Trade Policies and Poverty in Uganda: A Computable General Equilibrium Micro Simulation Analysis

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1. Introduction

Trade liberalization

Trade liberalization is seen by many governments as a vehicle to poverty alleviation in Africa. Yet, recent empirical evidence suggests that while trade liberalization can facilitate poverty reduction, there can be no simple general conclusion about the relationship between trade liberalization and poverty (Winters et al., 2004; Reimer, 2002). Although trade liberalization seems to have contributed to poverty reduction in some countries in the world, it actually worsened poverty in others (Winters et al., 2004; Reimer, 2002). As such, it is difficult to generalize from one country's experience to another, which suggests that we can only rely on country-specific evidence. This paper takes these concerns by examining the impact of trade liberalization on the incidence of poverty in Uganda.

Literature on trade liberalization and poverty is vast, but it leaves the question open as to whether multilateral liberalization can be more successful in reducing poverty than regional integration. One of the major arguments in favour of free trade is its potential for 'trade creation', associated with a shift in production in the direction of comparative advantage, which leads to saving resources and providing the consumer with cheap goods. This may not always be the case; free trade (especially regional integration) may also lead to trade diversion by allowing high-cost imports from partner countries to displace low-cost imports (cheaper goods) from outside the bloc. There is array of theoretical and empirical literature on these topics, which reinforces the earlier argument that it is difficult to generalize from one country's experience to another.

Hertel et al. (2003) examine how multilateral trade liberalization affects poverty in each of the seven different developing countries. Their findings suggest that multilateral trade liberalization reduced overall poverty in Indonesia, Philippines, Uganda, and Zambia, but increased overall poverty in Brazil, Chile, and Thailand. From 16 case studies for Latin American countries documented by Ganuza et al. (2005), poverty fell in 12 of them. Poverty increased in Costa Rica, Ecuador, Paraguay and Venezuela amidst overall decline in prices of their agricultural exports during the same period.

In Asia, Cororaton (2003) observes that a complete removal of tariffs on imports reduced poverty in the Philippines, but increased income inequality. Similarly, Cororaton et al. (2005) findings suggest that tariff reductions in the Philippines between 1994 and 2000 were generally poverty-reducing, although the reduction in poverty was much higher in urban areas than in rural areas, where poverty is widespread. Cockburn (2001) reports

the distribution impact of trade policies in Nepal, suggesting that a complete removal of tariffs would reduce poverty in urban areas while increasing it in rural areas.

In Africa, Bautista et al. (1998) and Chitiga et al. (2005) find that trade liberalization reduced overall poverty in Zimbabwe, although poverty fell more in urban than in rural areas. In Morocco, Ravallion and Lokshin (1994) argue that small cuts in protection (in order of 10%) would increase household inequality in Morocco, as benefits of tariff cuts flow disproportionately to the wealthy.

In Uganda, there is no doubt that a lot of attention has been on poverty reduction. However, very few studies have attempted to explore the relationship between trade and poverty. Insightful examples such as Blake et al. (2002), and Hertel et al. (2003) have suggested that multilateral trade liberalization is likely to be pro-poor, especially through increase in factor incomes. However, since the GTAP database is designed for broad country average, the Hertel et al. (2003) findings need to be reinforced with Uganda-specific case study. Studies that offer comprehensive analysis of poverty in Uganda, for example Okurut et al. (2002), Appleton (1999) are typically concerned with determinants of regional poverty and how poverty has evolved over time. But like other poverty studies so far, it does not examine the distributional impact of trade policies. Apart from DeRosa et al. (2003) that investigates the impact of EAC customs union, empirical work on poverty in Uganda generally fall outside the realm of trade policies.

Uganda is widely known for implementing rigorous economic reforms from the 1980s-1990s, in which trade liberalization was part. Export taxes were removed and import tariffs rates reduced. Control of domestic prices by government ended, and state-controlled enterprises were privatized to reduce government's involvement in commercial activities. On 30 November 1999, the Treaty Establishing the East African Community (EAC) was signed, bringing the number of regional agreements to which Uganda is a member to two, after COMESA (established in November 1993). Since then, regional integration programmes (EAC, COMESA) continue to drive trade policies in Uganda.

This new policy orientation is evidenced by a marked increase in Uganda's exports from US$ 196 million in 1991 to US$ 1.34 billion in 2007, while imports rose from US$ 1.73 billion in 2004 to US$ 3.5 billion in 2007. This in turn has generated a new optimism about Uganda's potential for accelerating economic growth and for reducing poverty. In 1992 (after five years of implementing new trade policies), there was a widespread poverty incidence (of over 50%) all across Uganda. Over 70% of the population in northern Uganda lived below the poverty line (Appleton, 1999). This result was confirmed by the census-based results, which also demonstrated that the central and western region had the lowest levels of poverty (54%) compared with other regions. When other measures of welfare: poverty gap and Gini coefficient are considered, northern Uganda had worsening indices of inequality and poverty gap in the early 1990s.

By 1999/2000, national poverty headcount had declined to 35% from 56% in 1992 (Appleton, 1999; UBOS, 2003a). Over the same period, total trade increased by 95%, from US$ 695.8 million in 1992 to US$ 1.36 billion in 2000. The gains in incomes through increased producer prices of cash crops, particularly coffee in the 1990s, contributed to reducing poverty in 1992 and 2000. Poverty declined throughout western, central and eastern Uganda, where coffee is widely grown. In northern Uganda where agricultural production was interrupted by the effects of war, poverty level remained high (Appleton, 1999; UBOS, 2003a).

However, in 2003, poverty rose to 38% despite the 40.4% increase in total trade between 2000 and 2003. Income inequality (measured by Gini coefficient) also rose from less than 0.39 in 1999/2000 to 0.43 in 2002/03, and continues to widen both in rural and urban areas. Similarly, the depth of poverty (measured by the poverty gap index– the ratio of the average extra consumption required to bring all poor people up to the poverty line) worsened. Poverty gap rose from Ush 711,592 million (€355 million) in 1992 to Ush 581,907 million in 1996 and about Ush 1,200 billion (€571 million: approx. 10% of Uganda's GDP) in 2002/03.

Recent statistics suggest that since 2003, poverty levels have reduced remarkably, but these official figures were subjected to searching criticism from politicians and academics who argue that it was inconceivable to talk about fall in poverty amongst a population that was surviving on food relief (referring to northern Uganda).[1]

Against this background, the aim of this paper is to help us understand to what extent Uganda's trade liberalization in the context of EAC and COMESA trading arrangements (if Uganda were to be a member of COMESA free trade area), and rest of the world (ROW) are likely to impact on the poor. Simply put, what impact is the reduction/removal of tariffs on Uganda's imports from the EAC likely to exert on the level of poverty in Uganda? Second, what will be the likely impact of removing tariffs on imports from the non-EAC COMESA countries? This second question is important because, at the moment, Uganda is not a member of COMESA free trade area and there have been proposals that Uganda joins the COMESA free trade area. This question facilitates the understanding of what would be the benefits of the actual vis-à-vis contemplated options with regard to Uganda's membership in COMESA.

This paper adds some new dimension to the understanding of the effects of trade policies on poverty by going beyond the traditional fashion of modelling the relationship between trade and poverty, to actually distinguishing the impact of policies at national, regional and multilateral level, thus presenting policy makers with potentially interesting choices and options to consider.

Objectives of the Study

The major aim of the study was to investigate the impact of trade policies on poverty in Uganda, specifically:

1. The extent to which tariff reductions on imports from the East African Community, COMESA and ROW affect levels of poverty in Uganda;
2. The effects of the reduction in tariffs on prices, production, wages and other key macro variables that affect poverty; and
3. To draw policy implications for regional and multilateral trade in context of poverty reduction in Uganda.

The rest of the paper is organized as follows: in section 2, developments in trade policies in Uganda are presented. Section 3 provides an overview of the CGE micro simulation approach used in trade and poverty analysis, while Section 4 introduces the model, combined with a theoretical framework linking trade and poverty. The empirical results are presented in section 5, while section 6 is the conclusion.

2. Trade policy reform in Uganda

Overview

This section gives a brief account of the trade policy developments in Uganda. It maps out Uganda's trade relationships in the East African Community (EAC), the Common Market for Eastern and Southern Africa (COMESA), the World Trade Organization (WTO) and with the European Union (EU). It distinguishes between these markets, in which Uganda's trade faces different conditions, with implications for poverty, and presents policy makers with potentially interesting choices and options to consider.

Unilateral trade reforms

Unilaterally, Uganda has implemented a series of trade reforms in a process that started in the late-1980s as part of structural adjustment programmes (SAPs) with support mainly from the World Bank and the International Monetary Fund. These programmes, anchored in economic liberalization led to: (i) privatization of state-owned enterprises, and encouraging greater participation by the private sector; (ii) removal of domestic price control and subsidies that were used extensively since the 1960s to protect the agricultural sector; (iii) reduction of tariffs on imports (from average of 40% to 30%) and removal of export taxes; and (iv) simplification of customs procedures.

Between the late-1980s to early 1990s, all state-owned agricultural marketing companies, notably the Produce Marketing Board (PMB), Lint Marketing Board (LMB), and Coffee Marketing Board (CMB), which for over 25 years held the monopoly on the purchase and export of agricultural commodities, were disbanded. Encouraged by the rise in farm share of export prices for cash crops in the 1990s, and improved economic performance, Uganda sought to build dynamic export sectors by reforming its overall tax system and exchange regime.[2]

On border taxes, the myriad tax rates charged on imports were reduced to five bands in 1990/91, and eventually to three standard rates: 0%, 7% and 15% under plant and machinery (capital goods), raw materials and intermediate goods, and finished goods, respectively. Tariff peaks were reduced from over 40% to an average of 10-30% range for most tariff lines as summarized in Table 1 for the year 2004 and 2005.

The mark-up applied on the value of imports – for sale tax valuation – was reduced and eventually eliminated. The temporary export stabilization tax on coffee exports was also removed. Incentives were targeted at export-oriented sectors to encourage diversification into traditional and non-traditional exports.

Table 1: Uganda: Import-weighted and simple average tariffs, 2004 and 2005

	Simple average		Import-weighted	
	2004	2005	2004	2005
Food and live animals	18.0	24.3	13.3	29.0
Beverages and tobacco	86.3	25.2	69.7	25.0
Crude materials, inedible	10.3	4.4	20.1	32.6
Mineral fuels and lubricants	7.1	11.6	0.3	0.7
Animal and vegetable oils and fats	13.8	12.6	17.3	16.0
Chemicals and related products	4.7	3.3	4.8	6.2
Manufactured goods	13.1	16.3	8.5	15.9
Machinery and equipment	5.5	6.2	7.2	6.0
Miscellaneous manufactures	13.7	19.0	11.2	15.0
Others	13.3	18.8	17.0	25.0
All categories	11.3	12.8	8.8	12.3

Source: World Bank (2006) based on UNCOMTRADE database (for imports) and UNCTAD trains database (for tariffs)

Note: the 2004 tariffs include excise taxes and import commissions. The data in Table 1 gives the impression that Uganda tariffs went up, on average after 2004, which is not the case. This is influenced by high tariffs of a few sensitive tariff lines (sensitive products). Readers can have a better picture by looking at 'all categories'.

Export/import-licensing requirements were replaced (in September 1990) with export/import certification system and import controls, with tariff-based protection. Customs formalities have been reduced to, essentially, commercial invoice. It is only in exceptional cases that health and phytosanitary certificates are required. Pre-shipment inspection was largely abolished.

A market-based inter-bank foreign exchange market (IFEM) system replaced the state-controlled "window" and auction system of the 1980s, reducing volatility in exchange rates and bias towards traditional export sectors. Traditional export sectors (coffee, cotton, tea and tobacco) were allocated foreign exchange through window one, the priority window. "Window two", which majority of traders used, had its exchange rate set through weekly auction by Bank of Uganda. Moreover, exports retention scheme operated under very stringent conditions, making it difficult for exporters to retain foreign currency to pay for imports.

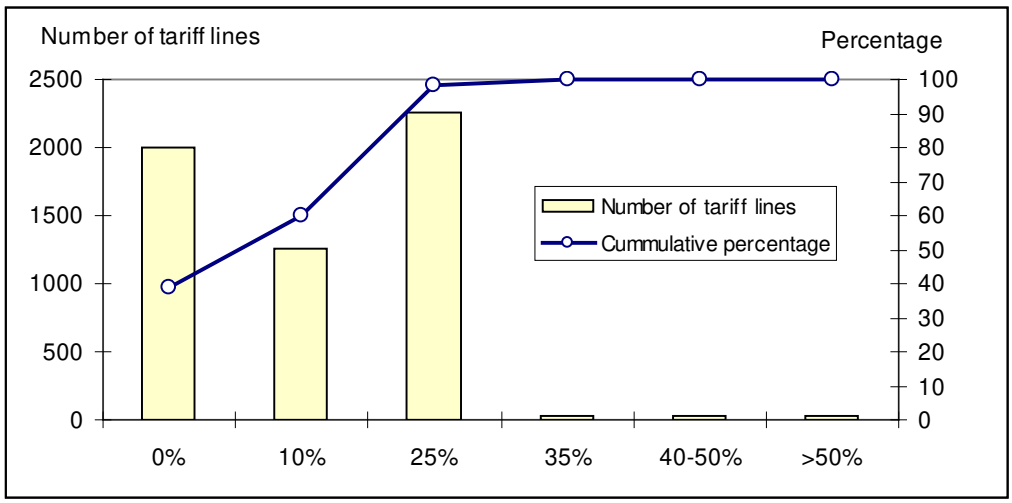
By 2004, Uganda was still levying 2% import commission on all imports, on top of the 10% excise duty (applied on an ad valorem basis across about 400 tariff lines). In addition, 17% value-added tax (VAT) was charged on a range of imports. Further to these, most of the statutory instruments had the flexibility to allow raw materials for specific industries to be imported at preferential rates, for example by remitting the customs duty payable from 15% to 7%. The sugar industry benefits simultaneously from high duties on sugar imports, and preferential access to imported sugar as a raw material for other production (beer and soft drinks). These preferences were withdrawn prior to the EAC customs union. The cost of inland freight also ceased to be part of the base for valuation of imports.

