, MAR, MDG, MDV, MLI, MLT, MEX, MOZ, MUS, MWI, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAN, PER, PHL, POL, PRT, PRY, ROM, RUS, RWA, SEN, SGP, SLE, STP, SWE, SYC, TGO, THA, TTO, TUN, TUR, TZA, UGA, UKR, URY, USA, VCT, VEN, ZMB and ZWE

Appendix 5AM: Selection of the estimator suitable for wine imports from the World to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	430	5	4.98*	OLS	*No*	473	4	21.96*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	430	9	4.90*	OLS	*No*	473	8	22.43*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	430	5	-0.17	FE-no auto	*Yes*	473	4	1.78	FE-no auto	*No*
		-	-	-	FE-auto	-	430	4	2.04**	FE-auto	*Yes*
		430	6	-1.80***	RE-no auto	*No*	473	6	1.08	RE-no auto	*No*
		387	6	-0.28	RE-auto	*Yes*	430	6	2.09**	RE-auto	*Yes*
	Yearly Impact	430	9	-0.29	FE-no auto	*Yes*	473	8	1.78	FE-no auto	*No*
		-	-	-	FE-auto	-	430	8	2.05**	FE-auto	*Yes*
		430	10	-1.99**	RE-no auto	*No*	473	9	1.08	RE-no auto	*No*
		387	10	-0.38	RE-auto	*Yes*	430	9	2.09**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	353.56*	FE	*Yes*	N/A	4	-1.79	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	320.35*	FE	*Yes*	N/A	9	2.56	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AN: Suitable equations for wine imports from the World to South Africa

Variables	Period Impact		Yearly Impact	
	Dynamic FE	Static RE	Dynamic FE	Static RE
Constant	-	-151.07** (-1.97)	-	-126.88 (-1.40)
lnY_{ijt-1}	0.12* (2.65)	-	0.13* (2.84)	-
$lnGDPPC_{it}$	25.94* (2.97)	18.42** (1.96)	28.25* (2.71)	15.36 (1.39)
$lnGDPPC_{jt}$	0.74 (0.75)	0.91** (2.41)	0.70 (0.71)	0.88* (2.36)
$REER_t$	1.28 (1.59)	1.14 (1.33)	-0.18 (-0.51)	1.07 (1.03)
D9599	1.39* (3.04)	1.25* (3.32)	-	-
D95	-	-	2.37* (2.69)	0.76 (1.62)
D96	-	-	2.25* (3.11)	1.27** (2.45)
D97	-	-	1.95* (2.79)	1.39** (2.51)
D98	-	-	2.12* (3.33)	1.42* (2.74)
D99	-	-	1.33** (2.28)	1.05** (2.26)
$lnDIST_{ij}$	-	-0.54 (-0.69)	-	-0.44 (-0.56)
Adjusted R^2	0.76	0.18	0.76	0.17
Observations	430	430	430	430
Cross-Sections	43	43	43	43

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported wine from the following **43 countries in the World**: ARE, ARG, AUS, AUT, BEL, BGR, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FIN, FRA, GBR, GRC, HUN, IRL, ISL, ISR, ITA, JPN, KEN, LUX, MUS, MWI, NLD, NZL, POL, PRI, PRT, ROM, RUS, SGP, SWE, THA, TUR, URY, USA, ZMB and ZWE

Appendix 5AO: Selection of the estimator suitable for wine trade between South Africa and the World

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	420	4	3.56*	OLS	*No*	462	3	26.35*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	420	8	3.51*	OLS	*No*	462	7	26.64*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	420	4	1.23	FE-no auto	*Yes*	462	3	1.35	FE-no auto	*No*
		-	-	-	FE-auto	-	420	3	1.74	FE-auto	*No*
		420	5	0.56	RE-no auto	*Yes*	462	4	1.10	RE-no auto	*No*
		-	-	-	RE-auto	-	420	4	1.66	RE-auto	*No*
	Yearly Impact	420	8	1.10	FE-no auto	*Yes*	462	7	1.35	FE-no auto	*No*
		-	-	-	FE-auto	-	420	7	1.71	FE-auto	*No*
		420	9	0.40	RE-no auto	*Yes*	462	8	1.10	RE-no auto	*No*
		-	-	-	RE-auto	-	420	8	1.66	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	4	184.68*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-
	Yearly Impact	N/A	8	179.76*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AP: Suitable equations for wine trade between South Africa and the World

Variables	Period Impact		Yearly Impact	
	Dynamic FE	?	Dynamic FE	?
Constant	-	?	-	?
$\ln Y_{ijt-1}$	0.36* (8.14)	?	0.37* (8.38)	?
$\ln GDPPC_{ijt}$	6.88* (4.85)	?	7.39* (5.08)	?
$REER_t$	0.13 (0.27)	?	-0.90 (-1.38)	?
D9599	0.43*** (1.74)	?		?
D95	-	?	1.09** (2.25)	?
D96	-	?	1.12* (2.74)	?
D97	-	?	1.27* (3.19)	?
D98	-	?	0.82** (2.52)	?
D99	-	?	0.31 (1.13)	?
$\ln DIST_{ij}$	-	?	-	?
Adjusted R^2	0.84	?	0.84	?
Observations	420	?	420	?
Cross-Sections	42	?	42	?

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded wine (imports plus exports) with the following **42 countries in the World**: ARE, ARG, AUS, AUT, BEL, BGR, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FIN, FRA, GBR, GRC, HUN, IRL, ISL, ISR, ITA, JPN, KEN, LUX, MUS, MWI, NLD, NZL, POL, PRT, ROM, RUS, SGP, SWE, THA, TUR, URY, USA, ZMB and ZWE

Appendix 5AQ: Selection of the estimator suitable for agricultural exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
	Period Impact	225	5	4.68*	OLS	*No*	240	4	216.30*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	225	9	4.29*	OLS	*No*	240	8	213.56*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Export Direction	1785	6	5.65*	OLS	*No*	1904	5	37.35*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	5	0.87	FE-no auto	*Yes*	240	4	1.32	FE-no auto	*No*
		-	-	-	FE-auto	-	225	4	2.05**	FE-auto	*Yes*
		225		-1.15	RE-no auto	*Yes*	240	6	1.25	RE-no auto	*No*
		-	-	-	RE-auto	-	225	6	1.91**	RE-auto	*Yes*
	Yearly Impact	225	9	-1.35	FE-no auto	*Yes*	240	8	1.35	FE-no auto	*No*
		-	-	-	FE-auto	-	225	8	2.09**	FE-auto	*Yes*
		225	10	-1.60	RE-no auto	*Yes*	240	9	1.28	RE-no auto	*No*
		-	-	-	RE-auto	-	225	9	1.94**	RE-auto	*Yes*
	Export Direction	1785	6	-0.25	FE-no auto	*Yes*	1904	5	1.31	FE-no auto	*No*
		-	-	-	FE-auto	-	1785	5	1.85	FE-auto	*No*
		1785	7	-0.51	RE-no auto	*Yes*	1904	6	1.19	RE-no auto	*No*
		-	-	-	RE-auto	-	1785	6	1.78	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	5	50.67*	FE	*Yes*	N/A	4	-17.73*	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	9	45.54*	FE	*Yes*	N/A	8	-15.34**	FE	*Yes*
					RE	*No*				RE	*No*
	Export Direction	N/A	6	472.87*	FE	*Yes*	N/A	5	0.03	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AR: Suitable equations for agricultural exports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	FE	FE	FE	FE	N/A
PERIOD VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-			-	-
$\ln Y_{ijt-1}$	0.46* (7.44)	0.46* (7.44)	-	-	0.47* (7.61)	0.47* (7.61)	-	-	0.38* (19.89)	0.38* (19.89)	-	-
$\ln GDPPC_{it}$	1.15 (1.00)	1.15 (1.00)	3.74* (4.08)	3.74* (4.08)	5.84* (2.79)	5.84* (2.79)	5.98* (3.40)	5.98* (3.40)	2.06** (1.89)	2.06** (1.89)	19.35* (6.39)	-
$\ln GDPPC_{jt}$	2.12* (4.47)	2.12* (4.47)	3.40* (6.44)	3.40* (6.44)	2.01* (4.16)	2.01* (4.16)	3.82* (7.61)	3.82* (7.61)	0.03 (0.24)	0.03 (0.24)	0.26 (0.98)	-
$REER_t$	0.15 (0.82)	0.15 (0.82)	0.30 (1.62)	0.30 (1.62)	0.43** (2.16)	0.43** (2.16)	0.53 (2.94)*	0.53 (2.94)*	-0.54* (-3.62)	-0.54* (-3.62)	-0.88* (-3.40)	-
D0004 / D0509	-0.24** (-2.16)	0.24 (1.03)	-0.34* (-4.13)	0.06 (0.36)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.2*** (1.70)	-0.21 (-0.67)	-0.28* (-2.94)	-0.26 (-1.13)	-	-	-	-
D01 / D06	-	-	-	-	-0.18 (-1.14)	-0.94** (-2.37)	-0.40* (-2.87)	-0.68** (-2.16)	-	-	-	-
D02 / D07	-	-	-	-	-0.05 (-0.21)	-0.89*** (-1.86)	-0.39*** (-1.76)	-0.71*** (-1.86)	-	-	-	-
D03 / D08	-	-	-	-	0.28 (1.51)	-0.95*** (-1.86)	0.03 (0.17)	-0.57 (-1.36)	-	-	-	-
D04 / D09	-	-	-	-	0.18 (0.68)	-0.76 (-1.64)	0.04 (0.19)	-0.24 (-0.62)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.46*** (-1.90)	0.52*** (1.93)	-0.59** (-2.27)	-
PTA_{no}	-	-	-	-	-	-	-	-	-0.44* (-2.73)	0.60** (2.54)	-0.51* (-3.40)	-
$\ln DIST_{ij}$	-	-	-	-	-	-	-15.03 (-1.04)	-	-	-	-	-
Adjusted R^2	0.96	0.96	1.00	1.00	0.97	0.97	1.00	1.00	0.86	0.86	0.95	-
Observations	225	225	225	225	225	225	225	225	1785	1785	1904	-
Cross-Sections	15	15	15	15	15	15	15	15	119	119	119	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported agricultural products to the following **15 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as to the following **104 non-EU countries** that were added under the export direction model: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAF, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GAB, GHA, GIN, GMB, GNQ, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDA, MDG, MDV, MEX, MLI, MLT, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NOR, NZL, OMN, PAK, PAN, PER, PHL, PNG, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, TZA, UGA, URY, USA, VCT, VEN, VNM, YEM, ZMB and ZWE

Appendix 5AS: Average actual, simulated and potential value of agricultural exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	5,404,720	15.50278	6,006,301	15.60832	6,037,724	15.61354	6,022,012	15.61093
		2005 - 2009	14,187,847	16.46790	12,233,764	16.31971	16,618,446	16.62602	14,426,105	16.48455
Belgium	BEL	2000 - 2004	112,023,658	18.53422	141,483,627	18.76769	144,101,678	18.78603	142,792,653	18.77690
		2005 - 2009	246,994,352	19.32488	227,221,770	19.24144	334,009,957	19.62668	280,615,864	19.45250
Denmark	DNK	2000 - 2004	16,562,195	16.62263	12,644,508	16.35273	12,415,435	16.33445	12,529,971	16.34363
		2005 - 2009	78,445,976	18.17792	61,795,816	17.93935	56,842,138	17.85579	59,318,977	17.89844
Finland	FIN	2000 - 2004	5,963,522	15.60117	5,717,855	15.55910	5,702,426	15.55640	5,710,140	15.55775
		2005 - 2009	28,688,860	17.17202	22,806,005	16.94253	27,078,655	17.11426	24,942,330	17.03208
France	FRA	2000 - 2004	61,144,925	17.92876	59,660,060	17.90417	59,550,712	17.90234	59,605,386	17.90326
		2005 - 2009	145,165,227	18.79338	124,067,453	18.63634	149,332,507	18.82169	136,699,980	18.73330
Germany	DEU	2000 - 2004	114,658,832	18.55747	119,993,278	18.60295	120,418,554	18.60648	120,205,916	18.60472
		2005 - 2009	391,378,601	19.78519	325,260,369	19.60014	393,878,191	19.79155	359,569,280	19.70042
Greece	GRC	2000 - 2004	7,536,694	15.83529	7,230,934	15.79388	7,211,416	15.79118	7,221,175	15.79253
		2005 - 2009	29,786,988	17.20958	26,530,393	17.09380	37,544,301	17.44103	32,037,347	17.28241
Ireland	IRL	2000 - 2004	11,189,475	16.23048	11,666,519	16.27223	11,699,392	16.27505	11,682,955	16.27364
		2005 - 2009	57,930,674	17.87476	48,535,498	17.69781	55,470,006	17.83135	52,002,752	17.76681
Italy	ITA	2000 - 2004	72,352,100	18.09706	72,772,746	18.10285	72,804,662	18.10329	72,788,704	18.10307
		2005 - 2009	222,330,992	19.21968	189,141,509	19.05801	213,016,848	19.17688	201,079,179	19.11921
Luxembourg	LUX	2000 - 2004	570,144	13.25365	618,971	13.33581	621,753	13.34030	620,362	13.33806
		2005 - 2009	3,009,079	14.91714	1,353,462	14.11818	2,297,929	14.64752	1,825,696	14.41747
Netherlands	NLD	2000 - 2004	288,850,015	19.48142	237,590,970	19.28606	233,866,855	19.27026	235,728,913	19.27819
		2005 - 2009	1,005,638,695	20.72889	842,528,606	20.55192	949,338,524	20.67128	895,933,565	20.61338
Portugal	PRT	2000 - 2004	24,361,526	17.00852	26,224,532	17.08221	26,362,066	17.08744	26,293,299	17.08482
		2005 - 2009	79,320,322	18.18900	69,777,044	18.06082	86,505,976	18.27572	78,141,510	18.17403
Spain	ESP	2000 - 2004	117,742,263	18.58401	112,890,779	18.54193	112,523,256	18.53867	112,707,018	18.54030
		2005 - 2009	316,875,702	19.57402	294,755,911	19.50166	359,152,173	19.69926	326,954,042	19.60533
Sweden	SWE	2000 - 2004	20,030,105	16.81275	19,821,078	16.80226	19,806,594	16.80153	19,813,836	16.80189
		2005 - 2009	158,572,016	18.88172	119,116,338	18.59561	125,231,980	18.64568	122,174,159	18.62096
United Kingdom	GBR	2000 - 2004	362,027,052	19.70723	376,046,068	19.74522	377,233,412	19.74837	376,639,740	19.74680
		2005 - 2009	1,137,822,230	20.85238	979,347,707	20.70240	1,255,209,790	20.95057	1,117,278,748	20.83416

Appendix 5AT: Selection of the estimator suitable for agricultural imports from the EU countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	5	6.35*	OLS	***No***	240	4	61.33*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	9	6.05*	OLS	***No***	240	8	61.41*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	1905	6	5.89*	OLS	***No***	2032	5	32.38*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	225	5	-0.13	FE-no auto	***Yes***	240	4	1.45	FE-no auto	***No***
		-	-	-	FE-auto	-	225	4	2.02**	FE-auto	***Yes***
		225	6	-1.56	RE-no auto	***Yes***	240	6	1.31	RE-no auto	***No***
		-	-	-	RE-auto	-	225	6	2.09**	RE-auto	***Yes***
	Yearly Impact	225	9	-0.17	FE-no auto	***Yes***	240	8	1.44	FE-no auto	***No***
		-	-	-	FE-auto	-	225	8	2.03**	FE-auto	***Yes***
		225	10	-1.66***	RE-no auto	***No***	240	9	1.30	RE-no auto	***No***
		210	10	-0.91	RE-auto	***Yes***	225	9	2.09**	RE-auto	***Yes***
	Import Direction	1905	6	0.11	FE-no auto	***Yes***	2032	5	1.59	FE-no auto	***No***
		-	-	-	FE-auto	-	1905	5	1.94**	FE-auto	***Yes***
		1905	7	-1.51	RE-no auto	***Yes***	2032	6	1.18	RE-no auto	***No***
		-	-	-	RE-auto	-	1905	6	2.08**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	94.68*	FE	***Yes***	N/A	4	20.38*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	9	93.41*	FE	***Yes***	N/A	8	19.37*	FE	***Yes***
					RE	***No***				RE	***No***
	Import Direction	N/A	6	977.19*	FE	***Yes***	N/A	5	-0.70	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5AU: Suitable equations for agricultural imports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-26.22 (-1.41)	-26.22 (-1.41)
$\ln Y_{ijt-1}$	0.28* (4.34)	0.28* (4.34)	-	-	0.29* (4.43)	0.29* (4.43)	-	-	0.23* (10.50)	0.23* (10.50)	-	-
$\ln GDPPC_{it}$	1.57 (0.51)	1.57 (0.51)	0.91 (0.29)	0.91 (0.29)	4.74 (0.78)	4.74 (0.78)	1.45 (0.22)	1.45 (0.22)	5.39** (2.39)	5.39** (2.39)	6.10* (2.90)	6.10* (2.90)
$\ln GDPPC_{jt}$	2.40*** (1.90)	2.40*** (1.90)	6.75* (3.48)	6.75* (3.48)	2.31*** (1.75)	2.31*** (1.75)	7.06* (3.41)	7.06* (3.41)	0.80* (3.00)	0.80* (3.00)	0.95 (5.73)	0.95 (5.73)
$REER_t$	0.30 (0.57)	0.30 (0.57)	0.84 (1.32)	0.84 (1.32)	0.47 (0.81)	0.47 (0.81)	0.93 (1.41)	0.93 (1.41)	-0.32 (-1.04)	-0.32 (-1.04)	-0.39 (-0.94)	-0.39 (-0.94)
D0004 / D0509	-0.01 (-0.02)	0.49 (0.73)	-0.28 (-0.68)	0.20 (0.37)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.13 (-0.26)	0.18 (0.19)	-0.34 (-0.71)	0.07 (0.08)	-	-	-	-
D01 / D06	-	-	-	-	-0.38 (-0.55)	-0.35 (-0.29)	-0.13 (-0.18)	-0.18 (-0.16)	-	-	-	-
D02 / D07	-	-	-	-	-0.82 (-0.78)	-0.18 (-0.13)	0.22 (0.18)	-0.08 (-0.06)	-	-	-	-
D03 / D08	-	-	-	-	-0.65 (-0.78)	-0.39 (-0.25)	-0.71 (-0.80)	-0.04 (-0.03)	-	-	-	-
D04 / D09	-	-	-	-	-0.64 (-0.55)	-0.17 (-0.12)	-1.14 (-0.97)	0.27 (0.20)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.01 (0.02)	0.03 (0.05)	-0.05 (-0.09)	0.36 (0.58)
PTA_{no}	-	-	-	-	-	-	-	-	0.33 (1.12)	-0.22 (-0.46)	0.13 (0.49)	-0.12 (-0.29)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-1.74** (-2.57)	-1.98* (-3.15)
Adjusted R^2	0.86	0.86	0.94	0.94	0.86	0.86	0.95	0.95	0.76	0.76	0.33	0.33
Observations	225	225	225	225	225	225	225	225	1905	1905	2032	2032
Cross-Sections	15	15	15	15	15	15	15	15	127	127	127	127

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported agricultural products from the following **15 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as from the following **112 non-EU countries** that were added under the import direction model: AGO, ALB, ARE, ARG, ATG, AUS, BDI, BEN, BGD, BGR, BHR, BHS, BOL, BRA, BTN, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DMA, DOM, DRC, ECU, EGY, EST, ETH, GHA, GIN, GMB, GRD, GTM, GUY, HRV, HTI, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KGZ, KOR, KWT, LAO, LBN, LKA, MAR, MDG, MEX, MLI, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NIC, NOR, NPL, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, SLV, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, TZA, UGA, UKR, URY, USA, VCT, VEN, VNM, ZMB and ZWE

Appendix 5AV: Average actual, simulated and potential value of agricultural imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	14,769,368	16.50807	10,358,398	16.15331	10,193,351	16.13725	10,275,875	16.14531
		2005 - 2009	66,503,044	18.01276	49,106,497	17.70950	47,798,440	17.68250	48,452,468	17.69609
Belgium	BEL	2000 - 2004	14,725,647	16.50510	18,054,746	16.70892	18,331,545	16.72413	18,193,145	16.71656
		2005 - 2009	78,875,372	18.18338	78,489,713	18.17848	78,460,993	18.17811	78,475,353	18.17830
Denmark	DNK	2000 - 2004	11,637,128	16.26971	12,733,197	16.35972	12,817,107	16.36629	12,775,152	16.36301
		2005 - 2009	45,149,774	17.62550	47,418,338	17.67452	47,586,862	17.67807	47,502,600	17.67629
Finland	FIN	2000 - 2004	1,641,458	14.31110	1,897,850	14.45623	1,915,545	14.46551	1,906,697	14.46088
		2005 - 2009	3,676,276	15.11741	6,447,026	15.67913	6,681,821	15.71490	6,564,423	15.69718
France	FRA	2000 - 2004	45,456,959	17.63228	51,860,303	17.76406	52,408,140	17.77457	52,134,222	17.76933
		2005 - 2009	212,594,203	19.17490	198,401,319	19.10580	197,325,388	19.10036	197,863,354	19.10309
Germany	DEU	2000 - 2004	44,546,640	17.61205	46,269,842	17.65000	46,409,083	17.65301	46,339,462	17.65150
		2005 - 2009	265,135,203	19.39575	215,952,506	19.19057	212,477,022	19.17434	214,214,764	19.18249
Greece	GRC	2000 - 2004	2,835,764	14.85782	2,891,773	14.87738	2,895,502	14.87867	2,893,638	14.87802
		2005 - 2009	9,123,344	16.02635	13,596,838	16.42535	13,964,756	16.45205	13,780,797	16.43879
Ireland	IRL	2000 - 2004	15,998,471	16.58800	29,926,675	17.21426	31,406,784	17.26253	30,666,730	17.23869
		2005 - 2009	70,487,247	18.07094	94,956,289	18.36893	97,114,808	18.39140	96,035,549	18.38023
Italy	ITA	2000 - 2004	33,722,779	17.33368	32,337,522	17.29174	32,232,605	17.28849	32,285,064	17.29012
		2005 - 2009	163,356,555	18.91145	136,604,533	18.73260	134,735,211	18.71882	135,669,872	18.72574
Luxembourg	LUX	2000 - 2004	25,142	10.13230	7,437	8.91425	7,097	8.86737	7,267	8.89108
		2005 - 2009	38,552	10.55976	21,592	9.98007	21,102	9.95710	21,347	9.96865
Netherlands	NLD	2000 - 2004	44,755,968	17.61674	45,019,454	17.62261	45,040,317	17.62307	45,029,886	17.62284
		2005 - 2009	245,209,582	19.31762	225,842,491	19.23535	224,374,222	19.22883	225,108,357	19.23209
Portugal	PRT	2000 - 2004	4,228,945	15.25746	4,527,435	15.32567	4,548,494	15.33031	4,537,964	15.32799
		2005 - 2009	25,359,201	17.04865	24,023,956	16.99456	23,933,940	16.99081	23,978,948	16.99269
Spain	ESP	2000 - 2004	16,106,396	16.59473	15,995,987	16.58785	15,987,829	16.58734	15,991,908	16.58759
		2005 - 2009	77,312,232	18.16336	73,035,493	18.10646	72,727,420	18.10223	72,881,456	18.10434
Sweden	SWE	2000 - 2004	2,506,931	14.73457	2,823,271	14.85341	2,845,438	14.86123	2,834,354	14.85732
		2005 - 2009	12,887,834	16.37179	13,496,018	16.41791	13,537,700	16.42099	13,516,859	16.41945
United Kingdom	GBR	2000 - 2004	117,140,037	18.57888	139,432,819	18.75309	141,501,894	18.76782	140,467,357	18.76049
		2005 - 2009	441,614,905	19.90595	528,924,189	20.08636	536,910,372	20.10134	532,917,281	20.09388

Appendix 5AW: Selection of the estimator suitable for agricultural trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	4	5.34*	OLS	***No***	240	3	200.88*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	8	4.02*	OLS	***No***	240	7	215.90*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Trade Direction	1635	5	6.64*	OLS	***No***	1744	4	58.39*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	4	-0.27	FE-no auto	***No***	240	3	1.46	FE-no auto	***No***
		-	-	-	FE-auto	***Yes***	225	3	1.84**	FE-auto	***Yes***
		225	5	-0.41	RE-no auto	***No***	240	4	1.40	RE-no auto	***No***
		-	-	-	RE-auto	***Yes***	225	4	1.78	RE-auto	***?***
	Yearly Impact	225	8	-0.38	FE-no auto	***No***	240	7	1.39	FE-no auto	***No***
		-	-	-	FE-auto	***Yes***	225	7	1.90**	FE-auto	***Yes***
		225	9	-0.82	RE-no auto	***No***	240	8	1.34	RE-no auto	***No***
		-	-	-	RE-auto	***Yes***	225	8	1.83	RE-auto	***?***
	Trade Direction	1635	5	0.53	FE-no auto	***No***	1744	4	1.35	FE-no auto	***No***
		-	-	-	FE-auto	***Yes***	1635	4	1.90	FE-auto	***No***
		1635	6	0.12	RE-no auto	***No***	1744	5	1.28	RE-no auto	***No***
		-	-	-	RE-auto	***Yes***	1635	5	1.91	RE-auto	***No***
Hausman Test Statistic	Period Impact	N/A	4	53.19*	FE	***No***	-	-	-	FE	-
					RE	***Yes***				RE	-
	Yearly Impact	N/A	8	43.95*	FE	***No***	-	-	-	FE	-
					RE	***Yes***				RE	-
	Trade Direction	N/A	5	497.07*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5AX: Suitable equations for agricultural trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	-	-
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.43* (7.27)	0.43* (7.27)	-	-	0.45* (6.73)	0.45* (6.73)	-	-	0.37* (10.80)	0.37* (10.80)	-	-
$\ln GDPPC_{ijt}$	1.50* (3.00)	1.50* (3.00)	4.05* (7.02)	4.05* (7.02)	1.65* (3.28)	1.65* (3.28)	4.49* (7.60)	4.49* (7.60)	0.46* (3.42)	0.46* (3.42)	-	-
$REER_t$	0.03 (0.16)	0.03 (0.16)	0.26 (1.28)	0.26 (1.28)	0.09 (0.53)	0.09 (0.53)	0.48** (2.47)	0.48** (2.47)	-0.48* (-4.69)	-0.48* (-4.69)	-	-
D0004 / D0509	0.08 (0.81)	0.66* (5.53)	-0.17*** (-1.84)	0.66* (5.55)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.07 (-0.68)	0.74* (5.84)	-0.13 (-1.43)	0.42* (3.55)	-	-	-	-
D01 / D06	-	-	-	-	-0.13 (-0.97)	0.32** (2.17)	-0.22 (-1.53)	0.30** (2.12)	-	-	-	-
D02 / D07	-	-	-	-	-0.15 (-0.76)	0.61* (3.98)	-0.25 (-1.09)	0.50* (3.14)	-	-	-	-
D03 / D08	-	-	-	-	0.32** (2.30)	0.61* (3.97)	0.18 (1.15)	0.72* (4.81)	-	-	-	-
D04 / D09	-	-	-	-	0.30** (2.33)	0.71* (4.55)	0.31** (2.01)	0.97* (7.00)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.16 (0.99)	0.93* (7.61)	-	-
PTA_{no}	-	-	-	-	-	-	-	-	0.23** (2.33)	0.94* (15.77)	-	-
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.96	0.96	0.99	0.99	0.96	0.96	0.996	0.996	0.89	0.89	-	-
Observations	225	225	225	225	225	225	225	225	1635	1635	-	-
Cross-Sections	15	15	15	15	15	15	15	15	109	109	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded agricultural products (imports plus exports) with the following **15 EU countries:** AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as with the following **94 non-EU countries** that were added under the trade direction model: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GHA, GIN, GMB, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LKA, MAR, MDG, MEX, MLI, MOZ, MRT, MUS, MWI, MYS, NER, NGA, NOR, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, TZA, UGA, URY, USA, VCT, VEN, VNM, ZMB and ZWE

Appendix 5AY: Average actual, simulated and potential value of agricultural trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	20,255,230	16.82392	19,047,241	16.76243	18,999,559	16.75993	19,023,400	16.76118
		2005 - 2009	80,834,738	18.20792	72,666,623	18.10139	72,164,259	18.09446	72,415,441	18.09793
Belgium	BEL	2000 - 2004	126,806,811	18.65818	151,782,395	18.83796	153,895,695	18.85179	152,839,045	18.84490
		2005 - 2009	328,837,486	19.61107	427,543,734	19.87357	436,069,760	19.89331	431,806,747	19.88349
Denmark	DNK	2000 - 2004	28,437,283	17.16321	26,710,861	17.10058	26,595,124	17.09624	26,652,992	17.09841
		2005 - 2009	123,902,989	18.63501	109,659,716	18.51289	108,730,175	18.50438	109,194,945	18.50865
Finland	FIN	2000 - 2004	7,737,780	15.86163	7,549,229	15.83696	7,537,340	15.83538	7,543,285	15.83617
		2005 - 2009	34,318,028	17.35118	34,603,232	17.35946	34,621,889	17.36000	34,612,561	17.35973
France	FRA	2000 - 2004	107,288,667	18.49103	109,956,855	18.51560	110,160,926	18.51745	110,058,891	18.51653
		2005 - 2009	359,835,503	19.70116	361,490,460	19.70575	361,614,271	19.70609	361,552,365	19.70592
Germany	DEU	2000 - 2004	160,197,912	18.89192	164,314,857	18.91730	164,637,243	18.91926	164,476,050	18.91828
		2005 - 2009	666,935,558	20.31820	638,324,651	20.27436	636,177,483	20.27099	637,251,067	20.27267
Greece	GRC	2000 - 2004	10,686,802	16.18452	9,768,739	16.09470	9,711,881	16.08886	9,740,310	16.09178
		2005 - 2009	39,152,836	17.48298	45,679,529	17.63716	46,148,140	17.64737	45,913,835	17.64228
Ireland	IRL	2000 - 2004	27,610,899	17.13372	32,244,780	17.28887	32,597,590	17.29975	32,421,185	17.29432
		2005 - 2009	129,852,493	18.68191	136,964,854	18.73523	137,481,585	18.73900	137,223,219	18.73712
Italy	ITA	2000 - 2004	106,155,583	18.48042	106,276,698	18.48156	106,285,789	18.48164	106,281,243	18.48160
		2005 - 2009	386,418,362	19.77243	377,511,820	19.74911	376,854,815	19.74737	377,183,318	19.74824
Luxembourg	LUX	2000 - 2004	826,318	13.62473	846,759	13.64917	847,889	13.65050	847,324	13.64984
		2005 - 2009	3,060,762	14.93417	2,496,899	14.73056	2,469,249	14.71942	2,483,074	14.72501
Netherlands	NLD	2000 - 2004	333,750,063	19.62590	290,948,361	19.48866	287,779,829	19.47771	289,364,095	19.48320
		2005 - 2009	1,265,236,017	20.95852	1,195,645,997	20.90195	1,190,286,337	20.89746	1,192,966,167	20.89971
Portugal	PRT	2000 - 2004	28,993,727	17.18259	30,035,583	17.21789	30,109,714	17.22036	30,072,648	17.21913
		2005 - 2009	105,855,325	18.47758	114,458,122	18.55572	115,084,878	18.56118	114,771,500	18.55845
Spain	ESP	2000 - 2004	134,214,339	18.71495	124,539,947	18.64014	123,833,413	18.63445	124,186,680	18.63730
		2005 - 2009	395,124,819	19.79471	438,735,905	19.89941	442,209,833	19.90730	440,472,869	19.90336
Sweden	SWE	2000 - 2004	22,672,782	16.93668	22,187,409	16.91504	22,154,525	16.91355	22,170,967	16.91429
		2005 - 2009	171,994,311	18.96297	138,602,626	18.74712	136,504,837	18.73187	137,553,732	18.73953
United Kingdom	GBR	2000 - 2004	481,159,852	19.99171	494,114,863	20.01828	495,193,991	20.02046	494,654,427	20.01937
		2005 - 2009	1,583,128,436	21.18267	1,760,413,273	21.28881	1,775,617,381	21.29741	1,768,015,327	21.29312

Appendix 5AZ: Selection of the estimator suitable for cheese exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	3.23*	OLS	*No*	96	4	8.08*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	9	3.20*	OLS	*No*	96	8	8.32	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Export Direction	435	6	2.52**	OLS	*No*	464	5	10.44*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) or Durbin-H Statistic (*for dynamic*)	Period Impact	90	6	0.29	FE-no auto	*Yes*	96	4	1.46	FE-no auto	*No*
		-	-	-	FE-auto	-	90	4	1.98**	FE-auto	*Yes*
		-	-	-	RE-no auto	-	96	6	0.41	RE-no auto	*No*
		-	-	-	RE-auto	-	90	6	2.29**	RE-auto	*Yes*
	Yearly Impact	90	9	0.02	FE-no auto	*Yes*	96	8	1.47	FE-no auto	*No*
		-	-	-	FE-auto	-	90	8	1.99**	FE-auto	*Yes*
		-	-	-	RE-no auto	-	96	9	0.43	RE-no auto	*No*
		-	-	-	RE-auto	-	90	9	2.30**	RE-auto	*Yes*
	Export Direction	480		-0.11	FE-no auto	*Yes*	512	5	1.28	FE-no auto	*No*
		-	-	-	FE-auto	-	480	5	1.97**	FE-auto	*Yes*
		480		-1.44	RE-no auto	*Yes*	512	6	0.79	RE-no auto	*No*
		-	-	-	RE-auto	-	480	6	2.08**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	FE	-	N/A	4	0.37	FE	*No*
					RE	-				RE	*Yes*
	Yearly Impact	-	-	-	FE	-	N/A	8	1.22	FE	*No*
					RE	-				RE	*Yes*
	Export Direction	N/A	6	146.69*	FE	*Yes*	N/A	5	14.94**	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BA: Suitable equations for cheese exports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-60.65 (-0.34)	-60.65 (-0.34)	-	-	71.48 (0.22)	71.48 (0.22)	-	-	-	-
$\ln Y_{ijt-1}$	0.28** (2.49)	0.28** (2.49)	-	-	0.30** (2.63)	0.30** (2.63)	-	-	0.40* (8.88)	0.40* (8.88)	-	-
$\ln GDPPC_{it}$	6.00 (0.34)	6.00 (0.34)	23.04 (1.27)	23.04 (1.27)	-10.86 (-0.31)	-10.86 (-0.31)	6.97 (0.19)	6.97 (0.19)	-7.72 (-1.44)	-7.72 (-1.44)	-3.73 (-0.77)	-3.73 (-0.77)
$\ln GDPPC_{jt}$	7.90 (0.99)	7.90 (0.99)	4.44 (1.21)	4.44 (1.21)	7.05 (0.86)	7.05 (0.86)	4.41 (1.17)	4.41 (1.17)	1.09 (1.16)	1.09 (1.16)	0.66 (0.54)	0.66 (0.54)
$REER_t$	2.49 (0.85)	2.49 (0.85)	1.21 (0.32)	1.21 (0.32)	1.07 (0.34)	1.07 (0.34)	0.07 (0.02)	0.07 (0.02)	-1.88** (-2.56)	-1.88** (-2.56)	-1.66*** (-1.83)	-1.66*** (-1.83)
D0004 / D0509	-3.08 (-1.53)	-2.89 (-0.75)	-3.53*** (-1.75)	-5.26 (-1.55)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-3.57 (-1.56)	-1.55 (-0.29)	-3.90 (-1.63)	-3.38 (-0.68)	-	-	-	
D01 / D06	-	-	-	-	-4.28 (-1.40)	2.06 (0.31)	-6.23*** (-1.72)	-1.21 (-0.18)	-	-	-	-
D02 / D07	-	-	-	-	-3.93 (-0.82)	2.53 (0.31)	-5.56 (-0.98)	0.06 (0.01)	-	-	-	-
D03 / D08	-	-	-	-	-4.91 (-1.35)	0.51 (0.06)	-7.27 (-1.62)	-1.92 (-0.21)	-	-	-	-
D04 / D09	-	-	-	-	-7.75 (-1.50)	0.55 (0.07)	-10.57*** (-1.79)	-2.15 (-0.25)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-2.37* (-2.58)	1.19 (0.92)	-1.74** (-1.83)	-0.15 (-0.13)
PTA_{no}	-	-	-	-	-	-	-	-	-0.96 (-1.40)	2.01*** (1.73)	-0.57 (-0.88)	1.45 (1.49)
$\ln DIST_{ij}$	-	-	-1.39 (-0.07)	-18.75 (-1.52)	-	-	-5.89 (-0.25)	-18.56 (-1.56)	-	-	-2.31* (-2.47)	-
Adjusted R^2	0.40	0.40	0.16	0.16	0.39	0.39	0.12	0.12	0.70	0.70	0.39	0.39
Observations	90	90	90	90	90	90	90	90	480	480	480	480
Cross-Sections	6	6	6	6	6	6	6	6	32	32	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported cheese to the following **6 EU countries**: DEU, ESP, FRA, GBR, GRC and NLD as well as to the following other **26 non-EU countries** that were added under the export direction model: AGO, ARE, BDI, CHE, CIV, CMR, COG, COM, DRC, ETH, GAB, GHA, JPN, KEN, MDG, MDV, MOZ, MUS, MWI, NGA, SYC, TZA, UGA, USA, ZMB and ZWE

Appendix 5BB: Average actual, simulated and potential value of cheese exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
France	FRA	2000 - 2004	2	0.61763	220	5.39154	345	5.84447	282	5.64343
		2005 - 2009	2	0.81228	1	0.11923	1	0.11474	1	0.11698
Germany	DEU	2000 - 2004	8	2.04074	229	5.43537	257	5.54792	243	5.49323
		2005 - 2009	17	2.86196	11	2.38260	10	2.31179	10	2.34719
Greece	GRC	2000 - 2004	3	1.02676	6	1.87045	6	1.71510	6	1.79579
		2005 - 2009	1,599	7.37691	204	5.31992	89	4.49037	135	4.90515
Netherlands	NLD	2000 - 2004	294	5.68434	241	5.48316	109	4.68763	175	5.16250
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Spain	ESP	2000 - 2004	3	1.09016	21	3.02602	18	2.89956	19	2.96478
		2005 - 2009	5	1.54186	5	1.63657	5	1.64575	5	1.64116
United Kingdom	GBR	2000 - 2004	947,613	13.76170	387	5.95945	19	2.93936	203	5.31395
		2005 - 2009	372	5.91841	8,545	9.05311	171,701	12.05351	38,304	10.55331

Appendix 5BC: Selection of the estimator suitable for cheese imports from the EU countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	**K**	**Statistic**	**Estimator**	**Decision**	**N**	**K**	**Statistic**	**Estimator**	**Decision**
Wald Test Statistic	Period Impact	195	5	3.99*	OLS	***No***	208	4	20.03*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	195	9	5.38*	OLS	***No***	208	8	25.50*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	360	6	3.72*	OLS	***No***	384	5	17.86*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	195	5	0.15	FE-no auto	***Yes***	208	4	1.46	FE-no auto	***No***
		-	-	-	FE-auto	-	195	4	1.92**	FE-auto	***Yes***
		195	6	-0.86	RE-no auto	***Yes***	208	6	0.96	RE-no auto	***No***
		-	-	-	RE-auto	-	195	6	1.96**	RE-auto	***Yes***
	Yearly Impact	195	9	-0.33	FE-no auto	***Yes***	208	8	1.40	FE-no auto	***No***
		-	-	-	FE-auto	-	195	8	2.03**	FE-auto	***Yes***
		195	10	-1.25	RE-no auto	***Yes***	208	9	1.01	RE-no auto	***No***
		-	-	-	RE-auto	-	195	9	2.08**	RE-auto	***Yes***
	Import Direction	360	-	0.14	FE-no auto	***Yes***	384	5	1.38	FE-no auto	***No***
		-	-	-	FE-auto		360	5	1.98**	FE-auto	***Yes***
		360	-	-0.95	RE-no auto	***Yes***	384	6	0.78	RE-no auto	***No***
		-	-	-	RE-auto	-	360	6	2.04**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	74.12*	FE	***Yes***	N/A	4	0.59	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	92.71*	FE	***Yes***	N/A	8	-4.20	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	131.24*	FE	***Yes***	N/A	5	-1.99	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BD: Suitable equations for cheese imports from the EU countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	11.76 (0.12)	11.76 (0.12)	-	-	-205.08 (-1.38)	-205.08 (-1.38)	-	-	-15.12 (-0.21)	-15.12 (-0.21)
$\ln Y_{ijt-1}$	0.30* (3.53)	0.30* (3.53)	-	-	0.35* (4.90)	0.35* (4.90)	-	-	0.32* (5.63)	0.32* (5.63)	-	-
$\ln GDPPC_{it}$	-2.10 (-0.25)	-2.10 (-0.25)	0.44 (0.05)	0.44 (0.05)	33.60** (2.38)	33.60** (2.38)	27.89*** (1.82)	27.89*** (1.82)	6.85 (0.90)	6.85 (0.90)	4.56 (0.62)	4.56 (0.62)
$\ln GDPPC_{jt}$	3.72 (1.04)	3.72 (1.04)	3.13 (1.34)	3.13 (1.34)	-3.02 (-0.96)	-3.02 (-0.96)	3.72*** (1.78)	3.72*** (1.78)	0.89 (0.36)	0.89 (0.36)	3.44* (6.02)	3.44* (6.02)
$REER_t$	0.84 (0.60)	0.84 (0.60)	1.19 (0.71)	1.19 (0.71)	1.28 (0.97)	1.28 (0.97)	2.19 (1.42)	2.19 (1.42)	1.91*** (1.67)	1.91*** (1.67)	3.38** (2.30)	3.38** (2.30)
D0004 / D0509	0.59 (0.77)	-0.08 (-0.05)	-0.12 (-0.16)	-1.15 (-0.73)			-	-			-	-
D00 / D05	-	-	-	-	-0.13 (-0.26)	-3.63*** (-1.66)	-0.25 (-0.30)	-3.26 (-1.54)	-	-	-	-
D01 / D06	-	-	-	-	-0.38 (-0.55)	-4.82*** (-1.76)	-1.29 (-1.14)	-4.62 (-1.62)	-	-	-	-
D02 / D07	-	-	-	-	-0.82 (-0.78)	-5.84*** (-1.78)	-1.40 (-0.81)	-5.57 (-1.59)	-	-	-	-
D03 / D08	-	-	-	-	-0.65 (-0.78)	-6.71*** (-1.90)	-1.74 (-1.27)	-6.01 (-1.57)	-	-	-	-
D04 / D09	-	-	-	-	-0.64 (-0.55)	-12.16* (-3.78)	-3.24*** (-1.70)	-11.56* (-3.32)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.91 (1.02)	-1.55 (-0.93)	0.99 (1.15)	-2.13 (-1.44)
PTA_{no}	-	-	-	-	-	-	-	-	-0.74 (-0.79)	-1.66 (-0.98)	-1.44 (-1.52)	-2.53 (-1.62)
$\ln DIST_{ij}$	-	-	-4.47 (-0.51)	-4.47 (-0.51)	-	-	-5.74 (-0.64)	-5.74 (-0.64)	-	-	-1.08 (-0.98)	-6.58 (-1.62)
Adjusted R^2	0.67	0.67	0.48	0.48	0.76	0.76	0.49	0.49	0.64	0.64	0.51	0.51
Observations	195	195	195	195	195	195	195	195	360	360	360	360
Cross-Sections	13	13	13	13	13	13	13	13	24	24	24	24

