What are the agricultural exports growth perspectives offered to sub-Saharan countries by current trade negotiations? [†, ‡]

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Still preliminary v2

Abstract

Sub-Saharan African (SSA) countries are involved in negotiations for increased trade integration at the regional, bilateral and multilateral level. Static effects of those shocks are simulated with the MIRAGE CGE model in order to compare them and test their coherence with the objective of enhanced value-added in agriculture. I find that limiting the analysis of the results to regional GDP and welfare changes can be deceptive since it hides contrasted distributional impacts across sectors and regions. Indeed a combination of DFQF and DDA brings the highest GDP growth both at the world level and for SSA. But, multilateral liberalization, and especially DFQF, would drive SSA countries further away from agricultural led industrialization. The increased competition leads to a reorientation of the structure of production and exports of SSA towards raw agricultural products. Third, on the contrary, regional integration fosters the production and trade of processed agricultural products and trade, and thus might be more in line with the stakes of economic development.

Keywords: Trade policy, multilateral negotiations, competitiveness, agriculture, computable general equilibrium, trade preferences, sub-Saharan Africa

JEL codes: C68, O13, O24, O55, Q17

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1. Introduction

Growth of the agricultural sector is an important issue for sub-Saharan African countries (De Janvry and Sadoulet, 2010) since it is still a major source of employment (FAO 2010), and an essential part of foreign exchange earnings for many governments (WDI and GDF 2010[4]). The fact that agricultural growth thought its many linkages with the other sectors could be a stimulus to the overall growth of sub-Saharan African economies is now largely documented (Delgado et al., 1994, Cervantes-Godoy D., Dewbre J., 2010).

On the one hand, increased market integration of smallholder farmers is pointed out as a potential powerful driver of economic growth (World Bank 2008). On the other hand, further specialization in the production of raw agricultural products is often pointed out as a risk for sustainable development (IAASTD 2008) while it is rather recommended that sub-Saharan African countries strengthen the linkages between industry and agriculture through enhanced value-added in agriculture (Reardon and Timmer, 2005).

Moreover, the Sub-Saharan African region is very heterogeneous in terms of the stakes linked with agricultural trade (Ng and Aksoy 2008). Some countries are major exporters of raw tropical products at the global level (Ivory Coast for cocoa, Madagascar for vanilla, Malawi for tobacco, etc.) while others, mostly natural resources rich countries, hardly export any agricultural goods (Angola, Congo, Equatorial Guinea, Gabon, Nigeria. As for imports, most low-income sub-Saharan African countries tend to be net food importers (even when agricultural exporter) sometimes also highly dependent on food aid, but some are self sufficient or even net exporters of food commodities (WDI 2010). The sub-Saharan African region is also diverse in terms of level of development. As a consequence they are offered different possibilities and required different commitments in current trade negotiations. Indeed sub-Saharan Africa is mostly composed of least developed countries which are exempted from commitments at the multilateral level. But the regional level includes both least developed countries and non "least developed countries" developing countries.

This study goes further than previous studies on the effects of trade integration on sub-Saharan Africa for several reasons. First, it brings forward new comparable quantitative assessments of the impacts of several trade integration scenarios at the regional, bilateral and multilateral level and their interactions.

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[4] Data from the World Bank's World Development Indicators and Global Development Finance databases.

Secondly, the results are analyzed taking into account the specific economic structure of sub-Saharan countries and the stake of structural transformation towards processing agricultural goods.

1.1. Comparing different level of market integration

Beyond domestic market integration within each country which seems consensual, there is no consensus at the international level on whether market integration at the regional, bilateral or multilateral level should be the priority for sub-Saharan African countries.

Indeed, the recent literature review of Harrisson (2010) shows that theory alone cannot predict the detailed impacts of trade liberalization, and thus the answer to my research question is empirical. Since the overall outcome of a trade policy on a given country depends on the relative impacts on its competitors as was shown by Low (2005) and Carrere and De Melo (2010), empirical trade policy analysis at a global level is the only way to compare different trade integration level. Global general and partial equilibrium models are useful to study the long term perspectives of trade agreements and specifically identify and quantify the opportunities that might arise, and some of the difficulties that might be faced.