Trade policies in the context of EAC integration

In January 2011, the implementation of the EAC customs union entered its seventh year, having come into force on 1st January 2005.[3] Since then, EAC partners have

adopted a common external tariff (CET) to 5,429 tariff lines (at the HS 8-digit level), of which 99.8% carry ad valorem duties. The CET comprises three bands: 25% for finished goods, 10% for semi-processed or intermediate goods, and zero-rate for raw materials and capital goods, except for sensitive products. These three rates apply to about 99% of overall tariff lines, with the top rate accounting for about 40% of existing tariff lines as illustrated in Figure 1.

Figure 1: EAC common external tariff



Source: WTO Secretariat calculations based on data provided by the EAC country authorities
Note: The EAC members were expected to review the maximum rate of the CET after 1 January 2010.[4]

The remaining 1% of the overall tariff lines (i.e., 58 tariff lines)—excluded from the CET—is for "sensitive products". They attract "special tariffs". About one-fifth of these tariffs are combined duties. *Ad valorem* rates vary from 35% duty on matches and battery cells to 100% duty on sugar imports. Other products on the sensitive list include dairy products; wheat; maize; cigarettes; cement; *kangu*, *kikoi*, and *kitenge* fabrics; crown cock; sack and jute bags.[5]

Sensitive products constitute important features of the EAC tariff structure. In the model, tariffs on EAC imports, including sensitive products, are set to zero (section 5.1). The data on Table 2 suggests that the five major sensitive products account for at least 5% of Uganda's imports, annually.

Another important feature of the EAC tariff structure is the exception for the lesser developed members of the EAC, including Uganda, who were not expected (at least up to 2010) to fully liberalize.[6] This exception applies to category "B" goods exports from Kenya to Uganda and Tanzania for 443 and 880 tariff lines, respectively.[7] These goods attracted 10% import duty on entry into Uganda and Tanzania in 2005. Beginning 2006, the duty was to be phased out progressively, down to zero in 2010. The same applies to the new EAC partners (Burundi and Rwanda) whose schedule of accession allows them until 2010 to bring their tariff regimes in conformity with the customs union protocol.

Table 2: Share of total imports in 2005 and 2007 of Uganda's selected sensitive products

	Imports in US$ from				Regional total (US$)	As share of total imports
Year 2005	**EAC**	**COMESA**	**EU**	**ROW**		
Dairy products	377,200	7,903	1,051,239	821,242	2,257,584	0.110
Maize	862,075	-	2,691,173	3,126,933	6,680,181	0.325
Wheat	6,182,536	-	11,849,131	72,617,542	90,649,209	4.413
Sugar	9,819,628	4,784,690	1,834,229	12,556,753	28,995,300	1.412
Cigarettes	817,811	2,957,405	70,178	182,524	4,027,918	0.196
Year 2007						
Dairy products	4,387,769	121,320	340,144	738,238	5,587,471	0.160
Maize	61568.43	192.05	-	50,069	111,829	0.003
Wheat	3,343,936	-	3,654,158	102,633,564	109,631,658	3.136
Sugar	16,262,301	14,329,347	849,853	39,977,836	71,419,337	2.043
cigarettes	8,999,262	6,215	8,431	236,295	9,250,203	0.265

Source: Author's calculation, based on Uganda Revenue Authority and Uganda Bureau of Statistics database

EAC remains an important market for Uganda (Table 3), accounting for a significant share of over 21% of total exports in 2010. Considering that more than half of these exports comprise agricultural products – mainly maize, fish, tea, and vegetables – that employ over 40% of the poor, removing intra-EAC tariffs has the potential to reduce poverty if it results in growth of such sectors. Clearly, potential for expanding Uganda's exports in the EAC market exists, as the trends in Table 3 suggest. The structure of imports is also expected to have a positive impact on poverty because it covers mainly manufactured goods other than agriculture, where majority poor are employed.

Table 3: Uganda: distribution of exports and imports, 2005-2007

	Trade flow in US$				Trade flow as share of total trade (%)			
Exports to	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**
2005	144,770,947	120,008,348	257,888,739	290,189,113	17.81	14.76	31.73	35.70
2006	152,829,274	144,666,141	263,751,647	400,946,359	15.88	15.04	27.41	41.67
2007	274,818,231	262,290,026	324,395,336	475,164,526	20.56	19.62	24.27	35.55
Imports								
2005	551,441,415	43,661,964	387,158,238	1,071,875,814	26.85	2.13	18.85	52.18
2006	430,179,532	48,948,384	481,208,855	1,596,963,298	16.82	1.91	18.82	62.45
2007	531,060,761	60,059,871	717,641,690	2,186,628,772	15.19	1.72	20.53	62.56

Source: Author's calculation based on Uganda Revenue Authority and Uganda Bureau of Statistics database

The downside of EAC tariffs removal is the huge loss in government revenue. Most of these losses are expected to come from manufactured imports, textiles, sugar, cooking oil, oil seeds, dairy products, crude materials and chemical imports (Table A3). For example, tariff revenue from manufactured products alone fell by 71% between 2005

and 2007 (i.e., from Ush 308.594 billion to Ush 90.145 billion). As we notice in Table 4, duty revenue on imports from EAC declined from Ush 338.5 billion in 2005 to 142.8 billion in 2007. Without temporary tariffs, Uganda will, in aggregate, lose about 35% of total duty revenue.

Table 4: Distribution of Uganda's tariff revenues by source of imports, 2005-2007

	2005	2006	2007
Source of imports		**Tariff revenue in Uganda shillings**	
EAC	338,525,324,139	229,065,876,697	142,776,425,255
COMESA	25,358,887,056	43,593,367,699	27,760,504,647
EU	105,914,628,717	144,850,933,111	116,443,542,045
ROW	478,176,061,460	843,974,034,895	654,097,185,448
Total	947,974,901,372	1,261,484,212,402	941,077,657,395
		Percentage share of total tariff revenue	
EAC	35.71	18.16	15.17
COMESA	2.68	3.46	2.95
EU	11.17	11.48	12.37
ROW	50.44	66.90	69.51
Total	100.00	100.00	100.00

Source: Author's calculations based on Uganda Revenue Authority's database

Trade policies in the context of COMESA regional arrangement

Unlike in the EAC market, Uganda's exports face tariffs of 4-6% in COMESA market (outside EAC) for most goods. Similar goods from COMESA face the same tariffs in Uganda (Uganda's tariff preferences with COMESA countries originally extended to over 700 goods). In the model, these tariffs are set to zero and the simulated effects demonstrate the likely impact Uganda's membership to COMESA free trade area would have on the poor in Uganda.

Uganda is a founding member of the Common Market for Eastern and Southern Africa (COMESA), established in November 1993 as a successor to the preferential trade area (PTA) for Eastern and Southern Africa. Of the current membership of 19 countries,[8] 13 are a free trade area (FTA),[9] while six members, including Uganda, are not in the FTA. As a founding member, however, Uganda can export to COMESA at tariff rates 60-90% below the COMESA CET, on a reciprocal basis. In the model, the tariffs on COMESA imports are set to zero to explore the alternative option of joining the COMESA FTA.

Uganda's major exports to COMESA include manufactured products, coffee, sugar, fish, and cereals. Increase in export of these goods is expected to have a positive impact on poverty because the exported products support rural income. Imports from COMESA, outside of EAC, account for less than 2% of Uganda's total imports, and are mainly manufactured products. These rates (share of exports and imports) are expected to rise with complete phase-out of intra-COMESA tariffs, and the effects on the poor will depend on whether the cost of the consumption bundle falls more or less than their wages/income.

Trade policies under the EAC-EPA arrangement

The European Union is the single largest market for Uganda's goods, accounting for about 30% of Uganda's total merchandise exports in 2010 against 21% of total imports in 2010. Uganda's major exports to the EU include fish (fish products), coffee, tobacco (tobacco products) and cotton, and imports from the EU manufactured goods, textiles, wheat, and other cereals (Table A2). Being a Least Developed Country (LDC), Uganda is allowed (under the EU's Everything But Arms Initiative), duty-free, quota-free access to the EU market, while EU's exports to Uganda are subject to the EAC common external tariffs (CET). The European Commission and the EAC partners have sought to establish a free trade area between them. Upon entering an interim economic partnership agreement on 27 November 2007, 31 December 2007 was set for a full agreement, as WTO waiver on the non-compatibility of the EU preferential trade relations with ACP countries would expire by then. By March 2011, the possibility of signing a full agreement seemed far from sight as the parties failed to agree on issues of development concerns to EAC and on the Most Favoured Nation (MFN) clause, among other issues.

The EAC-EU interim partnership agreement requires the EAC partners, including Uganda, to gradually liberalize 80% of their trade for imports from the EU. The liberalization, covering mainly capital goods, raw material and intermediate/industrial goods is to progress over a period of 15 years (attaining full liberalization over a period of 25 years). Although agricultural products, wines and spirits, chemicals, plastics, wood based paper, textiles and clothing, footwear, and glassware are excluded from liberalization, eliminating tariffs on EU manufactured imports alone will considerably lower tariff revenues. For example, in 2007, manufactured imports from the EU generated Ush 106.361 billion in tariff revenue (Table A3).

Trade policies under the GATT/WTO context

Liberalizing Uganda's trade in the context of GATT/WTO trading arrangement (as considered in the model) extends tariffs reduction beyond imports from regional trading partners to include imports from rest of the world (ROW). Uganda has been a GATT contracting party since independence (October 1962), after acquiring the GATT rights and obligations previously accruing to the United Kingdom with respect to its territory under the trade "succession" procedures. On 29th September 1994, Uganda ratified the Marrakech Agreement to become a founding member of the World Trade Organization (WTO). As a least developed country, Uganda is not expected to take on WTO liberalization commitments of cutting down its tariffs, and the purpose of reducing tariffs on ROW imports in the model is to demonstrate the potential impact of liberalizing Uganda's trade for imports from WTO members.

In the model, the rest of the world (ROW) includes the EU and non-members of the EAC and COMESA. Between 2005 and 2007, Uganda's total merchandise trade with ROW accounted for a share of 75% of its overall trade annually, comprising exports (18%) and imports (57%). Imports have tended to increase faster than exports, and this will deepen the balance of trade problem in case of reduction on ROW tariffs, with significant implications for poverty in Uganda. Uganda's major exports to ROW include

coffee, fish/fish products, cooking oil (fat), oil seeds, tobacco and tobacco products, manufactured products, cotton and vegetables. Its major imports from ROW include capital goods (manufactured products), wheat, textiles and clothing, cooking oil (fat), oil seeds, sugar, and food items. In value terms, imports from ROW are 5 times Uganda's exports to ROW.

Table 4 shows that about 70% of total tariffs revenue in 2007 was collected on imports from ROW. Most of the revenue losses are expected to be from manufactured imports, which generated Ush 532.606 billion in tariff revenue in 2007, textile imports (Ush 47.212 billion), sugar (Ush 37.583 billion), and beverages 5.1 billion in 2007.

The data in Appendix (Table A1–A3) provide some numerical insights, which are useful for understanding the results in section 5. In the next section, we turn briefly to the CGE micro simulation approaches commonly used in analysis of the impact of trade reforms on poverty.

3. An overview of micro simulation approach

Computable General Equilibrium (CGE) model has been used in poverty analysis for a long time, for example by Adelman and Robinson (1978) for South Korea. The second impetus to this literature can be identified with the OECD sponsored projects on the impact of structural adjustment programmes on income distribution in Indonesia (Thorbecke, 1991), Ecuador (de Janvry et al., 1991), and Morocco (Morrison, 1991). Since then, there has been a steady growth in literature on the link between trade policies and poverty, based on CGE models.

These CGE models have taken either the *representative household* approach (the most widely used approach), pioneered by Adelman and Robinson (1978), the *integrated multi-household* approach (IMH) applied by Decaluwé et al. (1999), or *top-down/micro-simulation sequential approach* (MSS).

In the *representative household* approach, only representative household sub-groups are included in the CGE model. Changes in the income of all households within each group are then inferred based on the changes of income of the representative households in the model. This approach is a bit simple because it does not require any modelling effort outside what is done in standard CGE modelling exercise (Savard, 2005). Its downside is that it fails to take into account the within-group redistribution of income, and can easily lead to misleading conclusions (Savard, 2005; Boccanfuso and Savard, 2005).

The *integrated multi-household* (IMH) approach includes all households, or a large number of households, from household survey in the CGE model. It accommodates intra-group changes and does not require household grouping or aggregation. This way, the controversy associated with household aggregation is avoided.[10] However, with such a large size of model (incorporating all households), numerical resolution as well as data reconciliation can be challenging (Boccanfuso and Savard, 2005; Chen and Ravallion, 2004).

With the *top-down* or *micro-simulation sequential* (MSS) *approach*, a CGE model is used to generate price changes that are fed into a micro-simulation household model. The first step is to introduce shock to get commodity and factor price changes. The new prices are then fed into a post-simulation framework that calculates the effects on actual or highly disaggregated representative households. Various poverty measures can then be applied to assess the distributional effects of the shocks (Reimer, 2002). An example (of the top-down method) is the *macro-accounting* method proposed by Chen and Ravallion (2004), and used extensively in recent years.

The top-down approach fully accounts for household behaviours and remains extremely flexible in terms of behaviours that can be modelled. Its limitation is that it

does not (fully) take into account the micro-feedback effects; that is, the reactions of households to changes in commodity and factor prices are not transmitted back to micro-simulation model. Only a fraction of the intra-group inequality is captured (Hertel and Reimer, 2004; Bourguignon and Spadaro, 2005).

