



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

THE POTENTIAL IMPACT OF A SOUTHERN AFRICAN COMMON EXTERNAL TARIFFS REGIME ON THE ECONOMY OF LESOTHO

Yonas Tesfamariam Bahta

University of the Free State, Department of Agricultural Economics Bloemfontein
9300, South Africa, E-mail: Bahtay@ufs.ac.za and Yonas204@yahoo.com

Johannes Andries Groenewald

University of the Free State, Department of Agricultural Economics Bloemfontein
9300, South Africa

Abstract

The aim of this paper is to determine the impact of Southern Africa Common External Tariff (CET) on the economy of Lesotho using a Computable General Equilibrium (CGE) model. Lesotho Social Accounting Matrix (SAM) was the core database and a base scenario for the application of a CGE model. The result indicate that CET for non-SACU (Southern African Custom Union) members were likely to cause significant decrease in exports of textile the main export product of Lesotho. The quantity of agriculture export varies from -1.78% (raw wool) to 0.25% (egg), the highest increase of quantity export observed in egg sector and the lowest quantity of export observed in raw wool sector. The quantity of agricultural import decreased in general, it ranges from -3.74% for skin and hide sector and -0.76% for egg sub-sector. In the textile sector, the quantity of aggregated marketed commodities was decreasing significantly. Quantity of aggregated marketed for processing of grain and grain products increase by 1.58%. Output prices and intermediate aggregate inputs of micro industry were increasing. Agricultural output decreased by 0.63%. CET also causes Lesotho household welfare, labour and capital to decline. The study concludes that CET within SACU (South African Custom Union) region will not benefit Lesotho, a country with a fragile economy. Lesotho should strength trade partnership with Rest of the world in order to boost the economy of the country.

Key words: Common External Tariff, Social Accounting Matrix, Computable General Equilibrium, Southern Africa Custom Union and Agriculture.

1. Introduction

Changes have occurred with respect to border protection facing Lesotho to South Africa, Southern Africa and rest of the world (ROW). The changes have resulted from ongoing inter-governmental efforts to liberalize regional markets within Southern Africa. The Southern African Custom Union (SACU) aims to create a free trade area among Southern African countries. SACU has developed a common external tariff (CET) regime that affects non-member imports; whereas within-SACU imports are essentially free of customs duties. Lesotho exports to South Africa and Southern Africa consist of vegetables, cattle, sheep and goats, poultry, diamonds, beef, processed grain, beverages and tobacco, raw wool, raw mohair, textiles, leather and wood, bricks, steel and metallic products, other manufacturing, electricity and water, commercial and informal trade, and other services. Textiles have

become Lesotho's most important export by far, accounting for approximately 60% of export earnings in 2000 (Conningarth Economists and World Bank, 2002).

Lesotho's macro-economic policy is circumscribed due to its membership of the Common Monetary Area (CMA). Other CMA members are Namibia, South Africa and Swaziland. In the CMA, currencies are pegged at parity with the South African Rand. This eliminates monetary policy autonomy and implies that Lesotho's external competitiveness will be reflected in movements in the real effective exchange rate (REER) of the Rand (Integrated Framework, 2003; Bahta, 2013).

Lesotho has had a relatively liberal foreign trade regime through its membership of SACU, the world's oldest customs union formed in 1910. The SACU agreement calls for all members to apply the same customs and excise duties (as well as related trade laws) to goods imported from outside into the common customs area (Bahta, 2007). Goods imported from outside the common customs area are subject to a common external tariff (CET). Lesotho has used SACU import tariffs (CET of SACU). In this paper the potential impact of a Southern African Common External Tariffs regime on the economy of Lesotho studied and analyses.

Tariff liberalization and simplification conducted in the 1990s caused SACU to have a relatively open trade regime. In 2001 the average tariff rate applied to most favourable nations (MFN) was 10.4%, down from 15.1% in 1997. There were significant tariff peaks on garments in the CET and this created an anti-export bias for Lesotho. The CET is moreover plagued by a number of specific, compound, mixed and formula duties, which are less transparent than simple *ad valorem* tariffs and therefore facilitate protectionist lobbying (Anon, 2003).

The CET is implemented within the customs union (SACU). The CET regime harmonizes the rate of tariffs applied to extra-SACU imports, while eliminating intra-SACU tariffs. Tariffs affect domestic resource allocation by raising the domestic price of tradable goods above world prices. Quantity restrictions, which reduce the supply of imports, also serve to increase domestic prices of restricted goods (Jakobeit *et al.*, 2005). Jakobeit *et al.* (2005) cited the average CET rates applicable to non-SACU imports in Lesotho in a summary that is showed Table 1.

The potential effects of CET reform are determined by applying the rates of relevant non-SACU imports. These rates are zero on SACU imports. The Lesotho Computable General Equilibrium (CGE) model uses an aggregate CET tariff, which is computed as a weighted average of the SACU and non-SACU tariffs under the CET regime (the weight being the respective shares of SACU and non-SACU imports in total imports). The CET simulation is run by substituting the aggregated import tariffs for the base tariffs calibrated from the Lesotho data. Thus, in this study, the average import tariff is taken as 8.21%. It incorporates the mean of the overall tariff by the corresponding import commodities (all commodities imported by Lesotho).