Numerous simulations of trade liberalization have been produced in the past, but Bouët (2008) has shown that the results of those studies are hardly comparable since simulations differ widely by the data, behavioral parameters, or theoretical features of the models they use. Furthermore most simulations focus on one precise trade agreement, assessing the impacts of slight variations of the terms of that agreement, without comparing several agreements nor studying their interactions. Notable exceptions are Fontagné et al. (2008) who test the interaction effect of the Economic Partnership Agreement (EPA) with regional integration, and Keck and Piermartini (2006) and Bouët et al. (2008) who compare EPA with multilateral liberalization, and Kowalski and Shepherd (2006) who compare North-South to South-South multilateral integration. Those studies highlight the fact that different level of trade integration have very different impacts, and that interaction effects of simultaneous integration are important to take into account.

It is indeed by taking into account the impacts of preferential agreements, that several studies, such as Bouët et al. (2006) have highlighted the fact that some countries being currently granted high preferential margins, such as sub-Saharan African countries, might experience an erosion of those preferences and terms of trade loss with increased competition on their exports, especially with multilateral liberalization. The recognition that some least developed countries are likely to lose from multilateral liberalization and should be compensated with extra-market access led to the proposal of a Duty Free Quota Free (DFQF) provision that, to my knowledge, has not yet been simulated in

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interaction with multilateral liberalization. Considering the high political stakes behind this proposal, it seems essential to deliver quantitative results to fuel the debate.

Hence at the multilateral level I simulate reciprocal liberalization in the form of the Doha Development Agenda as negotiated at the WTO, a preferential DFQF and test their interactions. I will compare the impacts of those different types of multilateral integration with those of different level of regional integration within sub-Saharan Africa. Furthermore I will test the sensitivity to those results to two possible outcomes of the current EPA negotiations, which could be either that bilateral EPA between the EU and each ACP country is signed or, what is already underway, that each ACP country is transferred to the European preferential system corresponding to its level of development (Everything but arms –EBA- for least developed countries –LDC- and Generalized System of Preferences –GSP- for non LDC.)

1.2. Analyzing detailed regional and sectoral changes

It is now widely acknowledged that trade liberalization invariably produces contrasted impacts across sectors and countries (Winters et al. 2004). Considering the fact that overall sub-Saharan Africa is experiencing an increasing food balance deficit and it is still the first region in the world affected by food insecurity and poverty (FAO, 2010), it seems crucial to assess those impacts. They can only be identified through a high degree of sectoral and regional disaggregation and a detailed analysis of the results.

Despite the many simulations of liberalization scenarios produced in the past, most global equilibrium studies fail to assess the impacts at the country level in sub-Saharan Africa because only 13 of the 52[5] countries of sub-Saharan Africa appear individually in the GTAP 7 database (Global Trade Analysis Project of the Purdue University, which is the most used database for trade policy analysis), and the rest are included in 5 regions grouping highly heterogeneous countries. The mapping of our study focusing on sub-Saharan Africa is described in Annex 1. Furthermore, as shown in Annex 2, the agricultural sectors of specific importance for sub-Saharan Africa, other than grains, are not detailed in

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[5]   Individual countries are Nigeria, Senegal, Ethiopia, Madagascar, Malawi, Mauritius, Mozambique, Tanzania, Uganda, Zambia, Zimbabwe, Bostwana, South Africa

        Regions are Rest of Western Africa (Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Saint Helena, Sierra Leone, Togo), Rest of Central Africa (Cameroon, Centrak African Republic, Chad, Congo, Equatorial Guinea, Gabon, Sao Tome and Principe), Rest of South Central Africa (Angola, Democratic Republic of Congo), Rest of Eastern Africa (Burundi, Comoros, Djibouti, Eritrea, Kenya, Mayotte, Reunion, Rwnada, Seychelles, Somalia, Sudan), and Rest of South African Customs Union (Lesotho, Namibia, Swaziland).

the GTAP database : roots and tubers are not separated and traditional exports crops such as coffee, cocoa, cotton, tea and tobacco are aggregated into the "exportable other crops" sector.