The approach relevant for this study is one that incorporates household data in the CGE model and simulates the model with all the individual households (Cogneau and Robilliard, 2000). The same approach was used by Cockburn (2001) to analyze the impact of trade liberalization on poverty in Nepal. He endogenises intra-group variations by incorporating all the households from a nationally representative survey. Cockburn's findings, as seen by many analysts –e.g. Chitiga et al. (2005) – lend support to the view that micro simulations are very important for poverty analysis. After him, Cororaton (2003) used the same approach for the Philippines with 24, 797 households, and Chitiga et al. (2005) for Zimbabwe with 14,006 households. They were able to carry out comprehensive poverty and income distribution analysis.

Decaluwé et al. (1999) compare results of poverty and income distribution using the three different CGE approaches reviewed above. The results suggest that the integrated multi-household approach (use of household data into the CGE model itself) is superior to all others in terms of comprehensive analysis of poverty. The results are also confirmed by Savard (2005). Thus, it is a worthwhile exercise for poverty analysis.

4. Model development

Theoretical linkages

Trade theory suggests several channels through which tariff changes affect the poor. Important ones are: effect on relative prices of traded goods on employment and wages (income), structure of consumption, and on government revenues.

We expect price effects to dominate trade policy shock and to be driving poverty in Uganda. The population that will either slide into poverty or be lifted out of poverty as a result of a policy shock are assumed to be those whose incomes are close to a monetary poverty line. We define this poverty line as the cost of a basket (of quantities) of different commodities indexed as $b = (b_1,b_2,...,b_n)$ reflecting basic needs consistent with Ravallion's (1994) approach to estimating absolute poverty – the "cost-of-basic needs" method.

This basic needs basket "*b*" applies to all households and remains invariant from one policy simulation to another. Prices of the commodities in the basket are represented by $p = (p_1,p_2,...,p_n)$. The population below the poverty line remains at base level before a policy shock. However, if composite commodity prices (p_i) rise following an external shock, the cost of the basic needs basket, hence the poverty line PL, will increase and the population below the poverty line will rise *ceteris paribu*s.

We consider Uganda to be a small country, which does not exert an influence on the world price of exports (PXw) and on that of imports (PMw). We represent prices of imports (including tariffs,) in domestic currency by:

$$PM_i = (1 + tm_i).ER.PMw_i$$

and quantities of imports by:

$$M_i = \gamma_i . \frac{p_i}{PM_i} \delta_i.X_i$$

where ER is exchange rate; M_i : quantities of imports; p_i : prices of composite commodities; γ_i: CES distribution parameter of Armington function; and δ_i: elasticities

of substitution of Armington function. The domestically produced commodities delivered to home market and imports combine to form composite commodities X_i by means of CES function.

Following a tariff cut (holding nominal exchange rate fixed), domestic price of imports (PM_i) will fall. Prices of domestically produced commodities delivered to home market (and prices of composite commodities) are expected to fall due to rise in demand for imports, which suppresses demand for domestically produced (import-substitute) goods,

$$XD = \gamma_i \left(\frac{p_i}{PD_i} . \delta_i . X_i \right) + X_i;$$

where XD is domestic demand for domestic output, and PD_i: prices of domestic output delivered to home market. Prices may fall for some of the commodities in the basic needs basket, and rise for others depending on whether they are import-substitute goods, among other factors.

If price of exports (PXw) remains unchanged, labour and capital in the import-substitute sector may be hurt in the short run. If the imports concerned are inputs to other goods rather than for sale to consumers, domestic production of goods using the inputs may increase. This causes changes in relative factor demands, depending upon the relative factor intensities used in different sectors.

Based on Heckscher-Ohlin theorem, we would expect that Uganda, as an economy relatively endowed with unskilled labour, would have its abundant unskilled labour aided by trade liberalization. The incomes of the poorest groups in Uganda (quintiles 1 and 2) are mainly composed of unskilled labour payments (Table A4). Table A5 reports the share of the primary factors of production in value-added for each productive sector in Uganda. Apart from the manufacturing and services sectors, most sectors including agriculture, are intensive in unskilled labour. This suggests that a shock that affects labour allocation in agricultural sectors is likely to affect rural incomes, especially among the unskilled wage earners.

If the changes in tariffs on consumption goods cause the relative price of unskilled labour intensive goods to increase, we would expect, as the Stolper-Samuelson theorem predicts, an increase in the wages of unskilled workers (hence reducing poverty if it is large enough to move some households above the monetary poverty line).

Features of the model

A Computable General Equilibrium (CGE) model is calibrated to a 2002 social accounting matrix (SAM) for Uganda (Alarcon et al., 2006). In its original form, the SAM consisted of 74 production branches/commodity sectors and activities, 32 household groups, and 18 factors of production and one foreign market (ROW). To keep the model tractable, we modified the SAM to 36 production branches/commodity

sectors (Table A8), and 3 factors of production (land, labour and capital). The rest of the world account (ROW) was decomposed into the EAC, COMESA and rest of the world (ROW) markets.

The 9,711 households from the 2002/03 national household survey were incorporated into the SAM by entering data related to the final consumption of individual households (in terms of commodities), income by economic activity, etc, from the survey, into the SAM (and balancing sum of consumption, income, etc over all households with the row/column totals for households in the SAM). For example, in the account "households", we entered, row-wise, the resources that are at the disposal of each household viz. its revenues from capital and labour, and the transfers from the government (pension benefits), corporations (pension and social security paid by firms), and transfers from other households. Column-wise, we entered expenditures of each household. In the block (Commodities, Household) we entered the expenditures on the consumption of commodities at market prices. In the block (Taxes on income, Household) we entered the taxes on income paid by individual households. Finally, in the block (Savings, Household) we entered household's savings.

Government expenditures in the model are funded from tariff revenues and revenues from indirect taxes (modelled as a value-added tax, 'VAT' and income tax, 'Ytax'). Tariffs and taxes on commodities, labour, capital, household income, and corporate income are given as fixed ad valorem rates. Tax revenues and income transfers received by government from ROW, including international aid, are used to meet government demand for commodities, to pay wages and capital, and to deliver public goods, including transfers (pension) and subsidies to households and other institutions. The government's budget balance (public savings) is endogenously determined. With expectation that tariff revenues will decline ceteris paribus, the model allows increase in VAT and Ytax to ensure revenue neutrality.

Each of the 36 production sectors of the domestic economy utilises a nested production technology. Commodities are produced using skilled and unskilled labour, intermediate inputs, capital and land. In the SAM account for "sectors", we entered, row-wise, the sales of the domestically produced commodity to the domestic market and to the foreign markets (EAC, COMESA and ROW). Column-wise, we included the inputs required for domestic production of the domestically produced commodity. The value added is equal to the remunerations of the factors of production: capital, labour and land.

Labour is assumed to be mobile across sectors. However, unskilled agricultural workers can be employed only in agriculture, while skilled workers are mobile between agriculture and non-agricultural sectors. The combination of labour in production is modelled according to constant elasticity of substitution (CES) function. In equilibrium, wages serve to equate demand and supply of labour. Capital is considered to be sector-specific, and primary factor supplies are exogenous to the model. The demand for intermediate inputs and value added are modelled as fixed proportions of total output. The components of value added are aggregated using a CES function. The transformation of domestic production into exports is modelled according to the CET function.

Exports are shared between the EAC, COMESA, and the rest of the world (ROW) markets. This relationship is characterised by three different CES function:

$$\text{Export supply, } QE_c = QD_c \left[\frac{PE_c}{PD_c} \cdot \frac{\left(1 - \delta_c^q\right)}{\delta_c^q} \right]^{\frac{1}{\rho_c^t - 1}} \tag{4.1}$$

where QD_c is quantity sold domestically of domestic output c; PE_c is export price for commodity c (in domestic currency); PD_c is domestic price of domestic commodity c; δ_c^q is Armington function share parameter; and ρ_c^q is Armington function exponent. Export supply in each of the three foreign markets is determined by demand, and the price received by producers is given in domestic currency.

Similarly, importers have the option to import commodities either from the EAC, COMESA, or ROW according to Armington substitution elasticity (CES) function. Imported and domestic goods are assumed to be imperfect substitutes (Armington, 1969). Domestically produced and imported goods combine to form a CES aggregate:

$$QQ_c = a_c^q \left(\delta_c^q . QM_c^{-\rho_c^q} + \left[1 - \delta_c^q \right] QD_c^{-\rho_c^q} \right)^{\frac{1}{\rho_c^q}} \tag{4.2}$$

where, QQ_c is quantity of goods in domestic market; a_c^q is Armington function shift parameter for commodity c; and QM_c is quantity of import:

$$QM_c = QD_c \left[\frac{PD_c}{PE_c} \cdot \frac{\delta_c^q}{\left(1 - \delta_c^q\right)} \right]^{\frac{1}{1+\rho_c^t}} \tag{4.3}$$

The domestic import price is the world price adjusted by the exchange rate and import taxes. Therefore, changes in tariffs cause changes in the composite prices of the traded goods. The model allows tariff rates to differ depending on whether the imports are from the EAC, COMESA or ROW. Importers/consumers are expected to allocate their expenditure on EAC, COMESA and ROW imports, and each allocation decision is modelled as a CES function.

Output QX_c is distributed between domestic market and export markets (EAC, COMESA and ROW). In the domestic market, the good is sold to households, government, or used as intermediate inputs or investment goods. Indirect taxes are added to the local (producer) price to form domestic prices which, together with the import price form the composite price of domestically consumed goods via a CES function (equation 4.4).

$$QX_c = \beta_c \left(\delta_c^t . QE_c^{-\rho_c^t} + \left[1 - \delta_c^t \right] QD_c^{-\rho_c^t} \right)^{\frac{1}{\rho_c^t}} \tag{4.4}$$

where QX_c is aggregate domestic output of commodity c; β_c is CET scale parameter; δ_c^t is CET elasticity of transformation; QE_c is quantity of exports, and ρ_c^t is constant elasticity of transformation (CET) parameter. Export price is affected by output price, which in turn is affected by input prices. Export prices may vary across the three markets: EAC, COMESA and ROW.

As referred to already earlier, household income comprises wages, profits from rent of capital, and transfers from government, firms, other households and rest of the world (remittances). Besides savings, households use part of their income to pay taxes, pay other households or institutions (transfers), and to pay for goods and services.

Final demand by each household arises from nested constant elasticity of substitution (CES) utility function subjected to the budget constraint, determined via a linear expenditure system (LES), which allows different marginal budget shares for different households to be included.[11]

That is,

$$C_{ch} = \frac{p_c.b_c + \beta_{ch}\left(Ch - \sum_{j=1}^{J} p_j b_j\right)}{p_i} \tag{4.5}$$

where C_{ch} is demand for commodity c by household h; p_c : price of commodity c; b_c : quantity of commodity c in household basic needs basket; β_{ch} is share of commodity c in the consumption of household h; C_h is total household consumption; p_j are unit prices of different commodities in the household basic needs basket; b_j : quantities of commodities in basic needs basket (these quantities are fixed, apply to all household groups and remain invariant from one simulation to another); and p_i : prices of composite commodities.

$\sum_{j=1}^{J} p_j b_j$ = the monetary value of the minimum consumption (monetary poverty line), determined endogenously within the CGE model. Each household is assumed to behave in such a way that it first satisfies its minimum consumption of the respective commodities. Changes in the composite prices induced by changes in tariff rates will affect cost of basic needs basket, and therefore rate of poverty. A number of general equilibrium responses triggered by these price changes (e.g. changes in wages, composition of output, exports and imports; and pattern of employment) are captured in the model. These endogenous variables ultimately impact on poverty. A Foster-Greer-Thorbecke (F-G-T) poverty measure due to Foster et al. (1984) P_α is used to compare poverty (pre- and post-simulation experiment).[12]

Finally, demand for each composite good is assumed to equals supply of such good. Demand for exports equals supply of exports; and total investment equals savings. The world prices of imports and exports, the current account balance, and nominal exchange rate are exogenous to the model. Flexible prices serve to clear the markets for all commodities and factors. The macro closures apply to the government, the savings-investment balance, and external markets (EAC, COMESA, and ROW).

Model closure

Nominal government expenditure is equal to fixed quantities of consumption goods multiplied by their endogenous prices. Fixing real government expenditure insulates the poverty-related variable from the influence of government spending. Government income is held at base level, so that any reduction in government income from tariff cuts is compensated endogenously by additional revenue from value-added tax (VAT) and income tax (Ytax).

The basic needs basket of commodities for the poor in Uganda consists mainly of unprocessed foodstuffs. Introducing replacement taxes may not increase the cost of the unprocessed food component of the basic needs basket, as this component does not attract taxes. That is, supply of basic foods such as unprocessed foodstuffs, unprocessed agricultural products and livestock, and cereals (grown, milled or produced in Uganda) are exempted from value-added tax.

Total nominal investment is equal to fixed quantities of investment goods multiplied by their endogenous prices. The propensities to save of individual households adjust proportionately to accommodate the fixed total real investment formulation. This is achieved through a factor in the household saving function, which adjusts endogenously.

The current account balance is exogenous (foreign savings is equal to foreign account deficit) and the nominal exchange rate is the model's numéraire. Flexible foreign savings serve to clear the current account balance. As long as the nominal foreign exchange rate is fixed, the presence of foreign savings/exchange rate does not influence the savings-investment closure of the model, according to which the savings value determines the investment value. Real exchange rate is equal to nominal exchange rate multiplied by the world export prices, divided by the domestic price index. Changes in real exchange rate (due to variations in export prices) effectively clear the foreign trade sector.

In the factor markets, wages clear the labour market, and a fixed capital use for each activity is assumed. We assume some unemployment with fixed, activity-specific real wages for labour. Besides capital, land is fixed in the short run, and technical change and other shift variables are assumed to remain constant. Walras law is satisfied since private consumption equals the income from primary factors plus net transfers to households (consumers) by government from domestic and international trade taxes.

