The Economic Partnership Agreements (EPAs) and the Southern African Customs Union (SACU) Region- The Case for South Africa

Sukati, Mphumuzi A
University of Nottingham, UK

01. September 2010

The Economic Partnership Agreements (EPAs) and the Southern African Customs Union (SACU) Region- The Case for South Africa

Mpumuzi A Sukati*

Abstract

EPAs between the EU and ACP countries can be viewed as being anti mercantilist and there has been a lot of speculations about their outcome. The aim of the study is to determine the effects of the Economic Partnership Agreements (EPAs) between the European Union (EU) and the Southern African Customs Union (SACU) members using Global Trade Analysis Project (GTAP) version 7. Two scenarios are analysed: first when the other SACU member states sign the EPAs with the EU excluding South Africa and secondly when the entire SACU member states including South Africa sign a full EPA with the EU. Results show that South Africa does stand to lose when the other member states sign. However, signing of the EPA of the SACU as a bloc, including South Africa result in welfare gain in the region. Significantly, there is an increased export of livestock and processed foods to the EU from SACU region meaning that the region stands to gain in promoting these industries after an EPA. Besides these two sectors, most of the other sectors tend to lose out. It should be noted that full benefits of trade liberalisation agreements depend on speed of industry reform and therefore can only be realised in the long run.

Introduction

There has been controversies concerning the accession to the Economic Partnership Agreements (EPAs) for some member countries of the Southern African Customs Union (SACU) with the stronger economy i.e. South Africa arguing that signing of the EPAs by members of the SACU will result in South African exports losing out to European Union (EU) exports to these state which are namely Botswana, Namibia, Lesotho, and Swaziland (BNLS) after an EPA agreement with the EU. However, South Africa's signing of the EPAs may offset this loss by increased exports to the EU. This paper aims to analyse these scenarios empirically by use of the GTAP model. The paper is arranged as follow: an introduction which gives the background of the study and the SACU region, a brief introduction to the GTAP model and data, Experimental designs, results, discussion and conclusion.

* Mpumuzi A Sukati, School of Economics, University of Nottingham, Nottingham NG7 2RD,
Email: lexmas1@nottingham.ac.uk

As such, various studies have been undertaken on the economic effects of the EPAs in Southern African Development Cooperation (SADC) countries using different approaches and with various and mixed outcomes. Milner et al (2007) found that if Mauritius eliminates all tariffs on imports from the EU, there will be a small welfare loss unless the potential for production gains is included.

Morrissey and Zgovu (2007) by use of a partial equilibrium analytical framework concluded that African Caribbean and the Pacific (ACP) countries should not be excessively concerned about the impact of EPAs: even assuming 'immediate' complete elimination of all tariffs on agriculture imports from the EU, and when excluding up to 20% of imports as sensitive products, over half of ACP countries are likely to experience welfare gains with 10 out of 13 Least Developed Countries (LDC) gaining and about 60% of non LCD's suffering welfare loses.

There has also been uncertainties on whether EPAs will promote regional integration of ACP countries as claimed by the EU or subject ACP countries to unfair competition from subsidized EU exports, such uncertainties arising due to question like: how much liberalization would each ACP country have to undertake to meet the definition of substantially all trade in the EPAs clause, how difficult is it likely to be to forge common regional positions under EPAs that do not result in future problems and what effect will EPA liberalization have on ACP government revenue (Stevens et al 2005).

An important contentious issue in the EPAs as far as trade liberalization and reciprocity arrangement with the EU is concerned is the heterogeneity of the ACP countries in their trade and tariff lines and on their classification of sensitive products. This means that no uniform trade agreement can be suitable for all the ACP countries and this is more so in cases of regional trading blocs and members of customs unions like the SACU who negotiate these EPAs as a unit. These issues makes the arguments proposed by the EU that the EPAs will promote regional integration look over ambitious and not easy to model and support empirically.

In another study by Milner et al (2006) of the effects of the EPAs on East African Cooperation (EAC) countries comprising of Uganda, Kenya and Tanzania where Kenya is the dominant economy and exports products to Tanzania and Uganda, the effect of the EPAs has been found to result in the displacement of Kenyan exports by EU exports with producers losses in Kenya. This 'Kenya effect' then is identical to the South African situation in the SACU region.

Another sensitive question is the effects of EPAs on government revenue and the SACU region is a good case to study in an attempt to answer this question.

Revenue implications and which items to liberalize becomes an important issue for members of a custom union. Studies by Institute of Development Studies, Sussex (IDS) have found that there is no product with a natural overlap among regional blocs meaning negotiations will have

to be set up by the liberalizing states to come to an agreement on which products to liberalize since the countries differ greatly in their trade profile with the EU and will therefore have different classification of sensitive products as the table 1 below shows:

Table 1: BLNS and South Africa's market access to the EU for selected products

Product	Market access for BLNS to EU	Market access for RSA to EU	Relevant for
Fresh, chilled, frozen de-boned meat	92% tariff preference for quota	MFN duty, excluded from the TDCA	Namibia, Botswana, Swaziland
Sugar	Fixed quantity and price	MFN duty, excluded from the TDCA	Swaziland
Grapes	Quota of 900 tons p.a. and only seasonal market access.	Free market access by 2010.	Namibia
Textiles and garments	Duty free market access if precondition of double transformation is fulfilled.	Free market access by 2003/2006 (depending on product). Double transformation is prerequisite.	All BLNS countries
Lamb	Quota of 600,000 tons p.a.	Quota of 600,000 tons applies now for southern Africa and has to be shared with South Africa	Namibia
Confectionery	12.9% plus a supplementary sugar duty	MFN duty, excluded from the TDCA	Swaziland
Sausages	65% reduction of MFN duty for a quota of 500 tons p.a.	Free market access by 2003. For other processed meat products: free market access by 2010.	Namibia, Botswana, Swaziland

Fresh and frozen fish	Free market access. All materials used must be wholly obtained. Limited cumulation options with South Africa (Cotonou Agreement, Annex XIV to Protocol 1)	15% tariff. Tariff concessions will only take effect once a fisheries agreement has been concluded.	Namibia
Canned tuna and tuna loins	Annual quota of 8,000 and 2,000 tons respectively.	Tariff concessions will only take effect once a fisheries agreement has been concluded.	Namibia

Source: Meyn (2004).

