Economic and Welfare Impacts of the EU-Africa Economic Partnership Agreements

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Abstract

This study tries to quantify the concerns that have been raised often on adjustment costs likely to be faced by African countries and makes recommendations of how the EPAs could be made to work in Africa's favour. The study addresses the following questions. First, how are African countries likely to gain or lose from a bilateral trade liberalisation between Africa and the EU as governed by the EPAs reciprocity principle? Second, what sectors in Africa are most likely to lose and what sectors gain from the EPAs? Third, what are the welfare implications for the African countries from the EPAs? Fourth, how will the formation of EPAs affect trade expansion through trade creation and trade diversion effects? Fifth, what are the potential fiscal implications of the EPAs? Lastly, what are the implications of the EPAs on regional integration?

A key finding of the study is that full reciprocity will be very costly for Africa in terms of revenue losses, adjustment costs associated with de-industrialisation and its undermining effect of regional integration. Of major concern was this finding that even though the full reciprocity principle appears to be trade expanding globally (singularly in favour of EU), it will pose serious implications for deepening of regional integration in Africa.

The benefits from regional integration efforts in Africa achieved so far are likely to be stymied by the EPAs since a significant portion of the trade gained by the EU will be due to trade diversion not only from the rest of the world but also from within the EPA groupings themselves that are configured around existing RECs. In deed, unless there are clear mitigating measures, the EPAs could seriously undermine the gains that have been achieved so far in the integration process of the continent.

Only if there was focus on deepening African integration with a view to enhancing intra-African trade will the EPAs provide positive results. Nevertheless, unrestricted market access for Africa, which deals effectively with barriers associated with sensitive European products, was found to hold huge gains for the continent from the EPAs. In deed, even with full reciprocity, a free trade area that does not exclude sectors of export interest to Africa in the EU market and one that deals with non-tariff barriers promises positive results for African countries.

The overarching conclusion from the study is that sequencing of EPAs will be critical to their success. The study recommends that the EPAs should first focus on deepening intra-African trade. This should be given sufficient lead-time to allow the African countries build the requisite competitiveness and should be accompanied with significant developmental programmes to complement the enlarged African market with increased supply and diversified capacities. Eventually, tariff dismantlement by the African countries towards full reciprocity should then be implemented in phases, hand-in-hand with unrestricted market access for the African exports into the EU market. Properly sequenced EPAs implementations would eventually offer annual welfare gains to SSA countries.

Introduction

The Cotonou Partnership Agreement (CPA) between the European Union (EU) and African, Caribbean and Pacific (ACP) countries is expected to succeed the expired Lomé Agreement. It envisages the signing of Economic Partnership Agreements (EPAs) by December 2007 between the EU and the ACP countries. The EPAs, which will be the new cooperative framework under the CPA, are expected to adopt an integrated approach based on partnership and promoting cooperation, trade and political dialogue between the EU and ACP countries. One of the essential characteristics of this multilateral partnership is that it hopes to combine responses to the challenge of globalization and the development aid essential to ACP countries; with a strengthened political dimension. The key CPA principles are reciprocity, differentiation, deeper regional integration, and coordination of trade and aid.

Any benefits that EPAs are expected to generate for ACP countries are unlikely to materialise spontaneously and instantaneously. Moreover, the implementation of EPAs will impose a number of severe challenges for ACP countries that include: how to manage the expected losses of fiscal revenue in some ACP countries; how to cope with more competition expected to be entailed under the EPAs principle of reciprocity; how to ascertain net benefits from the EPAs, especially in LDCs, that is, incentive compatibility between EPAs and the EBA provisions that do not require reciprocity; how to deal with limited negotiations capacity because EPAs negotiations will stretch the already limited resources available to the ACP countries; and how to ensure consistency between the negotiations under the EPAs and that under the Doha Work Programme (DWP), in particular, how to improve market access for agricultural and non-agricultural products that continue to impose difficulties in trade negotiations at the multilateral level.

The compatibility of regional economic agreements with the WTO provisions

One of the most basic WTO principles – the Most Favoured Nation (MFN) treatment – stipulates that a trade concession granted by a member state to another should be automatically extended to all other WTO members (Article I of the General Agreement on Tariffs and Trade).

There are two main exceptions to this MFN principle. The first one allows preferential treatment when based on development concerns; the second one is with regard to free trade areas.

The "Enabling clause" authorises "*preferential and more favourable treatment to developing countries*", on the basis that they are offered by a party, to all developing countries or all Least Developed Countries, without discrimination. The "Enabling clause" is for example utilised to provide preferential market access under schemes such as the various *Generalised System of Preferences* (GSP) in favour of all developing countries, or the *Everything but Arms* initiative (EBA), which the EU provides to the LDCs. The "enabling clause" may also be utilised for preferential trade liberalization among developing countries.

The WTO GATT agreements also contains provisions allowing for derogation to the MFN principle in the case of regional trade agreements. Article XXIV of the GATT-1947, completed by an understanding attached to the Marrakech Agreement on GATT-1994 defines the modalities under which WTO members may not respect the MFN clause in trade in goods, when engaging in a free trade agreement process. Article V (para. 3.a) of the General Agreement on Trade in Services (GATS) provides with similar exemptions with regard to trade in services. Both article XXIV of GATT and article V of GATS stipulate that more preferential treatment may be granted among

some members, without automatic extension to the entire WTO membership as is normally required under the MFN clause. The justification behind this derogation to the MFN principle is that, under certain conditions, free trade agreements benefit not only their members, but also the global economy as a whole, through trade creation which results in increased overall welfare. Free trade agreements such as the EPAs clearly could fall under that category, provided they are of a reciprocal nature (i.e. both parties offer each other symmetrical preferential treatment).

However, ACP countries might want to explore possibilities of maintaining a certain degree of asymmetry in their future agreement with the EU. Article XXIV leaves room for ambiguity with regard to this point. In particular, article 8(b) stipulates that "*duties and other restrictive regulations* […] *are* [to] *be eliminated on substantially all the trade*" between the members of a preferential agreements. The exact meaning of " *substantially all the trade*" is strongly debated. How much trade may not be liberalised is a crucial question, and could be important for African countries willing to maintain some protection on some of their trade with the EU in the context of an EPA. It is generally thought that at least 90 percent of the trade has to be liberalised under a free trade agreement, but there is no legal confirmation for that figure. The EU-South Africa free trade agreement, for example did interpret the Article XXIV in a manner allowing for some protection within the 90 percent limit, in a non-reciprocal manner. Under this free trade agreement, the EU agreed to extend liberalization on 95 percent of its trade with South Africa, while South Africa agreed to liberalise "only" 86 percent of its imports from the EU (see Bilal 2002).

Article XXIV also maintains some ambiguity on schedule to accomplish liberalization. Here the agreement mentions "*a reasonable length of time"* (Art.XXIV, par. 5c). Again, there is no legal or official interpretation of what a reasonable length of time might be, although it is conventionally thought to be ten years. For example, South Africa was offered 12 years to implement liberalization in its Free trade agreement with the EU, more time than the EU is allowed to liberalise its imports from South Africa. Again, the ambiguity contained in Article XXIV has in this case been utilised to maintain a certain degree of asymmetry. The schedule of liberalization may be important for African countries implementing EPAs, as they determine how much time they have to proceed to internal industrial adjustments before liberalization.

Importantly for African countries (and also for other developing countries), the Doha Declaration launched an effort to clarify the understanding of Article XXIV and the role of Special and Differential treatment in regional trade agreements. These points of negotiations under the WTO will be of crucial importance in determining the future shape of EPAs, and the degree of flexibility African countries might enjoy under them.

Some issues for African countries in the EPAs process in the WTO context

Most African countries have already opted for the EPA process and are participating in the ongoing second phase of the negotiations. It is believed that this is in part due to potential advantages that the EU would confer to EPA members, such as increased assistance, aid and capacity building support. Clearly, it was thought that the EU was itself in favour of the EPA solution, among other things to promote regional integration in Africa, and also to reduce the number of negotiations it would have to hold simultaneously.

One of the hardest problems to solve for African countries was that of the overlapping of regional groupings. For various political and historical reasons, one individual country may be part of several regional economic groupings. Out of the 53 African countries, only 6 belong to just one regional economic communities, 26 are members of two groupings, 20 are members of 3 groupings and one (Democratic Republic of Congo) belongs to four (ECA 2004).

Moreover, while some regional economic communities were thought to be very dynamic (UEMOA, SADC, for example), others were seen as dormant. The choice of which regional grouping to join for EPA negotiations, was a very crucial difficult one for some African countries. Countries that may have important economic and political ties with other African countries outside their own EPA may hence have an important stake to actively promote cooperation mechanisms and ties among EPAs.

Moreover, as seen in the previous section, current WTO negotiations under the Doha Round may profoundly transform the overall trade context in which EPA will be negotiated. As discussed, the negotiations to clarify the content of Article XXIV of GATT and Article V of GATS will be crucial. They will determine the degree of non-reciprocity as well as the degree of exemption from coverage that will be allowed to developing countries negotiating preferential trade agreements. African countries engaged in EPA negotiations have therefore a high stake in these negotiations.

Other negotiations in the WTO may affect the outcome of EPAs for African countries. For example, market access negotiations may result in a further deterioration in the preferential margins that African countries would enjoy under the EPA on the EU's markets. If the EU agrees to deep cuts in its protection under the MFN treatment, then the actual benefit of a free trade agreement with the EU may be substantially reduced for African countries.

One particular point of the future of Cotonou -crucial for some ACP countries- will also be determined by the future negotiations in the WTO: the trade protocols. Those protocols are often criticised by non-ACP developing countries and their future seems to be elimination. What mechanisms will replace them will be a crucial issue for some African countries, such as Botswana (beef) or Mauritius (sugar), and WTO negotiations on agriculture carry a high stake for them for this particular reason.

In addition, in view of the content of other EU agreements with developing countries, some commentators have raised a warning for African countries not to be imposed a "*WTO-plus*" agenda under EPAs. For example, African countries have been vocally opposed to the inclusion of some of the Singapore issues in the Doha Round. They should therefore be cautious not to be imposed excessive commitments on those issues or on intellectual property protection, in the EPA context.

Finally, reduction in tariff protection resulting from free trade agreements mechanically result in a loss in fiscal revenues. This should also be an important concern for many African countries undertaking EPAs with the EU. They will experience a loss of tariff revenues, firstly on tariff imposed on imports from other members of their Regional Economic Community, secondly on tariffs imposed on imports from the EU. This may cause significant problems for those African countries where tariff revenue constitute a large part of the government budget, and for which a lot of imports originates either in the European Union or in neighbouring countries.