In the study of the main African regional agreements the Economic and Monetary West Africa (UEMOA or WAEMU), the Economic Community of Central Africa (CEMAC) of preferential trade area and the monetary unions with a common currency (the CFA franc) zone, Carrere (2004), using a gravity model found that the combining preferential tariff and currency unions have largely reinforced the positive effect of the corresponding preferential trade agreement on intra-regional trade; while dampening their trade diversion effect and currency unions have a trade creation effect (all the more important as the international monetary environment is more unstable), whereas preferential trade agreements is evidence of a trade diversion. Enhancing intra-regional trade may result in trade diversion as well as trade creation. According to Viner's (1950) analysis, or that of Kemp and Wan (1976) relative to preferential trade agreements, in order to limit the risk of trade diversion and the associated loss of welfare, the member must not increase their tariffs on imports from the rest of the world (cited by Carrere, 2004).

Table 1. Average Nominal Tariff Protection (CET) on Imports from the Rest of the World (ROW) (%)

Commodity	SACU CET
Agriculture and forestry	5%
Fishing	8%
Mining	1%
Food processing	13%
Beverages	21%
Tobacco	32%
Textiles	24%
Clothing	51%
Leather and footwear	21%
Wood and wood products	9%
Furniture	19%
Paper	7%
Publishing	5%
Petroleum and coal products	3%
Basic chemicals	2%
Industrial chemicals	4%
Other chemicals	4%
Rubber	13%
Plastic	14%
Glass and ceramics	7%
Ceramic products	8%
Other non-metallic products	3%
Iron and steel products	3%
Fabricated metal products	8%
Machinery	3%
Electrical machinery and appliances	4%
Professional and scientific equipment	0%
Vehicles	17%
Other vehicles	1%
Other manufacturing	8%
All other products	2%

Source: Jakobeit *et al.* (2005).

Customs Unions (CUs) such as UEMOA and CEMAC have both LDC and non-LDC member countries. If the former do not liberalise their trade policy with respect to imports from the EU while the latter do, it will mean the end of the common external tariff (CET) and of the CUs. Significant barriers to intra-regional trade still remain within 'free' trade areas, even within customs unions, in Sub-Saharan Africa (SSA). The Economic Community of Western African States (ECOWAS) Free trade area has not yet really been implemented, the main problem being Nigeria. Nigeria's economy is larger than that of all of the other ECOWAS countries put together, and its trade policy is much more restrictive than that of the UEMOA and some countries in Common Market for Eastern and Southern Africa (COMESA) still maintains barriers to free intra-regional trade. Even though CEMAC and UEMOA are 'customs unions', substantial obstacles to internal free trade and country deviations from the common external tariff remain in both. The Eastern African Community (EAC) customs union is not yet operational but is likely to face similar problems. Only

SACU is a fully functioning customs union with full internal free trade. A common external tariff observed by all of its members, and common administration of the external tariff, and pooling of the revenues from it (Hinkle & Schiff, 2004).

There are likely to be differences between countries both over the products selected for exclusion from liberalisation and also over the number of such products. The reason for the first difference is clear: countries have different priorities for the sectors they wish to protect from import competition and the goods on which they wish to raise tariff revenue. The second arises because the composition of each country's imports from the EU varies, and so the 20% is calculated by each state against a different base. Take the case of Lesotho and Botswana. As members of the Southern African Customs Union (SACU) they have identical tariffs. If both chose to exclude from liberalisation the items they imported from the EU in 2003 that faced the highest tariffs, Lesotho would not need to liberalise on anything as over 80% of its imports already face zero tariffs, but Botswana would have to remove tariffs as high as 42.5% (Stevens & Kennan 2005b cited by Stevens, 2006). Countries would remove barriers between each other on 'substantially all' trade and probably adopt a common external tariff. But wish fulfilment is not the norm in such cases (Stevens, 2006).

The external trade relations of SACU have been driven by the bilateral and regional alliances of individual member states, rather than the customs union. This is best illustrated by the terms and operation of the Trade and Development Cooperation Agreement (TDCA) signed between South Africa and the EU in 2000. The EU-SA TDCA provides for the establishment of a free trade area between the two signatories. Although the Botswana, Lesotho, Namibia and Swaziland (BLNS) are not signatories to this Agreement, Article XIX of the 1969 SACU Agreement requires that they concur with the terms of the TDCA. In the absence of concurrence, the BLNS continue to charge the Common External Tariff on goods imported directly from the EU (Kirk & Stern, 2005).

2. Methodology and Data Used

The main data source for the basis of the CGE model is a 2000 Social Accounting matrix (SAM) produced by Conningarth Economists and the World Bank (2002). This SAM distinguishes between 53 products (activities) and 53 commodities. Distinction is made between 10 different labour groups, 6 different capital groups, 6 different enterprises, 10 different household types, 17 different types of government (9 from the expenditure and 8 from the income side), 3 different types of capital and the rest of the world (ROW).

A social accounting matrix (SAM) provides a comprehensive and consistent description of the transactions taking place in an economy in a given year; between production sectors, factors, households, government institutions and the rest of the world. Each macro account in the SAM is represented by a column and a row, with columns tracking expenditures and rows tracking incomes. The SAM follows the principles of double-entry accounting. This has two implications: (1) any purchase, expenditure or financial outlay by one account is sale, income or financial inflow to one or more other accounts, and (2) for each account a total income must be equal to total expenditure (Nielsen, 2002; Bahta *et al.*, 2014).