Table 1 above can be viewed as highlighting the comparative advantage for the various member states of SACU, which will therefore determine their classification of sensitive products. For example, Swaziland can be viewed as having a comparative advantage in sugar and sugar products as can be seen by the fact that the country export sugar to the EU and would potentially benefit from the reduction in tariff escalation for confectionary products which are sugar based. On the other hand Namibia can be seen as having a comparative advantage in grapes and lamb with all the BLNS states potentially being able to produce garments and textile products but hampered by the World Trade Organisation (WTO) rules of origin clause which cripple these industries in all these countries.

Besides these product differences, Lesotho is also classified as an LCD and is therefore a beneficial to the Everything But Arms (EBA) initiative, thus this country stand in the EPAs will be different from that of the other SACU member states. However, low exports of Lesotho products to the EU despite these arrangements is a sign of poor industry development in that country, as noted by at the United Nations Conference on Trade and Development (UNCTAD) in 2001. This poor industry development and export capacity can also affect the speed of adjustment to policy changes.

Trade agreements between the EU and ACP countries

The European Commission (EC) and African states have a long history of trade agreements. Until 2007 the EU granted non-reciprocity trade preferences to ACP countries under the Cotonou Agreement which was the latest Agreement between the EU and these countries. The Cotonou Agreement followed from a previous agreement called the Lome Convention which

came into effect in 1976 between EC and ACP countries and its various subsequent amendments. There have been other trade agreements between the EC and former African colonies like the Younde Convention of 1963 between EC and 18 African ex colonies and the Arusha convention of 1969 between the EC and the East African countries of Kenya, Uganda and Tanzania.

The hallmark of all these trade agreements is their non-reciprocity and violation of the MFN clause of the WTO and as such they were only temporarily covered by a waiver which expired in December 2007 (Vollmer et al 2008).

The EPAs then aim to integrate ACP countries into the global economy in cognizance of WTO trading rules and they include improvements in the business transactions, promote regional markets and good economic governance. As such, these EPAs have been seen as a way of promoting development and reducing poverty in ACP countries. However there has been a lot of arguments and conflicting stands about the potential benefits of these EPAs more specifically the concern by South Africa that that signing of the EPAs by members of the SACU will result in South African exports to the SACU member states losing out to EU imports by these state after the full applications of the EPAs, which is the direct effect of inter-regional import substitution effect and this may lead to welfare loss if South Africa does not liberalize as well and increase exports to the EU.

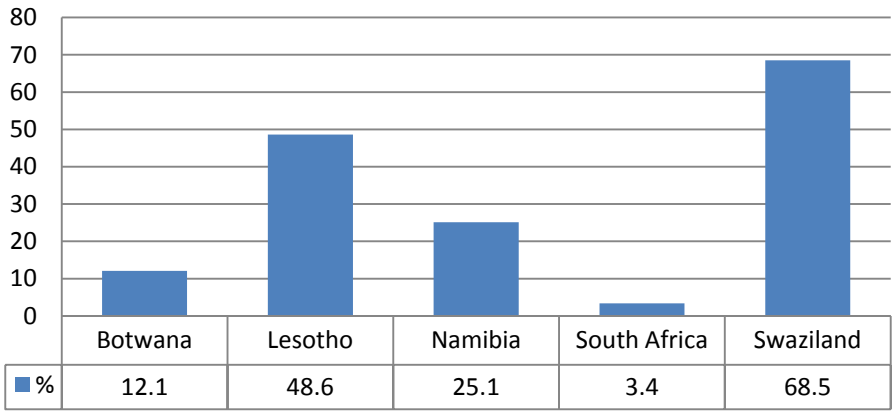
The SACU

The SACU began in 1969 and its members are Botswana, Lesotho, Namibia, South Africa and Swaziland. The aim of the SACU is to maintain free interchange of goods and services between member countries, provision of the application of a common external and excise tariff by the member states and the sharing of these tariff revenues according to a predetermined and agreed revenue sharing formula.

These SACU receipts contribute a significant revenue income for Botswana, Lesotho, Swaziland and Namibia and their potential erosion due to the signing of the EPAs will have significant consequences for these countries.

Graph 1 below show the total government revenue of the different member states from the SACU receipts

Graph 1:SACU receipts as a percentage of total government revenue



Source: Flatters and Stern (2005)

As the figure above shows the weaker economies like Swaziland and Lesotho get a substantial share of their government revenue from the SACU receipts meaning that policies that have a potential to affect the SACU revenue are important for the economic development of these states.

South Africa is the strongest economy of the SACU and also plays an important role at regional and global level. As part of the SACU it accounts for 69% of the total GDP of the SADC (Development Network Africa, 2007). It is also one of the founding countries of the New Partnership for Africa's Development (NEPAD) and plays a key role in the African Union (AU).

The relationship between South Africa and EU is guided by the Trade Development Cooperation Agenda (TDCA). The TDCA is a framework of cooperation in economic development, trade and investments, science and technology with extensions to environment and climate change, macro-economic policy, peace and security, migration, transport, housing, education and training, Information Communication Technology (ICT) and social matters (Council of European Union, 2007).

This paper will analyze the effect of full liberalization of the BNLS states excluding South Africa(experiment 1) and compare the scenario with that where South Africa joins the BNLS states and signs the full EPA agreement with the EU (experiment 2).

The aim is to find out the EPAs effects between the SACU member states and the EU and within the SACU member states in terms of welfare effects, commodity prices, trade volumes and

trade balance. Excluding South Africa in the initial experiment is to find out if the 'Kenya effect' applies to the SACU as well.

The GTAP Model

The model used in this paper is the Standard GTAP model which is a Computable General Equilibrium (CGE) model for comparative static analysis developed by Hertel in 1997.

The GTAP model is a widely used, static, multisector, multiregion applied general equilibrium model. It is based on a detailed database with a broad coverage of trade and explicit statistics on transport margins. Firms use constant-returns-to-scale technologies, except for the resource supply sectors with an upward-sloping supply function, where a fixed factor is included in the production technology to construct a diminishing-returns-to-scale technology. Import demand is modeled through the Armington assumption of imperfect substitutability between domestic and imported goods and between imported goods from different regions. The model assumes a global bank to mediate between world savings and investments, and a region-specific set of equations for consumer demand that allows for different responses to price and income changes across regions (Kuik, 2003)

Details on the theory behind the GTAP Model can be found in Hertel (1997).

Data and Methodology

To simulate the effects of the EPAs we use the GTAP model version 7. The standard GTAP 7 Data Base consists of 57 commodities and 113 regions. The 113 regions are defined as aggregates of 226 countries using the GTAP standard country list. The Alpha-3 codes defined by the International Organization for Standardization (ISO) are used as country codes for the GTAP primary regions.