There are several ways that studies address these issues and bring further their analysis, either by using alternative databases (Nuetah et al. (2010) use the UNCTAD Agricultural Trade Policy Simulation Model, ATPSM[6], which is a partial equilibrium model, Fontagné et al. (2008) have built their own partial equilibrium models to maximize the available data) and many studies also rely on national or sub-national general equilibrium models; or by linking the global model to the household level either through household level data as in Bourguignon et al.(2010) or a poverty elasticity as in Hertel et al. (2006), Chemingui and Bchir (2009) and Hertel (2009).

Considering the limitations of the poverty elasticity shown in Bouët (2007), this paper will not try to assess the impacts of trade integration on poverty but rather on the structure of the sub-Saharan African agricultural production and trade structure. I will concentrate on direct interpretation of the ouput of the model such as in Bouët et al. (2005), but calculating indices reflecting the evolution of the structure of exports and production.

1.3. The simulations with the MIRAGE model and GTAP7 database

The trade integration scenarios are implemented in the MIRAGE model initially developed by the CEPII, which proposes several innovations from other CGE models applied to trade policy analysis such as horizontal product differentiation linked to varieties, but also to geographical origin (nested Armington − Dixit-Stiglitz utility function) and distinction of product quality. MIRAGE can also describe imperfect competition, imperfect mobility of factors and several other specifications, including sequential dynamic.

However, following David and Mishra (2007)'s advice, one should wonder what extent of complexity in the model is really needed to adequately answer one's question. Thus, in this simulation exercise I do not take advantage of all the specifications MIRAGE has to offer. I consider perfect competition, since imperfect competition significantly impacts results (Karam 2009) and introduces a bias detrimental to countries specialization in agriculture (Decreux and Valin 2007), and in a static mode since I am focusing on the comparison of the long term effect of multiple scenarios.

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[6]   http://r0.unctad.org/ditc/tab/atpsm.shtm

The mapping of the study focusing on sub-Saharan Africa agricultural sectors is described in Annex 1 and 2: The 13 individualized sub-Saharan African countries, the 5 sub-Saharan African regions and the 18 agricultural sectors are kept.

Thanks to the way the MIRAGE model is constructed, the changes in the tariff barriers for each scenarios are first made at the HS6 level using the MAcMap database, contrary to what is commonly done in applied modeling. Only then are these data aggregated in the model's nomenclature, according to a procedure designed to limit the extent of the endogeneity bias. As a result, MIRAGE is based on a more precise description of trade barriers at the bilateral level.

However, despite the detailed trade and tariff data from the MAcMaps HS6 v2 database, the model is limited by the regional disaggregation of the GTAP 7 database. Fortunately for the regional scenarios chosen, the GTAP7 regional aggregation of sub-Saharan countries is mostly coherent with the regional groups chosen (Annex 3). The only exception is the "Rest of Central Africa" (XAC) GTAP 7 region which comprises the Democratic Republic of Congo that is part of the Central region and Angola that is part of the Southern region.

Thus, results for each scenario are available for the 29 regions of which 18 Sub-Saharan African and the 28 sectors of which 20 agricultural. For simplicity, the results are presented in this paper aggregated in 5 "zones of interest" (Sub-Saharan Africa –SSA-, North Africa -NA-, Developed Countries –DC-, Emerging Economies -EC- and Other developing countries -ODC-) as detailed in Annex 1 and "sectors of interest" (raw agricultural products –"Agrifood"-, processed agrofood industries –"Agrofood"-, Fishing –"Fish"- and all the other sectors –"Other"-) in Annex 2, the analysis focusing on the changes in the structure of «Agrifood» and production and exports of Sub-Saharan African countries.

2. Implementation of the tariff shocks with the MIRAGE CGE model

Scenarios of tariff changes are constructed using the Market Access Maps database. They are presented for zones and sectors of interests in Annex 4. General equilibrium effects of those shocks are simulated thanks to the MIRAGE model.

