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Effects of Multilateral and Preferential Trade Policy Reform in Africa: The Case of Uganda

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Effects of Multilateral and Preferential Trade Policy Reform in Africa: The Case of Uganda

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Abstract

This paper estimates the effects on production, trade and economic welfare of current trade policy regimes throughout the world on Uganda relative to other economies, as a benchmark against which to examine various multilateral and preferential trade policy scenarios that might emerge over the next decade as part of the WTO's Doha Round and from the expected move later this decade towards Economic Partnership Agreements with the European Union. The results suggest modest gains or worse for Uganda, in part because it already has low tariffs and ready preferential access to rich-country markets. Several important caveats to this type of analysis are stressed though, before drawing out some trade and policy implications for Uganda.

Effects of Multilateral and Preferential
Trade Policy Reform in Africa: The Case of Uganda

1. Introduction

In recent empirical analysis it has been shown that, despite the trade policy reforms of the past two decades, the world economy could still gain a lot by the removal of remaining trade barriers and agricultural subsidies – and that developing countries as a group would benefit disproportionately as a share of GDP from such a reform (Anderson 2004, Anderson, Martin and van der Mensbrugghe 2006). Sceptics have stressed that most of those gains would go to large middle-income countries such as Brazil, which receives little preferential access into rich-country markets at present. This raises the question of how a small, preference-receiving least-developed country such as Uganda would fare from preference-eroding multilateral reform and how that would compare with preferential or unilateral liberalization.

Uganda's external trade is a small share of its GDP, in part because it is land-locked by other low-income countries with similar trade patterns, and despite being a member since its foundation in 1994 of the Common Market for Eastern and Southern Africa (COMESA, a free trade area involving 19 countries with ambitions to become a customs union) and the (new in January 2005) customs union of the East African Community (EAC, comprising also Kenya and Tanzania). To get a sense of how much its trade and welfare would change under various scenarios involving unilateral, preferential and global trade reforms, including under various possible Economic Partnership

Agreements with the European Union, this paper uses a global computable general equilibrium (CGE) model known as LINKAGE.

The paper begins in Section 2 by describing that model and its trade and protection database. It then examines the effects on production, trade and economic welfare of current trade policy regimes throughout the world on Uganda relative to other economies (Section 3). This provides a sense of where Uganda's comparative advantages would be in a freely trading world, as well as the welfare impact on Uganda of own-country and other countries' policies. The paper goes on in Sections 4, 5 and 6 to examine various multilateral, unilateral and preferential trade policy scenarios that might emerge over the next decade as part of the WTO's Doha Round and from the expected move later this decade towards Economic Partnership Agreements with the European Union, again focusing on the trade and welfare consequences. Key caveats are discussed in Section 7 before concluding in the final section by drawing out some trade and policy implications for Uganda.

2. The global LINKAGE model and protection database

The model used for this analysis is the World Bank's global computable general equilibrium (CGE) model known as LINKAGE (van der Mensbrugghe 2005). It is a relatively straightforward CGE model but with some characteristics that distinguish it from standard comparative static models such as the GTAP model (see Hertel 1997). A key difference is that it is recursive, so while it starts with 2001 as its base year it can be solved annually through to 2015. The dynamics are driven by exogenous population and

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labor supply growth, savings-driven capital accumulation, and labor-augmenting technological progress (as assumed for the World Bank's global economic prospects exercise, see World Bank 2004, 2005). In any given year, factor stocks are fixed. Producers minimize costs subject to constant returns to scale production technology, consumers maximize utility, and all markets – including for labor[1] – are cleared with flexible prices. There are three types of production structures. Crop sectors reflect the substitution possibility between extensive and intensive farming. Livestock sectors reflect the substitution possibility between intensive versus pasture feeding. And all other sectors reflect standard capital/labor substitution (with two types of labor: skilled and unskilled). There is a single representative household per modeled region, allocating income to consumption using the extended linear expenditure system. Trade is modeled using a nested Armington structure for each product, in which aggregate import demand is the outcome of allocating domestic absorption between the domestically produced good and aggregate imports of that product, and then that aggregate import demand is allocated across source countries to determine the pattern of bilateral trade flows.

There are six sources of protection in the model. The most important involves bilateral import tariffs. There are also bilateral export subsidies, plus domestic production subsidies in agriculture which may apply to intermediate goods, outputs, and payments to capital and land.

Government fiscal balances are fixed in any given year, with the fiscal objective being met by changing the level of lump sum taxes on households.[2] This implies that losses of tariff revenues are replaced frictionlessly by higher direct taxes on households. The current account balance also is fixed. For example, if import tariffs are reduced, the

propensity to import increases and additional imports are financed by increasing export revenues. The latter typically is achieved by a real exchange rate depreciation. Finally, investment is driven by savings. With fixed public and foreign saving, investment comes from changes in the savings behavior of the domestic household and from changes in the unit cost of investment. The latter can play an important role in a dynamic model if imported capital goods are taxed. Because the capital account is exogenous, rates of return across countries can differ over time and across simulations. The model only solves for relative prices, with the numéraire, or price anchor, being the export price index of manufactured exports from high-income countries. This price is fixed at unity in the base year and throughout the projection period to 2015.

The newest version of the LINKAGE model, Version 6.0, incorporates the latest release of the GTAP dataset, Version 6.1 (Dimaranan 2006). Compared with Version 5 of the GTAP dataset, Version 6 has a 2001 base year instead of 1997, updated national and trade data and, importantly, a new source for the protection data. The new protection data come from a joint CEPII (Paris)/International Trade Centre (Geneva) project. The product of this effort, known as MAcMaps, is a tariff level detailed database on bilateral protection that integrates trade preferences, specific tariffs and a partial evaluation of non-tariff barriers, for example tariff rate quotas (TRQs).[3] The new GTAP database has lower tariffs than the previous Version 5 database because of the inclusion of bilateral trade preferences and of major reforms between 1997 and 2001 such as continued implementation of the Uruguay Round Agreements, the expansion eastwards of the European Union to 25 members in 2004, and China's implementation of its WTO accession commitments (van der Mensbrugghe 2006).