In the sectoral definitions used in the GTAP 7 Data Base GTAP agricultural and food processing sectors are defined by reference to the Central Product Classification (CPC) and the other GTAP sectors are defined by reference to the International Standard Industry Classification (ISIC) since this is the reference classification point for I-O statistics tables where the GTAP data is sourced. The CPC was developed by the Statistical Office of the United Nations and serves as a bridge between the ISIC and other sectoral classifications (Narayanan et al 2008).

The aggregation of the data base for the study used the complete GTAPAgg software licensed to the author.

Simulation experiments were done using RunGTAP, which is a graphical user environment developed by Mark Horridge of the Centre of Policy Studies at Monash University.

For the study the regions are aggregated in the following manner:

South Africa

EU27- Aggregation of the 27 EU member states

Rest of SACU (RoSACU) – this region comprised Swaziland, Lesotho, Namibia and Botswana

Rest of SADC (RoSADC) – this region comprise the rest of the SADC countries, namely Malawi, Mauritius, Mozambique, Tanzania, Zambia, Zimbabwe, and Madagascar.

Rest of the World (ROW) - all the other regions

Commodities are aggregated by the default GTAP 7 database and these are aggregated into the following groups:

Grain Crops, Livestock and Meat Products, Mining and Extraction, Processed Food, Textile and Clothing, Light Manufacturing, Heavy Manufacturing, Utilities and Construction, Transport and Communication and Other Services.

Factors of production are also the default GTAP7 database and these are divided into the following; Land, Unskilled Labor, Skilled Labor, Capital and Natural Resources.

To model the effects of the EU27 EPAs with the SACU region two experiments are run whereby the SACU region is divided into the South Africa, which is the strongest economy of the customs union and the Rest of SACU comprising the rest of the members of the customs union.

Experiments

Experiment 1: Full reciprocal liberalization of Rest of SACU and EU27 but not South Africa

In this experiment, Swaziland, Botswana, Namibia and Lesotho[1] sign the EPA with the EU and it is assumed that they take the extreme case of 100% reciprocal trade liberalization with the EU27 on all products. This experiment is the extreme case since it does not classify the products into sensitive products that need to be protected and not liberalized and it takes the clause substantial liberalization as full liberalization but it is useful in shedding some light on the possible effects of the EPAs on the SACU member states as an upper bound scenario.

[1] Lesotho is classified as a least developed country and is therefore a beneficially of the EBA protocol with the EU. However for this study, Lesotho is treated the same as the rest of the SACU member states.

Experiment 2: Full reciprocal liberalization of the Rest of South Africa, EU27 and South Africa

This experiment is an equivalent of the full reciprocal EPA agreement between South Africa, EU27 and the Rest of the SACU region.

This again is the extreme case and simulates full EPA without consideration of sensitive products in all the regions.

Closures

The standard GTAP closure is used for these simulations where prices and quantities of all endowment commodities and regional incomes are set to be endogenous. Policy variables, technical change variables and population are all exogenous in the model. To comply with Walras' Law, the equation equating global investment to global savings is eliminated. Therefore following Walras' Law the numeraire price is *pfactwld* which is the world price index of primary factors and *walraslack (a slack variable in the omitted equation) =0*

The following outcome variables are analyzed after the experiments.

Equivalent variation

Market price of commodity i in region r

Market price of composite imports i in region r

World price of composite import i in region r

Domestic price for good i supplied from r to region s

Industry output of commodity i in region r

Export sale of commodity i from region r to region s.

Change in trade balance of i by r: $ US Million

Results and Discussion

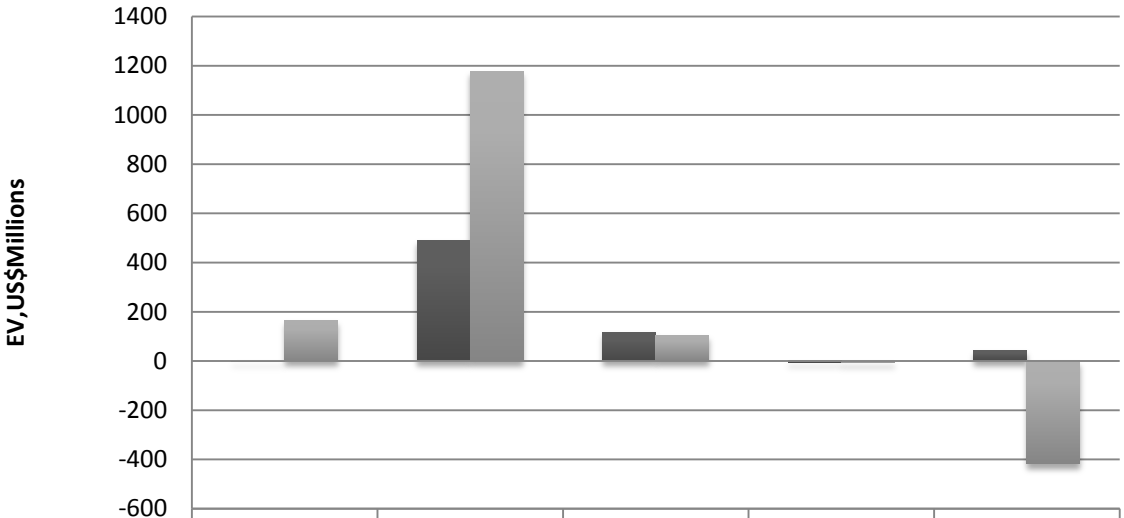
Results of the experiments are shown in Tables 2 to 17 in the appendix.

The results of equivalent variation, which measures welfare are summarised in graph 2 below and show that full reciprocal trade liberalization between the EU and the Rest of SACU region excluding South Africa result in welfare loss of US $2.918 Million for South Africa and a welfare gain of US$ 409.108 million and US$114.649 million for the EU27 and Rest of SACU region respectively. There is also a welfare loss of US$4.376 million for the Rest of the SADC region

which did not liberalized their markets and a welfare gain of US$43.98 million for the Rest of the World.

On the contrary, full reciprocal liberalization of the entire SACU region including South Africa result in a welfare gain of US$ 164.93 Million for South Africa, US$1178.04 million for EU27 and US$105.61 for the rest of the SACU region while there is welfare loss for the rest of SADC and the Rest of the World.