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported cheese from the following **13 EU countries**: AUT, BEL, DEU, DNK, ESP, FRA, GBR, GRC, IRL, ITA, NLD, PRT and SWE as well as from the following other **11 non-EU countries** that were added under the import direction model: ARG, AUS, BGR, CAN, CHE, MOZ, NZL, NOR, POL, USA and ZWE

Appendix 5BE: Average actual, simulated and potential value of cheese imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	364,986	12.80761	516,260	13.15437	543,642	13.20605	529,774	13.18021
		2005 - 2009	26,697	10.19230	147,771	11.90342	167,466	12.02854	157,311	11.96598
Belgium	BEL	2000 - 2004	88,832	11.39450	23,518	10.06552	21,397	9.97100	22,432	10.01826
		2005 - 2009	31,119	10.34556	41,908	10.64323	42,828	10.66495	42,366	10.65409
Denmark	DNK	2000 - 2004	2,982,915	14.90841	3,283,069	15.00429	3,317,850	15.01483	3,300,414	15.00956
		2005 - 2009	4,291,176	15.27207	3,064,104	14.93527	2,957,143	14.89973	3,010,149	14.91750
France	FRA	2000 - 2004	5,433,388	15.50807	6,611,744	15.70436	6,763,492	15.72705	6,687,188	15.71570
		2005 - 2009	5,775,476	15.56913	4,779,608	15.37987	4,682,038	15.35924	4,730,571	15.36956
Germany	DEU	2000 - 2004	3,328,056	15.01790	4,433,065	15.30460	4,578,150	15.33681	4,505,024	15.32070
		2005 - 2009	2,134,408	14.57370	2,703,557	14.81008	2,771,188	14.83479	2,737,164	14.82243
Greece	GRC	2000 - 2004	93,859	11.44955	111,098	11.61816	112,664	11.63216	111,878	11.62516
		2005 - 2009	9,246	9.13190	67,798	11.12429	78,964	11.27675	73,168	11.20052
Ireland	IRL	2000 - 2004	1,341,607	14.10938	1,226,614	14.01977	1,215,468	14.01064	1,221,028	14.01520
		2005 - 2009	100,370	11.51662	869,999	13.67625	1,069,862	13.88304	964,769	13.77964
Italy	ITA	2000 - 2004	3,737,395	15.13390	3,606,950	15.09837	3,592,822	15.09445	3,599,879	15.09641
		2005 - 2009	4,693,112	15.36161	3,362,899	15.02831	3,245,924	14.99291	3,303,893	15.01061
Netherlands	NLD	2000 - 2004	1,273,774	14.05749	1,834,019	14.42202	1,905,690	14.46035	1,869,511	14.44119
		2005 - 2009	1,136,217	13.94322	1,525,343	14.23773	1,570,972	14.26721	1,547,990	14.25247
Portugal	PRT	2000 - 2004	30,809	10.33557	5,008	8.51878	4,494	8.41060	4,744	8.46469
		2005 - 2009	40,839	10.61739	16,959	9.73853	15,998	9.68021	16,471	9.70937
Spain	ESP	2000 - 2004	4	1.36201	9	2.17463	9	2.18646	9	2.18054
		2005 - 2009	3,436	8.14214	309	5.73263	282	5.64101	295	5.68682
Sweden	SWE	2000 - 2004	5	1.57507	10	2.28560	10	2.29647	10	2.29103
		2005 - 2009	3,428	8.13979	199	5.29251	180	5.19285	189	5.24268
United Kingdom	GBR	2000 - 2004	1,112,152	13.92181	1,484,760	14.21076	1,529,820	14.24066	1,507,121	14.22571
		2005 - 2009	889,014	13.69787	1,204,007	14.00117	1,240,427	14.03097	1,222,082	14.01607

Appendix 5BF: Selection of the estimator suitable for cheese trade between the EU countries and South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	4.25*	OLS	***No***	96	3	15.40*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	8	4.67*	OLS	***No***	96	7	5.97*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Trade Direction	150	5	3.92*	OLS	***No***	160	4	20.55*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	4	1.53	FE-no auto	***Yes***	96	3	1.52	FE-no auto	***No***
		-	-	-	FE-auto	-	90	3	1.81**	FE-auto	***Yes***
		90	5	-1.94***	RE-no auto	***No***	96	4	1.05	RE-no auto	***No***
		84	5	0.21	RE-auto	***Yes***	90	4	1.93**	RE-auto	***Yes***
	Yearly Impact	75	8	0.63	FE-no auto	***Yes***	96	7	1.48	FE-no auto	***No***
		-	-	-	FE-auto	-	90	7	1.91**	FE-auto	***Yes***
		90	9	-2.14**	RE-no auto	***No***	96	8	1.03	RE-no auto	***No***
		84	9	0.79	RE-auto	***Yes***	90	8	2.02**	RE-auto	***Yes***
	Trade Direction	150	5	1.10	FE-no auto	***Yes***	160	4	1.66	FE-no auto	***No***
		-	-	-	FE-auto	-	150	4	1.95**	FE-auto	***Yes***
		150	6	-1.71***	RE-no auto	***No***	160	5	1.15	RE-no auto	***No***
		140	6	0.46	RE-auto	***Yes***	150	5	2.15**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	28.95*	FE	***Yes***	N/A	3	-113.23*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	28.49*	FE	***Yes***	N/A	7	-6.45	FE	***No***
					RE	***No***				RE	***Yes***
	Trade Direction	N/A	5	34.35*	FE	***Yes***	N/A	4	-2.44	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BG: Suitable equations for cheese trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-401.04*** (-1.91)	-401.04*** (-1.91)	-	-	-88.93** (-2.14)	-88.93** (-2.14)
$\ln Y_{ijt-1}$	0.26** (2.21)	0.26** (2.21)	-	-	0.28** (2.44)	0.28** (2.44)	-	-	0.23*** (1.89)	0.23*** (1.89)	-	-
$\ln GDPPC_{ijt}$	0.85 (0.18)	0.85 (0.18)	0.04 (0.01)	0.04 (0.01)	-0.64 (-0.14)	-0.64 (-0.14)	8.24 (1.13)	8.24 (1.13)	2.49 (0.52)	2.49 (0.52)	8.58* (3.70)	8.58* (3.70)
$REER_t$	0.39 (0.27)	0.39 (0.27)	0.09 (0.05)	0.09 (0.05)	0.05 (0.03)	0.05 (0.03)	0.36 (0.17)	0.36 (0.17)	0.87 (0.65)	0.87 (0.65)	0.84 (0.59)	0.84 (0.59)
D0004 / D0509	-0.79 (-0.86)	0.20 (0.21)	-0.88 (-1.06)	0.44 (0.40)	-	-	-	-	-	-	-	
D00 / D05	-	-	-	-	0.29 (0.31)	0.61 (0.55)	-0.66 (-0.74)	-0.26 (-0.22)	-	-	-	-
D01 / D06	-	-	-	-	1.99 (1.51)	0.72 (0.62)	-1.14 (-1.00)	-0.07 (-0.05)	-	-	-	-
D02 / D07	-	-	-	-	6.41* (3.28)	0.91 (0.74)	0.23 (0.13)	0.09 (0.05)	-	-	-	-
D03 / D08	-	-	-	-	2.24 (1.63)	1.20 (1.01)	-0.63 (-0.54)	0.49 (0.30)	-	-	-	-
D04 / D09	-	-	-	-	1.79 (1.42)	-1.24 (-1.12)	0.85 (0.76)	-1.33 (-0.87)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.56 (-0.92)	-0.06 (-0.06)	-1.03*** (-1.81)	-0.47 (-0.58)
PTA_{no}	-	-	-	-	-	-	-	-	-0.16 (-0.27)	-2.09** (-2.14)	-0.21 (-0.37)	-3.53* (-3.59)
$\ln DIST_{ij}$	-	-	-	-	-	-	36.21 (1.18)	36.21 (1.18)	-	-	1.04 (0.22)	1.04 (0.22)
Adjusted R^2	0.77	0.77	0.66	0.66	0.78	0.78	0.44	0.44	0.68	0.68	0.59	0.59
Observations	90	90	90	90	90	90	90	90	150	150	150	150
Cross-Sections	6	6	6	6	6	6	6	6	10	10	10	10

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded cheese (imports plus exports) with the following **6 EU countries**: FRA, DEU, ESP, FRA, GBR, GRC and NLD as well as with the following other **4 non-EU countries** that were added under the trade direction model: CHE, MOZ, USA and ZWE

Appendix 5BH: Average actual, simulated and potential value of cheese trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
France	FRA	2000 - 2004	5,433,393	15.50807	3,794,227	15.14899	3,458,650	15.05639	3,622,555	15.10269
		2005 - 2009	5,775,486	15.56913	6,721,196	15.72078	7,059,854	15.76993	6,888,444	15.74536
Germany	DEU	2000 - 2004	3,328,107	15.01791	2,719,004	14.81578	2,584,600	14.76508	2,650,950	14.79043
		2005 - 2009	2,134,780	14.57387	3,613,816	15.10027	4,248,650	15.26211	3,918,397	15.18119
Greece	GRC	2000 - 2004	93,866	11.44962	73,094	11.19950	69,900	11.15482	71,479	11.17716
		2005 - 2009	66,185	11.10021	110,300	11.61096	123,462	11.72369	116,695	11.66732
Netherlands	NLD	2000 - 2004	1,285,061	14.06632	1,162,565	13.96614	1,135,736	13.94279	1,149,072	13.95447
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Spain	ESP	2000 - 2004	18	2.86913	103	4.63224	116	4.75016	109	4.69120
		2005 - 2009	10,654	9.27367	1,419	7.25779	1,098	7.00092	1,248	7.12935
United Kingdom	GBR	2000 - 2004	3,209,011	14.98147	1,369,401	14.12988	1,119,664	13.92854	1,238,253	14.02921
		2005 - 2009	890,420	13.69945	2,036,096	14.52654	2,593,041	14.76834	2,297,756	14.64744

Appendix 5BI: Selection of the Estimator suitable for cut flowers exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	210	5	4.17*	OLS	*No*	224	4	43.65*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	210	9	4.30*	OLS	*No*	224	8	44.19*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Export Direction	840	6	3.25*	OLS	*No*	896	5	22.64*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	210	5	-0.81	FE-no auto	*Yes*	224	4	1.11	FE-no auto	*No*
		-	-	-	FE-auto	-	210	4	2.04**	FE-auto	*Yes*
		210	6	-1.75***	RE-no auto	*No*	224	6	0.96	RE-no auto	*No*
		196	6	-0.33	RE-auto	*Yes*	210	6	2.03**	RE-auto	*Yes*
	Yearly Impact	210	9	-0.92	FE-no auto	*Yes*	224	8	1.12	FE-no auto	*No*
		-	-	-	FE-auto	-	210	8	2.04**	FE-auto	*Yes*
		210	10	-1.71**	RE-no auto	*No*	224	9	0.96	RE-no auto	*No*
		196	10	-0.36	RE-auto	*Yes*	210	9	2.01**	RE-auto	*Yes*
	Export Direction	840	6	0.09	FE-no auto	*Yes*	896	5	1.11	FE-no auto	*No*
					FE-auto	-	840	5	1.89	FE-auto	*?*
		880	7	-0.79	RE-no auto	*Yes*	896	6	0.90	RE-no auto	*No*
		-	-	-	RE-auto	-	840	6	1.93**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	51.04*	FE	*Yes*	N/A	4	1.14	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	-32.82*	FE	*Yes*	N/A	8	-1.81	FE	*No*
					RE	*No*				RE	*Yes*
	Export Direction	N/A	6	235.37*	FE	*Yes*	N/A	5	-27.88*	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5BJ: Suitable equations for cut flowers exports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	468.61* (4.13)	468.61* (4.13)	-	-	371.96* (2.92)	371.96* (2.92)	-	-	-	-
$\ln Y_{ijt-1}$	0.51* (8.03)	0.51* (8.03)	-	-	0.52* (8.17)	0.52* (8.17)	-	-	0.49* (16.69)	0.49* (16.69)	-	-
$\ln GDPPC_{it}$	-1.56 (-0.35)	-1.56 (-0.35)	-8.31*** (-1.94)	-8.31*** (-1.94)	5.99 (0.66)	5.99 (0.66)	-1.01 (-0.11)	-1.01 (-0.11)	-4.03 (-1.50)	-4.03 (-1.50)	0.09 (0.04)	0.09 (0.04)
$\ln GDPPC_{jt}$	-2.00 (-1.03)	-2.00 (-1.03)	5.21** (2.34)	5.21** (2.34)	-2.95 (-1.49)	-2.95 (-1.49)	3.79 (1.63)	3.79 (1.63)	0.56 (1.05)	0.56 (1.05)	1.58** (2.36)	1.58** (2.36)
$REER_t$	-0.40 (-0.52)	-0.40 (-0.52)	0.47 (0.50)	0.47 (0.50)	-0.27 (-0.32)	-0.27 (-0.32)	0.24 (0.25)	0.24 (0.25)	-0.60 (-1.62)	-0.60 (-1.62)	-0.99** (-2.10)	-0.99** (-2.10)
D0004 / D0509	-0.51 (-0.95)	0.41 (0.41)	-1.00*** (-1.85)	0.36 (0.46)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.73 (0.95)	-0.58 (-0.41)	-0.96 (-1.56)	-0.20 (-0.17)	-	-	-	-
D01 / D06	-	-	-	-	1.09 (0.95)	-0.76 (-0.44)	-1.07 (-1.22)	-0.75 (-0.47)	-	-	-	-
D02 / D07	-	-	-	-	3.37*** (1.82)	-0.61 (-0.29)	0.32 (0.24)	-0.57 (-0.29)	-	-	-	-
D03 / D08	-	-	-	-	2.94** (2.01)	-1.87 (-0.83)	-0.20 (-0.19)	-1.27 (-0.58)	-	-	-	-
D04 / D09	-	-	-	-	3.05 (1.51)	-1.35 (-0.65)	-1.84 (-1.27)	-1.25 (-0.62)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-1.62* (-3.78)	0.51 (0.82)	-1.54* (-3.32)	-0.40 (-0.69)
PTA_{no}	-	-	-	-	-	-	-	-	-0.59*** (-1.73)	1.38** (2.38)	-0.08 (-0.23)	1.18** (2.39)
$\ln DIST_{ij}$	-	-	-49.18* (-3.92)	-49.18* (-3.92)	-	-	-43.28* (-3.71)	-43.28* (-3.71)	-	-	-	-
Adjusted R^2	0.83	0.83	0.15	0.15	0.83	0.83	0.15	0.15	0.78	0.78	0.78	0.78
Observations	210	210	210	210	210	210	210	210	840	840	840	840
Cross-Sections	14	14	14	14	14	14	14	14	56	56	56	56

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported cut flowers to the following **14 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, NLD, PRT and SWE as well as to the following **42 non-EU countries** that were added under the export direction model: AGO, ARE, ARG, AUS, BGR, BHR, CAN, CHE, CHN, CIV, COG, CZE, DRC, EGY, GAB, GHA, HUN, IND, JOR, JPN, KEN, KOR, KWT, LBN, MOZ, MUS, MWI, MYS, NGA, OMN, PAK, POL, RUS, SAU, SGP, SYC, TUR, TZA, UGA, USA, ZMB and ZWE

Appendix 5BK: Average actual, simulated and potential value of cut flowers exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	5,404,720	15.50278	4,131,725	15.23421	15,987,516	16.58732	10,059,620	16.12404
		2005 - 2009	127,206	11.75356	69,925	11.15518	45,758	10.73113	56,566	10.94315
Belgium	BEL	2000 - 2004	112,023,658	18.53422	18,042,749	16.70825	81,551,720	18.21675	49,797,234	17.72347
		2005 - 2009	1,239,669	14.03035	678,236	13.42725	405,420	12.91268	524,376	13.16996
Denmark	DNK	2000 - 2004	16,562,195	16.62263	2,991,085	14.91115	11,455,521	16.25398	7,223,303	15.79282
		2005 - 2009	5,232	8.56255	7,064	8.86276	5,398	8.59384	6,175	8.72830
Finland	FIN	2000 - 2004	5,963,522	15.60117	814,539	13.61038	2,704,480	14.81042	1,759,509	14.38055
		2005 - 2009	2	0.78798	15	2.70783	14	2.66029	15	2.68406
France	FRA	2000 - 2004	61,144,925	17.92876	12,485,262	16.34006	55,470,813	17.83137	33,978,038	17.34122
		2005 - 2009	398,972	12.89665	378,457	12.84386	244,687	12.40773	304,308	12.62580
Germany	DEU	2000 - 2004	114,658,832	18.55747	15,914,818	16.58276	70,218,671	18.06712	43,066,744	17.57826
		2005 - 2009	4,551,479	15.33096	3,401,234	15.03965	1,967,837	14.49245	2,587,097	14.76605
Greece	GRC	2000 - 2004	7,536,694	15.83529	14,364,281	16.48026	77,268,040	18.16279	45,816,160	17.64015
		2005 - 2009	154,964	11.95095	173,173	12.06205	116,995	11.66988	142,339	11.86597
Ireland	IRL	2000 - 2004	11,189,475	16.23048	1,629,978	14.30408	5,802,790	15.57385	3,716,384	15.12826
		2005 - 2009	35	3.56064	154	5.03448	138	4.92845	146	4.98147
Italy	ITA	2000 - 2004	72,352,100	18.09706	49,535,625	17.71820	279,924,329	19.45003	164,729,977	18.91982
		2005 - 2009	713,071	13.47734	653,744	13.39047	412,664	12.93039	519,400	13.16043
Netherlands	NLD	2000 - 2004	288,850,015	19.48142	25,923,155	17.07065	115,676,395	18.56631	70,799,775	18.07537
		2005 - 2009	13,342,124	16.40644	8,211,636	15.92106	4,473,475	15.31368	6,060,903	15.61737
Portugal	PRT	2000 - 2004	24,361,526	17.00852	7,543,362	15.83618	32,922,931	17.30968	20,233,147	16.82283
		2005 - 2009	531,378	13.18323	441,895	12.99883	280,368	12.54386	351,985	12.77134
Spain	ESP	2000 - 2004	117,742,263	18.58401	32,093,626	17.28417	160,371,591	18.89300	96,232,608	18.38228
		2005 - 2009	4	1.27989	215	5.37060	212	5.35861	214	5.36461
Sweden	SWE	2000 - 2004	20,030,105	16.81275	2,242,555	14.62313	8,079,280	15.90481	5,160,918	15.45662
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
United Kingdom	GBR	2000 - 2004	362,027,052	19.70723	31,398,246	17.26226	142,272,871	18.77326	86,835,558	18.27953
		2005 - 2009	12,736,224	16.35996	3,861,460	15.16656	1,998,644	14.50798	2,778,072	14.83727

Appendix 5BL: Selection of the estimator suitable for cut flowers imports from the EU countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	105	5	11.94*	OLS	***No***	112	4	25.45*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	105	9	12.16*	OLS	***No***	112	8	26.91*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	390	6	4.57*	OLS	***No***	416	5	19.20*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	105		0.80	FE-no auto	***Yes***	112	4	1.77**	FE-no auto	***Yes***
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		105		-1.81***	RE-no auto	***No***	112	5	1.01	RE-no auto	***No***
		98		0.36	RE-auto	***Yes***	105	5	2.17	RE-auto	***Yes***
	Yearly Impact	105		0.90	FE-no auto	***Yes***	112	8	1.75	FE-no auto	***No***
		-	-	-	FE-auto	-	105	8	1.99**	FE-auto	***Yes***
		105		-1.32	RE-no auto	***Yes***	112	9	1.02	RE-no auto	***No***
		-	-	-	RE-auto	-	105	9	2.08**	RE-auto	***Yes***
	Import Direction	390		-0.11	FE-no auto	***Yes***	416	5	1.58	FE-no auto	***No***
		-	-	-	FE-auto	-	390	5	1.98**	FE-auto	***Yes***
		390		-1.68***	RE-no auto	***No***	416	6	1.01	RE-no auto	***No***
		364		-0.36	RE-auto	***Yes***	390	6	2.04**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	101.93*	FE	***Yes***	N/A	4	-2.13	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	530.39*	FE	***Yes***	N/A	8	-1.99	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	925.91*	FE	***Yes***	N/A	5	-0.30	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BM: Suitable equations for cut flowers imports from the EU countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	1276.5** (2.57)	1276.5** (2.57)	-	-	1460.7** (2.42)	1460.7** (2.42)	-	-	-36.64 (-0.65)	-36.64 (-0.65)
$\ln Y_{ijt-1}$	0.04 (0.37)	0.04 (0.37)	-	-	0.06 (0.48)	0.06 (0.48)	-	-	0.26* (4.54)	0.26* (4.54)	-	-
$\ln GDPPC_{it}$	-7.75 (-0.60)	-7.75 (-0.60)	-13.69 (-1.00)	-13.69 (-1.00)	-38.29 (-1.52)	-38.29 (-1.52)	-38.35 (-1.38)	-38.35 (-1.38)	4.11 (0.57)	4.11 (0.57)	5.55 (0.84)	5.55 (0.84)
$\ln GDPPC_{jt}$	28.95* (2.97)	28.95* (2.97)	40.63* (3.47)	40.63* (3.47)	30.30* (3.02)	30.30* (3.02)	41.00* (3.22)	41.00* (3.22)	0.71 (0.66)	0.71 (0.66)	-0.90* (-3.47)	-0.90* (-3.47)
$REER_t$	6.45* (2.62)	6.45* (2.62)	7.70** (2.57)	7.70** (2.57)	4.98*** (1.92)	4.98*** (1.92)	6.39** (2.09)	6.39** (2.09)	0.58 (0.59)	0.58 (0.59)	0.94 (0.76)	0.94 (0.76)
D0004 / D0509	1.60 (1.10)	-3.14 (-1.11)	2.24*** (1.81)	-2.83 (-1.03)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	1.73 (1.06)	0.40 (0.10)	0.88 (0.62)	0.06 (0.02)	-	-	-	-
D01 / D06	-	-	-	-	-0.14 (-0.06)	3.52 (0.74)	-0.60 (-0.30)	3.04 (0.59)	-	-	-	-
D02 / D07	-	-	-	-	-0.55 (-0.06)	3.25 (0.57)	-3.20 (-1.07)	2.76 (0.44)	-	-	-	-
D03 / D08	-	-	-	-	0.09 (0.04)	5.49 (0.89)	-1.03 (-0.42)	4.82 (0.71)	-	-	-	-
D04 / D09	-	-	-	-	0.08 (0.02)	3.10 (0.55)	-2.12 (-0.64)	2.95 (0.48)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.36 (0.37)	-1.82 (-1.08)	-0.65 (-0.72)	-2.25 (-1.39)
PTA_{no}	-	-	-	-	-	-	-	-	1.00 (1.23)	-0.61 (-0.39)	1.57** (2.16)	-0.41 (-0.31)
$\ln DIST_{ij}$	-	-	-176.47* (-2.78)	-176.47* (-2.78)	-	-	-174.80** (-2.53)	-174.80** (-2.53)	-	-	0.12 (0.19)	0.12 (0.19)
Adjusted R^2	0.68	0.68	0.31	0.31	0.68	0.68	0.34	0.34	0.62	0.62	0.34	0.34
Observations	105	105	105	105	105	105	105	105	390	390	390	390
Cross-Sections	7	7	7	7	7	7	7	7	26	26	26	26

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported cut flowers from the following **7 EU countries**: DEU, ESP, FRA, GBR, ITA, NLD and PRT as well as from the following **19 non-EU countries** that were added under the import direction model: BGR, BRA, CHN, IND, ISR, KEN, MOZ, MUS, MWI, PHL, SGP, SYC, THA, TUR, TZA, UGA, USA, ZMB and ZWE

Appendix 5BN: Average actual, simulated and potential value of cut flowers imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
France	FRA	2000 - 2004	1,199	7.08962	114	4.73194	178	5.17991	142	4.95592
		2005 - 2009	561	0.00000	78	0.00000	138	0.00000	104	0.00000
Germany	DEU	2000 - 2004	23	3.14150	137	4.92297	580	6.36292	282	5.64295
		2005 - 2009	4	1.32150	55	4.00086	432	6.06942	154	5.03514
Italy	ITA	2000 - 2004	10	2.30704	17	2.83525	31	3.43579	23	3.13552
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Netherlands	NLD	2000 - 2004	15,131	9.62452	161	5.08270	154	5.03966	158	5.06118
		2005 - 2009	46,153	10.73973	81	4.39337	27	3.30338	47	3.84837
Portugal	PRT	2000 - 2004	5	1.53888	2	0.80366	3	0.91973	2	0.86170
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Spain	ESP	2000 - 2004	25	3.21464	8	2.04351	10	2.31668	9	2.18010
		2005 - 2009	3	1.01911	24	3.17451	97	4.57901	48	3.87676
United Kingdom	GBR	2000 - 2004	30	3.38650	249	5.51746	1,440	7.27271	599	6.39508
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000

Appendix 5BO: Selection of the estimator suitable for cut flowers trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	105	4	1.35	OLS	***Yes***	112	3	24.53*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Yearly Impact	105	8	1.01	OLS	***Yes***	112	7	23.92*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Trade Direction	330	5	4.63*	OLS	***No***	352	4	20.91*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) or Durbin-H Statistic (*for dynamic*)	Period Impact	105	4	-0.36	OLS-no auto	***Yes***	112	3	1.16	FE-no auto	***Yes***
		-	-	-	FE-auto	-	105	3	1.93**	FE-auto	-
		-	-	-	RE-no auto	-	112	4	1.10	RE-no auto	***No***
		-	-	-	RE-auto	-	105	4	1.85**	RE-auto	***Yes***
	Yearly Impact	105	8	-0.40	OLS-no auto	***Yes***	112	7	1.15	FE-no auto	***No***
		-	-	-	FE-auto	-	105	7	1.96**	FE-auto	***Yes***
		-	-	-	RE-no auto	-	112	8	1.09	RE-no auto	***No***
		-	-	-	RE-auto	-	105	8	1.87**	RE-auto	***Yes***
	Trade Direction	330	5	0.38	FE-no auto	***Yes***	352	4	1.42	FE-no auto	***No***
		-	-	-	FE-auto	-	330	4	1.87**	FE-auto	***Yes***
		330	6	-0.24	RE-no auto	***Yes***	352	5	1.25	RE-no auto	***No***
		-	-	-	RE-auto	-	330	5	1.92**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	-	-	-	FE	-	N/A	3	-1.32	FE	***No***
					RE	-				RE	***Yes***
	Yearly Impact	-	-	-	FE	-	N/A	7	-11.56	FE	***No***
					RE	-				RE	***Yes***
	Trade Direction	N/A	5	77.72*	FE	***Yes***	N/A	4	5.26	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BP: Suitable equations for cut flowers trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	OLS	OLS	RE	RE	OLS	OLS	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-253.34* (-5.01)	-253.34* (-5.01)	-417.11* (-3.65)	-417.11* (-3.65)	-246.26* (-4.47)	-246.26* (-4.47)	-459.05* (-4.21)	-459.05* (-4.21)	-	-	-2.85 (-0.37)	-2.85 (-0.37)
$\ln Y_{ijt-1}$	0.75* (11.04)	0.75* (11.04)	-	-	0.76* (10.55)	0.76* (10.55)	-	-	0.33* (6.28)	0.33* (6.28)	-	-
$\ln GDPPC_{ijt}$	-6.05* (-4.24)	-6.05* (-4.24)	-3.87** (-2.02)	-3.87** (-2.02)	-5.99* (-3.92)	-5.99* (-3.92)	-5.67* (-2.64)	-5.67* (-2.64)	3.44*** (1.93)	3.44*** (1.93)	2.90* (3.12)	2.90* (3.12)
$REER_t$	-0.69*** (-1.94)	-0.69*** (-1.94)	0.49 (1.12)	0.49 (1.12)	-0.72*** (-1.95)	-0.72*** (-1.95)	0.36 (0.83)	0.36 (0.83)	0.44 (1.03)	0.44 (1.03)	-0.58 (-1.09)	-0.58 (-1.09)
D0004 / D0509	-0.42*** (-1.89)	1.05* (4.60)	-0.54** (-2.08)	0.61** (2.31)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.49** (-2.08)	1.22* (4.43)	-0.38** (-1.96)	0.65** (2.40)	-	-	-	-
D01 / D06	-	-	-	-	-0.47 (-1.55)	0.99* (3.26)	-0.88* (-2.95)	0.84** (2.52)	-	-	-	-
D02 / D07	-	-	-	-	-0.01 (-0.03)	1.12* (3.41)	-0.86*** (-1.80)	1.06* (2.78)	-	-	-	-
D03 / D08	-	-	-	-	0.42 (1.33)	1.00* (3.15)	-0.19 (-0.58)	1.08* (2.89)	-	-	-	-
D04 / D09	-	-	-	-	-0.24 (-0.88)	0.89* (3.11)	-0.29 (-0.89)	0.87* (2.66)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.70 (-1.51)	-0.25 (-0.62)	-0.48 (-0.94)	0.37 (0.61)
PTA_{no}	-	-	-	-	-	-	-	-	-0.25 (-0.69)	0.32 (0.73)	-0.01 (-0.04)	1.34* (4.31)
$\ln DIST_{ij}$	35.35* (4.94)	35.35* (4.94)	51.61* (3.77)	51.61* (3.77)	34.51* (4.43)	34.51* (4.43)	58.28* (4.34)	58.28* (4.34)	-	-	-1.15* (-2.76)	-1.15* (-2.76)
Adjusted R^2	0.96	0.96	0.69	0.69	0.96	0.96	0.75	0.75	0.81	0.81	0.57	0.57
Observations	105	105	105	105	105	105	105	105	330	330	330	330
Cross-Sections	7	7	7	7	7	7	7	7	22	22	22	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) cut flowers with the following **7 EU countries**: DEU, ESP, FRA, GBR, ITA, NLD and PRT as well as from the following **15 non-EU countries** that were added under the trade direction model: BGR, CHN, IND, KEN, MOZ, MUS, MWI, SGP, SYC, TUR, TZA, UGA, USA, ZMB and ZWE

Appendix 5BQ: Average actual, simulated and potential value of cut flowers trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
France	FRA	2000 - 2004	325,063	12.69177	409,947	12.92378	403,432	12.90776	406,690	12.91581
		2005 - 2009	399,969	0.00000	557,603	0.00000	618,370	0.00000	587,201	0.00000
Germany	DEU	2000 - 2004	2,197,654	14.60290	2,223,144	14.61443	2,221,142	14.61353	2,222,143	14.61398
		2005 - 2009	4,551,610	15.33099	4,528,499	15.32590	4,519,374	15.32388	4,523,934	15.32489
Italy	ITA	2000 - 2004	472,912	13.06666	405,918	12.91391	410,238	12.92449	408,078	12.91921
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Netherlands	NLD	2000 - 2004	4,899,872	15.40472	4,089,394	15.22391	4,150,266	15.23868	4,119,830	15.23132
		2005 - 2009	13,463,241	16.41547	11,475,958	16.25576	10,744,012	16.18986	11,103,956	16.22281
Portugal	PRT	2000 - 2004	567,995	13.24987	462,401	13.04419	469,110	13.05859	465,756	13.05142
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Spain	ESP	2000 - 2004	46,884	10.75543	87,726	11.38198	84,460	11.34403	86,093	11.36318
		2005 - 2009	63,425	11.05762	53,658	10.89038	51,518	10.84968	52,577	10.87003
United Kingdom	GBR	2000 - 2004	781,708	13.56924	550,619	13.21880	564,507	13.24371	557,563	13.23133
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000

Appendix 5BR: Selection of the Estimator suitable for Frozen Fruits and Nuts Exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	105	5	1.97***	OLS	*Yes*	112	4	3.78*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Yearly Impact	105	9	1.89***	OLS	*Yes*	112	8	3.79*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Export Direction	300	6	3.01*	OLS	*No*	320	5	12.71*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) or Durbin-H Statistic (*for dynamic*)	Period Impact	105	6	-0.81	FE-no auto	*Yes*	112	4	1.55	FE-no auto	*No*
		-	-	-	-	-	105	4	2.03**	FE-auto	*Yes*
		-	-	-	-	-	112	5	0.22	RE-no auto	*No*
		-	-	-	-	-	105	5	2.60**	RE-auto	*Yes*
	Yearly Impact	105	10	-0.85	FE-no auto	*Yes*	112	8	1.50	FE-no auto	*No*
		-	-	-	-	-	105	8	2.04**	FE-auto	*Yes*
		-	-	-	-	-	112	9	0.21	RE-no auto	*No*
		-	-	-	-	-	105	9	2.63**	RE-auto	*Yes*
	Export Direction	315		-0.44	FE-no auto	*Yes*	336	5	1.31	FE-no auto	*No*
		-	-	-	FE-auto	-	315	5	2.04**	FE-auto	*Yes*
		315		-1.64	RE-no auto	*Yes*	336	6	0.80	RE-no auto	*No*
		-	-	-	RE-auto	-	315	6	2.17**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	-	-	N/A	4	9.39***	FE	*Yes*
					-	-				RE	*No*
	Yearly Impact	-	-	-	-	-	N/A	8	-2.56	FE	*No*
					-	-				RE	*Yes*
	Export Direction	N/A	6	128.08*	FE	*Yes*	N/A	5	-1.70	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BS: Suitable equations for frozen fruits and nuts exports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-936.2* (-3.32)	-936.2* (-3.32)	-	-	-34.62 (-0.58)	-34.62 (-0.58)
$\ln Y_{ijt-1}$	0.28* (2.70)	0.28* (2.70)	-	-	0.29* (2.86)	0.29* (2.86)	-	-	0.40* (7.44)	0.40* (7.44)	-	-
$\ln GDPPC_{it}$	-14.70 (-0.89)	-14.70 (-0.89)	-13.72 (-0.81)	-13.72 (-0.81)	-21.98 (-0.67)	-21.98 (-0.67)	-36.22 (-1.05)	-36.22 (-1.05)	3.00 (0.31)	3.00 (0.31)	7.46 (1.06)	7.46 (1.06)
$\ln GDPPC_{jt}$	20.32 (1.47)	20.32 (1.47)	19.27 (1.17)	19.27 (1.17)	17.16 (1.16)	17.16 (1.16)	15.2*** (1.95)	15.2*** (1.95)	0.32 (0.26)	0.32 (0.26)	0.69 (1.50)	0.69 (1.50)
$REER_t$	1.64 (0.51)	1.64 (0.51)	1.43 (0.41)	1.43 (0.41)	0.71 (0.21)	0.71 (0.21)	2.40 (0.67)	2.40 (0.67)	-1.86*** (-1.93)	-1.86*** (-1.93)	-2.21 (-1.51)	-2.21 (-1.51)
D0004 / D0509	-3.56*** (-1.68)	0.24 (0.07)	0.34 (0.19)	1.15 (0.37)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-10.55* (-3.53)	2.09 (0.43)	0.53 (0.27)	3.12 (0.69)	-	-	-	-
D01 / D06	-	-	-	-	-17.98* (-4.16)	1.68 (0.28)	0.01 (0.00)	3.72 (0.60)	-	-	-	-
D02 / D07	-	-	-	-	-26.85* (-3.86)	2.57 (0.35)	3.29 (0.91)	5.25 (0.68)	-	-	-	-
D03 / D08	-	-	-	-	-18.31* (-3.30)	4.01 (0.51)	2.50 (0.94)	7.44 (0.87)	-	-	-	-
D04 / D09	-	-	-	-	-25.85* (-3.32)	0.58 (0.08)	0.45 (0.12)	3.82 (0.49)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.77 (-0.62)	-0.60 (-0.46)	-0.80 (-0.69)	0.73 (0.47)
PTA_{no}	-	-	-	-	-	-	-	-	0.22 (0.20)	0.77 (0.61)	0.67 (0.68)	0.35 (0.25)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-1.57 (-1.40)	-1.57 (-1.40)
Adjusted R^2	0.55	0.55	0.34	0.34	0.54	0.54	0.93	0.93	0.57	0.57	0.33	0.33
Observations	105	105	105	105	105	105	105	105	315	315	315	315
Cross-Sections	7	7	7	7	7	7	7	7	21	21	21	21

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported preserved fruits and nuts to the following **7 EU countries**: AUT, BEL, DEU, FRA, GBR, NLD and SWE as well as to the following **14 non-EU countries** that were added under the export direction model: AGO, AUS, CHE, DRC, JPN, KEN, MOZ, MUS, MWI, NZL, SYC, USA, ZMB and ZWE

Appendix 5BT: Average actual, simulated and potential value of frozen fruits and nuts exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	7	1.98172	43	3.76274	45	3.81530	44	3.78936
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Belgium	BEL	2000 - 2004	780	6.65943	758	6.63099	790	6.67142	774	6.65141
		2005 - 2009	38,639	10.56201	22,927	10.04009	8,555	9.05426	14,005	9.54718
France	FRA	2000 - 2004	309,654	12.64321	82,438	11.31981	66,171	11.10000	74,305	11.21593
		2005 - 2009	80,003	11.28982	133,286	11.80025	51,939	10.85783	83,203	11.32904
Germany	DEU	2000 - 2004	5,275	8.57071	20,934	9.94912	29,383	10.28816	25,158	10.13294
		2005 - 2009	98	4.58254	1,056	6.96182	820	6.70925	930	6.83553
Netherlands	NLD	2000 - 2004	1,737,491	14.36795	378,754	12.84464	277,604	12.53395	328,179	12.70131
		2005 - 2009	4,004,633	15.20296	8,600,989	15.96739	2,333,120	14.66272	4,479,636	15.31505
Sweden	SWE	2000 - 2004	63	4.14749	273	5.61095	329	5.79579	301	5.70764
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
United Kingdom	GBR	2000 - 2004	417,503	12.94205	50,750	10.83467	34,781	10.45684	42,766	10.66349
		2005 - 2009	366,784	12.81253	1,129,029	13.93687	425,832	12.96180	693,380	13.44933

Appendix 5BU: Selection of the estimator suitable for frozen fruits and nuts imports from the EU countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	105	5	2.01***	OLS	*No*	112	4	3.64*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	105	9	1.95***	OLS	*No*	112	8	3.62*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Import Direction	345	6	2.70*	OLS	*No*	368	5	6.05*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	105	5	-0.72	FE-no auto	*Yes*	112	4	1.48	FE-no auto	*No*
		-	-	-	-	-	105	4	2.15**	FE-auto	*Yes*
		-	-	-	-	-	112	6	0.14	RE-no auto	*No*
		-	-	-	-	-	105	6	2.55**	RE-auto	*Yes*
	Yearly Impact	105	9	-1.01	FE-no auto	*Yes*	112	8	1.48	FE-no auto	*No*
		-	-	-	-	-	105	8	2.13**	FE-auto	*Yes*
		-	-	-	-	-	112	9	0.13	RE-no auto	*No*
		-	-	-	-	-	105	9	2.58**	RE-auto	*Yes*
	Import Direction	345	6	-0.56	FE-no auto		368	5	1.51	FE-no auto	*No*
		-	-	-	-	-	345	5	2.03**	FE-auto	*Yes*
		345	7	-1.84***	RE-no auto	*No*	368	6	0.73	RE-no auto	*No*
		322	7	-0.67	RE-auto	*Yes*	345	6	2.35**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	-	-	N/A	4	16.13*	FE	*Yes*
					-	-				RE	*No*
	Yearly Impact	-	-	-	-	-	N/A	8	8.57	FE	*No*
					-	-				RE	*Yes*
	Import Direction	N/A	6	157.96*	FE	*Yes*	N/A	5	-7.43	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5BV: Suitable equations for frozen fruits and nuts imports from the EU countries to South Africa.