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The main source of merchandise trade distortion resides in tariffs or border barriers, although some countries – particularly high-income countries – also have significant agricultural production and export subsidies, which are included in the database. In 2001 the average import tariff for primary and processed agriculture was 16 percent for high-income countries and 18 percent for developing countries, while for manufactures other than textiles and clothing it was 8 percent for developing countries and less than 2 percent for high-income countries (Anderson and Martin 2006, Table 1.1). Uganda in 2001 had import tariffs of 8.3 percent for primary and processed agriculture and 5.5 percent for other manufactures (column 1 of Table 1), which are about half the developing country averages. The extent to which Uganda's exporters are harmed by own-country protection for import-competing sectors is thus less than is the case for many other developing countries. Ugandan exporters are also harmed by other countries' barriers to market access. However, thanks to tariff preferences, exporters in Uganda face relatively low tariffs in their key markets abroad, averaging only 2 percent for both agricultural and manufactured goods, most of which is due to other developing countries' tariffs (Table 1).

Unfortunately the current GTAP protection database does not include measures of the distortions facing services trade and investment, and so in what follows attention focuses only on the impacts of possible reforms to merchandise trade policies.

3. Market and welfare impacts of current protection policies

Until a decade ago, Uganda was an agrarian economy with all but 6 percent of its exports being agricultural. During the past decade, though, it has opened its economy and been given preferential access to rich-country markets. Those reforms are rapidly transforming Uganda's economy and trade pattern. The share of agriculture in its merchandise exports is now less then two-thirds, with 35 percent coming from manufactures including processed farm products in 2004 (Walkenhorst 2005, Table 1). When services are included, the picture is even more diverse. According to the GTAP database, as of 2001 Uganda's export composition was as follows: 46 percent primary agriculture, 9 percent non-agricultural primary goods, 11 percent processed agricultural goods, 12 percent other manufactures, and 22 percent commercial services (most of which go to high-income countries). By contrast, Uganda's import composition is heavily focused on non-primary goods: just 3 percent primary agriculture, 9 percent non-agricultural primary goods and 5 percent processed agricultural goods, compared with 47 percent other manufactures and 36 percent commercial services in 2001 (Table 2). That table also reveals that most of Uganda's trade with high-income countries is with members of the European Union, but that it also trades heavily with other developing countries. Indeed in 2004 almost one-third of Uganda's merchandise exports and imports were with neighbouring countries in Eastern and Southern Africa (Walkenhorst 2005, Table 1).[4]

What would Uganda's production and trade patterns look like in the absence of its own, and other countries', trade policies (and, in the case of more-advanced economies, their agricultural subsidies)? This is relevant not because a move to completely free trade is likely in the foreseeable future but because it provides a benchmark against which to

compare alternative partial reform scenarios, both multilateral (under the Doha Development Agenda) and preferential. Table 3 shows that in a freely trading world, Uganda's total output would be only slightly larger (0.2 percent) but its trade volume would be about 5 percent larger. More striking would be the change in the composition of its output and trade. Overall agricultural output would be virtually unchanged, but within the sector some industries would be smaller (sugar, meats, grains) and others larger (cotton, other crops, dairy products). Textiles and clothing also would be smaller, and the services sector larger. The reason for these compositional changes has to do partly with Uganda's low own-country tariffs, and the fact that the tariffs faced by its exporters are nearly all zero into EU and US markets where more than two thirds of Uganda's exports go (Tables 1 and 2). Thus trade reform by those key trading partners leads to preference erosion for Uganda, which helps explain the impact on sugar, textiles and clothing.

The impact on Uganda's bilateral trade pattern is summarized in Table 4. Since it is expressed in value terms it includes the impact of terms of trade changes, unlike the changes in total trade volumes shown in Table 3. The direction of trade would be somewhat different under global free trade, with more exports to developing countries and less to preference-providing EU and US markets. Also fewer imports would come from the EU and US in that scenario.

The impacts of full liberalization globally on real incomes in Uganda and the rest of the world are shown in Table 5. According to these model results, Uganda (along with Madagascar, Mozambique and Zambia) would see a slight decline in real national income. In Uganda's case it would be by 0.3 percent, in contrast to a 1.4 percent **gain** on average for the rest of Sub-Saharan Africa. That small average loss hides considerable

variation across households, as can be seen by the impact such reform would have on output of the various sectors of Uganda's economy (see the first pair of columns of Table 3).

The majority of that small loss in national income is due to deterioration in Uganda's terms of trade. The first set of columns of Table 6 allows us to see more clearly the sources of that deterioration. For all products, export prices on average fall by 2.6 percent, more than offsetting the 0.3 percent average fall in import prices. The fall in export prices is fairly uniform across all main export sectors, while the rise in import prices is concentrated in dairy and sugar (both highly protected in the rest of the world and hence their international price would rise substantially if the world moved to free trade). The impacts of those price changes on national economic welfare are shown in the first set of columns of Table 7. The contribution from food and agricultural import prices turns out to be close to zero net, while that from other primary products and manufactures is positive and is offset only slightly by the higher price of services imports. However, the estimated price declines for exports from almost all sectors reduce Uganda's welfare in this full global liberalization scenario.

How full reform would affect real value added in each sector is shown in the first set of columns of Table 8. Again the percentage change overall is close to zero, with growth in services value added roughly equalling a decline in value added in goods sectors. Within each of the goods sectors there also would be some gainers and some losers.

4. Welfare impacts of multilateral partial reform, under the WTO's Doha Round

How would those changes from full reform compare with what might be the case under a partial multilateral reform such as that being negotiated under the World Trade Organization's Doha Development Agenda (DDA)? Since the DDA negotiations are yet to be completed it is only possible to surmise what might eventuate from that reform. A recent study (Anderson and Martin 2006) provides some scenarios based on the WTO's members' DDA Framework Agreement of July 2004. As it turned out, those scenarios cover the range of proposals tabled in the lead-up to the WTO's Trade Ministerial meeting in Hong Kong in December 2005.

