

world development report

2009

Reshaping Economic Geography



BACKGROUND PAPER

**EU-ACP ECONOMIC PARTNERSHIP
AGREEMENTS EMPIRICAL EVIDENCE FOR
SUB-SAHARAN AFRICA**

Sebastian Vollmer

Inmaculada Martínez-Zarzoso

Felicitas Nowak-Lehmann D.

Nils-Hendrik Klan

University of Göttinge

EU-ACP Economic Partnership Agreements

Empirical Evidence for Sub-Saharan Africa

Sebastian Vollmer*
Inmaculada Martínez-Zarzoso†
Felicitas Nowak-Lehmann D.‡
Nils-Hendrik Klann§

Abstract

Since early 2008 interim trade agreements between the EU and six regions of ACP countries (respectively sub-groups within the region) are in force. These agreements could be stepping stones towards full Economic Partnership Agreements between the EU and all ACP countries. We estimate the welfare effects of the interim agreements for nine African countries: Botswana, Cameroon, Côte d'Ivoire, Ghana, Kenya, Mozambique, Namibia, Tanzania, and Uganda.

Our analysis is based on highly disaggregated data for trade and tariffs (HS six digit level) and follows a simple analytical model by Milner et al. (2006) to quantify the welfare effects of trade liberalization. We extend the literature in two principal ways: First, we estimate elasticities of import demand for the nine African countries importing from the EU and Sub-Saharan Africa respectively. Second, we apply the actual tariff reduction rates recently negotiated between the EU and the African countries to estimate the agreement's welfare effects of trade liberalization for the African countries.

Results indicate that Botswana, Cameroon, Mozambique, and Namibia will significantly profit from the interim agreements, while the trade effects for Côte d'Ivoire, Ghana, Kenya, Tanzania, and Uganda are close to zero. However, Tanzania and Uganda also have the potential to experience positive welfare effects, but predicted results of the liberalization based on the interim agreement's reduction rates fall short of the potential of a full liberalization.

Keywords: Economic Partnership Agreements, Africa, trade liberalization, tariff reduction, welfare analysis, ACP countries

JEL codes: F10, F16, O24, O11

*University of Göttingen, Platz der Göttinger Sieben 3, 37073 Göttingen. Phone: +49551398171, Fax: +49551397302, Email: svollme@uni-goettingen.de.

†University of Göttingen and Universidad Jaume I., Email: martinei@eco.uji.es

‡University of Göttingen, Email: fnowak@uni-goettingen.de.

§University of Göttingen, Email: hhk@uni-goettingen.de

Funding This work was funded by the German Federal Ministry for Economic Cooperation and Development. A previous version of this paper was written as a background paper for the World Development Report 2009.

Acknowledgements The Authors would like to thank Matthias Busse, Souleymane Coulibaly, Indermit Gill, Birgit Hofmann, Stephan Klasen and participants of the ASSA Meetings 2009 in San Francisco for helpful comments. Financial support from Fundación Caja Castellón-Bancaja and the Spanish Ministry of Education is gratefully acknowledged (P1-1B2005-33 and SEJ 2007-67548).

1 Introduction

Until 2007 the European Union (EU) granted non-reciprocal trade preferences to African, Caribbean and Pacific (ACP) countries. This policy did not comply with the WTO principle of most-favoured treatment¹ and was only temporarily covered by a WTO waiver which expired in December 2007. Under Cotonou the principle of reciprocity was introduced implying that developing countries had to honour trade concessions given by developed trading partners. Hence, in order to avoid distortions of EU-ACP trade (especially between the EU and the ACP non-LDCs²) new trade agreements, so called Economic Partnership Agreements (EPAs), were negotiated with a target date of January 2008.

The EPAs between the EU and ACP countries are a new approach to promote trade and to achieve more general development goals at the same time. At the core of the EPAs are regional trade agreements between the EU and each of the six regional ACPs.

¹ The principle of most-favoured treatment implies that access given to any country has to be given to all countries or at least to all similar countries (e.g. all developing countries or all least developed countries (LDC)).

² For Least Developed Countries (LDCs) the Everything but Arms (EBA) initiative has been in force since 2001. The EBA regulation is granting duty-free access to imports of all products from least developed countries to the EU without any quantitative restrictions, except to arms and munitions. Only imports of fresh bananas, rice and sugar were not fully liberalized immediately but are liberalized step by step. This special arrangement for LDCs is not subject to the periodic renewal of the EU's generalized system of preferences (GSP). The GSP applies to all developing countries, but its conditions are less favourable for ACP non-LDCs than those offered under the Cotonou Agreement.

The EPAs intend to support ACP regional integration to create larger regional markets and foster their integration into world markets. While the previous trade preferences for ACP countries were determined unilaterally by the EU, the EPAs are jointly designed in negotiations between the EU and the ACP countries. ACP countries are requested to open to some extent their markets to EU products in return for their access to EU markets. The long-term goal is quasi duty-free and quota-free market access on both sides and simplified rules of origin in the EU. However, the ACP countries have to open their markets to a smaller extent than the EU does (on average 80 percent within 15 years).

Moreover, EPAs give incentives to ACP countries to increase regional trade and cooperation - to replace the previous arrangements that favoured a hub-and-spoke structure discouraging interaction with neighbours. Understandably, some countries are unwilling to cooperate on issues where they might lose. The EU as a third party can provide incentives to strengthen a regional resolve to enforce cooperation, and help to overcome such differences. Experience shows however, that (north-south) trade liberalization alone does not always promote economic development. EPAs could take a broader approach and try to improve coherence between trade and development. Besides trade of goods the EPAs also include trade in services as well as trade related issues such as investment, public procurement and competition law. While the agreements on trade of goods and services are about mutual, however asymmetric, trade liberalization, the trade related issues follow another objective. They aim to support regional integration by common regional regulation, harmonization and implementation, helping to improve political and economic stability and creating a better business and investment climate. The EU may thus have to subordinate its commercial interests to the development needs of the ACP countries.

In this paper we estimate the potential welfare effects of a trade agreement between

the EU and ACP countries for nine African countries: Botswana, Cameroon, Côte d'Ivoire, Ghana, Kenya, Mozambique, Namibia, Tanzania, and Uganda. The empirical framework is based on Milner et al. (2005) - yet with an extended set of countries. The contributions to the existent literature on this field are twofold: First, instead of rather arbitrarily choosing elasticities of import demand, we estimate bilateral elasticities between the EU and Sub-Saharan Africa and between the nine African countries and the EU from highly disaggregated data. Second, instead of simulating general scenarios like full, medium or low liberalization, we apply the actual tariff reduction rates recently negotiated between the EU and the African countries to estimate the agreement's welfare effects of trade liberalization for the African countries.