Data limitations

The household survey exhibited some gaps in data on wage rates and income by economic activity, net savings of the households, and inter-household transfers within the domestic household sector. These were estimated based on other related survey information. Some of the commodities in SAM (e.g. trade services, railway transport, goods road transport and other transport services) and factor income transfers from ROW to the domestic household sector were not accounted for in the household survey. Expenditures on these commodities have been allocated to each household according

to some expenditure share criteria. Second, reconciling data was very challenging as a result of incorporating a large number of households into the SAM. This led to adjusting some figures (especially inter-household transfers, consumption expenditures, income, etc) in view of considerations to balance the SAM. However, the order of magnitude of missing/unreliable data and related adjustments made are within reasonable limits and, as such, we do not expect it to affect the model/results significantly.

5. Empirical results and discussions

Policy simulations

Three types of policy simulations are performed, in line with the model closure described above. First, the weighted average of EAC tariffs is set to zero, i.e. imports from EAC enter Uganda free of duty, including category B goods exports from Kenya. The reason for including category B goods is to avoid the modelling difficulties associated with isolating these goods in the model. Considering that the 10% tariff on category B goods was a temporary measure to be phased out in 2010, applying uniform condition to EAC imports is appropriate. In the second simulation, the average weight of non-EAC COMESA tariffs is set to zero (i.e., imports from COMESA countries enter Uganda free of tariffs). The purpose of the second simulation is to demonstrate the likely impact that Uganda's membership to COMESA free trade area would have on the poor in Uganda. In the third simulation, tariffs are set to zero across the board (i.e., EAC, COMESA and ROW imports), including sensitive products (compared with a scenario in which all tariffs, but sensitive products are set to zero). Although this simulation is not identical to what happens in the real world, the purpose is to demonstrate the potential effect of complete tariff reduction.

In what follows, we first present the sectoral and macro results arising from these simulations, such as the reaction of imports, domestic prices, output and wages in the economy as they are key variables that affect poverty, and then results related to poverty.

Simulation 1: Reduction in EAC tariffs by 100%

Simulating 100% tariff reductions on EAC imports is associated with a rise in EAC imports across all sectors as reported in Table 5 (see Table A6 for full sector coverage). The highest increase in imports occurs in the dairy, beverages and textile sectors, which also happen to be highly protected sectors. Sources such as the Uganda Revenue Authority have also indicated that Uganda's imports from the EAC, particularly of dairy products, beverages and textiles have been growing steadily in recent years. This implies that, with complete phase out of intra-EAC tariffs, protected sectors are likely to contract due to rise of imports, and non-protected sectors to expand. We are likely to see decline in food imports from COMESA, but imports of beverages, sugar and manufactured products from COMESA and ROW are likely to rise, at least in the

short run, independent of existing tariffs. Rise in cereals imports from EAC (estimated at 1.1%) and imports of other food commodities (vegetables, legumes, sesame, etc) estimated at 2.6% suggests that removal of intra-EAC tariffs is likely to impact these sectors less than most sectors.

Table 5: Changes in imports by region sector after policy simulation

Sector	Base level EAC imports	Per cent change in EAC imports relative to the base	Variation in imports from other region (%)	
			COMESA	ROW
Livestock, livestock products	1.32	9.1	6.9	-2.1
Milk, dairy	0.40	13.3	4.3	-1.0
Fish, fish products	0.06	7.6	0.1	-7.8
Cereals	12.72	1.1	-3.1	1.8
Other food commodities 1/	17.84	2.6	-0.5	-0.1
Sugar	9.82	6.5	5.9	18.4
Agricultural, cash-based commodities /2	13.37	12.7	-0.3	6.1
Beverages	5.34	21.3	3.7	12.9
Textiles	11.3	38.4	-7.8	7.3
Manufactures	48.0	4.3	2.5	11.4

Note: 1/ sesame, vegetables, fruits, spices, groundnut, and other foodstuff; 2/ coffee, tea, tobacco, cotton/ textile

The modest rise in cereal imports of 1% (from EAC) has been more than compensated by a 3% fall in cereals imports from COMESA. Cereal imports from rest of the world went up by 1.8%. The fall in COMESA imports suggests that the complete phase-out of intra-EAC tariffs is likely to suppress imports of cereals and agricultural food from non-EAC COMESA countries. Imports from COMESA and ROW are predicted to fall in a number of sectors as a result of reducing EAC tariffs to zero. This is expected because COMESA and ROW imports will be competing with imports from EAC region that do not face the same tariffs in Uganda.

We expected the manufacturing imports (from the EAC) to grow by over 4.3% (Table 5) after the simulation, as manufacturing sector is relatively protected. This result suggests that although imports will rise after removing intra-EAC tariffs, the rise is likely to be rather modest in scope, in the short run. As such, the manufacturing sector in Uganda may not necessarily suffer adverse effects due to this reform.

In Table 6, we see that the effect of complete phase-out of intra-EAC tariffs remains positive for domestic production and domestic prices in most sectors. Overall, two sectors face fall in production: beverages (-17.1%) and fish sectors (-2.4%). Prices remain nearly unchanged for dairy, but fall for beverages and traditional cash crops: coffee, tea, tobacco and cotton. Rising levels of imports exert pressure on domestic prices of beverages, causing them to fall. Fall in prices in turn led to fall in domestic production (Table 6). This should come as no surprise, for the beverages sector happens to be among those sectors that were highly protected and relatively subsidized (e.g. imported sugar used in production of soft drinks at 7% duty instead of 17%).

On the dairy sector, available evidence indicates that the quantities of dairy imports as share of composite supply in the domestic market or of domestic production are quite

low. As a result, domestic production and prices (in the dairy sector) are not affected (Table 6).

Table 6: Effect of tariff change on domestic prices (composite) and production by sector

Sector	Index of composite prices base (average)	Production level of domestic firm, base (average)	Variation in dom. prices and production (%)	
			Prices	Production
Milk, dairy	1.07	83.0	0.01	0.0
Fish, fish products	1.00	67.2	16.1	-2.4
Cereals	1.02	59.1	6.3	2.7
Other food commodities 1/	1.03	70.0	7.9	0.9
Sugar	1.00	88.3	15.0	3.5
Agricultural, cash-based commodities /2	0.95	161.8	-1.3	5.0
Beverages	1.03	48.0	-10.1	-17.1
Manufactures	1.01	84.0	8.5	0.4

Note: 1/ and /2 as in Table 5

The domestic prices and production of cereals are hardly affected after this simulation because of the small increase in cereal/food imports and due to the fact that such imports contribute very small shares (less than 3%) of total supply of composite commodities in the domestic market. The neutrality (or near neutrality) of Uganda's food sector to EAC tariff reforms is helped by the fact that Uganda is a major food producer/net food exporter in the EAC.

The rise in domestic prices of fish is attributed to a fall in fish production. The fall in fish production could have been triggered by changes in relative prices, but not necessarily the rise in fish imports (7.6%), which we saw in Table 5.

The domestic price of sugar went up despite the rise in domestic production and imports. This is due to increase in export demand (Table A7 reports a 45.2% rise in sugar exports to the EAC market). Real exchange rate depreciates, leading to increase in exports. Prices of cereals and other food commodities have equally gone up after simulation. Available sources show that Uganda's food exports to the EAC region have increased dramatically in recent years.

Following a complete phase out of the EAC tariffs, demand for unskilled labour increases in all sectors, except in fish and beverages sectors. Where the relative price of unskilled labour intensive goods have increased (as the Stolper-Samuelson theorem suggests), we expect the wages of unskilled workers to go up. For fish and beverages sectors, demand for unskilled labour falls by 2.5% and 2.1% , respectively. Demand for skilled labour also drops in primary sectors (livestock, cereals, and other food production sectors) that are intensive in unskilled labour. This situation also shows a drop in unskilled sector wage in the livestock, traditional agricultural cash-crops sector, and beverages sector as demand for unskilled labour increases marginally or drops in some cases.

Increase in sector wages for unskilled workers (highest, as compared to other sector) reported in the food crops sector (cereals, sesame, vegetables, fruits, spices, groundnut, soy bean, etc) is due to increase in relative price of these commodities, which are intensive

in unskilled labour. The highest cut in sector wages (5% skilled wages and 9% unskilled) is seen in the beverages sector. This policy situation has relatively marginal effect on skilled sector wage, which remained within an average range of -2.4 to 5 percentage change (except for beverages). Although wages for skilled sector workers appear to be more stable than unskilled sector wages, unskilled labour is likely to gain from wage increases (as tariffs on EAC imports go down) than skilled labour.

Table 7: Simulated effect of tariff change on labour demand by sector

	Variation in labour demand (%)		Variation in wages (%)	
Sector	**unskilled**	**skilled**	**unskilled**	**skilled**
Livestock, livestock products	0.89	-6.04	-0.05	1.93
Fish, fish products	-2.54	0.02	0.05	-2.40
Cereals	1.00	-2.01	9.03	0.00
Other food commodities 1/	1.05	-0.01	2.40	0.90
Sugar	6.02	0.30	7.08	0.50
Agricultural, cash-based commodities/2	0.03	-0.01	-2.23	4.91
Beverages	-2.15	-0.57	-5.01	-9.06
Manufactures	0.79	0.32	0.10	0.17

Note: 1/ and 2/as in Table 5

Removing tariffs on EAC imports enhances exports. Exports to EAC markets increase in 27 out of the 36 sectors reported in Table A6. The top five export growth sectors include sugar (with 45% rise in exports), wheat (39%), cooking oil/oil seed (38.5%), manufactures (38%), and rice (35.4%). Uganda's exports growth in the COMESA market as predicted by the model is led by sugar. In the ROW market, coffee, at 38.7% export growth ranks first among Uganda's fast growing export sectors followed by tobacco (30.5%), and cooking oil (21.9%).

The general rise in level of production across sectors, which we noticed earlier, is in a way export-driven. The opportunities created in the export markets outweigh the negative effect arising from increased imports, as more goods than before can be exported. This situation is likely to spur domestic production in the medium term to long term, and unskilled workers especially in rural areas will gain, as we saw before, from a rise in their wages.

There is therefore a basis, from the evidence so far, for arguing that a complete phase-out of intra-EAC tariffs have little effect on sectors where most poor in Uganda derive their livelihoods, and therefore unlikely to increase poverty. Instead, it seems to offer new avenues for poverty reduction through its potential to stimulate exports, increase unskilled sector wages, and lower prices of other importable goods consumed by the poor.

With regard to government revenues and poverty, these are discussed in the end in sections 5.5 and 5.6. As discussed before, the model ensures revenue neutrality by allowing increases in VAT and income tax to compensate for any potential shortfall in revenue. However, to gauge the effect of tariff reduction on revenue, we relaxed the neutrality assumption, including changing some closure rules and re-run the simulation. We noted an overall loss in government revenue by a ratio of 13.2%. Finally, removing

tariffs on EAC imports (see section 5.6) is generally pro-poor since it lowers the cost of the basic needs basket for the poor, thus monetary poverty line by 2.76%.

Simulation 2: Reduction in COMESA tariffs by 100%

In this second scenario, we simulated a 100% reduction in COMESA tariffs. The results in Table 8 (and Table A6) show that Uganda's imports from COMESA increase after the simulation, but the increases are modest in scope for a number of sectors. Imports of tobacco (from COMESA) grew by 19.8% after the shock, manufactures by 16.5%, sugar 15.9%, poultry and poultry products 15.3%, and bottled water 13%.

Table 8: Import reaction to reduction in COMESA tariffs

Sector	Base level COMESA imports	Index of composite/ domestic prices (Base level)	Variation in imports and domestic prices (%)	
			imports from COMESA	Domestic prices
Livestock, livestock products	1.32	1.02	5.67	0.00
Poultry, poultry products	0.38	1.00	15.3	-0.01
Fish, fish products	0.01	1.02	0.10	0.00
Cereals	0.91	1.03	-5.25	0.00
Other food commodities 1/	0.98	1.00	2.94	0.00
Sugar	47.84	0.95	15.09	0.00
Agriculture, cash-based com /2	1.37	1.03	0.23	0.02
Tobacco	29.57	1.01	19.81	-0.01
Beverages	0.32	1.02	7.70	0.00
Textiles	1.30	1.00	9.23	0.00
Manufactures	33.56	1.02	16.50	0.00

Note: 1/ sesame, vegetables, fruits, spices, groundnut, and other foodstuff; 2/ coffee, tea, tobacco, cotton/ textile

One would argue that imports (from COMESA) are growing from small bases and, therefore, any small change tends to be magnified. The 5.3% and 9.0% decline in cereals and vegetables imports from COMESA (Table A6) are due to protected sectors (sensitive products) and exchange rate depreciation. Cereals and vegetables are very important in basic needs basket of the poor in Uganda. Table A6 tends to suggest that, while reducing tariffs on COMESA imports will invite more imports from the COMESA region, these imports are likely to be concentrated in few sectors, especially outside the sensitive tariff lines.

The effect on domestic prices of removing COMESA tariffs is negligible (Table 8). This seems to suggest that the rise in imports from COMESA due to tariff changes do not impact the level of domestic supply significantly enough to exert pressure on domestic prices. It follows, therefore, that the gains that the poor might derive from this policy in terms of reduced prices is relatively small, compared with that we saw in the case involving removal of intra-EAC tariffs. The gain to the economy comes from the rise in exports (Table A7) of rice (35%), cooking oil (40%), sugar (46%) and wheat (39%). The poor employed in this sector will experience a rise in their incomes – to the COMESA markets.

Simulation 3: Reduction across the board of import tariffs by 100%

Two simulations are performed as follows: (i) tariffs are set to zero on all imports from EAC, COMESA and ROW, including sensitive products; (ii) tariffs are set to zero on all imports, except sensitive products. As we mentioned in the previous section, Uganda, being an LDC, is not expected to take on WTO liberalization commitments of cutting down its tariffs. The purpose of these simulations is to demonstrate the potential impact of fully liberalizing Uganda's imports.