2.1. Pre-experiment

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The Market Access Maps database developed by the CEPII and ITC represents full structure of protection, bound, MFN applied, and preferential[7] applied duties, in 2004. It is thus necessary to update the database in a "pre-experiment" step to take into account major changes in tariffs since 2004 that have affected sub-Saharan African countries and their main trade partners. Bouët (2008) shows that without this preliminary step, gains from increased liberalization can be substantially overestimated. Hence, the main trade agreements concerning sub-Saharan African countries and their main trade partners since 2004 are added to the database at the HS6 level, such as the end of the multi-fiber agreements in 2005, the enlargement of the EU to 25 and then 27, expanded DFQF by India, China, Turkey and Korea to some least developed countries, some new FTA or the phasing out of the EU protocols for sugar, rice and banana.

| Importer | Sector | Exporter | | | | |
		Dvd	EmgEco	Odvg	NoAf	SSA
Dvd	AgriFood	0.14	0.17	0.12	0.11	0.10
	AgroFood	0.18	0.17	0.16	0.11	0.14
	Fish	0.04	0.04	0.05	0.04	0.05
	Other	0.03	0.04	0.03	0.03	0.02
EmgEco	AgriFood	0.13	0.13	0.11	0.09	0.19
	AgroFood	0.24	0.21	0.25	0.18	0.32
	Fish	0.14	0.11	0.13	0.10	0.20
	Other	0.08	0.11	0.09	0.06	0.07
Odvg	AgriFood	0.12	0.20	0.17	0.20	0.15
	AgroFood	0.19	0.32	0.21	0.25	0.22
	Fish	0.22	0.21	0.21	0.14	0.21
	Other	0.07	0.11	0.08	0.07	0.09
NoAf	AgriFood	0.21	0.25	0.26	0.17	0.12
	AgroFood	0.40	0.26	0.37	0.18	0.82
	Fish	0.25	0.26	0.26	0.11	0.25
	Other	0.14	0.18	0.17	0.07	0.16
SSA	AgriFood	0.11	0.16	0.13	0.16	0.18
	AgroFood	0.26	0.24	0.23	0.34	0.28
	Fish	0.16	0.11	0.10	0.05	0.15
	Other	0.10	0.16	0.12	0.12	0.14

Table 1 Average applied tariffs by sector and region (MAcMaps 2007 after pre-experiment, reference weight group aggregating method)

Looking at the tariffs in Table 1, I find that initially every region still applies higher tariffs on agricultural imports than on manufactured (Other) imports, that tariff escalation (applying a higher protection on more processed goods) is systematic in agriculture, that «Agrifood» exports from sub-

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7   It should be acknowledged that rules of origin are not taken into account and thus supposed to be fully used, even though there is some evidence that developing countries might not be able to fully take advantage of those preferences.

Saharan Africa do benefit from a preferential margin from Developed countries, which is somewhat reciprocal, since sub-Saharan Africa also applies a lower tariff on "agrifood" and "other" exports from developed countries than from other countries, and that sub-Saharan African countries are poorly integrated at the regional level.

2.2. "DDA" scenario : multilateral liberalization in the form of a "Doha Round"

The November 2001 declaration of the Fourth Ministerial Conference of the World Trade Organization in Doha, Qatar, provides the mandate for negotiations known as the "Doha Round". The Doha Development Agenda was to take into account the specific needs of developing countries. So far no agreement has been reached. The July 2008 package is considered a stepping stone on the way to concluding the Doha Round and the December 2008 draft modalities text seems to be widely accepted by WTO members as the basis for further negotiations[8].

Since then, no substantial achievement to conclude the Doha Round has been made, and trade liberalization has on the contrary evolved at the bilateral and regional level.