Section 2 briefly recalls the current state of the EPA negotiations. Section 3 describes the theoretical framework. Section 4 presents the empirical results before we conclude.

2 State of the EPA negotiations

The EU started EPAs' negotiations with six ACP regions, which were self-defined by the ACP countries in 2003. These regions include the Caribbean (CARIFORUM), Central Africa (CEMAC), South-East Africa (ESA), West Africa (ECOWAS), Southern Africa (SADC), and the Pacific. The trade structure of these regions often reflects dependency on just a few products. Table 1 lists the top four exported products of the six ACP regions. In most cases, these products account for at least two-thirds of total exports.

The schedule for negotiations was tight, since the WTO waiver expired in December 2007. In most cases this was insufficient time to finalize full EPAs, thus interim agreements were concluded, in many cases on a sub-regional or bilateral level. Negotiations toward full EPAs continue.

The course of negotiations differs between the regions. For the Caribbean region, a

full EPA including trade in services has been finalized in December 2007. The agreement implies a market opening of 61 percent within 10 years and 82.7 percent within 15 years. The members are: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Surinam, and Trinidad and Tobago.

For Eastern and Southern Africa two sub-regional interim agreements were concluded with the East African Community (EAC) and Eastern and Southern Africa (ESA). The agreement for EAC implies a market opening of 64 percent within 2 years, 80 percent within 15 years and 82 percent within 25 years. The members are: Burundi, Kenya, Rwanda, Tanzania, and Uganda. The extent of market opening differs among the members of the other agreement between 80 percent (Comoros) and 97 percent (Seychelles). The members are: Comoros, Madagascar, Mauritius, Seychelles, Zimbabwe. The other countries of this region can use market access to the EU under the Everything but Arms initiative for LDCs: Djibouti, Eritrea, Ethiopia, Malawi, Somalia, Sudan, and Zambia.

The sub-regional interim agreement for Southern Africa implies a market opening of 86 percent within 2 years except for Mozambique (80.5 percent within one year). The members are: Botswana, Lesotho, Mozambique, Namibia, and Swaziland. Unfortunately South Africa did not enter the agreement yet. From a development perspective it would be extremely helpful if the major economic driver of the region formed part of the agreement. Angola can continue to use market access through Everything but Arms.

In the Pacific region a sub-regional interim agreement has been concluded with Papua New Guinea and Fiji. It implies a market opening of 88 percent within 15 years in the case of Papua New Guinea and 80 percent in the case of Fiji. The other non-LDCs of this region include Cook Islands, Marshall Islands, Micronesia, Nauru, Niue, Palau,

and Tonga. Trade in goods is relatively unimportant for this region, the agreement is therefore expected to have its focus on trade in services. East Timor, Kiribati, Samoa, Solomon Islands, Tuvalu, and Vanuatu can use market access under Everything but Arms.

In Central Africa, only a bilateral agreement with Cameroon could be finalized in early 2008. The agreement includes market opening of 80% within 15 years. The remaining non-LDCs of this region are Congo-Brazzaville and Gabon, both continuing to negotiate own stepping stone agreements. Chad, Central African Republic, DR Congo, Equatorial Guinea, and São Tome are granted market access under Everything but Arms.

In West Africa, bilateral agreements have been signed only with Côte d'Ivoire and Ghana. The agreements imply market opening of 70 percent within 10 years for Côte d'Ivoire and 80 percent within 15 years for both Côte d'Ivoire and Ghana. The vast majority of exports of the region come from Nigeria which is a non-LDC where exports are dominated by oil and gas. The other countries of this region include Benin, Burkina Faso, Cape Verde, Gambia, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Senegal, Sierra Leone, and Togo, all of which are LDCs and can use market access under Everything but Arms.

3 Economic analysis of EPAs

3.1 Review of the literature

Before we proceed to the analytical framework let us briefly summarize the existing literature on EPAs and their potential impact in the ACP countries or sub-regions. The empirical approaches taken in the literature to estimate the potential effects of EPAs differ quite substantially. Some studies are based on computable general equilibrium

(CGE) models, whereas others are based on partial equilibrium (PE) models. On the one hand, the CGE studies are more complex and can take the linkages of the economy into account, on the other hand the PE studies allow for more detailed statements on what is to be expected on the sectoral level. CGE models are mostly unfeasible for African countries due to lack of sufficiently detailed data (Milner et al. 2006).

Although there is a considerably body of literature on the EPAs, most papers focus on policy options rather than assess the trade and welfare effects of the EPAs. To our knowledge, five main studies in the recent past have evaluated the impact of the EPAs in a PE framework. In the first study, Hinkle and Schiff (2004) investigate the effects of an EPA on Sub-Saharan African (SSA) countries. They observe that the liberalization of trade in services which can be part of an EPA agreement will benefit SSA in terms of consumer gains in sectors such as transportation, telecommunication and finance.

Karingi et al. (2005), evaluates the gains and losses associated with EPAs for ACP countries. They predict a decrease in the production of natural resources, energy and cotton and production increases in fishing, animal products, livestock, crops, sugar oilseeds, vegetables and cereals for SSA if a Free Trade Agreement (FTA) with the EU was signed. However, in case of full reciprocity production losses in fishing, livestock and vegetables are to be expected. With respect to manufacturing in the SSA countries, Karingi et al. (2005) find a decline in heavy industry, medium tech and low tech industry, clothing and textiles under full reciprocity, but increases in clothing, textiles and agriculture production under a FTA.

Milner et al. (2006) analyze the EPA's impact on Tanzania, Uganda and Kenya. The authors find the expected consumer gains and production losses but, more importantly, they identify Kenya as a country where losses outweigh benefits, mainly due to the fact that Kenya's manufacturing sector will be negatively affected by EU competition.

Busse and Großmann (2007) analyze the impact of EPAs on West African countries.

They find that in most cases trade creation effects (more trade with the EU and some African countries) outweigh the trade diversion effects (less trade with African countries that are not part of the agreement). They also find a negative impact on the government deficit.

Finally, Fontagné, Laborde and Mitoritonne (2008) investigate the impact of EPAs for all six ACP regions. Their results show increased exports of vegetal production, livestock, agrifood and textiles to the EU and big increases in imports from the EU (in the range of 20 to 40 percent) in textiles, metallurgy, primary products and other industries. Huge decreases in tariff revenue (70 to 80 percent) are found for all six regions except for the Pacific where the tariff revenue seems to be unimportant.