Given this background, this study provides an in-depth analytical work, among other things, aimed at informing African member States in RECs and the RECs themselves to ensure maximum benefits from the new cooperating framework. This study is therefore designed to contribute analytical work towards seeking ways for maximising gains for Africa from the EPAs. Moreover, the study hopes to play a crucial role as an indispensable building block for eliciting common negotiating positions of Africa both at sub-regional and regional level as the EPA negotiations pick momentum. While the study aims to contribute to effective participation of African countries in the new ACP-EU framework, it also hopes to play a part in expediting Africa's participation in the EPAs trade negotiations.

Why a Quantitative Assessment of the EPAs Principles is Important

As can be seen from the foregoing, there are many questions that arise. The focus of this study was to quantify the economic and social impacts of the trade liberalization aspects of the proposed EPAs. More precisely, the study will provide a quantitative assessment of the likely implications of the implementation of the EPAs establishing FTAs between EU and the various RECs. The study will aim to provide suggestions to some specific issues, which African negotiators must deal with in the negotiations with their EU counterparts on the form and nature of the respective EPAs within the different RECs. The issues are particularly of concern to policymakers in Africa as they are faced with the challenge of ensuring that the outcomes of the EPAs will be beneficial to the people of Africa, and will have positive returns for any sacrifices that Africa will have to make under the EPAs. It is expected that EPAs results will have to be better than the outcomes of the expired Lomé Convention, which have been argued in the literature to have been sub-optimal.

One challenge that studies such as this have to deal with is the multiplicity of RECs in sub-Sahara Africa (SSA). According to the CPA, it is expected that individual African countries will self-determine under which REC they will wish to negotiate for an EPA with the EU. Initially, this self-determination of membership to the RECs was complicated by two current factors. First, most countries in SSA are members of more than one REC. As a result, there was the initial difficulty of rationalising the RECs definition for the purposes of the EPAs negotiations. Second, under the CPA country nomenclature, some of the African countries are identified, as LDCs while others are non-LDCs. Within the existing RECs, some members are LDCs while others are non-LDCs. In which case, the LDCs may not be under pressure to conclude an EPA by December 2007 since come 1 January 2008, they will still be able to enjoy non-reciprocal preferences for their exports to the EU through the EBA initiative. However EBA does not involve aid, which means they need to weigh the benefits and costs of increased trade possibilities against the loss of aid.

For the purposes of this study, three propositions have been made to justify the empirical analysis. Firstly, it is proposed that it is in the interest of all SSA countries including the LDCs[1] that are guaranteed of EU market access through the EBA to wish to see EPAs concluded in which they are members. The reason behind this proposition is that unlike EBA initiative which focuses on trade aspects mainly, the EPAs are an integrated framework which have development aid component which countries may not wish to lose out on, particularly the elements that deal with addressing the supply-side constraints of the ACP countries. The EBA initiative does not commit to address the supply-side issues[2] that saw the ACP countries being unable to exploit the preferences granted to them under the Lomé Agreement. Thus, there are potentially additional significant developmental gains from the EPAs likely to be inbuilt in the financial and technical cooperation component of the EPAs.

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[1] It is important to note that when free trade of goods and services eventually becomes a reality, the non-LDCs may be at a stronger position than the LDCs that remain simply under EBA, as the non-LDCs will have been forced to restructure more deeply under EPAs. It is reasonable therefore to assume that EPAs may have more positive effects when compared to EBA initiative with respect to encouraging continuous structural adjustments that enable producers to restructure and hence be more competitive in the various economies that form EPAs.

[2] Whether an LDC country chooses EBA over EPA, it will still be faced with supply-side constraints. These will even be more pronounced by the fact that whether under EPA or EBA, preference erosion will be a reality when the Doha Round is concluded. Therefore, in order to resolve the supply-side constraints, adjustment will be required in the respective economies. Such adjustment is likely to be delayed under EBA when compared to the EPAs. The important issue then is to note that long-term competitiveness of economies under EBA may be delayed compared to those under EPA.

The second proposition is that under the EPA negotiations, agreement is likely to be reached on issues that are of interest even to the LDCs. There is scope under the EPAs for agreements in areas such as the EU commodity protocols on bananas, rice and sugar that the LDCs might also be interested in. Other areas include reduction in agricultural export and production subsidies; more liberal rules of origin compared to those under the EBA; and financial support to deal with revenue loses due to trade liberalization.

The third proposition is now a moot point, but it is in respect of RECs rationalization. It was proposed that once both LDCs and non-LDC countries in SSA accepted that there was merit beyond trade in concluding EPAs then geographical proximity was going to provide an acceptable criterion for determining the member country composition of the RECs to negotiate with the EU. This study carries out quantitative analysis of the social and economic impacts of the EPAs at the following regional levels, with each region representing a REC: East and Southern Africa; Southern Africa; Central Africa; and Western Africa.

Scope of Quantitative Inquiry into the EPAs

This sub-section detail the specific questions that the study sought to provide empirical suggestions on. The focus of the empirical analysis is on the trade liberalization component of the EPAs. In particular, the following questions are addressed. First, how are African countries likely to gain or lose as evidenced by the impacts on GDP, employment and other macroeconomic aggregates from a bilateral trade liberalization between Africa and the EU as governed by the EPAs reciprocity principle?

Second, what sectors in Africa are most likely to lose and what sectors gain in the EPA. And based on the empirical evidence on the industry structure likely to result under the EPAs, what can be said regarding the phasing in process of trade liberalization for goods from the EU? Would application of the asymmetry principle in the EPAs provide sufficient lead-time for the nascent manufacturing sectors in African economies? Article XXIV of the WTO under which the EPAs will be negotiated, requires that any FTAs formed liberalise "substantially all trade" (which has been interpreted to mean at least 90 percent of the intra-FTA member countries trade) and this has to be done within a reasonable amount of time (interpreted to imply 10 years or so). This study will seek to provide empirical evidence as to whether the 90 percent intra-regional bloc trade liberalization for African EPAs is a reasonable proposition and whether the 10 years suggested for this to take place is sufficient[3].

Third, what are the welfare implications for the African countries from the EPAs? And what does this portend for the need to have compensatory funds over and above the existing but unutilised European Development Fund (EDF). The welfare implications analysis combined with the potential changes in the economic structure provide the basis for investigating what it means to have preferential elimination of SSA tariffs on imports from the EU on the basis of sensitive sectors. The issue of which sectors are exempted from preferential trade liberalization in the EPAs was seen to be important as it fitted within the infant industry argument that some of the SSA countries would

[3] The Cotonou Partnership Agreement aims at reciprocity in trade policy for the EU and the ACP countries. Hence, the EPAs are expected to aim at the final products being FTAs. However, the European Union recently offered (see EC letter by Pascal Lamy and Franz Fischer dated 9 May 2004) to have the developing countries have the "Doha Round for free" meaning that they will not be expected to implement the agreements on tariff reductions in the on-going multilateral trade negotiations. If this proposal is accepted and forms part of the Doha Round agreement, then the architecture of the EPAs will have to change from what the CPA expects them to be.

like to see develop. By linking the welfare implications to the sectors exempted from the preferential liberalization it was possible to determine which sectors are most likely to lead to pro-development outcomes and which should not be exempted as that would simply be pandering to protectionist interests.

Fourth, how will the formation of EPAs affect trade expansion through trade creation and trade diversion effects[4]? Critics and those sceptical of the EPAs could argue that they have the possibility of causing significant trade diversion. As a result, proposals have even been made for the need to have the SSA countries reduce their applied MFN tariffs concomitantly with their bilateral reduction of tariffs for the EU imports. This study quantifies the trade expansion effects of the reduction of tariffs faced by the EU under the EPA. This analysis provides sort of ex ante counterfactual evidence of what it means for the SSA countries to ensure consistency between the tariff reductions related to the EPAs and those that may be agreed at the conclusion of the Doha round of trade negotiations. The World Bank has suggested that a pro-development outcome of the Doha round would need to achieve average tariffs of five percent for manufacturing, with a maximum of 10 percent and an average of 10 percent for agriculture, with a maximum of 15 percent (World Bank 2003).

Fifth, the fiscal implications of the EPAs are seen to be one of the key negotiation issues. Indeed, the development aid component of the CPA in addition to addressing the supply-side constraints of production in the ACP countries is also predicated on the expected loss of revenue. There are two ways that the loss in revenue has been shown to occur in this study. First is a direct effect due to the zero rating of the imports from the EU. The second effect is through trade diversion effects, which lead to further losses in revenue. Consequently, this study quantifies the direct revenue implications under each of the EPAs for the REC member countries. The quantification of the trade expansion has provided a basis for estimating the revenue effects resulting due to trade diversion from non-EU to EU producers and suppliers.

Empirical Tools for EPAs Analysis

Trade policy analysis such as that required in the evaluation of the potential impacts of EPAs largely involves analysing implications of trade policy instruments on the production structure in economies at the national and global level. Trade policy instruments such as tariffs and quotas have direct and indirect effects on the relative prices of commodities produced in a given country. As the mix of goods and services produced change, the demands for factors of production also change. Consequently, in any given economy, it is difficult to conceive a situation where the change in trade policy would affect only one sector. Due to the forward and backward linkages and their related strengths existing in a particular economy, the result is always one in which the relative mix of sectoral outputs change. This by extension affects the relative mix of the different factors of production in the different sectors.

The country-level effects on output mix and demands for factors of production can in the context of international trade be extended to the global economy. Changes in relative prices of outputs and inputs resulting in a given country's change in trade policy are transmitted to the industries and

[4] Partial equilibrium analysis results looking at the trade creation and diversion effects are contained in a larger version of this study going by the same title (Karingi et al. 2005) and can be downloaded from http://www.uneca.org/trid since they are not discussed in this shortened version. The same goes for revenue implications by country for all the countries in SSA negotiating EPAs.

input markets of other economies that the country trades with. Therefore, for trade policy analysis to be meaningful and for robust results to be produced, the interactions that prevail among different sectors as a result of a change in a given or group of countries trade policy instruments must be taken into account. Since, the EPAs will potentially have these kind of impacts, the general equilibrium methodology presented itself as the most appropriate analytical framework that would allow the inter- and intra-sectoral changes in output mix and by extension the demand for different factors of production to be captured. In this respect, this study utilises the Global Trade Analysis Project (GTAP) model and database to investigate the potential implications of the EPAs on sub-Saharan Africa. But, this model could only allow the assessment of the EPAs at the continental level through a hypothetical SSA-EU EPA due to data limitation with respect to representation of African countries in the GTAP database as stand-alone regions.