Economic welfare results from that study's most optimistic scenario in terms of merchandise trade reform (optimistic in the sense that 'sensitive' farm products are assumed not to be subject to lesser tariff cuts) are presented in the second set of columns in Table 5, assuming special and differential treatment (SDT) for developing countries. In this case SDT means that least-developed countries (including Uganda) do not make any trade policy changes and other developing countries reduce their bound tariffs on farm and non-farm goods by only two-thirds as much as high-income countries. Not surprisingly, in these partial reform scenarios Uganda loses a little less than under the full liberalization scenario.

In this partial reform case, the decline in the average of Uganda's export prices is much less than in the full reform scenario, but its import prices rise slightly because of the large rise in meat and sugar prices in international markets (second set of columns in Table 6). The dollar contribution to Uganda's welfare from the decline in the terms of

trade is only two-thirds as large in this partial reform case as in the case of full global liberalization.

Similarly, the decline in value added is only two-thirds that from full reform. However, note from comparing the first and second pairs of columns in Table 8 that the compositional effects differ between full global reform and the Doha scenario. In particular, there is much less switching from manufacturing to services in this scenario, and almost no decline in the textile and clothing sub-sector.

5. Welfare impacts of Economic Partnership Agreements with the EU

Following the dispute at the WTO over the EU's banana import regime, the *non-reciprocal* trade preferences provided by the EU's Cotonou Agreement with former colonies in Africa, the Caribbean and the Pacific (ACP) will not be allowed after 2007. As an alternative, Economic Partnership Agreements involving *reciprocal* preferences are to be negotiated simultaneously between the European Union and a large number of regional blocks of ACP countries. To get a sense of how they might affect the welfare of Uganda and other countries, two scenarios are reported in Tables 5 to 8 for comparison with the full global trade liberalization and Doha partial reform scenarios. Both scenarios examine the reciprocal freeing of trade between the EU and ACP countries, the first assuming no freeing of trade among the ACP countries and the second assuming complete freeing of trade among the ACP countries. In reality the likely arrangements will be part-way between these two alternatives, with regions within Africa forming regional arrangements first and each of those regions then negotiating with the EU.

However, since those regional collectives have yet to be firmed up, and because there is insufficient disaggregation of the GTAP database, this is the best that can be done at present.[5]

In both cases the effects are very close to zero for Uganda, because of its relatively low tariffs and its relatively unrestricted access to EU markets, in contrast to the considerable gain for ACP developing countries as a group. And like Uganda, the ACP group fares slightly better under these EPA agreements than under the Doha scenario. In Uganda's case, this is because of less decline in their terms of trade, while for other ACP countries it is because of a bigger terms of trade improvement.

For Uganda the export and import price changes for the various sectors are shown in Table 6, and their contribution to the change in welfare are shown in Table 7. There is not a lot of difference between this aspect of these two preferential trading arrangements. But the differences across sectors are more marked in terms of changes in value added, shown in Table 8. In particular, agriculture would grow at the expense of manufacturing and services if trade was opened up unconditionally between the EU and Uganda (along with every other ACP country), and even more so if intra-ACP trade also was liberalized. This reflects the high level of farm protection in both the EU and other ACP countries relative to that in Uganda.

Turning to the first row of Table 5, it is clear that global welfare is enhanced far more by the removal of EU agricultural subsidies and remaining tariff barriers to ACP exporters than it is by ACP countries removing their tariff barriers to other ACP exporters: the difference is around twenty-fold (c.f. columns 7 and 10). It is the EU that benefits mostly from this reform, through a more efficient use of its own resources (with

only a small part of its benefit due to improved terms of trade). The final two rows of Table 5 reveal, nonetheless, that there is a considerably greater gain to ACP countries, and especially those in Sub-Saharan Africa, from that expansion in intra-ACP trade in the second of these preferential trade reform scenarios.

6. Welfare impacts of unilateral reform by and with Uganda's trading partners

If the EU or US were to open their markets unilaterally just to Uganda, economic welfare in Uganda would be virtually unchanged (columns 3 and 4 of Table 9). This is because the extent of duty- and quota-free access to those markets for Ugandan exporters is already close to complete. (If other countries also were to open up just to Ugandan exports though, Ugandan welfare would be $60 million higher per year, mostly because of improved terms of trade – see column 2 of Table 9.)

Finally, what would be the effect of an agreement that involved Uganda giving duty-free access to EU products? If that was the only policy change, column 5 of Table 9 suggests Uganda would be worse off by $8 million per year, again mostly because of an adverse change in its terms of trade. If Uganda were to simultaneously open up also to all other countries, the efficiency of its resource use would improve but its terms of trade would deteriorate even further and so its economic welfare would worsen by $1 million more, according to these results (compare columns 5 and 6 of Table 9.) However, any EPA involving Uganda is almost certainly going to involve other African, Caribbean and Pacific (ACP) countries doing likewise, so the previous section's scenarios are the more relevant.

7. Key caveats

Results such as those presented above are always dependent on the model assumptions, data and parameters underlying them and so are subject to numerous qualifications. One that is particularly important to highlight has to do with the trade elasticities. Countries are assumed to prefer locally produced to imported products, and even imported products are differentiated by country source. Estimates of these so-called Armington elasticities have been scarce, and so have been subject to debate. The Linkage model's elasticities represent adjustment to long-term changes and so are relatively large, although not compared with those used by some other analysts such as Harrison et al. (2004). Other models, including GTAP-AGR (e.g., Keeney and Hertel 2005), focus more on the medium term and so have smaller elasticities, which thereby generate lesser welfare gains globally and for developing countries and smaller changes in quantities produced and traded. Elasticities in the GTAP model draw on econometric estimates by Hertel et al. (2003), but they may not be very reliable as they are based on econometric estimates for imports from the world into just seven countries: the United States, New Zealand, and five South American countries (and the pooled estimates of these elasticities for each product category are assumed to apply to all countries in the world).