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-825.83** (-2.25)	-825.83** (-2.25)	-	-	9.32 (0.09)	9.32 (0.09)
$\ln Y_{ijt-1}$	0.25** (2.48)	0.25** (2.48)	-	-	0.27* (2.66)	0.27* (2.66)	-	-	0.25* (4.39)	0.25* (4.39)	-	-
$\ln GDPPC_{it}$	16.68 (0.88)	16.68 (0.88)	11.79 (0.64)	11.79 (0.64)	58.31 (1.58)	58.31 (1.58)	67.06 (1.64)	67.06 (1.64)	-2.79 (-0.24)	-2.79 (-0.24)	-3.48 (-0.28)	-3.48 (-0.28)
$\ln GDPPC_{jt}$	10.82 (1.17)	10.82 (1.17)	14.66*** (1.67)	14.66*** (1.67)	7.09 (0.76)	7.09 (0.76)	-7.52 (-1.48)	-7.52 (-1.48)	8.17* (2.85)	8.17* (2.85)	-1.36* (-4.00)	-1.36* (-4.00)
$REER_t$	5.12*** (1.67)	5.12*** (1.67)	6.70** (2.05)	6.70** (2.05)	6.70** (1.97)	6.70** (1.97)	3.15 (0.75)	3.15 (0.75)	2.49 (1.57)	2.49 (1.57)	1.36 (0.50)	1.36 (0.50)
D0004 / D0509	1.47 (0.62)	-4.97 (-1.21)	-2.38 (-1.29)	-5.08 (-1.41)	-	-	-		-	-	-	-
D00 / D05	-	-	-	-	-0.07 (-0.02)	-9.12 (-1.60)	-0.47 (-0.21)	-6.45 (-1.23)	-	-	-	-
D01 / D06	-	-	-	-	2.45 (0.68)	-13.79*** (-1.94)	1.01 (0.28)	-11.36 (-1.57)	-	-	-	-
D02 / D07	-	-	-	-	-0.05 (-0.01)	-12.12 (-1.42)	-0.25 (-0.04)	-10.17 (-1.13)	-	-	-	-
D03 / D08	-	-	-	-	1.21 (0.28)	-15.59*** (-1.70)	0.71 (0.16)	-13.01 (-1.30)	-	-	-	-
D04 / D09	-	-	-	-	-1.62 (-0.27)	-15.20*** (-1.82)	-0.41 (-0.07)	-13.00 (-1.43)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	1.39 (0.92)	-0.41 (-0.16)	-1.24 (-0.95)	3.31 (1.29)
PTA_{no}	-	-	-	-	-	-	-	-	0.41 (0.29)	-1.74 (-0.70)	-1.65 (-1.48)	0.04 (0.02)
$\ln DIST_{ij}$	-	-	-	-	-	-	39.56** (2.23)	39.56** (2.23)	-	-	3.48* (2.88)	3.48* (2.88)
Adjusted R^2	0.25	0.25	0.11	0.11	0.26	0.26	0.94	0.94	0.35	0.35	0.22	0.22
Observations	105	105	105	105	105	105	105	105	345	345	345	345
Cross-Sections	7	7	7	7	7	7	7	7	23	23	23	23

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported frozen fruits and nuts from the following 7 **EU countries**: AUT, BEL, DEU, DNK, FRA, GBR, GRC and NLD as well as from the following **16 non-EU countries** that were added under the import direction model: ARG, AUS, BRA, CAN, CHE, CHL, CHN, ECU, IND, MDG, NZL, POL, THA, USA and ZWE

Appendix 5BW: Average actual, simulated and potential value of frozen fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Belgium	BEL	2000 - 2004	1,268	7.14499	638	6.45829	775	6.65290	703	6.55560
		2005 - 2009	638,152	0.00000	27,010	0.00000	13,302	0.00000	18,955	0.00000
Denmark	DNK	2000 - 2004	35,393	10.47426	6,851	8.83212	7,443	8.91496	7,141	8.87354
		2005 - 2009	5,984	8.69677	14,393	9.57451	17,266	9.75647	15,764	9.66549
France	FRA	2000 - 2004	65	4.17700	931	6.83613	1,914	7.55684	1,335	7.19648
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Germany	DEU	2000 - 2004	48	3.87805	149	5.00390	210	5.34534	177	5.17462
		2005 - 2009	77	4.33775	263	5.57292	302	5.71007	282	5.64150
Greece	GRC	2000 - 2004	676	6.51613	76	4.32518	75	4.31147	75	4.31832
		2005 - 2009	1,082	6.98658	3,078	8.03212	3,670	8.20808	3,361	8.12010
Netherlands	NLD	2000 - 2004	285,945	12.56355	37,614	10.53513	37,742	10.53853	37,678	10.53683
		2005 - 2009	1,340,080	0.00000	573,406	0.00000	439,997	0.00000	502,292	0.00000
United Kingdom	GBR	2000 - 2004	6,074	8.71177	12,499	9.43337	23,252	10.05414	17,047	9.74376
		2005 - 2009	3,886	8.26513	9,117	9.11793	10,771	9.28464	9,910	9.20128

Appendix 5BX: Selection of the estimator suitable for frozen fruits and nuts trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	0.93	OLS	***Yes***	96	3	2.47***	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Yearly Impact	90	8	0.94	OLS	***Yes***	96	7	2.77**	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Trade Direction	165	5	2.03***	OLS	***No***	176	4	4.17*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	90	4	-8.96*	OLS-no auto	***No***	96	3	1.23	FE-no auto	***No***
		-	-	-	FE-auto	-	90	3	2.11**	FE-auto	***Yes***
		-	-	-	RE-no auto	-	-	-	-	RE-no auto	-
		-	-	-	RE-auto	-	-	-	-	RE-auto	-
	Yearly Impact	90	8	∞	OLS-no auto	?	96	7	1.21	FE-no auto	***No***
		-	-	-	FE-auto	-	90	7	2.14**	FE-auto	***Yes***
		-	-	-	RE-no auto	-	-	-	-	RE-no auto	-
		-	-	-	RE-auto	-	-	-	-	RE-auto	-
	Trade Direction	165	5	-1.24	FE-no auto	***Yes***	176	4	1.23	FE-no auto	***No***
		-	-	-	FE-auto	-	165	4	2.22**	FE-auto	***Yes***
		-	-	-	RE-no auto	-	176	5	0.41	RE-no auto	***No***
		-	-	-	RE-auto	-	165	5	2.46**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	-	-	-	FE	-	-	-	-	FE	-
					RE	-				RE	-
	Yearly Impact	-	-	-	FE	-	-	-	-	FE	-
					RE	-				RE	-
	Trade Direction	-	-	-	FE	-	N/A	4	5.11	FE	***No***
					RE	-				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ∞ means infinity. ? means inconclusive.

Appendix 5BY: Suitable equations for frozen fruits and nuts trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	-	-	FE	FE	?	?	FE	FE	FE	FE	RE	RE
PERIOD / VARIABLES	1994 - 2004	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2004	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009
Constant	-	-	-	-	?	?	-	-	-	-	-26.60 (-1.41)	-26.60 (-1.41)
$\ln Y_{ijt-1}$	-	-	-	-	?	?	-	-	0.42* (4.25)	0.42* (4.25)	-	-
$\ln GDPPC_{ijt}$	-	-	1.46 (0.10)	1.46 (0.10)	?	?	6.72 (0.41)	6.72 (0.41)	-8.84 (-0.93)	-8.84 (-0.93)	13.14* (6.88)	13.14* (6.88)
$REER_t$	-	-	1.06 (0.33)	1.06 (0.33)	?	?	0.96 (0.29)	0.96 (0.29)	-2.28 (-1.04)	-2.28 (-1.04)	1.34 (0.58)	1.34 (0.58)
D0004 / D0509	-	-	-1.07 (0.15)	-0.32 (0.15)	?	?	-	-	-	-	-	-
D00 / D05	-	-	-	-	?	?	-0.93 (-0.68)	0.70 (0.31)	-	-	-	-
D01 / D06	-	-	-	-	?	?	0.23 (0.12)	-1.75 (-0.64)	-	-	-	-
D02 / D07	-	-	-	-	?	?	5.06 (1.62)	0.29 (0.09)	-	-	-	-
D03 / D08	-	-	-	-	?	?	1.96 (0.95)	-0.39 (-0.13)	-	-	-	-
D04 / D09	-	-	-	-	?	?	0.30 (0.14)	0.35 (0.14)	-	-	-	-
PTA_{yes}	-	-	-	-	?	?	-	-	-0.57 (-0.43)	1.70 (1.07)	-0.21 (-0.17)	-0.96 (-0.71)
PTA_{no}	-	-	-	-	?	?	-	-	-0.48 (-0.37)	0.29 (0.15)	-0.97 (-0.78)	-4.08* (-2.82)
$\ln DIST_{ij}$	-	-	-	-	?	?	-	-	-	-	-11.14* (-3.55)	-11.14* (-3.55)
Adjusted R^2	-	-	0.40	0.40	?	?	0.28	0.28	0.47	0.47	0.94	0.94
Observations	-	-	90	90	?	?	90	90	165	165	165	165
Cross-Sections	-	-	6	6	?	?	6	6	11	11	11	11

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) frozen fruits and nuts with the following **6 EU countries**: AUT, BEL, DEU, FRA, GBR and NLD as well as from the following **5 non-EU countries** that were added under the trade direction model: AUS, CHE, NZL, USA and ZWE

Appendix 5BZ: Average actual, simulated and potential value of frozen fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	13	2.53625	25	3.21950	27	3.29910	26	3.25930
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Belgium	BEL	2000 - 2004	2,895	7.97059	4,614	8.43692	5,605	8.63135	5,109	8.53414
		2005 - 2009	1,136,839	13.94376	43,563	10.68197	19,371	9.87151	29,049	10.27674
France	FRA	2000 - 2004	337,804	12.73022	59,207	10.98880	47,480	10.76806	53,344	10.87843
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Germany	DEU	2000 - 2004	37,419	10.52994	61,439	11.02580	80,792	11.29964	71,115	11.16272
		2005 - 2009	1,453	7.28135	25,633	10.15163	58,532	10.97732	38,734	10.56448
Netherlands	NLD	2000 - 2004	2,170,532	14.59048	1,260,265	14.04683	1,337,080	14.10600	1,298,673	14.07642
		2005 - 2009	5,816,648	15.57623	4,213,757	15.25387	4,215,225	15.25421	4,214,491	15.25404
United Kingdom	GBR	2000 - 2004	537,199	13.19412	485,597	13.09314	578,760	13.26864	532,179	13.18089
		2005 - 2009	414,957	12.93593	613,330	13.32666	798,336	13.59028	699,745	13.45847

Appendix 5CA: Selection of the estimator suitable for preserved fruits and nuts exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	5	5.44*	OLS	***No***	240	4	38.48*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	9	5.48*	OLS	***No***	240	8	38.74*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1155	6	2.83*	OLS	***No***	1360	5	13.36*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	5	0.42	FE-no auto	***Yes***	240	4	1.27	FE-no auto	***No***
		-	-	-	-	-	225	4	1.82**	FE-auto	***Yes***
		225	6	-1.23	RE-no auto	***Yes***	240	5	1.07	RE-no auto	***No***
		-	-	-	-	-	225	5	1.80**	RE-auto	***Yes***
	Yearly Impact	225	5	0.40	FE-no auto	***Yes***	240	8	1.28	FE-no auto	***No***
		-	-	-	-	-	225	8	1.80	FE-auto	***?***
		225	10	-1.25	RE-no auto	***Yes***	240	9	1.08	RE-no auto	***No***
		-	-	-	-	-	225	9	1.79	RE-auto	***?***
	Export Direction	1275	6	-0.22	FE-no auto	***Yes***	1360	5	1.13	FE-no auto	***No***
		-	-	-	-	-	1275	5	1.95**	FE-auto	***Yes***
		1275	7	-1.48	RE-no auto	***Yes***	1360	6	0.73	RE-no auto	***No***
		-	-	-	-	-	1275	6	2.05**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	92.08*	FE	***Yes***	N/A	4	22.39*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	9	92.54*	FE	***Yes***	N/A	8	13.06	FE	***No***
					RE	***No***				RE	***Yes***
	Export Direction	N/A	6	387.54*	FE	***Yes***	N/A	5	18.12*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5CB: Suitable equations for preserved fruits and nuts exports from South Africa to the EU countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD / **VARIABLES**	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009
Constant	-	-	-	-	-	-	-50.78 (0.47)	-50.78 (0.47)	-	-	-	-
$\ln Y_{ijt-1}$	0.18* (6.34)	0.18* (6.34)	-	-	0.17* (6.21)	0.17* (6.21)	-	-	0.46* (17.93)	0.46* (17.93)	-	-
$\ln GDPPC_{it}$	-0.76 (-0.20)	-0.76 (-0.20)	-0.78 (-0.19)	-0.78 (-0.19)	0.76 (0.57)	0.76 (0.57)	5.65 (0.63)	5.65 (0.63)	-4.66 (-1.36)	-4.66 (-1.36)	-7.29** (-2.30)	-7.29** (-2.30)
$\ln GDPPC_{jt}$	0.54 (0.38)	0.54 (0.38)	2.83 (1.13)	2.83 (1.13)	-0.54 (0.08)	-0.54 (0.08)	-3.73*** (-1.76)	-3.73*** (-1.76)	0.83 (1.24)	0.83 (1.24)	2.96* (2.98)	2.96* (2.98)
$REER_t$	1.09** (2.12)	1.09** (2.12)	2.13** (2.54)	2.13** (2.54)	1.49** (2.32)	1.49** (2.32)	1.38 (1.50)	1.38 (1.50)	-0.63 (-1.55)	-0.63 (-1.55)	-1.45* (-2.59)	-1.45* (-2.59)
D0004 / D0509	-0.04 (-0.08)	0.34 (0.11)	-0.38 (-0.72)	-0.35 (-0.46)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.50 (-0.80)	-0.81 (-0.40)	-0.44 (-0.73)	-0.34 (-0.29)	-	-	-	-
D01 / D06	-	-	-	-	-0.56 (-0.67)	-1.48 (-0.56)	-0.71 (-0.78)	-0.47 (-0.30)	-	-	-	-
D02 / D07	-	-	-	-	-1.53 (-1.22)	-1.79 (-0.52)	-1.63 (-1.14)	-0.48 (-0.25)	-	-	-	-
D03 / D08	-	-	-	-	0.26 (0.26)	-2.08 (-0.59)	0.01 (0.01)	-0.65 (-0.30)	-	-	-	-
D04 / D09	-	-	-	-	-0.68 (-0.48)	-2.18 (-0.69)	-0.31 (-0.21)	-0.99 (-0.50)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-1.21** (-2.05)	1.11 (1.05)	-1.03 (-1.44)	0.89 (1.16)
PTA_{no}	-	-	-	-	-	-	-	-	-0.21 (-0.49)	0.82 (1.09)	-0.32 (-0.81)	1.33** (2.12)
$\ln DIST_{ij}$	-	-	-	-	-	-	7.36 (0.66)	5.45 (0.59)	-	-	-2.39* (-3.96)	-
Adjusted R^2	0.68	0.68	0.85	0.85	0.68	0.68	0.19	0.19	0.68	0.68	0.72	0.72
Observations	225	225	225	225	225	225	225	225	1275	1275	1275	1275
Cross-Sections	15	15	15	15	15	15	15	15	85	85	85	85

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported preserved fruits and nuts to the following **15 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as to the following **70 non-EU countries** that were added under the export direction model: AGO, ARE, ARG AUS, BGD, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, COG, COM, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GAB, GHA, HUN, ISL, ISR, JOR, JPN, KEN, KOR, KWT, LBN, LBR, MAR, MDG, MDV, MLI, MLT, MOZ, MUS, MWI, MYS, NGA, NOR, NZL, OMN, PAK, PER, PHL, POL, PRI, RUS, SAU, SEN, SGP, STP, SVK, SVN, SYC, SYR, THA, TTO, TZA, UGA, URY, USA, YEM, ZMB and ZWE

Appendix 5CC: Average actual, simulated and potential value of preserved fruits and nuts exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	3,884,273	15.17245	3,762,815	15.14068	3,710,384	15.12665	3,736,599	15.13369
		2005 - 2009	7,843,104	15.87515	3,775,602	15.14407	3,080,465	14.94059	3,428,034	15.04750
Belgium	BEL	2000 - 2004	5,308,462	15.48481	4,784,949	15.38099	4,745,347	15.37268	4,765,148	15.37684
		2005 - 2009	9,657,804	16.08328	4,145,049	15.23743	3,551,463	15.08287	3,848,256	15.16313
Denmark	DNK	2000 - 2004	317,245	12.66743	330,647	12.70881	331,541	12.71151	331,094	12.71016
		2005 - 2009	117,862	11.67727	1,865,217	14.43889	2,101,267	14.55805	1,983,242	14.50024
Finland	FIN	2000 - 2004	20,396	9.92310	98,587	11.49869	108,133	11.59112	103,360	11.54597
		2005 - 2009	592,135	13.29149	2,235,348	14.61991	2,266,998	14.63397	2,251,173	14.62696
France	FRA	2000 - 2004	2,260,406	14.63106	1,952,045	14.48439	1,930,681	14.47338	1,941,363	14.47890
		2005 - 2009	8,727,920	15.98204	4,037,147	15.21105	3,480,195	15.06260	3,758,671	15.13958
Germany	DEU	2000 - 2004	18,023,605	16.70719	16,275,208	16.60515	16,131,414	16.59628	16,203,311	16.60073
		2005 - 2009	40,176,037	17.50878	5,173,891	15.45914	4,020,728	15.20697	4,597,310	15.34098
Greece	GRC	2000 - 2004	675,339	13.42297	521,102	13.16370	512,031	13.14614	516,567	13.15496
		2005 - 2009	379,746	12.84726	3,203,222	14.97967	3,455,739	15.05555	3,329,480	15.01833
Ireland	IRL	2000 - 2004	81,484	11.30816	255,880	12.45246	275,271	12.52551	265,576	12.48966
		2005 - 2009	435,545	12.98435	1,929,346	14.47269	1,979,545	14.49838	1,954,446	14.48562
Italy	ITA	2000 - 2004	1,764,877	14.38359	1,783,613	14.39415	1,785,018	14.39494	1,784,315	14.39455
		2005 - 2009	3,115,837	14.95201	3,754,072	15.13835	3,487,400	15.06467	3,620,736	15.10219
Luxembourg	LUX	2000 - 2004	4,967	8.51064	480	6.17362	447	6.10197	463	6.13844
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Netherlands	NLD	2000 - 2004	7,601,306	15.84383	7,465,484	15.82580	7,454,383	15.82431	7,459,933	15.82506
		2005 - 2009	22,773,727	16.94112	4,577,859	15.33674	3,691,851	15.12164	4,134,855	15.23496
Portugal	PRT	2000 - 2004	2,882,330	14.87411	2,451,996	14.71241	2,421,929	14.70007	2,436,962	14.70626
		2005 - 2009	932,190	13.74529	4,581,349	15:33750	4,746,835	15.37299	4,664,092	15.35540
Spain	ESP	2000 - 2004	1,568,917	14.26590	1,730,990	14.36420	1,743,692	14.37152	1,737,341	14.36787
		2005 - 2009	3,297,577	15.00870	4,327,818	15.28057	4,044,311	15.21282	4,186,064	15.24727
Sweden	SWE	2000 - 2004	906,854	13.71774	1,202,568	13.99997	1,227,375	14.02039	1,214,972	14.01023
		2005 - 2009	3,514,296	15.07235	2,851,448	14.86334	2,574,406	14.76113	2,712,927	14.81354
United Kingdom	GBR	2000 - 2004	16,361,609	16.61045	16,491,988	16.61839	16,503,394	16.61908	16,497,691	16.61873
		2005 - 2009	57,680,100	17.87042	5,177,018	15.45974	3,909,891	15.17902	4,543,454	15.32920

Appendix 5CD: Selection of the estimator suitable for preserved fruits and nuts imports from the EU countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	135	5	5.17*	OLS	***No***	144	4	14.12*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	135	9	5.09*	OLS	***No***	144	8	14.05*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	570	6	2.91*	OLS	***No***	608	5	10.29*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	135	5	-0.62	FE-no auto	***Yes***	144	4	1.67	FE-no auto	***No***
		-	-	-	-	-	135	4	1.97**	FE-auto	***Yes***
		135	6	-1.89***	RE-no auto	***No***	144	5	1.19	RE-no auto	***No***
		126	6	-0.89	RE-auto	***Yes***	135	5	2.19**	RE-auto	***Yes***
	Yearly Impact	135	9	-0.65	FE-no auto	***Yes***	144	8	1.67	FE-no auto	***No***
		-	-	-	-	-	135	8	1.98**	FE-auto	***Yes***
		135	10	-1.97**	RE-no auto	***No***	144	9	1.19	RE-no auto	***No***
		126	10	-0.92	RE-auto	***Yes***	135	9	2.22**	RE-auto	***Yes***
	Import Direction	570	6	0.06	FE-no auto	***Yes***	608	5	1.33	FE-no auto	***No***
		-	-	-	-	-	570	5	1.96**	FE-auto	***Yes***
		570	7	-1.42	RE-no auto	***Yes***	608	6	0.78	RE-no auto	***No***
		-	-	-	-	-	570	6	2.12**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	289.55*	FE	***Yes***	N/A	4	8.01***	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	9	191.08*	FE	***Yes***	N/A	8	4.69	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	224.38*	FE	***Yes***	N/A	5	-0.97	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CE: Suitable equations for preserved fruits and nuts imports from the EU countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-356.61** (-2.17)	-356.61** (-2.17)	-	-	-161.09* (-3.21)	-161.09* (-3.21)
$\ln Y_{ijt-1}$	0.15** (1.97)	0.15** (1.97)	-	-	0.15** (1.96)	0.15** (1.96)	-	-	0.35* (8.59)	0.35* (8.59)	-	-
$\ln GDPPC_{it}$	4.17 (0.61)	4.17 (0.61)	14.97** (2.13)	14.97** (2.13)	4.32 (0.32)	4.32 (0.32)	33.91** (2.25)	33.91** (2.25)	7.47 (1.25)	7.47 (1.25)	18.22* (3.10)	18.22* (3.10)
$\ln GDPPC_{jt}$	0.57 (0.16)	0.57 (0.16)	0.97 (0.20)	0.97 (0.20)	0.16 (0.04)	0.16 (0.04)	-9.87* (-3.13)	-9.87* (-3.13)	3.07*** (1.94)	3.07*** (1.94)	0.63* (2.81)	0.63* (2.81)
$REER_t$	0.06 (0.05)	0.06 (0.05)	-0.76 (-0.55)	-0.76 (-0.55)	-0.05 (-0.04)	-0.05 (-0.04)	-1.97 (-1.28)	-1.97 (-1.28)	-0.45 (-0.55)	-0.45 (-0.55)	0.90 (0.76)	0.90 (0.76)
D0004 / D0509	-0.15 (-0.16)	0.97 (0.66)	-0.91 (-1.17)	-0.08 (-0.06)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.47 (-0.46)	0.93 (0.45)	-0.10 (-0.10)	-1.23 (-0.62)	-	-	-	-
D01 / D06	-	-	-	-	-2.51*** (-1.66)	1.09 (0.42)	-1.42 (-1.02)	-1.80 (-0.66)	-	-	-	-
D02 / D07	-	-	-	-	-5.26** (-2.25)	1.32 (0.42)	-1.56 (-0.71)	-2.39 (-0.71)	-	-	-	-
D03 / D08	-	-	-	-	-2.49 (-1.32)	0.81 (0.24)	-0.94 (-0.56)	-3.47 (-0.94)	-	-	-	-
D04 / D09	-	-	-	-	-2.55 (-1.02)	0.85 (0.28)	-1.42 (-0.60)	-2.99 (-0.88)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.37 (-0.39)	-0.51 (-0.38)	-0.23 (-0.26)	-0.83 (-0.63)
PTA_{no}	-	-	-	-	-	-	-	-	0.69 (0.91)	-0.20 (-0.16)	0.85 (1.24)	-1.21 (-1.05)
$\ln DIST_{ij}$	-	-	-	-	-	-	22.18*** (1.77)	22.18*** (1.77)	-	-	1.41*** (1.65)	1.41*** (1.65)
Adjusted R^2	0.61	0.61	0.73	0.73	0.60	0.60	0.57	0.57	0.57	0.57	0.42	0.42
Observations	135	135	135	135	135	135	135	135	570	570	570	570
Cross-Sections	9	9	9	9	9	9	9	9	38	38	38	38
*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses												
From 1994 to 2009, SA imported preserved fruits and nuts from the following **9 EU countries**: AUT, BEL, DEU, ESP, FRA, GBR, GRC, ITA and NLDas well as from the following **29 non-EU countries** that were added under the import direction model: ARE, AUS, BRA, CAN, CHE, CHN, ECU, GHA, HUN, IDN, IND, ISR, JPN, KEN, LKA, MEX, MUS, MWI, MYS, NZL, PAK, PHL, POL, SAU, SGP, THA, TUR, USA and ZWE												

Appendix 5CF: Average actual, simulated and potential value of preserved fruits and nuts imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	288	5.66296	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	2,199	7.69579	1,976	7.58903	1,655	7.41169	1,809	7.50036
Belgium	BEL	2000 - 2004	0	0.00000	93	4.53569	158,476	11.97336	3,845	8.25452
		2005 - 2009	14,233	9.56332	333,877	12.71853	356,993	12.78547	345,241	12.75200
France	FRA	2000 - 2004	33,884	10.43069	12	2.46711	619	6.42862	85	4.44786
		2005 - 2009	60,803	11.01540	578,638	13.26843	672,887	13.41933	623,986	13.34388
Germany	DEU	2000 - 2004	565	6.33704	155	5.04077	751,083	13.52927	10,775	9.28502
		2005 - 2009	55,260	10.91980	1,019,173	13.83450	1,111,866	13.92155	1,064,511	13.87803
Greece	GRC	2000 - 2004	0	0.00000	137	4.92279	518,785	13.15924	8,442	9.04102
		2005 - 2009	62,490	11.04277	69,104	11.14336	62,581	11.04421	65,761	11.09379
Italy	ITA	2000 - 2004	246,368	12.41458	271	5.60043	4,086,958	15.22331	33,252	10.41187
		2005 - 2009	51,684	10.85291	1,374,541	14.13363	1,717,897	14.35661	1,536,659	14.24512
Netherlands	NLD	2000 - 2004	318,578	12.67162	37	3.60249	9,403	9.14873	587	6.37561
		2005 - 2009	47,243	10.76306	514,114	13.15020	513,392	13.14880	513,753	13.14950
Spain	ESP	2000 - 2004	193,221	12.17159	355	5.87106	9,803,253	16.09822	58,962	10.98464
		2005 - 2009	286,215	12.56450	637,880	13.36591	678,055	13.42698	657,661	13.39644
United Kingdom	GBR	2000 - 2004	21,678	9.98403	703	6.55549	91,558,857	18.33249	253,721	12.44399
		2005 - 2009	376,709	12.83923	794,923	13.58600	700,960	13.46021	746,465	13.52310

Appendix 5CG: Selection of the estimator suitable for preserved fruits and nuts trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	135	4	3.99*	OLS	*No*	144	3	18.41*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	135	8	3.59*	OLS	*No*	144	7	18.50*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Trade Direction	480	5	6.86*	OLS	*No*	512	4	14.34*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	135	4	0.60	FE-no auto	*Yes*	144	3	1.33	FE-no auto	*No*
		-	-	-	-	-	135	3	1.86**	FE-auto	*Yes*
		135	5	0.53	RE-no auto	*Yes*	144	4	1.32	RE-no auto	*No*
		-	-	-	RE-auto	*Yes*	135	4	1.86**	RE-auto	*Yes*
	Yearly Impact	135	8	0.26	FE-no auto	*Yes*	144	7	1.36	FE-no auto	*No*
		-	-	-	-	-	135	7	1.85**	FE-auto	*Yes*
		135	9	0.25	RE-no auto	*Yes*	144	8	1.34	RE-no auto	*No*
		-	-	-	RE-auto	*Yes*	135	8	1.85**	RE-auto	*Yes*
	Trade Direction	480	5	0.09	FE-no auto	*Yes*	512	4	1.80	FE-no auto	*No*
		-	-	-	-	-	480	4	1.66	FE-auto	*No*
		480	6	-0.08	RE-no auto	*Yes*	512	5	1.60	RE-no auto	*No*
		-	-	-	-	-	480	5	1.74	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	4	17.87*	FE	*Yes*	N/A	3	0.40	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	8	16.82**	FE	*Yes*	N/A	7	0.56	FE	*Yes*
					RE	*No*				RE	*No*
	Trade Direction	N/A	5	215.36*	FE	*Yes*	-	-	-	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CH: Suitable equations for preserved fruits and nuts trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-110.9** (-2.30)	-110.9** (-2.30)	-	-	-109.12** (-2.29)	-109.12** (-2.29)	-	-	-	-
$\ln Y_{ijt-1}$	0.39* (4.49)	0.39* (4.49)	-	-	0.42* (4.87)	0.42* (4.87)	-	-	0.18* (4.12)	0.18* (4.12)	-	-
$\ln GDPPC_{ijt}$	-1.74*** (-1.79)	-1.74*** (-1.79)	-0.75 (-0.68)	-0.75 (-0.68)	-1.76*** (-1.78)	-1.76*** (-1.78)	-0.68 (-0.57)	-0.68 (-0.57)	1.10 (1.14)	1.10 (1.14)	0.58 (0.52)	0.58 (0.52)
$REER_t$	-0.40 (-1.50)	-0.40 (-1.50)	-0.08 (-0.25)	-0.08 (-0.25)	-0.43 (-1.61)	-0.43 (-1.61)	-0.07 (-0.21)	-0.07 (-0.21)	-0.08 (-0.30)	-0.08 (-0.30)	-0.95* (-2.75)	-0.95* (-2.75)
D0004 / D0509	-0.17 (-0.95)	0.72* (4.16)	-0.24 (-1.48)	0.68* (3.59)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.33** (-1.97)	0.91* (4.53)	-0.29*** (-1.95)	0.73* (3.61)	-	-	-	-
D01 / D06	-	-	-	-	-0.10 (-0.48)	0.55** (2.46)	-0.23 (-1.12)	0.58** (2.44)	-	-	-	-
D02 / D07	-	-	-	-	0.24 (0.77)	0.75* (3.23)	-0.04 (-0.12)	0.70* (2.65)	-	-	-	-
D03 / D08	-	-	-	-	0.44** (2.04)	0.71* (3.15)	0.37*** (1.75)	0.70* (2.72)	-	-	-	-
D04 / D09	-	-	-	-	0.32 (1.53)	0.59* (2.87)	0.36*** (1.71)	0.63* (2.70)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.04 (0.11)	0.43*** (1.74)	-0.23 (-0.55)	0.54*** (1.68)
PTA_{no}	-	-	-	-	-	-	-	-	0.71** (2.43)	0.85* (3.72)	0.59** (2.14)	1.03* (3.86)
$\ln DIST_{ij}$	-	-	14.87* (2.59)	14.87* (2.59)	-	-	14.58** (2.54)	14.58** (2.54)	-	-	-	-
Adjusted R^2	0.88	0.88	0.52	0.52	0.88	0.88	0.54	0.54	0.81	0.81	0.94	0.94
Observations	135	135	135	135	135	135	135	135	480	480	480	480
Cross-Sections	9	9	9	9	9	9	9	9	32	32	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) preserved fruits and nuts with the following **9 EU countries**: AUT, BEL, DEU, ESP, FRA, GBR, GRC, ITA and NLD as well as from the following **23 non-EU countries** that were added under the trade direction model: ARE, AUS, BRA, CAN, CHE, CHN, GHA, HUN, ISR, JPN, KEN, MUS, MWI, MYS, NZL, PAK, PHL, POL, SAU, SGP, THA, USA and ZWE

Appendix 5CI: Average actual, simulated and potential value of preserved fruits and nuts trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	3,893,219	15.17475	4,091,915	15.22452	4,117,406	15.23073	4,104,660	15.22763
		2005 - 2009	7,879,929	15.87983	8,250,062	15.92573	8,297,296	15.93144	8,273,679	15.92859
Belgium	BEL	2000 - 2004	5,501,856	15.52060	5,409,165	15.50361	5,397,474	15.50144	5,403,319	15.50252
		2005 - 2009	10,151,577	16.13314	10,810,053	16.19599	10,896,515	16.20395	10,853,284	16.19998
France	FRA	2000 - 2004	2,268,381	14.63458	2,147,273	14.57971	2,133,316	14.57319	2,140,294	14.57645
		2005 - 2009	8,934,059	16.00538	7,050,085	15.76855	6,847,633	15.73941	6,948,859	15.75409
Germany	DEU	2000 - 2004	18,119,341	16.71249	18,170,118	16.71529	18,177,170	16.71568	18,173,644	16.71548
		2005 - 2009	40,733,001	17.52255	40,646,052	17.52041	40,633,958	17.52011	40,640,005	17.52026
Greece	GRC	2000 - 2004	1,031,739	13.84676	721,389	13.48893	693,797	13.44993	707,593	13.46962
		2005 - 2009	587,252	13.28321	767,256	13.55058	788,872	13.57836	778,064	13.56456
Italy	ITA	2000 - 2004	1,940,168	14.47829	2,142,592	14.57753	2,168,009	14.58932	2,155,301	14.58344
		2005 - 2009	3,500,229	15.06834	4,233,151	15.25846	4,329,654	15.28100	4,281,403	15.26979
Netherlands	NLD	2000 - 2004	7,836,483	15.87430	8,399,680	15.94370	8,476,651	15.95283	8,438,166	15.94828
		2005 - 2009	23,366,308	16.96681	20,850,597	16.85289	20,537,983	16.83779	20,694,290	16.84537
Spain	ESP	2000 - 2004	1,759,926	14.38078	2,009,691	14.51349	2,041,477	14.52918	2,025,584	14.52137
		2005 - 2009	3,863,375	15.16705	3,961,100	15.19203	3,972,788	15.19498	3,966,944	15.19351
United Kingdom	GBR	2000 - 2004	16,665,918	16.62888	17,977,444	16.70463	18,167,152	16.71513	18,072,298	16.70989
		2005 - 2009	60,553,801	17.91904	47,713,245	17.68072	46,147,160	17.64735	46,930,203	17.66417

Appendix 5CJ: Selection of the estimator suitable for fruits and vegetable juices exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	210	5	9.32*	OLS	***No***	224	4	27.17*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	210	9	9.11*	OLS	***No***	224	8	27.23*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1290	6	4.71*	OLS	***No***	1376	5	17.16*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	210	5	0.23	FE-no auto	***Yes***	224	4	1.76	FE-no auto	***No***
		-	-	-	FE-auto	-	210	4	1.99**	FE-auto	***Yes***
		210	6	-0.81	RE-no auto	***Yes***	224	6	1.12	RE-no auto	***No***
		-	-	-	RE-auto	-	210	6	2.06**	RE-auto	***Yes***
	Yearly Impact	210	9	0.20	FE-no auto	***Yes***	224	8	1.75	FE-no auto	***No***
		-	-	-	FE-auto	-	210	8	2.00**	FE-auto	***Yes***
		210	10	-0.92	RE-no auto	***Yes***	224	9	1.12	RE-no auto	***No***
		-	-	-	RE-auto	-	210	9	2.07**	RE-auto	***Yes***
	Export Direction	1290	6	-0.02	FE-no auto	***Yes***	1376	5	1.53	FE-no auto	***No***
		-	-	-	FE-auto	-	1290	5	1.97**	FE-auto	***Yes***
		1290	7	-1.50	RE-no auto	***Yes***	1376	6	0.96	RE-no auto	***No***
		-	-	-	RE-auto	-	1290	6	2.09**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	220.39*	FE	***Yes***	N/A	4	4.51	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	210.85	FE	***Yes***	N/A	8	-34.70*	FE	***Yes***
					RE	***No***				RE	***No***
	Export Direction	N/A	6	644.88*	FE	***Yes***	N/A	5	37.17*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CK: Suitable equations for fruits and vegetable juices exports from South Africa to the EU countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-70.08 (-0.64)	-70.08 (-0.64)	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.11*** (1.68)	0.11*** (1.68)	-	-	0.11*** (1.74)	0.11*** (1.74)	-	-	0.27* (10.14)	0.27* (10.14)	-	-
$\ln GDPPC_{it}$	16.92** (2.25)	16.92** (2.25)	14.35*** (1.77)	14.35*** (1.77)	16.94 (1.12)	16.94 (1.12)	9.92 (0.66)	9.92 (0.66)	8.29** (2.41)	8.29** (2.41)	12.22* (3.88)	12.22* (3.88)
$\ln GDPPC_{jt}$	1.53 (0.48)	1.53 (0.48)	0.04 (0.01)	0.04 (0.01)	0.96 (0.29)	0.96 (0.29)	4.10 (1.13)	4.10 (1.13)	2.17* (3.09)	2.17* (3.09)	2.32*** (2.60)	2.32*** (2.60)
$REER_t$	1.10 (0.87)	1.10 (0.87)	-0.33 (-0.20)	-0.33 (-0.20)	0.93 (0.65)	0.93 (0.65)	1.34 (0.92)	1.34 (0.92)	-0.33 (-0.70)	-0.33 (-0.70)	-0.66 (-1.20)	-0.66 (-1.20)
D0004 / D0509	-0.80 (-0.88)	-2.55 (-1.55)	-0.97 (-1.13)	-1.29 (-0.86)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-1.11 (-1.08)	-2.41 (-1.03)	0.07 (0.07)	-1.65 (-0.76)	-	-	-	-
D01 / D06	-	-	-	-	-1.45 (-1.08)	-2.55 (-0.87)	0.48 (0.31)	-1.47 (-0.52)	-	-	-	-
D02 / D07	-	-	-	-	-1.65 (-0.81)	-2.01 (-0.57)	1.66 (0.68)	-1.07 (-0.31)	-	-	-	-
D03 / D08	-	-	-	-	-0.36 (-0.22)	-2.52 (-0.67)	2.41 (1.24)	-0.82 (-0.22)	-	-	-	-
D04 / D09	-	-	-	-	-2.10 (-0.90)	-2.84 (-0.83)	1.60 (0.63)	-1.43 (-0.43)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.44 (-0.71)	-1.04 (-1.26)	0.17 (0.25)	-1.4*** (-1.78)
PTA_{no}	-	-	-	-	-	-	-	-	0.45 (1.01)	-0.44 (-0.60)	0.60 (1.50)	-0.87 (-1.39)
$\ln DIST_{ij}$	-	-	-3.83 (-0.33)	-3.83 (-0.33)	-	-	-	-	-	-	-	-
Adjusted R^2	0.70	0.70	0.31	0.31	0.69	0.69	0.65	0.65	0.65	0.65	0.56	0.56
Observations	210	210	210	210	210	210	210	210	1290	1290	1290	1290
Cross-Sections	14	14	14	14	14	14	14	14	86	86	86	86

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported fruits and vegetable juices to the following **14 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, NLD, PRT and SWE as well as to the following **72 non-EU countries** that were added under the export direction model: AGO, ARE, ARG, AUS, BDI, BEN, BGD, BHR, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CYP, DRC, EGY, ETH, GAB, GHA, GIN, HUN, IDN, IND, ISL, ISR, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDG, MDV, MLI, MLT, MOZ, MUS, MWI, MYS, NGA, NOR, NZL, OMN, PAK, PHL, POL, RUS, RWA, SAU, SEN, SGP, SLE, SYC, TGO, THA, TTO, TUR, TZA, UGA, URY, USA, ZMB and ZWE

Appendix 5CL: Average actual, simulated and potential value of fruits and vegetable juices exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	162	5.08583	249	5.51580	303	5.71453	276	5.62009
		2005 - 2009	39	3.67367	43,101	10.67130	153,980	11.94458	98,541	11.49822
Belgium	BEL	2000 - 2004	587,876	13.28427	670,988	13.41651	1,020,915	13.83621	845,952	13.64822
		2005 - 2009	2,049,427	14.53307	112,923	11.63446	258,152	12.46130	185,537	12.13101
Denmark	DNK	2000 - 2004	496,237	13.11481	131,351	11.78563	166,676	12.02381	149,013	11.91179
		2005 - 2009	213,939	12.27345	134,006	11.80564	377,608	12.84161	255,807	12.45218
Finland	FIN	2000 - 2004	2	0.68837	0	-2.21302	0	-2.23048	0	-2.22171
		2005 - 2009	289	5.66796	53,938	10.89559	212,557	12.26697	133,248	11.79997
France	FRA	2000 - 2004	156,298	11.95952	286,386	12.56510	442,190	12.99950	364,288	12.80570
		2005 - 2009	1,079,265	13.89179	96,050	11.47263	225,157	12.32455	160,604	11.98669
Germany	DEU	2000 - 2004	982,468	13.79782	1,194,089	13.99289	1,865,517	14.43905	1,529,803	14.24065
		2005 - 2009	797,673	13.58945	105,452	11.56601	256,947	12.45663	181,200	12.10736
Greece	GRC	2000 - 2004	74,243	11.21510	10,515	9.26053	12,120	9.40265	11,318	9.33411
		2005 - 2009	158,049	11.97066	38,590	10.56074	90,426	11.41228	64,508	11.07454
Ireland	IRL	2000 - 2004	247	5.51116	496	6.20594	611	6.41479	553	6.31580
		2005 - 2009	332,254	12.71365	121,796	11.71010	325,854	12.69421	223,825	12.31862
Italy	ITA	2000 - 2004	6,937	8.84457	3,142	8.05265	3,797	8.24189	3,469	8.15174
		2005 - 2009	262,642	12.47855	57,061	10.95187	137,120	11.82861	97,090	11.48340
Netherlands	NLD	2000 - 2004	18,036,986	16.70794	11,928,505	16.29444	18,773,433	16.74795	15,350,969	16.54669
		2005 - 2009	52,035,291	17.76743	175,981	12.07813	330,545	12.70850	253,263	12.44218
Portugal	PRT	2000 - 2004	468,700	13.05772	622,912	13.34216	959,673	13.77435	791,292	13.58142
		2005 - 2009	1,294,297	14.07348	34,509	10.44898	68,480	11.13429	51,494	10.84923
Spain	ESP	2000 - 2004	2,627,827	14.78167	3,470,974	15.05995	6,907,489	15.74812	5,189,231	15.46210
		2005 - 2009	7,517,189	15.83270	67,535	11.12040	129,425	11.77086	98,480	11.49761
Sweden	SWE	2000 - 2004	30,472	10.32456	37,100	10.52137	18,994	9.85190	28,047	10.24164
		2005 - 2009	4,364	8.38121	96,077	11.47290	346,505	12.75565	221,291	12.30723
United Kingdom	GBR	2000 - 2004	1,312,675	14.08758	2,129,651	14.57147	845,331	13.64748	1,487,491	14.21260
		2005 - 2009	2,436,290	14.70599	139,656	11.84693	325,561	12.69330	232,608	12.35711

Appendix 5CM: Selection of the estimator suitable for fruits and vegetable juices imports from the EU countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	195	5	4.24	OLS	***No***	208	4	16.96*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	195	9	4.18*	OLS	***No***	208	8	17.05*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	645	6	4.25*	OLS	***No***	688	5	14.46*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	195	5	0.63	FE-no auto	***Yes***	208	4	1.29	FE-no auto	***No***
		-	-	-	FE-auto	-	195	4	1.77	FE-auto	***?***
		195	6	-0.77	RE-no auto	***Yes***	208	6	0.71	RE-no auto	***No***
		-	-	-	RE-auto	-	195	6	1.86**	RE-auto	***Yes***
	Yearly Impact	195	9	0.60	FE-no auto	***Yes***	208	8	1.30	FE-no auto	***No***
		-	-	-	FE-auto	-	195	8	1.79	FE-auto	***?***
		195	10	-0.86	RE-no auto	***Yes***	208	9	0.71	RE-no auto	***No***
		-	-	-	RE-auto	-	195	9	1.87**	RE-auto	***Yes***
	Import Direction	645	6	0.10	FE-no auto	***Yes***	688	5	1.56	FE-no auto	***No***
		-	-	-	FE-auto	-	645	5	1.96**	FE-auto	***Yes***
		645	7	-1.59	RE-no auto	***Yes***	688	6	0.87	RE-no auto	***No***
		-	-	-	RE-auto	-	645	6	2.06**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	95.38*	FE	***Yes***	N/A	4	-0.10	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	95.05*	FE	***Yes***	N/A	8	0.28	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	351.39	FE	***Yes***	N/A	5	-3.07	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5CN: Suitable equations for fruits and vegetable juices imports from the EU countries to South Africa.