My DDA scenario[9] is based on the December 2008 modalities consistently with Bouët and Laborde (2010). Sensitive and special products were defined using the Jean, Laborde and Martin (2005) method[10].

| Importer | Sector | Exporter | | | | |
		DVD	EmgEco	Odvg	NoAf	SSA
Dvd	AgriFood	-32.15	-35.58	-36.23	-43.03	-34.49
	AgroFood	-36.24	-43.03	-39.46	-37.66	-35.37
	Fish	-51.47	-55.23	-40.55	-51.16	-51.29
	Other	-33.03	-41.31	-41.49	-43.73	-26.61
EmgEco	AgriFood	-0.21	-0.23	-0.28	-0.54	-0.11
	AgroFood	-5.04	-1.62	-2.83	-6.27	-9.95
	Fish	-25.78	-22.81	-30.39	-27.21	-35.38
	Other	-27.17	-21.27	-29.22	-22.66	-12.90
Odvg	AgriFood	-0.03	-0.28	-0.09	-0.21	-0.22
	AgroFood	-3.93	-2.29	-3.51	-4.28	-7.02
	Fish	-39.58	-28.56	-30.45	-27.15	-29.64
	Other	-12.95	-21.22	-14.77	-12.36	-9.64
NoAf	AgriFood	-0.03	-0.64	-0.09	-0.05	-0.23
	AgroFood	-4.62	-4.81	-6.88	-1.32	-3.04
	Fish	-46.58	-45.65	-51.40	-23.74	-47.99
	Other	-31.16	-35.07	-31.58	-30.59	-35.66

8   Based on lastest updates of http://www.wto.org/

9   Detailed formula available upon request.

10   Thanking David Laborde for having made that list available.

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	AgriFood	-7.85	-8.38	-5.04	-23.08	-15.35
SSA	AgroFood	-8.42	-12.92	-12.62	-25.21	-22.87
	Fish	-24.70	-5.37	-9.10	-21.25	-4.77
	Other	-4.21	-7.09	-6.20	-4.88	-5.19

Table 2 Percentage tariff change from a DDA on applied tariffs by sector and region

(reference weight group aggregating method)

The tariff shock of a DDA, presented in Table 2 illustrates the fact that issue of sensitive products is crucial to take into account. Even when reduced to a few percentages of the tariff lines, the option to exempt sensitive products from liberalization substantially reduces the effective liberalization of tariff cuts (Bouët 2008). Indeed, in the structure of most developing economies protection pattern, a few tariff lines are highly protected, and account for most of the average protection. Excluding them from tariff reduction widely reduces the effective reduction in protection. Often these products are agricultural products which are export interests for sub-Saharan African countries.

What is noteworthy is that with the exception of agricultural exports from Northern African countries to Developed countries, the tariffs cuts are always higher for «Agrofood» products than for "Agrifood»products, which will tend to reduce the existing tariff escalation.

Furthermore, as a region, Sub-Saharan Africa is not exempted from tariff reduction. The average weighted average tariff cut for the region represent the fact that the richest countries are also the countries trading the most. Hence substantial tariff reduction incur, for instance from Nigeria, some of which benefitting to other Sub-Saharan African countries such as South Africa (Annex 4).

2.3. "DFQF" scenario: preferential multilateral liberalization for Least Developed Countries

It was agreed at the 2005 WTO Ministerial that all developed countries would offer at least 97% duty-free, quota free (DFQF) access for least developed countries. Since 2001, some OECD countries have already proposed a DFQF access to some least developed countries. A number of emerging countries (Turkey, Korea, and China) have also put in place preferential market access albeit covering less products (Elliott 2010). It is crucial to take those preferential agreements that have already happened into account in the pre-experiment because they reduce the potential gains from the DFQF proposal.

Without specifically testing the interaction effects of those different agreements, Berisha-Krasniqi et. al.2008 and more recently Bouët et al.(2010) using a general equilibrium model and partial equilibrium models find that there is little to expect for least developed countries from DFQF market access if this market access doesn't cover 100 per cent tariff lines and is not extended to as many preference-giving countries as possible, including emerging markets economies. Their various simulations include full

EPA and regional integration in the various negotiating regions in the baseline and do not consider parallel impacts of DDA. Building from their results, I implement a rather ambitious DFQF scenario: 100% duty free quota free market access by OECD countries and Brazil, China and India to all least developed countries.