A second important caveat has to do with the way tariff preferences are treated in the Version 6 GTAP database. In previous versions of that database, only key *reciprocal* preferences were included (notably between members within the EU, NAFTA, ASEAN and Australia-New Zealand regional integration arrangements). The new Version 6 has

the virtue of including *non-reciprocal* tariff preferences provided by developed countries for their imports from developing countries under numerous arrangements such as the Generalized System of Preferences (GSP), the EU's provisions for former colonies under the Africa, Caribbean and Pacific (ACP) program and more recently for Least Developed Countries under the Everything But Arms (EBA) agreement, and likewise the US's Africa Growth and Opportunity Act (AGOA) and Caribbean Basin Initiative (CBI). However, this latest GTAP database assumes that there are no rules of origin or other compliance requirements which discourage developing countries from taking full advantage of those preferences and lead to their underutilization. It also assumes perfect competition between traders in the two sets of countries, which determines how rents from those preferences are shared between the exporting and importing countries (even though we know the developed country importers often have more market power than the developing country exporters of standard commodities such that the latter receives a smaller share of the rents than our analysis generates).[6] We therefore overstate the extent of preference erosion that would occur for especially least-developed countries, and so understate their gains from multilateral trade reform. If instead those non-reciprocal preferences were excluded from the database, we would overestimate the preference-receiving countries' gains from developed country trade reform.

A closely related caveat is that only import tariffs and agricultural subsidies are being liberalized in the above scenarios. In so far as technical and other non-tariff distortions to trade exist, and become binding under tariff reform, then the gains from removing all trade barriers are understated (or losses overstated).

Another important issue is the extent to which our model captures the supply-side constraints to adjustment by low-income countries to international price chances. Our elasticities are aimed at representing adjustment to long-term changes. Other models, including GTAP-AGR (e.g., Hertel and Keeney 2006), focus more on the medium terms and use smaller supply elasticities than ours, thereby generating lesser gains globally and for developing countries, with more countries of Sub-Saharan Africa making small losses. More knowledge of supply responsiveness over various adjustment periods in Uganda and other low-income countries is needed before there is convergence across models in these assumed elasticities.

Also to be kept in mind is that global CGE models such as Linkage necessarily have to aggregate across sectors, thereby reducing the large variance in tariffs that is evident at the HS6 or greater levels of disaggregation. Since the welfare cost of a tariff is roughly proportional to the square of its size, this aggregation process necessarily leads to an under-estimate of that cost.

The above analysis does not take account of the facts that trade reform typically boosts factor productivity growth and that not all sectors are subject to constant returns to scale and perfect competition. Most models that allow increasing returns and imperfect competition in some sectors generate higher gains from trade reform (although there is the possibility of the opposite outcome if reform induces resources to move back into an agricultural sector that has sufficiently fewer economies of scale than the rest of the economy).

8. Conclusion: trade and policy implications for Uganda

The modelling results presented in this paper suggest Uganda is not likely to gain a lot – and may even lose very slightly – from further reducing its tariffs, and likewise from the EU waiving remaining tariffs on imports from Uganda and other ACP countries. This is not surprising, given the relatively low tariffs faced by exporters to Uganda and by those exporting from Uganda, and the perhaps unduly low trade elasticities assumed to be faced by Uganda's exporters.

This does not mean, however, that there is no need for further trade reform by Uganda and its prospective ACP developing country partners. One reason is that the lower are those tariffs, the less likely is welfare-reducing trade diversion when a regional FTA is formed and when it in turn forms an FTA with the EU.

A second reason is that non-tariff barriers – which have been ignored in the above analysis – still exist and so welfare almost certainly would be enhanced if they were reduced.

Thirdly, there are typically considerable dynamic gains from freeing trade, not least because entrepreneurs turn their attention away from lobbying and towards more-productive endeavours – but these are not included in our analysis.

Fourthly, services trade reform also has been ignored, yet it may well yield significant gains not only directly via the services sector but also indirectly through lowering the cost of services inputs into goods production and exports. If more temporary movement of labour to high-income countries were to be permitted as part of services reform, that could be especially significant for English-speaking Ugandans (World Bank 2006).

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Finally, the extent to which the Ugandan economy gains from trade reform depends heavily on its costs of trading. If trade-facilitating investments were to lower those costs, for example via an aid-for-trade package that may well be available as a complement to the WTO's eventual Doha round agreement (Nielson 2006), then the tradability of the economy would be enhanced and so too would be the opportunities for gains from trade liberalization at home and abroad.

Notes

[1]   The results would be different if unemployment was present and changed as a consequence of the shocks considered, as discussed in Section 7 below.

[2]   For the sake of simplicity the fiscal balance is fixed in US$ terms at the base year level, minimizing potential sustainability problems; but this implies they decrease over time as a percentage of GDP for expanding economies.

[3]   More information on the MAcMaps database is available at http://www.cepii.fr/anglaisgraph/bdd/macmap.htm.

[4]   These data do not include informal trade with neighbouring countries. According to Walkenhorst (2005, page 7), informal exports to Uganda's five neighbours (mostly to DR Congo and Kenya, but also to Rwanda, Sudan and Tanzania) comprised as much as half its formal exports. In the case of imports, however, the informal component was only about 5 percent of formal imports. Informal refers to trade by unregistered businesses that are not subjected to import and value-added taxes, and it is not recorded other than unofficially via occasional surveys as in late-2003/early 2004. In the model results reported below, informal trade is not included.

In January 2005 Uganda began implementing with Kenya and Tanzania the East African Community (EAC) customs union, involving a common external tariff (CET). The average CET exceeds Uganda's average tariff as of that date (Walkenhorst 2005, Table 4), so is likely to involve a raising of protection in Uganda (especially for processed food, textiles and clothing) and a diversion of its trade to its neighbors (as forecast by DeRosa, Obwona and Roningen 2002). Uganda is also a member of the 19-country COMESA bloc, formed in 1994 as a preferential trading area, but COMESA has yet to proceed with its plans to establish a customs union. Since the CET being contemplated by COMESA also is much higher than Uganda's average tariff, it too would likely lead to welfare-reducing trade diversion for Uganda. Neither of these areas is explicitly modeled in this paper, however, because neither COMESA nor EAC looks like being the grouping within which Uganda and its neighbors will negotiate an EPA with the EU. Instead, there are currently two other overlapping groups that have begun to form, of which Uganda is a member of only one but Tanzania is choosing to negotiate with the other (Walkenhorst 2005, p. 27).