In this paper we will emphasize three major points: First, there is no consistent way to define the "EPA effect". Some studies estimate the welfare effects of a free trade agreement and call the difference to the pre-EPA status quo the EPA effect. However, the pre-EPA status quo is not an alternative, since the WTO waiver which facilitated this status expired in December 2007. Comparisons should therefore be made to the Generalized System of Preferences (GSP) as also acknowledged by Fontagné, Laborde and Mitoritonne (2008). Second, the elasticities of import demand which are in most models necessary to assess the economic impact of an EPA are often chosen quite arbitrary, for example the U.S. elasticity of import demand is taken for African countries. Third, a high level of disaggregation in the trade and tariff data is desirable in order to obtain more reliable results.

3.2 Theoretical framework

The theoretical framework is based on Milner et al. (2006). The authors illustrate the welfare effects of preferential trade agreements for a small country member of an initial PTA graphically. These effects arise from the transition of initial preferential trade

agreements (PTA) between African countries to Economic Partnership Agreements. Figure 1 shows this initial situation of a PTA between an African country (H) and its regional partner (P). With a PTA in force home country demand for imports (D_H) for a good is met by partner supply of exports (S_P), since domestic production capabilities are assumed to be negligible. Two additional flat lines are shown indicating the infinitely elastic supply of the same good from the European Union and the rest of the world (ROW), respectively. Prices P_{EU} and P_{ROW} are given exogenously since the African countries are small in size relative to the EU and the rest of the world and thus are unable to trigger variations in world market prices through shifts in demand.

In the initial phase with the PTA in force country H imposes an ad-valorem tariff on imports from regions not covered by the PTA i.e. global goods. The resulting price increase is taken into account by adding a second global export supply curve S_{ROW}^t . As can easily be derived from the graph imports amount to OM_2 . These inflows originate both from country P (OM_1) and the rest of the world (M_1M_2).

In the given situation country H could benefit from two sources of welfare gains: assuming that P_{ROW}^t is the price level consumers face, this price level undercuts the spending propensity of all consumers left of point B . This fact generates consumer surplus and is also the first source of welfare the country may derive from the initial situation. The import of M_1M_2 of goods from the rest of the world allows for further welfare gains since duties are levied on these goods resulting in state revenue ($a + b$).

The implementation of an EPA framework removes these tariffs on goods from the European Union whereas duties remain in place for goods from the rest of the world. The implication of such a shift in policy is a reduction of prices for imports from the EU. Consumers would now face a lower price regime indicated by P_{EU} in Figure 1.

Several welfare effects are triggered by this pro-European shift in trade policies: Firstly, the drop of the import price from P_{ROW}^t to P_{EU} will displace country H 's

former trading partner P as a supplier. Goods of the amount OM_1 are now imported from the EU. Hence, the EPA framework results in trade creation, represented by area c in Figure 1. The lower price P_{EU} also increases imports and thus consumption of the good in question by M_2M_3 (consumer surplus increase by area e (Figure 1). This result is the consumption effect of the EPA-driven shift in the trading structure of the country. With tariffs favouring EU imports over goods from the rest of the world the bear share of imports i.e. M_1M_2 is now purchased from EU suppliers in place of tapping supply from the rest of the world. The welfare effects of this shift, in terms of trade creation and trade diversion, towards the EPA framework are complex: The EU is a less efficient choice for importing the good in question than the rest of the world. This is indicated by the higher price of EU goods in comparison with suppliers from the rest of the world. The adverse effect of this trade preference is captured by the trade diversion effect amounting to M_1M_2 . The consequence of employing a less efficient source for imports generates costs of the amount of area b in Figure 1. In addition, since the tariff revenue is not collected anymore, the total tariff revenue lost by the home country is represented by area $(a + b)$ in Figure 1. The global welfare effect is ambiguous, and depends on the elasticities of the home demand for imports and the export supply of exports and is represented by the area $(c + d + e) - b$ in Figure 1.

These three trade effects, consumption effect, trade creation and trade diversion, associated with a move from a PTA to an EPA usually take place simultaneously. However, for specific sectors (products) it could be that only one or two of the effects occur. As a matter of fact, it is assumed that in sectors for which the EU is the dominant supplier only consumption effects will follow, while in sectors for which the dominant supplier is the rest of the world, also trade diversion occurs. Trade creation together with consumption effects will follow in sectors where another ACP country (in the regional PTA) is a relatively important supplier (providing more than approx. 25

percent of imports).

It can be assumed for sectors in which the EU is the dominant supplier that supply from the rest of the world is more expensive than the supply from the EU and that there are no competitive regional supply capabilities. Thus the consumption effect alone is given by

$$\Delta M^C = \left(\frac{t}{1+t} \right) \varepsilon_M^D M_0^{EU} UV_0^{EU} \quad (1)$$

where t is the current tariff, ε_M^D the price elasticity of import demand, M_0^{EU} the current import volume originating from the EU and UV_0^{EU} the current unit values³ (prices) from the EU. The associated revenue (ΔR^C) and welfare (ΔW^C) effects are

$$\Delta R^C = -t M_0^{EU} UV_0^{EU} \quad (2)$$

$$\Delta W^C = 0.5t \Delta M^C \quad (3)$$

The consumption effects with trade diversion are given by the following formulas, where ROW stands for rest of the world:

$$\Delta M^{TD} = M_0^{ROW} UV_0^{ROW} \quad (4)$$

$$\Delta R^{TD} = -t M_0^{ROW} UV_0^{ROW} \quad (5)$$

$$\Delta M_{TD}^C = 0.5 \left(\frac{t}{1+t} \right) \varepsilon_M^D M_0^{ROW} UV_0^{EU} \quad (6)$$

$$\Delta W_{TD}^C = 0.25t \Delta M_{TD}^C - 0.5t M_0^{ROW} UV_0^{ROW} \quad (7)$$

³ Unit values are defined as import value divided by import volume.

Finally the consumption effects with trade creation are given by:

$$\Delta M^{TC} = M_0^{PTA} U V_0^{PTA} \quad (8)$$

$$\Delta M_{TC}^C = 0.5 \left(\frac{t}{1+t} \right) \varepsilon_M^D M_0^{PTA} U V_0^{EU} \quad (9)$$

$$\Delta W_{TC}^C = 0.5t \Delta M_{TC}^C + t M_0^{PTA} U V_0^{PTA} \quad (10)$$

We will focus on the welfare and the revenue effects of trade creation, trade diversion and consumption. With this aim, sectors will be classified into three different categories according to who is the dominant supplier in this sector.