The Lesotho CGE model was implemented using computer codes provided by the International Food Policy Research Institute (IFPRI), as documented in Lofgren *et al.* (2002) which includes a mathematical statement of the model equations. A CGE model consists of a set of simultaneous equations that describe the functioning of an economy. These equations specify how all the payments (economic flows) that are recorded in a SAM change as a consequence of a change in an exogenous variable or parameter. As a consequence, the model follows the SAM disaggregation of factors, activities, commodities, and institutions. It is written as a set of simultaneous equations, many of which are non-linear. The equations define the behaviour of the different actors. In part, this behaviour follows simple rules

captured by fixed coefficients. For production and consumption decisions, behaviour is captured by non-linear, first-order optimality conditions. The equations also include a set of constraints that have to be satisfied by the system as a whole but which are not necessarily considered by any individual actor. These constraints cover markets (for factors and commodities) and macro-economic aggregates (balances for savings-investment, the government, and the current-account of the rest of the world) (for details equation and explanation see (Lofgren *et al.*, 2002). The Lesotho CGE model was solved numerically with General Algebraic Modelling Systems (GAMS) software. Some of the Key model equations (1-15) of the CGE models are:

1. Import price

$$PM_c = pwm_c \cdot (1 + tmc) \cdot EXR + \sum_{c' \in CT} PQ_{c'icm_c} \quad (1)$$

2. Export price

$$PE_c = pwe_c \cdot (1 - te_c) \cdot EXR - \sum_{c' \in CT} PQ_{c'ice_c} \quad (2)$$

3. Absorption

$$PQ_c \cdot (1 - tq_c) \cdot QQ_c = PDD_c \cdot QD_c + PM_c \cdot QM_c \quad (3)$$

4. Market output value

$$PX_c \cdot QX_c = PDS_c \cdot QD_c + PE_c \cdot QE_c \quad (4)$$

5. Activity price

$$PA_a = \sum_{c \in C} PXAC_{ac\theta ac} \quad (5)$$

6. CES technology: Activity production function

$$QA_a = \alpha_a^a \cdot (\delta_a^a \cdot QVA_a^{-p_a} + (1 - \delta_a^a) \cdot QINT_a^{-p_a})^{\frac{-1}{p_a}} \quad (6)$$

7. CES technology: Value-added intermediate-input quality ratio

$$\frac{QVA_a}{QINT_a} = \left[\frac{PINT_a}{PVA_a} \cdot \frac{\delta_a^a}{1 - \delta_a^a} \right]^{\frac{1}{1+p_a}} \quad (7)$$

8. Commodity production and allocation

$$QXAC_{ac} + \sum_{h \in H} QHA_{ach} \cdot \theta_{ac} \cdot QA_a \quad (8)$$

9. Output aggregation function

$$QX_c = \alpha_c^{ac} \cdot \left(\sum_{a \in A} \delta_c^{ac} \cdot QXAC_{ac}^{-p_c^{ac}} \right)^{1/p_c^{ac}-1} \quad (9)$$

10. Output transformation (CET) function

$$QX_c = \left(\delta_c^t \cdot Q E_c^{p_c^t} + (1 - \delta_c^t) \cdot Q D_c^{p_c^t} \right)^{1/p_c^t} \quad (10)$$

11. Composite supply (Armington) function

$$QQ_c = \alpha_c^q \cdot \left(\delta_c^q \cdot QM_c^{-p_c^q} + (1 - \delta_c^q) \cdot QD_c - p_c^q \right)^{1/p_c^q} \quad (11)$$

12. Import –domestic demand ratio

$$\frac{QM_c}{QD_c} = \left(\frac{PDD_c \cdot \delta_c^q}{QM_c \cdot (1 - \delta_c^q)} \right)^{\frac{1}{1+p_c^q}} \quad (12)$$

13. Factor income

$$YF_f = \sum_{a \in A} WF_f \cdot WFDIST_{fa} \cdot QF_{fa} \quad (13)$$

14. Institutional factor income

$$YIF_{if} = shif_{if} \cdot (1 - tf_f) \cdot YF_f - trnsfr_{rowf} \cdot EXR \quad (14)$$

15. Income of domestic, non-government institution

$$YI_i = \sum_{f \in F} YIF_{if} + \sum_{i' \in INSDNG} TRII_{ii'} + trnsfr_{igov} \cdot \overline{CPI} + trnsfr_{irow} \cdot EXR \quad (15)$$

Where:

PX_c	= aggregate producer price for a commodity
PDS_c	= supply price for commodity produced and sold domestically
PE_c	= export price (domestic currency)
PA_a	= activity price (unit gross revenue)
$PXAC_{ac}$	= producer price for commodity c for activity a
PQ_c	= composite commodity price
PDD_c	= demand price for commodity produced and sold domestically
PM_c	= import price (domestic currency)
$PINTA_a$	= aggregate intermediary input price for activity
PVA_a	= value-added price (factor income per unit of activity)
pwm_c	= import price (foreign currency)
pwe_c	= export price (foreign currency)
YF_f	= income of factor f
YIF_{if}	= income of institution i from factor f
$shif_{if}$	= share of domestic institution i in income of factor f
tf_f	= direct tax rate for factor f , and
$trnsfr_{if}$	= transfer from factor f to institution i
YI_i	= income of institution i (in the set INSDNG), and
$TRII_{ii}$	= transfers from institution ii' to i (both in the set INSDNG)