Clearly, trade issues by nature require an analytical framework that allows a holistic view of the world economies. This is not only because of the inter-linkages between the various sectors in any given economy but also because of the relationships between sectors in one economy to the rest of the world economies. These national, regional and global linkages may occur either in the inputs or products markets or as are usually the case, in both. Therefore, in order to avoid ignoring these linkages, a general equilibrium methodology such as one using the Global Trade Analysis Project (GTAP) model is one of the analytical instruments be used in this study[5].

Kehoe and Kehoe (1994) capture succinctly the essence of general equilibrium models. General equilibrium models are an abstraction that is complex enough to capture the essential features of the economy, yet simple enough to be tractable. These models are popular over their partial equilibrium counterparts because they stress the interactions among different sectors. However, they are not perfect, especially the static ones. This is because they fail to take account of the dynamic effects that accompany changes taking place in a given economy as a result of policy change. The Global Trade Analysis Project (GTAP) model is in this class of general equilibrium models. GTAP is a multi-region computable general equilibrium (CGE) model designed for comparative-static analysis of trade policy issues (Adams et al. 1997). It can be used to capture effects on output mix, factor usage, trade effects and resultant welfare distribution between countries as a result of changing trade policies at the country, bilateral, regional and multilateral levels. Since the GTAP model puts emphasis on resource reallocation across economic sectors, it is a good instrument for identifying the winning and losing countries and sectors under policy changes involving the trade aspects of the EPAs.

The GTAP model is a multi-country multi-commodity model that requires data for each and every country (see Hertel 1997). However, most African countries, due to their lack of up-to-date input-output tables, are not included in the GTAP database. Given the challenge that this posed for analysis of implications of the EPAs at the level of the individual RECs, the study used the limited data available to look build some scenarios for EU-SSA EPA. This approach allowed the potential general equilibrium effects of the EPAs at the RECs level to be analysed. This is a common approach to resolving the data limitation issue (see Karingi et al. 2002 and ECA forthcoming). Some parallels could be drawn for individual African countries where their economic structure can be distinctively identified. As argued in Karingi et al. (2002) in a study of COMESA's FTA and customs union, an initial look at COMESA member countries may show homogenous agricultural

[5] The GTAP methodology will need to be complemented by partial equilibrium analysis, particularly with regard to revenue implications of the EPAs. Several studies that have looked at this issue of the EPAs to date have tended to employ the partial equilibrium methodology (see Morrissey et al.; Tekere and Ndlela 2003).

economies. However, when the countries are closely examined, three heterogeneous groupings of countries emerge as constituting COMESA.

First group are the purely agricultural economies such as Malawi. Second group comprises of economies with some significant level of manufacturing base such as Zimbabwe. And the third group are those countries rich in mineral resources such as Zambia and Zimbabwe. This meant that, through appropriate disaggregation of sectors (or commodities) in the GTAP database; these three characteristics could be captured in detail.

In using the GTAP model whose database benchmark is 1997, the study faced the challenge of the parallel multilateral negotiations taking place even as the EPAs negotiations proceed. This challenge was however overcome in the GTAP simulations in the same way that ECA (forthcoming) study on agriculture in the Doha Round did. Essentially, the ECA study simulated the changes that have taken or are expected to take place between 1997 and 2005. Thus, a baseline that captured all the Uruguay Round commitments, the reform of the Common Agricultural Policy of the EU Agenda 2000, China's WTO accession, the implementation of the Agreement on Textiles and Clothing expected in 2005, and the EU eastwards enlargement was constructed. This study also starts from a baseline that captures these important changes expected to precede the inauguration of the EPAs.

The revenue implications of the EPAs as already pointed out are major concerns for the African countries as majority of them raise a significant proportion of their ordinary revenues from import duties. This justified the case for the complementary partial equilibrium analysis using trade statistics to shed more light on the EPAs possible implications (results using partial equilibrium modelling are available on request). Tekere and Ndlela (2003) is an example that developed scenarios for SADC using a partial equilibrium methodology to analyse revenue implication for SADC member countries of different levels of opening up of trade to EU-sourced imports into SADC.

A Brief Look at the Theoretical Framework of the GTAP Model

There is abundant literature discussing the underlying theory of the GTAP modelling framework. The theory of the GTAP model is documented in Hertel (1997). Brockmeier (2001) provides a simplified graphical exposition of the model. The GTAP model is essentially a multi-country multi-commodity model. The theory of the GTAP model resembles that underlying the standard multi-regional single country CGE models. The origins of GTAP can indeed be traced to the ORANI model, a regional single country general equilibrium model[6] first developed for the Australian economy (see Dixon et al. 1997). The modelling of each region in GTAP is based on ORANI model. The theory of the ORANI model has been extended to allow international trade to take place between the different countries in the global economy through introduction of a global transport sector and savings institution.

[6] The ORANI model is one of the early general equilibrium models that have come to be known as Computable General Equilibrium (CGE) models. The CGE models have been credited with the operationalization of the abstract Arrow-Debreu general equilibrium model. The ORANI model applied the Johansen procedure that was first applied by the Norwegian economist to find the solution for Norway's first CGE model (Johansen 1960). Since the Johansen solution procedure, other mathematical numerical methods have been integrated to the solution algorithms for general equilibrium modelling to the extent that non-linear models have become part of the wide class of CGE models.

Essentially, the underlying theory of GTAP is captured in two types of equations. The key drivers of the model are the behavioural equations, which are based on microeconomic theory. These equations capture the behaviour of agents in the economy. Accordingly there are behavioural equations for the consumers and also for the international trade (exports and imports). The behavioural equations capture the behaviour of the optimizing agents such as the consumers that allows the derivation of the demand functions. The second type of the equations is the accounting relationships. These are essential in order to ensure that the behavioural equations solution occurs within a consistent macroeconomic framework. Thus, the accounting relationships ensure that the receipts and the expenditures of all the agents (consumers, producers, government, rest-of-the-world) are balanced. Hertel (1997) covers in details the theory behind the model and the derivations of the behavioural equations[7]. For the purposes of this study, these derivations are taken as given and the study simply provides just the broad outline of what the GTAP model is like.

The GTAP model allows international mobility of capital, multiple trading regions, multiple goods and primary factors, empirically based differences in production technology and consumer preferences across regions and explicit recognition of a global transport sector (Siriwardana 2001). In each region there are five types of factors of production. First, the model recognizes two types of labour (skilled and unskilled) and a single, homogenous capital good. Then there is land and other natural resources that also form part of the set of the factors of production. In the typical closure of the model, total supplies of labour and land are fixed for each region, but capital can cross regional borders to equalise changes in rates of return. In other words, there is clear distinction between those factors that are perfectly mobile and those that are sluggish in adjusting. In the case of the mobile factors, they earn the same market return regardless of the use location. As for the sluggish factors, returns in equilibrium may be different across sectors.

In the derivation of factor inputs demands, the model structure uses constant returns to scale technology and nested constant elasticity of substitution (CES) production functions with three levels. Two categories of inputs to production are recognized, the intermediate inputs and the primary factors. The technology is assumed to be weakly separable between the primary and intermediate factors of production. There are two advantages of the separability assumption. First, profit maximising firms are able to select their optimal mix of primary factors independently of the prices of intermediate inputs and vice-versa. Second, it also implies that the elasticity of substitution between primary factors and that between intermediate inputs at the middle nest is equal. In each region, each sector chooses the mix of inputs to minimize total cost for a given level of output. At the highest (top) nest level, intermediate input bundles and primary factor bundles are used in fixed proportions. At the middle nest, intermediate input bundles are formed through combinations of similar imported and domestic intermediate goods. Similarly, primary factors bundles are formed through combinations of labour, capital and land at this middle nest. In both cases the aggregator function has a CES form. At the lowest level, imported bundles are formed through CES combinations of imported goods from each region.

Each region or composite[8] region in GTAP has a single representative household that collects all the regional income. This representative household aggregate income is exhausted through constant

[7] Chapter 2 of what has come to be popularly known as the GTAP Book covers the economic theory of the GTAP model.

[8] A composite region is an aggregation of different countries whose individual disaggregation has not be done in the GTAP database e.g. rest of sub-Sahara Africa is an aggregation of all African countries that are not available in the database as stand-alones.

shares[9] to private household consumption, government expenditures and national savings. The private household buys bundles of commodities to maximise utility subject to its expenditure constraint. The constrained optimizing behaviour of the private household is represented by Constant Difference Elasticity (CDE) demand system. The CDE function is not as general as the commonly used CES and Linear Expenditure System (LES) but is more flexible and easy to calibrate with different price and income elasticities of consumption by region. The consumption bundles are CES combinations of domestic goods and import bundles, with the import bundles being CES aggregations of imports from each region.

Demand equals supply in all markets, which are, considered competitive implying equality between the price received by the producer and the producer's marginal cost. Regional governments intervene in their own markets by imposing taxes and subsidies on commodities and primary factors, thus driving wedges between prices paid by purchasers and prices received by producers. These policy interventions are modelled as ad valorem taxes, tariffs and subsidies, or quantitative restrictions in the case of textile and apparel trade. International trade is linked through Armington substitution among goods differentiated by country of origin. Therefore, in markets for traded commodities, buyers differentiate between domestically produced products and imported products with the same name. Product differentiation between imports by region of origin allows for two-way trade across regions in each tradable product.

Other general features of the model are its explicit recognition of savings by regional economies. These savings are completely exhausted on investments that are savings-driven in the model. In the static form of GTAP, current investment is assumed not to affect the production capacity of the industries, as it is not yet installed. The demand for investments however affects economic activity through its effect on patterns of production in the capital goods producing sector in each region to service investment. The cost-minimising capital creator in each region combines inputs to assemble units of capital, subject to a nested production technology similar to that facing each sector for current production. The only difference is that the capital creator does not use primary factors. The use of primary factors in capital creation is recognized indirectly through inputs of commodities to capital construction. In essence, capital goods are just a Leontief combination of other goods typically. They do not require value added.

Investment in each region is financed from a global pool of savings. Each region contributes a fixed proportion of its income to the savings pool. Two alternative ways can be used to allocate the savings pool. The first way is where each region's share increases by the proportion in which aggregate pool increases. The second way is where the investment allocation is done according to the relative rates of return. Regions, which experience increases in their rate of return relative to the global average, will receive increased shares of the investment budget, whereas regions experiencing reductions in their rate of return relative to the global average will receive reduced shares.