According to the outlined analytical framework and in line with the empirical studies discussed in section 3.1, the effects that will follow after an EPA between the EU and ACP countries or subgroups are now summarised. First, a lowering of tariffs in the ACP region (among African countries) will lead to trade creation in this region as long as ACP prices are below EU prices. EU countries will also profit from better access to ACP country markets because import tariffs will have to be lowered for EU manufactured and agricultural exports as part of an EPA agreement. Given that the EU is strong in producing manufactured exports a rise in EU exports of manufactures to ACP countries is expected.

Second, lower tariffs of manufactured products will put producers of manufactures (the import substitution industry) in ACP countries under pressure. ACP countries with bias towards producing products such as machinery, chemicals, pharmaceuticals, plastic, glass, and ceramics will lose given that a lowering of import tariffs will make them less competitive and will reveal weaknesses in productivity or innovation. Third, better EU access to the ACP market can lead to a displacement (trade diversion) of previously competitive African neighbours if they are not part of the agreement and if their price is above the EU price in the aftermath of the EPA agreement. Fourth, the

consumers in all the ACP countries (in the very poor, poor and richer ACP countries) will profit from cheaper imports (trade concessions for the EU countries) and from a greater variety of incoming imports. Finally, with respect to government revenue, state earnings from levying duties will decrease in all ACP countries and new sources of revenue creation or taxation will have to be found.

4 Empirical analysis and Policy Implications

4.1 Elasticities for Import Demand

Import demand elasticities are an important ingredient of ex-ante analyses of trade reforms. Price elasticities are crucial for assessing the effects on trade volumes of changes in relative prices following tariff cuts arranged in the negotiations of regional trade agreements. Price elasticities are also necessary to estimate ad-valorem equivalents of quotas or other non-tariff barriers. In addition, trade policy is frequently determined at high levels of disaggregation, whereas existing import demand elasticities are only available, for many countries, at a high aggregation level. This divergence can lead to serious aggregation biases when calculating the impact of trade policies. We aim to fill in this gap by estimating import demand elasticities for the nine African countries considered in this paper. We are thus able to build up on the methodology employed in Busse and Großmann (2007) where elasticities are pre-defined in place of being estimated from the data.

In the recent past, trade economists often used trade elasticities from the surveys of the empirical literature put together by Stern et al. (1976) and by Sawyer and Sprinkle (1999). More recent attempts to provide disaggregated estimates of import demand elasticities include Shiells, Stern and Deardorff (1986), Shiells and Reinert (1993), Blonigen and Wilson (1999), Marquez (1990, 1999, 2002), Broda et al. (2008)

and Gallaway, McDaniel and Rivera (2003), Kee et al. (2004) and Hertel et al. (2003). Import demand elasticities for many African countries at disaggregate level are not available in the existent literature.

In order to evaluate the impact of the EPA agreements and its associated welfare effects across different African countries, one would need to have a consistent set of trade elasticities, estimated using the same data and methodology. If possible, it would also be desirable to use a framework for the estimation that is consistent with trade theory. Hence we will specify and estimate a demand for imports that relates changes in the quantity of imports to changes in relative prices. This follows the Armington assumption (based on the differentiation of products with respect to their origin and the imperfect substitution in demand between imports and domestic supply).

The share of import in domestic demand is related to their relative prices. An increase in domestic price level creates an incentive for increasing the share of imports. The specification of the import demand is,

$$\frac{M}{D} = \left(\frac{P_D}{P_M} \frac{\delta}{1 - \delta} \right)^\sigma \quad (11)$$

where M denotes import quantity, D denotes domestic demand (quantity produced and sold in Home), P_D is the domestic price and P_M is the world market price, and σ is the price elasticity of imports, that will be estimated.

A way of extending this formulation to the multiple countries (regions) case consists of using bilateral trade at highly disaggregated level. Given this scenario two different types of elasticities can be considered: The elasticity for the choice between imports from different exporters and the elasticity of the choice between imports and domestic production. Since domestic production is not available at a high level of disaggregation we choose to use the first elasticity. We will follow a difference in difference approach

that is described below. The import demand equation for multiple exporters and products is,

$$\frac{M_{ijk}}{M_{ilk}} = \left(\frac{\delta_{ijk}P_{ijk}}{\delta_{ilk}P_{ilk}} \right)^{\sigma_{ik}} \quad (12)$$

where i denotes the importing country and j, l the exporter countries (regions), k denotes a specific product (HS six digits level). M are import quantities and P are import prices. We use import unit values as a proxy for import prices. This measure has been controversial at times; however Shiells (1991) has shown that in some cases this does not appear to be a serious problem. By taking logarithms of equation 2 and adding and error term and importer fixed effects we derive the empirical model as,

$$\log \left(\frac{M_{ijk}}{M_{ilk}} \right) = \sigma_{ik} \log \left(\frac{\delta_{ijk}P_{ijk}}{\delta_{ilk}P_{ilk}} \right) + \alpha_i + \varepsilon_{ik} \quad (13)$$

where α_i are importer fixed effects and ε_{ik} is the error term which is assumed to be well behaved. Equation (13) is estimated with trade data for 2005 (Import values and import quantities are from COMTRADE) for nine importers (Uganda, Tanzania, Mozambique, Ghana, Côte D'Ivoire, Cameroon, Botswana, Kenya and Namibia) and three exporting regions (European Union, Sub-Saharan Africa and World). Two versions of equation (13) are estimated. The first one considers imports from the EU with respect to imports from the world as the dependent variable, whereas the second considers imports from SSA with respect to imports from the world.

Table 2 presents the aggregate price elasticities of import demand for each importer country. Tables 3 and 4 summarize the trade elasticities for imports broken into greater detail. In essence, the disaggregated data used to generate the measures reported in Tables 3 and 4 avoids imposing identical parameters on all classes of goods. It is interesting to note that many of the elasticity estimates across import categories within

specific countries have very similar magnitudes.

In the subsequent analysis we use the estimated elasticities at the highest level of disaggregation possible. However, for some countries and sectors there were no sufficient data to estimate a significant elasticity (for example Namibia and HS 0). In these cases we use elasticities obtained at a more aggregate level.

4.2 Welfare effects of an EPA

Combining the trade elasticities of section 4.1 and the analytical framework of section 3.2 we are now able to assess the potential welfare effects of full trade liberalization and of the interim agreements. For this purpose we use trade data from UNSD COMTRADE and tariff data from UNCTAD TRAINS at a very high level of disaggregation (HS six digits level). As a first step we assume that tariffs are completely abolished with the PTA. The overall welfare effects for the nine African countries are shown in Table 5.