Graph 2: Welfare effects of a SACU EPA without and with South Africa



	SouthAfrica	EU27	RoSACU	RoSADC	ROW
Experiment 1	-2.918	490.108	114.649	-4.376	43.98
Experiment 2	164.93	1178.04	105.61	-7.45	-418.65

These results mean that liberalisations of SACU as a regional bloc will benefit the region and that the concern of South Africa that accession to the EPAs of the other SACU member states will harm South African economy is reasonable. Although the welfare loss is modest, the welfare gain from full EPAs of all the SACU member states is significant.

Market prices of commodities in general go up in the Rest of SACU region after the EPA with EU27. The price of land goes up by as much as 48.52% in the Rest of SACU region, which is significant. Prices of natural resources go down in the Rest of SACU region in both experiments while it goes down slightly for South Africa after experiment 1 and goes up again after experiment 2. Prices of commodities in South Africa generally follow similar trend before and after South African EPA. The price of land goes up by 1.4% before South African EPA and by 5.12% after South African EPA with the EU27 and Rest of SACU.

Prices of commodities in the EU27 generally stay constant after the two experiments. Prices of imports in all the regions under focus i.e. EU27, Rest of SACU and South Africa stay the same for

the two experiments. However, South African signing of EPA together with the Rest of SACU region i.e. experiment 2 results in price decrease for imports of light manufacturing.

World prices of composite imports in all regions generally stay the same in all the regions after the two experiments. Percentage changes of less that 1% are taken to be not significant for the purposes of this discussion.

World prices of composite imports generally stay flat in all regions for both experiments. Prices of imports from EU27 to Rest of SACU generally go down for the Rest of SACU region after experiment 1 while they stay flat for South Africa. This fall in prices of imported commodities could be the reason for the welfare gain in the Rest of SACU region after experiment 1. Prices for goods supplied from South Africa to Rest of SACU stay flat generally after experiment 1.

Industry output of commodities in all the focus regions generally stay flat or go down for commodities like textile, light and heavy manufacturing after experiment in the Rest of SACU region meaning a displacement of these industries outputs in this region by EU27 imports. However, of note is the meat and livestock industries and processed food industries which experience a gain in output of 36.19% and 21.2% respectively for the Rest of SACU region after experiment 1, meaning that these industry output experience high trade barriers into the EU27 markets. These industries experience similar output growth after experiment 2 as well. However, light manufacturing, textile industries and heavy manufacturing shrink after experiment 2 in all the regions of SACU, more significantly in the Rest of SACU region, meaning a lack of competitiveness in these industries.

Export sale of commodities from EU27 to Rest of SACU and from South Africa to Rest of SACU increase but the increase in export sale from EU27 to Rest of SACU is higher than that from South Africa to Rest of SACU which means that South African products are not price competitive with those from EU27.

The Rest of SACU region in both experiments remain a net importer of commodities from both the EU27 and from South Africa in both experiments except for two commodities output which are the livestock industry and the processed food industry in which case the Rest of the SACU region experience a massive increase in exports to the EU27 in both experiments of more that 100% for processed food and more that 200% for livestock industries. These export growth are also supported by the increase in industry output in these sectors, meaning that EPAs agreements between the EU and Rest of SACU will result in significant increase in these two sectors.

The meat and livestock and food processing industries in the Rest of SACU region experience an increase in trade balance of US$278.75 Million and US$386.93 Million respectively after experiment 1 and US$281.06 Million and US$379.01 Million after experiment 2. Indeed the

EU27 experience a negative trade balance in these commodities of comparable magnitude to the trade balance gains in the Rest of the SACU region.

Export sale of commodities from South Africa to Rest of SACU follow similar trends in both experiments in that South African export to this region increase in both cases. This is according to intuition as these states are members of a customs union and already function as a free trade area. Of note is the increase in exports from South Africa to EU27 after a South African EPA with the EU27, which could account for the welfare gain noted for South Africa except for the textile industry, light and heavy manufacturing which experience a huge negative trade balance after experiment 2, which means that these industries are not competitive in South Africa.

The results have therefore shown that the EPAs in the SACU region will benefit mainly the livestock and meat industries and food processing industries. It should be noted that even though there will be no quota or tariff barriers after EPAs, non tariff barriers like Sanitary and the PhytoSanitary (SPS) requirements are expected to remain. As such, for these industries to benefit they should improve their standards and transparency in the food production chain. For this reason programs like food safety standards and disease control programs especially of transboundary livestock disease like Foot and Mouth Disease (FMD), Avian Influenza (AI) and other zoonotics with potential to be pandemics should be better tackled at regional level to reduce costs and improve international trade and regional integration.

Conclusion

The paper has shown the usefulness of the GTAP in analysis regional and international trade policies. The study has shown that in the SACU region, the stronger economy i.e. South Africa stand to lose out if the other member states, i.e. Botswana, Namibia, Lesotho and Swaziland sign the EPA with the EU without South Africa as shown by the welfare loss. However, if they sign the EPAs as a regional bloc, the region stand to gain, as shown by a general welfare gain. Industries that stand to benefit the most are the livestock and meat industries and the food processing industries.

Industries that are likely to lose out from EU27 exports are the light and heavy manufacturing industries. It is important that for the region to fully benefit from EPA with the EU27, the member states should cooperate with each other especially in terms of food processing standards and livestock disease control programs since it is likely that non tariff barriers like the SPS requirements will become even more important in food industries development and trade.

Negotiation of EPAs as regional blocs and developing industries that could potentially benefit all members of the region will reduce country heterogeneity in terms of their classification of sensitive products, harmonize trade, reduce costs and promote regional integration.