Importer	Sector	Exporter	
		Odvg	SSA
Dvd	AgriFood	-0.52	-18.69
	AgroFood	-0.59	-9.37
	Fish	-2.75	-16.82
	Other	-5.34	-2.92
EmgEco	AgriFood	-17.35	-41.67
	AgroFood	-1.76	-23.79
	Fish	-8.94	-44.45
	Other	-1.64	-14.28
Odvg	AgriFood	-0.68	-14.15
	AgroFood	-0.31	-4.22
	Fish	-3.39	-9.21
	Other	-0.62	-5.29

Table 3 Percentage tariff change from a DFQF on applied tariffs by sector and region
(reference weight group aggregating method)

The equivalent average tariff cut presented in Table 3 show that DFQF would mostly benefit the sub-Saharan African region, and the few LDC in the "Other Developing Countries" group. For SSA, the equivalent average tariff cuts are much higher than from DDA. Moreover, tariff cuts are more important in the "Agrifood" sector than in the «Agrofood» sector, even though initial tariffs were higher in the «Agrofood» sector (Table 1). This apparent paradox reflects the fact that LDCs exports more agrifood products than «Agrofood» products to OECD countries and emerging economies, and/or that those specific agrifood products face higher tariffs than «Agrofood» products for those destinations. Annex 5 illustrates some of the major tariff cuts for SSAn agricultural exports from DFQF.

2.4. "DDA+DFQF"scenario

It is sometimes argued that the 100% DFQF could be realized only within the conclusion of the DDA, in which case it would be compensation towards least developed countries for the erosion of preferences they experience in the DDA. Hence I also simulate a combination of the two.

Importer	Sector	Exporter				
		DVD	EmgEco	Odvg	RoAf	SSA
Dvd	AgriFood	-32.16	-35.58	-36.56	-43.03	-42.41
	AgroFood	-36.26	-43.03	-39.76	-37.66	-40.86
	Fish	-51.87	-55.23	-42.82	-51.16	-61.67
	Other	-33.04	-41.31	-43.60	-43.73	-28.92

EmgEco	AgriFood	-0.24	-0.23	-17.59	-0.54	-41.69
	AgroFood	-5.12	-1.62	-4.47	-6.27	-29.56
	Fish	-29.13	-22.81	-36.48	-27.21	-66.49
	Other	-27.31	-21.27	-30.55	-22.66	-25.41
Odvg	AgriFood	-0.33	-0.28	-0.78	-0.21	-14.36
	AgroFood	-4.01	-2.29	-3.69	-4.28	-9.91
	Fish	-49.74	-28.56	-32.19	-27.15	-34.27
	Other	-13.00	-21.22	-15.17	-12.36	-14.48
RoAf	AgriFood	-0.03	-0.64	-0.09	-0.05	-0.23
	AgroFood	-4.62	-4.81	-6.88	-1.32	-3.04
	Fish	-46.58	-45.65	-51.40	-23.74	-47.99
	Other	-31.16	-35.07	-31.58	-30.59	-35.66
SSA	AgriFood	-7.85	-8.38	-5.04	-23.08	-15.35
	AgroFood	-8.42	-12.92	-12.62	-25.21	-22.87
	Fish	-24.70	-5.37	-9.10	-21.25	-4.77
	Other	-4.21	-7.09	-6.20	-4.88	-5.19

Table 4 Percentage tariff change from a combined DDA and DFQF on applied tariffs by sector and region (reference weight group aggregating method)

It is noteworthy in Table 4 that the equivalent tariff cuts are not the exact sum of tariff cuts from the two scenario alone, since some source of tariff reduction are the same in both agreements.

Annex 6 illustrates some of the major tariff cuts for SSAn agricultural exports from a combined DDA+ DFQF.

2.5. "Regional FTA" scenario : four regional free trade agreements in sub-Saharan Africa

Despite the substantial number of trade agreements signed within sub-Saharan African States, progresses in regional integration are uneven across the continent (UNECA 2010).