QX_c	= aggregate marketed quantity of domestic output of Commodity
QD_c	= quantity sold domestically of output
QE_c	= quantity of exports
QQ_c	= quantity of goods supplied to domestic market (composite supply)
QD_c	= quantity sold domestically of output
QM_c	= quantity of imports
QA_a	= quantity (level) of activity
QVA_a	= quantity of (aggregate) value-added
QVA_a	= quantity of (aggregate) value-added
$QINTA_a$	= quantity of aggregate intermediary input
$QXAC_{ac}$	= quantity of market output of commodity c from activity a
$QHA_{a,c,h}$	= quantity of household home consumption of commodity c from activity a for household h
θ_{ac}	= yield of output c per unit of activity a
tq_c	= rate of sales tax
α_a^a	= efficiency parameter in the CES activity function
δ_a^a	= CES activity share parameter
ρ_a^a	= CES production function exponent
δ_{ac}^{ac}	= share parameter of domestic commodity aggregation function
α_c^t	= CET shift function parameter (exports and domestic sales)
δ_c^t	= CET function share parameter (exports and domestic sales)
δ_c^q	= CES function share parameter (imports and domestic sales)
δ_c^q	= CES function share parameter (imports and domestic sales)
ρ_c^q	= CES function exponent (imports and domestic sales)
tm_c	= import tariff rate
$icm_{cc'}$	= quantity of commodity c as trade input per imported unit of c'
te_c	= export tax rate
$ice_{cc'}$	= quantity of commodity c as trade input per exported unit of c'
EXR	= exchange rate (local currency per unit of foreign currency)

The neo-classical structuralist model is very standard. The classical book by Dervis *et al.* (1982) and also other references such as Lofgren *et al.* (2002) thoroughly discuss the structure of the model and document the complete set of equations. Some of the key equations: The price system of the model is rich, primarily because of the assumed quality differences among commodities of different origins and destinations (exports, imports, and domestic outputs used domestically). The price block consists of equations in which endogenous model prices are linked to other prices (endogenous or exogenous) and to non-price model variables (Lofgren *et al.*, 2002). The key price block is represented by equations for imports (Equation 1), exports (Equation 2), the absorption (Equation 3), the value of marketed output (Equation 4) and activity price (Equation 5).

The production and trade block covers domestic production and input use, the allocation of domestic output to home consumption, the domestic market, and exports, the aggregation of supply to the domestic market (from imports and domestic output sold domestically) and the definition of the demand for trade inputs that is generated by the distribution process. Production is carried out by activities that are assumed to maximize profits subject to their technology and taking prices (for their outputs, intermediate inputs, and factors) as given. In other words, it acts in a perfectly competitive setting. The CGE model includes the first-order conditions for profit-maximization by producers. Two alternative specifications are

permitted at the top level of the technology nest: the activity level is either a CES or a Leontief function of the quantities of value-added and aggregate intermediate input use. The key production and trade block equations are an activity production function represented by a CES combination of aggregate value-added and aggregate intermediate input quantities (Equation 6) and the corresponding first-order condition, which is represented by the ratio of quantities of aggregate value-added and aggregate intermediate inputs (Equation 7), Commodity production (from fixed unit of activities) and allocation of the production to marketed output and home consumption (Equation 8), CES aggregation of marketed output from activities to an aggregate marketed output for each commodity (Equation 9), a CET output transformation function of the aggregate marketed output into the aggregated exports and domestic sales (Equation 10), a CES composite supply combining aggregate imports and domestic supply (Equation 11), and the corresponding first-order condition indicating the ratio of aggregate imports to domestic demand (Equation 12).

In the CGE model, institutions are represented by households, enterprises, the government, and the rest of the world. The CGE model allows for three domestic institutions (households, enterprises and government) and one foreign institution (ROW). The key institutional blocks equations are total factor incomes (Equation 13), factor incomes to institutions (Equation 14) and incomes to domestic non-government institutions (Equation 15).

Table 2. Own-price, Income, LES Demand and GME Armington Elasticity

	Urban		Rural		All households		Armington elasticity
	e_c	n_c	e_c	n_c	e_c	n_c	
Commodities							
Agriculture	0.376	0.198	-1.00	0.480	0.267	0.271	0.898
Food	0.313	0.364	-0.212	0.490	0.206	0.444	1.37
Mining							4.01
Textiles	0.05	0.497	-1.00	0.539	-0.074	0.325	4.232
Utilities	-0.160	0.871	-0.198	0.500	-0.279	1.066	
Private Service	-0.608	1.836	-0.508	1.688	-0.736	1.282	
Government Service	-0.288	0.930	0.559	0.428	-0.485	0.787	
Transport	-0.977	3.21	-1.00	0.852	-1.00	2.092	1.696
Other Manufacturing	-0.004	0.687	-0.654	1.534	-0.165	0.807	0.486
Financial Service	-1.00	2.867	0.069	2.537	-1.00	2.513	
Frisch Parameter	-2.188		-1.634		-2.415		

Note: “e” represents own-price elasticity; “n” is the income elasticity.