Imports increase for most sectors after setting overall tariffs to zero (Table 9). Rest of the world imports grew faster than EAC or COMESA imports. For example, sugar imports from ROW rose by 26.5% after simulation, compared with 5.9% and 18.4% rise in sugar imports from EAC and COMESA, respectively. Another important observation (from the results in Table 9) is that higher increases in imports are associated with sectors that were highly protected (or sensitive products), for example sugar, rice, wheat, textile, and manufactures.

However, when original tariffs on sensitive products were maintained in the model, the increase in imports, especially of sensitive products, were about 50% lower than the rates achieved by setting the tariffs (on all products including sensitive products) to zero. For example, 19% increase in sugar imports was achieved with zero tariffs on sugar imports, compared with 9.2% increase in sugar imports by maintaining the original 100% duty on sugar imports (Table 9). However, textiles are more resilient to tariffs than any other sensitive products. Textiles imports are estimated to increase by 35.1%, with zero tariffs on textile imports and by 32.4% with 35% (average) duty on textiles.

The fall in domestic prices observed in Table 9, particularly for manufactured products, textile, and beverages arise from increased imports. Increase in imports push the prices of domestically produced import-competitive products down. Compared with the EAC tariff reform discussed in section 5.2, the sector price effects associated with current scenario (involving 100% tariff reduction on all imports) are much deeper. It is likely that competition from cheaper imports is huge, as shown by a 5.5% fall in production in manufacturing sector (Table 10), 5% fall in textile production, and 18.7% fall in beverages production. Some poor households may gain from the price fall, especially if the share of these imports in the consumption basket of the poor is large enough. However, for the poor employed in the manufacturing, textile, and beverages sectors, their wages decline as we shall see later in Table 11. They may become worse off as a result unless the cost of the consumption bundle falls more than their wages.

Domestic prices of sugar, livestock/livestock products, fish, cereals, and other food commodities went up due to increase in exports and domestic demand. For all these products, except fish, domestic production also went up. Domestic price of sugar increases by 1% (Table 10), in contrast with 15% price increase in the previous simulation (Table 6). Sugar production increases by 0.8 per cent (Table 10) under the current 100% tariff reduction on all imports as opposed to EAC tariff reduction (Table 6), which resulted in 3.5% increase in sugar production.

Table 9: Changes in imports across sectors, after tariffs reduction

Sector	Overall % change in imports with 100% tariff reduction		% change in ROW imports with 100% tariff reduction (with/without protection to special product		% change in EAC and COMESA imports with 100% tariff reduction	
	including tariffs on SP	Excl. tariffs on SP	SP protected	SP not protected	EAC	COMESA*
Livestock, livestock products	11.0	n/a	0.0	0.0	9.0	7.1
Fish	7.7	n/a	n/a	-2.9	7.6	-0.1
Cereals	1.9	1.9	1.8	1.8	-3.1	1.8
Wheat	4.5	3.8	4.0	7.7	-5.6	-6.8
Rice	12.5	11.9	0.6	2.6	10.5	-3.0
Other food commodities	1.0	n/a	n/a	1.6	-0.1	-0.1
Sugar	19.0	9.2	18.3	26.5	5.9	18.4
Agricultural, cash-based commodities /2	1.3	n/a	n/a	2.7	-0.3	6.1
Beverages	21.0	n/a	n/a	15.3	20.9	2.7
Textile	35.1	32.4	7.1	15.2	29.4	0.6
Manufactures	21.6	n/a	n/a	23.3	2.3	1.3

Notes: SP: sensitive products. * Tariffs on sensitive products maintained on imports from COMESA; 1/sesame, vegetables, fruits, spices, groundnut, and other foodstuff; 2/ coffee, tea, tobacco, cotton

Table 10: Effect on domestic prices and output

Sector	Index of composite prices base (average)	Domestic output of firm, base (average)	Percentage change in	
			Domestic prices	production
Livestock, livestock products	1.02	118.2	0.9	1.9
Fish, fish products	1.00	67.2	16.1	-2.4
Cereals	1.02	59.1	6.3	5.3
Other food commodities 1/	1.03	70.0	7.0	1.6
Sugar	1.00	88.3	0.9	0.8
Agricultural, cash-based commodities /2	0.95	161.8	-1.3	5.0
Beverages	1.03	48.0	-17.0	-29.0
Textile	1.00	98.2	-11.0	-5.0
Manufactures	1.01	84.0	-1.9	-5..5

Note: /1 and 2 Table 5

The results presented in this table are derived from simulating a 100% reduction in import tariffs (except for tariffs on sensitive products). Original tariffs on sensitive sectors

are maintained, since we expect these sectors to be excluded from future liberalization commitments, including that under EPA arrangement.

The poor rely very much on their labour, and thus defines their condition after a shock. In Table 11, we observe increase in demand for unskilled labour (in both rural and urban areas) and fall in demand for skilled labour in primary agriculture sectors (cereals, other food production sector, and livestock). As expected, sector wages for unskilled labour employed in the livestock sector, cereals, sugar and other food sectors improve (and the poor, by assumption gain). These sectors use more unskilled labour than the manufacturing and beverages sectors, which have seen their production contract after the shock and, as expected, manufactured wages drop and skilled sector wages fall in primary sectors. The rise in unskilled sector wages and fall in skilled wages can be seen as reflecting a narrowing of the wage gap between skilled and skilled workers.

In Zimbabwe, Chitiga et al. (2005) find similar increase in wages for unskilled workers employed in the primary agriculture sector in the magnitude of 10.4% and a corresponding 11.4% fall in skilled wages. Hertel et al. (2003)'s findings for Uganda on factor incomes also show an increase in average earnings for land, labour and capital, and of course increased demand for these factors under multilateral liberalization.

Table 11: Effects of tariff reduction on labour demand and sector wages

	Changes in labour demand (%)				Changes in wages (%)			
	unskilled labour		skilled labour		unskilled labour		skilled labour	
Sector	rural	urban	rural	urban	rural	urban	rural	urban
Livestock	3.10	0.89	0.05	-0.04	9.06	0.55	1.88	-0.03
Fish	-0.10	0.54	-0.49	0.20	-10.5	1.15	0.00	1.22
Cereals	12.10	3.50	-0.01	-2.01	5.70	6.03	0.00	-0.01
Other food com sector	2.40	1.05	-0.90	-0.01	2.98	2.40	-0.05	-0.03
Sugar	4.50	6.02	0.10	1.30	5.10	7.08	0.09	3.65
Agricultural, cash-based commodities /1	-0.01	0.03	0.00	-0.01	-2.03	1.01	0.00	-5.91
Beverages	-15.07	-2.15	-1.07	-0.17	-0.02	-19.02	0.01	-18.50
Manufactures	-10.32	0.79	-1.10	-0.56	-0.01	-19.17	0.00	-11.11

Note: /1 as in Table 5

Based on these results, it may then be expected that the poor in rural areas benefit from 100% reduction in tariffs because demand for their labour increase, stepping up their wages while at the same time seeing the prices of the goods they produce go up.

The poor who are employed primarily in the exportable sector and consume importable goods gain more from full liberalization than those who are primarily employed in the import-competing sector, and consume primarily exportable goods. In the long run, as labour and capital become mobile across sectors, labour should pay across sectors. We would also expect to see the import sector contract in relative terms, while the exports sector expands and domestic industries are able to adjust.

Analyzing revenue impact (Simulations 1-3)

As already discussed before, our model ensures revenue neutrality; any reduction in government revenue from tariff cuts is compensated endogenously by additional VAT and income tax. However, we are also interested in the revenue impact of tariff reduction. By relaxing the neutrality assumption, changing some closure rules and re-running simulations 1-3 (that is a 100% tariffs reduction on EAC imports, a 100% reduction on COMESA tariffs, and a 100 per cent reduction of tariffs on all imports from EAC, COMESA and ROW, including sensitive products), we obtain results reported in Table 12.

Revenue falls by 13.2 per cent after simulation 1, by 8 per cent after simulation 2, and by 19.6 per cent after simulation 3 (Table 12). These results suggest that Uganda's trade liberalization in the context of EAC/COMESA integration (i.e., a complete phase out of intra-EAC or intra-COMESA tariffs) or in a multilateral context (i.e., removal of tariffs on imports from EAC, COMESA and ROW) will lead to revenue losses. Multilateral liberalization will account for most of the revenue losses.

Table 12: Impact on government revenue (by sector) due to tariffs reduction

Sector	Base	Simulation 1: 100% reduction in EAC weighted average tariffs	Simulation 2: 100% reduction in COMESA weighted average tariffs	Simulation 3: 100% reduction in tariffs
		Change in sector revenue collection (%)		
Livestock, livestock products	628.2	-4.65	-6.13	-14.42
Fish, fish products	16.9	-17.00	-0.90	-35.20
Food, agriculture primary commodities	1,289.39	-9.43	-8.03	-48.65
Agricultural cash-based commodities /3	757.7	-4.48	-0.22	-11.13
Manufacturers, and others	2,276.2	-15.87	-11.44	-43.10
Effect on revenue (%)		-13.24	-7.91	-19.6

Note: 3/ coffee, tea, tobacco, cotton/textile, vanilla, cocoa, flowers

As we saw in Table 4, about 70% of total tariffs revenue in 2007 was collected on imports from ROW (trading partners outside EAC and COMESA). Across sectors, tax revenue declines in all sectors. As can be observed, most of the revenue losses are from manufactured imports: over 15% of potential revenue from manufactured imports is lost due to EAC tariffs reform, 11% due to liberalizing COMESA imports, and 43% due to multilateral liberalization.

Uganda's reliance on tariff revenues remains high (above 21% of total tax revenues). Without wide bases for consumption and income taxes to compensate for the decline in tariff revenues, multilateral liberalization has the potential to stifle government expenditure: government demand for commodities, payment of wages and capital and

delivery of public goods, including expenditure on poverty reduction programmes and transfers (pension).

Poverty impact of the tariff reductions (Simulations 1-3)

The results in Table 13 demonstrate the effect of simulating three shocks, viz: removal of EAC tariffs, removal of non-EAC COMESA tariffs, and removal of all tariffs. We observe that monetary poverty line decreases in all cases, but it falls more in the case of a complete removal of tariffs (by 2.94%), than in the case of removal of EAC tariffs (2.76%), or removal of non-EAC COMESA tariffs (1.08%).

Table 13: Monetary poverty line

		Simulation 1: 100% reduction in EAC weighted average tariffs	Simulation 2: 100% reduction in COMESA weighted average tariffs	Simulation 3: 100% reduction in tariffs
	Base	New poverty line after simulation	New poverty line after simulation	New poverty line after simulation
Poverty line /1 NHS	137,568.0			
Poverty line (model)/2	137, 694.84	133,894.46	136,207.73	129,957.96
Poverty line /3	137, 694.84	133,894.06		
Change in monetary poverty line (%)		-2.76	-1.08	-2.94

Note: */1 NHS: monetary poverty line published in the Uganda National Household Survey 2002/2003; /2 monetary poverty line (Base) generated by the model is much the same with food poverty line in 1/; Household Survey (the poverty line allows for some limited expenditure on non-food items that constitute the basic needs; 3/poverty line generated by the model within 10-15% change in elasticity parameters.

The fall in poverty line in each of these cases is induced by a combination of factors, including a fall in composite prices of commodities comprising the basic needs basket of the poor. The decrease in composite prices is attributed to a fall in relative prices of imports (in domestic currency) following a removal of tariffs.

The results suggest that all the three liberalization strategies (removing EAC tariffs, non-EAC COMESA tariffs, and all tariffs) are likely to facilitate poverty reduction in Uganda. However, greater poverty reduction is likely to be achieved with across-the-board tariffs reduction (i.e., removing tariffs on all imports from EAC, COMESA and ROW).

We explore this further by applying the Foster, Greer and Thorbecke (1984) (FGTα) decomposable indices (P0 and P1). Analysis centres on changes in indices after the shocks. Table 14 shows the changes in poverty headcount index) – the proportion of people living below the poverty line, and the poverty gap index (– the depth of poverty, the minimum cost of eliminating poverty through perfectly targeted transfers.

National poverty headcount (including poverty in rural and urban areas) falls in all cases (removal of EAC tariffs, removal of non-EAC COMESA tariffs, and removal of all tariffs), but it falls more in the case of a complete removal of tariffs by 3.2% , and least in the case of removal of non-EAC COMESA tariffs (1.3%). These results reinforce the findings on Table 13, which shows the potential poverty (reduction) impact of fully liberalizing trade as opposed to regional trading arrangement.

Table 14: FGT poverty indices (P_0, P_1 and P_2)

	Base	Sim1	Variation (%)	Sim2	Variation (%)	Sim3	Variation (%)
Poverty head count, α = 0							
All (National)	38.800	37.837	-2.482	38.283	-1.333	37.546	-3.232
Rural	42.700	41.901	-1.871	42.392	-0.721	41.842	-2.010
Urban	14.400	13.978	-2.933	14.130	-1.874	13.903	-3.450
Poverty gap index, α = 1							
All (National)	11.900	11.626	-2.301	11.729	-1.433	11.530	-3.111
Rural	13.100	12.913	-1.425	12.981	-0.912	12.842	-1.970
Urban	3.900	3.827	-1.861	3.837	-1.610	3.761	-3.554
Severity of poverty, α = 2							
All (National)	4.84	4.643	-4.070	4.738	-2.103	4.556	-5.870
Rural	5.027	4.9218	-2.093	4.972	-1.091	4.917	-2.198
Urban	2.659	2.569	-3.371	2.583	-2.867	2.498	-6.043

Table 14 further indicates that poverty headcount index falls more in urban areas than in rural areas, in all the cases. For example, poverty headcount falls by 3.4% in urban areas after removal of all tariffs (simulation 3) against a 2% fall in rural areas.