References

1. Development Network Africa (2007). '*Evaluation of an Appropriate Model for a SADC Customs Union.'* Report Commissioned by The SADC Secretariat
2. Flatters F, Stern M (2005). '*Implementing the SACU Revenue-Sharing Formula: Customs Revenues.'* Policy briefing prepared for the South Africa National Treasury, under the Trade Policy Development Project (TPDP) and Support for Economic Growth and Analysis (SEGA II) SACU Secretariat, South Africa National Treasury, any other SACU Member State, USAID, or any of their officials or representatives.
3. Hertel T (1997). Purdue University. '*Global Trade Analysis: Modelling and Application*.' Cambridge University Press, Cambridge CB2 1RP
4. Kuik O, Gerlagh R (2003). '*Trade Liberalisation and Carbon Leakage.*' The Energy Journal, Vol. 24, No. 3.
5. Meyn M (2004). *'The EU – South Africa FTA and its effect on EPA negotiations'* Institute for World Economics and International Management (IWIM),University of Bremen: Conference paper prepared for the European Community Studies Association in Southern Africa: "The relationship between Africa and the European Union", University of Western Cape, January 22nd-23rd, 2004.
6. Milner C et al (2006). '*Some Simple Analytics of the Trade and Welfare Effects of Economic Partnership Agreements.*' Journal of African Economics, Volume 14, Number 3 pp. 327-358.
7. Milner C, Morrissey C, Zgovu E (2007). '*Adjusting to Bilateral Trade Liberalization under an EPA: Evidence for Mauritius*.' Centre for Research in Economic Development and International Trade (CREDIT) Research Paper. University of Nottingham
8. Morrissy O, Zgovu E (2007). '*The Impact of Economic Partnership Agreements on ACP Agricultural Imports and Welfare*.' Centre for Research in Economic Development and International Trade (CREDIT) Research Paper. University of Nottingham
9. Stevens C, Kennan J (2005). *'EU-ACP Economic Partnership Agreements: The effects of Reciprocity'*: Institute of Development Studies, Sussex
10. United Nations Conference on Trade and Development (UNCTAD, 2001). 'Improving Market Access for Least Developed Countries.' UNCTAD/DITC/TNCD/4
11. Vollmer S et al (2008). '*EU-ACP ECONOMIC PARTNERSHIP AGREEMENTS: Empirical Evidence for Sub-Saharan Africa.'* World Development Report 2009 – Development in 3D: Density, Distance, Division

Appendix

Table 2: Equivalent Variation (Experiment 1)	
EV	US$ Million
SouthAfrica	-2.918
EU27	490.108
RoSACU	114.649
RoSADC	-4.376
ROW	43.98

Table 3: Market price of commodity i in region r (% change) [Experiment 1]					
	pm[*EU27]	pm[*SouthAfrica]	pm[*RoSACU]	pm[*RoSADC]	pm[*ROW]
Land	-0.16	1.41	48.52	0.09	-0.02
UnSkLab	0	0.03	2.5	0.01	0
SkLab	0	0.03	1.79	-0.01	0
Capital	0	0.03	1.9	0	0
NatRes	0.08	-0.11	-13.85	0.03	0.04
GrainsCrops	-0.01	0.13	4.68	0.02	0
MeatLstk	-0.02	0.09	4.12	0.01	0
Extraction	0.01	0.01	0.29	0.01	0.01
ProcFood	-0.01	0.05	1.65	0.01	0
TextWapp	0	0.04	1.19	0.01	0
LightMnfc	0	0.04	1.07	0.01	0
HeavyMnfc	0	0.03	1.37	0.01	0
Util_Cons	0	0.03	1.24	0.01	0
TransComm	0	0.03	1.55	0.01	0
OthServices	0	0.03	1.65	0	0
CGDS	0	0.04	0.71	0.02	0

Table 4: Market price of composite imports i in region r (% change) [Experiment 1]

	pim[*EU27]	pim[*SouthAfrica]	pim[*RoSACU]	pim[*RoSADC]	pim[*ROW]
GrainsCrops	0	0.11	0.08	0.04	0
MeatLstk	-0.18	0.99	0.1	0.18	0
Extraction	0.01	0.01	0.01	0.03	0.01
ProcFood	-0.1	0.3	-0.18	0.11	0
TextWapp	0	0.13	-0.22	0.01	0
LightMnfc	0	0.03	-0.9	0.02	0
HeavyMnfc	0	0.06	-0.07	0.04	0
Util_Cons	0	0	0.01	0	0
TransComm	0	0	0	0	0
OthServices	0	0	0	0	0

Table 5: World price of composite imports i in region r (% change) [Experiment 1]

	piw[*EU27]	piw[*SouthAfrica]	piw[*RoSACU]	piw[*RoSADC]	piw[*ROW]
GrainsCrops	0	0.11	0.1	0.03	0
MeatLstk	-0.01	1.06	0.15	0.18	0
Extraction	0.01	0.01	0.01	0.03	0.01
ProcFood	0	0.33	0.05	0.11	0
TextWapp	0	0.16	0.02	0.01	0
LightMnfc	0	0.04	0.03	0.02	0
HeavyMnfc	0	0.06	0.03	0.04	0
Util_Cons	0	0	0.01	0	0
TransComm	0	0	0	0	0
OthServices	0	0	0	0	0

Table 6: Domestic price for good i supplied from region r to region s (% change) [Experiment 1]

pms[*EU27*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-0.01	-0.01	-3.81	-0.01	-0.01

MeatLstk	-0.02	-0.02	-5.08	-0.02	-0.02
Extraction	0.01	0.01	0	0.01	0.01
ProcFood	-0.01	-0.01	-7.7	-0.01	-0.01
TextWapp	0	0	-12.67	0	0
LightMnfc	0	0	-11.89	0	0
HeavyMnfc	0	0	-1.25	0	0
Util_Cons	0	0	0	0	0
TransComm	0	0	0	0	0
OthServices	0	0	0	0	0

pms[*SouthAfrica*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**
GrainsCrops	0.13	0.1	0.12	0.11	0.11
MeatLstk	0.09	0.09	0.09	0.09	0.09
Extraction	0.01	0.01	0.01	0.01	0.01
ProcFood	0.05	0.05	0.05	0.05	0.05
TextWapp	0.04	0.04	0.04	0.04	0.04
LightMnfc	0.04	0.03	0.03	0.03	0.03
HeavyMnfc	0.03	0.03	0.03	0.03	0.03
Util_Cons	0.03	0.03	0.03	0.03	0.03
TransComm	0.03	0.03	0.03	0.03	0.03
OthServices	0.03	0.03	0.03	0.03	0.03

pms[*RoSACU*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**
GrainsCrops	4.03	3.12	4.07	4.13	4.07
MeatLstk	3.92	-40.32	4.02	3.88	3.93
Extraction	0.24	0.29	0.27	0.27	0.28
ProcFood	1.52	-29.25	1.55	1.52	1.52
TextWapp	1.12	0.91	1.12	1.11	1.13
LightMnfc	1.02	1.04	1.03	0.99	1.02
HeavyMnfc	1.31	1.31	1.31	1.31	1.34