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-152.35 (-1.30)	-152.35 (-1.30)	-	-	-67.45 (-0.40)	-67.45 (-0.40)	-	-	-180.67* (-3.85)	-180.67* (-3.85)
$\ln Y_{ijt-1}$	0.36* (5.56)	0.36* (5.56)	-	-	0.36* (5.52)	0.36* (5.52)	-	-	0.24* (6.27)	0.24* (6.27)	-	-
$\ln GDPPC_{it}$	9.11 (1.08)	9.11 (1.08)	16.21** (1.96)	16.21** (1.96)	-0.59 (-0.03)	-0.59 (-0.03)	7.65 (0.45)	7.65 (0.45)	13.86** (2.48)	13.86** (2.48)	22.02* (3.98)	22.02* (3.98)
$\ln GDPPC_{jt}$	5.74 (1.59)	5.74 (1.59)	2.31 (0.97)	2.31 (0.97)	5.88 (1.55)	5.88 (1.55)	2.70 (1.14)	2.70 (1.14)	1.32 (1.22)	1.32 (1.22)	0.38 (1.63)	0.38 (1.63)
$REER_t$	1.74 (1.22)	1.74 (1.22)	-0.31 (-0.19)	-0.31 (-0.19)	1.22 (0.76)	1.22 (0.76)	-0.35 (-0.20)	-0.35 (-0.20)	-0.39 (-0.51)	-0.39 (-0.51)	-0.50 (-0.46)	-0.50 (-0.46)
D0004 / D0509	-1.25 (-1.10)	-1.81 (-0.97)	-0.54 (-0.54)	-1.65 (-1.05)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-1.42 (-1.09)	-0.48 (-0.18)	-0.81 (-0.66)	-0.67 (-0.29)	-	-	-	-
D01 / D06	-	-	-	-	-0.28 (-0.16)	0.06 (0.02)	-0.47 (-0.25)	0.01 (0.00)	-	-	-	-
D02 / D07	-	-	-	-	-0.55 (-0.21)	0.52 (1.13)	-1.78 (-0.62)	0.12 (0.03)	-	-	-	-
D03 / D08	-	-	-	-	-1.30 (-0.63)	1.05 (0.25)	-1.72 (-0.74)	0.77 (0.18)	-	-	-	-
D04 / D09	-	-	-	-	-1.05 (-0.36)	-0.05 (-0.01)	-1.30 (-0.43)	-0.05 (-0.01)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-1.60*** (-1.80)	-1.90 (-1.51)	-1.73** (-2.02)	-1.97 (-1.54)
PTA_{no}	-	-	-	-	-	-	-	-	-0.39 (-0.50)	-0.49 (-0.41)	-0.59 (-0.82)	-1.13 (-1.00)
$\ln DIST_{ij}$	-	-	1.10 (0.10)	1.10 (0.10)	-	-	-1.12 (-0.10)	-1.12 (-0.10)	-	-	1.19** (2.42)	1.19** (2.42)
Adjusted R^2	0.63	0.63	0.45	0.45	0.63	0.63	0.45	0.45	0.62	0.62	0.38	0.38
Observations	195	195	195	195	195	195	195	195	645	645	645	645
Cross-Sections	13	13	13	13	13	13	13	13	43	43	43	43

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported fruits and vegetable juices from the following **13 EU countries**: AUT, BEL, DEU, DNK, ESP, FRA, GBR, GRC, IRL, ITA, NLD, PRT and SWE as well as from the following other **30 non-EU countries** that were added under the import direction model: ARE, ARG, AUS, BRA, CAN, CHE, CHL, CHN, CZE, IDN, IND, ISL, ISR, JPN, KEN, LKA, MOZ, MUS, MWI, MYS, NZL, PHL, POL, SAU, SGP, THA, TZA, USA, ZMB and ZWE

Appendix 5CO: Average actual, simulated and potential value of fruits and vegetable juices imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	36,987	10.51832	8,184	9.00990	79,896	11.28848	25,570	10.14919
		2005 - 2009	2,940	7.98627	16,657	9.72058	18,637	9.83288	17,619	9.77673
Belgium	BEL	2000 - 2004	28,666	10.26345	3,814	8.24656	31,397	10.35448	10,944	9.30052
		2005 - 2009	75,316	11.22945	69,657	11.15133	69,136	11.14383	69,396	11.14758
Denmark	DNK	2000 - 2004	131	4.87713	148	4.99485	574	6.35278	291	5.67381
		2005 - 2009	8,096	8.99917	9,071	9.11283	9,151	9.12160	9,111	9.11721
France	FRA	2000 - 2004	5,916	8.68537	2,861	7.95875	24,797	10.11850	8,422	9.03862
		2005 - 2009	65,936	11.09644	45,445	10.72425	43,914	10.69000	44,673	10.70712
Germany	DEU	2000 - 2004	67,425	11.11878	15,900	9.67409	212,557	12.26697	58,135	10.97053
		2005 - 2009	204,409	12.22788	260,639	12.47089	267,613	12.49730	264,103	12.48409
Greece	GRC	2000 - 2004	396	5.98241	3	0.96459	3	1.15547	3	1.06003
		2005 - 2009	19	2.95971	142	4.95353	154	5.03429	148	4.99391
Ireland	IRL	2000 - 2004	555	6.31942	32	3.46206	71	4.25959	48	3.86083
		2005 - 2009	3,939	8.27866	1,575	7.36202	1,489	7.30573	1,531	7.33387
Italy	ITA	2000 - 2004	55,172	10.91821	12,297	9.41708	151,068	11.92548	43,100	10.67128
		2005 - 2009	287,067	12.56747	160,330	11.98499	150,908	11.92443	155,548	11.95471
Netherlands	NLD	2000 - 2004	528,395	13.17760	59,406	10.99215	1,067,550	13.88088	251,830	12.43651
		2005 - 2009	1,452,817	14.18901	1,649,576	14.31603	1,676,351	14.33213	1,662,909	14.32408
Portugal	PRT	2000 - 2004	3,072	8.02999	257	5.54870	979	6.88662	502	6.21766
		2005 - 2009	85,760	11.35931	11,550	9.35448	9,852	9.19541	10,667	9.27494
Spain	ESP	2000 - 2004	87	4.47048	214	5.36739	978	6.88581	458	6.12660
		2005 - 2009	35,903	10.48858	17,696	9.78107	16,683	9.72216	17,182	9.75161
Sweden	SWE	2000 - 2004	2	0.78798	1	-0.49086	1	-0.60776	1	-0.54931
		2005 - 2009	32	3.48074	32	3.45457	32	3.45384	32	3.45421
United Kingdom	GBR	2000 - 2004	123,602	11.72482	23,022	10.04422	333,706	12.71802	87,651	11.38112
		2005 - 2009	239,837	12.38772	386,093	12.86383	407,329	12.91738	396,569	12.89061

Appendix 5CP: Selection of the Estimator suitable for Fruits and Vegetable Juices Trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	195	4	5.29*	OLS	*No*	208	3	19.84*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	195	8	5.46*	OLS	*No*	240	7	79.61*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Trade Direction	630	5	5.75*	OLS	*No*	672	4	20.26*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	195	4	0.03	FE-no auto	*Yes*	208	3	1.74	FE-no auto	*?*
		-	-	-	FE-auto	-	195	3	1.88**	FE-auto	*Yes*
		195	5	-1.85***	RE-no auto	*No*	208	4	1.35	RE-no auto	*No*
		182	5	-0.41	RE-auto	*Yes*	195	4	2.14**	RE-auto	*Yes*
	Yearly Impact	195	8	0.09	FE-no auto	*Yes*	240	7	1.05	FE-no auto	*No*
		-	-	-	FE-auto	-	225	7	1.71	FE-auto	*No*
		195	9	-1.81***	RE-no auto	*No*	240	8	0.88	RE-no auto	*No*
		182	9	-0.58	RE-auto	*Yes*	225	8	1.61	RE-auto	*No*
	Trade Direction	630	5	0.26	FE-no auto	*Yes*	672	4	1.69	FE-no auto	*No*
		-	-	-	FE-auto	-	630	4	1.90**	FE-auto	*Yes*
		630	6	-0.58	RE-no auto	*Yes*	672	5	1.42	RE-no auto	*No*
		-	-	-	RE-auto	-	630	5	1.98**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	4	118.03*	FE	*Yes*	N/A	3	-27.79*	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	8	130.52*	FE	*Yes*	N/A	7	32.72*	FE	*Yes*
					RE	*No*				RE	*No*
	Trade Direction	N/A	5	290.70*	FE	*Yes*	N/A	4	32.80*	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5CQ: Suitable equations for fruits and vegetable juices trade between South Africa and the EU countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	-	-	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
lnY_{ijt-1}	0.17** (2.40)	0.17** (2.40)	-	-	0.16** (2.18)	0.16** (2.18)	-	-	0.20* (5.27)	0.20* (5.27)	-	-
$lnGDPPC_{ijt}$	4.55 (1.55)	4.55 (1.55)	7.68* (2.74)	7.68* (2.74)	4.05 (1.37)	4.05 (1.37)	-	-	4.29* (3.67)	4.29* (3.67)	8.39* (6.26)	8.39* (6.26)
$REER_t$	0.45 (0.48)	0.45 (0.48)	0.00 (0.00)	0.00 (0.00)	0.61 (0.65)	0.61 (0.65)	-	-	-0.09 (-0.25)	-0.09 (-0.25)	-0.06 (-0.14)	-0.06 (-0.14)
D0004 / D0509	-0.29 (-0.47)	-0.10 (-0.18)	-0.21 (-0.31)	-0.33 (-0.54)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.31 (-0.46)	-1.37*** (-1.90)	-	-	-	-	-	-
D01 / D06	-	-	-	-	-0.09 (-0.10)	0.25 (0.32)	-	-	-	-	-	-
D02 / D07	-	-	-	-	0.17 (0.13)	0.10 (0.12)	-	-	-	-	-	-
D03 / D08	-	-	-	-	0.25 (0.28)	0.90 (1.22)	-	-	-	-	-	-
D04 / D09	-	-	-	-	-0.22 (-0.28)	0.08 (0.11)	-	-	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.09 (-0.20)	-0.08 (-0.27)	-0.23 (-0.56)	-0.44 (-1.20)
PTA_{no}	-	-	-	-	-	-	-	-	0.75** (2.25)	0.75* (2.72)	0.67** (2.04)	0.21 (0.68)
$lnDIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.56	0.56	0.70	0.70	0.58	0.58	-	-	0.68	0.68	0.84	0.84
Observations	195	195	195	195	195	195	-	-	630	630	630	630
Cross-Sections	13	13	13	13	13	13	-	-	42	42	42	42

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) fruits and vegetable juices with the following **13 EU countries**: AUT, BEL, DEU, DNK, ESP, FRA, GBR, GRC, IRL, ITA, NLD, PRT and SWE as well as from the following other **29 non-EU countries** that were added under the trade direction model: ARE, ARG, AUS, BRA, CAN, CHE, CHL, CHN, IDN, IND, ISL, ISR, JPN, KEN, LKA, MOZ, MUS, MWI, MYS, NZL, PHL, POL, SAU, SGP, THA, TZA, USA, ZMB and ZWE

Appendix 5CR: Average actual, simulated and potential value of fruits and vegetable juices trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	128,018	11.75993	195,137	12.18146	201,856	12.21531	198,496	12.19853
		2005 - 2009	4,495	8.41065	50,273	10.82522	59,080	10.98664	54,676	10.90918
Belgium	BEL	2000 - 2004	624,415	13.34457	678,268	13.42730	683,295	13.43468	680,781	13.43100
		2005 - 2009	2,150,196	14.58107	1,539,164	14.24675	1,493,599	14.21670	1,516,381	14.23184
Denmark	DNK	2000 - 2004	502,594	13.12754	229,241	12.34253	215,041	12.27859	222,141	12.31107
		2005 - 2009	228,331	12.33855	313,123	12.65435	321,037	12.67931	317,080	12.66691
France	FRA	2000 - 2004	202,767	12.21981	404,971	12.91157	429,656	12.97074	417,314	12.94159
		2005 - 2009	1,206,932	14.00359	716,532	13.48218	685,593	13.43804	701,063	13.46035
Germany	DEU	2000 - 2004	1,070,226	13.88338	1,504,268	14.22382	1,553,741	14.25618	1,529,004	14.24013
		2005 - 2009	1,082,767	13.89503	1,634,006	14.30655	1,695,861	14.34370	1,664,934	14.32530
Greece	GRC	2000 - 2004	79,719	11.28626	13,285	9.49441	11,899	9.38421	12,592	9.44083
		2005 - 2009	159,883	11.98220	97,574	11.48837	94,201	11.45319	95,888	11.47093
Ireland	IRL	2000 - 2004	2,154	7.67509	2,591	7.85974	2,615	7.86904	2,603	7.86440
		2005 - 2009	412,320	12.92955	46,675	10.75096	40,392	10.60638	43,533	10.68128
Italy	ITA	2000 - 2004	93,574	11.44651	74,748	11.22187	73,523	11.20536	74,136	11.21365
		2005 - 2009	747,543	13.52455	227,652	12.33557	207,760	12.24414	217,706	12.29090
Netherlands	NLD	2000 - 2004	18,646,700	16.74118	12,868,255	16.37027	12,349,270	16.32911	12,608,763	16.34990
		2005 - 2009	53,597,301	17.79701	38,017,437	17.45356	36,577,872	17.41495	37,297,655	17.43444
Portugal	PRT	2000 - 2004	473,713	13.06836	630,958	13.35499	647,212	13.38043	639,085	13.36779
		2005 - 2009	1,384,548	14.14088	1,276,095	14.05932	1,266,906	14.05209	1,271,501	14.05571
Spain	ESP	2000 - 2004	2,632,794	14.78356	3,523,211	15.07488	3,628,751	15.10440	3,575,981	15.08975
		2005 - 2009	8,335,671	15.93605	7,556,725	15.83795	7,482,257	15.82804	7,519,491	15.83301
Sweden	SWE	2000 - 2004	30,477	10.32474	39,589	10.58632	40,311	10.60438	39,950	10.59539
		2005 - 2009	4,469	8.40486	26,335	10.17867	29,429	10.28972	27,882	10.23574
United Kingdom	GBR	2000 - 2004	1,475,855	14.20475	2,720,977	14.81650	2,891,581	14.87731	2,806,279	14.84737
		2005 - 2009	2,693,069	14.80619	3,725,762	15.13078	3,843,677	15.16194	3,784,720	15.14648

Appendix 5CS: Selection of the estimator suitable for wine exports from South Africa to the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	5	5.70*	OLS	***No***	240	4	101.21*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	9	6.26*	OLS	***No***	240	8	107.88*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1530	6	4.64*	OLS	***No***	1632	5	22.01*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	5	-0.64	FE-no auto	***Yes***	240	4	1.52	FE-no auto	***No***
		-	-	-	-	-	225	5	1.95**	FE-auto	***Yes***
		225	6	-1.23	RE-no auto	***Yes***	240	5	1.34	RE-no auto	***No***
		135	6	-0.10	RE-auto	***Yes***	150	5	2.06**	RE-auto	***Yes***
	Yearly Impact	225	9	-0.75	FE-no auto	***Yes***	240	8	1.55	FE-no auto	***No***
		-	-	-	-	-	225	8	2.03**	FE-auto	***Yes***
		225	10	-1.22	RE-no auto	***Yes***	240	9	1.37	RE-no auto	***No***
		-	-	-	-	-	225	9	1.96**	RE-auto	***Yes***
	Export Direction	1530	6	-0.37	FE-no auto	***Yes***	1632	5	1.44	FE-no auto	***No***
		-	-	-	-	-	1530	5	2.04**	FE-auto	***Yes***
		1530	7	-1.70***	RE-no auto	***No***	1632	6	1.05	RE-no auto	***No***
		1428	7	-0.17	RE-auto	***Yes***	1530	6	2.14**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	73.42*	FE	***Yes***	N/A	4	11.65**	RE-no auto	***Yes***
					RE	***No***				RE-auto	***No***
	Yearly Impact	N/A	9	79.79*	FE	***Yes***	N/A	9	3.97	FE	***No***
					RE	***No***				RE	***Yes***
	Export Direction	N/A	6	627.17*	FE	***Yes***	N/A	5	5.78	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CT: Suitable equations for wine exports from South Africa to the EU countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-250.7*** (-1.91)	-250.7*** (-1.91)	-	-	-48.42** (-2.29)	-48.42** (-2.29)
$\ln Y_{ijt-1}$	0.37* (5.89)	0.37* (5.89)	-	-	0.34* (5.47)	0.34* (5.47)	-	-	0.30* (12.46)	0.30* (12.46)	-	-
$\ln GDPPC_{it}$	3.72*** (1.76)	3.72*** (1.76)	6.50* (3.20)	6.50* (3.20)	12.96* (3.17)	12.96* (3.17)	14.46* (3.58)	14.46* (3.58)	3.58 (1.43)	3.58 (1.43)	9.92* (4.11)	9.92* (4.11)
$\ln GDPPC_{jt}$	3.80* (4.35)	3.80* (4.35)	7.04* (5.26)	7.04* (5.26)	3.85* (4.33)	3.85* (4.33)	5.66* (4.64)	5.66* (4.64)	0.32 (1.17)	0.32 (1.17)	0.68* (3.43)	0.68* (3.43)
$REER_t$	0.01 (0.02)	0.01 (0.02)	0.56 (1.36)	0.56 (1.36)	0.54 (1.42)	0.54 (1.42)	0.57 (1.39)	0.57 (1.39)	-1.19* (-3.48)	-1.19* (-3.48)	-0.68 (-1.39)	-0.68 (-1.39)
D0004 / D0509	-0.44** (-1.72)	0.02 (0.04)	-0.26 (-1.06)	-0.19 (-0.51)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.50 (-1.12)	-1.05*** (-1.69)	-0.40 (-1.49)	-1.05** (-1.96)	-	-	-	-
D01 / D06	-	-	-	-	-0.58 (-0.83)	-1.99** (-2.57)	-0.53 (-1.30)	-1.78** (-2.46)	-	-	-	-
D02 / D07	-	-	-	-	-0.78 (-0.66)	-2.22** (-2.39)	-0.83 (-1.27)	-2.12** (-2.38)	-	-	-	-
D03 / D08	-	-	-	-	-0.16 (-0.17)	-2.43** (-2.43)	-0.02 (-0.04)	-2.19** (-2.25)	-	-	-	-
D04 / D09	-	-	-	-	-0.45 (-0.37)	-1.73*** (-1.91)	-0.05 (-0.07)	-1.32 (-1.48)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.67 (-1.43)	0.79 (1.30)	-0.35 (-0.58)	0.15 (0.23)
PTA_{no}	-	-	-	-	-	-	-	-	-0.77** (-2.37)	1.04*** (1.93)	-0.57*** (-1.91)	0.21 (0.46)
$\ln DIST_{ij}$	-	-	-	-	-	-	9.84 (0.69)	9.84 (0.69)	-	-	-2.74* (-4.22)	-2.74* (-4.22)
Adjusted R^2	0.95	0.95	0.96	0.96	0.95	0.95	0.58	0.58	0.74	0.74	0.31	0.31
Observations	225	225	225	225	225	225	225	225	1530	1530	1530	1530
Cross-Sections	15	15	15	15	15	15	15	15	102	102	102	102

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported wine to the following **15 EU countries:** AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as to the following **87 non-EU countries** that were added under the export direction model: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAN, CAF, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DRC, EGY, EST, ETH, GAB, GHA, GMB, GRD, HUN, IDN, IND, IRN, ISL, ISR, JAM, JPN, JOR, KEN, KOR, LBN, LKA, MAR, MDG, MDV, MLI, MLT, MEX, MOZ, MUS, MWI, MYS, NER, NGA, NOR, NZL, OMN, PAN, PER, PHL, POL, PRY, ROM, RUS, RWA, SEN, SGP, SLE, STP, SYC, TGO, THA, TTO, TUN, TUR, TZA, UGA, UKR, URY, USA, VCT, VEN, ZMB and ZWE

Appendix 5CU: Average actual, simulated and potential value of wine exports from South Africa to EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	831,620	13.63113	769,578	13.55360	769,277	13.55321	769,427	13.55340
		2005 - 2009	3,363,087	15.02837	3,574,385	15.08930	3,599,548	15.09632	3,586,967	15.09282
Belgium	BEL	2000 - 2004	11,637,146	16.26971	12,331,094	16.32763	12,451,229	16.33733	12,391,162	16.33249
		2005 - 2009	41,324,231	17.53696	49,057,254	17.70850	49,726,739	17.72205	49,391,996	17.71530
Denmark	DNK	2000 - 2004	13,370,037	16.40853	10,836,532	16.19843	10,704,897	16.18621	10,770,714	16.19234
		2005 - 2009	67,616,214	18.02936	57,790,230	17.87233	57,070,491	17.85980	57,430,361	17.86608
Finland	FIN	2000 - 2004	4,315,060	15.27762	3,583,205	15.09177	3,549,347	15.08227	3,566,276	15.08703
		2005 - 2009	22,385,682	16.92393	24,260,964	17.00438	24,409,037	17.01046	24,335,001	17.00743
France	FRA	2000 - 2004	4,941,366	15.41315	4,999,332	15.42481	5,027,121	15.43036	5,013,227	15.42759
		2005 - 2009	15,611,795	16.56354	16,321,472	16.60799	16,375,064	16.61127	16,348,268	16.60963
Germany	DEU	2000 - 2004	29,652,168	17.20505	26,744,435	17.10184	26,644,939	17.09811	26,694,687	17.09998
		2005 - 2009	151,321,044	18.83491	140,320,137	18.75944	139,432,179	18.75309	139,876,158	18.75627
Greece	GRC	2000 - 2004	6,951	8.84657	13,527	9.51246	13,989	9.54606	13,758	9.52940
		2005 - 2009	298,420	12.60626	256,918	12.45651	254,837	12.44838	255,878	12.45245
Ireland	IRL	2000 - 2004	9,068,109	16.02027	10,212,811	16.13915	10,362,188	16.15367	10,287,499	16.14644
		2005 - 2009	27,482,419	17.12906	50,394,991	17.73540	52,872,502	17.78339	51,633,746	17.75969
Italy	ITA	2000 - 2004	372,390	12.82770	444,833	13.00545	451,696	13.02076	448,265	13.01314
		2005 - 2009	1,863,273	14.43784	1,827,785	14.41862	1,825,557	14.41740	1,826,671	14.41801
Luxembourg	LUX	2000 - 2004	7,561	8.93082	4,930	8.50317	4,856	8.48803	4,893	8.49563
		2005 - 2009	270,253	12.50711	99,341	11.50631	94,495	11.45631	96,918	11.48162
Netherlands	NLD	2000 - 2004	54,851,184	17.82013	49,213,089	17.71167	48,999,783	17.70733	49,106,436	17.70950
		2005 - 2009	141,237,888	18.76596	201,807,157	19.12282	208,087,255	19.15347	204,947,206	19.13826
Portugal	PRT	2000 - 2004	30,060	10.31095	17,736	9.78333	17,345	9.76105	17,540	9.77225
		2005 - 2009	113,699	11.64131	116,634	11.66680	116,785	11.66809	116,710	11.66745
Spain	ESP	2000 - 2004	54,861	10.91256	81,920	11.31350	84,044	11.33910	82,982	11.32638
		2005 - 2009	626,646	13.34814	483,517	13.08884	476,395	13.07400	479,956	13.08145
Sweden	SWE	2000 - 2004	14,962,045	16.52103	16,317,792	16.60777	16,519,534	16.62005	16,418,663	16.61393
		2005 - 2009	135,415,133	18.72386	130,286,253	18.68524	129,865,628	18.68201	130,075,941	18.68363
United Kingdom	GBR	2000 - 2004	132,344,790	18.70092	140,607,300	18.76148	142,238,007	18.77301	141,422,653	18.76726
		2005 - 2009	371,786,719	19.73383	529,763,960	20.08794	547,035,417	20.12002	538,399,688	20.10411

Appendix 5CV: Selection of the estimator suitable for wine imports from the EU countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	5	10.12*	OLS	***No***	240	4	45.04*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	9	9.65*	OLS	***No***	240	8	45.53*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	675	6	7.05*	OLS	***No***	720	5	31.36*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	5	0.48	FE-no auto	***Yes***	240	4	1.96**	FE-no auto	***Yes***
		-	-	-	FE-auto	-	-	-	-	FE-auto	-
		225	6	-1.66***	RE-no auto	***No***	240	6	1.42	RE-no auto	***No***
		210	6	-0.54	RE-auto	***Yes***	225	6	2.08**	RE-auto	***Yes***
	Yearly Impact	225	9	0.28	FE-no auto	***Yes***	240	8	1.95**	FE-no auto	***Yes***
		-	-	-	FE-auto	-	-	-	-	-	-
		225	10	-1.85***	RE-no auto	***No***	240	9	1.43	RE-no auto	***No***
		210	10	-0.85	RE-auto	***Yes***	225	9	2.07**	RE-auto	***Yes***
	Import Direction	675	6	0.00	FE-no auto	***Yes***	720	5	1.77	FE-no auto	***No***
		-	-	-	-	-	675	5	1.98**	FE-auto	***Yes***
		675	7	-1.75***	RE-no auto	***No***	720	6	1.22	RE-no auto	***No***
		630	7	-0.65	RE-auto	***Yes***	675	6	2.05**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	141.52*	FE	***Yes***	N/A	4	-36.32*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	9	184.57*	FE	***Yes***	N/A	8	68.47*	FE	***Yes***
					RE	***No***				RE	***No***
	Import Direction	N/A	6	414.44*	FE	***Yes***	N/A	5	-2.95	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CW: Suitable equations for wine imports from the EU countries to South Africa.

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / **VARIABLES**	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	-0.01 (-0.19)	-0.01 (-0.19)	-	-	0.01 (0.12)	0.01 (0.12)	-	-	0.13* (3.21)	0.13* (3.21)	0.13* (3.21)	0.13* (3.21)
$\ln GDPPC_{it}$	-1.99 (-0.36)	-1.99 (-0.36)	-2.04 (-0.37)	-2.04 (-0.37)	9.37 (0.83)	9.37 (0.83)	8.90 (0.82)	8.90 (0.82)	4.40 (1.06)	4.40 (1.06)	4.40 (1.06)	4.40 (1.06)
$\ln GDPPC_{jt}$	6.15** (2.57)	6.15** (2.57)	6.17* (2.96)	6.17* (2.96)	4.91** (1.97)	4.91** (1.97)	5.27** (2.45)	5.27** (2.45)	1.62** (2.07)	1.62** (2.07)	1.62** (2.07)	1.62** (2.07)
$REER_t$	1.15 (1.19)	1.15 (1.19)	1.11 (1.27)	1.11 (1.27)	1.48 (1.39)	1.48 (1.39)	1.56 (1.54)	1.56 (1.54)	1.95* (3.35)	1.95* (3.35)	1.95* (3.25)	1.95* (3.25)
D0004 / D0509	-2.06* (-2.91)	0.85 (0.69)	-1.69* (-2.67)	0.84 (0.70)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-1.88** (-2.35)	-0.20 (-0.12)	-1.80** (-2.26)	-0.19 (-0.11)	-	-	-	-
D01 / D06	-	-	-	-	-3.38* (-3.19)	-1.58 (-0.73)	-3.30* (-2.83)	-1.54 (-0.73)	-	-	-	-
D02 / D07	-	-	-	-	-3.38** (-2.10)	-1.10 (-0.42)	-3.92** (-2.17)	-1.06 (-0.48)	-	-	-	-
D03 / D08	-	-	-	-	-2.18*** (-1.71)	-1.93 (-0.69)	-2.04 (-1.42)	-1.85 (-0.68)	-	-	-	-
D04 / D09	-	-	-	-	-2.10 (-1.17)	-2.03 (-0.80)	-1.96 (-1.02)	-1.97 (-0.79)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.69 (-1.17)	0.06 (0.07)	-0.44 (-0.72)	0.06 (0.07)
PTA_{no}	-	-	-	-	-	-	-	-	-2.01* (-3.77)	-0.81 (-0.89)	-2.26* (-4.38)	-0.81 (-0.89)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.75	0.75	0.75	0.75
Observations	225	225	240	240	225	225	240	240	675	675	675	675
Cross-Sections	15	15	15	15	15	15	15	15	45	45	45	45

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported wine from the following **15 EU countries:** AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as from the following **40 non-EU countries** that were added under the import direction model: ARE, ARG, AUS, BGR, BRA, CAN, CHE, CHL, CHN, HUN, ISL, ISR, JPN, KEN, MOZ, MUS, MWI, NZL, POL, PRI, ROM, RUS, SGP, THA, TUR, TZA, URY, USA, ZMB and ZWE

Appendix 5CX: Average actual, simulated and potential value of wine imports from the EU countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	1,704	7.44090	1,665	7.41760	1,644	7.40508	1,655	7.41134
		2005 - 2009	15,100	9.62245	8,345	9.02937	7,635	8.94052	7,982	8.98495
Belgium	BEL	2000 - 2004	8,170	9.00818	5,590	8.62882	5,443	8.60211	5,516	8.61546
		2005 - 2009	15,827	9.66948	19,682	9.88745	19,979	9.90245	19,830	9.89495
Denmark	DNK	2000 - 2004	621	6.43071	710	6.56508	715	6.57216	712	6.56862
		2005 - 2009	876	6.77516	1,706	7.44185	1,765	7.47579	1,735	7.45882
Finland	FIN	2000 - 2004	11	2.41177	11	2.43482	11	2.43525	11	2.43504
		2005 - 2009	8	2.02993	33	3.48647	34	3.52028	33	3.50338
France	FRA	2000 - 2004	3,147,653	14.96217	2,613,472	14.77619	2,552,507	14.75259	2,582,810	14.76439
		2005 - 2009	23,947,825	16.99139	10,356,830	16.15316	9,385,543	16.05468	9,859,233	16.10392
Germany	DEU	2000 - 2004	21,213	9.96238	25,222	10.13547	25,590	10.14997	25,406	10.14272
		2005 - 2009	165,711	12.01800	110,578	11.61347	106,980	11.58040	108,764	11.59693
Greece	GRC	2000 - 2004	7,361	8.90389	6,498	8.77924	6,440	8.77031	6,469	8.77477
		2005 - 2009	6,579	8.79166	34,026	10.43489	38,354	10.55462	36,126	10.49476
Ireland	IRL	2000 - 2004	30	3.40323	66	4.19049	68	4.21647	67	4.20348
		2005 - 2009	909	6.81221	434	6.07386	421	6.04347	428	6.05867
Italy	ITA	2000 - 2004	556,239	13.22895	495,514	13.11335	489,194	13.10052	492,344	13.10693
		2005 - 2009	2,658,863	14.79341	1,659,135	14.32181	1,580,624	14.27333	1,619,404	14.29757
Luxembourg	LUX	2000 - 2004	8	2.12336	8	2.10474	8	2.10444	8	2.10459
		2005 - 2009	620	6.42924	115	4.74324	109	4.68954	112	4.71639
Netherlands	NLD	2000 - 2004	21,711	9.98556	23,760	10.07577	23,939	10.08328	23,850	10.07952
		2005 - 2009	36,478	10.50446	81,826	11.31235	87,252	11.37655	84,495	11.34445
Portugal	PRT	2000 - 2004	621,434	13.33978	625,794	13.34678	626,293	13.34757	626,044	13.34718
		2005 - 2009	1,959,380	14.48814	2,484,318	14.72551	2,547,617	14.75067	2,515,768	14.73809
Spain	ESP	2000 - 2004	342,637	12.74443	425,765	12.96164	436,029	12.98546	430,866	12.97355
		2005 - 2009	362,284	12.80018	1,103,455	13.91396	1,232,873	14.02486	1,166,371	13.96941
Sweden	SWE	2000 - 2004	187	5.23372	105	4.64933	102	4.62785	103	4.63859
		2005 - 2009	8,525	9.05078	1,362	7.21663	1,244	7.12624	1,302	7.17143
United Kingdom	GBR	2000 - 2004	162,144	11.99624	162,092	11.99592	162,088	11.99589	162,090	11.99591
		2005 - 2009	390,021	12.87396	595,064	13.29642	619,363	13.33645	607,092	13.31644

Appendix 5CY: Selection of the estimator suitable for wine trade between South Africa and the EU countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	225	4	3.08*	OLS	***No***	240	3	77.05*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	225	8	2.88*	OLS	***No***	240	7	79.61*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Trade Direction	660	5	3.75*	OLS	***No***	704	4	40.37*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	225	4	0.79	FE-no auto	***Yes***	240	3	1.10	FE-no auto	***Yes***
		-	-	-	FE-auto	-	225	3	1.66	-	-
		225	5	0.47	RE-no auto	***Yes***	240	4	0.92	RE-no auto	***No***
		-	-	-	RE-auto	-	225	4	1.57	RE-auto	***Yes***
	Yearly Impact	225	8	0.78	FE-no auto	***Yes***	240	7	1.05	FE-no auto	***No***
		-	-	-	FE-auto	-	225	7	1.71	-	***No***
		225	9	0.40	RE-no auto	***Yes***	240	8	0.88	RE-no auto	***No***
		-	-	-	RE-auto	-	225	8	1.61	RE-auto	***No***
	Trade Direction	660	5	1.13	FE-no auto	***Yes***	704	4	1.10	FE-no auto	***No***
		-	-	-	-	-	660	4	1.72	FE-auto	***No***
		660	6	0.67	RE-no auto	***Yes***	704	5	0.96	RE-no auto	***No***
		-	-	-	RE-auto	-	660	5	1.69	RE-auto	***No***
Hausman Test Statistic	Period Impact	N/A	4	40.28*	FE	***Yes***	N/A	3	71.09*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	38.92*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-
	Trade Direction	N/A	5	144.25*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5CY: Suitable equations for wine trade between South Africa and the EU countries.

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	-	-	FE	FE	-	-
PERIOD / **VARIABLES**	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2004	1994 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
lnY_{ijt-1}	0.62* (12.05)	0.62* (12.05)	-	-	0.64* (12.08)	0.64* (12.08)	-	-	0.50* (15.31)	0.50* (15.31)	-	-
$lnGDPPC_{ijt}$	3.13* (3.96)	3.13* (3.96)	4.92* (5.16)	4.92* (5.16)	3.41* (4.26)	3.41* (4.26)	-	-	3.95* (5.22)	3.95* (5.22)	-	-
$REER_t$	0.31 (1.17)	0.31 (1.17)	-0.50 (-1.53)	-0.50 (-1.53)	0.38 (1.44)	0.38 (1.44)	-	-	0.39*** (1.66)	0.39*** (1.66)	-	-
D0004 / D0509	0.07 (0.40)	0.24 (1.44)	0.01 (0.06)	1.13* (5.57)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.06 (-0.29)	0.46** (2.29)	-	-	-	-	-	-
D01 / D06	-	-	-	-	-0.09 (-0.35)	-0.12 (-0.53)	-	-	-	-	-	-
D02 / D07	-	-	-	-	-0.02 (-0.04)	0.11 (0.49)	-	-	-	-	-	-
D03 / D08	-	-	-	-	0.28 (1.09)	0.06 (0.27)	-	-	-	-	-	-
D04 / D09	-	-	-	-	0.31 (1.36)	0.32 (1.52)	-	-	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.24 (-0.76)	0.33*** (1.68)	-	-
PTA_{no}	-	-	-	-	-	-	-	-	-0.51*** (-1.95)	0.34*** (1.76)	-	-
$lnDIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.96	0.96	0.92	0.92	0.96	0.96	-	-	0.87	0.87	-	-
Observations	225	225	240	240	225	225	-	-	660	660	-	-
Cross-Sections	15	15	15	15	15	15	-	-	44	44	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded wine (imports plus exports) with the following **15 EU countries**: AUT, BEL, DEU, DNK, ESP, FIN, FRA, GBR, GRC, IRL, ITA, LUX, NLD, PRT and SWE as well as with the following **29 non-EU countries** that were added under the trade direction model: ARE, ARG, AUS, BGR, BRA, CAN, CHE, CHL, CHN, HUN, ISL, ISR, JPN, KEN, MOZ, MUS, MWI, NZL, POL, ROM, RUS, SGP, THA, TUR, TZA, URY, USA, ZMB and ZWE

Appendix 5DA: Average actual, simulated and potential value of wine trade between South Africa and the EU countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Austria	AUT	2000 - 2004	834,051	13.63405	685,623	13.43808	679,791	13.42954	682,707	13.43382
		2005 - 2009	3,385,950	15.03515	3,319,003	15.01517	3,283,755	15.00450	3,301,379	15.00985
Belgium	BEL	2000 - 2004	11,671,337	16.27265	11,277,107	16.23829	11,246,709	16.23559	11,261,908	16.23694
		2005 - 2009	41,350,667	17.53760	43,953,334	17.59864	44,159,466	17.60332	44,056,400	17.60098
Denmark	DNK	2000 - 2004	13,371,932	16.40867	10,870,689	16.20158	10,695,739	16.18536	10,783,214	16.19350
		2005 - 2009	67,625,540	18.02950	58,152,341	17.87858	57,472,012	17.86681	57,812,177	17.87271
Finland	FIN	2000 - 2004	4,315,428	15.27771	3,562,336	15.08593	3,513,107	15.07201	3,537,721	15.07899
		2005 - 2009	22,385,740	16.92393	23,532,557	16.97390	23,619,400	16.97758	23,575,978	16.97574
France	FRA	2000 - 2004	8,152,780	15.91387	8,681,107	15.97666	8,723,269	15.98150	8,702,188	15.97909
		2005 - 2009	39,622,227	17.49490	34,266,992	17.34969	33,893,393	17.33873	34,080,193	17.34423
Germany	DEU	2000 - 2004	29,680,166	17.20599	25,220,869	17.04318	24,883,348	17.02971	25,052,108	17.03647
		2005 - 2009	151,503,491	18.83612	135,159,173	18.72196	133,900,549	18.71261	134,529,861	18.71730
Greece	GRC	2000 - 2004	22,937	10.04051	28,726	10.26555	29,039	10.27641	28,883	10.27099
		2005 - 2009	317,303	12.66761	331,239	12.71060	332,012	12.71292	331,625	12.71176
Ireland	IRL	2000 - 2004	9,068,198	16.02028	12,193,449	16.31641	12,481,844	16.33979	12,337,646	16.32817
		2005 - 2009	27,492,795	17.12943	43,187,744	17.58107	44,707,472	17.61565	43,947,608	17.59851
Italy	ITA	2000 - 2004	944,859	13.75879	1,165,378	13.96856	1,181,827	13.98257	1,173,603	13.97559
		2005 - 2009	4,542,182	15.32892	4,076,889	15.22084	4,048,077	15.21375	4,062,483	15.21730
Luxembourg	LUX	2000 - 2004	7,622	8.93875	4,395	8.38828	4,302	8.36677	4,348	8.37758
		2005 - 2009	272,984	12.51717	107,756	11.58762	102,940	11.54190	105,348	11.56502
Netherlands	NLD	2000 - 2004	54,892,286	17.82088	47,148,547	17.66881	46,535,573	17.65573	46,842,060	17.66229
		2005 - 2009	141,317,030	18.76652	175,933,518	18.98562	179,170,077	19.00385	177,551,797	18.99477
Portugal	PRT	2000 - 2004	659,429	13.39913	717,525	13.48356	721,434	13.48900	719,480	13.48628
		2005 - 2009	2,095,240	14.55518	2,720,894	14.81647	2,766,608	14.83313	2,743,751	14.82484
Spain	ESP	2000 - 2004	483,542	13.08889	933,417	13.74661	974,631	13.78981	954,024	13.76844
		2005 - 2009	1,076,489	13.88922	1,329,132	14.10004	1,346,192	14.11279	1,337,662	14.10643
Sweden	SWE	2000 - 2004	14,962,374	16.52105	15,014,248	16.52451	15,018,397	16.52479	15,016,323	16.52465
		2005 - 2009	135,466,476	18.72423	132,253,531	18.70023	131,993,893	18.69827	132,123,712	18.69925
United Kingdom	GBR	2000 - 2004	132,517,202	18.70222	126,714,290	18.65745	126,197,198	18.65336	126,455,744	18.65540
		2005 - 2009	372,209,548	19.73497	452,373,306	19.93002	460,178,338	19.94712	456,275,822	19.93861

Appendix 5DB: Selection of the estimator suitable for agricultural exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	2.26***	OLS	***No***	96	4	3.56*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	9	2.41**	OLS	***No***	96	8	4.43*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1785	6	5.71*	OLS	***No***	1904	5	38.04*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	90	5	0.86	FE-no auto		96	4	1.48	FE-no auto	***No***
		-	-	-	FE-auto	-	90	4	1.85**	FE-auto	***Yes***
		-	-	-	RE-no auto	-	96	5	1.15	RE-no auto	***No***
		-	-	-	RE-auto	-	90	5	1.68	RE-auto	***?***
	Yearly Impact	90	9	0.67	FE-no auto	***Yes***	96	8	1.34	FE-no auto	***No***
		-	-	-	FE-auto	-	90	8	177	FE-auto	***?***
		-	-	-	RE-no auto	-	96	9	1.16	RE-no auto	***No***
		-	-	-	RE-auto	-	90	9	1.77	RE-auto	***?***
	Export Direction	1785	6	-0.25	FE-no auto	***Yes***	1904	5	1.31	FE-no auto	***No***
		-	-	-	FE-auto	-	1785	5	1.85	FE-auto	***No***
		1785	7	-0.51	RE-no auto	***Yes***	1904	6	1.19	RE-no auto	***No***
		-	-	-	RE-auto	-	1785	6	1.78	RE-auto	***No***
Hausman Test Statistic	Period Impact	-	-	-	FE	-	-	-	-	FE	-
					RE	-				RE	-
	Yearly Impact	-	-	-	FE	-	-	-	-	FE	-
					RE	-				RE	-
	Export Direction	N/A	6	478.54*	FE	***Yes***	-	-	-	FE	-
					RE	***No***				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5DC: Suitable equations for agricultural exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	?	?	FE	FE	-	-
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	?	?	-	-	-	-
$\ln Y_{ijt-1}$	0.26* (2.98)	0.26* (2.98)	-	-	0.34* (3.66)	0.34* (3.66)	?	?	0.38* (19.86)	0.38* (19.86)	-	-
$\ln GDPPC_{it}$	1.02 (0.57)	1.02 (0.57)	2.94** (2.01)	2.94** (2.01)	-0.98 (-0.34)	-0.98 (-0.34)	?	?	2.07*** (1.89)	2.07*** (1.89)	-	-
$\ln GDPPC_{jt}$	-0.17 (-1.03)	-0.17 (-1.03)	-0.35** (-2.09)	-0.35** (-2.09)	-0.19 (-1.24)	-0.19 (-1.24)	?	?	0.03 (0.24)	0.03 (0.24)	-	-
$REER_t$	-0.25 (-1.14)	-0.25 (-1.14)	-0.39 (-1.60)	-0.39 (-1.60)	-0.27 (-1.10)	-0.27 (-1.10)	?	?	-0.54* (-3.63)	-0.54* (-3.63)	-	-
D0004 / D0509	-0.56* (-3.76)	0.84** (2.35)	-0.56* (-3.99)	0.84* (2.74)	-	-	?	?	-	-	-	-
D00 / D05	-	-	-	-	0.36 (0.80)	1.25* (2.71)	?	?	-	-	-	-
D01 / D06	-	-	-	-	1.07*** (1.81)	0.93 (1.62)	?	?	-	-	-	-
D02 / D07	-	-	-	-	1.76** (2.03)	0.78 (1.13)	?	?	-	-	-	-
D03 / D08	-	-	-	-	1.86** (2.57)	1.64** (2.22)	?	?	-	-	-	-
D04 / D09	-	-	-	-	1.91*** (1.88)	1.30*** (1.93)	?	?	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	?	?	-0.69** (-2.02)	0.45 (1.41)	-	-
PTA_{no}	-	-	-	-	-	-	?	?	-0.43* (-2.69)	0.59** (2.53)	-	-
$\ln DIST_{ij}$	-	-	-	-	-	-	?	?	-	-	-	-
Adjusted R^2	0.87	0.87	1.00	1.00	0.89	0.89	?	?	0.86	0.86	-	-
Observations	90	90	90	90	90	90	?	?	1785	1785	-	-
Cross-Sections	6	6	6	6	6	6	?	?	119	119	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported agricultural products to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **113 non-SADC countries** that were added under the export direction model: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAF, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CRI, CYP, CZE, DEU, DNK, DOM, DRC, EGY, ESP, ETH, FIN, FRA, GAB, , GBR, GHA, GIN, GMB, GNQ, , GRC, HUN, IDN, IND, IRN, IRL, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, LUX, MAR, MDA, MDG, MDV, MEX, MLI, MLT, MRT, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAK, PAN, PER, PHL, PNG, POL, PRI, PRT, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SWE, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, URY, USA, VCT, VEN, VNM and YEM