[6] Evidence that the preference margin is often eroded by complex rules of origin, and that the rent is shared between importing and exporting countries with the latter getting less the more trade is concentrated on standard commodities, can be found in Olarreaga and Ozden (2005) and Ozden and Sharma (2004).

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Table 1: Baseline applied[a] tariffs in 2001 and (if no further policy changes) in 2015

(percent)

	Ugandan tariffs		Tariffs faced by Ugandan exporters											
			World		European Union		United States		Other high-income		SSA		All developing	
	2001	2015	2001	2015	2001	2015	2001	2015	2001	2015	2001	2015	2001	2015
Merchandise trade	**5.9**	**5.9**	**1.9**	**1.9**	**0.1**	**0.1**	**0.0**	**0.0**	**1.3**	**1.5**	**4.5**	**4.6**	**5.2**	**5.3**
Agriculture and food	8.3	8.3	2.0	2.0	0.2	0.2	0.0	0.0	1.4	1.6	6.1	6.1	6.9	6.9
Agriculture	4.3	4.3	2.0	2.0	0.2	0.2	0.0	0.0	1.3	1.2	4.7	4.7	5.9	5.9
Grains	0.7	0.7	3.2	3.2	3.3	3.4			10.7	10.6	2.1	2.1	2.1	2.1
Sugar	15.0	15.0												
Plant-based fibres			0.2	0.2									0.7	0.7
Vegetables and fruits			3.7	3.5	2.8	2.8			11.4	9.3	7.3	7.3	7.3	7.3
Other crops	1.7	1.7	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.3	7.2	7.2
Livestock			1.0	1.0	0.0	0.0			0.0	0.0			4.6	4.5
Processed foods	10.4	10.5	2.0	2.1	0.0	0.0			2.3	4.8	16.2	16.2	16.2	16.2
Processed meats	10.6	10.7												
Dairy products	14.7	14.7												
Other processed foods	10.2	10.3	2.0	2.1	0.0	0.0			2.3	4.8	16.2	16.2	16.2	16.2
Fossil fuels	6.6	6.7	0.4	0.9	0.0	0.0			0.1	1.0	0.1	0.8	0.8	1.5
Other non-agric primary products	1.4	1.4	1.7	1.7	0.1	0.1							2.8	2.8
Manufacturing excl processed foods	5.5	5.5	2.2	2.2	0.0	0.0	0.0	0.0	0.5	0.5	4.1	4.1	4.2	4.2
Textiles and leather	10.4	10.4	1.3	1.3	0.0	0.0							3.8	3.8
Wearing apparel	15.0	15.0												
Chemicals, rubber and plastics	4.3	4.3	15.8	15.8									15.8	15.8
Other manufacturing	5.1	5.1	1.5	1.5	0.0	0.0	0.0	0.0	0.5	0.5	2.6	2.6	2.8	2.8

[a] These average applied tariffs are somewhat below the most-favored-nation rates in Uganda's tariff schedule (as reported for 2002 in Walkenhorst 2005, Table 4).
Source: GTAP database (www.gtap.org) and authors' Linkage model results.

Table 2: Ugandan trade patterns in base year, 2001

($million)

	Ugandan imports						Ugandan exports					
	World	EU25	USA	Other HICs	SSA	Other DCs	World	EU25	USA	Other HICs	SSA	Other DCs
Agriculture and food	**115**	**28**	**10**	**24**	**12**	**41**	**399**	**241**	**17**	**34**	**90**	**17**
Agriculture	41	6	4	21	3	7	320	182	11	30	79	18
Grains	28	4	4	21			19	2		2	15	
Sugar	10	2				8						
Plant based fibres							20	10		4		6
Vegetables and fruits							15	10	2	2	2	
Other crops	3				3		246	157	9	11	63	7
Livestock							19	3		12		4
Processed foods	74	22	6	4	9	33	79	60	5	4	11	
Processed meats	12	2		2	2	6						
Dairy products	2	2										
Other processed foods	60	17	6	2	7	27	79	60	5	4	11	
Fossil fuels	**106**	**12**	**3**	**2**	**67**	**22**	**63**	**23**	**3**	**2**	**30**	**5**
Other non-agric primary products	**11**				**11**		**4**	**2**			**2**	
Manufacturing excl processed foods	**646**	**200**	**25**	**57**	**172**	**191**	**80**	**34**	**3**	**2**	**39**	**2**
Textiles and leather	36	3		3	6	24	10	6			3	3
Wearing apparel	19	2				17						
Chemicals, rubber and plastics	170	60	5	7	47	52	4				4	
Other manufacturing	421	135	20	47	119	99	67	28	3	2	32	2
All merchandise trade	**878**	**240**	**39**	**83**	**262**	**254**	**546**	**300**	**22**	**38**	**161**	**24**
Services	**485**	**234**	**77**	**82**	**4**	**88**	**156**	**70**	**31**	**24**	**2**	**29**
Total	**1,364**	**475**	**116**	**166**	**266**	**341**	**701**	**370**	**54**	**62**	**163**	**53**

Source: GTAP database (see www.gtap.org)

Table 3: Change in output, export and import volumes for Uganda from global full merchandise trade reform, 2015

($million and % change relative to baseline in 2015)