The depth of poverty (as measured by poverty gap index, P_1) has gone down in all the cases, and in both urban and rural areas. Like the case of headcount index, poverty gap index shows more improvement in the case of removal of all tariffs (where it declined by 3.1%) than the case of removal of EAC or non-EAC COMESA tariffs (simulations 1 and 2, respectively). P_1 falls more in urban areas than in rural areas; for example, a 3.5% fall in urban poverty gap compared with a 1.9% fall in rural poverty gap after a removal of all tariffs (simulation 3, Table 14). The results suggest that the cost of lifting the poor (all households below the poverty line) out of poverty through transfers will be lower under multilateral trade liberalization than under regional integration (removal of tariffs on EAC or non-EAC COMESA tariffs).

The severity of poverty, measured by P_2, falls in all cases; by 4% with removal of EAC tariffs, 2% with removal of non-COMESA EAC tariffs, and by 6% with removal of all tariffs. Severity of poverty falls more in urban areas than in rural areas.

Sensitivity analysis

The simulation results are influenced by the choice of parameters in the model. This section highlights the impact (on the results) of varying the values of some

of the key parameters. There are three parameters that have had a strong impact on the results: the elasticities of substitution between imports of different origin; elasticities of substitution between domestic and imported goods; and elasticities of transformation (in CET function). All parameters retained their standard (original) values, except the parameter in question. Variables associated with welfare improvements, for example domestic output, and wages reacted positively to an increase in substitution elasticities. This is not surprising, since higher elasticities imply that agents are able to shift to sectors, products and sources that are cheaper and economically more rewarding.

By varying the elasticity estimates (from about 10 to 50 percentage point below and above the standards GTAP elasticity indexes), the poverty line index varied between -0.01 to about -1.2 percentage points in the three simulations, and the effects were much stronger for the third policy scenario (100% reduction in tariffs) than any of the two simulations performed separately.

6. Conclusions and policy implications

In this paper, we have outlined the developments in trade policies in Uganda since the 1980s and have provided empirical evidence on how tariffs reduction can impact on poverty. Evidence from a CGE evaluation of trade policies at regional level (EAC and COMESA) reveals differences in impact of these policies on key macro variables and poverty level. However, it shows that both of them will be poverty reducing. A complete phase out of tariffs on EAC imports is likely to reduce poverty, as shown in the decrease in poverty threshold (-2.76%) and poverty headcount index. Tariff reduction on COMESA imports is also likely to facilitate poverty reduction (as poverty line decreased by 1.08% on implementing this policy, poverty headcount decreased in rural and urban areas). Still, we can conclude that greater poverty reduction is likely to be achieved with liberalization that is wider in scope than free trade arrangement under EAC and COMESA alone (as evidenced by 2.94% fall in poverty threshold with wider tariff reduction). However, noting the reaction to tariff reduction of the sectors that are currently classified as 'sensitive' in Uganda, care is needed when opening up these sectors to free trade due to vulnerability from increased imports.

One of the most influential channels of trade policy in Uganda is the first order effect transmitted through the price of imports. This implies that policy to reduce poverty need to pay more attention to enhancing output in import-competing sectors, and stimulating production and exports in the agricultural sector. This will minimize the long run price effects of rising imports when these sectors are fully open to competition.

Notes

1. A household that appears not to be poor according to the standard national poverty line could actually be poor if a poverty line based on the (high) cost of living in her region were used instead (Okurut et al., 2002).

2. Many argue that, at the time when the CMB was a monopoly in coffee export, farmers' share of the export price was less than 30%. This share rose to 82% in 1996/97 from 45% in 1991/92 (as unit export price for Uganda coffee increased 3-fold from US$ 0.82/kg in 1992 to US$ 2.55/kg in 1994/95) following liberalization of the coffee sector in 1991. But how do we attribute this to the policy change?

3. Furthermore, a protocol establishing a common market for EAC was signed on 19th November 2009, coming into effect on 1st July 2010. It is expected to facilitate movement of persons, labour, and services within the EAC, as well as a right to establishment and residence of EAC citizens within the community. This in turn is expected to increase intra-EAC trade and help facilitate poverty reduction.

4. Article 12 of the Protocol on the Establishment of the East African Community Customs Union.

5. Annex I to the EAC Customs Union Protocol.

6. Article 11 of the Protocol on the Establishment of the East African Community Customs Union.

7. Category "A" goods from EAC partner states enter into each others' territory free of customs duty.

8. They are Burundi, Comoros, DR Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe.

9. They are Burundi, Comoros, Djibouti, Egypt, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Sudan, Zambia and Zimbabwe.

10. Some modellers have used income deciles to group the households; others have used socio, demographic, or geographic criteria.

11. The LES utility function restricts households to consuming a basket of subsistence goods. The minimum consumption of a good by one household is derived using the

Frisch parameter and the income elasticity. For a detailed presentation, see Dervis et al. (1982).

12. That is, $P_\alpha = \frac{1}{n^*} \sum_{i=1}^{q} \left(\frac{z - y_i}{z} \right)^\alpha$

where y_i is adult equivalent consumption expenditures for those individuals below the poverty line, and zero for those above, z is the endogenous poverty line, n^* the total population, and q the number of poor people. The parameter α takes the value of zero for the headcount index (P_0), 1 for the poverty gap (P_1) and 2 for the squared poverty gap (P_2).

References

Adelman, I. and S. Robinson. 1978. Income distribution policy: A computable general equilibrium model of South Korea, Stanford: Stanford University Press.

Alarcon, J., S. Baryahirwa, S. Bahemuka, J. van Heemst, I. Kasirye, N. Rudaheranwa, and P. de Valk. 2006. Social Accounting Matrix Uganda 2002: Project report – Output, Procedures and Methodology, The Hague, August 2006.

Appleton, S. 1999. Changes in poverty in Uganda, 1992-1997, WPS/99.22, unpublished report, Centre for the Study of African Economies, University of Oxford.

Armington, P. 1969. "A theory of demand for products distinguished by place of production", IMF Staff Papers.

Bautista, R., H. Lofgren and M. Thomas. 1998. Does trade liberalization enhance income growth and equity in Zimbabwe? The role of complementary policies, TMD Discussion Paper No. 32, Washington DC: IFPRI.

Boccanfuso, D. and L. Savard. 2005. Impact analysis of the liberalization of groundnut production in Senegal: A multiple household computable general equilibrium model, Working Paper 05-12, Groupe de Recherche en Économie et Développement International.

Bourguignon, F., Michael , G, and D. Miqueu. 1983. "Short-run rigidities and long run adjustments in a computable general equilibrium model of income distribution and development", Journal of Development Economics, Vol. 13, No.1-2.

Bourguignon, F., J. de Melo and A. Suwa. 1991. "Modelling the effects of adjustment programs on income distribution", World Development, Vol. 19, No. 11.

Bourguignon, F. and A. Spadaro. 2005. "Macrosimulation as a tool for evaluating redistribution policies", Working Paper No. 2005-02, Paris: Paris-Jourdain Sciences Économiques.

Castro, L., C. Kraus and M. de la Rocha. 2004. Regional trade integration in East Africa: Trade and revenue impacts of the planned East African Community Customs Union, Africa Region Working Paper No. 72, Washington DC: World Bank.

Chen, S and M. Ravallion. 2004. "How have the world's poorest fared since the early 1980s?" World Bank Research Observer, 19.

Chitiga, M., T. Kandiero and R. Mabugo. 2005. "Computable general equilibrium micro simulation analysis of the impact of trade policies on poverty in Zimbabwe, PEP Working Paper 2005-01, available at www.pep-net.org.

Cockburn, J. 2001. Trade liberalization and poverty in Nepal: A computable general equilibrium micro simulation analysis", CREFA Working Paper (01-18).

Cogneau, D. and A. S. Robilliard . 2000. "Income distribution, poverty and growth in Madagascar: Micro simulations in a general equilibrium framework, IFPRI TMD Discussion Paper No. 61, Washington DC: IFPRI.

Cororaton, C.B. 2003. Analysis of trade reforms, income inequality and poverty using micro simulation Approach: The case of Philippines, Discussion Paper No. 2003-09, Philippines Institute of Development Studies.

Cororaton, C.B., J. Cockburn and E. Corong. 2005. Doha scenarios, trade reforms, and poverty

in the Philippines: A CGE analysis, MPIA Working Paper 2005-03, PEP, www.pep-net.org.
Dervis, K., J. De Melo and S. Robinson. 1982. General equilibrium models for development policy, London: Cambridge University Press.
de Janvry, A., E. Sadoulet and A. Fargeix. 1991. "Politically feasible and equitable adjustment: Some alternatives of Ecuador", World Development, Vol. 19, No. 11.
Decaluwé, B., A. Patry, L. Savard and E. Thorbecke. 1999. Poverty analysis within a general equilibrium framework, CREFA Working Paper 9909, Université Laval, available at http://www.crefa.ecn.ulaval.cahier/liste99.html.
DeRosa, D.A., M. Obwona and V.O. Roningen. 2003. The new EAC Customs Union: Implications for trade, industry competitiveness and economic welfare in East Africa, unpublished (draft) report.
Foster, J., J. Greer and E. Thorbecke. 1984. "A class of decomposable poverty measure", Econometrica, 52(3).
Ganuza, E., S. Morley, V. Pineiro, S. Robinson, and R. Vos. 2005. "Are export promotion and trade liberalization good for Latin America's poor?", Development Policy Review, vol.23, No.3, pp.385-403
Harrison, G.W., T. F. Rutherford and D. G. Tarr. 2000. Trade liberalisation, poverty and efficient equity, Economics Working Paper B-81-02, Moore School of Business, University of South Carolina.
Hess, R. 1998. Synthesis of the studies on the harmonisation of external tariffs within the cross-border initiative, unpublished draft report, Imani Development.
Hertel, T.W, M. Ivanic, P.V. Preckel and J.A.L. Cranfield. 2003. Trade liberalization and the structure of poverty in developing countries". Paper prepared for the Conference on Globalization, Agricultural Development and Rural Livelihood, Cornell University, Ithaca, 11-12 April 2003.
Hertel, T,W. and J.J. Reimer. 2004. Predicting the poverty impacts of trade reform, Policy Research Working Paper 3444, Washington DC: World Bank.
Minot, N. and F. Golleti. 2000. "Rice market liberalization and poverty in Vietnam", IFPRI Research Report 114, Washington DC: IFPRI.
Morrison, C. 1991. "Adjustment, incomes and poverty in Morocco", World Development, Vol. 19, No. 11.
Okurut, F.N., J.J.A.O. Odwee, A. Asaf. 2002. Determinants of regional poverty in Uganda, AERC Research Paper 122, Nairobi: African Economic Research Consortium.
Ravallion, M. 1994. Poverty comparisons, Chur, Switzerland: Harwood Academic Press.
Ravallion, M. and M. Lokshin. 1994. "Gainers and losers from trade reform in Morocco", Mimeo, paper presented at the Seventh Annual Conference on Global Economic Analysis, Washington DC.
Reimer, J. J. 2002. "Estimating the poverty impacts of trade liberalization", GTAP Working Paper No. 20.
Savard, L. 2005. "Poverty and inequality analysis within a CGE framework: A comparative analysis of the representative agent and micro simulation approaches", Development Policy Review, Vol. 23, No. 3.
The World Bank and EAC. 2007. Options for strengthening East African Community's trade integration, Report No. 40978 – AFR, September 2007.
Thorbecke, E. 1991. "Adjustment, growth and income distribution in Indonesia and equity in Indonesia", World Development, Vol. 19, No. 11.
UBOS (Uganda Bureau of Statistics). 2003a. Uganda National Household Survey 2002/2003: Report on the Socio-Economic Survey, Entebbe: Uganda Bureau of Statistics.
UBOS. 2003b. Uganda National Household Survey 2002/2003: Report on the Labour Force Survey, Entebbe: Uganda Bureau of Statistics.

Warr, P.G. 2001. "Welfare and distributional effects of and export tax: Thailand's rice premium." American Journal of Agricultural Economics 83(4), November.

Winters, L. A. 2000. Trade, trade policy and poverty: What are the links?, Discussion Paper No. 2382, London: Centre for Economic Policy Research.

Winters, L.A., N. McCulloch and A. McKay 2004. "Trade liberalization and poverty: The empirical evidence so far", Journal of Economic Literature, Vol. XLII.

World Bank. 2006. Uganda diagnostic trade integration study, Washington DC: World Bank.