It should be noted that a tariff reduction to zero describes a rather extreme case which would stand at the very end of an EPA process. Nevertheless, we find that in most cases trade creation effects outweigh trade diversion effects. Only Côte d'Ivoire, Ghana and Kenya experience relatively small welfare losses compared to their overall trade volume. Botswana, Cameroon, Mozambique and Namibia are identified as biggest winners under a full trade liberalization scenario.

The overall welfare effects can be decomposed into partial effects for manufacturing (HS codes 3 to 9) and non-manufacturing (HS codes 0 to 2) products. Generally speaking one could say that manufacturing products account for most welfare losses, while the welfare effects are positive for the non-manufacturing products (except for Ghana).

Next we calculate the short-run (five years) and long-run (end of the transition period) welfare effects of a trade liberalization given the actual interim agreement's

tariff reduction rates. The results are shown in Tables 6 and 7, respectively. Table 7 shows that in the long-run only Botswana, Cameroon and Namibia realize their full potential of welfare gains under the interim agreements. The welfare effects for Mozambique are still positive though smaller than in the full liberalization scenario.

The welfare losses of Côte d'Ivoire, Ghana and Kenya under the actual tariff reduction rates are smaller compared to a full liberalization. The effects are now close to zero for these countries, implying that the trade effects of the agreements can be considered more or less neutral. Also for Tanzania and Uganda the predicted welfare effects are close to zero, although the full liberalization scenario suggests that both countries have potential for welfare gains through trade liberalization.

5 Conclusions

Overall, we can conclude that a tariff reduction for imports from the EU has no or a slightly positive effect for the African countries in our study. One should note, that this welfare effect can not be interpreted as the total effect of an Economic Partnership Agreement. On the contrary, these effects can be seen as a prize to maintain preferential access to EU markets which is compatible to WTO rules. Even a small negative welfare effect due to tariff reduction would not imply that EPAs have a negative impact on African countries. Falling back to GSP would certainly be more disadvantageous for those countries than an EPA. However, other aspects besides tariffs are also important for the potential development success of the EPAs. The interim agreements have to be extended with development components comparable to the Caribbean agreement.

With respect to the loss in tariff revenues, shown in the fourth row of Table 5, although the losses are always compensated by consumption and trade creation effects except for the countries that experience welfare losses (Côte d'Ivoire, Ghana and

Kenya), this is a very important issue in practice. Tariff revenues contribute, on average, by 2 percent to the GDP - in some cases even up to 6 percent-for Sub-Saharan African countries. Given that trade with the EU accounts for 40 percent of total trade, lower tariffs would imply a stiff decline in government revenues, as our estimates also confirm. Two steps could be taken to resolve this problem. First, ACP countries should be allowed to open their markets to a smaller extent than the EU and with appropriate transition periods, as already acknowledged by the present state of the EPAs or interim agreements. Second the lost tariff revenues should be replaced by increased tax revenues through reforms of domestic tax systems and tax administration.

Certainly, the EU profits the most from making the pre-2008 EU-ACP trade relations WTO compatible. We therefore argue that these additional profits on the EU side should be used for development cooperation. A more radical approach in terms of the tariff losses in Africa would therefore be for the EU to provide budget support to the most affected countries during a predetermined transition period. Such transfers could help African countries to cope with the financial burden of transition costs and offset revenue losses caused by tariff reductions. For companies to reap the full potential of export markets African countries are also well-advised to dedicate some attention to creating a supportive environment for potential exporters. This may include efforts to improve relevant factors such as infrastructure or the legal framework. EU countries could enhance the development impact of EPA policies by contributing to these improvements through financial or technical assistance. This assistance may also entail helping to establish a sound tax system which replaces tariff collection as a pivotal source of income for the government of African countries. In accordance African countries should make an effort to ensure that their tax collection scheme is able to compensate the losses incurring from tariff reduction. This also entails the improvement of tax administration to ensure reliable tax collection. Hinkle and Schiff (2004) suggest

improving the countries ability to collect indirect taxes such as value added taxes in order to compensate losses incurring from tariff reductions.

Comparing the revenue losses under the full liberalization scenario and the long-run interim agreement scenario reveals that revenues were a dominant issue when selecting the products for exclusion. In the case of Tanzania and Uganda the protection of tariff revenues was certainly paid with welfare losses. Overall it is interesting to note that infant industries and welfare arguments did not receive enough attention compared to tariff revenues.

In order to improve the welfare effects, both for countries which are already profiting from a complete tariff offset as well as countries which would loose from a complete tariff offset, products and sectors which suffer from negative welfare effects could be identified and excluded from trade liberalization. Moreover, the exclusion of products from liberalization could be motivated by infant industry arguments or by their importance for government revenues. Only a limited proportion of products can be excluded from liberalization. Therefore we argue that the protection of infant industries should be chosen over the protection of government revenues. The tariff reduction tables of the interim agreements should be evaluated from this perspective.

References

- Blonigen, B.A. and W.W. Wilson (1999) "Explaining Armington: what determines substitutability between home and foreign goods?", *Canadian Journal of Economics* 32(1): 1–21.
- Broda, C., N. Limao and D. Weinstein (2009) "Optimal Tariffs: The Evidence", *American Economic Review*. Forthcoming.
- Busse, M. and H. Großmann (2007) "The trade and fiscal impact of EU/ACP economic partnership agreements on West African countries", *Journal of Development Studies* 43(5): 787–811.
- Fontagné, L., D. Laborde and C. Mitonitonne (2008) "An Impact Study of the EU-ACP EPAs in the Six ACP Regions", *CEPII Working Paper* No 2008 – 04.
- Gallaway, M. P., C. McDaniel and S.A. Rivera (2003) "Short-run and Long-run Industry-level Estimates of U.S. Armington Elasticities", *North American Journal of Economics and Finance* 14(1): 49–68.
- Hertel, T.W., D. Hummels, M. Ivanic and R. Keeney (2003) "How Confident Can We Be in CGE-Based Assessments of Free Trade Agreements?" *GTAP Working Paper* No. 26.
- Hinkle, L.E. and M. Schiff (2004) "Economic Partnership Agreements Between Sub-Saharan Africa and the EU: A Development Perspective", *The World Economy* 27(9): 1321–1333.
- Karingi, S., R. Lang, N. Oulmane, R. Perez, M.S. Jallab and H.B. Hammouda (2005) "Economic and Welfare Impacts of the EU-Africa Economic Partnership Agreements", *Economic Commission for Africa ATCP Working Paper* No. 10.
- Kee, H., A. Nicita and M. Olarreaga (2004) "Import Demand Elasticities and Trade Distorsions", *The Review of Economics and Statistics* 90(4): 666–682.
- Marquez, J. (1990) "Bilateral Trade Elasticities," *The Review of Economics and Statistics* 72(1): 70–77.
- Marquez, J. (1999) "Long-Period Trade Elasticities for Canada, Japan, and the United States" *Review of International Economics* 7(1): 102–116.
- Marquez, J., (2002) *Estimating Trade Elasticities*, New York: Springer.
- Milner, C., O. Morrissey and A. McKay (2005) "Some Simple Analytics of the Trade and Welfare Effects of Economic Partnership Agreements", *Journal of African Economies* 14(3): 327–358.
- Sawyer, W.C. and R.L. Sprinkle (1999) *The Demand for Imports and Exports in the World Economy*, Ashgate: Aldershot.
- Shiells, C.R., R.M. Stern and A.V. Deardorff (1986) "Estimates of the elasticities of sub-