Appendix 5DD: Average actual, simulated and potential value of agricultural exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	32,427,760	17.29453	31,830,759	17.27594	31,715,417	17.27231	31,773,036	17.27413
		2005 - 2009	63,292,647	17.96328	85,729,847	18.26671	90,878,864	18.32504	88,266,818	18.29587
Mauritius	MUS	2000 - 2004	20,436,235	16.83282	20,187,054	16.82055	20,140,245	16.81823	20,163,636	16.81939
		2005 - 2009	126,988,429	18.65961	97,326,693	18.39358	92,435,807	18.34202	94,849,731	18.36780
Mozambique	MOZ	2000 - 2004	153,009,627	18.84601	141,842,571	18.77023	139,540,387	18.75386	140,686,770	18.76205
		2005 - 2009	392,399,583	19.78779	436,779,254	19.89494	446,862,615	19.91776	441,792,168	19.90635
Tanzania	TZA	2000 - 2004	17,745,405	16.69164	19,895,532	16.80601	20,330,431	16.82763	20,111,806	16.81682
		2005 - 2009	62,843,336	17.95616	66,942,419	18.01934	67,747,235	18.03129	67,343,625	18.02532
Zambia	ZMB	2000 - 2004	54,000,515	17.80450	49,047,772	17.70831	48,107,316	17.68894	48,575,268	17.69863
		2005 - 2009	194,366,332	19.08526	187,389,036	19.04870	186,009,624	19.04131	186,698,056	19.04500
Zimbabwe	ZWE	2000 - 2004	82,317,542	18.22609	89,931,210	18.31456	91,614,211	18.33310	90,768,810	18.32383
		2005 - 2009	415,185,094	19.84423	349,861,031	19.67305	337,499,697	19.63708	343,624,784	19.65506

Appendix 5DE: Selection of the estimator suitable for agricultural imports from the SADC countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	3.76*	OLS	*No*	96	4	45.78*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	9	4.00*	OLS	*No*	96	8	47.95*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Import Direction	1905	6	5.88*	OLS	*No*	2032	5	32.36*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	0.06	FE-no auto	*Yes*	96	4	1.15	FE-no auto	*No*
		-	-	-	FE-auto	-	90	4	2.01**	FE-auto	*Yes*
		90	6	-0.89	RE-no auto	*Yes*	96	5	1.04	RE-no auto	*No*
		-	-	-	RE-auto	-	90	5	2.06**	RE-auto	*Yes*
	Yearly Impact	90	9	-0.72	FE-no auto	*Yes*	96	8	1.18	FE-no auto	*No*
		-	-	-	FE-auto	-	90	8	1.99**	FE-auto	*Yes*
		90	10	-1.20	RE-no auto	*Yes*	96	9	1.06	RE-no auto	*No*
		-	-	-	RE-auto	-	90	9	2.05**	RE-auto	*Yes*
	Import Direction	1905	6	0.11	FE-no auto	*Yes*	2032	5	1.59	FE-no auto	*No*
		-	-	-	FE-auto	-	1905	5	1.94**	FE-auto	*Yes*
		1905	7	-1.52	RE-no auto	*Yes*	2032	6	1.18	RE-no auto	*No*
		-	-	-	RE-auto	-	1905	6	2.08**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	21.39*	FE	*Yes*	N/A	4	-3.08	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	21.54*	FE	*Yes*	N/A	8	5.40	FE	*No*
					RE	*No*				RE	*Yes*
	Import Direction	N/A	6	1063.89*	FE	*Yes*	N/A	5	-0.64	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DF: Suitable equations for agricultural imports from SADC countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-63.00* (-3.46)	-63.00* (-3.46)	-	-	-74.27** (-2.18)	-74.27** (-2.18)	-	-	-24.83 (-1.34)	-24.83 (-1.34)
$\ln Y_{ijt-1}$	0.48* (5.21)	0.48* (5.21)	-	-	0.49* (5.64)	0.49* (5.64)	-	-	0.23* (10.50)	0.23* (10.50)	-	-
$\ln GDPPC_{it}$	3.19 (1.26)	3.19 (1.26)	11.06* (5.68)	11.06* (5.68)	9.17** (2.16)	9.17** (2.16)	12.50* (3.11)	12.50* (3.11)	5.39** (2.39)	5.39** (2.39)	5.92* (2.81)	5.92* (2.81)
$\ln GDPPC_{jt}$	0.40*** (1.79)	0.40*** (1.79)	-0.04 (-0.14)	-0.04 (-0.14)	0.47** (2.16)	0.47** (2.16)	-0.03 (-0.10)	-0.03 (-0.10)	0.80* (2.99)	0.80* (2.99)	1.00* (6.07)	1.00* (6.07)
$REER_t$	-0.26 (-0.89)	-0.26 (-0.89)	0.05 (0.12)	0.05 (0.12)	0.06 (0.16)	0.06 (0.16)	-0.02 (-0.06)	-0.02 (-0.06)	-0.32 (-1.04)	-0.32 (-1.04)	-0.39 (-0.95)	-0.39 (-0.95)
D0004 / D0509	-0.19 (-0.83)	0.23 (0.46)	0.01 (0.05)	-0.50 (-1.26)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.06 (0.24)	-0.70 (-1.06)	0.08 (0.34)	-0.71 (-1.26)	-	-	-	-
D01 / D06	-	-	-	-	0.17 (0.53)	-0.74 (-0.90)	0.27 (0.92)	-0.59 (-0.78)	-	-	-	-
D02 / D07	-	-	-	-	0.71 (1.51)	-0.97 (-0.99)	0.91** (2.30)	-0.68 (-0.73)	-	-	-	-
D03 / D08	-	-	-	-	1.03** (2.54)	-1.64 (-1.57)	1.30* (3.85)	-1.09 (-1.07)	-	-	-	-
D04 / D09	-	-	-	-	0.29 (0.48)	-1.33 (-1.40)	0.78*** (1.68)	-0.77 (-0.83)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.01 (0.01)	0.04 (0.06)	-0.27 (-0.28)	-0.02 (-0.02)
PTA_{no}	-	-	-	-	-	-	-	-	0.31 (1.05)	-0.20 (-0.42)	0.13 (0.49)	-0.05 (-0.12)
$\ln DIST_{ij}$	-	-	-1.51 (-1.31)	-1.51 (-1.31)	-	-	-1.51 (-1.25)	-1.51 (-1.25)	-	-	-2.01* (-3.21)	-2.01* (-3.21)
Adjusted R^2	0.93	0.93	0.68	0.68	0.93	0.93	0.66	0.66	0.75	0.75	0.33	0.33
Observations	90	90	90	90	90	90	90	90	1905	1905	1905	1905
Cross-Sections	6	6	6	6	6	6	6	6	127	127	127	127

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported agricultural products from the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **121 non-SADC countries** that were added under the import direction model: AGO, ALB, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGD, BGR, BHR, BHS, BOL, BRA, BTN, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DMA, DNK, DOM, DRC, ECU, EGY, ESP, EST, ETH, FIN, FRA, GBR, GHA, GIN, GMB, GRC, GRD, GTM, GUY, HRV, HTI, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KGZ, KOR, KWT, LAO, LBN, LKA, LUX, MAR, MDG, MEX, MLI, MRT, MYS, NER, NGA, NIC, NLD, NOR, NPL, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRT, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, SLV, STP, SUR, SVK, SVN, SWE, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, UKR, URY, USA, VCT, VEN and VNM

Appendix 5DG: Average actual, simulated and potential value of agricultural imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	19,445,172	16.78311	887,035	13.69564	3,099,069	14.94661	1,658,006	14.32113
		2005 - 2009	70,312,360	18.06846	76,602,454	18.15414	78,011,346	18.17236	77,303,690	18.16325
Mauritius	MUS	2000 - 2004	385,685	12.86278	348,220	12.76059	1,863,424	14.43793	805,532	13.59926
		2005 - 2009	3,518,699	15.07360	2,215,997	14.61121	2,053,808	14.53521	2,133,362	14.57321
Mozambique	MOZ	2000 - 2004	11,088,659	16.22143	17,078,506	16.65333	196,646,432	19.09692	57,951,939	17.87512
		2005 - 2009	46,147,529	17.64735	50,786,388	17.74314	51,802,891	17.76296	51,292,122	17.75305
Tanzania	TZA	2000 - 2004	4,256,178	15.26388	299,801	12.61087	1,005,641	13.82114	549,083	13.21600
		2005 - 2009	22,953,923	16.94900	21,238,349	16.87132	20,919,450	16.85619	21,078,296	16.86375
Zambia	ZMB	2000 - 2004	7,372,201	15.81323	1,862,034	14.43718	10,014,634	16.11956	4,318,285	15.27837
		2005 - 2009	35,540,616	17.38619	35,267,602	17.37848	35,212,750	17.37692	35,240,165	17.37770
Zimbabwe	ZWE	2000 - 2004	50,061,291	17.72876	2,984,697	14.90901	12,625,842	16.35126	6,138,754	15.63013
		2005 - 2009	95,528,998	18.37494	137,792,148	18.74126	149,417,387	18.82225	143,487,082	18.78176

Appendix 5DH: Selection of the estimator suitable for agricultural trade between South Africa and the SADC countries.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	5.32*	OLS	*No*	96	3	15.49*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	8	4.62*	OLS	*No*	96	7	17.15*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Trade Direction	1635	5	4.61*	OLS	*No*	1744	4	58.84*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	4	0.80	FE-no auto	*Yes*	96	3	1.39	FE-no auto	*No*
		-	-	-	FE-auto	-	90	3	1.80**	FE-auto	*Yes*
		90	5	0.75	RE-no auto	*Yes*	96	4	1.37	RE-no auto	*No*
		-	-	-	RE-auto	-	90	4	1.80**	RE-auto	*Yes*
	Yearly Impact	90	8	0.68	FE-no auto	*Yes*	96	7	1.32	FE-no auto	*No*
		-	-	-	FE-auto	-	90	7	1.95**	FE-auto	*Yes*
		90	9	0.60	RE-no auto	*Yes*	96	8	1.30	RE-no auto	*No*
		-	-	-	RE-auto	-	90	8	1.93**	RE-auto	*Yes*
	Trade Direction	1635	5	0.53	FE-no auto	*Yes*	1744	4	1.35	FE-no auto	*No*
		-	-	-	FE-auto	-	1635	4	1.90	FE-auto	*No*
		1635	6	0.12	RE-no auto	*Yes*	1744	5	1.28	RE-no auto	*No*
		-	-	-	RE-auto	-	1635	5	1.91	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	4	-40.12*	FE	*Yes*	N/A	3	-0.12	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	8	8.04	FE	*No*	N/A	7	0.46	FE	*No*
					RE	*Yes*				RE	*Yes*
	Trade Direction	N/A	5	497.54*	FE	*Yes*	-	-	-	FE	-
					RE	*No*				RE	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DI: Suitable equations for agricultural trade between South Africa and the SADC countries.

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	RE	RE	RE	RE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	14.61*** (1.82)	14.61*** (1.82)	15.40* (4.10)	15.40* (4.10)	27.71* (3.21)	27.71* (3.21)	-	-	-	-
$\ln Y_{ijt-1}$	0.30* (3.78)	0.30* (3.78)	-	-	0.38* (4.22)	0.38* (4.22)	-	-	0.36* (18.78)	0.36* (18.78)	-	-
$\ln GDPPC_{ijt}$	0.65 (0.73)	0.65 (0.73)	1.56*** (1.81)	1.56*** (1.81)	0.20 (0.48)	0.20 (0.48)	-0.40 (-0.40)	-0.40 (-0.40)	0.46* (3.43)	0.46* (3.43)	-	-
$REER_t$	-0.21 (-1.35)	-0.21 (-1.35)	-0.31 (-1.50)	-0.31 (-1.50)	-0.17 (-1.24)	-0.17 (-1.24)	-0.25 (-1.38)	-0.25 (-1.38)	-0.48* (-4.69)	-0.48* (-4.69)	-	-
D0004 / D0509	-0.20** (-2.17)	0.87* (4.78)	-0.21** (-2.07)	1.00* (5.57)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.20** (-2.11)	0.98* (7.73)	-0.22** (-2.57)	1.10* (6.58)	-	-	-	-
D01 / D06	-	-	-	-	-0.28** (-2.18)	0.68* (4.07)	-0.38* (-3.01)	1.16* (5.49)	-	-	-	-
D02 / D07	-	-	-	-	-0.03 (-0.17)	0.63* (3.57)	-0.23 (-1.25)	1.20* (4.83)	-	-	-	-
D03 / D08	-	-	-	-	0.10 (0.81)	1.15* (6.53)	0.06 (0.46)	1.70* (6.31)	-	-	-	-
D04 / D09	-	-	-	-	0.06 (0.58)	0.91* (4.39)	0.06 (0.53)	1.70* (6.66)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.01 (-0.05)	0.83* (4.44)	-	-
PTA_{no}	-	-	-	-	-	-	-	-	0.24** (2.40)	0.95* (16.33)	-	-
$\ln DIST_{ij}$	-	-	-1.06 (-1.55)	-1.06 (-1.55)	-0.72* (-3.20)	-0.72* (-3.20)	-0.69 (-1.11)	-0.69 (-1.11)	-	-	-	-
Adjusted R^2	0.92	0.92	0.83	0.83	0.87	0.87	0.84	0.84	0.89	0.89	-	-
Observations	90	90	90	90	90	90	90	90	1635	1635	-	-
Cross-Sections	6	6	6	6	6	6	6	6	109	109	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded agricultural products (imports plus exports) with the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **103 non-SADC countries** that were added under the trade direction model: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DOM, DNK, DRC, EGY, ESP, ETH, FIN, FRA, GBR, GHA, GIN, GMB, GRC, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LKA, LUX, MAR, MDG, MEX, MLI, MRT, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRT , PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SWE, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, URY, USA, VCT, VEN and VNM

Appendix 5DJ: Average actual, simulated and potential value of agricultural trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	55,210,277	17.82666	51,384,670	17.75485	53,353,276	17.79245	52,368,973	17.77382
		2005 - 2009	134,638,785	18.71811	160,202,757	18.89195	165,772,514	18.92613	162,987,635	18.90918
Mauritius	MUS	2000 - 2004	20,928,296	16.85661	22,770,894	16.94099	24,298,502	17.00593	23,534,698	16.97399
		2005 - 2009	132,213,327	18.69993	103,596,835	18.45602	98,876,901	18.40939	101,236,868	18.43297
Mozambique	MOZ	2000 - 2004	164,246,809	18.91688	161,642,565	18.90090	170,359,109	18.95342	166,000,837	18.92750
		2005 - 2009	439,245,922	19.90057	503,657,216	20.03741	518,412,884	20.06628	511,035,050	20.05195
Tanzania	TZA	2000 - 2004	23,101,606	16.95541	26,340,085	17.08660	28,377,134	17.16109	27,358,610	17.12454
		2005 - 2009	86,213,154	18.27233	88,722,134	18.30102	89,205,219	18.30645	88,963,677	18.30374
Zambia	ZMB	2000 - 2004	61,862,742	17.94043	59,959,472	17.90918	62,790,955	17.95532	61,375,213	17.93252
		2005 - 2009	242,756,314	19.30757	225,265,497	19.23279	221,907,638	19.21777	223,586,568	19.22531
Zimbabwe	ZWE	2000 - 2004	139,937,404	18.75671	97,895,327	18.39941	95,952,280	18.37936	96,923,804	18.38944
		2005 - 2009	532,427,831	20.09296	521,529,179	20.07228	519,253,500	20.06790	520,391,340	20.07009

Appendix 5DK: Selection of the Estimator suitable for cheese exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	0.30	OLS	*Yes*	96	4	3.05*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Yearly Impact	90	9	0.29	OLS	*Yes*	96	8	3.28*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Export Direction	480	6	2.48**	OLS	*No*	512	5	10.49*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	0.01	OLS-no auto	*Yes*	96	4	0.77	FE-no auto	*No*
		-	-	-	-	-	90	4	2.18**	FE-auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-
	Yearly Impact	90	9	-0.05	OLS-no auto	*Yes*	96	8	0.80	FE-no auto	*No*
		-	-	-	-	-	90	8	2.16**	FE-auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-
	Export Direction	480	6	-0.15	FE-no auto	*Yes*	512	5	1.28	FE-no auto	*No*
		-	-	-	-	-	480	5	1.98**	FE-auto	*Yes*
		480	7	-1.48	RE-no auto	*Yes*	512	6	0.79	RE-no auto	*No*
		-	-	-	-	-	480	6	2.08**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Yearly Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Export Direction	N/A	6	143.91*	FE	*Yes*	N/A	5	17.92*	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DL: Suitable equations for cheese exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	OLS	OLS	FE	FE	OLS	OLS	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	21.36 (0.81)	21.36 (0.81)	-	-	-6.95 (-0.13)	-6.95 (-0.13)	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.70* (10.00)	0.70* (10.00)	-	-	0.71* (9.84)	0.71* (9.84)	-	-	0.40* (9.00)	0.40* (9.00)	-	-
$\ln GDPPC_{it}$	-1.90 (-0.60)	-1.90 (-0.60)	1.74 (0.62)	1.74 (0.62)	1.51 (0.24)	1.51 (0.24)	-0.54 (-0.09)	-0.54 (-0.09)	-7.75 (-1.44)	-7.75 (-1.44)	-4.98 (-1.02)	-4.98 (-1.02)
$\ln GDPPC_{jt}$	-0.01 (-0.09)	-0.01 (-0.09)	0.12 (0.31)	0.12 (0.31)	-0.01 (-0.07)	-0.01 (-0.07)	0.07 (0.17)	0.07 (0.17)	1.07 (1.14)	1.07 (1.14)	0.78 (0.63)	0.78 (0.63)
$REER_t$	0.12 (0.27)	0.12 (0.27)	1.32** (2.16)	1.32** (2.16)	0.33 (0.62)	0.33 (0.62)	1.38** (2.23)	1.38** (2.23)	-1.87** (-2.54)	-1.87** (-2.54)	-1.64*** (-1.80)	-1.64*** (-1.80)
D0004 / D0509	-0.10 (-0.22)	0.65 (0.96)	-0.55 (-1.13)	0.09 (0.17)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.12 (-0.23)	0.37 (0.36)	-1.00** (-2.24)	0.37 (0.47)	-	-	-	-
D01 / D06	-	-	-	-	-0.24 (-0.34)	-0.24 (-0.19)	-1.77** (-2.26)	0.36 (0.33)	-	-	-	-
D02 / D07	-	-	-	-	-0.15 (-0.14)	-0.07 (-0.05)	-2.80** (-2.35)	0.60 (0.44)	-	-	-	-
D03 / D08	-	-	-	-	0.51 (0.59)	-0.11 (-0.07)	-1.78*** (-1.96)	0.79 (0.52)	-	-	-	-
D04 / D09	-	-	-	-	0.10 (0.08)	-0.31 (-0.21)	-2.58** (-2.23)	0.53 (0.39)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.34 (-0.43)	2.02 (1.59)	-0.57 (-0.60)	1.47 (1.21)
PTA_{no}	-	-	-	-	-	-	-	-	0.33 (0.60)	1.84 (1.57)	0.48 (1.01)	1.22 (1.20)
$\ln DIST_{ij}$	-0.41** (-2.09)	-0.41** (-2.09)	-	-	-0.41** (-2.03)	-0.41** (-2.03)	-	-	-	-	-	-
Adjusted R^2	0.78	0.78	0.91	0.91	0.77	0.77	0.92	0.92	0.70	0.70	0.39	0.39
Observations	90	90	90	90	90	90	90	90	480	480	480	480
Cross-Sections	6	6	6	6	6	6	6	6	32	32	32	32

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported wine to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **26 non-SADC countries** that were added under the export direction model: AGO, ARE, BDI, CHE, CIV, CMR, COG, COM, DEU, DRC, ESP, ETH, FRA, GAB, GBR, GHA, GRC, JPN, KEN, MDG, MDV, NGA, NLD, SYC, UGA and USA (**See Appendix 5IT for full country names**)

Appendix 5DM: Average actual, simulated and potential value of cheese exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	188,798	12.14843	157,222	11.96541	151,760	11.93006	154,467	11.94774
		2005 - 2009	556,692	13.22977	528,426	13.17766	522,943	13.16723	525,677	13.17244
Mauritius	MUS	2000 - 2004	172,776	12.05975	171,349	12.05146	171,074	12.04985	171,212	12.05066
		2005 - 2009	106,636	11.57718	136,702	11.82556	142,811	11.86928	139,723	11.84742
Mozambique	MOZ	2000 - 2004	1,055,420	13.86945	973,072	13.78821	955,116	13.76959	964,052	13.77890
		2005 - 2009	3,531,692	15.07729	3,058,771	14.93352	2,957,983	14.90002	3,007,955	14.91677
Tanzania	TZA	2000 - 2004	89,991	11.40746	85,134	11.35199	84,282	11.34192	84,707	11.34695
		2005 - 2009	302,353	12.61935	276,934	12.53154	272,388	12.51498	274,652	12.52326
Zambia	ZMB	2000 - 2004	215,364	12.28009	220,206	12.30232	221,189	12.30677	220,697	12.30455
		2005 - 2009	1,012,027	13.82747	802,886	13.59597	765,169	13.54785	783,801	13.57191
Zimbabwe	ZWE	2000 - 2004	184,491	12.12536	250,470	12.43109	266,451	12.49294	258,337	12.46202
		2005 - 2009	319,795	12.67543	417,581	12.94223	439,988	12.99450	428,638	12.96837

Appendix 5DN: Selection of the estimator suitable for cut flowers exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	3.79*	OLS	*No*	96	4	6.17*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	9	16.03*	OLS	*No*	96	8	6.29*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Export Direction	840	6	3.11*	OLS	*No*	896	5	21.56*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	1.26	FE-no auto	*Yes*	96	4	1.89**	FE-no auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		90	6	0.47	RE-no auto	*Yes*	96	5	1.21	RE-no auto	*No*
		-	-	-	-	-	90	5	2.06**	RE-auto	*Yes*
	Yearly Impact	90	9	1.13	FE-no auto	*Yes*	96	8	1.83**	FE-no auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		90	10	0.58	RE-no auto	*Yes*	96	9	1.19	RE-no auto	*No*
		-	-	-	-	-	90	9	2.12**	RE-auto	*Yes*
	Export Direction	840	6	0.05	FE-no auto	*Yes*	896	5	1.11	FE-no auto	*No*
		-	-	-	-	-	840	5	1.91**	FE-auto	*Yes*
		840	7	-0.82	RE-no auto	*Yes*	896	6	0.89	RE-no auto	*No*
		-	-	-	-	-	840	6	1.94**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	85.89*	FE	*Yes*	N/A	4	-8.57***	FE	*Yes*
					RE	*No*				RE	*No*
	Yearly Impact	N/A	9	86.44*	FE	*Yes*	N/A	8	-22.91*	FE	*Yes*
					RE	*No*				RE	*No*
	Export Direction	N/A	6	209.56*	FE	*Yes*	N/A	5	-14.44**	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DO: Suitable equations for cut flowers exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.14 (1.51)	0.14 (1.51)	-	-	0.13 (1.44)	0.13 (1.44)	-	-	0.50* (17.33)	0.50* (17.33)	-	-
$\ln GDPPC_{it}$	12.63*** (1.86)	12.63*** (1.86)	14.65*** (1.93)	14.65*** (1.93)	-1.24 (-0.09)	-1.24 (-0.09)	11.16 (0.75)	11.16 (0.75)	-4.26 (-1.58)	-4.26 (-1.58)	0.70 (0.27)	0.70 (0.27)
$\ln GDPPC_{jt}$	0.91 (1.32)	0.91 (1.32)	1.11 (1.48)	1.11 (1.48)	0.72 (1.05)	0.72 (1.05)	1.03 (1.36)	1.03 (1.36)	0.74 (1.38)	0.74 (1.38)	1.66** (2.35)	1.66** (2.35)
$REER_t$	0.29 (0.31)	0.29 (0.31)	-1.40 (-1.45)	-1.40 (-1.45)	-0.56 (-0.49)	-0.56 (-0.49)	-1.63 (-1.28)	-1.63 (-1.28)	-0.55 (-1.47)	-0.55 (-1.47)	-0.91*** (-1.88)	-0.91*** (-1.88)
D0004 / D0509	1.02 (1.35)	-1.78 (-1.22)	-0.43 (-0.43)	-1.88 (-1.14)	-				-	-	-0.51 (-0.91)	-
D00 / D05	-	-	-	-	1.65 (1.22)	0.14 (0.06)	-0.23 (-0.26)	-1.35 (-0.56)	-	-	-0.60** (-1.96)	-
D01 / D06	-	-	-	-	0.97 (0.48)	0.54 (0.20)	-2.30** (-2.09)	-1.56 (-0.52)	-	-	-1.32* (-2.80)	-
D02 / D07	-	-	-	-	1.75 (0.53)	1.50 (0.47)	-3.13** (-2.10)	-1.12 (-0.31)	-	-	-	-
D03 / D08	-	-	-	-	2.58 (0.98)	1.71 (0.50)	-1.72 (-1.36)	-1.22 (-0.32)	-	-	-	-
D04 / D09	-	-	-	-	3.85 (1.05)	2.05 (0.66)	-2.42 (-1.37)	-0.40 (-0.11)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-		-	-0.85 (-1.53)	1.38** (2.01)	-0.51 (-0.91)	0.41 (0.62)
PTA_{no}	-	-	-	-	-	-		-	-0.93* (-2.69)	1.14** (1.96)	-0.60** (-1.96)	0.74 (1.56)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-	-	-	-	-
Adjusted R^2	0.67	0.67	0.64	0.64	0.66	0.66	0.63	0.63	0.78	0.78	0.71	0.71
Observations	90	90	96	96	90	90	96	96	840	840	840	840
Cross-Sections	6	6	6	6	6	6	6	6	56	56	56	56

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported cut flowers to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **50 non-SADC countries** that were added under the export direction model: AGO, ARE, ARG, AUS, AUT, BEL, BGR, BHR, CAN, CHE, CHN, CIV, COG, CZE, DEU, DNK, DRC, EGY, ESP, FIN, FRA, GAB, GBR, GHA, GRC, HUN, IND, IRL, ITA, JOR, JPN, KEN, KOR, KWT, LBN, MYS, NGA, NLD, OMN, PAK, POL, PRT, RUS, SAU, SGP, SWE, SYC, TUR, UGA and USA

Appendix 5DP: Average actual, simulated and potential value of cut flowers exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	1,156	7.05312	734	6.59783	685	6.52935	709	6.56359
		2005 - 2009	24,400	10.10233	6,194	8.73135	4,809	8.47820	5,458	8.60478
Mauritius	MUS	2000 - 2004	31,918	10.37092	14,027	9.54876	11,578	9.35687	12,744	9.45282
		2005 - 2009	103,484	11.54717	64,175	11.06936	57,051	10.95169	60,508	11.01053
Mozambique	MOZ	2000 - 2004	54,111	10.89879	50,354	10.82683	49,374	10.80718	49,861	10.81700
		2005 - 2009	314,886	12.65997	253,293	12.44230	238,029	12.38015	245,543	12.41123
Tanzania	TZA	2000 - 2004	233	5.44900	416	6.03107	450	6.11010	433	6.07059
		2005 - 2009	39	3.67430	256	5.54344	314	5.74872	283	5.64608
Zambia	ZMB	2000 - 2004	4,496	8.41088	4,990	8.51524	5,097	8.53643	5,043	8.52583
		2005 - 2009	8,067	8.99558	8,494	9.04714	8,579	9.05707	8,536	9.05210
Zimbabwe	ZWE	2000 - 2004	3,926	8.27549	7,619	8.93842	8,788	9.08115	8,183	9.00979
		2005 - 2009	8,419	9.03829	9,741	9.18405	10,023	9.21263	9,881	9.19834

Appendix 5DQ: Selection of the estimator suitable for cut flowers imports from the SADC countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	5.02*	OLS	*No*	96	4	37.61*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	9	5.97*	OLS	*No*	96	8	41.10*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Import Direction	285	6	4.98*	OLS	*No*	304	5	19.88*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	0.22	FE-no auto	*Yes*	96	4	1.39	FE-no auto	*No*
		-	-	-	-	-	90	4	1.88**	FE-auto	*Yes*
		90	6	-1.75***	RE-no auto	*No*	96	5	0.81	RE-no auto	*No*
		84	6	-0.66	RE-auto	*Yes*	90	5	2.00**	RE-auto	*Yes*
	Yearly Impact	-	-	-	-	-	96	8	1.45	FE-no auto	*No*
		84	9	0.67	FE-auto	*Yes*	90	8	1.96**	FE-auto	*Yes*
		90	10	-1.88***	RE-no auto	*No*	96	9	0.87	RE-no auto	*No*
		84	10	-0.73	RE-auto	*Yes*	90	9	2.07**	RE-auto	*Yes*
	Import Direction	390	6	-0.11	FE-no auto	*Yes*	416	5	1.65	FE-no auto	*No*
		-	-	-	-	-	390	5	1.97**	FE-auto	*Yes*
		390	7	-1.59	RE-no auto	*Yes*	416	6	1.06	RE-no auto	*No*
		-	-	-	-	-	390	6	2.04**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	31.86*	FE	*Yes*	N/A	4	-0.21	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	38.65*	FE	*Yes*	N/A	8	2.96	FE	*No*
					RE	*No*				RE	*Yes*
	Import Direction	N/A	6	153.98*	FE	*Yes*	N/A	5	1.83	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DR: Suitable equations for cut flowers imports from SADC countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-192.11** (-2.18)	-192.11** (-2.18)	-	-	-440.6** (-2.48)	-440.6** (-2.48)	-	-	-42.36 (-0.77)	-42.36 (-0.77)
$\ln Y_{ijt-1}$	0.33* (3.27)	0.33* (3.27)	-	-	0.30* (2.96)	0.30* (2.96)	-	-	0.24* (4.07)	0.24* (4.07)	-	-
$\ln GDPPC_{it}$	18.97 (1.64)	18.97 (1.64)	21.57** (2.09)	21.57** (2.09)	69.18* (3.06)	69.18* (3.06)	51.89** (2.41)	51.89** (2.41)	3.16 (0.45)	3.16 (0.45)	5.83 (0.89)	5.83 (0.89)
$\ln GDPPC_{jt}$	0.50 (0.42)	0.50 (0.42)	-1.21*** (-1.67)	-1.21*** (-1.67)	1.04 (0.89)	1.04 (0.89)	-1.10 (-1.44)	-1.10 (-1.44)	1.46 (1.39)	1.46 (1.39)	-1.02* (-4.11)	-1.02* (-4.11)
$REER_t$	0.87 (0.55)	0.87 (0.55)	3.00 (1.52)	3.00 (1.52)	3.86** (2.00)	3.86** (2.00)	4.37** (2.02)	4.37** (2.02)	0.61 (0.63)	0.61 (0.63)	0.86 (0.71)	0.86 (0.71)
D0004 / D0509	0.09 (0.06)	-2.60 (-1.03)	1.46 (1.23)	-2.13 (-1.04)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-4.69*** (-1.85)	-9.18** (-2.57)	0.69 (0.50)	-5.73*** (-1.90)	-	-	-	-
D01 / D06	-	-	-	-	-10.78* (-2.91)	-12.11* (-2.70)	-1.69 (-0.88)	-8.18** (-2.01)	-	-	-	-
D02 / D07	-	-	-	-	-15.89* (-2.65)	-14.39* (-2.68)	-2.62 (-0.91)	-9.38*** (-1.87)	-	-	-	-
D03 / D08	-	-	-	-	-8.64*** (-1.80)	-16.06* (-2.78)	2.56 (1.09)	-10.08*** (-1.84)	-	-	-	-
D04 / D09	-	-	-	-	-18.39* (-2.71)	-14.28* (-2.72)	1.45 (0.44)	-8.78*** (-1.76)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	1.73*** (1.71)	0.86 (0.53)	1.98** (1.93)	0.88 (0.60)
PTA_{no}	-	-	-	-	-	-	-	-	0.30 (0.37)	-1.59 (-1.03)	0.66 (0.91)	-1.58 (-1.16)
$\ln DIST_{ij}$	-	-	2.69 (1.02)	2.69 (1.02)	-	-	2.59 (0.96)	2.59 (0.96)	-	-	0.68 (1.09)	0.68 (1.09)
Adjusted R^2	0.72	0.72	0.39	0.39	0.73	0.73	0.29	0.29	0.64	0.64	0.36	0.36
Observations	90	90	90	90	90	90	90	90	390	390	390	390
Cross-Sections	6	6	6	6	6	6	6	6	26	26	26	26

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported cut flowers from the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **20 non-SADC countries** that were added under the import direction model: BGR, BRA, CHN, DEU, ESP, FRA, GBR, IND, ISR, ITA, KEN, NLD, PHL, PRT, SGP, SYC, THA, TUR, UGA and USA

Appendix 5DS: Average actual, simulated and potential value of cut flowers imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	16,587	9.71637	9,638	9.17343	9,735	9.18348	9,686	9.17845
		2005 - 2009	48,149	10.78206	33,909	10.43142	31,379	10.35389	32,619	10.39266
Mauritius	MUS	2000 - 2004	121	4.79565	331	5.80112	417	6.03208	371	5.91660
		2005 - 2009	999	6.90633	1,757	7.47151	1,912	7.55573	1,833	7.51362
Mozambique	MOZ	2000 - 2004	22	3.09797	35	3.54366	38	3.63014	36	3.58690
		2005 - 2009	7	1.93246	33	3.49466	36	3.59554	35	3.54510
Tanzania	TZA	2000 - 2004	110	4.69885	81	4.39001	83	4.41914	82	4.40457
		2005 - 2009	26,381	10.18039	3,663	8.20601	2,639	7.87806	3,109	8.04204
Zambia	ZMB	2000 - 2004	54,313	10.90252	38,472	10.55769	41,326	10.62924	39,873	10.59346
		2005 - 2009	722,536	13.49052	571,361	13.25578	532,650	13.18562	551,666	13.22070
Zimbabwe	ZWE	2000 - 2004	474,254	13.06950	205,254	12.23200	187,018	12.13896	195,924	12.18548
		2005 - 2009	1,649,091	14.31573	2,541,109	14.74811	2,948,772	14.89690	2,737,362	14.82251

Appendix 5DT: Selection of the estimator suitable for cut flowers trade between South Africa and the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	10.95*	OLS	***No***	96	3	21.72*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	8	11.17*	OLS	***No***	96	7	22.08*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Trade Direction	330	5	5.17*	OLS	***No***	352	4	21.85*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	4	-0.54	FE-no auto	***Yes***	96	3	2.09**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	5	-0.38	RE-no auto	***Yes***	96	4	1.74**	RE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
	Yearly Impact	90	8	-0.61	FE-no auto	***Yes***	96	7	2.10**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	9	-0.29	RE-no auto	***Yes***	96	8	1.73	RE-no auto	**?**
		-	-	-	-	-	90	8	2.13**	RE-auto	***Yes***
	Trade Direction	330	5	0.24	FE-no auto	***Yes***	352	4	1.45	FE-no auto	***No***
		-	-	-	-	-	330	4	1.84**	FE-auto	***Yes***
		330	6	-0.25	RE-no auto	***Yes***	352	5	1.27	RE-no auto	***No***
		-	-	-	-	-	330	5	1.87**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	-654.77*	FE	***Yes***	N/A	3	4.22	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	-465.95*	FE	***Yes***	N/A	7	1.72	FE	***No***
					RE	***No***				RE	***Yes***
	Trade Direction	N/A	5	90.69*	FE	***Yes***	N/A	4	-0.18	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5DU: Suitable equations for cut flowers trade between South Africa and the SADC countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-0.53 (-0.04)	-0.53 (-0.04)	-	-	-2.36 (-0.19)	-2.36 (-0.19)	-	-	-4.41 (-0.57)	-4.41 (-0.57)
lnY_{ijt-1}	-0.06 (-0.66)	-0.06 (-0.66)	-	-	-0.06 (-0.67)	-0.06 (-0.67)	-	-	0.31* (5.95)	0.31* (5.95)	-	-
$lnGDPPC_{ijt}$	12.02* (3.30)	12.02* (3.30)	4.64* (2.94)	4.64* (2.94)	13.76* (3.20)	13.76* (3.20)	4.69* (2.86)	4.69* (2.86)	4.83* (2.93)	4.83* (2.93)	3.09* (3.34)	3.09* (3.34)
$REER_t$	0.07 (0.10)	0.07 (0.10)	-1.24*** (-1.93)	-1.24*** (-1.93)	0.13 (0.19)	0.13 (0.19)	-0.80 (-1.09)	-0.80 (-1.09)	0.60 (1.48)	0.60 (1.48)	-0.56 (-1.09)	-0.56 (-1.09)
D0004 / D0509	0.88 (1.16)	-0.07 (-0.10)	0.70 (1.24)	1.41* (3.13)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.94 (1.18)	-0.19 (-0.25)	0.51 (0.71)	1.15** (2.17)	-	-	-	-
D01 / D06	-	-	-	-	-0.78 (-0.75)	-0.25 (-0.28)	-1.50*** (-1.68)	1.67* (2.87)	-	-	-	-
D02 / D07	-	-	-	-	0.11 (0.07)	-0.41 (-0.39)	-1.28 (-1.08)	1.80* (2.89)	-	-	-	-
D03 / D08	-	-	-	-	1.16 (1.08)	-0.84 (-0.75)	0.33 (0.36)	1.56** (2.41)	-	-	-	-
D04 / D09	-	-	-	-	0.97 (1.03)	-0.46 (-0.43)	0.21 (0.25)	1.76* (2.60)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.20 (0.45)	0.59 (1.43)	0.56 (1.31)	1.66* (4.78)
PTA_{no}	-	-	-	-	-	-	-	-	-0.65*** (-1.73)	-0.44 (-1.13)	-0.81** (-2.25)	0.57 (1.46)
$lnDIST_{ij}$	-	-	-3.03* (-4.20)	-3.03* (-4.20)	-	-	-3.15* (-2.74)	-3.15* (-2.74)	-	-	-1.19* (-2.72)	-1.19* (-2.72)
Adjusted R^2	0.78	0.78	0.44	0.44	0.77	0.77	0.63	0.63	0.81	0.81	0.59	0.59
Observations	90	90	96	96	90	90	90	90	330	330	330	330
Cross-Sections	6	6	6	6	6	6	6	6	22	22	22	22

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, , SA traded (imports plus exports) cut flowers with the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **16 non-SADC countries** that were added under the trade direction model: BGR, CHN, DEU, ESP, FRA, GBR, IND, ITA, KEN, NLD, PRT, SGP, SYC, TUR, UGA and USA

Appendix 5DV: Average actual, simulated and potential value of cut flowers trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	18,113	9.80438	10,677	9.27589	5,574	8.62583	7,715	8.95086
		2005 - 2009	73,363	11.20317	73,410	11.20381	73,418	11.20393	73,414	11.20387
Mauritius	MUS	2000 - 2004	33,787	10.42782	38,434	10.55670	20,460	9.92623	28,042	10.24147
		2005 - 2009	107,499	11.58524	289,637	12.57639	355,376	12.78093	320,827	12.67866
Mozambique	MOZ	2000 - 2004	56,110	10.93507	8,100,922	15.90749	13,427,856	16.41284	10,429,669	16.16017
		2005 - 2009	328,253	12.70154	2,970,860	14.90436	5,201,801	15.46452	3,931,135	15.18444
Tanzania	TZA	2000 - 2004	800	6.68494	817	6.70597	555	6.31944	674	6.51271
		2005 - 2009	26,934	10.20115	20,235	9.91515	19,352	9.87057	19,789	9.89286
Zambia	ZMB	2000 - 2004	60,751	11.01454	51,980	10.85861	25,585	10.14977	36,468	10.50419
		2005 - 2009	732,240	13.50386	182,232	12.11304	138,506	11.83867	158,872	11.97585
Zimbabwe	ZWE	2000 - 2004	482,447	13.08663	171,146	12.05027	62,757	11.04702	103,636	11.54864
		2005 - 2009	1,658,373	14.32135	363,508	12.80356	263,939	12.48347	309,748	12.64351

Appendix 5DW: Selection of the estimator suitable for frozen fruits and nuts exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	3.79*	OLS	*No*	96	4	2.61**	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	90	9	3.76*	OLS	*No*	96	8	3.54*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Export Direction	315	6	2.93*	OLS	*No*	336	5	12.33*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) or Durbin-H Statistic (*for dynamic*)	Period Impact	90	5	-1.14	FE-no auto	*Yes*	96	4	1.21	FE-no auto	*No*
		-	-	-	-	-	90	4	2.38**	FE-auto	*Yes*
		90	6	-1.95***	RE-no auto	*No*	96	5	0.63	RE-no auto	*No*
		84	6	-0.80	RE-auto	*Yes*	90	5	2.40**	RE-auto	*Yes*
	Yearly Impact	90	9	-1.15	FE-no auto	*Yes*	96	8	1.22	FE-no auto	*No*
		-	-	-	-	-	90	8	2.33**	FE-auto	*Yes*
		90	10	-1.94***	RE-no auto	*No*	96	9	0.57	RE-no auto	*No*
		84	10	-0.57	RE-auto	*Yes*	90	9	2.34**	RE-auto	*Yes*
	Export Direction	315	6	-0.42	FE-no auto	*Yes*	336	5	1.32	FE-no auto	*No*
		-	-	-	-	-	315	5	2.04**	FE-auto	*Yes*
		315	7	-1.55	RE-no auto	*Yes*	336	6	0.80	RE-no auto	*No*
		-	-	-	-	-	315	6	2.15**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	N/A	5	58.48*	FE	*Yes*	N/A	4	0.24	FE	*No*
					RE	*No*				RE	*Yes*
	Yearly Impact	N/A	9	142.75*	FE	*Yes*	N/A	8	-1.23	FE	*No*
					RE	*No*				RE	*Yes*
	Export Direction	N/A	6	118.90*	FE	*Yes*	N/A	5	0.40	FE	*No*
					RE	*No*				RE	*Yes*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5DX: Suitable equations for frozen fruits and nuts exports from South Africa to the SADC countries