	Output volumes		Export volumes		Import volumes	
	Change $million	Change percent	Change $million	Change percent	Change $million	Change percent
Agriculture	*-6.1*	*-0.1*	*65.6*	*5.9*	*12.2*	*24.8*
Grains	-18.1	-2.3	-10.3	-14.1	3.0	10.4
Sugar	-21.6	-6.5			9.3	62.3
Plant-based fibres	3.7	3.0	8.7	8.7		
Vegetables and fruits	-23.5	-0.8	-8.7	-17.0		
Other crops	89.7	10.7	91.5	11.9	-0.1	-1.5
Livestock	-36.2	-2.9	-15.6	-13.8		
Processed foods	*-53.1*	*-3.9*	*-21.7*	*-9.2*	*33.3*	*23.9*
Processed meats	-4.8	-5.7			5.9	25.0
Dairy products	1.6	4.2			-1.9	-39.7
Other processed foods	-49.9	-4.1	-21.7	-9.2	29.3	26.4
Fossil fuels	*1.9*	*1.2*	*10.1*	*18.6*	*20.0*	*9.4*
Other non-agric primary products	*-1.7*	*-0.6*	*-1.1*	*-15.4*	*0.5*	*2.0*
Manufactures excl processed foods						
Textiles and leather	-25.2	-24.1	-9.7	-36.3	14.0	19.7
Wearing apparel	-4.9	-18.7			10.8	27.2
Chemicals, rubber and plastics	7.2	37.4	7.6	76.5	8.4	2.4
Other manufacturing	-9.3	-1.5	17.9	9.7	39.5	5.9
Construction	*23.7*	*1.9*				
Services	*108.0*	*1.7*	*49.0*	*13.5*	*-44.3*	*-5.4*
Total	**40.6**	**0.2**	**117.8**	**5.9**	**94.5**	**4.0**

Source: Authors' Linkage model results.

Table 4: Changes in Uganda's bilateral trade flows from global full merchandise trade reform, 2015

(a) $ million change (relative to baseline in 2015)

	Ugandan imports						Ugandan exports					
	World	EU25	USA	Other HIC	SSA	All DCs	World	EU25	USA	Other HIC	SSA	All DCs
Merchandise trade	**113**	**-18**	**-1**	**24**	**-8**	**108**	**-16**	**-104**	**-2**	**-24**	**11**	**115**
Agriculture and food	59	-7	1	23	-3	42	-53	-130	-5	-27	13	109
Agriculture	24	-6	-2	17	0	14	-22	-101	-4	-24	12	108
Grains	13	-2	-2	17			-24	-4		-8	-12	-12
Sugar	11	-3				15						
Plant based fibres							17	1		3		12
Vegetables and fruits							-15	-13	-1	1	-2	-2
Other crops	0				0	0	18	-80	-4	-5	27	107
Livestock							-17	-4		-16		3
Processed foods	36	-1	3	6	-3	28	-32	-29	-1	-2	1	1
Processed meats	5	0		3	-1	2						
Dairy products	-1	-1										
Other processed foods	32	0	3	3	-2	25	-32	-29	-1	-2	1	1
Fossil fuels	16	6	1	1	-5	8	11	5	1	0	-1	4
Other non-agric primary	-1				-1	-1	-1	0			-1	-1
Manuf. excl. processed foods	38	-17	-3	-0	0	59	27	20	2	2	0	3
Textile and leather	9	1		0	-1	8	-8	-1			-7	-7
Wearing apparel	8	1				7						
Chemicals rubber & plastics	3	-8	-1	0	4	11	7				7	7
Other manufacturing	19	-10	-3	0	-3	32	28	21	2	2	0	2
Services	-68	-27	-9	-16	0	-17	58	22	11	11	1	13
Total merchandise and services	44	-44	-10	8	-9	90	42	-82	9	-13	11	128

Table 4: Changes in Uganda's bilateral trade flows from global full merchandise trade reform, 2015 (continued)

(b) percent change in value (relative to baseline in 2015)

	Ugandan imports						Ugandan exports					
	World	EU25	USA	Other HICs	SSA	All DCs	World	EU25	USA	Other HICs	SSA	All DCs
Merchandise trade	**8**	**-5**	**-2**	**23**	**-2**	**11**	**-1**	**-14**	**-4**	**-21**	**3**	**24**
Agriculture and food	34	-20	7	93	-11	40	-5	-21	-12	-25	6	33
Agriculture	53	-90	-47	86	-7	95	-2	-22	-14	-24	6	35
Grains	48	-82	-47	86			-41	-60		-100	-28	-28
Sugar	83	-98				141						
Plant based fibres							20	4		25		29
Vegetables and fruits							-37	-50	-13	17	-61	-61
Other crops	-7				-7	-7	3	-20	-14	-17	18	59
Livestock							-18	-33		-34		8
Processed foods	27	-4	33	119	-12	31	-15	-18	-7	-38	3	3
Processed meats	24	-7		121	-11	14						
Dairy products	-26	-26										
Other processed foods	30	2	33	118	-13	35	-15	-18	-7	-38	3	3
Fossil fuels	8	16	15	18	-5	5	20	29	27	27	-6	14
Other non-agric primary	-4				-4	-4	-9	12			-24	-24
Manuf. excl. processed foods	3	-6	-9	0	0	8	13	26	33	41	0	2
Textile and leather	13	26		0	-12	13	-33	-5			-72	-72
Wearing apparel	21	20				22						
Chemicals rubber & plastics	1	-9	-9	2	5	5	77				77	77
Other manufacturing	3	-7	-9	-1	-1	8	16	32	33	41	0	3
Services	-8	-7	-6	-12	-5	-8	16	16	15	20	13	16
Total merchandise and services	**2**	**-6**	**-5**	**4**	**-2**	**7**	**2**	**-9**	**7**	**-8**	**3**	**23**

Source: Authors' Linkage model results.