The GTAP framework described above relies on country and regional input-output tables as its database. More specifically, the GTAP database comprises: input-output data for each region,

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[9] As indicated in Brockmeier (2001), according to a Cobb-Douglas per capita utility function, the regional income is distributed over the three forms of final demand: private household expenditures; government expenditures; and savings. But the constancy of this proportionality between the three may sometimes not be maintained because of the endogenous nature of the private expenditure through its non-homothetic function. The price of the private household expenditure ends up depending on the quantities purchased and as a result of this endogeneity of the private household's optimisation problem; the shares in the resultant demand equations cease to be constant.

bilateral trade data derived from United Nations trade statistics; and support and protection data derived from a number of sources. A discussion on the database follows including a description of the characteristics of the African economies already captured in the version of the database used in the study.

The GTAP Data description

The GTAP model is used together with the GTAP database. The database, like the model, captures different individual and composites of countries. In this exposition, Version 5.4 of the database is utilised. For each of the individual or composite region, there are 57 sectors whose data is captured in the overall GTAP database. Not all countries are individually captured in GTAP, however, all the world economies are part of the database as they could be part of a given composite region or included as part of the rest of the world[10]. Thus, global macroeconomic consistency holds. Unfortunately, only a very small proportion of African countries are individually disaggregated in Version 5.4 of the database. Majority of African countries are captured through one or other regional composite. It is useful to describe very briefly what constitutes the GTAP database.

Bilateral trade data is a critical component of the GTAP database. It is this bilateral trade flows that transmit policy and growth shocks between countries. Indeed, trade shares are important in explaining the simulation results. The bilateral trade is also important when it comes to looking at the terms of trade implications. The global bilateral data is sourced from the United Nations COMTRADE data. This is supplemented with individual countries global trade information and trade totals or aggregate bilateral trade statistics such as from the IMF, FAO and World Bank.

Another important sub-component of the GTAP database is the protection data. This data is both explicit and implicit. Explicit in the sense that tariff revenue or export revenue by commodity is available. In addition, anti-dumping data by commodity and region is also obtainable. It is implicit in the sense that the bilateral trade data is available both in market and world prices. The key sources of the protection data vary. In the case of tariffs, the agricultural tariffs are obtained from the Economic Research Service, the EU and the applied or MFN rates. Merchandise tariffs on the other hand are available from the World Integrated Trade Solution project of the World Bank and UNCTAD. The domestic support protection data is obtained from the OECD's producer subsidy equivalent tables and this can be divided into output subsidies, input subsidies, land-based and capital-based payments.

Potential Economic and Welfare Impacts of EPAs on African Economies: General Equilibrium Results

In this section, the general equilibrium analysis results are discussed. The general equilibrium analysis was undertaken using Version 5.4 of the GTAP database. The motivation for the analysis is what implications EPAs are likely to have on African economies. The aggregation scheme for the analysis comprises of seven regions: North America (NAM); Japan; Sub-Saharan Africa (SSA); China; Rest of the World (ROW); EU-15; and EU-10 (CEEC). There are 16 sectors in each of these regions.

[10] The simulations conducted in this study use version 5.4 of the GTAP database, which is not very different from Version 5 apart from the level of disaggregation, and a few improvements. However, Version 6 of GTAP database that is yet to be made available does away with the aggregation rest of the world that is then replaced with composite aggregates for different geographical regions.

Three scenarios were investigated, each addressing a possible option that the EPAs negotiations are likely to be faced with. It needs to be noted that the results, as presented here, are more indicative of the directions of change on the economic variables. While the magnitudes are also important, it is important to qualify at this early stage that the robustness of the changes indicated have not been analysed in any statistical way. Nevertheless, the results do broadly indicate the direction of change and what policymakers could expect from their decisions on the African countries' position in the EPAs negotiations. The discussion of the general equilibrium results starts by presenting how a new baseline was developed upon which the changes resulting from the various scenarios were evaluated.

Generating the baseline scenario for EPAs

The Cotonou Partnership Agreement specifies January 1, 2008 as the date by which the EPAs should take effect. Before that date, various international agreements will have been implemented with important implications on the global economic landscape. It is therefore important that these changes be captured in the baseline upon which implication of the trade aspects of the EPAs are to be assessed. The main events that will precede the launch of the EPAs and hence likely to affect how they impact on the economies and welfare of sub-Sahara Africa include the following: the enlargement of the European Union; the implementation of the Agreement on Textiles and Clothing as part of the MFA phase out; the implementation of the Uruguay Round Agreement on domestic support and export subsidies; the full accession of China into the WTO; and the conclusion of the Doha Development Round. The Doha Round outcome is currently not clear how it will likely impact on the EPAs. Therefore, it has not been built into the baseline of the EPAs as yet. As for the other four main issues, the following discussions explains how they were incorporated into the baseline:

Enlargement of the EU: An enlarged EU will ultimately be the trading bloc that the African countries will have to face by the time the EPAs come into effect. A harmonized and integrated trade policy is expected to be in place by the time the EPAs come into force. In order to capture this integration, the following trade policy changes are reflected in the baseline. First, all tariffs and export subsidies as well as non-tariff barriers between the EU-15 and the new ten members are abolished. Second, trade barriers among the 10 new EU members have also been eliminated. Finally, all sectors in the EU-10 are given the same level of protection against the rest of the world as found in the EU-15 at the time of the accession. This means that some of the tariff rates that the new EU members charge third countries have been increased or reduced to the existing levels of the old EU members. The relevant percent changes effected on the prevailing tariffs are shown on Table 1.

Elimination of MFA quotas (implementation of the Agreement on Textiles and Clothing): It is expected that the phasing out of the multifibre agreement on textiles and clothing will have significant implications for developing countries. It was therefore important to capture the likely effects of the removal of the MFA into the baseline. The elimination of the MFA was captured through elimination of the export tax equivalents of the textile and clothing quotas in the developed countries markets in particular.

Uruguay Round Agreement implementation: The European Union has traditionally used domestic support and export subsidies especially in agriculture. While the Doha Round negotiations are expected to have an agreement that will have dramatic impacts on how these two instruments are applied, there are still outstanding issues from the Uruguay Round. The EPAs baseline captures the 20 percent reductions for developed countries domestic support. A rate of 13 percent was applied for the developing countries. In the case of the agricultural export subsidies, the baseline

implements the 36 percent and 24 percent reductions agreed at the Uruguay Round for developed and developing countries respectively.

Table 1: Required change (%) on prevailing CEEC tariffs for a harmonized enlarged EU CET

	NAM	Japan	SSA	China	ROW
Cereals	169.79	251.25	22.35	128.93	181.44
Vegetables	-16.18	-9.38	20.83	-22.46	-29.61
Oilseeds	-100.00	-100.00	-100.00	-100.00	-100.00
Sugar	1521.94	1576.00	1521.94	1511.54	1598.65
Cotton	-100.00	-100.00	-100.00	-100.00	-100.00
Other Crops	-77.04	-69.00	-71.82	-80.00	-70.75
Livestock	7.33	23.23	24.07	18.83	50.00
Animal products	-75.74	-70.67	-63.79	-78.69	-69.29
Fishing	83.67	1.4*	700.00	52.17	-12.20
Other Natural resources	-86.96	-95.24	-100.00	-86.21	-33.33
Agro-processing	-24.92	43.06	-8.80	-6.73	16.27
Textiles	-22.33	-8.14	159.52	-25.78	-2.15
Clothing	16.67	31.46	112.28	-42.49	-29.41
Low tech industries	-57.63	-35.21	-61.19	-44.06	-33.33
Medium tech industries	-47.95	-38.67	16.67	-36.90	-53.06
Heavy industries	-60.98	-49.51	-66.67	-54.37	-69.47

Source: GTAP 5.4 and authors' computations; * Tariff rate of 1.4% on fish imports from Japan

China accession to the WTO: The full accession of China to the WTO is expected to have important implications for both developed and developing countries. At full accession, all WTO members will be expected to impose import tariffs on Chinese goods on an MFN basis. This was captured in the baseline by reducing tariffs on Chinese imports above the highest rate currently charged by importing country on each commodity[11].

After the construction of the new baseline, three scenarios were designed to assess the possible implications of the EPAs on African economies. As already observed, the scenarios are based on a hypothetical SSA-EU EPA that is motivated by the objective of an African Economic Community. The Cotonou Partnership Agreement presented an opportunity that could advance the African economic integration if the EPAs were to be negotiated on a continental rather than the RECs basis. But given that the negotiations are taking place at regional level, and since not many African

[11] The following sectors were found to be the most important with regards to China's accession to the WTO on the basis of the tariff rates currently applied on Chinese goods: animal products, clothing, low and medium technology industrial goods in the case of sub-Saharan Africa; cereals and low technology goods into ROW; cereals, other natural resources and medium technology goods into North America; other natural resources, low and medium technology goods into Japan; and low and medium technology goods into the enlarged European Union.

countries are individually disaggregated in the GTAP database, the optimal way to look at implications on the economies of the African countries is through the SSA-EU EPA. It is only in the case of SADC where a more detailed country level analysis can be undertaken. The scenarios that are described below are for a typical African country, based on the SSA composite region derived from the GTAP database.

Scenarios for the EU-SSA Economic Partnership Agreements

With the baseline in place, three scenarios were designed to help unravel some of the impacts that the EPAs are likely to have on the sub-Saharan Africa economies. The first scenario looked at full reciprocity by the SSA countries to the EU preferences without addressing the sensitivities that currently exist on the part of the EU for some of the sectors. Essentially, the tariffs faced by the EU in Africa were equated to the low tariffs that SSA products face in the EU market. In the second scenario, a benevolent stance of the EU was assumed that would accept EPAs that front-load in the first phase dismantlement of tariffs and other barriers within the SSA region in line with the principle of deepening regional integration in Africa as captured in the Cotonou Partnership Agreement. This scenario was further motivated by the desire to increase the market size within the SSA region that would support the development of competitive industries driven by economies of scale. The third scenario considered the ultimate goal of the EPAs, the establishment of free trade area between the EU and the SSA region. Essentially, full trade liberalization is undertaken between the EU and SSA and the sensitive markets in the EU are opened up for the SSA producers and exporters and vice-versa.