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant			-11.65 (-0.16)	-11.65 (-0.16)			-159.26 (-1.06)	-159.26 (-1.06)			-33.45 (-0.57)	-33.45 (-0.57)
$\ln Y_{ijt-1}$	0.38* (4.44)	0.38* (4.44)			0.37* (4.40)	0.37* (4.40)			0.40* (7.46)	0.40* (7.46)		
$\ln GDPPC_{it}$	1.68 (0.20)	1.68 (0.20)	3.97 (0.45)	3.97 (0.45)	10.60 (0.63)	10.60 (0.63)	22.58 (1.23)	22.58 (1.23)	3.03 (0.42)	3.03 (0.42)	7.40 (1.07)	7.40 (1.07)
$\ln GDPPC_{jt}$	-0.80 (-0.94)	-0.80 (-0.94)	0.54 (1.11)	0.54 (1.11)	-0.71 (-0.83)	-0.71 (-0.83)	0.58 (1.18)	0.58 (1.18)	0.26 (0.23)	0.26 (0.23)	0.76*** (1.82)	0.76*** (1.82)
$REER_t$	-1.28 (-1.12)	-1.28 (-1.12)	-2.41 (-1.26)	-2.41 (-1.26)	-0.76 (-0.53)	-0.76 (-0.53)	-2.55 (-1.33)	-2.55 (-1.33)	-1.87*** (-1.90)	-1.87*** (-1.90)	-2.91** (-2.03)	-2.91** (-2.03)
D0004 / D0509	-1.89 (-1.44)	1.62 (0.89)	-1.93 (-1.50)	1.37 (0.86)	-		-		-		-	
D00 / D05	-		-		1.05 (0.45)	0.57 (0.21)	-1.63 (-1.13)	-0.57 (-0.24)	-		-	
D01 / D06	-		-		0.08 (0.02)	-0.37 (-0.11)	-4.45** (-2.15)	-1.78 (-0.54)	-		-	
D02 / D07	-		-		4.57 (0.77)	-0.36 (-0.09)	-3.49 (-1.11)	-2.48 (-0.60)	-		-	
D03 / D08	-		-		1.93 (0.43)	-0.80 (-0.19)	-2.68 (-1.04)	-3.56 (-0.78)	-		-	
D04 / D09	-		-		3.06 (0.48)	-0.43 (-0.11)	-3.30 (-0.96)	-2.89 (-0.70)	-		-	
PTA_{yes}	-		-		-		-		0.44 (0.35)	1.09 (0.66)	0.66 (0.48)	0.98 (0.63)
PTA_{no}	-		-		-		-		0.70 (0.69)	0.10 (0.06)	0.69 (0.73)	0.53 (0.39)
$\ln DIST_{ij}$	-		-0.63 (-0.55)	-0.63 (-0.55)	-		-0.72 (-0.62)	-0.72 (-0.62)	-		-1.31 (-1.23)	-1.31 (-1.23)
Adjusted R^2	0.70	0.70	0.65	0.65	0.69	0.69	0.68	0.68	0.57	0.57	0.46	0.46
Observations	90	90	90	90	90	90	90	90	315	315	315	315
Cross-Sections	6	6	6	6	6	6	6	6	21	21	21	21

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported preserved fruits and nuts to the following **6 SADC countries**: MOZ, MUS, MWI, ZMB and ZWE as well as to the following **15 non-SADC countries** that were added under the export direction model: AGO, AUS, AUT, BEL, CHE, DEU, DRC, FRA, GBR, JPN, KEN, NLD, NZL, SWE, SYC and USA

Appendix 5DY: Average actual, simulated and potential value of frozen fruits and nuts exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	480	6.17377	714	6.57021	761	6.63481	737	6.60251
		2005 - 2009	3,855	8.25703	5,666	8.64223	6,084	8.71341	5,871	8.67782
Mauritius	MUS	2000 - 2004	50,925	10.83810	26,761	10.19470	21,081	9.95612	23,752	10.07541
		2005 - 2009	49,612	10.81199	68,061	11.12816	73,690	11.20762	70,820	11.16789
Mozambique	MOZ	2000 - 2004	2,576	7.85389	3,574	8.18155	3,822	8.24855	3,696	8.21505
		2005 - 2009	12,743	9.45275	20,512	9.92878	22,759	10.03270	21,606	9.98074
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	488	6.19073	91	4.50956	78	4.36061	84	4.43509
Zambia	ZMB	2000 - 2004	3,793	8.24086	2,921	7.97968	2,697	7.89975	2,807	7.93972
		2005 - 2009	19,313	9.86852	30,241	10.31694	33,508	10.41954	31,832	10.36824
Zimbabwe	ZWE	2000 - 2004	1,395	7.24090	1,781	7.48510	1,856	7.52613	1,818	7.50562
		2005 - 2009	50,342	10.82659	53,206	10.88194	53,931	10.89546	53,568	10.88870

Appendix 5DZ: Selection of the estimator suitable for preserved fruits and nuts exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	2.74**	OLS	***No***	96	4	12.51*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	9	2.86*	OLS	***No***	96	8	12.75*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1275	6	2.85*	OLS	***No***	1360	5	13.34*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	90	5	-0.20	FE-no auto	***Yes***	96	4	1.33	FE-no auto	***No***
		-	-	-	-	-	90	4	1.90**	FE-auto	***Yes***
		-	-	-	-	-	96	5	1.24	RE-no auto	***No***
		-	-	-	-	-	90	5	1.94**	RE-auto	***Yes***
	Yearly Impact	90	9	-0.31	FE-no auto	***Yes***	96	8	1.36	FE-no auto	***No***
		-	-	-	-	-	90	8	2.00**	FE-auto	***Yes***
		-	-	-	-	-	96	9	1.29	RE-no auto	***No***
		-	-	-	-	-	90	9	2.06**	RE-auto	***Yes***
	Export Direction	1275	6	-0.22	FE-no auto	***Yes***	1360	5	1.14	FE-no auto	***No***
		-	-	-	-	-	1275	5	1.95**	FE-auto	***Yes***
		1275	7	-1.49	RE-no auto	***Yes***	1360	6	0.74	RE-no auto	***No***
		-	-	-	-	-	1275	6	2.05**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	-	-	-	-	-	N/A	4	7.57	FE	***No***
					-	-				RE	***Yes***
	Yearly Impact	-	-	-	-	-	N/A	8	8.15	FE	***No***
					-	-				RE	***Yes***
	Export Direction	N/A	6	384.82*	FE	***Yes***	N/A	5	-14.84**	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EA: Suitable equations for preserved fruits and nuts exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-30.92 (-1.20)	-30.92 (-1.20)	-	-	-75.60 (-1.50)	-75.60 (-1.50)	-	-	-	-
$\ln Y_{ijt-1}$	0.39* (4.11)	0.39* (4.11)	-	-	0.37* (3.82)	0.37* (3.82)	-	-	0.46* (17.73)	0.46* (17.73)	-	-
$\ln GDPPC_{it}$	-2.37 (0.78)	-2.37 (0.78)	6.73** (2.31)	6.73** (2.31)	-4.83 (0.80)	-4.83 (0.80)	12.01** (1.98)	12.01** (1.98)	-4.69 (-1.37)	-4.69 (-1.37)	-6.74** (-2.15)	-6.74** (-2.15)
$\ln GDPPC_{jt}$	-0.04 (-0.13)	-0.04 (-0.13)	0.32 (1.01)	0.32 (1.01)	-0.04 (-0.12)	-0.04 (-0.12)	0.38 (1.23)	0.38 (1.23)	0.86 (1.21)	0.86 (1.21)	2.79* (2.85)	2.79* (2.85)
$REER_t$	-0.94** (-2.38)	-0.94** (-2.38)	-1.48** (-2.49)	-1.48** (-2.49)	-0.79 (-1.62)	-0.79 (-1.62)	-1.34** (-2.21)	-1.34** (-2.21)	-0.64 (-1.36)	-0.64 (-1.36)	-1.39** (-2.50)	-1.39** (-2.50)
D0004 / D0509	0.28 (0.59)	0.58 (0.92)	0.12 (0.31)	0.37 (0.64)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.36 (0.80)	0.27 (0.29)	0.16 (0.37)	-0.34 (-0.40)	-	-	-	-
D01 / D06	-	-	-	-	1.07*** (1.81)	0.13 (0.11)	0.56 (0.84)	-0.54 (-0.47)	-	-	-	-
D02 / D07	-	-	-	-	1.76** (2.03)	-0.23 (-0.17)	0.96 (0.92)	-1.10 (-0.78)	-	-	-	-
D03 / D08	-	-	-	-	1.86* (2.57)	0.03 (0.02)	1.67** (2.01)	-1.11 (-0.72)	-	-	-	-
D04 / D09	-	-	-	-	1.91** (1.88)	0.22 (0.16)	1.64 (1.49)	-0.50 (-0.36)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.03 (-0.04)	1.81** (1.96)	-0.12 (-0.13)	2.49** (2.54)
PTA_{no}	-	-	-	-	-	-	-	-	-0.41 (-0.95)	0.79 (1.08)	-0.77** (-2.11)	1.19*** (1.95)
$\ln DIST_{ij}$	-	-	-0.97 (-0.94)	-0.97 (-0.94)	-	-	-0.77 (-0.77)	-0.77 (-0.77)	-	-	-	-
Adjusted R^2	0.86	0.86	0.52	0.52	0.85	0.85	0.53	0.53	0.68	0.68	0.72	0.72
Observations	90	90	90	90	90	90	90	90	1275	1275	1275	1275
Cross-Sections	6	6	6	6	6	6	6	6	85	85	85	85

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported preserved fruits and nuts to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **79 non-SADC countries** that were added under the export direction model: AGO, ARE, ARG AUS, AUT, BEL, BGD, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, COG, COM, CRI, CYP, CZE, DEU, DNK, DOM, DRC, EGY, ESP, ETH, FIN, FRA, GAB, GBR, GHA, GRC, HUN, IRL, ISL, ISR, ITA, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LUX, MAR, MDG, MDV, MLI, MLT, MYS, NGA, NLD, NOR, NZL, OMN, PAK, PER, PHL, POL, PRI, PRT, RUS, SAU, SEN, SGP, STP, SVK, SVN, SWE, SYC, SYR, THA, TTO, UGA, URY, USA and YEM

Appendix 5EB: Average actual, simulated and potential value of preserved fruits and nuts exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	50,030	10.82037	35,035	10.46409	32,928	10.40209	33,965	10.43309
		2005 - 2009	164,221	12.00897	143,514	11.87419	140,095	11.85008	141,795	11.86213
Mauritius	MUS	2000 - 2004	752,447	13.53109	771,405	13.55597	775,983	13.56189	773,691	13.55893
		2005 - 2009	2,042,383	14.52963	2,474,215	14.72143	2,586,664	14.76588	2,529,815	14.74366
Mozambique	MOZ	2000 - 2004	267,437	12.49664	333,867	12.71850	350,550	12.76726	342,107	12.74288
		2005 - 2009	624,886	13.34532	776,325	13.56233	812,459	13.60782	794,187	13.58507
Tanzania	TZA	2000 - 2004	19,217	9.86354	19,831	9.89499	19,933	9.90012	19,882	9.89755
		2005 - 2009	79,752	11.28668	69,808	11.15351	68,280	11.13137	69,040	11.14244
Zambia	ZMB	2000 - 2004	215,575	12.28106	181,782	12.11056	175,476	12.07526	178,601	12.09291
		2005 - 2009	1,045,258	13.85977	976,976	13.79222	962,955	13.77776	969,940	13.78499
Zimbabwe	ZWE	2000 - 2004	109,009	11.59919	139,772	11.84777	146,959	11.89791	143,321	11.87284
		2005 - 2009	551,471	13.22034	512,495	13.14705	504,964	13.13224	508,716	13.13964

Appendix 5EC: Selection of the estimator suitable for fruits and vegetable juices exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	1.34	OLS	***Yes***	96	4	4.23*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Yearly Impact	90	9	1.50	OLS	***Yes***	96	8	4.66*	OLS	***No***
					FE or RE	***No***				FE or RE	***Yes***
	Export Direction	1290	6	4.67*	OLS	***No***	1376	5	16.99*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	0.46	OLS-no auto	***Yes***	96	4	1.05	FE-no auto	***No***
		-	-	-	-	-	90	4	1.86**	FE-auto	***Yes***
		-	-	-	-	-	96	5	0.95	RE-no auto	***No***
		-	-	-	-	-	90	5	1.74	RE-auto	**?**
	Yearly Impact	90	9	0.74	OLS-no auto	***Yes***	96	8	0.91	FE-no auto	***No***
		-	-	-	-	-	90	8	1.86**	FE-auto	***Yes***
		-	-	-	-	-	96	9	0.84	RE-no auto	***No***
		-	-	-	-	-	90	9	1.72	RE-auto	**?**
	Export Direction	1290	6	-0.03	FE-no auto	***Yes***	1376	5	1.53	FE-no auto	***No***
			-	-	-	-	1290	5	1.97**	FE-auto	***Yes***
		1290	7	-1.50	RE-no auto	***Yes***	1376	6	0.96	RE-no auto	***No***
			-	-	-	-	1290	6	2.09**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Yearly Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Export Direction	N/A	6	605.04*	FE	***Yes***	N/A	5	51.59*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5ED: Suitable equations for fruits and vegetable juices exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	OLS	OLS	FE	FE	OLS	OLS	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-16.60 (-1.08)	-16.60 (-1.08)	-57.15* (-3.73)	-57.15* (-3.73)	-68.93** (-2.46)	-68.93** (-2.46)	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.72* (10.37)	0.72* (10.37)	-	-	0.72* (10.33)	0.72* (10.33)	-	-	0.27* (10.21)	0.27* (10.21)	12.27* (3.90)	12.27* (3.90)
$\ln GDPPC_{it}$	2.69 (1.42)	2.69 (1.42)	9.37* (5.20)	9.37* (5.20)	9.01* (2.65)	9.01* (2.65)	11.18* (3.38)	11.18* (3.38)	8.21** (2.38)	8.21** (2.38)	2.35* (2.67)	2.35* (2.67)
$\ln GDPPC_{jt}$	0.13*** (1.94)	0.13*** (1.94)	0.45* (2.89)	0.45* (2.89)	0.13*** (1.95)	0.13*** (1.95)	0.23 (1.08)	0.23 (1.08)	2.24* (3.19)	2.24* (3.19)	-0.65 (-1.19)	-0.65 (-1.19)
$REER_t$	-0.01 (-0.05)	-0.01 (-0.05)	0.02 (0.05)	0.02 (0.05)	0.38 (1.28)	0.38 (1.28)	0.17 (0.49)	0.17 (0.49)	-0.32 (-0.69)	-0.32 (-0.69)	-	-
D0004 / D0509	-0.22 (-1.03)	0.15 (0.40)	-0.05 (-0.28)	-0.18 (-0.53)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.15 (-0.63)	-0.58 (-1.08)	-0.08 (0.35)	-0.53 (-1.22)	-	-	-	-
D01 / D06	-	-	-	-	-0.64*** (-1.73)	-1.28*** (-1.69)	-0.32 (0.92)	-0.84 (-1.42)	-	-	-	-
D02 / D07	-	-	-	-	-0.53 (-0.87)	-1.35*** (-1.69)	-0.20 (0.35)	-0.89 (-1.20)	-	-	-	-
D03 / D08	-	-	-	-	-0.59 (-1.24)	-1.57*** (-1.82)	0.05 (0.10)	-0.87 (-1.05)	-	-	-	-
D04 / D09	-	-	-	-	-0.95 (-1.48)	-1.18 (-1.50)	-0.15 (0.26)	-0.22 (-0.29)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.05 (0.07)	-0.64 (-0.68)	0.20 (0.17)	-0.77 (-0.72)
PTA_{no}	-	-	-	-	-	-	-	-	0.33 (0.75)	-0.54 (-0.73)	0.54 (1.38)	-0.97 (-1.55)
$\ln DIST_{ij}$	-0.23** (-2.16)	-0.23** (-2.16)	-	-	-0.23** (-2.16)	-0.23** (-2.16)	-	-	-	-	-	-
Adjusted R^2	0.91	0.91	0.87	0.87	0.92	0.92	0.96	0.96	0.65	0.65	0.55	0.55
Observations	90	90	90	90	90	90	90	90	1290	1290	1290	1290
Cross-Sections	6	6	6	6	6	6	6	6	86	86	86	86

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported fruits and vegetable juices to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **80 non-SADC countries** that were added under the export direction model: AGO, ARE, ARG, AUS, AUT, BEL, BDI, BEN, BGD, BHR, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CYP, DEU, DNK, DRC, EGY, ESP, ETH, FIN, FRA, GAB, GBR, GHA, GIN, GRC, HUN, IDN, IND, ISL, IRL, ISR, ITA, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDG, MDV, MLI, MLT, MYS, NGA, NLD, NOR, NZL, OMN, PAK, PHL, POL, PRT, RUS, RWA, SAU, SEN, SGP, SLE, SWE, SYC, TGO, THA, TTO, TUR, UGA, URY and USA

Appendix 5EE: Average actual, simulated and potential value of fruits and vegetable juices exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	480	6.17377	714	6.57021	761	6.63481	737	6.60251
		2005 - 2009	3,855	8.25703	5,666	8.64223	6,084	8.71341	5,871	8.67782
Mauritius	MUS	2000 - 2004	50,925	10.83810	26,761	10.19470	21,081	9.95612	23,752	10.07541
		2005 - 2009	49,612	10.81199	68,061	11.12816	73,690	11.20762	70,820	11.16789
Mozambique	MOZ	2000 - 2004	2,576	7.85389	3,574	8.18155	3,822	8.24855	3,696	8.21505
		2005 - 2009	12,743	9.45275	20,512	9.92878	22,759	10.03270	21,606	9.98074
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	488	6.19073	91	4.50956	78	4.36061	84	4.43509
Zambia	ZMB	2000 - 2004	3,793	8.24086	2,921	7.97968	2,697	7.89975	2,807	7.93972
		2005 - 2009	19,313	9.86852	30,241	10.31694	33,508	10.41954	31,832	10.36824
Zimbabwe	ZWE	2000 - 2004	1,395	7.24090	1,781	7.48510	1,856	7.52613	1,818	7.50562
		2005 - 2009	50,342	10.82659	53,206	10.88194	53,931	10.89546	53,568	10.88870

Appendix 5EF: Selection of the estimator suitable for fruits and vegetable juices imports from the SADC countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	8.10*	OLS	***No***	96	4	24.47*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	9	8.16*	OLS	***No***	96	8	27.94*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	645	6	4.27*	OLS	***No***	688	5	14.01*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	90	5	0.92	FE-no auto	***Yes***	96	4	1.94**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	6	-1.91***	RE-no auto	***No***	96	5	1.03	RE-no auto	***No***
		84	6	-0.14	RE-auto	***Yes***	90	5	2.14**	RE-auto	***Yes***
	Yearly Impact	90	9	0.77	FE-no auto	***Yes***	96	8	1.83**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	10	-1.89***	RE-no auto	***No***	96	9	1.01	RE-no auto	***No***
		84	10	-0.82	RE-auto	***Yes***	90	9	2.10**	RE-auto	***Yes***
	Import Direction	645	6	0.10	FE-no auto	***Yes***	688	5	1.53	FE-no auto	***No***
		-	-	-	-	-	645	5	1.97**	FE-auto	***Yes***
		645	7	-1.58	RE-no auto	***Yes***	688	6	0.84	RE-no auto	***No***
		-	-	-	-	-	645	6	2.06**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	49.60*	FE	***Yes***	N/A	4	0.39	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	57.89*	FE	***Yes***	N/A	8	-0.78	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	334.71*	FE	***Yes***	N/A	5	-0.41	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EG: Suitable equations for fruits and vegetable juices imports from SADC countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-190.8*** (-1.70)	-190.8*** (-1.70)	-	-	-434.3** (-2.03)	-434.3** (-2.03)	-	-	-172.7* (-3.71)	-172.7* (-3.71)
lnY_{ijt-1}	0.04 (0.35)	0.04 (0.35)	-	-	0.09 (0.76)	0.09 (0.76)	-	-	0.26* (6.62)	0.26* (6.62)	-	-
$lnGDPPC_{it}$	20.97 (1.48)	20.97 (1.48)	24.79*** (1.86)	24.79*** (1.86)	51.8*** (1.94)	51.8*** (1.94)	54.99** (2.13)	54.99** (2.13)	13.57** (2.42)	13.57** (2.42)	21.67* (3.95)	21.67* (3.95)
$lnGDPPC_{jt}$	2.01 (1.47)	2.01 (1.47)	1.40* (3.18)	1.40* (3.18)	2.36*** (1.81)	2.36*** (1.81)	1.56* (2.88)	1.56* (2.88)	1.49 (1.38)	1.49 (1.38)	0.35 (1.51)	0.35 (1.51)
$REER_t$	0.04 (0.02)	0.04 (0.02)	0.09 (0.04)	0.09 (0.04)	2.01 (0.88)	2.01 (0.88)	1.14 (0.46)	1.14 (0.46)	-0.35 (-0.46)	-0.35 (-0.46)	-0.74 (-0.69)	-0.74 (-0.69)
D0004 / D0509	-3.37 (-1.36)	-2.94 (-0.95)	-0.68 (0.39)	-3.37 (-1.20)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-1.31 (-0.48)	-6.32 (-1.49)	0.59 (0.34)	-5.98 (-1.60)	-	-	-	-
D01 / D06	-	-	-	-	-4.46 (-1.25)	-9.31*** (-1.75)	-1.63 (-0.77)	-8.70*** (-1.75)	-	-	-	-
D02 / D07	-	-	-	-	-1.02 (-0.19)	-10.05 (-1.58)	1.48 (0.52)	-10.17*** (-1.67)	-	-	-	-
D03 / D08	-	-	-	-	-4.19 (-0.97)	-9.32 (-1.36)	1.73 (0.71)	-9.72 (-1.48)	-	-	-	-
D04 / D09	-	-	-	-	-1.03 (-0.17)	-13.28** (-2.14)	5.76*** (1.71)	-13.23** (-2.21)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.22 (0.17)	-1.87 (-1.33)	0.08 (0.06)	-3.79** (-2.52)
PTA_{no}	-	-	-	-	-	-	-	-	-0.87 (-1.16)	-0.83 (-0.69)	-1.05 (-1.56)	-0.97 (-0.89)
$lnDIST_{ij}$	-	-	-2.01** (-2.04)	-2.01** (-2.04)	-	-	-2.50*** (-1.87)	-2.50*** (-1.87)	-	-	-	0.77 (1.57)
Adjusted R^2	0.66	0.66	0.15	0.15	0.68	0.68	0.19	0.19	0.61	0.61	0.40	0.40
Observations	90	90	90	90	90	90	90	90	645	645	645	645
Cross-Sections	6	6	6	6	6	6	6	6	43	43	43	43

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA imported fruits and vegetable juices from the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **37 non-SADC countries** that were added under the import direction model: ARE, ARG, AUS, AUT, BEL, BRA, CAN, CHE, CHL, CHN, CZE, DEU, DNK, ESP, FRA, GBR, GRC, IDN, IND, IRL, ISL, ISR, ITA, JPN, KEN, LKA, MYS, NLD, NZL, PHL, POL, PRT, SAU, SGP, SWE, THA and USA

Appendix 5EH: Average actual, simulated and potential value of fruits and vegetable juices imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	9	2.22624	5	1.65396	5	1.60688	5	1.63042
		2005 - 2009	3	1.18537	6	1.71776	14	2.66880	9	2.19328
Mauritius	MUS	2000 - 2004	294	5.68352	804	6.68984	1,257	7.13676	1,006	6.91330
		2005 - 2009	1,064	6.96969	151	5.01676	1,877	7.53721	532	6.27699
Mozambique	MOZ	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	26	3.25125	177	5.17475	11,929	9.38671	1,452	7.28073
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	5	1.68473	7	1.91598	19	2.95378	11	2.43488
Zambia	ZMB	2000 - 2004	68	4.22564	37	3.60462	33	3.48130	35	3.54296
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Zimbabwe	ZWE	2000 - 2004	15,053	9.61933	18,146	9.80622	21,156	9.95968	19,593	9.88295
		2005 - 2009	536,572	13.19296	57	4.04710	46	3.83218	51	3.93964

Appendix 5EI: Selection of the estimator suitable for fruits and vegetable juices trade between South Africa and the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	1.39	OLS	*Yes*	96	3	2.85**	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Yearly Impact	90	8	1.46	OLS	*Yes*	96	7	3.01*	OLS	*No*
					FE or RE	*No*				FE or RE	*Yes*
	Trade Direction	630	5	5.64*	OLS	*No*	672	4	20.89*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	4	0.33	OLS-no auto	*Yes*	96	3	0.85	FE-no auto	*No*
		-	-	-	-	-	90	3	1.73**	FE-auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-
	Yearly Impact	90	8	0.48	OLS-no auto	*Yes*	96	7	0.75	FE-no auto	*No*
		-	-	-	-	-	90	7	1.84**	FE-auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-
	Trade Direction	630	5	0.21	FE-no auto	*Yes*	672	4	1.66	FE-no auto	*No*
		-	-	-	-	-	630	4	1.90**	FE-auto	*Yes*
		630	6	-0.69	RE-no auto	*Yes*	672	5	1.40	RE-no auto	*No*
		-	-	-	-	-	630	5	1.97**	RE-auto	*Yes*
Hausman Test Statistic	Period Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Yearly Impact	-	-	-	-	-	-	-	-	-	-
					-	-				-	-
	Trade Direction	N/A	5	286.49*	FE	*Yes*	N/A	4	39.13*	FE	*Yes*
					RE	*No*				RE	*No*

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EJ: Suitable equations for fruits and vegetable juices trade between South Africa and the SADC countries

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	OLS	OLS	FE	FE	OLS	OLS	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	2.08 (1.17)	2.08 (1.17)	-	-	2.07 (1.15)	2.07 (1.15)	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.75* (10.28)	0.75* (10.28)	-	-	0.75* (9.31)	0.75* (9.31)	-	-	0.22* (5.70)	0.22* (5.70)	-	-
$\ln GDPPC_{ijt}$	0.43 (1.44)	0.43 (1.44)	6.11* (3.90)	6.11* (3.90)	0.42 (1.33)	0.42 (1.33)	3.80*** (1.80)	3.80*** (1.80)	4.52* (3.84)	4.52* (3.84)	8.33* (6.30)	8.33* (6.30)
$REER_t$	-0.13 (-0.54)	-0.13 (-0.54)	-0.35 (-0.90)	-0.35 (-0.90)	-0.12 (-0.52)	-0.12 (-0.52)	-0.29 (-0.74)	-0.29 (-0.74)	-0.04 (-0.11)	-0.04 (-0.11)	-0.01 (-0.02)	-0.01 (-0.02)
D0004 / D0509	0.00 (0.01)	0.61* (4.81)	-0.01 (-0.06)	0.52 (1.64)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.08 (0.72)	0.76* (3.88)	-0.03 (-0.25)	0.53 (1.64)	-	-	-	-
D01 / D06	-	-	-	-	-0.05 (0.87)	0.35*** (1.67)	-0.02 (-0.09)	0.55 (1.30)	-	-	-	-
D02 / D07	-	-	-	-	0.67 (0.15)	0.66* (3.13)	0.79*** (1.84)	0.85*** (1.69)	-	-	-	-
D03 / D08	-	-	-	-	0.32 (0.32)	0.59* (2.65)	0.43 (1.53)	1.04*** (1.88)	-	-	-	-
D04 / D09	-	-	-	-	0.48 (0.09)	0.70* (2.96)	0.43 (1.66)	1.44* (2.73)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	0.33 (0.57)	0.62 (1.39)	0.03 (0.04)	0.12 (0.19)
PTA_{no}	-	-	-	-	-	-	-	-	0.57*** (1.73)	0.39 (1.52)	0.69** (2.39)	-0.01 (-0.02)
$\ln DIST_{ij}$	-0.21*** (-1.69)	-0.21*** (-1.69)	-	-	-0.20 (-1.58)	-0.20 (-1.58)	-	-	-	-	-	-
Adjusted R^2	0.91	0.91	0.99	0.99	0.91	0.91	0.98	0.98	0.68	0.68	0.87	0.87
Observations	90	90	90	90	90	90	90	90	630	630	630	630
Cross-Sections	6	6	6	6	6	6	6	6	42	42	42	42

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA traded (imports plus exports) fruits and vegetable juices with the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **36 non-SADC countries** that were added under the trade direction model: ARE, ARG, AUS, AUT, BEL, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FRA, GBR, GRC, IDN, IND, IRL, ISL, ISR, ITA, JPN, KEN, LKA, MYS, NLD, NZL, PHL, POL, PRT, SAU, SGP, SWE, THA and USA

Appendix 5EK: Average actual, simulated and potential value of fruits and vegetable juices trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	2,187,294	14.59818	9,133,807	16.02749	2,313,582	14.65431	4,596,935	15.34090
		2005 - 2009	2,043,085	14.52997	11,204,487	16.23182	5,031,380	15.43120	7,508,265	15.83151
Mauritius	MUS	2000 - 2004	3,303,426	15.01047	13,364,846	16.40814	3,202,823	14.97954	6,542,571	15.69384
		2005 - 2009	8,376,812	15.94098	26,365,567	17.08757	9,720,270	16.08972	16,008,761	16.58865
Mozambique	MOZ	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	13,749,504	16.43651	27,765,350	17.13930	9,084,311	16.02206	15,881,721	16.58068
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	6,567,164	15.69759	12,083,916	16.30739	4,134,550	15.23489	7,068,349	15.77114
Zambia	ZMB	2000 - 2004	1,399,899	14.15191	5,441,263	15.50952	1,427,914	14.17173	2,787,410	14.84062
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Zimbabwe	ZWE	2000 - 2004	712,053	13.47591	2,460,955	14.71606	681,233	13.43166	1,294,791	14.07386
		2005 - 2009	4,636,538	15.34948	10,648,991	16.18098	3,884,629	15.17254	6,431,747	15.67676

Appendix 5EL: Selection of the estimator suitable for wine exports from South Africa to the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	4.72*	OLS	***No***	96	4	18.78*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	9	4.23*	OLS	***No***	96	8	21.30*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Export Direction	1530	6	4.71*	OLS	***No***	1632	5	22.48*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	0.03	FE-no auto	***Yes***	96	4	1.20	FE-no auto	***No***
		-	-	-	-	-	90	4	1.97**	FE-auto	***Yes***
		90	6	-0.01	RE-no auto	***Yes***	96	5	1.16	RE-no auto	***No***
		-	-	-	-	-	90	5	1.95**	RE-auto	***Yes***
	Yearly Impact	90	9	-1.33	FE-no auto	***Yes***	96	8	1.17	FE-no auto	***No***
		-	-	-	-	-	90	8	1.89**	FE-auto	***Yes***
		90	10	-1.26	RE-no auto	***Yes***	96	9	1.13	RE-no auto	***No***
		-	-	-	-	-	90	9	1.88**	RE-auto	***Yes***
	Export Direction	1530	6	-0.36	FE-no auto	***Yes***	1632	5	1.44	FE-no auto	***No***
		-	-	-	-	-	1530	5	2.04**	FE-auto	***Yes***
		1530	7	-1.70	RE-no auto	***Yes***	1632	6	1.06	RE-no auto	***No***
		-	-	-	-	-	1530	6	2.13**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	12.60**	FE	***Yes***	N/A	4	0.42	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	10.93	FE	***No***	N/A	8	3.54	FE	***No***
					RE	***Yes***				RE	***Yes***
	Export Direction	N/A	6	626.39*	FE	***Yes***	N/A	5	7.08	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EM: Suitable equations for wine exports from South Africa to the SADC countries.

MODEL	Period Impact				Yearly Impact				Export Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	RE	RE	RE	RE	FE	FE	RE	RE
PERIOD VARIABLES	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009	1994 - 2009
Constant	-	-	-22.3*** (-1.71)	-22.3*** (-1.71)	-72.56* (-3.10)	-72.56* (-3.10)	-79.09* (-3.39)	-79.09* (-3.39)	-	-	-48.42** (-2.29)	-48.42** (-2.29)
lnY_{ijt-1}	0.38* (4.19)	0.38* (4.19)	-	-	0.55* (6.75)	0.55* (6.75)	-	-	0.30* (12.34)	0.30* (12.34)	-	-
$lnGDPPC_{it}$	1.38 (0.83)	1.38 (0.83)	4.29* (3.12)	4.29* (3.12)	9.72* (3.43)	9.72* (3.43)	11.31* (4.12)	11.31* (4.12)	3.62 (1.44)	3.62 (1.44)	9.92* (4.11)	9.92* (4.11)
$lnGDPPC_{jt}$	0.32*** (1.86)	0.32*** (1.86)	0.46* (2.68)	0.46* (2.68)	0.25** (2.55)	0.25** (2.55)	0.53* (3.25)	0.53* (3.25)	0.32 (1.17)	0.32 (1.17)	0.68* (3.43)	0.68* (3.43)
$REER_t$	-0.04 (-0.21)	-0.04 (-0.21)	0.19 (0.81)	0.19 (0.81)	0.50** (2.06)	0.50** (2.06)	0.51*** (1.97)	0.51*** (1.97)	-1.19* (-3.49)	-1.19* (-3.49)	-0.68 (-1.39)	-0.68 (-1.39)
D0004 / D0509	-0.16 (-1.08)	0.58*** (1.72)	-0.02 (-0.13)	0.33 (1.15)	-	-	-	-	-	-		-
D00 / D05	-	-	-	-	-0.15 (-0.94)	-0.44 (-0.97)	-0.25 (-1.50)	-0.52 (-1.30)	-	-	-	-
D01 / D06	-	-	-	-	-0.36*** (-1.70)	-1.49* (-2.64)	-0.54** (-2.04)	-1.12** (-2.10)	-	-	-	-
D02 / D07	-	-	-	-	-0.26 (-0.83)	-1.62** (-2.40)	-0.73*** (-1.70)	-1.41** (-2.17)	-	-	-	-
D03 / D08	-	-	-	-	-0.27 (-1.06)	-1.86** (-2.57)	-0.51 (-1.51)	-1.58** (-2.24)	-	-	-	-
D04 / D09	-	-	-	-	-0.60 (-1.65)	-1.44** (-2.19)	-1.02** (-2.33)	-1.13*** (-1.76)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-1.20*** (-1.84)	-0.20 (0.28)	-0.57 (-0.65)	-0.13 (-0.14)
PTA_{no}	-	-	-	-	-	-	-	-	-0.73** (-2.26)	1.05** (1.96)	-0.29 (-1.07)	0.23 (0.51)
$lnDIST_{ij}$	-	-	-0.55 (-0.64)	-0.29 (-0.34)	-0.37** (-2.04)	-0.37** (-2.04)	0.03 (0.03)	-0.45 (-0.54)	-	-	-2.74* (-4.22)	-2.74* (-4.22)
Adjusted R^2	0.88	0.88	0.80	0.80	0.84	0.84	0.78	0.78	0.74	0.74	0.32	0.32
Observations	90	90	90	90	90	90	90	90	1530	1530	1530	1530
Cross-Sections	6	6	6	6	6	6	6	6	102	102	102	102

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2004, SA exported wine to the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **96 non-SADC countries** that were added under the export direction model: AGO, ARE, ARG, ATG, AUS, AUT, BDI, BEL, BEN, BGR, BHR, BHS, BRA, CAN, CAF, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DEU, DNK, DRC, EGY, ESP, EST, ETH, FIN, FRA, GAB, GBR, GHA, GMB, GRC, GRD, HUN, IDN, IND, IRL, IRN, ISL, ISR, ITA, JAM, JPN, JOR, KEN, KOR, LBN, LKA, LUX, MAR, MDG, MDV, MLI, MLT, MEX, MYS, NER, NGA, NLD, NOR, NZL, OMN, PAN, PER, PHL, POL, PRT, PRY, ROM, RUS, RWA, SEN, SGP, SLE, STP, SWE, SYC, TGO, THA, TTO, TUN, TUR, UGA, UKR, URY, USA, VCT and VEN

Appendix 5EN: Average actual, simulated and potential value of wine exports from South Africa to SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	359,872	12.79350	474,781	13.07061	499,952	13.12227	487,204	13.09644
		2005 - 2009	1,047,039	13.86148	1,108,430	13.91845	1,119,887	13.92874	1,114,143	13.92360
Mauritius	MUS	2000 - 2004	1,848,108	14.42967	1,780,787	14.39257	1,767,012	14.38480	1,773,886	14.38868
		2005 - 2009	8,148,743	15.91337	7,322,097	15.80641	7,159,378	15.78393	7,240,281	15.79517
Mozambique	MOZ	2000 - 2004	2,972,795	14.90501	2,581,937	14.76405	2,504,573	14.73363	2,542,961	14.74884
		2005 - 2009	8,496,797	15.95520	10,527,850	16.16953	11,026,633	16.21582	10,774,356	16.19268
Tanzania	TZA	2000 - 2004	937,366	13.75083	562,352	13.23988	510,505	13.14316	535,802	13.19152
		2005 - 2009	6,097,274	15.62335	4,698,339	15.36272	4,456,214	15.30981	4,575,675	15.33626
Zambia	ZMB	2000 - 2004	652,700	13.38887	857,788	13.66211	905,108	13.71581	881,130	13.68896
		2005 - 2009	2,337,933	14.66478	2,262,981	14.63219	2,248,903	14.62595	2,255,931	14.62907
Zimbabwe	ZWE	2000 - 2004	1,100,538	13.91131	1,264,250	14.04999	1,300,389	14.07817	1,282,192	14.06408
		2005 - 2009	3,339,469	15.02132	3,798,792	15.15019	3,897,793	15.17592	3,847,974	15.16306

Appendix 5EO: Selection of the estimator suitable for wine imports from the SADC countries to South Africa.

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	5	2.55**	OLS	***No***	96	4	8.40*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	9	6.28*	OLS	***No***	96	8	8.63*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Import Direction	675	6	6.95*	OLS	***No***	720	5	32.01*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	5	-0.17	FE-no auto	***Yes***	96	4	2.23**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	6	-3.96*	RE-no auto	***No***	96	5	0.92	RE-no auto	***No***
		84	6	-1.50	RE-auto	***Yes***	90	5	2.49**	RE-auto	***Yes***
	Yearly Impact	90	9	0.26	FE-no auto	***Yes***	96	8	2.20**	FE-no auto	***Yes***
		-	-	-	-	-	-	-	-	-	-
		90	10	-3.91*	RE-no auto	***No***	96	9	0.95	RE-no auto	***No***
		84	10	-1.42	RE-auto	***Yes***	90	9	2.51**	RE-auto	***Yes***
	Import Direction	675	6	-0.06	FE-no auto	***Yes***	720	5	1.76	FE-no auto	***No***
		-	-	-	-	-	675	5	1.99**	FE-auto	***Yes***
		675	7	-1.81***	RE-no auto	***No***	720	6	1.21	RE-no auto	***No***
		630	7	-0.69	RE-auto	***Yes***	675	6	2.06**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	5	84.18*	FE	***Yes***	N/A	4	2.96	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	9	71.72*	FE	***Yes***	N/A	8	1.34	FE	***No***
					RE	***No***				RE	***Yes***
	Import Direction	N/A	6	395.21*	FE	***Yes***	N/A	5	-3.40	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EP: Suitable equations for wine imports from SADC countries to South Africa

MODEL	Period Impact				Yearly Impact				Import Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-185.7*** (-1.69)	-185.7*** (-1.69)	-	-	-114.92 (-0.55)	-114.92 (-0.55)	-	-	-33.92 (-1.00)	-33.92 (-1.00)
$\ln Y_{ijt-1}$	-0.14 (-1.19)	-0.14 (-1.19)	-	-	-0.14 (-1.17)	-0.14 (-1.17)	-	-	0.16* (3.98)	0.16* (3.98)	-	-
$\ln GDPPC_{it}$	28.54** (2.15)	28.54** (2.15)	21.58*** (1.66)	21.58*** (1.66)	12.50 (0.49)	12.50 (0.49)	13.87 (0.55)	13.87 (0.55)	4.73* (5.40)	4.73* (5.40)	3.41 (0.86)	3.41 (0.86)
$\ln GDPPC_{jt}$	1.87 (1.55)	1.87 (1.55)	-0.26 (-0.31)	-0.26 (-0.31)	1.66 (1.37)	1.66 (1.37)	0.03 (0.03)	0.03 (0.03)	1.35** (2.32)	1.35** (2.32)	1.17* (3.70)	1.17* (3.70)
$REER_t$	5.21* (2.81)	5.21* (2.81)	3.50 (1.47)	3.50 (1.47)	4.14*** (1.86)	4.14*** (1.86)	3.04 (1.22)	3.04 (1.22)	-	-	1.47** (2.04)	1.47** (2.04)
D0004 / D0509	-0.49 (-0.29)	-5.07*** (-1.76)	-0.41 (-0.26)	-4.06 (-1.56)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	-1.21 (-0.72)	-3.48 (-0.85)	-0.83 (-0.43)	-3.74 (-1.04)	-	-	-	-
D01 / D06	-	-	-	-	2.88 (1.31)	-1.50 (-0.29)	1.83 (0.61)	-0.76 (-0.16)	-	-	-	-
D02 / D07	-	-	-	-	3.29 (1.04)	-1.05 (-0.17)	1.56 (0.33)	-2.31 (-0.39)	-	-	-	-
D03 / D08	-	-	-	-	2.50 (0.93)	-1.86 (-0.28)	1.88 (0.50)	-3.27 (-0.51)	-	-	-	-
D04 / D09	-	-	-	-	-0.87 (-0.23)	-0.32 (-0.05)	-0.49 (-0.10)	-2.24 (-0.38)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-2.31* (-2.60)	0.53 (0.70)	-2.02** (-2.23)	-0.47 (-0.46)
PTA_{no}	-	-	-	-	-	-	-	-	-1.45* (-2.83)	0.93** (2.07)	-1.51* (-3.10)	-0.04 (-0.05)
$\ln DIST_{ij}$	-	-	0.40 (0.22)	0.40 (0.22)	-	-	-0.77 (-0.34)	-0.77 (-0.34)	-	-	-0.62 (-1.04)	-0.62 (-1.04)
Adjusted R^2	0.36	0.36	0.58	0.58	0.34	0.34	0.58	0.58	0.81	0.81	0.09	0.09
Observations	90	90	90	90	90	90	90	90	675	675	675	675
Cross-Sections	6	6	6	6	6	6	6	6	45	45	45	45

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported wine from the following 6 **SADC countries**: : MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **39 non-SADC countries** that were added under the import direction model: ARE, ARG, AUS, AUT, BEL, BGR, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FIN, FRA, GBR, GRC, HUN, IRL, ISL, ISR, ITA, JPN, KEN, LUX, NLD, NZL, POL, PRI, PRT, ROM, RUS, SGP, SWE, THA, TUR, URY and USA

Appendix 5EQ: Average actual, simulated and potential value of wine imports from the SADC countries to South Africa for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	3	1.06895	41	3.71532	67	4.19750	52	3.95641
		2005 - 2009	221	5.39921	148	4.99436	47	3.84358	83	4.41897
Mauritius	MUS	2000 - 2004	20	2.99060	12	2.49939	8	2.04748	10	2.27343
		2005 - 2009	195	5.27081	81	4.39943	27	3.30879	47	3.85411
Mozambique	MOZ	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	10	2.34148	75	4.32368	50	3.90840	61	4.11604
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	24	3.16617	144	4.96999	84	4.42722	110	4.69861
Zambia	ZMB	2000 - 2004	5	1.59174	31	3.42282	35	3.56553	33	3.49417
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Zimbabwe	ZWE	2000 - 2004	416	6.03096	32	3.47191	8	2.03587	16	2.75389
		2005 - 2009	26	3.26204	95	4.55119	51	3.93995	70	4.24557

Appendix 5ER: Selection of the estimator suitable for wine trade between South Africa and the SADC countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	90	4	5.56*	OLS	***No***	96	3	24.46*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	90	8	5.03*	OLS	***No***	96	7	27.53*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Trade Direction	660	5	3.82*	OLS	***No***	704	4	41.27*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	90	4	0.15	FE-no auto	***Yes***	96	3	1.15	FE-no auto	***No***
		-	-	-	-	-	90	3	1.99**	FE-auto	***Yes***
		90	5	-0.06	RE-no auto	***Yes***	96	4	1.02	RE-no auto	***No***
		-	-	-	-	-	90	4	2.05**	RE-auto	***Yes***
	Yearly Impact	90	8	-1.56	FE-no auto	***Yes***	96	7	1.18	FE-no auto	***No***
		-	-	-	-	-	90	7	2.05**	FE-auto	***Yes***
		90	9	-1.56	RE-no auto	***Yes***	96	8	1.02	RE-no auto	***No***
		-	-	-	-	-	90	8	2.11**	RE-auto	***Yes***
	Trade Direction	660	5	1.12	FE-no auto	***Yes***	704	4	1.11	FE-no auto	***No***
		-	-	-	-	-	660	4	1.71	FE-auto	***No***
		660	6	0.68	RE-no auto	***Yes***	704	5	0.97	RE-no auto	***No***
		-	-	-	-	-	660	5	1.68	RE-auto	***No***
Hausman Test Statistic	Period Impact	N/A	4	31.08*	FE	***Yes***	N/A	3	6.22	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	23.62*	FE	***Yes***	N/A	7	-46.72*	FE	***Yes***
					RE	***No***				RE	***No***
	Trade Direction	N/A	5	146.61*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5ES: Suitable equations for wine trade between South Africa and the SADC countries.