Appendix

Table A1: Uganda's regional exports by sector, in US$ '1000

	2005				2006				2007			
Description	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW$**
Live animal	8.7	0.150	3.2	19.9	2.0	-	9.8	16.2	1,546.4	7.5	1.1	14.7
Beef, other meat	756.1	1.6	-	73.5	316.2	130.3	15.5	6.9	17.6	142.9	-	100.5
Chicken, poultry products	238.3	1.3	8.0	2.1	3.4	-	-	0.2	141.1	-	1.0	0.263
Milk, diary products	227.3	9.0	-	-	114.5	184.4	5.7	0.03	323.8	278.3	0.15	34.8
Fish, fish products	4,419.6	3,963.3	104,760.4	26,720.9	810.2	4,499.4	100,629.8	34,766.1	857.2	2,616.5	86,225.7	28,008.7
Potatoes	0.099		1.7	0.0	3.7	0.032	-	1.9	1.7	0.05	-	-
Rice	915.6	2,785.4	0.0	29.4	1,691.1	2,520.4	-	123.7	2,328.5	4609.3	12.0	-
Maize (grain)	11,477.6	789.3	1.4	0.7	13,198.4	2,688.0	-	108.5	11,355.3	1065.5	0.5	-
Bread	1,084.5	2,622.8	0.0	709.7	673.7	3,266.1	-	168.8	1,168.4	6786.3	-	220.1
Cooking oil, oil seeds	5,566.8	4,192.1		62.3	11,331.3	5,121.6	-	8,228.4	38,155.5	21,275.0	121.3	2,674.2
Fruits, fruit juice	472.2	14.4	742.4	129.6	442.96	65.6	870.7	383.0	997.9	445.2	1,686.6	411.4
Ground nuts	-	23.4	0.0	0.0	7.77	-	-	0.051	26.5	121.3	-	0.694
Sim sim	6.3	0.956	0.0	0.0	39.43	-	-	-	41.7	-	-	-
Soy beans	124.8	-	1.5	0.0	604.7	-	-	4.5	1,303.4	-	-	27.4
Sugar	1,115.5	5,345.9	27.7	395.0	1,130.0	10,098.7	4.9	526.3	6,162.1	26,444.1	14.9	987.6
Wheat	85.6	379.6	-	3.0	1,713.5	1,481.7	-	20.0	3,443.9	385.3	-	8.2
Sorghum	44.8	112.7	0.0	0.0	34.3	74.6	-	-	22.3	-	0.22	-
Other cereals	2,566.7	7,120.1	93.1	217.9	4,232.0	4,444.5	186.3	170.1	2,832.2	8,849.0	41.2	12.0
Cassava					42.9	0.027	4.2	0.2	1,199.7	47.5	15.8	0.952
Vegetables	5,217.9	3,306.4	1,347.5	488.5	4,562.7	3,489.6	3,190.0	2,945.1	4,124.4	6,344.9	4,022.4	6,875.2
Matoke, other banana	228.5	-	572.5	5.3	31.5	0.025	94.3	0.75	76.9	-	346.1	6.6
Spices	21.2	5.0	648.5	26.5	34.6	0.1	209.5	36.9	88.1	33.0	260.0	7.4
Other food exports	2,552.5	954.4	3.0	8.4	1,343.0	209.8	24.0	831.6	4,647.7	769.0	0.113	17,855.1
Water	75.5	437.2	16.6	24.9	157.8	1,500.7	4.9	4.0	299.4	5,772.4	8.3	43.6
Beverages	1,017.0	4,434.0	42.5	1,248.6	902.9	7,580.5	59.7	1,251.2	1,527.1	17,357.4	89.2	6,703.6
Coffee	1,242.5	29,590.0	73528.3	68580.9	1,557.5	35,610.4	86,088.6	66,573.7	1,305.4	42512.4	126,902.0	95,133.0

continued next page

Table A1 Continued

	2005				2006				2007			
Description	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW$**
Tea	34,190.2	0.167	3.5	80.6	50,785.4	0.002	16.4	71.4	47,462.2	56.0	17.3	93.4
Tobacco/products	3,166.0	7,114.9	11371.5	10629.0	3,385.1	831.3	10,130.7	13,306.3	24,886.0	462.5	28,046.6	13,869.0
Cocoa	1.8	-	4036.3	5600.3	41.6	-	4,952.7	5,021.6	4.1	4.6	8,707.2	7,342.1
Cotton, textiles	5,341.7	4,042.0	6,032.0	32,426.8	5,000.1	3,497.6	2,414.1	18,971.6	7,056.8	7,753.3	3,634.9	17,219.7
Flowers	1.1	9.0	2023.9	16.0	0.736	-	129.4	2.2	-	-	37.1	14.8
Hides and skins	425.1	-	177.7	6,461.5	328.9	7.5	179.0	6,356.6	330.9	-	422.2	15,184.1
Vanilla	-	3.9	2691.4	3439.7	-	-	2,529.4	2,278.7	0.149	140.0	2,607.9	3,513.8
Seeds	501.7	33.8	1101.0	3566.8	705.5	140.0	933.4	3,367.6	334.4	173.1	1,258.8	0.10
Manufactured products	56,755.0	42,611.8	16,073.8	124,427.9	42,683.8	57,096.4	18,923.8	226,884.5	101,044.8	107,245.4	23,848.5	245,968.3
Other exports	4,922.9	103.7	32,579.2	4,793.8	4,915.8	126.6	32,144.8	8,517.7	9,704.5	592.2	36,066.3	12,833.2
Total	144,770.9	120,008.4	257,888.7	290,189.1	152,829.3	144,666.1	263,751.6	400,946.4	274,818.2	262,290.0	324,395.3	475,164.5

Source: Author's calculation based on Uganda Revenue Authority/Uganda Bureau of Statistics' database

Table A2: Uganda's imports by sector and region US$ '000, 2005-2007

	2005				2006				2007			
Description	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**
Live animal	70.4	0.223	1.3	105.0	31.8	0.3	0.3	101.9	8.6	0.399	121.1	42.4
Beef, other meat	750.0	-	25.8	40.4	673.6	2.9	17.7	44.7	873.7	1.8	10.9	46.8
Chicken, poultry products	104.0	38.5	482.9	10.2	28.7	3.9	270.8	0.8	62.5	55.2	520.9	52.1
Milk, diary products	377.2	7.9	1,051.2	821.2	2,662.2	2.2	361.2	626.9	4,387.8	121.3	340.1	738.2
Fish/fish products	58.0	-	96.5	401.2	69.6	1.7	68.1	47.8	498.9	-	42.1	157.4
Potatoes	0.132	-	-	0.8	0.05	-	0.004	2.0	0.98	-	3.0	0.088
Rice	910.3	-	542.0	16,002.0	372.8	17.1	532.4	12,497.4	2652.1	2.1	62.3	16,409.2
Maize (grain)	862.1	-	2,691.2	3,126.9	132.2	-	1,023.8	3,245.4	61.6	0.2	-	50.1
Bread	406.7	-	46.5	767.8	996.2	15.6	52.0	1,068.5	1062.0	30.7	126.2	1,615.2
Cooking oil, oil seeds	5,851.2	-	5,310.7	52,751.9	11,097.6	-	3,088.1	68,294.8	6,932.6	31.4	447.5	105,924.8
Fruits, fruit juice	703.4	44.7	202.5	1,325.2	938.7	70.3	404.6	1,909.4	1,058.0	285.5	629.1	3,429.3
Ground nuts	32.6	-	-	0.284	2.4	-		0.005	40.3	-	-	-
Sim sim	-	-	.051	224.0	-	-	0.03	694.3	-	-	-	32.7
Soy beans	-	43.4	7.5	155.5	-	139.0	-	23.0				
Sugar	9,819.6	4,784.7	1,834.2	12,556.8	10,652.8	10,847.7	4,131.0	16,931.4	16,262.3	14,329.3	849.9	39,977.8
Wheat	6,182.5	-	11,849.1	72,617.5	833.0	14.6	29,125.7	80,439.3	3,343.9	-	3,654.2	102,633.6
Sorghum	393.5	-	7,350.3	3,049.6	9.0	-	-	12,075.6	-	-	-	6,594.5
Other cereals	4,314.0	182.5	5,844.8	4,054.7	3,491.2	47.7	7,025.0	3,753.8	4,526.6	76.7	10,702.9	5,174.7
Vegetables	589.9	19.2	10,448.5	7,112.6	202.6	38.5	2,351.2	6,552.6	430.0	4.2	1,314.5	13,325.0
Spices	1,058.1	6.3	5.9	161.5	1,726.3	19.4	4.4	143.8	2,630.1	33.5	10.3	318.6
Other food imports	8,544.8	98.4	8,870.9	7,137.6	3,623.7	371.1	4563.3	7,956.4	7,281.0	580.6	3,022.2	7,025.1
Water	1,110.4	100.9	258.4	232.6	1,239.5	197.4	579.6	180.7	1,433.9	440.4	1,530.5	496.0
Beverages	5,356.7	32.3	1,804.1	1,409.8	10,712.0	31.6	1,465.1	2,184.1	16,621.0	1,090.1	2,228.5	4,369.0
Coffee	224.7	-	2.6	7.4	631.1	-	0.2	3.0	81.1	3.2	6.2	14.8
Tea	17.1	.011	1.6	8.7	14.9	-	3.6	9.9	32.5	0.189	6.9	15.5
Tobacco/ products	817.8	2,957.4	70.2	182.5	5,522.3	15.0	40.1	68.9	8,999.3	6.2	8.4	236.3
Cocoa	875.6	408.9	106.9	173.0	819.8	658.9	63.7	243.0	1,070.8	525.5	79.6	178.3
Cotton, textiles	11,319.4	1,298.5	9,844.5	73,051.8	14,835.4	983.1	10,092.9	87,973.3	15,669.9	379.5	10,913.9	124,411.0
Flowers	3.4	-	0.122	45.0	13.6	-	0.4	45.1	10.1	1.2	0.499	60.7
Hides and skins	64.3	-	-	0.7	12.0	4,800.00	-	0.017	64.7	9.4	1.8	0.120

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Table A2 Continued

	2005				2006				2007			
Description	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**	**EAC**	**COMESA**	**EU**	**ROW**
Vanilla	0.226	-	0.093	1.3	11.9	3.6	83.7	0.14	0.607	16.7	0.012	1.5
Seeds	615.8	-	380.8	535.0	1,005.1	-	551.4	524.3	878.6	30.8	670.6	1,866.9
Manufactured products	488,141.8	33,561.5	317,957.9	813,645.7	356,945.5	35,486.1	414951.0	1,288,818.0	418,230.0	41,991.1	679603.9	1,749,442.8
Other Imports	1,865.5	76.6	69.0	159.4	872.0	19.6	357.4	503.0	15,855.3	12.8	732.6	1,988.0
Total	551,441.4	43,662.0	387,158.2	1,071,875.8	430,179.5	48,948.4	481,208.9	1,596,963.3	531,060.8	60,059.9	717,641.7	2,186,628.8

Source: Author's calculation based on Uganda Revenue Authority / Uganda Bureau of Statistics' database

Table A3: Sector distribution of Uganda's tariff revenues by region of imports (%), 2005 - 2007

	2005				2006				2007			
Description	**EAC**	**COM**	**EU**	**ROW**	**EAC**	**COM**	**EU**	**ROW**	**EAC**	**COM**	**EU**	**ROW**
Live animal	35.8	-	-	64.2	29.3	-	0.0	70.7	5.0	-	95.0	-
Beef, other meat	84.8	-	5.7	9.5	87.8	0.6	5.1	6.5	90.1	0.2	3.7	6.0
Chicken, poultry products	14.9	10.5	72.4	2.1	0.1	1.4	96.5	2.0	25.7	5.7	53.5	15.2
Milk, diary products	9.0	0.2	48.4	42.4	43.1	0.1	17.5	39.3	44.3	7.7	13.3	34.8
Fish/fish products	3.9	-	33.6	62.5	7.7	1.1	43.9	47.3	19.9	-	12.2	67.9
Potatoes	6.3	-	-	93.7	2.6	-	1.9	95.5	25.0	-	70.6	4.5
Rice	0.8	-	0.1	99.1	0.5	0.1	0.6	98.8	1.1	0.0	0.2	98.7
Maize (Grain)	1.2	-	-	98.8	0.1	-	0.1	99.9	21.0	6.3	-	72.7
Bread	26.7	-	4.6	68.6	40.0	0.8	3.7	55.5	24.2	0.5	5.7	69.5
Cooking oil, oil seeds	14.1	-	0.4	85.5	17.4	-	0.1	82.4	5.8	0.0	0.2	93.9
Fruits, fruit juice	25.8	1.9	10.9	61.4	25.5	2.1	11.1	61.3	18.4	4.9	11.1	65.6
Ground nuts	98.2	-	-	1.8	99.7	-	-	0.3	100.0	-	-	-
Sim sim	-	-	0.4	99.6	-	-	-	100.0	-	-	-	-
Soy beans	-	-	-	100.0	-	-	-	100.0	-	-	-	-
Sugar	16.7	30.6	1.8	50.9	8.4	42.4	7.1	42.0	7.3	30.2	0.4	62.1
Wheat	3.8	-	10.3	86.0	5.3	3.6	0.3	90.8	21.3	-	2.1	76.6
Sorghum	-	-	45.3	54.7	-	-	-	100.0	-	-	-	-
Other cereals	41.7	4.1	33.3	21.0	34.1	0.7	54.8	10.4	38.2	1.1	39.0	21.7
Tomatoes, cabbages	12.9	-	21.0	66.1	7.3	1.4	30.5	60.9	7.8	0.1	48.4	43.7
Spices	75.4	1.0	0.5	23.1	82.9	1.5	0.4	15.2	82.5	2.1	0.9	14.6
Other food imports	48.4	0.6	27.0	24.0	19.5	4.4	40.8	35.3	37.0	8.3	25.5	29.2
Water	51.1	5.7	23.2	20.1	41.0	8.3	39.2	11.5	26.8	6.6	56.6	10.0
Beverages	56.3	0.5	22.3	20.9	67.7	0.3	12.5	19.6	64.4	4.0	11.4	20.2
Coffee	96.3	-	0.9	2.8	82.6	-	0.7	16.6	11.9	17.6	19.9	50.6
Tea	56.9	0.1	7.3	35.7	42.6	-	15.6	41.7	37.0	1.0	24.3	37.7
Tobacco, tobacco products	11.1	87.6	0.0	1.3	99.7	0.3	0.0	0.0	98.8	-	-	1.2
Cocoa	47.4	33.4	6.9	12.3	32.6	49.9	6.1	11.4	27.8	53.3	5.9	13.0
Cotton, textiles	5.2	0.7	12.7	81.5	6.9	0.3	10.1	82.6	5.9	0.0	6.3	87.9

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Table A3 Continued

	2005				2006				2007			
Description	**EAC**	**COM**	**EU**	**ROW**	**EAC**	**COM**	**EU**	**ROW**	**EAC**	**COM**	**EU**	**ROW**
Flowers	6.6	-	0.3	93.1	5.5	-	0.8	93.7	14.6	-	1.7	83.7
Hides and skins	98.8	-	-	1.2	71.4	28.5	-	0.1	84.8	12.8	2.4	0.0
Vanilla	12.9	-	5.7	81.3	57.6	39.8	1.1	1.6	0.5	98.6	0.1	0.9
Seeds	8.2	-	0.0	91.8	53.2	-	0.0	46.8	5.5	-	-	94.5
Manufactured products	40.0	1.5	11.3	47.2	15.6	1.3	12.4	70.7	12.2	1.0	14.4	72.3
Other imports	83.3	4.7	3.3	8.7	57.0	2.5	27.9	12.6	13.7	0.1	23.4	62.8
Total	35.7	2.7	11.2	50.4	18.2	3.5	11.5	66.9	15.2	2.9	12.4	69.5