Util_Cons	1.24	1.24	1.24	1.24	1.24
TransComm	1.55	1.55	1.55	1.55	1.55
OthServices	1.65	1.65	1.65	1.65	1.65

pms[*RoSADC*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**
GrainsCrops	0.02	0.01	0.01	0.02	0.02
MeatLstk	0.01	0.01	0.01	0.01	0.01
Extraction	0.01	0.01	0.01	0.01	0.01
ProcFood	0.01	0.01	0.01	0.01	0.01
TextWapp	0.01	0.01	0.01	0.01	0.01
LightMnfc	0.01	0.01	0.01	0.01	0.01
HeavyMnfc	0.01	0.01	0.01	0.01	0.01
Util_Cons	0.01	0.01	0.01	0.01	0.01
TransComm	0.01	0.01	0.01	0.01	0.01
OthServices	0	0	0	0	0

pms[*ROW*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**
GrainsCrops	0	0	0	0	0
MeatLstk	0	0	0	0	0
Extraction	0.01	0.01	0.01	0.01	0.01
ProcFood	0	0	0	0	0
TextWapp	0	0	0	0	0
LightMnfc	0	0	0	0	0
HeavyMnfc	0	0	0	0	0
Util_Cons	0	0	0	0	0
TransComm	0	0	0	0	0
OthServices	0	0	0	0	0

Table 7: Industry output of commodity i in region r (% change) [Experiment 1]

	qo[*EU27]	**qo[*SouthAfrica]**	**qo[*RoSACU]**	**qo[*RoSADC]**	**qo[*ROW]**
Land	0	0	0	0	0

UnSkLab	0	0	0	0	0
SkLab	0	0	0	0	0
Capital	0	0	0	0	0
NatRes	0	0	0	0	0
GrainsCrops	-0.01	0.41	1.41	0.02	0
MeatLstk	-0.19	0.36	36.19	0.03	-0.01
Extraction	0.01	-0.02	-2.8	0	0.01
ProcFood	-0.05	0.21	21.2	0.01	-0.01
TextWapp	0.01	-0.06	-7.44	-0.03	0.01
LightMnfc	0.01	-0.15	-4.4	-0.02	0
HeavyMnfc	0.01	-0.04	-7.26	0.01	0
Util_Cons	0	-0.01	1.45	-0.02	0
TransComm	0	0	-0.08	-0.01	0
OthServices	0	0	-0.58	-0.01	0
CGDS	0	-0.01	2.27	-0.03	0

Table 8: Export Sales of commodity i from region r to region s (% change) [Experiment 1]

qxs[*EU27*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**
GrainsCrops	0.79	0.01	36.15	0.2	0.05
MeatLstk	4.7	-0.8	56.7	0.94	0.11
Extraction	0	0.04	0.27	0.16	-0.01
ProcFood	0.89	-0.23	38.83	0.32	0.03
TextWapp	0.71	0.02	91.74	0.07	0.04
LightMnfc	0.19	0.01	76.25	0.1	0.02
HeavyMnfc	0.36	0.01	10.28	0.24	0.02
Util_Cons	0.07	0	2.63	0.02	0.01
TransComm	0.08	0.01	3.23	0.01	0.01
OthServices	0.08	0.01	2.76	0.01	0.01
qxs[*SouthAfrica*]	**SouthAfrica**	**EU27**	**RoSACU**	**RoSADC**	**ROW**

GrainsCrops	0.06	-0.56	16.33	-0.44	-0.55
MeatLstk	3.91	-1.57	19.52	0.2	-0.65
Extraction	-0.05	0	0.07	0.15	-0.04
ProcFood	0.63	-0.47	5.47	0.09	-0.2
TextWapp	0.38	-0.31	-3.05	-0.24	-0.28
LightMnfc	-0.06	-0.23	-2.76	-0.13	-0.22
HeavyMnfc	0.09	-0.24	0.7	0	-0.23
Util_Cons	-0.09	-0.16	2.47	-0.14	-0.15
TransComm	-0.07	-0.14	3.09	-0.13	-0.13
OthServices	-0.06	-0.13	2.63	-0.13	-0.13

qxs[*RoSACU*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-19.62	-15.81	-3.64	-20.72	-20.57
MeatLstk	-23.62	288.81	-8.76	-27.06	-28.29
Extraction	-2.72	-3.26	-2.92	-2.86	-3.24
ProcFood	-5.68	125.62	-0.97	-6.26	-6.56
TextWapp	-7.68	-6.78	-11.12	-8.22	-8.37
LightMnfc	-6.59	-6.88	-9.37	-6.47	-6.74
HeavyMnfc	-9.39	-9.73	-8.85	-9.52	-9.95
Util_Cons	-5.68	-5.74	-3.11	-5.73	-5.74
TransComm	-5.81	-5.88	-2.65	-5.87	-5.87
OthServices	-6.2	-6.27	-3.52	-6.27	-6.27

qxs[*RoSADC*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	0.65	-0.13	16.84	0.06	-0.09
MeatLstk	4.47	-1.03	20.07	0.72	-0.12
Extraction	0.02	0.05	0.12	0.18	0
ProcFood	0.8	-0.31	5.63	0.24	-0.05
TextWapp	0.63	-0.07	-2.81	-0.01	-0.04
LightMnfc	0.11	-0.08	-2.59	0.02	-0.07

HeavyMnfc	0.26	-0.08	0.87	0.15	-0.07
Util_Cons	0.02	-0.05	2.58	-0.03	-0.04
TransComm	0.04	-0.03	3.2	-0.02	-0.02
OthServices	0.05	-0.02	2.74	-0.01	-0.01

qxs[*ROW*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	0.74	-0.04	16.93	0.15	0
MeatLstk	4.59	-0.92	20.18	0.83	-0.01
Extraction	0.02	0.05	0.12	0.17	0
ProcFood	0.86	-0.26	5.68	0.29	0
TextWapp	0.69	-0.01	-2.75	0.05	0.02
LightMnfc	0.17	-0.01	-2.53	0.08	0
HeavyMnfc	0.33	-0.01	0.93	0.22	0
Util_Cons	0.06	-0.01	2.62	0.01	0
TransComm	0.06	-0.01	3.22	0	0
OthServices	0.06	0	2.75	0	0

Table 9: Change in trade balance by i and by r ($US Million) [Experiment 1]