Source: Nganou (2004).

The model has two types of production elasticities which characterize the two levels of the nested production technology. At the bottom of the technology nest, production factors are CES aggregated into value added. Production elasticities at this first level are characteristic of the rate of substitution between production factors. These elasticities were obtained from Nganou (2004). The remaining elasticities were adopted from literature. The production elasticities were set at 0.6. The model also contains an output aggregation elasticity, which was set to 8.

As with production elasticities, there are two types of trade elasticities. The first represents the demand side of the economy and corresponds to the substitution between imports and local sales of domestic output. The second characterizes the supply side of the economy and shows the rate of transformation of total output into domestic sales and exports. These two sets of elasticities were taken from Nganou (2004). Parameters for the Linear Expenditure System (LES) of demand are calibrated from the aggregated SAM entries, along with assumed values for expenditure elasticities and the Frisch parameter. The Frisch parameter (Frisch, 1959) measures the negative of the marginal utility of income, also known as the flexibility of the marginal utility of income was set to negative 2.415 for all households.

Armington elasticity – the degree of substitution between domestic and imported goods – is a behavioural parameter that materially affects the effects of trade on macroeconomic parameters (Gibson, 2003). For instance, trade policy can affect the price of traded goods relative to domestically produced goods. Such a price change will affect a country's trade opportunities, level of income, and employment. The magnitude of these impacts will largely depend on the magnitude of the elasticities, including Armington parameters. Thus, it is important to use the true Armington parameters for the countries of study. Table 2 summarizes elasticities of expenditure, Armington and LES.

3. Closure Rules

The macro-economic closure rules selected for the purpose of the simulations in the Lesotho's model or the economic environment under which the simulations are carried out are characterised by:

- i. The numeraire – the consumer price index (CPI) is the numeraire and it is fixed while domestic producer index (DPI) is flexible
- ii. Savings-investment – Investment driven savings – uniform marginal propensity to save (MPS) rate for selected institutions
- iii. Government – Flexible government savings with fixed direct tax
- iv. External or Rest of World – Flexible exchange rate with fixed savings
- v. Factor account/markets – Capital market – capital is activity-specific and fully employed and Labour market – labour is mobile and unemployed (fixed wages)

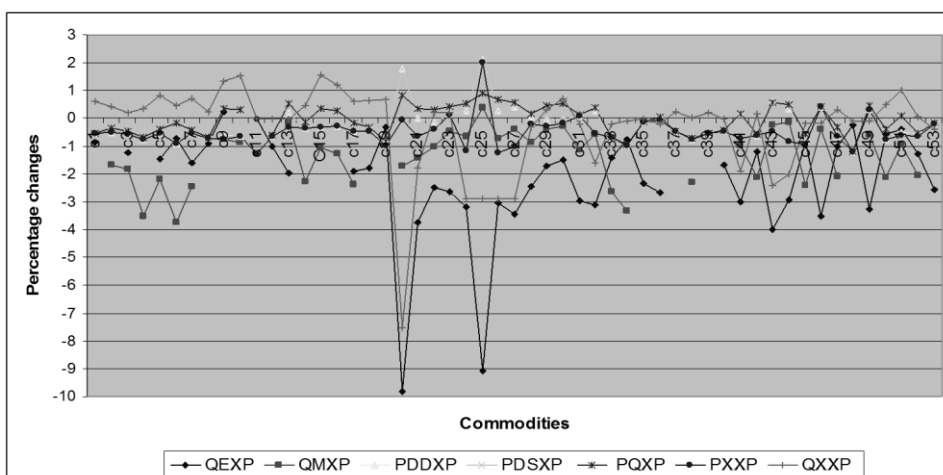
4. Simulated result of CET

4.1. Impact on commodity price and trade

CET for non-SACU members resulted in a 1.29% decrease in the domestic export price. This led to an average decrease of 2.19% in the quantity of exported. The largest decreases observed was in the textile sector (9.83%) followed by pharmaceutical products (9.09%). CET caused an increase of import prices by 0.56%, varying from a 0.73% increase for water services and a 0.44% increase for the sale and repair of Automobiles. On average, quantities of imported commodities decreased by 1.39%. The largest decrease (3.74%) was observed in the skins and hides sector. The only sector experienced an increase of import was pharmaceutical products by 0.39%. The demand and supply price for commodities produced and sold domestically on average decreased by 0.22% for the overall commodity mix in both cases, ranging between -1.21% for financial services and a 2.13% for pharmaceutical products. The demand price of the main commodity of Lesotho, which is the textile sector increased by 1.8%. The quantity of agriculture export varies from -1.78% (raw wool) to 0.25% (egg), the highest increase of quantity export observed in the egg sector and

the lowest quantity of export observed in the raw wool sector. The quantity of agricultural import decreased in general, it ranges from -3.74% for skin and hide sector and -0.76% for the egg sub-sector.