Scenario 1 – SSA reciprocation of EU preferential tariffs: One of the key principles of the EPAs is reciprocity. This scenario assesses the EPAs implications in the case of SSA reciprocating on the favourable tariffs it is currently receiving from the EU. The scenario addresses the question of whether full reciprocity is feasible under the EPAs. The Lomé Conventions provided for duty free access for 95 percent of the tariff lines of the ACP member countries. But as can be seen from the Table 2 below based on the GTAP Version 5.4 protection data, the EU is still shown to levy duties on SSA goods albeit at generally lower rates compared to what the SSA countries impose on EU goods. The indicated protection rates by the EU on SSA goods could be explained in three ways. Firstly, the UNCTAD TRAINS tariff data might not reflect fully the preferential rates accorded to African countries. Secondly, due to aggregation from the original thousands of tariff lines in TRAINS to the GTAP level of aggregation, it is possible that the five percent of tariff lines excluded from the Lomé Conventions (besides possibly being of more interest to Africa) find themselves in the 16 sectors used in this analysis as shown in Table 2. And thirdly, the inclusion of the additional ten new EU members may have contributed to the non-zero tariffs observed for SSA.

Table 2: Percent change on SSA tariffs for reciprocity purposes.

	EU tariffs rates on SSA	SSA tariffs rates on EU	SSA reciprocation (% change)
Cereals	41.6	10.5	296.2
Vegetables	14.5	17.1	-15.2
Oilseeds	0.0	9.6	-100.0
Sugar	251.4	1.5	16660.0
Cotton	0.0	3.6	-100.0
Other crops	3.1	16.1	-80.7

Livestock	36.6	11.7	212.8
Animal products	6.3	9.9	-36.4
Fishing	12.0	9.3	29.0
Energy	0.0	9.5	-100.0
Other natural resources	0.0	13.1	-100.0
Agro-processed goods	39.4	23.9	64.9
Textiles	10.9	16.4	-33.5
Clothing	12.1	29.6	-59.1
Low tech industries	2.6	23.5	-88.9
Medium tech industries	2.1	15.4	-86.4
Heavy industries	1.4	15.8	-91.1

Source: GTAP V.5.4 and authors' simulation baseline

Therefore, in order to capture the reciprocal principle[12] without necessarily thinking of an FTA, all the tariffs by SSA that are above those levied by EU on SSA sourced imports are reduced to the EU level. In other words, a key assumption in this simulation is that the EPAs are aim to establish partnerships that are compatible with the WTO but not necessarily to create a free trade area between EU and African countries, which would in itself require full trade liberalization[13]. For the sectors cereals, sugar, livestock, fishing, and agro-processing, whose tariffs are lower in SSA that in the EU, no change is effected in this scenario. The main justification for this treatment is that, in the case of agro-processing sector, there are the beef and sugar protocols that are part of the aggregated. Another reason is that these sectors reflect problem of tariff peaks and escalation. The commodity protocols, tariff peaks and escalations, non-tariff barriers questions while being part of the EPAs negotiations are not part of the full reciprocity simulation. From Table 2, reciprocation will be an issue mainly in sectors such as textiles and clothing; industrial sectors; and most primary producing sectors.

Scenario 2 – Deeper regional integration without reciprocity: The Cotonou Partnership Agreement also hopes to achieve deeper integration in participating ACP states. One might therefore ask would deeper integration within sub-Saharan Africa be acceptable to a benevolent EU as a substitute for immediate full reciprocity by SSA countries? In this scenario, the principle of deeper regional integration within Africa is investigated further. Essentially, the rationale behind this second scenario is that one reason why most African countries have not been able to exploit the preferences under Lomé Agreement is the lack of supply capacity. Thus, these countries would require sufficient time for them to build this capacity. Since the EPAs must eventually be WTO compliant, this scenario presents an option where the SSA countries liberalise trade among themselves without immediate reciprocation on the preferences granted by the EU on the understanding that the EU is in a position to agree to EPAs that provide enough time to the African

[12] Due to failure for GTAP version 5.4 database to fully reflect preferences African countries enjoy in the EU market, results from this simulation may be understated in the sense that the rate of reduction is not as would be the case had tariffs faced by SSA countries been zero.

[13] The free trade area between the EU and SSA is presented as an alternative scenario in case the negotiations eventually aim for an FTA rather than what is currently perceived as the objective to establish partnerships that are not necessarily FTAs.

countries to build their capacities so that they can eventually be able to compete with the EU producers and exporters. The time before the reciprocation by the SSA countries will begin is not captured in this scenario due to the static nature of the model, but the point is that deeper regional integration[14] within SSA will enable the producers and exporters in the region to build capacities as they compete among themselves before facing the EU producers and exporters when the reciprocity principle kicks in. This scenario is also premised on the desire to increase the market size that African producers and exporters face within the continent. Due to small domestic markets, African industries might not be able to exploit the economies of scale that could afford possibilities for the building of competitive industries.

Scenario 3 – EU-SSA Free Trade Area: Scenarios 1 and 2 considered the option of establishing a partnership between the EU and SSA that is not necessarily a free trade area. Thus, in scenario 1, the assumption is that in order for the partnership to be WTO compliant, the SSA countries must reciprocate on the preferential treatment that they are currently receiving from the EU. The EU takes no action on the commodity protocols and other non-tariff barriers and does not deal with market access issues related to tariff peaks and escalation. The second scenario's objective was to provide room for capacity building within the SSA regions before they can reciprocate on the preferences that the EU has been according the region's exports. In this third scenario, the option for a EU-SSA FTA is explored. Should the EPAs aim for just partnerships that do not address issues such as the commodity protocols, non-tariff barriers, tariff peaks and escalations fully or should they aim for WTO compliance that is based on free trade between the two sub-regions? In this scenario therefore, all the trade barriers between the SSA and EU in both directions are eliminated.

Results from EU-SSA EPA Scenarios

Macroeconomic, trade and welfare: aggregate effects

The income and trade effects of the three scenarios are shown in Table 3. The results for SSA are also presented in Figure 1 for comparison purposes of the three scenarios. The results indicate the aggregate impacts full reciprocity and deeper regional integration principles of the EPAs are likely to have. It is clear based on the implication on the volume of GDP that other than the EU, all other regions stand to lose from full reciprocity. SSA's income marginally declines. The effect of SSA's reciprocation is more pronounced in the effects on trade and welfare as measured through equivalent variation. SSA's imports grow faster than its exports and combined with the deterioration in the terms of trade, its balance of trade worsens by US$1,868 million. This can be seen to represent a major adjustment cost for the SSA. In deed, in spite of the marginal deterioration in the terms of trade for other regions, it is only SSA that suffers from a poorer balance of trade position under full reciprocity. The poor GDP performance, worsening trade balance, and deteriorating terms of trade result in loss of welfare for SSA region from EPAs' reciprocal principle. Full reciprocity, at least in the short-run stands to lead to losses both in terms economic and welfare outcomes for SSA.

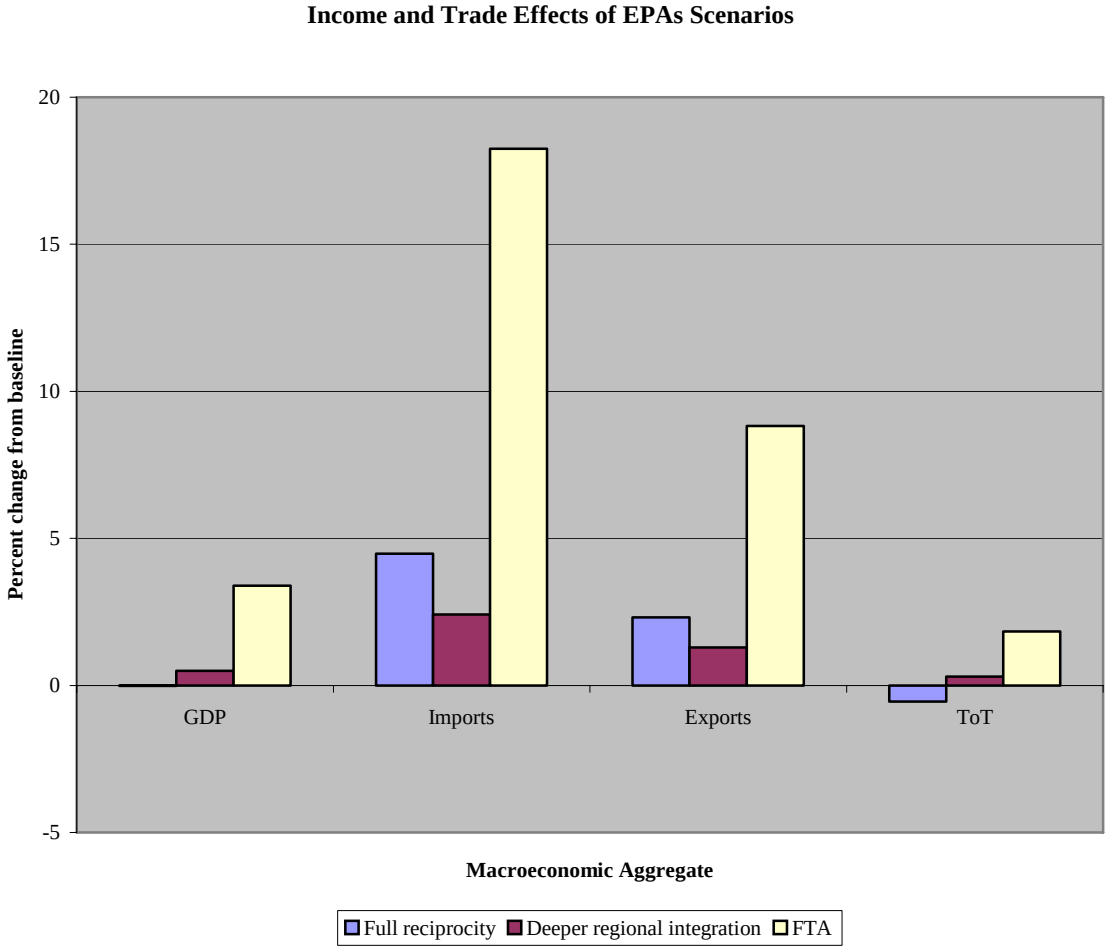
[14] Ideally, due to the mix of LDCs and non-LDCs among the SSA countries, an asymmetrical intra-Africa trade liberalization would be more realistic. However, due to the data aggregation and the limited number of individual SSA countries disaggregation in the GTAP database, we were unable to capture this asymmetry arrangement where all the least-developed SSA countries would have full market access in the non-least developed SSA countries. The latter would face some level of protection in the least-developed SSA countries.