Figure 1 Assessing Regional Integration in Africa from United Nations Economic Comission for Africa, 2006, II: Rationalizing Regional Economic Communities

In terms of future prospects, it seems most likely that regional integration will continue, but the pace will highly depend on the willingness of the respective government to enforce the agreements they have signed.
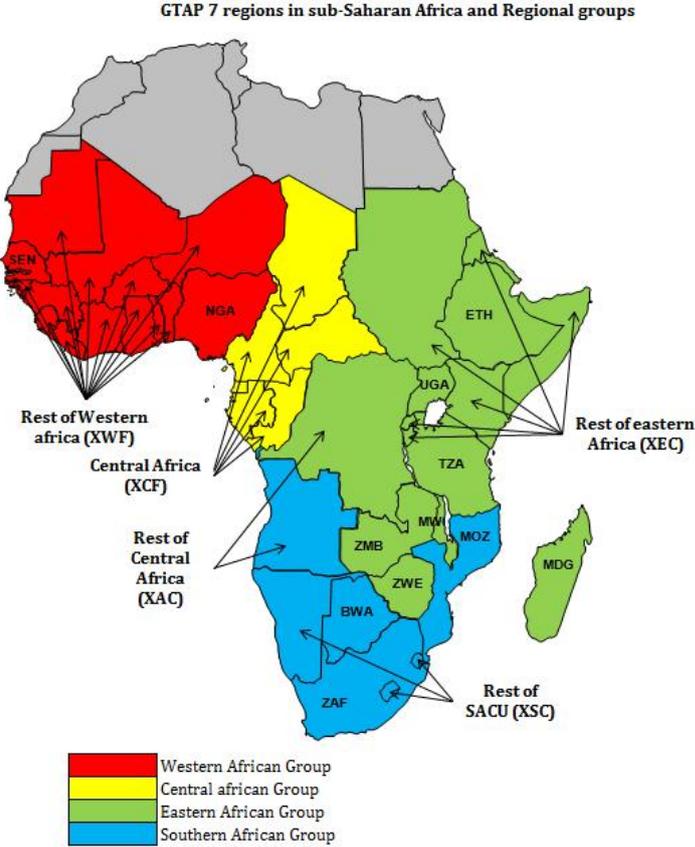

Figure 2: GTAP 7 data on sub-Saharan Africa and the four EPA regional groups

Considering the overwhelming number of overlapping memberships of sub-Saharan African countries as illustrated in Figure 1, it is necessary to make a choice as regards to which regional economic community to choose. A combination of regional economic communities that covers the entire Sub-Saharan African countries with no overlap is chosen (Figure 2): those are the same broad four economic communities that were used for the EPA regional negotiations in Africa namely a Western African group based on ECOWAS (Economic Community of West African States) members plus Mauritania; a Central African group based on CEMAC (Monetary and Economic Community of Central Africa) members plus Democratic Republic of Congo and Sao Tome and Principe; .a Southern African group named the SADC (Southern African Development Community) group but actually only based on SACU members plus Mozambique and Angola; and an Eastern African group that I consider

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as one region but was divided in two negotiating groups, one being based on the EAC (East African Community) members and the other one named the ESA (Eastern and Southern Africa) based on some COMESA (Common Market for Eastern and Southern Africa) members.

Data on the effective applied tariff, and the commitments of various agreements being very hard to gather and consolidate, I choose rather drastic regional integration scenarios. For each sub-Saharan African country, all equivalent ad valorem tariffs applied to imports from other countries of the same region are set to zero, creating four Free Trade Areas.

Importer	Sector	Exporter
		SSA
SSA	AgriFood	-20
	AgroFood	-23
	Fish	-31
	Other	-24

Table 5 Percentage tariff change from four regional FTA in Sub-Saharan Africa on average applied tariffs by sector and region (reference weight group aggregating method)

Considering the fact that sub-Saharan African countries do not trade only with the countries within the same FTA, at the sub-Saharan African level equivalent tariff cuts (Table 5) from the four FTA are only equal to less than 30% cuts on average sub-Saharan African trade.