The impact on prices of composite goods, average output prices and quantities of aggregated marketed commodities are as follow: price of composite goods decreased by 0.06% on average ranging between a decreased of 1.21% for financial services and a 0.91% increased for pharmaceutical products. The textile sector is hardly affected (an increase of 0.82%). Average output price decreased on average by 0.49%, ranging from -1.29% to +2.00% for diamonds and pharmaceutical products respectively. The textile sector hardly experience change (-0.05%). Quantity of aggregated marketed commodities decreased on average 0.28% for the overall commodity categories, ranging from -7.55% for textiles to +1.58% for processing of grain and grain products (reported in Figure 1).



Where: QEXP = percentage change of quantities exported, QMXP = percentage change of quantities imported, PDDXP/ PDSXP = percentage change of demand/supply price for commodities produced and sold domestically, PQXP= percentage change of price of composite goods, PXXP = percentage change of average output price and QXXP = percentage change of quantity of aggregated marketed commodities.

Note: Agriculture included from c1 to c16, Mining c17, Manufacturing c18 - c34 and Services c35 - c53 (where c=commodities)

Source: Model estimation results

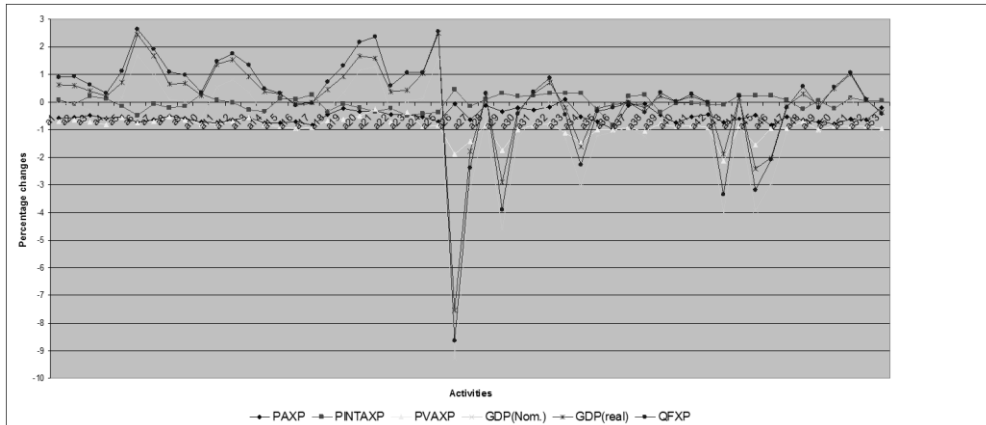
Figure 1. Model estimation results of QEXP, QMXP, PDDXP, PDXP, PQXP, PXXP and QXXP

4.2. Impact on activities' output, intermediate input cost and labour employment

The impact of CET on activity output price found to range between -0.97% and +0.09% for water services and micro-industries respectively. Agricultural output decreased by 0.63%, mining output by 0.85%, manufacturing output by 0.33%, and the services sector output by 0.57%. None of these changes can be considered to be of material importance.

The price of intermediate aggregate inputs experienced an increase and decrease trend. The increased was observed in the textile sector by 0.45% and the decrease in the water service sector by 0.83%. The rest of the sectors were between this ranges. Expansion or contraction of industries will primarily be affected via changes in return to factors and

subsequent reallocations. The change in prices of value added indicates changes in the overall return to factors in different activities (reported in Figure 2). The results show that CET will result in a decrease in return to factors in all activities, implying a contraction of economic activity in all industries. In terms of aggregated industries, the services industry experienced an absolute average decrease (-1.00%), followed by the mining sector (-0.94%), manufacturing (-0.91%) and agriculture (-0.73%).



Where: PAXP= percentage change of activities output price, PINTAP= percentage change of price of intermediate inputs, PVAXP = percentage change of price of value added, GDP = percentage change of gross domestic product and QFXP = Percentage change of quantity demanded of factor (labour) from activity.

Note: Agriculture included from a1 to a16, Mining a17, Manufacturing a18 - a34 and Services a35 - a53 (where a=activities)

Source: Model estimation results

Figure 2. Model estimation results of PAXP, PINTAXP, PVAXP, QFXP and GDP

The model estimates the change in the gross domestic product (GDP) at factor cost in both nominal and real terms. At nominal prices the overall activity experienced a slight decrease of 0.89%, which amounts to merely 0.001% in real terms. The GDP of activities in nominal term ranges from -9.29% to +1.68% for textiles and cattle production respectively. Other activities with a positive change or increase (of more than 1.05% and less than 1.68%) were dairy and other food processing, grain milling, wool and mohair processing. At aggregate level, in nominal terms, the agricultural sector increased by 0.06%, the mining sector decreased by 0.93%, the manufacturing sector decreased by 1.23%, and the services sector decreased by 1.26%.

However, in real terms, value changes range from -7.55% to +2.50% for textiles and the wool and mohair processing sectors respectively. Other activities showed an increase of over 1.00% but less than +3.00%. Besides the textiles sector, the following activities undergo declines of more than 1.00%: chemical and pharmaceutical production, freight and passengers, air transport-commercial, other manufacturing and footwear production. At aggregate level, the agricultural sector increased by 0.80%, while in real terms the mining sector decreased by 0.02%, the manufacturing sector by 0.24%, and the service sector by 0.26%. These aggregate level changes are too slight to be regarded meaningful.