	DTBALi[*EU27]	DTBALi[*SouthAfrica]	DTBALi[*RoSACU]	DTBALi[*RoSADC]	DTBALi[*ROW]
GrainsCrops	37.3	26.7	-65.59	2.13	1.57
MeatLstk	-243.73	25.06	278.75	0.6	-68.7
Extraction	-21.02	1.99	-116.26	0.57	130.41
ProcFood	-361.29	41.1	386.93	0.06	-89.53
TextWapp	41.26	-3.59	-77.77	-0.54	43.34
LightMnfc	196.72	-56.95	-101.04	-0.21	-37.55
HeavyMnfc	277.02	-18.14	-234.18	-0.75	-22.23
Util_Cons	4.6	0.18	-4.3	0.11	-0.6
TransComm	53.02	-6.53	-30.3	-0.3	11.67
OthServices	64.32	-4.84	-70.33	-0.07	10.93

Table 10: Equivalent variation ($ US million) [Experiment 2]	
EV	
SouthAfrica	164.93
EU27	1178.04
RoSACU	105.61
RoSADC	-7.45
ROW	-418.65

Table 11: Market Price of Commodity i in Region r [Experiment 2]					
	SouthAfrica	EU27	RoSACU	RoSADC	ROW
Land	5.12	-0.28	49.01	0.21	-0.03
UnSkLab	0.28	0.02	1.96	-0.06	-0.01
SkLab	0.29	0.02	1.39	-0.07	-0.01
Capital	0.3	0.02	1.56	-0.08	-0.01
NatRes	0.91	-0.04	-11.06	0.27	0.06
GrainsCrops	0.34	0	4.41	-0.03	-0.01
MeatLstk	0.14	-0.01	3.82	-0.04	-0.01
Extraction	0.11	0.01	0.23	-0.01	0
ProcFood	0.02	0.01	1.36	-0.04	-0.01
TextWapp	-0.07	0.01	0.9	-0.05	-0.01
LightMnfc	-0.59	0.02	0.72	-0.06	-0.01
HeavyMnfc	-0.05	0.01	1.05	-0.05	-0.01
Util_Cons	-0.01	0.02	0.91	-0.05	-0.01
TransComm	0.02	0.02	1.2	-0.06	-0.01
OthServices	0.07	0.02	1.28	-0.06	-0.01
CGDS	-0.59	0.01	0.42	-0.05	-0.01

Table 12: Market price of composite import i in region r (% change) [Experiment 2]

pim	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-0.13	-0.02	0.17	0.06	-0.01
MeatLstk	0.28	-0.2	0.14	0.18	-0.01
Extraction	0	0.01	0.05	0.03	0
ProcFood	-2.23	-0.16	-0.21	0.08	0
TextWapp	-1.18	0	-0.28	-0.01	0
LightMnfc	-5.41	0	-1.39	-0.15	0
HeavyMnfc	-0.69	0.01	-0.13	0	0
Util_Cons	0	0.01	-0.01	-0.01	0
TransComm	0	0	0	0	0
OthServices	0	0.01	0.01	0	0

Table 13: World price of composite import i in region r (% change) [Experiment 2]

piw	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	0.1	0	0.25	0.06	-0.01
MeatLstk	0.98	0	0.19	0.17	-0.01
Extraction	0.01	0.01	0.05	0.03	0
ProcFood	0.27	0.01	0.02	0.08	0
TextWapp	0.11	0	-0.04	-0.01	0
LightMnfc	0.03	0.01	-0.46	-0.15	0
HeavyMnfc	0.05	0.01	-0.04	0	0
Util_Cons	0	0.01	-0.01	-0.01	0
TransComm	0	0	0	0	0
OthServices	0	0.01	0.01	0	0

Table 14: Domestic price for good i supplied from r to region s [Experiment 2]

pms[*EU27*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-4.11	0	-3.8	0	0
MeatLstk	-5.14	-0.01	-5.07	-0.01	-0.01
Extraction	-0.04	0.01	0	0.01	0.01

ProcFood	-10.25	0.01	-7.69	0.01	0.01
TextWapp	-10.5	0.01	-12.66	0.01	0.01
LightMnfc	-10.47	0.01	-11.87	0.01	0.01
HeavyMnfc	-1.55	0.01	-1.24	0.01	0.01
Util_Cons	0.02	0.02	0.02	0.02	0.02
TransComm	0.02	0.02	0.02	0.02	0.02
OthServices	0.02	0.02	0.02	0.02	0.02
pms[*SouthAfrica*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	0.34	-0.79	0.22	0.29	0.27
MeatLstk	0.14	-4.77	0.14	0.13	0.13
Extraction	0.11	-0.06	0.1	0.09	0.1
ProcFood	0.02	-10.7	0.01	0.01	0.01
TextWapp	-0.07	-0.74	-0.07	-0.07	-0.07
LightMnfc	-0.59	-2.19	-0.58	-0.54	-0.56
HeavyMnfc	-0.05	-0.22	-0.05	-0.05	-0.05
Util_Cons	-0.01	-0.01	-0.01	-0.01	-0.01
TransComm	0.02	0.02	0.02	0.02	0.02
OthServices	0.07	0.07	0.07	0.07	0.07
pms[*RoSACU*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	3.8	2.91	3.84	3.9	3.84
MeatLstk	3.64	-40.6	3.73	3.6	3.65
Extraction	0.19	0.23	0.21	0.21	0.22
ProcFood	1.25	-29.52	1.27	1.25	1.25
TextWapp	0.85	0.63	0.85	0.84	0.85
LightMnfc	0.69	0.7	0.7	0.67	0.69
HeavyMnfc	1	0.99	1.01	1	1.02
Util_Cons	0.91	0.91	0.91	0.91	0.91
TransComm	1.2	1.2	1.2	1.2	1.2

OthServices	1.28	1.28	1.28	1.28	1.28
pms[*RoSADC*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-0.02	-0.02	-0.02	-0.02	-0.02
MeatLstk	-0.04	-0.04	-0.04	-0.04	-0.04
Extraction	-0.01	-0.01	-0.01	-0.01	-0.01
ProcFood	-0.04	-0.04	-0.04	-0.04	-0.04
TextWapp	-0.04	-0.04	-0.04	-0.04	-0.04
LightMnfc	-0.05	-0.05	-0.05	-0.05	-0.05
HeavyMnfc	-0.04	-0.04	-0.04	-0.04	-0.04
Util_Cons	-0.05	-0.05	-0.05	-0.05	-0.05
TransComm	-0.06	-0.06	-0.06	-0.06	-0.06
OthServices	-0.06	-0.06	-0.06	-0.06	-0.06
pms[*ROW*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-0.01	-0.01	-0.01	-0.01	-0.01
MeatLstk	-0.01	-0.01	-0.01	-0.01	-0.01
Extraction	0	0	0	0	0
ProcFood	-0.01	-0.01	-0.01	-0.01	-0.01
TextWapp	-0.01	-0.01	-0.01	-0.01	-0.01
LightMnfc	-0.01	-0.01	-0.01	-0.01	-0.01
HeavyMnfc	-0.01	-0.01	-0.01	-0.01	-0.01
Util_Cons	-0.01	-0.01	-0.01	-0.01	-0.01
TransComm	-0.01	-0.01	-0.01	-0.01	-0.01
OthServices	-0.01	-0.01	-0.01	-0.01	-0.01