Source: Author's calculation based on Uganda Revenue Authority's database

Table A4: Uganda labour income shares (in %) by consumption quintiles, 2003

Region	Quintiles	Rural household labour				Urban household labour			
		Un skille-d	Semi-skilled	Skilled	High-skilled	Un-skilled	Semi-skilled	Skilled	High-skilled
Central	Q1	100.0	0.0	0.0	0.0	38.4	11.4	43.9	6.3
	Q2	54.9	20.1	8.8	16.2	48.8	1.4	7.7	42.1
	Q3	47.3	15.1	18.1	19.6	2.4	3.2	4.3	90.1
	Q4	26.7	8.1	25.9	39.4	9.7	9.4	36.6	44.2
Eastern	Q1	70.7	9.5	8.2	11.7	59.3	0.0	14.1	26.6
	Q2	41.8	3.6	36.8	17.9	43.1	13.8	34.5	8.7
	Q3	47.8	0.0	6.3	45.9	3.8	2.0	5.2	88.9
	Q4	31.0	5.8	13.0	50.1	8.4	6.3	42.7	42.6
Northern	Q1	80.0	9.1	3.2	7.7	49.4	25.3	16.5	8.9
	Q2	44.7	9.4	35.2	10.7	22.2	20.4	23.4	34.0
	Q3	7.4	3.9	22.1	66.7	1.5	0.6	6.0	91.8
	Q4	18.7	0.6	10.6	70.2	9.2	10.2	42.2	38.4
Western	Q1	84.7	8.5	4.6	2.2	18.8	69.2	9.9	2.1
	Q2	29.7	6.9	13.7	49.8	18.0	7.3	48.5	26.2
	Q3	31.2	11.3	10.5	47.0	2.9	4.6	4.0	88.4
	Q4	22.8	4.8	19.6	52.8	20.1	7.3	35.2	37.3

Source: Author calculation based on Uganda SAM 2002/2003

Table A5: Uganda share of primary factors in the value added by sector, 2003

	Rural household labour				Urban household labour			
	Un-skilled	Semi-skilled	Skilled	Highly skilled	Un-skilled	Semi-skilled	Skilled	Highly skilled
Food crops	72.9	9.2	6.9	3.3	2.2	2.5	3.0	0.2
Cash crops	72.9	9.2	6.9	3.3	2.2	2.5	3.0	0.2
Livestock	62.9	3.6	3.8	21.6	4.9	0.0	3.0	0.2
Forestry	45.8	0.0	8.3	0.0	0.0	5.4	1.2	39.3
Fish sector	59.1	22.8	4.6	0.0	1.7	1.7	7.7	2.5
Mining	10.1	57.8	0.0	0.0	19.9	11.2	0.0	1.0
Food proc	10.0	0.6	7.1	0.0	30.8	8.7	24.2	18.6
Manuf	8.0	2.4	11.0	20.9	8.5	12.1	26.7	10.5
Construction	5.4	7.4	12.9	37.0	5.9	9.2	11.9	10.4
Trad. services	3.1	2.5	7.6	1.5	8.8	8.4	19.7	48.5
Pub services	2.8	0.6	8.7	36.5	0.6	1.4	7.9	41.5
Others	10.3	9.1	0.6	4.0	51.3	10.5	11.3	2.9

Source: Author's calculation based on Uganda SAM 2002

Notes: Mining: mining and quarrying; food proc: food processing; Manuf: textile, petroleum and chemical manufacturing, wood processing, and other manufacturing activities); Trad. services: tradable services; pub services: public services; and others: other production activities.

Table A6: Simulation results: Effects of tariff reductions on imports

Sector	Simulation 1: 100% reduction in tariffs on imports from EAC				Simulation 2: 100% reduction in COMESA tariffs		Simulation 3: 100% reduction in tariffs	
	EAC imports	% change in imports from			Imports from COMESA		Imports from ROW	
	Base	EAC	COMESA	ROW	Base	Change, %	Base	Change, %
sec1	0.07	-8.7	7.8	-19.0	0.02	1.9	0.10	11.0
sec2	0.75	12.4	1.2	9.8	0.10	2.2	0.04	10.1
sec3	0.10	-30.8	4.3	10.8	0.38	15.3	0.01	12.3
sec4	0.40	13.3	4.3	-1.0	0.07	3.3	0.82	-9.9
sec5	0.06	7.6	0.1	-7.8	0.01	0.1	0.40	7.7
sec6	0.01	6.4	0.0	-8.9	0.01	0.0	0.01	0.0
sec7	0.91	19.1	-0.5	0.5	0.01	-1.5	16.00	11.9
sec8	0.90	-9.2	-2.3	-9.8	0.01	2.3	3.12	-7.9
sec9	0.40	16.1	-0.5	1.1	0.01	0.1	0.76	1.0
sec10	5.90	1.8	-0.9	10.1	0.01	-2.5	52.75	1.8
sec11	0.70	5.0	5.3	1.8	0.47	7.3	1.32	9.0
sec12	0.03	2.3	-2.0	-5.7	0.01	-5.0	0.01	0.0
sec13	0.01	0.0	0.0	-8.4	0.01	0.0	0.22	0.0
sec14	0.01	0.0	-10.0	-10.0	0.43	10.0	0.15	4.0
sec15	9.82	6.5	5.9	18.4	47.84	15.9	12.55	9.2
sec16	6.20	-4.5	-6.9	4.1	0.00	4.9	72.61	3.8
sec17	0.40	0.0	0.0	11.6	0.00	0.0	3.04	-0.3
sec18	4.31	0.4	-5.8	2.7	1.82	-12.8	4.05	1.9
sec19	0.00	-2.7	0.0	0.1	0.01	0.0	0.01	0.0
sec20	0.60	1.4	-7.8	8.7	0.19	-8.8	7.11	0.9
sec21	0.01	0.0	0.3	0.0	0.01	0.3	0.01	0.0
sec22	1.06	1.4	4.3	9.7	0.06	3.3	0.16	6.7
sec23	8.54	-1.4	4.9	-1.9	0.98	2.9	7.13	1.0
sec24	1.10	2.9	33.6	11.3	1.00	13.1	0.23	8.5
sec25	5.34	21.3	32.7	20.9	0.32	7.7	1.40	21.0
sec26	0.20	-6.3	-2.9	10.0	0.01	-2.0	0.74	-5.3
sec27	0.17	9.0	16.1	7.8	0.01	-10.1	0.87	8.0
sec28	0.82	10.0	-9.8	2.5	29.57	19.8	0.18	1.3
sec29	0.88	12.3	2.8	3.1	4.08	12.8	0.17	1.0
sec30	11.30	38.4	-7.8	7.3	1.30	9.2	73.05	32.4
sec31	0.01	1.9	7.1	3.4	0.01	-0.8	0.04	0.0
sec32	0.06	0.6	-5.2	-8.3	0.01	-5.1	0.01	-3.9
sec33	0.01	1.6	-8.7	1.5	0.01	-9.9	0.01	1.7
sec34	0.61	4.2	0.1	2.4	0.01	-7.1	0.53	2.5
Sec35	48.8	4.3	2.5	11.4	33.56	16.5	81.36	21.6
Sec36	1.85	27.4	-8.4	11.4	0.76	11.4	0.16	13.5

Notes: See Table A8 for definition of sectors

Table A7: Simulation results: Effects of tariff reduction on Uganda's exports

	Simulation 1: 100% reduction in EAC tariffs				Simulation 2: 100% red in COMESA tariffs		Simulation 3: 100% reduction in tariffs	
	Exports to EAC		% change in to exports		Exports to COMESA		Exports to ROW	
	Base	% change	COMESA	ROW	Base	% change	Base	% change
sec1	0.08	17.67	4.9	-26.1	0.01	16.07	0.01	-26.5
sec2	0.75	-9.7	8.8	3.6	0.01	-8.0	0.07	-1.0
sec3	0.23	-4.8	-2.4	-8.7	0.01	-4.8	0.01	-9.4
sec4	0.22	4.2	29.9	9.2	0.09	4.2	0.01	11.1
sec5	4.42	-8.0	-24.0	4.8	3.96	-7.9	2.60	-5.7
sec6	0.01	16.1	0.6	3.3	0.01	19.4	0.01	3.5
sec7	0.92	35.4	5.5	6.6	2.78	35.0	0.29	7.9
sec8	11.47	-1.1	35.0	15.4	0.78	-1.0	0.07	22.2
sec9	1.08	7.7	15.8	-6.9	2.62	7.1	7.09	-6.0
sec10	5.57	38.5	27.5	21.9	4.19	40.5	0.62	15.0
sec11	0.47	11.1	29.9	21.7	0.14	12.1	0.12	13.8
sec12	0.00	9.0	4.1	1.7	0.02	9.0	0.01	4.0
sec13	0..06	3.9	2.3	8.1	0.01	3.0	0.01	10.6
sec14	0.12	9.4	13.0	1.0	0.01	9.4	0.01	-1.2
sec15	1.11	45.2	39.4	15.0	5.30	46.2	3.95	14.0
sec16	0.85	39.2	1.5	17.3	0.37	39.4	0.03	16.9
sec17	0.04	-5.0	-5.0	-1.0	0.11	-5.8	0.01	4.4
sec18	2.56	10.3	24.3	-9.4	7.12	10.5	0.21	5.0
sec19	0.01	0.0	0.9	-2.0	0.01	0.8	0.01	3.4
sec20	5.21	-21.0	9.1	13.1	3.30	-1.0	0.48	11.1
sec21	0.22	-6.6	-1.1	24.5	0.01	-4.9	0.05	21.2
sec22	0.02	31.5	5.6	-7.2	0.05	29.5	0.02	-13.0
sec23	2.55	8.2	-19.4	21.2	0.95	8.1	0.08	22.6
sec24	0.07	29.6	12.2	7.5	0.43	29.8	0.24	5.8
sec25	1.01	5.0	29.1	4.4	4.43	2.0	1.24	-16.1
sec26	1.24	5.1	43.7	38.7	25.59	5.1	6.85	38.7
sec27	34.20	38.8	33.4	15.9	0.01	38.7	0.80	10.9
sec28	3.16	68.6	-9.3	30.5	7.11	55.1	1.06	29.9
sec29	0.00	12.7		31.1	0.01	13.3	5.60	30.8
sec30	5.34	32.1	9.1	-26.9	4.04	32.1	3.24	-6.7
sec31	0.01	0.8	-1.2	-7.5	0.01	0.8	1.60	3.0
sec32	0.42	-22.2	-9.0	13.5	0.01	-22.1	6.46	1.9
sec33	0.01	0.9	3.4	2.2	0.03	0.1	3.43	1.9
sec34	0.50	-33.3	4.1	-10.0	0.50	-9.6	3.56	-5.0
Sec35	56.75	38.0	15.1	9.7	42.61	46.0	12.40	1.4
Sec36	4.92	9.7	4.7	16.7	0.10	2.7	4.70	9.5

Notes: See Table A8 for definition of sectors

Table A8: Sectors included in the model, and substitution elasticities

Name used in GAMS code	Meaning of the name	Elasticity 1/		
		Domestic/ imported (σD)	Sourcing of imports (σM)	Value-added (σVA)
sec1	Live animal	2.00	4.00	0.24
sec2	Beef, other meat	3.85	7.70	1.12
sec3	Poultry, poultry product	1.30	2.60	0.24
sec4	Milk, dairy products	3.65	7.30	1.12
sec5	Fish/fish products	1.25	2.50	0.20
sec6	Potatoes	2.50	5.00	0.24
sec7	Rice	2.60	5.20	1.12
sec8	Maize	1.30	2.60	0.24
sec9	Bread	2.00	4.00	1.12
sec10	Cooking oil, oil seeds	3.30	6.60	1.12
sec11	Fruits, fruit juice	1.85	3.70	0.24
sec12	Ground nuts	2.45	4.90	0.24
sec13	Sesame	2.45	4.90	0.24
sec14	Soy beans	2.45	4.90	0.24
sec15	Sugar	2.70	5.40	1.12
sec16	Wheat	4.45	8.90	0.24
sec17	Sorghum	1.30	2.60	0.24
sec18	Other cereals	1.30	2.60	0.24
sec19	Cassava	2.50	5.00	0.24
sec20	Vegetables	1.85	3.70	0.24
sec21	Matoke/other banana	1.85	3.70	0.24
sec22	Spices	2.00	4.00	1.12
sec23	Other foods	2.00	4.00	1.12
sec24	Water	2.80	5.60	1.26
sec25	Beverages	1.15	2.30	1.12
sec26	Coffee	1.15	2.30	1.12
sec27	Tea	1.15	2.30	1.12
sec28	Tobacco	1.15	2.30	1.12
sec29	Cocoa	3.25	6.50	0.24
sec30	Cotton, textiles	3.75	7.50	1.26
sec31	Flowers	3.25	6.50	0.24
sec32	Hides and skins	4.05	8.10	1.26
sec33	Vanilla	1.15	2.30	1.12
sec34	Seeds	2.45	4.90	0.24
Sec35	Manufactures	3.75	7.50	1.26
Sec36	Other commodities	4.05	8.10	1.26

Notes: 1/ Source: GTAP Data Base - Dimaranam, B.V., McDoutall, and Hertel, T.W. Behavioral Parameters, GTAP Data Base; σD = Armington elasticity of substitution between domestic and imported goods; σVA = Elasticity of substitution between primary factors in the production of commodity

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Abstract

This paper examines the impact of trade liberalization on poverty in Uganda. Using a Computable General Equilibrium (CGE) framework and benchmark data from the 2002 household survey, three simulations are performed: removal of EAC tariffs, removal of non-EAC COMESA tariffs, and removal of all tariffs. Results indicate that poverty falls in all cases, but poverty falls much more in the case of a complete removal of tariffs on all imports (2.94%), compared with the case of removal of EAC tariffs (2.76%) or non-EAC COMESA tariffs (1.08%).

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