Table 3: Income, trade and welfare effects of EPAs

	GDP (%)	Imports (%)	Exports (%)	ToT (%)	BoT (US$ mln)	EV (US$ mln)
Scenario 1: Full reciprocity						
EU15	0.0044	0.1095	0.05	0.0565	52.7352	1748.8019
CEEC	0.0019	-0.01	0.0211	-0.0058	23.4368	-2.5357
NAM	-0.0001	-0.0317	0.0207	-0.0103	529.9121	-83.1632
Japan	-0.0005	-0.0574	0.0493	-0.0214	366.1649	-45.8012
SSA	-0.0129	4.4775	2.3152	-0.5477	-1868.361	-563.9485
China	-0.0018	-0.0671	-0.0115	-0.0282	45.5154	-57.3101
ROW	-0.003	-0.0864	-0.0032	-0.0406	850.6011	-921.4965
Scenario 2: Deeper intra-Africa integration						
EU15	-0.0004	-0.0082	0.0045	-0.0048	191.6676	-150.4622
CEEC	-0.0005	-0.0043	0.0049	-0.0018	11.8501	-5.3033
NAM	0	-0.0078	0.0092	-0.0042	150.7274	-58.1692
Japan	-0.0001	-0.0106	0.0186	-0.0083	98.9025	-45.1652
SSA	0.4916	2.4112	1.2906	0.2996	-629.7655	1204.2651
China	-0.0002	-0.0113	0.0016	-0.0056	15.5255	-16.4879
ROW	-0.0002	-0.0045	0.0014	0.0024	161.0926	27.1114
Scenario 3: EU-SSA Free Trade Area						
EU15	0.0079	0.2245	0.2331	0.0194	934.9118	1116.3458
CEEC	0.0030	-0.0696	0.1245	-0.0829	169.0720	-131.7854
NAM	-0.0003	-0.0780	0.0751	-0.0349	1437.1685	-438.9070
Japan	-0.0013	-0.1163	0.1579	-0.0693	928.5612	-313.1068
SSA	3.3890	18.2476	8.8278	1.8336	-5484.2998	8028.7661
China	-0.0032	-0.1236	0.0051	-0.0557	144.5395	-144.1505
ROW	-0.0040	-0.1205	0.0072	-0.0327	1870.0596	-883.5765

Trade barriers among African countries evidently limit the realisation of the economic and welfare gains of intra-African trade (scenario 2). The elimination of the tariff barriers and the tariff equivalent of non-tariff barriers have the potential of raising incomes and welfare in the SSA region. As the Figures 1 and 2 indicate, a scenario where the SSA countries liberalise trade among themselves in an EPA without immediate reciprocity, results in gains both in terms of economic expansion and improved welfare. While the change in balance of trade still indicates deterioration, there are positive gains in all the other economic indicators in the SSA region. A comparison of the outcomes from full reciprocity and deeper regional integration strongly indicate that an EPA that expects immediate or full reciprocity would be disadvantageous to SSA countries. Without full reciprocity but deepened regional integration, SSA countries would experience positive GDP growths from the EPAs. The terms of trade, which under full reciprocity register deterioration, improve in a deepened regional integration scenario.

Figure 1: Income and trade effects on Sub-Saharan Africa

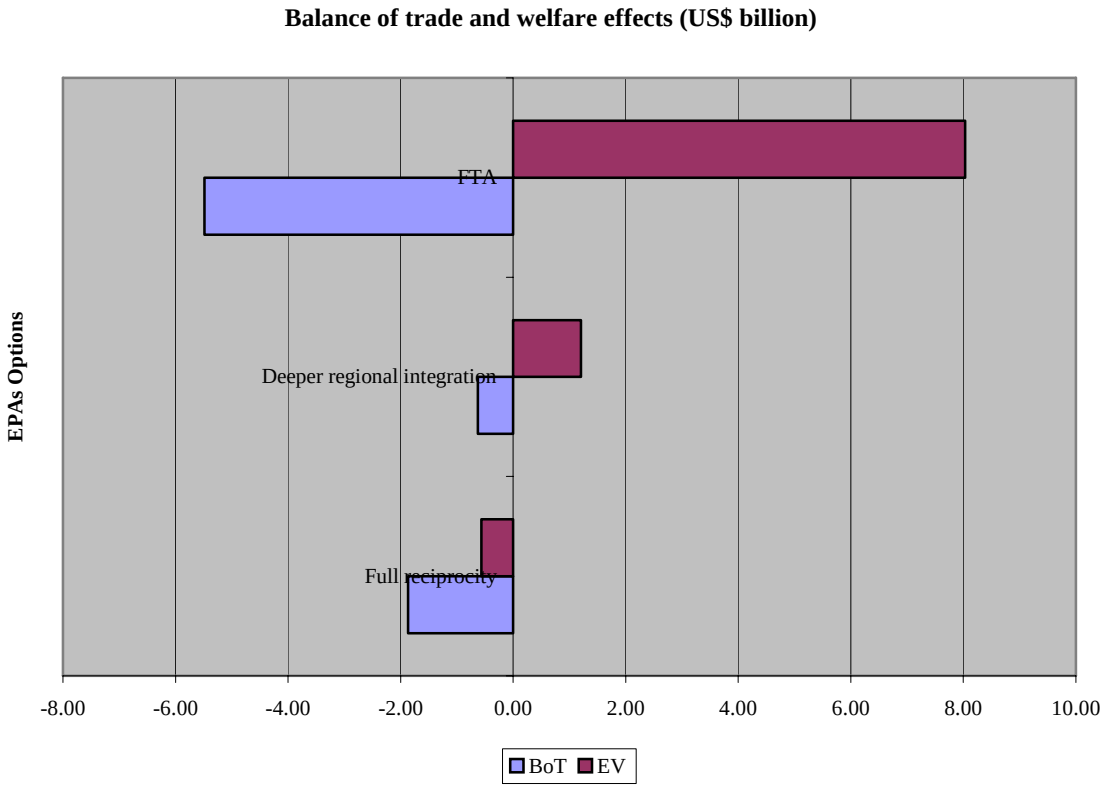


A very telling result from the three scenarios is that the SSA region would reap the largest gains from EPAs that take the form of FTAs rather than partnerships that do not address all the trade barriers with EU. The SSA's GDP would expand by an additional 3.4 percent above the base in an FTA agreement. The terms of trade for the region in the FTA would also be most favourable. This

result suggests that unless the EPAs are aim to include even what are perceived to be sensitive sectors in the EU, the African economies are unlikely to benefit. An ambitious liberalization of the EU with unrestricted market access comes out clearly as the best way that the EPAs can hope to lock in benefits for SSA countries. Hence, unrestricted market access into the EU market even with reciprocation by the SSA countries can derive benefits to the latter. These results suggests that the exports that are of interest to African countries are more likely to be best handled in an unrestricted market situation even with reciprocity rather than having sensitive sectors in the eyes of the EU being included in the EPAs agreements. It is important to look the results of the unrestricted market access also in the context of scenario 2. Deeper regional integration without reciprocation has benefits for Africa. Locking in these benefits by allowing a lead time for African countries and then pursuing the unrestricted market access option suggest the most beneficial sequencing for the African countries for them to maximise gains from the EPAs.

Whereas welfare gains and the balance of trade outcomes are more positive in an integrated SSA region that does not have to immediately reciprocate on the EU preferences over an EPA that simply has full reciprocity, it is an FTA that provides the highest gains of over US$8 billion to the region. This gain will however come at a major macroeconomic adjustment cost in terms of the balance of trade.

Figure 2: Impacts of EPAs on SSA balance of trade and welfare



Industry structure in SSA: EPAs options

Majority of sub-Saharan African countries have stated industrial policies that endeavour to achieve more industrialisation and diversification in their economies. In deed, explanations that are given for the dismal performance of SSA in global trade are lack of supply capacities and exports diversification. As a result, the impact of EPAs on the industrial structure of these countries is

important. Table 4 indicates the likely impacts of the three EPAs options on industries in SSA. Deeper regional integration in SSA could potentially provide the space for diversification in production and exports to take place. Unlike in the case of full reciprocity scenario where SSA region will specialise in production of primary commodities, deeper regional integration allows the emergence of high value-added non-primary commodity producing sections. The region has the potential to develop production capacities in sectors that require low- and medium-technologies and even in heavy industries. But it is in textiles and clothing, sectors likely to provide solid foundation for industrialisation and diversification that will benefit most from deepened trade in the region. These sectors will see their outputs expand by 1.2 and 2.7 percent compared to contractions if the region was to fully reciprocate to the EU lower tariffs. Another important result is the positive result for some primary producing sectors that could otherwise decline under full reciprocity. These include sectors such as vegetables, oilseeds, livestock and animal products.

Table 4: Industry outputs in Sub-Saharan Africa (percent change in output from the base)

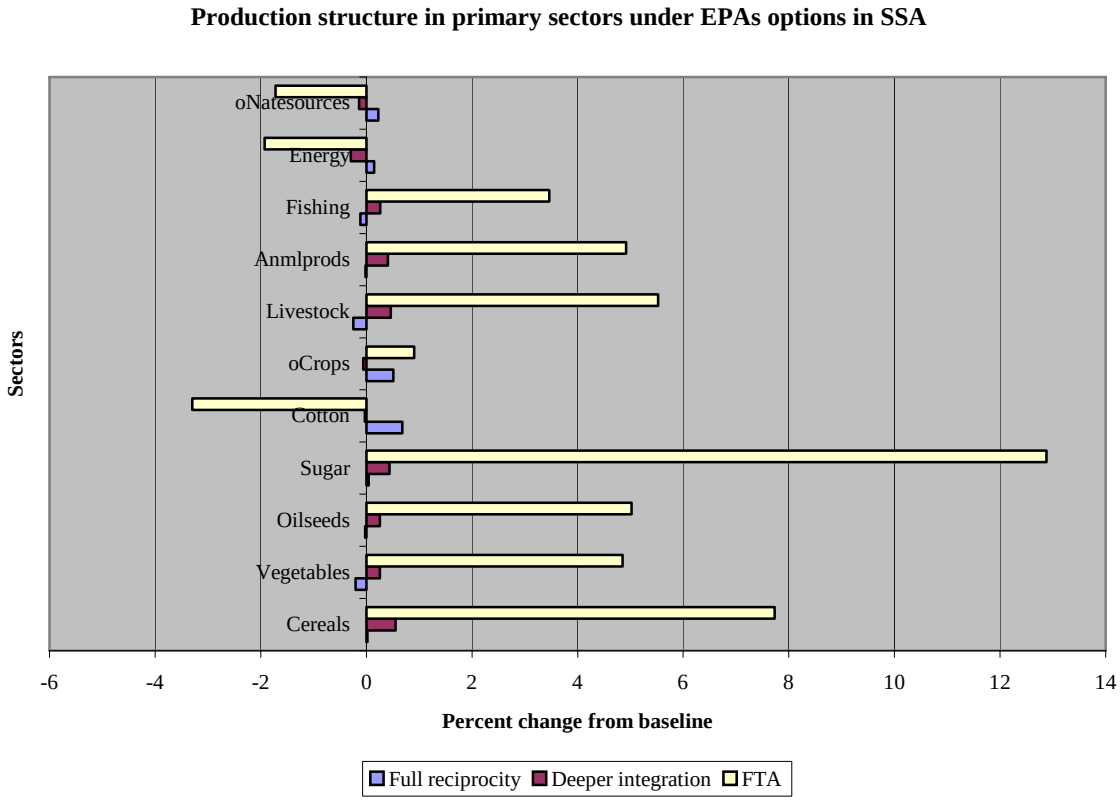
	Full reciprocity	Deeper integration	Free trade area
Cereals	0.0213	0.5554	7.7333
Vegetables	-0.2063	0.2536	4.8533
Oilseeds	-0.0199	0.2588	5.0238
Sugar	0.0423	0.4369	12.8798
Cotton	0.6788	-0.0293	-3.2957
Other Crops	0.5084	-0.0616	0.9048
Livestock	-0.2478	0.4614	5.5269
Animal prods	-0.0189	0.4063	4.9162
Fishing	-0.1151	0.2612	3.4621
Energy	0.1458	-0.2934	-1.9289
Other Natural resources	0.2248	-0.1383	-1.7175
Agro-processing	0.0885	0.4376	12.482
Textiles	-0.6989	1.3384	2.3047
Clothing	-2.6639	2.7493	9.1321
Low tech industries	-4.8511	1.2875	-5.0218
Medium tech industries	-3.0865	1.0426	-2.9961
Heavy industries	-3.2136	1.2986	-10.7966