MODEL	Period Impact				Yearly Impact				Trade Direction			
	Dynamic		Static		Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	FE	FE	FE	FE	-	-
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-7.65 (-0.93)	-7.65 (-0.93)	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.36* (3.77)	0.36* (3.77)	-	-	0.47* (5.05)	0.47* (5.05)	-	-	0.49* (15.06)	0.49* (15.06)	-	-
$\ln GDPPC_{ijt}$	2.78** (2.11)	2.78** (2.11)	4.03* (3.74)	4.03* (3.74)	3.85* (2.88)	3.85* (2.88)	6.67* (5.64)	6.67* (5.64)	4.00* (5.35)	4.00* (5.35)	-	-
$REER_t$	0.09 (0.38)	0.09 (0.38)	0.21 (0.70)	0.21 (0.70)	0.15 (0.73)	0.15 (0.73)	0.50** (2.11)	0.50** (2.11)	0.40*** (1.69)	0.40*** (1.69)	-	-
D0004 / D0509	0.12 (0.88)	0.37 (1.50)	0.13 (0.96)	0.46** (1.96)	-	-	-	-	-	-	-	-
D00 / D05	-	-	-	-	0.15 (1.04)	0.60** (2.51)	0.20 (1.36)	0.19 (0.91)	-	-	-	-
D01 / D06	-	-	-	-	-0.17 (-0.90)	-0.22 (-0.82)	-0.13 (-0.63)	-0.17 (-0.69)	-	-	-	-
D02 / D07	-	-	-	-	-0.07 (-0.26)	-0.07 (-0.22)	0.07 (0.25)	-0.25 (-0.84)	-	-	-	-
D03 / D08	-	-	-	-	0.03 (0.17)	-0.17 (-0.52)	0.08 (0.41)	-0.33 (-1.04)	-	-	-	-
D04 / D09	-	-	-	-	0.07 (0.42)	-0.03 (-0.10)	0.16 (0.86)	-0.14 (-0.47)	-	-	-	-
PTA_{yes}	-	-	-	-	-	-	-	-	-0.15 (-0.32)	-0.04 (-0.13)	-	-
PTA_{no}	-	-	-	-	-	-	-	-	-0.47*** (-1.85)	0.39** (2.22)	-	-
$\ln DIST_{ij}$	-	-	-1.77*** (-1.91)	-1.77*** (-1.91)	-	-	-	-	-	-	-	-
Adjusted R^2	0.88	0.88	0.74	0.74	0.90	0.90	0.99	0.99	0.87	0.87	-	-
Observations	75	75	75	75	75	75	75	75	660	660	-	-
Cross-Sections	5	5	5	5	5	5	5	5	44	44	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded wine (imports plus exports) with the following **6 SADC countries**: MOZ, MUS, MWI, TZA, ZMB and ZWE as well as to the following **38 non-SADC countries** that were added under the trade direction model: ARE, ARG, AUS, AUT, BEL, BGR, BRA, CAN, CHE, CHL, CHN, DEU, DNK, ESP, FIN, FRA, GBR, GRC, HUN, IRL, ISL, ISR, ITA, JPN, KEN, LUX, NLD, NZL, POL, PRT, ROM, RUS, SGP, SWE, THA, TUR, URY and USA

Appendix 5ET: Average actual, simulated and potential value of wine trade between South Africa and the SADC countries for the periods 2000–2004 and 2005–2009 in dollars (US$) and natural logarithms (Logs)

Country Name	Country Code	Period	Actual		Simulated		Adjusted		Potential	
			Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)	Value (US$)	Value (Logs)
Malawi	MWI	2000 - 2004	359,918	12.79363	282,517	12.55150	262,784	12.47909	272,472	12.51529
		2005 - 2009	1,047,786	13.86219	1,147,627	13.95321	1,171,215	13.97355	1,159,361	13.96338
Mauritius	MUS	2000 - 2004	1,849,108	14.43021	1,866,674	14.43967	1,873,042	14.44307	1,869,855	14.44137
		2005 - 2009	8,154,548	15.91409	7,336,922	15.80843	7,137,364	15.78085	7,236,455	15.79464
Mozambique	MOZ	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	8,497,060	15.95523	10,273,520	16.14508	10,809,868	16.19597	10,538,282	16.17053
Tanzania	TZA	2000 - 2004	0	0.00000	0	0.00000	0	0.00000	0	0.00000
		2005 - 2009	6,097,486	15.62339	4,608,899	15.34350	4,295,754	15.27314	4,449,572	15.30832
Zambia	ZMB	2000 - 2004	652,729	13.38892	697,631	13.45545	713,003	13.47724	705,275	13.46634
		2005 - 2009	0	0.00000	0	0.00000	0	0.00000	0	0.00000
Zimbabwe	ZWE	2000 - 2004	1,101,089	13.91181	1,300,115	14.07796	1,377,518	14.13579	1,338,257	14.10688
		2005 - 2009	3,341,342	15.02188	3,710,059	15.12656	3,807,220	15.15241	3,758,326	15.13948

Appendix 5EU: Selection of the Estimator suitable for agricultural exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1470	4	5.38*	OLS	***No***	1568	3	31.96*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	1470	8	5.41*	OLS	***No***	1568	7	32.37*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	1470	4	-0.25	FE-no auto		1568	3	1.31	FE-no auto	***No***
		-	-	-	-	-	1470	3	1.85	FE-auto	***No***
		1470	5	-0.55	RE-no auto		1568	4	1.18	RE-no auto	***No***
		-	-	-	-	-	1470	4	1.78	RE-auto	***No***
	Yearly Impact	1470	8	-0.31	FE-no auto		1568	7	1.31	FE-no auto	***No***
		-	-	-	-	-	1470	7	1.87	FE-auto	***No***
		1470	9	-0.60	RE-no auto		1568	8	1.18	RE-no auto	***No***
		-	-	-	-	-	1470	8	1.80	RE-auto	***No***
Hausman Test Statistic	Period Impact	N/A	4	390.56*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-
	Yearly Impact	N/A	8	389.54*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EV: Suitable equations for agricultural exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	-	-	FE	FE	-	-
PERIOD / **VARIABLES**	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
lnY_{ijt-1}	0.38* (17.65)	0.38* (17.65)	-	-	0.38* (17.69)	0.38* (17.69)	-	-
$lnGDPPC_{it}$	2.20 (1.64)	2.20 (1.64)	-	-	9.85* (3.77)	9.85* (3.77)	-	-
$lnGDPPC_{jt}$	0.02 (0.12)	0.02 (0.12)	-	-	0.02 (0.15)	0.02 (0.15)	-	-
$REER_t$	-0.59* (-3.25)	-0.59* (-3.25)	-	-	-0.12 (-0.53)	-0.12 (-0.53)	-	-
D0004 / D0509	-0.48** (-2.54)	0.59** (2.05)	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.80* (-3.64)	-0.29 (-0.69)	-	-
D01 / D06	-	-	-	-	-0.85* (-2.93)	-1.07** (-2.07)	-	-
D02 / D07	-	-	-	-	-1.49* (-3.46)	-1.30** (-2.10)	-	-
D03 / D08	-	-	-	-	-0.81** (-2.29)	-1.32** (-1.99)	-	-
D04 / D09	-	-	-	-	-1.28* (-2.58)	-1.18** (-1.95)	-	-
$lnDIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.82	0.82	-	-	0.82	0.82	-	-
Observations	1470	1470	-	-	1470	1470	-	-
Cross-Sections	98	98	-	-	98	98	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported agricultural products to the following **98 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAF, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GAB, GHA, GIN, GMB, GNQ, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDA, MDG, MDV, MEX, MLI, MLT, MRT, MYS, NER, NGA, NOR, NZL, OMN, PAK, PAN, PER, PHL, PNG, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, URY, USA, VCT, VEN, VNM and YEM

Appendix 5EW: Selection of the estimator suitable for agricultural imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1590	4	5.72*	OLS	***No***	1696	3	28.95*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	1590	8	5.82*	OLS	***No***	1696	7	29.25*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1590	4	0.12	FE-no auto	***Yes***	1696	3	1.60	FE-no auto	***No***
		-	-	-	-	-	1590	3	1.94**	FE-auto	***Yes***
		1590	5	-1.55	RE-no auto	***Yes***	1696	4	1.13	RE-no auto	***No***
		-	-	-	-	-	1590	4	2.09**	RE-auto	***Yes***
	Yearly Impact	1590	8	0.13	FE-no auto	***Yes***	1696	7	1.60	FE-no auto	***No***
		-	-	-	-	-	1590	7	1.94**	FE-auto	***Yes***
		1590	9	-1.54	RE-no auto	***Yes***	1696	8	1.14	RE-no auto	***No***
		-	-	-	-	-	1590	8	2.09**	RE-auto	***Yes***
Hausman Test · Statistic	Period Impact	N/A	4	841.79*	FE	***Yes***	N/A	3	-0.01	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	855.33*	FE	***Yes***	N/A	7	0.19	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EX: Suitable equations for agricultural imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
VARIABLES								
Constant	-	-	-30.90 (-1.43)	-30.90 (-1.43)	-	-	-141.84* (-3.35)	-141.84* (-3.35)
$\ln Y_{ijt-1}$	0.23* (9.48)	0.23* (9.48)	-	-	0.22* (9.32)	0.22* (9.32)	-	-
$\ln GDPPC_{it}$	5.73** (2.14)	5.73** (2.14)	6.20** (2.49)	6.20** (2.49)	19.54* (3.71)	19.54* (3.71)	19.85* (3.88)	19.85* (3.88)
$\ln GDPPC_{jt}$	0.81* (2.69)	0.81* (2.69)	0.81* (4.39)	0.81* (4.39)	0.81* (2.69)	0.81* (2.69)	0.83* (4.59)	0.83* (4.59)
$REER_t$	-0.37 (-1.00)	-0.37 (-1.00)	-0.48 (-0.98)	-0.48 (-0.98)	0.45 (1.00)	0.45 (1.00)	-0.03 (-0.07)	-0.03 (-0.07)
D0004 / D0509	0.32 (0.94)	-0.31 (-0.53)	0.10 (0.33)	-0.10 (-0.20)	-	-	-	-
D00 / D05	-	-	-	-	0.29 (0.74)	-2.02** (-2.42)	-0.22 (-0.63)	-1.70** (-2.42)
D01 / D06	-	-	-	-	0.24 (0.45)	-3.16* (-3.03)	-0.40 (-0.76)	-2.74* (-2.87)
D02 / D07	-	-	-	-	0.23 (0.30)	-3.62* (-2.89)	-0.95 (-1.18)	-3.38* (-2.86)
D03 / D08	-	-	-	-	0.62 (0.98)	-4.04* (-3.01)	-0.21 (-0.32)	-3.77* (-2.92)
D04 / D09	-	-	-	-	0.42 (0.47)	-3.27* (-2.68)	-0.52 (-0.60)	-2.95** (-2.50)
$\ln DIST_{ij}$	-	-	-1.40** (-2.23)	-1.40** (-2.23)	-	-	-1.43** (-2.29)	-1.43** (-2.29)
Adjusted R^2	0.72	0.72	0.35	0.35	0.72	0.72	0.37	0.37
Observations	1590	1590	1590	1590	1590	1590	1590	1590
Cross-Sections	106	106	106	106	106	106	106	106

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported agricultural products from the following **106 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ALB, ARE, ARG, ATG, AUS, BDI, BEN, BGD, BGR, BHR, BHS, BOL, BRA, BTN, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DMA, DOM, DRC, ECU, EGY, EST, ETH, GHA, GIN, GMB, GRD, GTM, GUY, HRV, HTI, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KGZ, KOR, KWT, LAO, LBN, LKA, MAR, MDG, MEX, MLI, MRT, MYS, NER, NGA, NIC, NOR, NPL, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, SLV, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, UKR, URY, USA, VCT, VEN and VNM

Appendix 5EY: Selection of the estimator suitable for agricultural trade between South Africa and the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1320	4	121.60*	OLS	***No***	1408	3	50.50*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	1320	8	119.27*	OLS	***No***	1408	7	50.66*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1320	4	0.56	FE-no auto	***Yes***	1408	3	1.35	FE-no auto	***No***
		-	-	-	-	-	1320	3	1.99**	FE-auto	***Yes***
		1320	5	0.12	RE-no auto	***Yes***	1408	4	1.28	RE-no auto	***No***
		-	-	-	-	-	1320	4	1.98**	RE-auto	***Yes***
	Yearly Impact	1320	8	0.50	FE-no auto	***Yes***	1408	7	1.34	FE-no auto	***No***
		-	-	-	-	-	1320	7	1.98**	FE-auto	***Yes***
		1320	9	0.04	RE-no auto	***Yes***	1408	8	1.27	RE-no auto	***No***
		-	-	-	-	-	1320	8	1.97**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	414.84*	FE	***Yes***	N/A	3	-1.36	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	398.92*	FE	***Yes***	N/A	7	-2.12	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5EZ: Suitable equations for agricultural trade between South Africa and the ROW countries

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	22.20* (4.06)	22.20* (4.06)			21.89* (4.03)	21.89* (4.03)
$\ln Y_{ijt-1}$	0.36* (16.73)	0.36* (16.73)	-	-	0.37* (16.76)	0.37* (16.76)	-	-
$\ln GDPPC_{ijt}$	0.45* (3.05)	0.45* (3.05)	0.62* (3.47)	0.62* (3.47)	0.46* (3.09)	0.46* (3.09)	0.58* (3.22)	0.58* (3.22)
$REER_t$	-0.54* (-4.33)	-0.54* (-4.33)	-1.49* (-7.38)	-1.49* (-7.38)	-0.52* (-4.15)	-0.52* (-4.15)	-1.36* (-6.48)	-1.36* (-6.48)
D0004 / D0509	0.25** (2.09)	0.95* (14.17)	0.29* (2.85)	1.42* (15.18)			-	-
D00 / D05	-		-	-	0.09 (0.63)	1.10* (10.38)	-0.14 (-1.00)	1.24* (10.78)
D01 / D06		-	-	-	0.13 (0.70)	0.78* (7.04)	-0.47** (-2.24)	1.31* (10.14)
D02 / D07			-	-	0.30 (1.18)	0.82* (7.35)	-0.93* (-2.95)	1.45* (10.64)
D03 / D08			-	-	0.47** (2.53)	1.04* (9.25)	-0.08 (-0.35)	1.63* (11.53)
D04 / D09			-	-	0.55* (3.36)	1.00* (8.75)	0.31 (1.45)	1.79* (12.00)
$\ln DIST_{ij}$			-0.74 (-1.22)	-0.74 (-1.22)			-0.75 (-1.24)	-0.75 (-1.24)
Adjusted R^2	0.86	0.86	0.42	0.42	0.86	0.86	0.42	0.42
Observations	1320	1320	1320	1320	1320	1320	1320	1320
Cross-Sections	88	88	88	88	88	88	88	88

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded agricultural products (imports plus exports) with the following **88 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GHA, GIN, GMB, HUN, IDN, IND, IRN, ISL, ISR, JAM, JOR, JPN, KEN, KOR, KWT, LBN, LKA, MAR, MDG, MEX, MLI, MRT, MYS, NER, NGA, NOR, NZL, OMN, PAK, PAN, PER, PHL, POL, PRI, PRY, ROM, RUS, RWA, SAU, SDN, SEN, SGP, SLE, STP, SUR, SVK, SVN, SYC, SYR, TCD, TGO, THA, TTO, TUN, TUR, UGA, URY, USA, VCT, VEN and VNM.

Appendix 5FA: Selection of the estimator suitable for cheese exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	300	4	2.46**	OLS	***No***	320	3	10.71*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	300	8	2.50**	OLS	***No***	320	7	10.84*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	300	4	-0.14	FE-no auto	***Yes***	320	3	1.26	FE-no auto	***No***
		-	-	-	-	-	300	3	1.92**	FE-auto	***Yes***
		300	5	-1.47	RE-no auto	***Yes***	320	4	0.78	RE-no auto	***No***
		-	-	-	-	-	300	4	2.08**	RE-auto	***Yes***
	Yearly Impact	300	8	-0.11	FE-no auto	***Yes***	320	7	1.26	FE-no auto	***No***
		-	-	-	-	-	300	7	1.94**	FE-auto	***Yes***
		300	9	-1.47	RE-no auto	***Yes***	320	8	0.78	RE-no auto	***No***
		-	-	-	-	-	300	8	2.09**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	91.63*	FE	***Yes***	N/A	3	7.88***	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	92.12*	FE	***Yes***	N/A	7	6.49	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FB: Suitable equations for cheese exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE
PERIOD / **VARIABLES**	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	99.00 (0.85)	99.00 (0.85)
$\ln Y_{ijt-1}$	0.41* (7.28)	0.41* (7.28)	-	-	0.40* (7.18)	0.40* (7.18)	-	-
$\ln GDPPC_{it}$	-15.63** (-2.23)	-15.63** (-2.23)	-12.38*** (-1.91)	-12.38*** (-1.91)	-12.38 (-0.91)	-12.38 (-0.91)	-9.64 (-0.68)	-9.64 (-0.68)
$\ln GDPPC_{jt}$	2.63 (1.62)	2.63 (1.62)	3.29 (1.19)	3.29 (1.19)	2.75*** (1.69)	2.75*** (1.69)	-0.95* (-3.03)	-0.95* (-3.03)
$REER_t$	-3.27* (-3.38)	-3.27* (-3.38)	-3.56* (-3.00)	-3.56* (-3.00)	-3.10* (-2.61)	-3.10* (-2.61)	-3.29** (-2.24)	-3.29** (-2.24)
D0004 / D0509	-1.12 (-1.14)	3.41** (2.28)	-0.60 (-0.81)	2.86** (2.27)	-	-	-	-
D00 / D05	-	-	-	-	-1.34 (-1.32)	2.81 (1.29)	-0.49 (-0.50)	2.70 (1.43)
D01 / D06	-	-	-	-	-0.84 (-0.64)	3.27 (1.21)	0.16 (0.10)	3.37 (1.30)
D02 / D07	-	-	-	-	-1.64 (-0.84)	2.64 (0.82)	0.34 (0.14)	3.11 (0.97)
D03 / D08	-	-	-	-	-1.52 (-0.94)	2.67 (0.77)	0.35 (0.18)	2.84 (0.80)
D04 / D09	-	-	-	-	-1.92 (-0.84)	2.15 (0.68)	-0.13 (-0.05)	2.17 (0.67)
$\ln DIST_{ij}$	-	-	-	-	-	-	0.78 (0.65)	0.78 (0.65)
Adjusted R^2	0.59	0.59	0.27	0.27	0.59	0.59	0.21	0.21
Observations	300	300	300	300	300	300	300	300
Cross-Sections	20	20	20	20	20	20	20	20

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported cheese to the following **20 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, BDI, CHE, CIV, CMR, COG, COM, DRC, ETH, GAB, GHA, JPN, KEN, MDG, MDV, NGA, SYC, UGA and USA

Appendix 5FC: Selection of the estimator suitable for cheese imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	135	4	3.78*	OLS	***No***	144	3	15.20*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	135	8	3.84*	OLS	***No***	144	7	15.90*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	135	4	0.01	FE-no auto	***Yes***	144	3	1.35	FE-no auto	***No***
		-	-	-	-	-	135	3	2.07**	FE-auto	***Yes***
		135	5	-0.98	RE-no auto	***Yes***	144	4	0.56	RE-no auto	***No***
		-	-	-	-	-	135	4	2.16**	RE-auto	***Yes***
	Yearly Impact	135	8	-0.54	FE-no auto	***Yes***	144	7	1.39	FE-no auto	***No***
		-	-	-	-	-	135	7	2.11**	FE-auto	***Yes***
		135	9	-1.38	RE-no auto	***Yes***	144	8	0.59	RE-no auto	***No***
		-	-	-	-	-	135	8	2.17**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	62.60*	FE	***Yes***	N/A	3	0.94	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	62.61*	FE	***Yes***	N/A	7	0.89	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1[st] order autocorrelation problem respectively.

Appendix 5FD: Suitable equations for cheese imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-205.02 (-1.43)	-205.02 (-1.43)	-	-	-210.64 (-0.81)	-210.64 (-0.81)
$\ln Y_{ijt-1}$	0.31* (3.83)	0.31* (3.83)	-	-	0.33* (4.07)	0.33* (4.07)	-	-
$\ln GDPPC_{it}$	20.75 (1.47)	20.75 (1.47)	19.38 (1.30)	19.38 (1.30)	48.33*** (1.78)	48.33*** (1.78)	13.13 (0.42)	13.13 (0.42)
$\ln GDPPC_{jt}$	-1.32 (-0.37)	-1.32 (-0.37)	2.79* (3.33)	2.79* (3.33)	-1.79 (-0.51)	-1.79 (-0.51)	2.39** (2.49)	2.39** (2.49)
$REER_t$	4.08** (2.07)	4.08** (2.07)	8.21* (2.58)	8.21* (2.58)	5.49** (2.35)	5.49** (2.35)	7.73** (2.37)	7.73** (2.37)
D0004 / D0509	-1.01 (-0.57)	-4.24 (-1.41)	-0.71 (-0.45)	-5.16*** (-1.94)			-	-
D00 / D05			-	-	-2.84 (-1.46)	-8.10*** (-1.90)	-3.83** (-2.04)	-3.82 (-0.96)
D01 / D06			-	-	-4.17 (-1.60)	-8.35 (-1.57)	-5.80** (-2.14)	-3.42 (-0.62)
D02 / D07			-	-	-6.72*** (-1.72)	-9.26 (-1.45)	-10.41** (-2.46)	-2.36 (-0.34)
D03 / D08			-	-	-2.00 (-0.63)	-11.36 (-1.65)	-4.26 (-1.28)	-3.22 (-0.42)
D04 / D09			-	-	-8.64** (-2.04)	-12.97** (-2.08)	-7.80*** (-1.72)	-6.21 (-0.90)
$\ln DIST_{ij}$			-0.56 (-0.07)	-0.56 (-0.07)			6.24 (0.76)	6.24 (0.76)
Adjusted R^2	0.60	0.60	0.17	0.17	0.61	0.61	0.11	0.11
Observations	135	135	135	135	135	135	135	135
Cross-Sections	9	9	9	9	9	9	9	9

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported cheese from the following **9 ROW countries (i.e. non-EU and non-SADC countries)**: ARG, AUS, BGR, CAN, CHE, NZL, NOR, POL and USA

Appendix 5FE: Selection of the estimator suitable for cut flowers exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	540	4	2.62**	OLS	***No***	576	3	18.63*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	540	8	2.69*	OLS	***No***	576	7	18.97*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*).	Period Impact	540	4	0.09	FE-no auto	***Yes***	576	3	1.07	FE-no auto	***No***
		-	-	-	-	-	540	3	1.83	FE-auto	***No***
		540	5	-0.84	RE-no auto	***Yes***	576	4	0.84	RE-no auto	***No***
		-	-	-	-	-	540	4	1.91**	RE-auto	***Yes***
	Yearly Impact	540	8	0.11	FE-no auto	***Yes***	576	7	1.09	FE-no auto	***No***
		-	-	-	-	-	540	7	1.84	FE-auto	**?**
		540	9	-0.81	RE-no auto	***Yes***	576	8	0.85	RE-no auto	***No***
		-	-	-	-	-	540	8	1.92**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	126.77*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-
	Yearly Impact	N/A	8	129.36*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5FF: Suitable equations for cut flowers exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-6.90 (-0.23)	-6.90 (-0.23)	-	-	-69.34 (-1.21)	-69.34 (-1.21)
$\ln Y_{ijt-1}$	0.51* (13.86)	0.51* (13.86)	-	-	0.50* (13.72)	0.50* (13.72)	-	-
$\ln GDPPC_{it}$	-7.18** (-1.99)	-7.18** (-1.99)	1.67 (0.50)	1.67 (0.50)	-2.01 (-0.29)	-2.01 (-0.29)	9.51 (1.37)	9.51 (1.37)
$\ln GDPPC_{jt}$	0.72 (0.88)	0.72 (0.88)	1.15* (3.82)	1.15* (3.82)	0.78 (0.95)	0.78 (0.95)	1.12* (3.83)	1.12* (3.83)
$REER_t$	-1.09** (-2.20)	-1.09** (-2.20)	-1.30*** (-1.90)	-1.30*** (-1.90)	-0.83 (-1.38)	-0.83 (-1.38)	-1.29*** (-1.84)	-1.29*** (-1.84)
D0004 / D0509	-1.14* (-2.70)	1.96* (2.59)	-0.44 (-1.13)	0.99 (1.56)	-	-	-	-
D00 / D05	-	-	-	-	-1.36* (-2.66)	1.24 (1.13)	-0.99** (-2.28)	0.22 (0.24)
D01 / D06	-	-	-	-	-2.38* (-3.49)	1.14 (0.83)	-2.10* (-3.24)	0.02 (0.02)
D02 / D07	-	-	-	-	-2.58** (-2.51)	1.10 (0.67)	-2.51** (-2.50)	-0.36 (-0.23)
D03 / D08	-	-	-	-	-1.97** (-2.39)	0.55 (0.31)	-1.43*** (-1.76)	-1.13 (-0.65)
D04 / D09	-	-	-	-	-2.34** (-2.02)	0.30 (0.19)	-1.75*** -1.64	-1.32 (-0.83)
$\ln DIST_{ij}$	-	-	-0.11 (-0.12)	-0.11 (-0.12)	-	-	-0.11 (-0.12)	-0.11 (-0.12)
Adjusted R^2	0.75	0.75	0.41	0.41	0.75	0.75	0.43	0.43
Observations	540	540	540	540	540	540	540	540
Cross-Sections	36	36	36	36	36	36	36	36

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported cut flowers to the following **36 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG, AUS, BGR, BHR, CAN, CHE, CHN, CIV, COG, CZE, DRC, EGY, GAB, GHA, HUN, IND, JOR, JPN, KEN, KOR, KWT, LBN, MYS, NGA, OMN, PAK, POL, RUS, SAU, SGP, SYC, TUR, UGA and USA

Appendix 5FG: Selection of the estimator suitable for cut flowers imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	195	4	4.13*	OLS	***No***	208	3	10.44*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	195	8	3.90*	OLS	***No***	208	7	10.74*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	195	4	-0.06	FE-no auto	***Yes***	208	3	1.75	FE-no auto	**?**
		-	-	-	-	-	195	3	1.96	FE-auto	***Yes***
		195	5	-1.70***	RE-no auto	***No***	208	4	1.05	RE-no auto	***No***
		182	5	-0.70	RE-auto	***Yes***	195	4	2.15**	RE-auto	***Yes***
	Yearly Impact	195	8	0.00	FE-no auto	***Yes***	208	7	1.69	FE-no auto	***No***
		-	-	-	-	-	195	7	1.97**	FE-auto	***Yes***
		195	9	-1.71***	RE-no auto	***No***	208	8	1.03	RE-no auto	***No***
		182	9	-0.98	RE-auto	***Yes***	195	8	2.14**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	110.86*	FE	***Yes***	N/A	3	2.10	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	74.35*	FE	***Yes***	N/A	7	1.86	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5FH: Suitable equations for cut flowers imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / **VARIABLES**	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	30.05 (0.35)	30.05 (0.35)	-	-	-344.51** (-2.03)	-344.51** (-2.03)
$\ln Y_{ijt-1}$	0.19** (2.23)	0.19** (2.23)	-	-	0.22* (2.61)	0.22* (2.61)	-	-
$\ln GDPPC_{it}$	-11.68 (-1.00)	-11.68 (-1.00)	-1.85 (-0.18)	-1.85 (-0.18)	21.24 (0.97)	21.24 (0.97)	43.83** (2.12)	43.83** (2.12)
$\ln GDPPC_{jt}$	4.04*** (1.74)	4.04*** (1.74)	-1.29* (-4.00)	-1.29* (-4.00)	3.42 (1.50)	3.42 (1.50)	-1.27* (-3.82)	-1.27* (-3.82)
$REER_t$	0.14 (0.09)	0.14 (0.09)	-2.02 (-1.04)	-2.02 (-1.04)	2.11 (1.15)	2.11 (1.15)	0.37 (0.18)	0.37 (0.18)
D0004 / D0509	-0.14 (-0.12)	0.80 (0.33)	-0.05 (-0.05)	0.52 (0.25)	-	-	-	-
D00 / D05	-	-	-	-	-0.28 (-0.21)	-4.03 (-1.19)	-0.06 (-0.05)	-5.17*** (-1.79)
D01 / D06	-	-	-	-	0.52 (0.30)	-4.03 (-0.96)	0.25 (0.12)	-6.32 (-1.62)
D02 / D07	-	-	-	-	-0.72 (-0.28)	-8.38*** (-1.66)	-1.09 (-0.35)	-11.17** (-2.33)
D03 / D08	-	-	-	-	-0.21 (-0.10)	-7.19 (-1.33)	-0.44 (-0.18)	-11.47** (-2.19)
D04 / D09	-	-	-	-	2.10 (0.71)	-6.29 (-1.28)	1.49 (0.46)	-9.77** (-2.05)
$\ln DIST_{ij}$	-	-	1.08 (1.18)	1.08 (1.18)	-	-	0.92 (1.02)	0.92 (1.02)
Adjusted R^2	0.52	0.52	0.56	0.56	0.53	0.53	0.53	0.53
Observations	195	195	195	195	195	195	195	195
Cross-Sections	13	13	13	13	13	13	13	13

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported cut flowers from the following **13 ROW countries (i.e. non-EU and non-SADC countries)**: BGR, BRA, CHN, IND, ISR, KEN, PHL, SGP, SYC, THA, TUR, UGA and USA

Appendix 5FI: Selection of the estimator suitable for cut flowers trade between South Africa and the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	135	4	2.77**	OLS	***No***	144	3	13.06*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	135	8	3.46*	OLS	***No***	144	7	14.24*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	135	4	1.23	FE-no auto	***Yes***	144	3	1.24	FE-no auto	***No***
		-	-	-	-	-	135	3	1.71	FE-auto	**?**
		135	5	-0.36	RE-no auto	***Yes***	144	4	1.01	RE-no auto	***No***
		-	-	-	-	-	135	4	1.74	RE-auto	**?**
	Yearly Impact	135	8	1.07	FE-no auto	***Yes***	144	7	1.29	FE-no auto	***No***
		-	-	-	-	-	135	7	1.75	FE-auto	**?**
		135	9	-0.19	RE-no auto	***Yes***	144	8	1.08	RE-no auto	***No***
		-	-	-	-	-	135	8	1.72	RE-auto	**?**
Hausman Test Statistic	Period Impact	N/A	4	37.28*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-
	Yearly Impact	N/A	8	36.68*	FE	***Yes***	-	-	-	-	-
					RE	***No***				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5FJ: Suitable equations for cut flowers trade between South Africa and the ROW countries

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	?	?	FE	FE	?	?
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	?	?	-	-	?	?
$\ln Y_{ijt-1}$	0.45* (5.96)	0.45* (5.96)	?	?	0.45* (6.21)	0.45* (6.21)	?	?
$\ln GDPPC_{ijt}$	5.16*** (1.93)	5.16*** (1.93)	?	?	7.90* (2.87)	7.90* (2.87)	?	?
$REER_t$	0.99 (1.36)	0.99 (1.36)	?	?	1.23*** (1.74)	1.23*** (1.74)	?	?
D0004 / D0509	-1.05 (-1.52)	-0.75 (-1.04)	?	?			?	?
D00 / D05	-	-	?	?	-1.41*** (-1.86)	-0.35 (-0.48)	?	?
D01 / D06	-	-	?	?	-1.91*** (-1.90)	-1.06 (-1.31)	?	?
D02 / D07			?	?	-2.67*** (-1.86)	-2.06** (-2.29)	?	?
D03 / D08			?	?	-1.38 (-1.32)	-1.43 (-1.57)	?	?
D04 / D09		-	?	?	-0.98 (-1.01)	-2.34* (-2.67)	?	?
$\ln DIST_{ij}$			?	?			?	?
Adjusted R^2	0.73	0.73	?	?	0.74	0.74	?	?
Observations	135	135	?	?	135	135	?	?
Cross-Sections	9	9	?	?	9	9	?	?

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) cut flowers with the following **9 ROW countries (i.e. non-EU and non-SADC countries)**: BGR, CHN, IND, KEN, SGP, SYC, TUR, UGA and USA

Appendix 5FK: Selection of the estimator suitable for frozen fruits and nuts exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	135	4	2.18***	OLS	***No***	144	3	9.03*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	135	8	2.18**	OLS	***No***	144	7	9.19*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	135	4	0.13	FE-no auto	***Yes***	144	3	1.14	FE-no auto	***No***
		-	-	-	-	-	135	3	1.93**	FE-auto	***Yes***
		135	5	2.52**	RE-no auto	***No***	144	4	0.61	RE-no auto	***No***
		126	5	-1.25	RE-auto	***Yes***	135	4	2.17**	RE-auto	***Yes***
	Yearly Impact	135	8	0.03	FE-no auto	***Yes***	144	7	1.11	FE-no auto	***No***
		-	-	-	-	-	135	7	2.00**	FE-auto	***Yes***
		135	9	2.56**	RE-no auto	***No***	144	8	0.61	RE-no auto	***No***
		126	9	-1.46	RE-auto	***Yes***	135	8	2.21**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	49.22*	FE	***Yes***	N/A	3	1.09	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	45.98*	FE	***Yes***	N/A	7	-51.27*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FL: Suitable equations for frozen fruits and nuts exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-77.88 (-0.73)	-77.88 (-0.73)	-	-	-	-
$\ln Y_{ijt-1}$	0.43* (5.42)	0.43* (5.42)	-	-	0.43* (5.44)	0.43* (5.44)	-	-
$\ln GDPPC_{it}$	7.16 (0.61)	7.16 (0.61)	11.75 (0.93)	11.75 (0.93)	2.57 (0.11)	2.57 (0.11)	16.09 (0.74)	16.09 (0.74)
$\ln GDPPC_{jt}$	2.75 (1.07)	2.75 (1.07)	0.06 (0.11)	0.06 (0.11)	2.73 (1.07)	2.73 (1.07)	8.27* (2.71)	8.27* (2.71)
$REER_t$	-1.58 (-1.01)	-1.58 (-1.01)	-2.19 (-0.78)	-2.19 (-0.78)	-1.93 (-1.00)	-1.93 (-1.00)	-2.94 (-1.35)	-2.94 (-1.35)
D0004 / D0509	1.09 (0.58)	-0.70 (-0.28)	-0.19 (-0.13)	-0.68 (-0.30)	-	-	-	-
D00 / D05	-	-	-	-	0.98 (0.46)	-0.53 (-0.15)	-0.37 (-0.21)	-2.49 (-0.82)
D01 / D06	-	-	-	-	3.37 (1.22)	0.49 (0.11)	2.57 (0.96)	-2.30 (-0.56)
D02 / D07	-	-	-	-	5.02 (1.24)	0.48 (0.09)	4.57 (1.08)	-3.33 (-0.66)
D03 / D08	-	-	-	-	2.10 (0.63)	-0.47 (-0.08)	1.79 (0.53)	-4.20 (-0.76)
D04 / D09	-	-	-	-	-1.77 (-0.38)	1.38 (0.26)	-2.82 (-0.65)	-2.05 (-0.41)
$\ln DIST_{ij}$	-	-	0.07 (0.04)	0.07 (0.04)	-	-	-	-
Adjusted R^2	0.53	0.53	0.18	0.18	0.52	0.52	0.20	0.20
Observations	135	135	135	135	135	135	135	135
Cross-Sections	9	9	9	9	9	9	9	9

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported frozen fruits and nuts to the following **9 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, AUS, CHE, DRC, JPN, KEN, NZL, SYC and USA

Appendix 5FM: Selection of the estimator suitable for frozen fruits and nuts imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	210	4	2.72*	OLS	***No***	224	3	5.74*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	210	8	2.79*	OLS	***No***	224	7	6.03*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	210	4	-0.51	FE-no auto	***Yes***	224	3	1.52	FE-no auto	***No***
		-	-	-	-	-	210	3	1.97**	FE-auto	***Yes***
		210	5	-2.13**	RE-no auto	***No***	224	4	0.66	RE-no auto	***No***
		196	5	-0.81	RE-auto	***Yes***	210	4	2.43**	RE-auto	***Yes***
	Yearly Impact	210	8	-0.59	FE-no auto	***Yes***	224	7	1.51	FE-no auto	***No***
		-	-	-	-	-	210	7	1.99**	FE-auto	***Yes***
		210	9	-2.09**	RE-no auto	***No***	224	8	0.67	RE-no auto	***No***
		196	9	-0.73	RE-auto	***Yes***	210	8	2.39**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	108.39*	FE	***Yes***	N/A	3	8.05**	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	157.98*	FE	***Yes***	N/A	7	-4.90	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FN: Suitable equations for frozen fruits and nuts imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	53.40 (0.21)	53.40 (0.21)
$\ln Y_{ijt-1}$	0.24* (3.35)	0.24* (3.35)	-	-	0.25* (3.50)	0.25* (3.50)	-	-
$\ln GDPPC_{it}$	-13.89 (-0.94)	-13.89 (-0.94)	-23.07*** (-1.73)	-23.07*** (-1.73)	-39.46 (-1.40)	-39.46 (-1.40)	-8.89 (-0.29)	-8.89 (-0.29)
$\ln GDPPC_{jt}$	8.45* (2.73)	8.45* (2.73)	8.74** (2.35)	8.74** (2.35)	8.66* (2.86)	8.66* (2.86)	-2.03* (-6.69)	-2.03* (-6.69)
$REER_t$	1.35 (0.68)	1.35 (0.68)	-0.51 (-0.25)	-0.51 (-0.25)	0.07 (0.03)	0.07 (0.03)	-0.52 (-0.16)	-0.52 (-0.16)
D0004 / D0509	0.35 (0.19)	0.54 (0.18)	-1.91 (-1.44)	2.96 (1.10)	-	-	-	-
D00 / D05	-	-	-	-	0.66 (0.35)	5.59 (1.28)	-2.15 (-1.52)	3.21 (0.78)
D01 / D06	-	-	-	-	-1.22 (-0.49)	2.24 (0.41)	-3.79** (-2.08)	-1.03 (-0.18)
D02 / D07	-	-	-	-	-0.16 (-0.04)	7.31 (1.12)	-5.62** (-2.11)	2.48 (0.35)
D03 / D08	-	-	-	-	-3.60 (-1.17)	8.33 (1.18)	-7.60* (-3.50)	3.18 (0.41)
D04 / D09	-	-	-	-	-1.73 (-0.41)	6.01 (0.94)	-5.93*** (-1.93)	2.02 (0.29)
$\ln DIST_{ij}$	-	-	-	-	-	-	4.89* (4.20)	4.89* (4.20)
Adjusted R^2	0.36	0.36	0.34	0.34	0.38	0.38	0.29	0.29
Observations	210	210	210	210	210	210	210	210
Cross-Sections	14	14	14	14	14	14	14	14

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported frozen fruits and nuts from the following **14 ROW countries (i.e. non-EU and non-SADC countries)**: ARG, AUS, BRA, CAN, CHE, CHL, CHN, ECU, IND, MDG, NZL, POL, THA and USA