stitution between imports and home goods for the United States”, *Weltwirtschaftliches Archiv* 122(3): 497–519.

Shiells, C.R. and K.A. Reinert (1993) ”Armington Models and Terms-of-Trade Effects: Some Econometric Evidence for North America”, *Canadian Journal of Economics* 26(2): 299–316.

Shiells, C.R. (1991) ”Errors in import demand estimates based upon unit-value indexes” *Review of Economics and Statistics* 73(2): 378–382.

Stern, R., J. Francis and B. Schumacher (1976) *Price Elasticities in International Trade: An Annotated Bibliography*, London: Macmillan.

Figure 1: Welfare effects of a reduction in tariffs

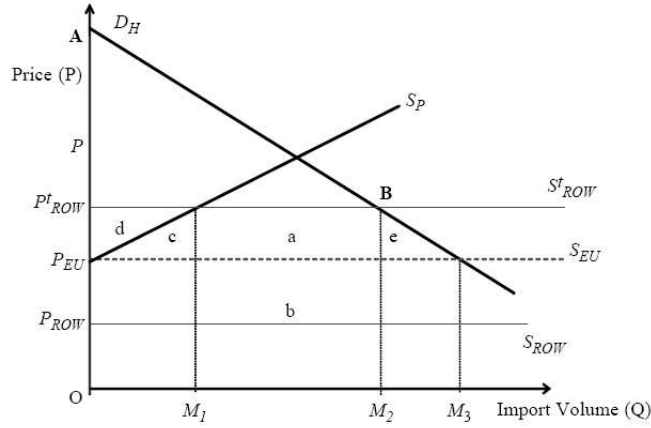


Table 1: Top four exports of the six ACP regions

	Top export (%)	Second export (%)	Third export (%)	Fourth export (%)
Southern Africa	Diamonds (42)	Mineral oil (17)	Aluminum (13)	Fish (8)
West Africa	Mineral oil (45)	Cocoa (21)	Fish (5)	Timber (4)
Central Africa	Mineral oil (47)	Timber (23)	Bananas (5)	Cocoa (4)
East Africa	Textiles (15)	Fish (11)	Diamonds (9)	Sugar (8)
Caribbean	Ships (23) a	Corundum (10)	Ethanol (10)	Sugar (8)
Pacific region	Palm oil (36)	Sugar (16)	Copper (13)	Coffee (7)

Ships and aircraft are not actually manufactured in the Caribbean, the statistics also include cases in which ownership of a ship or aircraft has been transferred. Source: EU Commission and BMZ (2007).

Table 2: Import demand elasticities by country

	EU 25	Sub-Saharan Africa	Non-Manufacturing SSA (HS 0 - HS 2)	Manufacturing SSA (HS 3 - HS 8)
Uganda	-0.967*** (0.036)	-0.707*** (0.051)	-0.522** (0.171)	-0.684*** (0.053)
Tanzania	-0.815*** (0.047)	-0.845*** (0.046)	-0.935*** (0.110)	-0.809*** (0.053)
Mozambique	-0.911*** (0.034)	-1.044*** (0.040)	-1.189*** (0.148)	-1.005*** (0.043)
Ghana	-0.870*** (0.055)	-0.589*** (0.050)	-0.638*** (0.122)	-0.566*** (0.055)
Côte d'Ivoire	-1.588*** (0.088)	-0.774*** (0.076)	-1.059*** (0.200)	-0.722*** (0.081)
Botswana	-0.997*** (0.057)	-0.479*** (0.123)	0.222 (0.639)	-0.487*** (0.126)
Kenya	-1.063*** (0.042)	-1.054*** (0.037)	-1.122*** (0.106)	-0.989*** (0.041)
Namibia	-0.796*** (0.047)	-0.941*** (0.126)	-1.009** (0.331)	-0.932*** (0.138)
Cameroon	-1.484*** (0.079)	-0.677*** (0.091)	-1.084* (0.503)	-0.631*** (0.085)
Fixed Effects			YES	
R-squared	0.74	0.7	0.563	0.746
AIC	68891.6	64701.41	15520.4	46040.21
BIC	69031.07	64840.83	15633.85	46173.75
N	17123	17079	4034	12315

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 3: Import demand elasticity for each 1 digit HS category, EU 25