The effect of common external tariffs on the various labour categories largely depends on the way in which those activities that provide employment are affected. On average,

activities employed 0.081% more labour. The textile sectors laid-off many workers (-8.65%). The sector that experienced the most significant increase was cattle production (+2.64%). Fourteen activities or sectors showed an increase larger than 1.00%.

4.3. Impact on factor income and Households

Table 3 shows the effect on factor incomes resulting from the changes in wage rates and employment. Labour factor income was decrease by 0.91%, while capital factor decreased by 0.85%.

Table 3. Factor Income (YFXP) (% Change)

	BASE	YFXP (%)
FLAB (Labour)	3006.46	-0.905
FCAP (Capital)	1472.98	-0.849

Source: Model estimation results

Lesotho households were disaggregated into five groups: (i) urban areas, (ii) rural lowlands, (iii) rural foothills, (iv) rural mountains, and (v) rural Senqu River Valley (SRV). There are disparities between urban and rural groups, between regions, and also between different income groups. To account for this, the household classification was further disaggregated into low- and high-income groups. The threshold levels were taken from the Consumer Price Index Report (BOS, 2001). Low-income households comprise all households with a monthly income of less than 500 Maloti (Lesotho's Currency), while high-income households have a monthly income equal to 500 Moloti (Lesotho's Currency) or above.¹

Table 4. Household Expenditure, Income and Equivalent Variation

Households	BASE	EHXP	EV	BASE	YIXP
Urban high income	3231.72	-0.26	-0.3	3606.32	-0.86
Urban low income	22.15	-1.26	-1.2	24.50	-1.86
Rural lowlands high income	512.88	-0.02	-0.1	542.50	-0.61
Rural lowlands low income	254.56	-0.49	-0.5	266.95	-1.07
Rural foothills high income	283.29	-0.04	-0.1	301.86	-0.64
Rural foothills low income	139.21	-0.55	-0.5	146.97	-1.15
Rural mountain high income	216.26	-0.08	-0.1	225.61	-0.66
Rural mountain low income	97.91	-0.63	-0.5	99.24	-1.21
Rural SRV high income	119.05	-0.15	-0.2	126.78	-0.73
Rural SRV low income	64.47	-0.73	-0.7	67.16	-1.31
Total	4941.5	-0.42	-0.2	5407.89	-1.00

Note: EHXP = Household consumption expenditure, EV = Equivalent variation, YIXP = Household income and SRV= Sengu River Valley.

Source: Model estimation results

¹ 1US \$ = 9.86 Maloti, (in 2000), 1US \$ = 15.24 Maloti, (in 2001) and 1US \$ = 11.75 Maloti, (in 2002). (Source: Reserve Bank of South Africa). Lesotho's macroeconomic policy is circumscribed because of its membership in the Common Monetary Area (CMA). Under CMA, currencies are pegged at parity with the South African Rand.

The impact on household income and welfare that is measured in terms of equivalent variation also presented in Table 4. According to Gohin (2003), one of the main tasks of applied economists is the computation and explanation of the welfare effects of policy reform or other shocks to the economy that may be of interest. The effects of the simulated results on household welfare in Lesotho can further be measured by the concept of Equivalent Variation (EV). EV is a welfare measure indicating how in terms of money equivalent households are better or worse off as a result of the shock/simulation of CET.

Table 4 showed that common external tariffs (CETs) cause household consumption expenditure to decrease by 0.42% on aggregate. The urban low-income households experienced the most significant decrease in household consumption expenditure (-1.26%), followed by rural Sengu River Valley low-income households (-0.73%). Household income decreased on aggregate by 1%. The loss of household income is concentrated particularly in the urban areas, where the urban low-income households experienced a decrease in household income by 1.86%, and followed by the rural SRV low-income households decreased by 1.31%. Lesotho can experience a small (0.20%) loss in welfare (measured by Equivalent variation). This loss concentrated in urban areas. Table 4 indicates that urban low-income households lost by 1.2% and followed by rural SRV low-income households at 0.7%.

4.4. Impact on macroeconomic variables

The effect of CET on a number of government and macro-economic variables is shown in Table 5. CET increased the gross domestic product (GDP) at market price by 0.51% in nominal terms, but decreased by 0.20% in real terms. Such a change cannot be regarded as significant. Investment and government consumption expenditure increased by 0.051% and 0.045% at nominal terms respectively.

Table 5. GDP and National Account (Nominal And Real)

	BASE	Value of gross domestic product (GDPTAB1) (Million Maloti)		Percentage change of gross domestic product (GDPTAB1P)	
		Nominal	Real	Nominal	Real
ABSORP	9171.34	9161.068	9159.06	-0.112	-0.134
PRVCON	4941.5	4929.184	4929.22	-0.249	-0.248
FIXINV	2376.56	2377.774	2376.56	0.051	0*
GOVCON	1853.28	1854.11	1853.28	0.045	0*
EXPORTS	1280.79	1311.881	1609.228	-4.953	-3.708
IMPORTS	-4423.71	-4454.917	-4446.11	-2.127	-0.844
GDPMP	6009.06	6039.695	5996.78	0.51	-0.204
GDPMP2	6009.06	6039.695	6009.06	0.51	0*
NETITAX	1529.62	1599.985	1517.645	4.6	-0.783
GDPFC2	4479.44	4439.71	4479.384	-0.887	-0.001

Note: * there is no percentage change

Source: Model estimation results

The terms of trade caused trade to marginally decrease relative to GDP, with the value of both exports and imports to decrease by 4.95% and 2.13% respectively in nominal terms. Net indirect tax was decrease by 0.78% in real terms.