Appendix 5FO: Selection of the estimator suitable for preserved fruits and nuts exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	960	4	2.49**	OLS	***No***	1024	3	10.73*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	960	8	2.55**	OLS	***No***	1024	7	10.92*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic *(for static)* **or Durbin-H Statistic** *(for dynamic)*	Period Impact	960	4	-0.22	FE-no auto	***Yes***	1024	3	1.14	FE-no auto	***No***
		-	-	-	-	-	960	3	1.95**	FE-auto	***Yes***
		960	5	-1.39	RE-no auto	***Yes***	1024	4	0.68	RE-no auto	***No***
		-	-	-	-	-	960	4	2.10**	RE-auto	***Yes***
	Yearly Impact	960	8	-0.21	FE-no auto	***Yes***	1024	7	1.16	FE-no auto	***No***
		-	-	-	-	-	960	7	1.95**	FE-auto	***Yes***
		960	9	-1.40	RE-no auto	***Yes***	1024	8	0.69	RE-no auto	***No***
		-	-	-	-	-	960	8	2.10**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	280.16*	FE	***Yes***	N/A	3	-3.16	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	283.97*	FE	***Yes***	N/A	7	2.83	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FP: Suitable equations for preserved fruits and nuts exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	116.52* (3.01)	116.52* (3.01)	-	-	-56.83 (-0.74)	-56.83 (-0.74)
$\ln Y_{ijt-1}$	0.46* (15.04)	0.46* (15.04)	-	-	0.45* (14.75)	0.45* (14.75)	-	-
$\ln GDPPC_{it}$	-7.24 (-1.57)	-7.24 (-1.57)	-10.88** (-2.41)	-10.88** (-2.41)	11.87 (1.33)	11.87 (1.33)	10.36 (1.11)	10.36 (1.11)
$\ln GDPPC_{jt}$	1.80*** (1.69)	1.80*** (1.69)	1.69* (8.48)	1.69* (8.48)	1.73 (1.63)	1.73 (1.63)	1.64* (8.21)	1.64* (8.21)
$REER_t$	-0.94 (-1.51)	-0.94 (-1.51)	-0.54 (-0.57)	-0.54 (-0.57)	0.21 (0.27)	0.21 (0.27)	-0.04 (-0.04)	-0.04 (-0.04)
D0004 / D0509	-0.56 (-1.03)	1.03 (1.06)	-1.08** (-2.33)	1.47*** (1.78)	-	-	-	-
D00 / D05	-	-	-	-	-0.49 (-0.79)	-1.28 (-0.92)	-0.46 (-0.78)	-0.79 (-0.65)
D01 / D06	-	-	-	-	0.61 (0.74)	-2.73 (-1.56)	0.29 (0.32)	-2.22 (-1.32)
D02 / D07	-	-	-	-	1.03 (0.84)	-3.73*** (-1.78)	0.79 (0.55)	-3.45 (-1.64)
D03 / D08	-	-	-	-	1.13 (1.13)	-3.68 (-1.63)	1.26 (1.11)	-3.90*** (-1.68)
D04 / D09	-	-	-	-	0.97 (0.69)	-3.50*** (-1.71)	1.40 (0.94)	-3.65*** (-1.73)
$\ln DIST_{ij}$	-	-	-3.48* (-4.34)	-3.48* (-4.34)	-	-	-3.29* (-4.13)	-3.29* (-4.13)
Adjusted R^2	0.63	0.63	0.35	0.35	0.64	0.64	0.34	0.34
Observations	960	960	960	960	960	960	960	960
Cross-Sections	64	64	64	64	64	64	64	64

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported preserved fruits and nuts to the following **64 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG AUS, BGD, BHR, BHS, BRA, CAN, CHE, CHL, CHN, CIV, COG, COM, CRI, CYP, CZE, DOM, DRC, EGY, ETH, GAB, GHA, HUN, ISL, ISR, JOR, JPN, KEN, KOR, KWT, LBN, LBR, MAR, MDG, MDV, MLI, MLT, MYS, NGA, NOR, NZL, OMN, PAK, PER, PHL, POL, PRI, RUS, SAU, SEN, SGP, STP, SVK, SVN, SYC, SYR, THA, TTO, UGA, URY, USA and YEM

Appendix 5FQ: Selection of the estimator suitable for preserved fruits and nuts imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	390	4	3.84*	OLS	***No***	416	3	8.48*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	390	8	3.89*	OLS	***No***	416	7	8.53*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	390	4	-0.09	FE-no auto	***Yes***	416	3	1.30	FE-no auto	***No***
		-	-	-	-	-	390	3	1.96**	FE-auto	***Yes***
		390	5	-1.95***	RE-no auto	***No***	416	4	0.68	RE-no auto	***No***
		308	5	-0.48	RE-auto	***Yes***	390	4	2.07**	RE-auto	***Yes***
	Yearly Impact	390	8	-0.14	FE-no auto	***Yes***	416	7	1.30	FE-no auto	***No***
		-	-	-	-	-	390	7	1.96**	FE-auto	***Yes***
		390	9	-1.96**	RE-no auto	***No***	416	8	0.68	RE-no auto	***No***
		308	9	-0.57	RE-auto	***Yes***	390	8	2.06**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	166.03*	FE	***Yes***	N/A	3	3.25	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	165.83*	FE	***Yes***	N/A	7	3.46	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FR: Suitable equations for preserved fruits and nuts imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	**FE**	**FE**	**RE**	**RE**	**FE**	**FE**	**RE**	**RE**
PERIOD / **VARIABLES**	**2000 - 2004**	**2005 - 2009**	**2000 - 2004**	**2005 - 2009**	**2000 - 2004**	**2005 - 2009**	**2000 - 2004**	**2005 - 2009**
Constant	-	-	-175.83* (-2.76)	-175.83* (-2.76)	-	-	-309.35** (-2.40)	-309.35** (-2.40)
$\ln Y_{ijt-1}$	0.20* (3.84)	0.20* (3.84)	-	-	0.20* (3.76)	0.20* (3.76)	-	-
$\ln GDPPC_{it}$	15.86*** (1.92)	15.86*** (1.92)	19.78* (2.64)	19.78* (2.64)	35.25** (2.19)	35.25** (2.19)	36.30** (2.31)	36.30** (2.31)
$\ln GDPPC_{jt}$	0.34 (0.18)	0.34 (0.18)	0.38*** (1.68)	0.38*** (1.68)	0.15 (0.08)	0.15 (0.08)	0.38*** (1.69)	0.38*** (1.69)
$REER_t$	-1.20 (-1.09)	-1.20 (-1.09)	0.82 (0.52)	0.82 (0.52)	-0.09 (-0.07)	-0.09 (-0.07)	1.15 (0.71)	1.15 (0.71)
D0004 / D0509	-0.28 (-0.27)	-0.22 (-0.13)	1.14 (1.32)	-1.34 (-0.94)	-	-	-	-
D00 / D05	-	-	-	-	-1.18 (-0.98)	-2.72 (-1.08)	-0.50 (-0.48)	-3.35 (-1.59)
D01 / D06	-	-	-	-	-3.59** (-2.27)	-3.83 (-1.22)	-2.97** (-1.99)	-4.51 (-1.57)
D02 / D07	-	-	-	-	-5.80** (-2.49)	-4.80 (-1.28)	-6.14* (-2.68)	-5.28 (-1.48)
D03 / D08	-	-	-	-	-2.03 (-1.06)	-5.30 (-1.31)	-1.96 (-1.07)	-5.94 (-1.51)
D04 / D09	-	-	-	-	-3.39 (-1.24)	-4.63 (-1.27)	-0.89 (-0.38)	-4.33 (-1.21)
$\ln DIST_{ij}$	-	-	1.92** (2.41)	1.92** (2.41)	-	-	1.92** (2.39)	1.92** (2.39)
Adjusted R^2	0.53	0.53	0.40	0.40	0.53	0.53	0.40	0.40
Observations	390	390	390	390	390	390	390	390
Cross-Sections	26	26	26	26	26	26	26	26
*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses								
From 1994 to 2004, SA imported preserved fruits and nuts from the following **26 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, AUS, BRA, CAN, CHE, CHN, ECU, GHA, HUN, IDN, IND, ISR, JPN, KEN, LKA, MEX, MYS, NZL, PAK, PHL, POL, SAU, SGP, THA, TUR and USA								

Appendix 5FS: Selection of the estimator suitable for preserved fruits and nuts trade between South Africa and the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	300	4	6.87*	OLS	*No*	320	3	12.64*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	300	8	6.82*	OLS	*No*	320	7	12.70*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	300	4	0.11	FE-no auto	*Yes*	320	3	1.84**	FE-no auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		300	5	-0.15	RE-no auto	*Yes*	320	4	1.56	RE-no auto	*No*
		-	-	-	-	-	300	4	1.82	RE-auto	?
	Yearly Impact	300	8	0.09	FE-no auto	*Yes*	320	7	1.86**	FE-no auto	*Yes*
		-	-	-	-	-	-	-	-	-	-
		300	9	-0.15	RE-no auto	*Yes*	320	8	1.58	RE-no auto	*No*
		-	-	-	-	-	300	8	1.79	RE-auto	?
Hausman Test Statistic	Period Impact	N/A	4	247.53*	FE	*Yes*	-	-	-	-	-
					RE	*No*				-	-
	Yearly Impact	N/A	8	234.80*	FE	*Yes*	-	-	-	-	-
					RE	*No*				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively. ? means inconclusive.

Appendix 5FT: Suitable equations for preserved fruits and nuts trade between South Africa and the ROW countries

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.17* (3.07)	0.17* (3.07)	-	-	0.17* (3.19)	0.17* (3.19)	-	-
$\ln GDPPC_{ijt}$	1.76 (1.41)	1.76 (1.41)	2.42*** (1.70)	2.42*** (1.70)	1.89 (1.48)	1.89 (1.48)	2.62*** (1.80)	2.62*** (1.80)
$REER_t$	-0.16 (-0.42)	-0.16 (-0.42)	-1.03** (-2.46)	-1.03** (-2.46)	-0.15 (-0.39)	-0.15 (-0.39)	-1.03** (-2.46)	-1.03** (-2.46)
D0004 / D0509	0.89** (2.05)	0.75* (2.63)	0.69*** (1.67)	0.98* (2.97)	-	-	-	-
D00 / D05	-	-	-	-	0.82*** (1.70)	0.93* (2.62)	0.47 (1.04)	1.17* (2.79)
D01 / D06	-	-	-	-	0.57 (0.92)	0.74*** (1.94)	0.04 (0.05)	1.03** (2.30)
D02 / D07	-	-	-	-	1.68*** (1.95)	0.67*** (1.66)	0.54 (0.52)	0.90*** (1.89)
D03 / D08	-	-	-	-	1.73* (2.72)	0.89** (2.21)	1.12 (1.47)	1.02** (2.13)
D04 / D09	-	-	-	-	1.85* (3.18)	0.35 (0.89)	1.33*** (1.92)	0.60 (1.31)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.78	0.78	0.72	0.72	0.78	0.78	0.72	0.72
Observations	300	300	320	320	300	300	320	320
Cross-Sections	20	20	20	20	20	20	20	20

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) preserved fruits and nuts with the following **20 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, AUS, BRA, CAN, CHE, CHN, GHA, HUN, ISR, JPN, KEN, MYS, NZL, PAK, PHL, POL, SAU, SGP, THA and USA

Appendix 5FU: Selection of the estimator suitable for fruits and vegetable juices exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	990	4	4.05*	OLS	***No***	1056	3	14.87*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	990	8	4.07*	OLS	***No***	1056	7	14.90*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	990	4	-0.06	FE-no auto	***Yes***	1056	3	1.49	FE-no auto	***No***
		-	-	-	-	-	990	3	1.96**	FE-auto	***Yes***
		990	5	-1.62	RE-no auto	***Yes***	1056	4	0.90	RE-no auto	***No***
		-	-	-	-	-	990	4	2.10**	RE-auto	***Yes***
	Yearly Impact	990	8	-0.06	FE-no auto	***Yes***	1056	7	1.49	FE-no auto	***No***
		-	-	-	-	-	990	7	1.96**	FE-auto	***Yes***
		990	9	-1.61	RE-no auto	***Yes***	1056	8	0.91	RE-no auto	***No***
		-	-	-	-	-	990	8	2.10**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	442.68*	FE	***Yes***	N/A	3	1138.06*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	443.98*	FE	***Yes***	N/A	7	24.74*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FV: Suitable equations for fruit and vegetable juices exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.30* (9.53)	0.30* (9.53)	-	-	0.29* (9.45)	0.29* (9.45)	-	-
$\ln GDPPC_{it}$	5.43 (1.28)	5.43 (1.28)	10.00** (2.54)	10.00** (2.54)	16.03*** (1.93)	16.03*** (1.93)	26.21* (3.37)	26.21* (3.37)
$\ln GDPPC_{jt}$	3.16* (3.34)	3.16* (3.34)	3.75* (3.04)	3.75* (3.04)	3.10* (3.28)	3.10* (3.28)	3.55* (2.95)	3.55* (2.95)
$REER_t$	-0.62 (-1.09)	-0.62 (-1.09)	-1.06 (-1.59)	-1.06 (-1.59)	0.01 (0.02)	0.01 (0.02)	-0.31 (-0.43)	-0.31 (-0.43)
D0004 / D0509	0.62 (1.17)	-0.09 (-0.10)	0.70 (1.48)	-0.70 (-0.92)	-	-	-	-
D00 / D05	-	-	-	-	1.06*** (1.74)	-1.44 (-1.10)	0.75 (1.29)	-2.67** (-2.42)
D01 / D06	-	-	-	-	1.34*** (1.69)	-2.11 (-1.30)	1.20 (1.36)	-3.64** (-2.48)
D02 / D07	-	-	-	-	3.22* (2.75)	-2.63 (-1.35)	2.63*** (1.89)	-4.60* (-2.58)
D03 / D08	-	-	-	-	2.51* (2.61)	-2.80 (-1.34)	2.70** (2.44)	-4.98* (-2.58)
D04 / D09	-	-	-	-	0.97 (0.71)	-2.61 (-1.37)	1.44 (1.00).	-4.26** (-2.43)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.61	0.61	0.51	0.51	0.61	0.61	0.57	0.57
Observations	990	990	990	990	990	990	990	990
Cross-Sections	66	66	66	66	66	66	66	66

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported fruits and vegetable juices to the following **66 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG, AUS, BDI, BEN, BGD, BHR, BRA, CAN, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CPV, CYP, DRC, EGY, ETH, GAB, GHA, GIN, HUN, IDN, IND, ISL, ISR, JOR, JPN, KEN, KOR, KWT, LBN, LBR, LKA, MAR, MDG, MDV, MLI, MLT, MYS, NGA, NOR, NZL, OMN, PAK, PHL, POL, RUS, RWA, SAU, SEN, SGP, SLE, SYC, TGO, THA, TTO, TUR, UGA, URY and USA

Appendix 5FW: Selection of the estimator suitable for fruits and vegetable juices imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	360	4	3.84*	OLS	***No***	384	3	9.92*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	360	8	3.89*	OLS	***No***	384	7	10.00*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	360	4	-0.09	FE-no auto	***Yes***	384	3	1.66	FE-no auto	***No***
		-	-	-	-	-	360	3	1.98**	FE-auto	***Yes***
		360	5	-1.95***	RE-no auto	***No***	384	4	0.84	RE-no auto	***No***
		308	5	-0.48	RE-auto	***Yes***	360	4	2.21**	RE-auto	***Yes***
	Yearly Impact	360	8	-0.14	FE-no auto	***Yes***	384	7	1.68	FE-no auto	***No***
		-	-	-	-	-	360	7	1.98**	FE-auto	***Yes***
		360	9	-1.96**	RE-no auto	***No***	384	8	0.85	RE-no auto	***No***
		308	9	-0.57	RE-auto	***Yes***	360	8	2.20**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	166.03*	FE	***Yes***	N/A	3	-3.02	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	165.83*	FE	***Yes***	N/A	7	-2.83	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FX: Suitable equations for fruit and vegetable juices imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-176.15** (-2.47)	-176.15** (-2.47)			-250.90*** (-1.74)	-250.90*** (-1.74)
$\ln Y_{ijt-1}$	0.20* (3.84)	0.20* (3.84)	-	-	0.20* (3.76)	0.20* (3.76)	-	-
$\ln GDPPC_{it}$	15.86*** (1.92)	15.86*** (1.92)	22.86* (2.73)	22.86* (2.73)	35.25** (2.19)	35.25** (2.19)	32.03*** (1.83)	32.03*** (1.83)
$\ln GDPPC_{jt}$	0.34 (0.18)	0.34 (0.18)	0.21 (0.83)	0.21 (0.83)	0.15 (0.08)	0.15 (0.08)	0.23 (0.94)	0.23 (0.94)
$REER_t$	-1.20 (-1.09)	-1.20 (-1.09)	0.42 (0.25)	0.42 (0.25)	-0.09 (-0.07)	-0.09 (-0.07)	0.69 (0.39)	0.69 (0.39)
D0004 / D0509	-0.40 (-0.38)	-0.22 (-0.13)	-0.77 (-0.81)	-0.94 (-0.57)	-	-	-	-
D00 / D05			-	-	-0.63 (-0.53)	-2.72 (-1.08)	0.03 (0.02)	-2.07 (-0.85)
D01 / D06			-	-	-1.20 (-0.77)	-3.83 (-1.22)	-0.07 (-0.04)	-2.68 (-0.81)
D02 / D07			-	-	-2.02 (-0.87)	-4.80 (-1.28)	0.13 (0.04)	-3.11 (-0.77)
D03 / D08			-	-	1.22 (0.64)	-5.30 (-1.31)	2.91 (1.23)	-3.41 (-0.77)
D04 / D09			-	-	1.45 (0.55)	-4.63 (-1.27)	3.92 (1.27)	-2.60 (-0.64)
$\ln DIST_{ij}$			-0.36 (-0.37)	-0.36 (-0.37)	-	-	-0.35 (-0.37)	-0.35 (-0.37)
Adjusted R^2	0.53	0.53	0.39	0.39	0.53	0.53	0.40	0.40
Observations	360	360	360	360	360	360	360	360
Cross-Sections	24	24	24	24	24	24	24	24
*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses								
From 1994 to 2009, SA imported fruits and vegetable juices from the following **24 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, ARG, AUS, BRA, CAN, CHE, CHL, CHN, CZE, IDN, IND, ISL, ISR, JPN, KEN, LKA, MYS, NZL, PHL, POL, SAU, SGP, THA and USA								

Appendix 5FY: Selection of the estimator suitable for fruits and vegetable juices trade between South Africa and the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	345	4	6.29*	OLS	***No***	362	3	19.30*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	345	8	6.35*	OLS	***No***	362	7	19.21*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	345	4	0.65	FE-no auto	***Yes***	362	3	1.67	FE-no auto	***No***
		-	-	-	-	-	345	3	1.91**	FE-auto	***Yes***
		345	5	0.21	RE-no auto	***Yes***	362	4	1.38	RE-no auto	***No***
		-	-	-	-	-	345	4	1.86**	RE-auto	***Yes***
	Yearly Impact	345	8	0.68	FE-no auto	***Yes***	362	7	1.67	FE-no auto	***No***
		-	-	-	-	-	345	7	1.90**	FE-auto	***Yes***
		345	9	0.25	RE-no auto	***Yes***	362	8	1.39	RE-no auto	***No***
		-	-	-	-	-	345	8	1.86**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	191.88*	FE	***Yes***	N/A	3	14.29*	FE	***Yes***
					RE	***No***				RE	***No***
	Yearly Impact	N/A	8	190.62*	FE	***Yes***	N/A	7	26.98*	FE	***Yes***
					RE	***No***				RE	***No***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5FZ: Suitable equations for fruit and vegetable juices trade between South Africa and the ROW countries

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.21* (4.34)	0.21* (4.34)	-	-	0.21* (4.17)	0.21* (4.17)	-	-
$\ln GDPPC_{ijt}$	4.74* (3.54)	4.74* (3.54)	9.16* (5.49)	9.16* (5.49)	4.52* (3.27)	4.52* (3.27)	9.00* (4.77)	9.00* (4.77)
$REER_t$	-0.25 (-0.64)	-0.25 (-0.64)	-0.03 (-0.05)	-0.03 (-0.05)	-0.21 (-0.54)	-0.21 (-0.54)	0.11 (0.22)	0.11 (0.22)
D0004 / D0509	0.81*** (1.89)	0.66** (2.16)	0.97** (2.48)	0.12 (0.34)	-	-	-	-
D00 / D05	-	-	-	-	0.95** (2.01)	0.63*** (1.71)	0.82*** (1.90)	0.05 (0.14)
D01 / D06	-	-	-	-	0.71 (1.16)	0.52 (1.31)	0.73 (1.08)	-0.17 (-0.39)
D02 / D07	-	-	-	-	2.22* (2.61)	0.56 (1.30)	1.88*** (1.81)	-0.13 (-0.26)
D03 / D08	-	-	-	-	2.23* (3.54)	0.93** (2.13)	2.31* (3.07)	0.26 (0.50)
D04 / D09	-	-	-	-	1.43** (2.51)	0.93** (2.18)	2.13* (3.18)	0.51 (1.00)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.73	0.73	0.88	0.88	0.73	0.73	0.87	0.87
Observations	345	345	345	345	345	345	345	345
Cross-Sections	23	23	23	23	23	23	23	23

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded (imports plus exports) fruits and vegetable juices with the following **23 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, ARG, AUS, BRA, CAN, CHE, CHL, CHN, IDN, IND, ISL, ISR, JPN, KEN, LKA, MYS, NZL, PHL, POL, SAU, SGP, THA and USA

Appendix 5GA Selection of the estimator suitable for wine exports from South Africa to the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	1215	4	4.30*	OLS	***No***	1296	3	17.46*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	1215	8	4.34*	OLS	***No***	1296	7	17.67*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	1215	4	-0.35	FE-no auto	***Yes***	1296	3	1.45	FE-no auto	***No***
		-	-	-	-	-	1215	3	2.04**	FE-auto	***Yes***
		1215	5	-1.71***	RE-no auto	***No***	1216	4	1.01	RE-no auto	***No***
		1134	5	-0.17	RE-auto	***Yes***	1140	4	2.16**	RE-auto	***Yes***
	Yearly Impact	1215	8	-0.42	FE-no auto	***Yes***	1216	7	1.46	FE-no auto	***No***
		-	-	-	-	-	1140	7	2.04**	FE-auto	***Yes***
		1215	9	-1.76***	RE-no auto	***No***	1216	8	1.02	RE-no auto	***No***
		1134	9	-0.24	RE-auto	***Yes***	1140	8	2.17**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	496.22*	FE	***Yes***	N/A	3	1.89	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	539.72*	FE	***Yes***	N/A	7	0.99	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5GB: Suitable equations for wine exports from South Africa to the ROW countries.

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	RE	RE	FE	FE	RE	RE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-53.70** (-2.03)	-53.70** (-2.03)	-	-	-165.37* (-3.18)	-165.37* (-3.18)
$\ln Y_{ijt-1}$	0.30* (10.71)	0.30* (10.71)	-	-	0.30* (10.79)	0.30* (10.79)	-	-
$\ln GDPPC_{it}$	3.52 (1.11)	3.52 (1.11)	10.58* (3.48)	10.58* (3.48)	19.54* (3.17)	19.54* (3.17)	24.42* (3.89)	24.42* (3.89)
$\ln GDPPC_{jt}$	0.26 (0.84)	0.26 (0.84)	0.42** (1.96)	0.42** (1.96)	0.28 (0.90)	0.28 (0.90)	0.40*** (1.84)	0.40*** (1.84)
$REER_t$	-1.35* (-3.13)	-1.35* (-3.13)	-0.73 (-1.18)	-0.73 (-1.18)	-0.42 (-0.79)	-0.42 (-0.79)	-0.43 (-0.67)	-0.43 (-0.67)
D0004 / D0509	-0.92** (-2.30)	1.15*** (1.70)	-0.87** (-2.45)	0.21 (0.36)	-	-	-	-
D00 / D05	-	-	-	-	-1.22* (-2.65)	-0.92 (-0.94)	-1.69* (-4.11)	-1.29 (-1.52)
D01 / D06	-	-	-	-	-2.40* (-3.97)	-1.86 (-1.52)	-3.28* (-5.56)	-2.10*** (-1.81)
D02 / D07	-	-	-	-	-2.98* (-3.32)	-2.26 (-1.54)	-4.72* (-5.26)	-2.72*** (-1.88)
D03 / D08	-	-	-	-	-1.75** (-2.39)	-3.12** (-1.98)	-2.76* (-3.84)	-3.54** (-2.24)
D04 / D09	-	-	-	-	-2.77* (-2.68)	-3.04** (-2.13)	-3.65* (-3.74)	-3.27** (-2.27)
$\ln DIST_{ij}$	-	-	-2.54* (-3.43)	-2.54* (-3.43)	-	-	-2.55* (-3.39)	-2.55* (-3.39)
Adjusted R^2	0.67	0.67	0.34	0.34	0.67	0.67	0.36	0.36
Observations	1215	1215	1215	1215	1215	1215	1215	1215
Cross-Sections	81	81	81	81	81	81	81	81

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA exported wine to the following **81 ROW countries (i.e. non-EU and non-SADC countries)**: AGO, ARE, ARG, ATG, AUS, BDI, BEN, BGR, BHR, BHS, BRA, CAN, CAF, CHE, CHL, CHN, CIV, CMR, COG, COL, COM, CRI, CYP, CZE, DRC, EGY, EST, ETH, GAB, GHA, GMB, GRD, HUN, IDN, IND, IRN, ISL, ISR, JAM, JPN, JOR, KEN, KOR, LBN, LKA, MAR, MDG, MDV, MLI, MLT, MEX, MYS, NER, NGA, NOR, NZL, OMN, PAN, PER, PHL, POL, PRY, ROM, RUS, RWA, SEN, SGP, SLE, STP, SYC, TGO, THA, TTO, TUN, TUR, UGA, UKR, URY, USA, VCT and VEN

Appendix 5GC: Selection of the estimator suitable for wine imports from the ROW countries to South Africa

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	360	4	5.83*	OLS	***No***	384	3	23.39*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
	Yearly Impact	360	8	5.87*	OLS	***No***	384	7	23.56*	OLS	***No***
					FE or RE	***Yes***				FE or RE	***Yes***
Durbin Watson Statistic (*for static*) **or Durbin-H Statistic** (*for dynamic*)	Period Impact	360	4	0.15	FE-no auto	***Yes***	384	3	1.68	FE-no auto	***No***
		-	-	-	FE-auto	-	360	3	1.97**	FE-auto	***Yes***
		360	5	-1.31	RE-no auto	***Yes***	384	4	1.03	RE-no auto	***No***
		-	-	-	RE-auto	-	360	4	2.05**	RE-auto	***Yes***
	Yearly Impact	360	8	0.10	FE-no auto	***Yes***	384	7	1.69	FE-no auto	***No***
		-	-	-	FE-auto	-	360	7	1.97**	FE-auto	***Yes***
		360	9	-1.34	RE-no auto	***Yes***	384	8	1.05	RE-no auto	***No***
		-	-	-	RE-auto	-	360	8	2.05**	RE-auto	***Yes***
Hausman Test Statistic	Period Impact	N/A	4	190.08*	FE	***Yes***	N/A	3	-18.81*	FE	***No***
					RE	***No***				RE	***Yes***
	Yearly Impact	N/A	8	191.11*	FE	***Yes***	N/A	7	30.90*	FE	***No***
					RE	***No***				RE	***Yes***

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5GD: Suitable equations for wine imports from the ROW countries to South Africa

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	FE	FE	FE	FE	FE	FE
PERIOD / VARIABLES	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.21* (3.79)	0.21* (3.79)	-	-	0.21* (3.76)	0.21* (3.76)	-	-
$\ln GDPPC_{it}$	4.26 (0.70)	4.26 (0.70)	5.18 (0.89)	5.18 (0.89)	13.40 (1.11)	13.40 (1.11)	11.17 (0.97)	11.17 (0.97)
$\ln GDPPC_{jt}$	0.79 (0.61)	0.79 (0.61)	1.61 (1.04)	1.61 (1.04)	0.68 (0.52)	0.68 (0.52)	1.43 (0.91)	1.43 (0.91)
$REER_t$	2.45* (2.89)	2.45* (2.89)	2.39* (2.81)	2.39* (2.81)	2.98* (2.86)	2.98* (2.86)	2.70* (2.71)	2.70* (2.71)
D0004 / D0509	-1.57** (-2.19)	-0.76 (-0.59)	-1.88* (-2.72)	-0.95 (-0.82)	-	-	-	-
D00 / D05	-	-	-	-	-1.34*** (-1.65)	-2.03 (-1.08)	-2.25* (-2.58)	-1.80 (-1.05)
D01 / D06	-	-	-	-	-0.91 (-0.84)	-2.41 (-1.03)	-2.37*** (-1.77)	-1.98 (-0.90)
D02 / D07	-	-	-	-	0.34 (0.21)	-3.06 (-1.09)	-1.66 (-0.78)	-2.44 (-0.92)
D03 / D08	-	-	-	-	1.00 (0.77)	-3.33 (-1.10)	-1.00 (-0.59)	-2.62 (-0.92)
D04 / D09	-	-	-	-	-0.48 (-0.26)	-2.51 (-0.91)	-2.92 (-1.33)	-2.00 (-0.77)
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.69	0.69	0.64	0.64	0.69	0.69	0.65	0.65
Observations	360	360	360	360	360	360	360	360
Cross-Sections	24	24	24	24	24	24	24	24

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA imported wine from the following **24 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, ARG, AUS, BGR, BRA, CAN, CHE, CHL, CHN, HUN, ISL, ISR, JPN, KEN, NZL, POL, PRI, ROM, RUS, SGP, THA, TUR, URY and USA

Appendix 5GE: Selection of the estimator suitable for wine trade between South Africa and the ROW countries

Selection Criteria	Models	Dynamic					Static				
		N	K	Statistic	Estimator	Decision	N	K	Statistic	Estimator	Decision
Wald Test Statistic	Period Impact	345	4	3.25*	OLS	*No*	362	3	22.79*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
	Yearly Impact	345	8	3.22*	OLS	*No*	362	7	22.88*	OLS	*No*
					FE or RE	*Yes*				FE or RE	*Yes*
Durbin Watson Statistic (*for static*) or Durbin-H Statistic (*for dynamic*)	Period Impact	345	4	1.25	FE-no auto	*Yes*	362	3	1.13	FE-no auto	*No*
		-	-	-	-	-	345	3	1.73	FE-auto	*No*
		345	5	0.65	RE-no auto	*Yes*	362	4	0.95	RE-no auto	*No*
		-	-	-	-	-	345	4	1.71	RE-auto	*No*
	Yearly Impact	345	8	1.29	FE-no auto	*Yes*	362	7	1.10	FE-no auto	*No*
		-	-	-	-	-	345	7	1.75	FE-auto	*No*
		345	9	0.65	RE-no auto	*Yes*	362	8	0.92	RE-no auto	*No*
		-	-	-	-	-	345	8	1.76	RE-auto	*No*
Hausman Test Statistic	Period Impact	N/A	4	84.40*	FE	*Yes*	-	-	-	-	-
					RE	*No*				-	-
	Yearly Impact	N/A	8	83.17*	FE	*Yes*	-	-	-	-	-
					RE	*No*				-	-

NB: *, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. N & K denote the sample size and the number of regressors respectively. OLS, FE & RE denote Pooled Ordinary Least Squares, Fixed Effects and Random Effects models respectively. -no auto & -auto denote estimation assuming no autocorrelation problem and estimation with the correction of 1st order autocorrelation problem respectively.

Appendix 5GF: Suitable equations for wine trade between South Africa and the ROW countries

MODEL	Period Impact				Yearly Impact			
	Dynamic		Static		Dynamic		Static	
ESTIMATORS	FE	FE	-	-	FE	FE	-	-
PERIOD / **VARIABLES**	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Constant	-	-	-	-	-	-	-	-
$\ln Y_{ijt-1}$	0.48* (10.39)	0.48* (10.39)	-	-	0.47* (10.13)	0.47* (10.13)	-	-
$\ln GDPPC_{ijt}$	4.29* (3.55)	4.29* (3.55)	-	-	4.13* (3.35)	4.13* (3.35)	-	-
$REER_t$	0.54 (1.38)	0.54 (1.38)	-	-	0.56 (1.41)	0.56 (1.41)	-	-
D0004 / D0509	-0.86*** (-1.96)	0.40 (1.34)	-	-	-	-	-	-
D00 / D05	-	-	-	-	-0.93*** (-1.92)	0.34 (0.93)	-	-
D01 / D06	-	-	-	-	-0.66 (-1.03)	0.37 (0.95)	-	-
D02 / D07	-	-	-	-	0.89 (1.00)	0.52 (1.25)	-	-
D03 / D08	-	-	-	-	0.18 (0.28)	0.57 (1.33)	-	-
D04 / D09	-	-	-	-	0.63 (1.09)	0.41 (1.00)	-	-
$\ln DIST_{ij}$	-	-	-	-	-	-	-	-
Adjusted R^2	0.80	0.80	-	-	0.80	0.80	-	-
Observations	345	345	-	-	345	345	-	-
Cross-Sections	23	23	-	-	23	23	-	-

*, ** & *** denote significance at the 1, 5 and 10 percent levels respectively. t-values are in parentheses

From 1994 to 2009, SA traded wine (imports plus exports) with the following **23 ROW countries (i.e. non-EU and non-SADC countries)**: ARE, ARG, AUS, BGR, BRA, CAN, CHE, CHL, CHN, HUN, ISL, ISR, JPN, KEN, NZL, POL, ROM, RUS, SGP, THA, TUR, URY and USA

Appendix 5GG: Lists of countries and their codes

Code	Country Name	Code	Country Name	Code	Country Name
AGO	Angola	GIN	Guinea	OMN	Oman
ALB	Albania	GMB	Gambia, The	PAK	Pakistan
ARE	United Arab Emirates	GRC	Greece	PAN	Panama
ARG	Argentina	GRD	Grenada	PER	Peru
ATG	Antigua and Barbuda	GTM	Guatemala	PHL	Philippines
AUS	Australia	GUY	Guyana	POL	Poland
AUT	Austria	HRV	Croatia	PRI	Puerto Rico
BDI	Burundi	HTI	Haiti	PRT	Portugal
BEL	Belgium	HUN	Hungary	PRY	Paraguay
BEN	Benin	IDN	Indonesia	ROM	Romania
BGD	Bangladesh	IND	India	RUS	Russian Federation
BGR	Bulgaria	IRL	Ireland	RWA	Rwanda
BHR	Bahrain	IRN	Iran, Islamic Rep.	SA	South Africa
BHS	Bahamas, The	ISL	Iceland	SAU	Saudi Arabia
BOL	Bolivia	ISR	Israel	SDN	Sudan
BRA	Brazil	ITA	Italy	SEN	Senegal
BTN	Bhutan	JAM	Jamaica	SGP	Singapore
CAN	Canada	JOR	Jordan	SLE	Sierra Leone
CHE	Switzerland	JPN	Japan	SLV	El Salvador
CHL	Chile	KEN	Kenya	STP	Sao Tome and Principe
CHN	China	KGZ	Kyrgyz Republic	SUR	Suriname
CIV	Cote d'Ivoire	KOR	Korea, Rep.	SVK	Slovak Republic
CMR	Cameroon	KWT	Kuwait	SVN	Slovenia
COG	Congo Republic	LAO	Lao PDR	SWE	Sweden
COL	Colombia	LBN	Lebanon	SYC	Seychelles
COM	Comoros	LKA	Sri Lanka	SYR	Syrian Arab Republic
CRI	Costa Rica	LUX	Luxembourg	TCD	Chad
CYP	Cyprus	MAR	Morocco	TGO	Togo
CZE	Czech Republic	MDG	Madagascar	THA	Thailand
DEU	Germany	MEX	Mexico	TTO	Trinidad and Tobago
DMA	Dominica	MLI	Mali	TUN	Tunisia
DNK	Denmark	MOZ	Mozambique	TUR	Turkey
DOM	Dominican Republic	MRT	Mauritania	TZA	Tanzania
DRC	Democratic Republic of Congo	MUS	Mauritius	UGA	Uganda
ECU	Ecuador	MWI	Malawi	UKR	Ukraine
EGY	Egypt, Arab Rep.	MYS	Malaysia	URY	Uruguay
ESP	Spain	NER	Niger	USA	United States
EST	Estonia	NGA	Nigeria	VCT	St. Vincent and the Grenadines
ETH	Ethiopia	NIC	Nicaragua	VEN	Venezuela, RB
FIN	Finland	NLD	Netherlands	VNM	Vietnam
FRA	France	NOR	Norway	ZMB	Zambia
GBR	United Kingdom	NPL	Nepal	ZWE	Zimbabwe
GHA	Ghana	NZL	New Zealand		

Appendix 6.A: Detailed results of WTO AoA impacts on agricultural trade flows

Trade Flows	Joint period effects (1995 – 1999)	Individual yearly effects (1995 – 1999)
Agric X	+	+ (1)
Agric M	0	0
Agric T	–	– (2)
HS0406 X	+	+ (1)
HS0406 M	0	0
HS0406 T	0	+ (1)
HS0603 X	+	+ (1)
HS0603 M	0	– (2)
HS0603 T	0	0
HS0811 X	0	0
HS0811 M	0	0
HS0811 T	0	+ (1)
HS2008 X	0	0
HS2008 M	0	– (3)
HS2008 T	0	0
HS2009 X	0	0
HS2009 M	0	0
HS2009 T	–	– (1)
HS2204 X	+	+ (1)
HS2204 M	+	+ (5)
HS2204 T	+	+ (4)

NB: X, M and T stand for exports, imports and trade respectively. For Joint period effects: + means positive effects and – means negative effects). For Individual yearly effects: + (**NY**) means positive effects (number of years) and – (**NY**) means negative effects (number of years). **na** means not applicable

Appendix 6.B: Detailed results of the EU-SA TDCA impacts on agricultural trade flows

Trade Flows	Joint period effects		Individual yearly effects		Direction effects		Potential effects	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Agric X	–	0	– (1)	– (3)	–	+	+ (8) – (7)	+ (8) – (7)
Agric M	0	0	0	0	0	0	+ (11) – (4)	+ (6) – (9)
Agric T	0	+	+ (2)	+ (5)	0	+	+ (8) – (7)	+ (8) – (7)
HS0406 X	–	0	– (2)	0	0	0	+ (4) – (2)	+ (2) – (3)
HS0406 M	0	0	0	– (5)	0	0	+ (9) – (4)	+ (7) – (6)
HS0406 T	0	0	+ (1)	0	0	0	+ (1) – (5)	+ (4) – (1)
HS0603 X	0	0	+ (2)	0	–	0	+ (1) – (13)	+ (4) – (9)
HS0603 M	+	0	0	0	0	0	+ (3) – (4)	+ (2) – (2)
HS0603 T	–	+	– (1)	+ (5)	0	0	+ (3) – (4)	+ (1) – (3)
HS0811 X	–	0	– (5)	0	0	0	+ (3) – (4)	+ (5) – (1)
HS0811 M	0	0	0	– (3)	0	0	+ (3) – (4)	+ (4) – (2)
HS0811 T	0	0	0	0	0	0	+ (3) – (3)	+ (2) – (2)
HS2008 X	0	0	0	0	0	0	+ (7) – (8)	+ (7) – (7)
HS2008 M	0	0	– (2)	0	0	0	+ (1) – (8)	+ (5) – (4)
HS2008 T	0	+	– (2)	+ (5)	0	+	+ (6) – (3)	+ (5) – (4)
HS2009 X	0	0	0	0	0	0	+ (8) – (6)	+ (3) – (11)
HS2009 M	0	0	0	0	0	0	+ (3) – (10)	+ (6) – (7)
HS2009 T	0	0	0	–(1)	0	0	+ (9) – (4)	+ (5) – (8)
HS2204 X	–	0	0	– (5)	–	0	+ (8) – (7)	+ (8) – (7)
HS2204 M	–	0	– (2)	0	–	0	+ (7) – (8)	+ (8) – (7)
HS2204 T	0	0	0	+ (1)	–	+	+ (7) – (8)	+ (8) – (7)

NB: X, M and T stand for exports, imports and trade respectively. For Joint period effects: + means positive effects and – means negative effects. For Individual yearly effects: + (**NY**) means positive effects (number of years) and – (**NY**) means negative effects (number of years). For Direction effects: + means trade flow creation and – means trade flow diversion. For potential effects: + (**NC**) means potential underscored (number of countries) and – (**NC**) means potential exhausted (number of countries). In all cases **0** means no effects and na means not applicable

Appendix 6.C: Detailed results of the SADC Trade Protocol impacts on agricultural trade flows

Trade Flows	Joint period effects		Individual yearly effects		Direction effects		Potential effects	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Agric X	–	+	– (5)	+ (3)	–	0	+ (2) – (4)	+ (3) – (3)
Agric M	0	0	+ (2)	0	0	0	+ (2) – (4)	+ (3) – (3)
Agric T	–	+	– (2)	+ (5)	0	+	+ (3) – (3)	+ (3) – (3)
HS0406 X	0	0	0	0	0	0	+ (2) – (4)	+ (2) – (4)
HS0406 M	na	na	na	na	na	na	na	na
HS0406 T	na	na	na	na	na	na	na	na
HS0603 X	0	0	+ (1)	0	–	+	+ (3) – (3)	+ (3) – (3)
HS0603 M	0	0	– (5)	– (5)	+	0	+ (2) – (4)	+ (3) – (3)
HS0603 T	0	+	– (1)	+ (5)	–	0	+ (1) – (5)	+ (3) – (3)
HS0811 X	0	0	0	0	0	0	+ (2) – (3)	+ (2) – (4)
HS0811 M	na	na	na	na	na	na	na	na
HS0811 T	na	na	na	na	na	na	na	na
HS2008 X	0	0	+ (4)	0	0	+	+ (4) – (2)	+ (2) – (4)
HS2008 M	na	na	na	na	na	na	na	na
HS2008 T	na	na	na	na	na	na	na	na
HS2009 X	0	0	– (1)	– (3)	0	0	+ (2) – (4)	+ (4) – (2)
HS2009 M	0	0	0	– (3)	0	0	+ (2) – (2)	+ (3) – (2)
HS2009 T	0	+	+ (1)	+ (5)	0	0	+ (4)	+ (5)
HS2204 X	0	-	– (1)	– (4)	–	0	+ (3) – (3)	+ (3) – (3)
HS2204 M	0	0	0	0	–	0	+ (2) – (2)	+ (3) – (2)
HS2204 T	0	0	0	+ (1)	–	0	+ (3) – (1)	+ (3) – (2)

NB: X, M and T stand for exports, imports and trade respectively. For Joint period effects: + means positive effects and – means negative effects. For Individual yearly effects: + (**NY**) means positive effects (number of years) and – (**NY**) means negative effects (number of years). For Direction effects: + means trade flow creation and – means trade flow diversion. For potential effects: + (**NC**) means potential underscored (number of countries) and – (**NC**) means potential exhausted (number of countries). In all cases **0** means no effects and na means not applicable

Appendix 6.D: Detailed results of the agricultural trade flows response between South Africa and ROW countries

Trade Flows	Joint period effects		Individual yearly effects	
	2000 - 2004	2005 - 2009	2000 - 2004	2005 - 2009
Agric X	–	+	– (5)	– (4)
Agric M	0	0	0	– (5)
Agric T	+	+	+ (2)	+ (5)
HS0406 X	0	+	0	0
HS0406 M	0	0	– (2)	– (2)
HS0406 T	na	na	na	na
HS0603 X	–	+	– (5)	0
HS0603 M	0	0	0	– (1)
HS0603 T	0	0	– (3)	– (2)
HS0811 X	0	0	0	0
HS0811 M	0	0	0	0
HS0811 T	na	na	na	na
HS2008 X	0	0	0	– (2)
HS2008 M	0	0	– (2)	0
HS2008 T	+	+	+ (1)	+ (4)
HS2009 X	0	0	+ (2)	0
HS2009 M	0	0	0	0
HS2009 T	+	+	+ (4)	+ (3)
HS2204 X	–	+	– (5)	– (2)
HS2204 M	–	–	– (1)	0
HS2204 T	–	0	– (1)	0

NB: X, M and T stand for exports, imports and trade respectively. For Joint period effects: + means positive effects and – means negative effects). For Individual yearly effects: + (NY) means positive effects (number of years) and – (NY) means negative effects (number of years). **na** means not applicable