Table 5: Welfare and terms of trade impacts from various scenarios
(Change in 2015 relative to baseline)

	Global			Doha plus SDT			EPA excl. cross-ACP			EPA incl. cross-ACP		
	Welfare change			Welfare change			Welfare change			Welfare change		
	Total	Due to terms of trade	Welfare change	Total	Due to terms of trade	Welfare change	Total	Due to terms of trade	Welfare change	Total	Due to terms of trade	Welfare change
	($ million)		(%)	($ million)		(%)	($ million)		(%)	($ million)		(%)
World total	224,659	2,119	0.5	93,499	-513	0.2	18,647	118	0.0	19,671	71	0.0
High-income countries	165,158	27,882	0.5	67,713	-2,352	0.2	19,064	1,098	0.1	18,339	589	0.1
EU25 plus EFTA	63,110	8,753	0.6	25,530	-3,516	0.3	19,824	1,553	0.2	19,244	1,161	0.2
United States	13,306	4,995	0.1	3,108	-1,634	0.0	-74	72	0.0	-143	-1	0.0
Rest of high income	88,741	14,134	1.1	39,075	2,797	0.5	-686	-526	0.0	-763	-571	0.0
Developing countries	59,501	-25763	0.6	25,786	1,840	0.3	-417	-980	0.0	1,332	-518	0.0
Botswana	644	316	9.1	145	66	2.0	1,167	704	16.5	1,195	684	16.8
South Africa	2,759	998	1.8	638	90	0.4	-177	-290	-0.1	980	401	0.6
Rest of SACU	897	436	14.0	332	170	5.2	1,169	744	18.3	1,350	831	21.1
Malawi	45	10	2.2	-1	0	0.0	-6	-3	-0.3	6	-2	0.3
Mozambique	-45	-70	-0.7	-22	-14	-0.3	-30	-9	-0.4	-45	-50	-0.6
Tanzania	235	1	1.4	-16	-8	-0.1	-43	-40	-0.3	-12	-41	-0.1
Zambia	-20	-36	-0.4	-9	-5	-0.2	-14	-6	-0.3	-22	-30	-0.4
Zimbabwe	173	-41	1.9	113	52	1.2	405	163	4.3	467	113	5.0
Rest of SADC	300	-948	0.8	-102	-58	-0.3	-354	-486	-1.0	-144	-595	-0.4
Madagascar	-65	-59	-0.9	-12	-8	-0.2	-6	-6	-0.1	-7	-7	-0.1
Uganda	**-24**	**-29**	**-0.3**	**-17**	**-13**	**-0.2**	**-13**	**-9**	**-0.1**	**-5**	**-3**	**-0.1**
Rest of Sub-Sah. Africa	1,257	-2,212	0.7	-374	-298	-0.2	-1,715	-1,471	-0.9	-1,307	-1,370	-0.7
Memo items:												
Sub-Saharan Africa	6,155	-1,634	1.4	676	-27	0.2	383	-710	0.1	2,457	-68	0.6
All ACP countries	9,217	-1,019	1.4	1,894	379	0.3	2,855	607	0.4	4,917	1,210	0.8

Source: Authors' Linkage model results.

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Table 6: Impact of trade reform scenarios on indices of real export and import prices, Uganda, 2015

(percent)

	Global merchandise trade reform		Doha with SDT		EPA excl. cross-ACP		EPA incl. cross-ACP	
	Export prices	Import prices	Export prices	Import prices	Export prices	Import prices	Export prices	Import prices
Agriculture	-2.2	1.3	-0.4	4.5	-0.5	4.3	0.2	4.3
Grains	-2.1	-1.9	-0.4	1.4	-0.4	2.1	0.2	2.1
Sugar		10.7		14.2		11.4		11.3
Plant based fibres	-2.3		-0.4		-0.5		0.1	
Vegetables and fruits	-2.1		-0.4		-0.5		0.2	
Other crops	-2.2	-0.9	-0.4	-0.1	-0.5	-0.4	0.1	-0.2
Livestock	-2.1		-0.4		-0.5		0.2	
Processed foods	-3.1	1.0	-0.3	2.3	-0.9	2.0	-0.4	2.0
Processed meats		0.0		1.4		1.3		1.3
Dairy products		28.5		29.7		29.9		29.9
Other foods	-3.1	0.0	-0.3	1.3	-0.9	1.0	-0.4	1.0
Fossil fuels	-3.4	0.2	-0.1	-0.1	-1.1	-0.3	-1.7	0.3
Other natural resources	2.3	-2.4	5.1	0.0	-0.2	-1.3	5.0	-0.9
Manufacturing excl proc. foods	-3.3	-1.1	-0.2	0.1	-1.0	-0.4	-0.7	-0.2
Textile and leather	-3.1	-2.6	-0.3	0.1	-0.8	-0.5	-0.3	-0.5
Wearing apparel		-1.6		0.1		-0.1		-0.1
Chemicals rubber and plastics	-3.9	-1.1	-0.1	0.1	-1.2	-0.3	-1.4	0.0
Other manufacturing	-3.3	-1.0	-0.1	0.1	-1.0	-0.5	-0.7	-0.2
Services	-2.7	0.3	-0.3	-0.1	-0.9	0.0	-0.5	0.0
Total	-2.6	-0.3	-0.3	0.2	-0.7	0.0	-0.3	0.2

Source: Authors' Linkage model results.

Table 7: Terms of trade's contribution to economic welfare changes from various trade scenarios, Uganda, 2015