A comparison between the three options is also shown in Figures 3 and 4 for the primary and manufacturing sectors in SSA. Considering first the primary sectors, the full reciprocity scenario is unfavourable for SSA even in these sectors. But in the cases of deeper intra-SSA integration and the FTA, sectors concerned with primary commodities production other those of extraction in nature expand.

Clearly, majority of SSA industries will witness a reduction in their output under full reciprocity. This contraction will be more serious in those sectors that are perceived to be the foundations for industrialisation, viz. low-tech and mid-tech industries; heavy industry; clothing; and textiles. Other than cotton, other crops, energy, natural resources and agro-processing industries where there are marginal expansions, SSA industrial sectors stand to contract significantly. Thus, de-industrialisation is likely to be a major outcome if the EPAs reciprocity principle is implemented

through full reciprocation. The only industrial sector that is likely to survive under such EPAs is agro-processing and this is because no tariff change was effected for this sector under this scenario as earlier noted. The outcome on the industrial structure from full reciprocity is replicated somehow but on larger magnitudes in the FTA option. De-industrialisation is a clear possibility even for the low-tech industrial sector. Nonetheless, under an FTA, the SSA region's agro-processing, textiles and clothing sectors expand substantially.

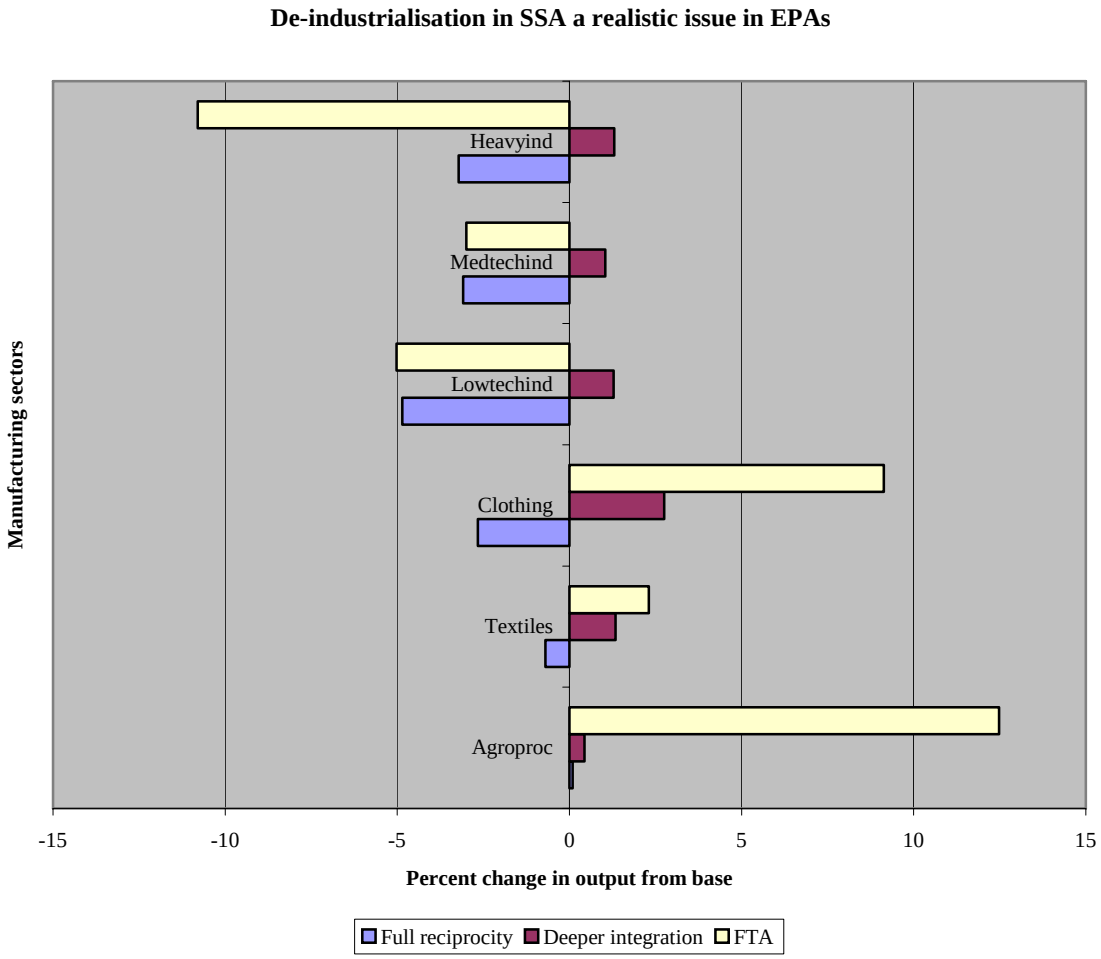
Figure 3: Impacts on primary sectors in SSA as a result of the EPAs



SSA countries have potential to develop an industrial base as Figure 4 indicates. But it needs to be reiterated that this outcome needs to be put in the context of the other two scenarios. If there is fully reciprocity without the exports of interest to SSA countries being considered in the liberalization, then Africa will stand to lose its existing industries. On the other hand, the capacity for the current industries in SSA to withstand competition can be strengthened through enlarged African markets if the intra-African trade barriers were to be eliminated. Therefore, the industrial base that appears possible under the FTA scenario with the EU is realisable if the sequencing of the implementations of the EPA was such that the SSA countries have room to build competitiveness, broaden supply

capacities and diversify their industries. The implications on the industrial structure of SSA countries then suggest that the best way to configure the EPAs is by first undertaking deep integration within the African market and thereafter have unrestricted market access to the EU market with reciprocity.

Figure 4: Implications of EPAs options on SSA countries industrial structure



Demand for and returns to factors of productions

The three EPAs options would have varying levels of adjustment costs in terms of endowments utilisation. In SSA region, this adjustment would especially be of interest in the case of employment demand and the returns to labour. The adjustments likely to take place in terms of demand for unskilled labour in selected sectors, under a full reciprocity scenario is indicated in Figure 5. The demand for unskilled labour in the sectors where there is more value adding, that is, in the manufacturing industries contracts sharply. But, there is likely to be increased demand in the use of unskilled workers in sectors such as cotton, other crops, energy, natural resources and agro-processing. The contractions out of textiles and clothing and other industrial sectors could prove to be too costly, as returns to labour tend to be higher in these sectors than in the primary sectors.

Figure 5: Demand for unskilled labour in SSA (volume terms) in a full reciprocity scenario

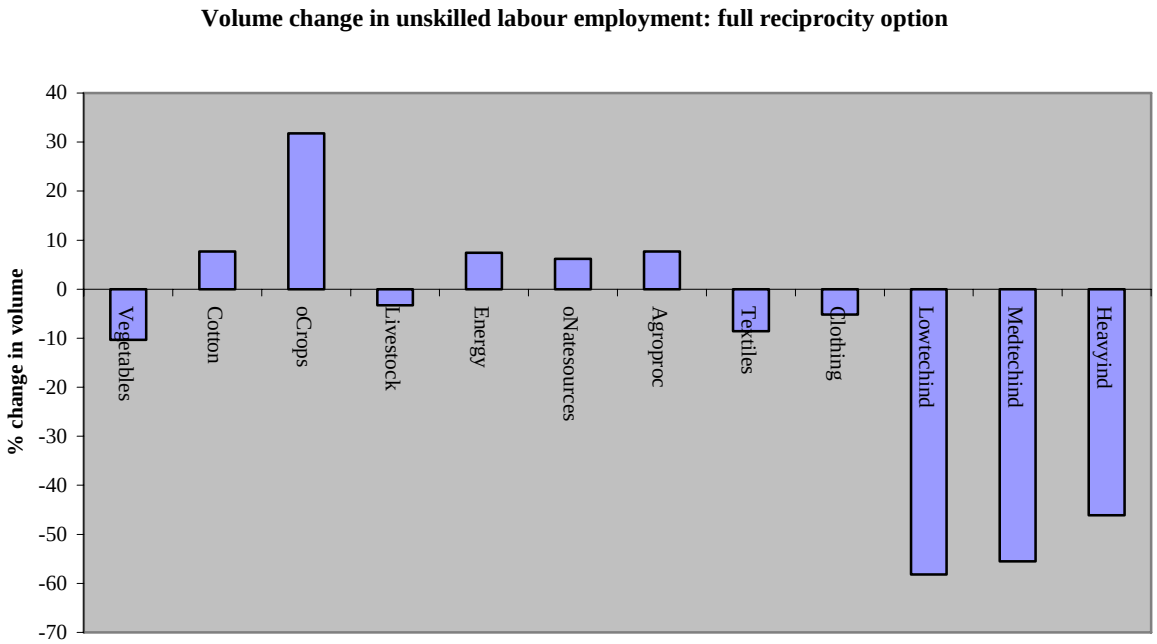


Table 5: Demand for endowment factors in primary and manufacturing sectors in SSA under a EU-SSA FTA (percent deviation from baseline)