5. Conclusion

CET for non-SACU members caused a significant decrease in quantity of textile exported in general. The quantity of agriculture export and import shows an increase and decrease trend that varies from one commodity to others. Both demand and supply prices of commodities produced and sold domestically increased significantly for pharmaceutical products. The average output price increased for pharmaceutical products. The quantity of aggregated marketed commodities decreased significantly for the textile sector. Lesotho experienced a loss in welfare due to common external tariffs policy. The labour and capital factor incomes also experienced a slight decrease. The effect on the various labour categories largely depend on the way in which those activities that provide employment are affected, a significant decreased in the textile sector observed.

From the analysis it is observed that the Lesotho economy is indeed fragile. Whereas general experience leads one to expect the formation of infant trade blocs as personified in common external tariff regimes to benefit members, the results obtained in this study indicate that small, fragile economies in an environment dominated by more stronger economies (South Africa in the case of the Southern African Customs Union) can experience net negative effects. This phenomenon should be kept in mind in regions where disparate stages of development are in evidence. Lesotho should strength trade partnership with Rest of the world in order to boost the economy of the country.

References

- Anon (2003). Lesotho: Diagnostic Trade Integration Study: Integration into the World Trading Environment, mimeo, Chapter 1. mimeo. www.integratedframework.org.
- Bahta, Y.T. (2007). The potential impact of trade on the economy of Lesotho. (Doctoral dissertation). University of the Free State, Bloemfontein, South Africa.
- Bahta, Y.T. (2013). Modelling the Lesotho Economy: A Social Accounting Matrix Approach. *International Journal of Food and Agricultural Economics*, 1(1), 49-62.
- Bahta, Y.T., Willemse, B.J. & Grove, B. (2014). The role of agriculture in welfare, income distribution and economic development of the Free State Province of South Africa: A CGE approach. *Agrekon*, 53(1),46-74.
- BOS (2001). Internal Report (Unpublished). Bureau of Statistics, Maseru.
- Carrère, C. (2004). African regional agreements: impact on trade with or without currency unions. *Journal of African Economies*, 13(2), 199-239.
- Conningarth economist and World Bank (2002). Notes on the methodologies and data used for compiling a Social accounting Matrix for Lesotho for 2000. Final Report.
- Dervis, K., Melo, J.D.E. & Robinson, S. (1982). *General equilibrium models for development policy*. Cambridge: Cambridge University Press.
- Frisch, R. (1959). A complete scheme for computing all direct and cross demand elasticities in a model with many sectors. *Econometrica*, 27, 177-196.
- Gibson, K.L. (2003). Armington elasticities for South Africa: Long and short-run industry level estimates. Trade and Industrial Policy Strategies (TIPS) working paper: WP12-2003, ISBN: 1-919982-10-8, University of Natal.
- Gohin, A. (2003). Welfare decomposition in general equilibrium models: A path independent decomposition of equivalent variation. Agricultural Trade (TRADEAG) Working Paper 06/03.
- Hinkle, L. E. & Schiff, M. (2004). Economic Partnership Agreements between Sub-Saharan Africa and the EU: A Development Perspective. *The World Economy*, 27(9), 1321-1333.
- Integrated Framework (2003). Lesotho: Diagnostic trade integration study, Volume 1, Integration into the World Trading Environment, mimeo.

- Jakobeit, C.; Hartzenberg, T. & Charalambides, N. (2005). Overlapping membership in COMESA, EAC, SACU, and SADC. Trade policy options for the region and for EPA negotiations. Commissioned by GTZ.
- Kemp, M. & Wan, H. (1976). An Elementary Proposition Concerning the formation of Custom Unions. *Journal of International economics*, 7(4), 555-570.
- Kirk, R. & Stern, M. (2005). The new Southern African customs union agreement. *The World Economy*, 28(2), 169-190.
- Lofgren, H., Harris, R. L., Robinson, S., Thomas, M. & El-Said, M. (2002). A standard computable General Equilibrium (CGE) model in GAMS, Microcomputers in Policy Research 5,1-68. Washington D.C.: International Food Policy Research Institute (IFPRI).
- Nielson, CP. (2002). Social Accounting Matrix for Vietnam 1996 and 1997. Danish Research Institute of Food Economics (FOI), Trade and Microeconomics Division. International Food Policy Research Institute.
- Nganou, JP. (2004). Estimating the key parameters of the Lesotho CGE model American University 4400 Massachusetts avenue, NW Washington, DC 20016. Paper prepared for the International Conference "Input-Output and General Equilibrium: Data, Modeling, and Policy Analysis", Brussels (Belgium).
- Stevens, C. (2006). The EU, Africa and Economic Partnership Agreements: unintended consequences of policy leverage. *The Journal of Modern African Studies*, 44(03), 441-458.
- Stevens, C. & Kennan, J. (2005b). 'EU-ACP Economic Partnership Agreements: the effects of Reciprocity', briefing note. Brighton: IDS.
- Viner, J. (1950). The Custom Union Issue. New York: Carnegie Endowment for International Peace.