Table 15: Industry output of commodity i in region r (% change) [Experiment 2]

qo	SouthAfrica	EU27	RoSACU	RoSADC	ROW
Land	0	0	0	0	0
UnSkLab	0	0	0	0	0
SkLab	0	0	0	0	0

Capital	0	0	0	0	0
NatRes	0	0	0	0	0
GrainsCrops	1.46	-0.05	1.67	0.07	0
MeatLstk	1.19	-0.22	36.5	0.02	-0.01
Extraction	0.09	-0.01	-2.24	0.05	0.01
ProcFood	1.95	-0.08	20.76	0	-0.01
TextWapp	-0.79	0.02	-7.11	0.08	0.01
LightMnfc	-2.25	0.09	-9.08	-1.19	-0.03
HeavyMnfc	-0.15	-0.01	-6.81	0.1	0.01
Util_Cons	1.49	0	1.44	-0.01	-0.01
TransComm	-0.09	0	-0.22	0.03	0
OthServices	0.01	0	-0.44	0.02	0
CGDS	2.75	0	2.16	-0.07	-0.02

Table 16: Export sale of commodity i from r to s (% change) [Experiment 2]

qxs[*EU27*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	21.95	-0.09	35.76	0.13	-0.04
MeatLstk	38.8	-0.93	55.94	0.65	-0.03
Extraction	0.54	-0.03	0.21	0.14	-0.04
ProcFood	39.3	-0.41	38.11	0.09	-0.06
TextWapp	72.16	-0.05	90.76	-0.22	-0.14
LightMnfc	45.08	-0.03	72.27	-1.05	-0.15
HeavyMnfc	8.6	-0.04	9.15	-0.18	-0.13
Util_Cons	0.12	-0.02	1.9	-0.22	-0.1
TransComm	0	-0.02	2.51	-0.17	-0.08
OthServices	0.1	-0.02	2.07	-0.18	-0.09
qxs[*SouthAfrica*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-0.49	3.87	15.44	-1.37	-1.43
MeatLstk	0.85	33.32	18.51	-0.33	-1.03

Extraction	-1.3	0.8	-1.03	-0.76	-1.09
ProcFood	-4.88	45.65	4.96	0.05	-0.09
TextWapp	-5.56	5.56	-3.09	0.38	0.48
LightMnfc	-20.42	14.6	-2.54	2.59	3.64
HeavyMnfc	-2.59	1.67	0.29	0.28	0.33
Util_Cons	0.25	0.11	2.03	-0.09	0.03
TransComm	-0.01	-0.03	2.5	-0.18	-0.09
OthServices	-0.08	-0.2	1.89	-0.36	-0.27

qxs[*RoSACU*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	-17.96	-14.81	-2.82	-19.56	-19.44
MeatLstk	-24.28	290.81	-7.33	-25.24	-26.29
Extraction	-2.22	-2.62	-2.3	-2.23	-2.57
ProcFood	-10.19	126.66	-0.45	-5.28	-5.42
TextWapp	-12.43	-4.63	-9.93	-6.37	-6.38
LightMnfc	-28.85	-4.57	-11.02	-5.38	-4.61
HeavyMnfc	-10.41	-7.31	-7.56	-7.53	-7.65
Util_Cons	-4.03	-4.17	-2.25	-4.37	-4.25
TransComm	-4.5	-4.52	-1.99	-4.67	-4.58
OthServices	-4.7	-4.82	-2.73	-4.98	-4.88

qxs[*RoSADC*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	1.32	0	16.68	0.22	0.06
MeatLstk	2.13	-0.71	19.74	0.87	0.19
Extraction	0.17	0.21	0.31	0.37	0.21
ProcFood	-4.66	-0.23	5.17	0.26	0.13
TextWapp	-5.79	0.38	-3.29	0.19	0.28
LightMnfc	-23.96	0.42	-6.07	-0.62	0.3
HeavyMnfc	-2.64	0.4	0.21	0.24	0.3
Util_Cons	0.44	0.3	2.22	0.1	0.22

TransComm	0.29	0.27	2.8	0.12	0.21
OthServices	0.42	0.3	2.39	0.14	0.23

qxs[*ROW*]	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	1.26	-0.05	16.63	0.16	0
MeatLstk	1.95	-0.89	19.58	0.69	0.01
Extraction	-0.02	0.02	0.13	0.2	0.02
ProcFood	-4.78	-0.34	5.06	0.15	0.01
TextWapp	-6.04	0.12	-3.54	-0.06	0.03
LightMnfc	-24.25	0.12	-6.34	-0.9	0
HeavyMnfc	-2.92	0.12	-0.02	-0.02	0.02
Util_Cons	0.24	0.1	2.02	-0.1	0.02
TransComm	0.1	0.08	2.61	-0.07	0.02
OthServices	0.22	0.1	2.19	-0.06	0.03

Table 17: Change in trade balance by i and by r ($ US Million) [Experiment 2]

DTBALi	SouthAfrica	EU27	RoSACU	RoSADC	ROW
GrainsCrops	63.26	-31.69	-62.68	6.63	10.18
MeatLstk	83.19	-312.45	281.06	0.9	-63.32
Extraction	24.5	-30.38	-93.06	3.9	87.81
ProcFood	392.04	-686.41	379.01	-0.54	-142.4
TextWapp	-63.99	39.99	-74.45	1.98	89.13
LightMnfc	-1061.99	2084.76	-183.79	-28.08	-872.04
HeavyMnfc	-354.99	-624.06	-202.22	10.92	1137.32
Util_Cons	-0.12	-26.76	-3.27	1.51	28.64
TransComm	-3.87	-103.72	-23.65	4.85	318.39
OthServices	-10.05	-283.34	-54.32	3.34	344.37