	HS0	HS1	HS2	HS3	HS4	HS5	HS6	HS7	HS8	HS9
Uganda	-0.857*** (0.242)	-0.946* (0.442)	-1.113*** (0.122)	-1.162*** (0.133)	-1.113*** (0.201)	-0.603* (0.257)	-1.024*** (0.074)	-1.016*** (0.136)	-0.855*** (0.056)	-0.945*** (0.088)
Tanzania	-0.830*** (0.173)	-1.337*** (0.305)	-1.256*** (0.108)	-1.081*** (0.106)	-0.486* (0.218)	-0.526** (0.160)	-0.223* (0.094)	-0.544*** (0.131)	-0.975*** (0.085)	-0.694*** (0.108)
Mozambique	-1.198*** (0.132)	-0.487* (0.234)	-1.316*** (0.158)	-1.044*** (0.167)	-0.930*** (0.144)	-0.526*** (0.105)	-1.061*** (0.086)	-1.010*** (0.071)	-0.785*** (0.044)	-0.762*** (0.074)
Ghana	-0.626* (0.309)	-1.408*** (0.339)	-0.905*** (0.202)	-1.146*** (0.204)	-1.320*** (0.144)	-0.586*** (0.107)	-0.416*** (0.103)	-1.048*** (0.126)	-0.933*** (0.120)	-0.368 (0.234)
Côte d'Ivoire	-1.680*** (0.271)	-2.320*** (0.387)	-1.904*** (0.314)	-2.386*** (0.230)	-1.573*** (0.319)	-1.115*** (0.221)	-1.173*** (0.134)	-1.466*** (0.183)	-1.104*** (0.092)	-1.052*** (0.201)
Botswana	-0.726** (0.276)	-1.027*** (0.207)	-1.890*** (0.251)	-1.042*** (0.186)	-1.217*** (0.177)	-0.575* (0.244)	-0.667*** (0.176)	-0.762*** (0.209)	-0.971*** (0.083)	-0.713*** (0.148)
Kenya	-1.115*** (0.178)	-1.103*** (0.133)	-1.415*** (0.169)	-0.854*** (0.159)	-1.186*** (0.125)	-0.898*** (0.136)	-0.877*** (0.106)	-0.937*** (0.082)	-0.954*** (0.061)	-0.892*** (0.142)
Namibia	-0.880*** (0.168)	-0.905** (0.275)	-1.172*** (0.178)	-0.987*** (0.143)	-0.992*** (0.129)	-0.731*** (0.188)	-0.700*** (0.123)	-0.475** (0.158)	-0.737*** (0.084)	-0.609*** (0.123)
Cameroon	-1.951*** (0.300)	-2.787*** (0.426)	-1.941*** (0.319)	-1.683*** (0.156)	-1.528*** (0.153)	-1.240*** (0.163)	-0.729*** (0.168)	-1.846*** (0.243)	-1.275*** (0.115)	-1.019*** (0.245)
Fixed Effects					YES					
R-squared	0.726	0.652	0.726	0.773	0.780	0.693	0.842	0.774	0.793	0.737
AIC	4009.242	3724.583	7775.706	6681.943	5548.05	3588.515	6046.93	6134.704	14866.76	5626.691
BIC	4096.959	3809.87	7876.277	6780.732	5642.407	3673.106	6142.423	6230.793	14981.22	5722.245
N	966	844	1973	1787	1397	812	1488	1538	4266	1493

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 4: Import demand elasticity for each 1 digit HS category, Sub-Saharan Africa

	HS0	HS1	HS2	HS3	HS4	HS5	HS6	HS7	HS8	HS9
Uganda	-0.686* (0.311)	-0.297 (0.439)	-0.568*** (0.159)	-0.983** (0.353)	-0.571*** (0.173)	-0.748** (0.243)	-0.964*** (0.134)	-0.665*** (0.163)	-0.611*** (0.061)	-0.578*** (0.174)
Tanzania	-0.902** (0.301)	-1.071*** (0.291)	-0.892*** (0.125)	-0.507*** (0.151)	-0.738*** (0.146)	-0.729*** (0.185)	-0.738*** (0.167)	-1.038*** (0.199)	-0.885*** (0.072)	-0.760*** (0.127)
Mozambique	-1.234*** (0.229)	-1.126*** (0.272)	-1.222*** (0.113)	-1.060*** (0.140)	-1.319*** (0.142)	-1.072*** (0.113)	-1.227*** (0.067)	-1.022*** (0.079)	-0.827*** (0.074)	-0.965*** (0.071)
Ghana	-0.871*** (0.263)	-0.103 (0.244)	-0.722*** (0.154)	-0.633*** (0.137)	-0.742*** (0.172)	-0.137 (0.189)	-1.000*** (0.139)	-0.548*** (0.141)	-0.609*** (0.125)	-0.478*** (0.098)
Côte d'Ivoire	-0.971*** (0.212)	-1.618** (0.530)	-0.960* (0.431)	-0.765*** (0.212)	-0.753*** (0.226)	-1.304** (0.436)	-1.143*** (0.249)	-1.083*** (0.326)	-0.532*** (0.127)	-0.740*** (0.205)
Botswana	1.595*** (0.355)	-0.618 (0.465)	0.330 (0.766)	-0.151 (0.241)	-1.122*** (0.336)	-1.500*** (0.302)	-1.243*** (0.060)	-0.745* (0.304)	0.025 (0.174)	-0.068 (0.258)
Kenya	-0.942** (0.297)	-1.621*** (0.306)	-1.028*** (0.112)	-0.997*** (0.096)	-1.230*** (0.125)	-0.650** (0.243)	-0.758*** (0.115)	-1.120*** (0.096)	-0.979*** (0.067)	-0.911*** (0.131)
Namibia	-0.437 (0.630)	-2.886** (0.986)	-0.807* (0.397)	-4.073*** (0.620)	-0.491 (0.333)	-1.175*** (0.265)	-1.354*** (0.206)	-0.245 (0.373)	-0.255* (0.120)	-0.530 (0.283)
Cameroon	-0.300 (0.620)	-2.559** (0.837)	-0.536 (0.664)	-0.960*** (0.254)	-0.642 (0.422)	-0.055 (0.382)	-0.530 (0.327)	-0.188 (0.212)	-0.731*** (0.113)	-0.296 (0.180)
Fixed Effects					YES					
R-squared	0.556	0.560	0.591	0.716	0.716	0.663	0.797	0.706	0.815	0.775
AIC	3837.857	3884.921	7641.013	6734.74	5167.006	4270.725	4998.589	5952.82	13235.19	4965.852
BIC	3927.263	3972.051	7742.168	6833.377	5261.182	4359.875	5092.661	6049.507	13347.58	5059.527
N	1061	935	2038	1772	1383	1046	1375	1590	3804	1345

Note: *** denotes significance at 1 percent level, ** denotes significance at 5 percent level. Standard errors are reported in brackets.

Table 5: Welfare effects of a full liberalization (all tariffs equal zero)

All products										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	60.68	7256.11	8697.38	5741.34	2100.62	201.68	14.87	2051.05	255.62	
Diversion	-275.91	-27390.91	-20974.4	-148269.2	-76760.92	-10679.51	-957.47	-34380.72	-29559.79	
Creation	163104.9	15341.28	160097.8	44628.63	46416.89	77565.48	247078.9	57062.36	63250.91	
Total	162889.7	-4793.51	147820.8	-97899.23	-28243.41	67087.65	246136.3	24732.69	33946.74	
in %	5.35%	-0.08%	5.42%	-1.12%	-0.55%	4.27%	10.07%	1.01%	2.06%	
Revenue	-1905.1	-155502.2	-120378.9	-431936.9	-228347.2	-30452.95	-2530	-124062.5	-90611.12	