($million)	Global merch. trade reform			Doha with SDT			EPA excl. cross-ACP			EPA incl. cross-ACP		
	Change in regional welfare due to:			*Change in regional welfare due to:*			*Change in regional welfare due to:*			*Change in regional welfare due to:*		
	Change in export prices	*Change in import prices*	*Sum of export and import price effects*	*Change in export prices*	*Change in import prices*	*Sum of export and import price effects*	*Change in export prices*	*Change in import prices*	*Sum of export and import price effects*	*Change in export prices*	*Change in import prices*	*Sum of export and import price effects*
Agriculture	-20.2	0.2	-20.0	-13.1	-0.4	-13.5	-12.6	-0.4	-13.0	-9.7	-0.4	-10.1
Grains	-1.1	1.0	-0.2	-0.7	0.6	-0.1	-0.7	0.4	-0.3	-0.5	0.4	-0.1
Sugar		-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		-0.8	-0.8
Plant based fibres	-2.0		-2.0	-1.3		-1.3	-1.2		-1.2	-1.0		-1.0
Vegetables and fruits	-0.8		-0.8	-0.5		-0.5	-0.5		-0.5	-0.3		-0.3
Other crops	-14.6	0.0	-14.5	-9.5	0.0	-9.5	-9.2	0.0	-9.2	-7.2	0.0	-7.2
Livestock	-1.8		-1.8	-1.1		-1.1	-1.0		-1.0	-0.7		-0.7
Processed foods	-6.3	-0.4	-6.7	-3.5	-1.6	-5.0	-3.9	-1.1	-5.1	-3.4	-1.1	-4.5
Processed meats		0.2	0.2		-0.1	-0.1		0.0	0.0		0.0	0.0
Dairy products		-1.1	-1.1		-1.2	-1.2		-1.2	-1.2		-1.2	-1.2
Other foods	-6.3	0.5	-5.8	-3.5	-0.3	-3.8	-3.9	0.0	-3.9	-3.4	0.0	-3.4
Fossil fuels	-2.0	0.4	-1.6	-1.1	0.3	-0.8	-1.4	0.6	-0.8	-1.5	0.1	-1.5
Other natural resources	0.1	0.8	1.0	0.2	0.4	0.6	0.0	0.6	0.7	0.2	0.6	0.8
Manufacturing ex proc. food	-6.9	18.0	11.0	-3.9	9.2	5.3	-4.6	12.5	7.9	-4.3	11.4	7.0
Textile and leather	-0.6	2.0	1.4	-0.3	1.1	0.8	-0.3	1.2	0.9	-0.3	1.2	1.0
Wearing apparel		0.7	0.7		0.4	0.4		0.4	0.4		0.4	0.4
Chemicals rubber & plastics	-0.5	5.3	4.8	-0.3	2.6	2.3	-0.4	3.5	3.1	-0.4	3.1	2.7
Other manufacturing	-5.9	9.9	4.1	-3.3	5.1	1.9	-3.9	7.3	3.4	-3.7	6.6	2.9
Services	-10.4	-2.1	-12.5	-6.2	-1.4	-7.5	-7.1	-1.0	-8.1	-6.5	-1.1	-7.5
Total	-45.7	16.9	-28.8	-27.5	6.6	-20.9	-29.6	11.2	-18.5	-25.2	9.4	-15.8

Source: Authors' Linkage model results.

Table 8: Change in real value added (factor income), Uganda, by sector
(change in 2015 relative to baseline)

	Global merchandise trade reform		Doha with SDT		EPA /x cross ACP		EPA /w cross ACP	
	Change $million	Change percent	Change $million	Change percent	Change $million	Change percent	Change $million	Change percent
Agriculture	-18.3	-0.4	-15.3	-0.3	5.0	0.1	12.3	0.3
Grains	-16.3	-2.6	-3.6	-0.6	4.4	0.7	8.8	1.4
Sugar	-9.8	-6.8	1.0	0.7	0.3	0.2	0.7	0.5
Plant based fibres	2.3	2.6	16.9	19.4	1.4	1.6	-1.9	-2.2
Vegetables and fruits	-26.9	-1.2	-9.1	-0.4	-3.2	-0.1	-4.2	-0.2
Other crops	64.4	10.3	-14.8	-2.4	7.0	1.1	20.5	3.3
Livestock	-32.0	-3.3	-5.7	-0.6	-4.7	-0.5	-11.7	-1.2
Processed foods	-25.7	-5.4	-4.2	-0.9	-9.0	-1.9	-4.7	-1.0
Processed meats	-1.5	-7.4	0.2	0.9	-0.2	-1.1	-0.5	-2.3
Dairy products	0.4	3.3	0.8	7.1	0.4	3.8	0.4	3.8
Other foods	-24.6	-5.6	-5.2	-1.2	-9.2	-2.1	-4.7	-1.1
Fossil fuels	0.0	0.0	0.7	0.9	-0.4	-0.5	-3.7	-4.9
Other natural resources	-3.6	-1.8	-1.4	-0.7	-1.6	-0.8	-3.2	-1.7
Manufacturing excl proc. foods	-16.2	-6.1	-0.7	-0.3	-9.4	-3.5	-6.8	-2.6
Textile and leather	-8.7	-24.8	-0.2	-0.7	-1.6	-4.7	-1.6	-4.6
Wearing apparel	-2.5	-19.9	0.1	0.6	-0.2	-1.6	-0.3	-2.2
Chemicals rubber & plastics	0.8	34.8	0.0	1.5	-0.3	-15.3	1.3	60.9
Other manufacturing	-5.7	-2.7	-0.6	-0.3	-7.2	-3.3	-6.2	-2.9
Construction & services	37.0	0.9	2.9	0.1	0.1	0.0	-1.6	0.0
Total	-26.9	-0.3	-18.0	-0.2	-15.3	-0.2	-7.8	-0.1

Source: Authors' Linkage model results.

Table 9: Decomposition of welfare changes and terms of trade impact for Uganda and other countries from global full merchandise trade reform, from other countries opening up to Uganda, and from unilateral trade reform by Uganda, 2015
($million change relative to the baseline in 2015)

	Global full trade lib'n	Market access opening to only Ugandan exporters:			Unilateral opening by Uganda:	
		By all countries	By EU only	By USA only	To EU only	To all partners
(a) Change in real income ($m), impact on:						
Uganda	**-24**	**60**	**-2**	**0**	**-8**	**-9**
European Union 25 plus EFTA	63,110	-10	3	0	20	7
United States	13,306	-1	0	0	1	0
Other high-income countries	88,742	-7	0	0	0	3
Developing countries excl. Uganda	59,525	-47	1	0	-21	16
World total	224,659	-5	2	0	-9	17
(b) Income change due just to change in terms of trade ($m), impact on:						
Uganda	**-29**	**46**	**-1**	**0**	**-6**	**-21**
European Union 25 plus EFTA	8,753	-13	1	0	18	9
United States	4,995	0	0	0	1	0
Other high-income countries	14,134	-4	0	0	0	3
Developing countries excl. Uganda	-25,734	-31	0	0	-11	10

Source: Authors' Linkage model results.

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