	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Cereals	2.3449	9.0177	7.2315	7.0138	0.0368
Vegetables	0.0548	6.0083	4.2714	4.0597	0.0251
Oilseeds	0.2072	6.2081	4.4679	4.2558	0.0259
Sugar	6.4283	14.4232	12.5484	12.3198	0.0572
Cotton	-6.436	-2.4318	-4.0304	-4.2253	-0.0098
Other Crops	-3.0492	1.9554	0.2849	0.0813	0.0087
Livestock	0.6094	6.7356	4.9868	4.7736	0.0279
Animal products	0.1196	6.0933	4.355	4.1431	0.0254
Fishing	1.9935	7.5047	6.016	5.8343	0.0366
Energy	-5.4413	-1.8293	-3.1887	-3.3547	-0.0086
Other natural resources	-4.6468	-0.8387	-2.2118	-2.3794	-0.0036
Agro-processing	-4.2477	19.79	10.7919	9.7325	0.0167
Textiles	-9.7968	7.6427	-1.41	-2.4699	0.0064
Clothing	-6.9228	15.5495	5.8319	4.6941	0.012
Low tech industries	-12.7499	-0.1578	-8.5545	-9.5376	0.0004
Med tech industries	-11.2978	3.6367	-5.079	-6.0995	0.0034
Heavy industries	-14.7534	-5.2645	-13.2317	-14.1646	-0.0037

The demand for the different factors in the FTA scenario is also shown in Table 5. Demand for most of the factors of production grows in the primary sectors except for cotton sub-sector. The increased demand is consistent with the expansion of these sectors as the region specialises more on primary raw-materials production. The manufacturing sectors in the FTA have mixed results for labour and capital demand. Demand for these factors in the low-tech industries contracts across board. A similar result occurs in the heavy industry sector. The agro-processing and clothing sectors would generally benefit in terms of increased labour and capital demand under the FTA. It is useful however to note that the more important results relate to the returns that these factors have in each of the EPAs options. The returns to the factors of production in the SSA region comparing the scenarios for deeper regional integration without immediate reciprocity and the FTA are summarised in Table 6 below.

Table 6: Real returns to factors of production in SSA (percent deviation from base)

	Deeper integration	FTA
Land	1.3223	25.0395
Unskilled labour	-0.3219	-1.9728
Skilled labour	0.7898	5.1056
Capital	0.8745	6.0111
Natural Resources	-0.9176	-2.509

Integration in SSA, under the deepened intra-African integration, in addition to facilitating diversification in the industrial structure also results in positive returns to some of the crucial factors of production. Real returns to land, skilled labour and capital are positive, a result that is crucial in contributing to the region's development. Similar outcomes but on a higher scale are also likely to be achieved in the case of a EU-SSA FTA form of EPA. However, due to its abundance and hence the rate of change in the money wage for unskilled labour in SSA, its real returns fall. Unlike the other factors of production whose supply is assumed fixed, unskilled labour is abundant in the SSA region and the fall in the real returns indicates that the nominal wage does not increase as fast as a result of this abundance. The returns to the factors of production and also the overall economic performance of the SSA region have implications for the regions welfare. This was evident at the aggregate level, where the SSA region was shown would lose in welfare terms from full reciprocity but gain from both the deepened integration and FTA scenario, with the latter according up to US$8 billion. The next sub-section decomposes the determinants of the welfare change under each of these scenarios, in order to highlight the potential implications each of the scenarios has in terms of policy.

Sources of welfare changes under EPAs options: decomposition

At the aggregate level, full-reciprocity on the EPAs indicated that apart from the European Union, all the other regions would experience welfare losses. Sub-Saharan Africa is likely to suffer a welfare loss of US$564 million. The Table 7 shows the determinants of this welfare loss. The worsening terms-of-trade that the SSA region will face explain more than half of the deterioration in the welfare. In other words, the inability of the exports to pay for the imports increase following the reciprocity will result in the African countries being worse-off in an EPA with full reciprocity. Moreover, the region will also experience a welfare loss emanating from deterioration in the investment-savings balance. The only positive determinant of the welfare, though heavily out-

weighed by the negatives, is the US$45.7 million resulting from the endowment changes[15]. This is attributable to net increase in demand for the unskilled labour.

Table 7: Sources of welfare changes by region (US$ million)

		Efficiency	Endowment Changes	Terms of Trade	Investment Savings balance	Total
	Reciprocity	347.4	0	1412.8	-11.5	1748.8
EU15	Integration	-34	0	-116.9	0.4	-150.5
	FTA	628.9	0	503.9	-16.4	1116.3
	Reciprocity	5.4	0	-22.9	14.9	-2.5
CEEC	Integration	-1.4	0	-2.1	-1.8	-5.3
	FTA	8.8	0	-124.9	-15.7	-131.8
	Reciprocity	-12	0	-91.3	20.2	-83.2
NAM	Integration	-0.6	0	-46.4	-11.2	-58.2
	FTA	-24.9	0	-360.5	-53.5	-438.9
	Reciprocity	-19.2	0	-125.8	99.2	-45.8
Japan	Integration	-6.3	0	-41	2.1	-45.2
	FTA	-55.5	0	-364.7	107.1	-313.1
	Reciprocity	-71.6	45.7	-323	-215.1	-563.9
SSA	Integration	168.6	844.7	174.4	16.7	1204.3
	FTA	878.2	6112	1104.3	-65.8	8028.8
	Reciprocity	-16.1	0	-77.3	36.1	-57.3
China	Integration	-2	0	-14.4	-0.1	-16.5
	FTA	-28.5	0	-149.2	33.5	-144.2
	Reciprocity	-201.7	0	-775	55.2	-921.5
ROW	Integration	-12.8	0	46.1	-6.2	27.1
	FTA	-274.6	0	-620.1	11.1	-883.6

The intra-SSA trade barriers as they exist today impose a substantial cost to the region. Their elimination, in an EPA whose objectives is to create competitiveness through deepened regional integration would lead to the region reaping US$1,204 million in welfare gains. This gain would emanate mainly from the change in endowments utilisation, better terms of trade in the region and removal of distortions that currently result in inefficient allocation of the endowments under utilisation.

[15] The macroeconomic closure in the GTAP scenarios discussed here allows the supply for unskilled labour to be endogenous by fixing the nominal wage for the same labour category. The endowment change creating a positive impact on welfare is in this case associated to the endogenous unskilled labour rather than the other factors of production.

But it is still an FTA that guarantees unrestricted market access into the EU that offers the highest welfare gain of US$8,028.6 million for sub-Saharan African countries. And 75 percent of this improvement in welfare is attributable to increased demand in the unskilled labour. Clearly, the EPAs if designed in favour of Africa have the long-term potential of addressing income poverty as indicated by the welfare gains emanating from endowment changes in the decomposition of the total welfare. Allocative efficiency is also important, as there is potential from a reallocation of resources under an FTA with unrestricted market access to yield US$1,104.3 million in welfare.

The results that emerge from the welfare implications of the EPAs are consistent to the economic and trade effects. That the EPAs should aim first to consolidate the intra-African trade. Then secure unrestricted market access. The reciprocity elements of the EPAs should as much as possible be backloaded because of they will undermine the welfare gains through deterioration of terms of trade for SSA and also through weaker investment-savings balance for these countries.

Conclusion

An attempt has been made in this paper to try and shed light of the possible impacts of the EPAs on the African economies. The general equilibrium framework allowed the implications on the industrial structure to also be investigated. The main conclusions that can be drawn from the results and the discussion are that full reciprocity will be very costly for Africa irrespective of how the issue is looked at. A focus on deepening integration with a view to enhancing intra-African trade would provide positive results. But it is the scenario for unrestricted market access for Africa that portends the largest gain for the continent. Even with reciprocity, a free trade area that does not exclude sectors of export interest to Africa and one that deals with non-tariff barriers promises positive results for African countries.

The overarching conclusion from these findings then are that sequencing of policy reforms that Africa will need to undertake is critical to the success of the EPAs. To begin with, the EPAs should focus on deepening intra-African trade. This should be given sufficient lead-time to allow the African countries build the requisite competitiveness. This would have to be accompanied with significant developmental programmes to complement the larger markets with increased supply and diversified capacities. Eventually, any tariff dismantlement by the African countries will need to be implemented in phases hand in hand with unrestricted market access for the African exports into the EU market. Clearly, the 10-12 years period interpreted from Article XXIV of GATT is only sufficient for the deepening of the intra-African trade. The EPAs should look beyond the 12 years as the possible dates for introducing reciprocity. Before then, unrestricted market access and deeper African integration will have provided sufficient room for supply capacities and exports diversity to be built in the continent.

The main conclusions that can be drawn from the results and the discussion are that full reciprocity will be very costly for Africa irrespective of how the issue is looked at. A focus on deepening integration with a view to enhancing intra-African trade would provide positive results. But it is the scenario for unrestricted market access for Africa, which deals effectively with barriers associated to sensitive European products, that portends the largest gain for the continent. Even with reciprocity, a free trade area that does not exclude sectors of export interest to Africa and one that deals with non-tariff barriers promises positive results for African countries.

Based on the magnitudes and direction of impacts under the three scenarios, the overarching conclusion from the findings is that sequencing of policy reforms that Africa will need to undertake is critical to the success of the EPAs. To begin with, the EPAs should focus on deepening intra-African trade. This should be given sufficient lead-time to allow the African countries build the

requisite competitiveness. This would have to be accompanied with significant developmental programmes to complement the larger markets with increased supply and diversified capacities. Eventually, any tariff dismantlement by the African countries will need to be implemented in phases hand in hand with unrestricted market access for the African exports into the EU market. Clearly, the 10-12 years period interpreted from Article XXIV of GATT is only sufficient for the deepening of the intra-African trade. The EPAs should look beyond the 12 years as the possible dates for introducing reciprocity. Before then, unrestricted market access and deeper African integration will have provided sufficient room for supply capacities and exports diversity to be built in the continent.

The adjustment costs at the country level and the dangers to the regional integration processes in the continent emerged also as potential challenges for the EPAs. Two consistent stories underpin these concerns. The first consistent outcome in each of the proposed EPA at the regional economic community (REC) level is that EU stands to gain significantly in terms of expanded trade into RECs markets. While part of this trade expansion will result from trade creation, which is welfare improving, significant proportions of the trade gain will also be due to trade diversion from the rest of the world and from within the REC EPA grouping itself. As a result, while the reciprocity principle appears to be trade expanding, it will pose serious implications for deepened regional integration in Africa. In deed, unless there are clear mitigating measures, the EPAs could seriously undermine the gains that have been achieved so far in the integration process of the continent.

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