Non-manufacturing										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	0.05	4776.27	3706.5	2409.5	392.53	174.19	0.39	803.24	64.01	
Diversion	0	-3573.07	-2475.2	-48474.36	-18658.82	-6729.47	-7.59	4166.82	-9814.55	
Creation	2732.19	14751.16	157731.9	21264.45	33953.27	23711.4	48884.25	30997.74	38892.14	
Total	2732.24	15954.35	158963.2	-24800.4	15686.97	17156.12	48877.05	35967.8	29141.6	
in %	0.25%	0.50%	11.41%	-0.93%	0.97%	3.47%	8.06%	5.93%	5.36%	
Revenue	-1.02	-49668.85	-27310.43	-156580.8	-63662.65	-16543.93	-255.84	-25342.99	-24412.88	

Manufacturing										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	60.63	5185.24	4990.88	3331.95	1957.71	27.49	14.48	1259.08	193.23	
Diversion	-277.18	-28087.53	-18499.2	-100101.2	-74954.16	-3950.04	-949.89	-49647.93	-26536.35	
Creation	155662	1838.58	2365.87	23892.61	15487.33	56173.02	198141.8	33311.55	29379.43	
Total	155445.4	-21063.71	-11142.45	-72876.6	-57509.12	52250.47	197206.4	-15077.31	3036.31	
in %	7.90%	-0.64%	-0.84%	-1.20%	-1.40%	4.72%	10.73%	-0.65%	0.21%	
Revenue	-1904.07	-135051.4	-93068.45	-275978.5	-202989.4	-13909.02	-2274.16	-121830.8	-80569.24	

Note: Units are 1000 USD.

Table 6: Short-run welfare effects of a tariff reduction according to the interim agreements (after five years)

All products									
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda
Consumption	60.68	1459.97	54	86.64	689.34	12.26	14.87	27.35	29.23
Diversion	-275.91	-6870.85	-271.2	-3912.16	-26641.35	-1365.95	-957.47	-20998.8	-3702.75
Creation	163104.9	7456.67	390.88	300.23	5520.45	33701.15	246969.7	4754.79	3883.86
Total	162889.7	2045.79	173.68	-3525.29	-20431.56	32347.46	246027.1	-16216.65	210.34
in %	5.35%	0.03%	0.01%	-0.04%	-0.36%	2.02%	10.07%	-0.55%	0.01%
Revenue	-1905.1	-42732.96	-3064.91	-11960.81	-78259.52	-4868.95	-2354.41	-44151.47	-8585.84

Non-manufacturing									
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda
Consumption	60.67	762.46	15.23	27.08	1	3.55	0.66	13.2	0
Diversion	-11.96	-1373.6	-21.75	-1649.25	-73.26	-118.86	-7.59	-106.34	-118.94
Creation	8194.93	6686.75	293.25	258.81	675.66	4993.73	56452.78	16.14	619.1
Total	8243.64	6075.61	286.73	-1363.36	603.41	4878.42	56445.84	-76.99	500.16
in %	0.69%	0.18%	0.02%	-0.05%	0.03%	0.88%	7.89%	-0.01%	0.08%
Revenue	-1329.63	-14588.26	-713.72	-4290.16	-169.6	-409.44	-86.97	-400.74	-242.44

Manufacturing									
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda
Consumption	0	697.51	38.77	59.56	688.34	8.71	14.22	14.15	29.23
Diversion	-265.21	-5497.24	-249.46	-2262.92	-26568.09	-1247.1	-949.89	-20892.46	-3583.81
Creation	150199.3	769.91	97.63	41.42	4844.78	28707.43	190464	4738.65	3264.76
Total	149934	-4029.82	-113.05	-2161.94	-21034.97	27469.04	189528.4	-16139.66	-289.82
in %	8.12%	-0.13%	-0.01%	-0.04%	-0.53%	2.63%	10.97%	-0.72%	-0.02%
Revenue	-575.47	-28144.7	-2351.19	-7670.65	-78089.91	-4459.51	-2267.44	-43750.73	-8343.4

Note: Units are 1000 USD.

Table 7: Long-run welfare effects of a tariff reduction according to the interim agreements (end of the transition period)

All products										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	60.68	5934.84	8697.38	3558.57	1347.27	18.23	14.87	74.09	116.85	
Diversion	-275.91	-22364.72	-20974.4	-70937.72	-40832.61	-1519.43	-957.47	-28107.73	-15822.8	
Creation	163104.9	14498.93	160097.8	9754.32	10849.89	36287.77	246991.2	17725.59	11739.78	
Total	162889.7	-1930.95	147820.8	-57624.84	-28635.44	34786.57	246048.6	-10308.06	-3966.17	
in %	5.35%	-0.03%	5.42%	-0.66%	-0.50%	2.17%	10.07%	-0.35%	-0.20%	
Revenue	-1905.1	-120689.2	-120378.9	-202055.1	-117753.8	-5681.96	-2354.41	-61453.07	-38126.76	

Non-manufacturing										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	60.67	2620.05	3735.52	1691.15	349.96	9.53	0.66	34.8	4.5	
Diversion	-11.96	-3721.01	-3464.15	-21493.68	-1481.43	-272.33	-7.59	-905.99	-818.37	
Creation	8194.93	13312.04	157913.9	3371.19	1249.85	6109.72	56474.26	2126.61	1533.12	
Total	8243.64	12211.08	158185.3	-16431.34	118.38	5846.91	56467.32	1255.43	719.25	
in %	0.69%	0.37%	11.02%	-0.58%	0.01%	1.05%	7.89%	0.18%	0.12%	
Revenue	-1329.63	-33049.63	-29870.22	-71332.81	-6907.59	-1222.45	-86.97	-2483.71	-2071.51	

Manufacturing										
	Botswana	Côte d'Ivoire	Cameroon	Ghana	Kenya	Mozambique	Namibia	Tanzania	Uganda	
Consumption	0	3510.4	4961.86	1691.15	997.31	8.71	14.22	39.29	112.36	
Diversion	-265.21	-18877.95	-17510.25	-21493.68	-39351.18	-1247.1	-949.89	-27201.75	-15004.42	
Creation	150199.3	1564.66	2183.87	3371.19	9600.04	30178.05	190464	15598.98	10206.65	
Total	149934	-13802.89	-10364.53	-16431.34	-28753.83	28939.66	189528.4	-11563.48	-4685.42	
in %	8.12%	-0.44%	-0.80%	-0.58%	-0.73%	2.77%	10.97%	-0.51%	-0.34%	
Revenue	-575.47	-90044.52	-90508.66	-71332.81	-110846.2	-4459.51	-2267.44	-58969.35	-36055.25	
	10 years	17 years	18 years	17 years	28 years	13 years	10 years	28 years	28 years	

Note: Units are 1000 USD.