Annex 7 illustrates some of the major tariff cuts for SSAn agricultural exports from Regional FTA

2.6. "SSA FTA" scenario:

An extended version of regional integration is also chosen in the form of a sub-Saharan African Free Trade Area. For each sub-Saharan African country, equivalent ad valorem tariffs applied on imports from other sub-Saharan African countries are set to zero.

Annex 8 illustrates some of the major tariff cuts for SSAn agricultural exports from SSAn FTA.

2.7. "EPA"scenario: bilateral Economic Partnership Agreements EU-ACP

According to MacMapsv2, in 2004, Sub-Saharan African region exports 45% of its agricultural exports to the EU with 17 Sub-Saharan countries depending on EU for more than 50% of their agricultural exports. Since the European Union (EU) is the main trade partners for sub-Saharan African countries, I consider that I should test the impacts of potential outcomes of the current negotiations between the EU and Sub-Saharan countries, on my baseline and on other scenarios.

In 2007 the WTO waiver for the Cotonou agreements[11] ended, without the expected conclusion of the Economic Partnership Agreements being successfully signed. Initiated as regional negotiations between regional communities in the ACP countries and the EU (which required countries that had overlapping memberships to those regional communities to decide with which to negotiate), the negotiations have now become bilateral negotiations with the EU.

Applied equivalent ad valorem tariffs between the EU and the corresponding ACP regions are set to zero (Annex 9). Tariffs of the sensitive products are excluded from any cuts. As, only the countries that signed Interim EPA (IEPA) have published their list of sensitive products, these lists are extended to the other countries of the same regional group who have not signed the IEPA[12].

Importer	Sector	Exporter		
		Dvd	Odvg	SSA
Odvg	AgriFood	0.00		
	AgroFood	0.00		
	Fish	-0.01		
	Other	-0.02		
SSA	AgriFood	-0.15		
	AgroFood	-0.19		
	Fish	-0.04		
	Other	-0.17		
Dvd	AgriFood		0.00	-0.15
	AgroFood		-0.02	-0.35
	Fish		-0.01	-0.11
	Other		-0.01	-0.29

Table 6 Percentage tariff change from bilateral ACP-EU EPA on average applied tariffs by sector and region (reference weight group aggregating method)

Overall the EPA are equivalent to tariff cuts ranging from 4% to 19% (Table 6) on tariffs applied by SSA on imports from all developed countries and 11 to 35% on tariffs applied by all developed countries on imports from SSA.

2.8. "GSP" scenario : the counterfactual scenario

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[11]   The Cotonou Agreement signed in 2000 had replaced the Lomé Convention which had been the basis for ACP-EU development cooperation since 1975 providing non reciprocal preferential access for all African Caribbean and Pacific countries to the EU market. The Cotonou Agreement however were supposed to be transitional towards the Economic Partnership Agreements in which ACP countries would also provide duty-free access to their own markets for EU exports.

[12]   Specifically: In the Western African group, Ghana and Côte d'Ivoire have their own exclusion lists from their individual IEPA. For the other countries, I use Ghana's list. For all Central African countries I use the list of Cameroon's IEPA. In Eastern Africa, EAC countries, Comoros, Madagascar, Maurice, Seychelles, Zambia, Zimbabwe all use their own IEPA exclusion list. For the other countries, I use the EAC exclusion list. For all Southern African countries, I use the SAD-1 IEAP exclusion list. All lists were found at http://ec.europa.eu/trade/wider-agenda/development/economic-partnerships/

Considering the difficulties in bringing negotiations forward in the EPA, it is necessary to devise a counterfactual scenario for the case in which the EPA negotiation fail. Since 2008, all countries whose governments initiated the IEPA have benefited from the maintenance of traditional trade preferences from Cotonou. Only the ones that have refused to sign such as Gabon, Congo, Nigeria are no longer Cotonou preference receivers.

Indeed, the EU has preferential programs for developing countries, a "Everything But Arms" (EBA) initiative granting all eligible least developed countries duty-free, quota-free access for all products but arms[13] and a Generalized System of Preferences (GSP)[14] for other developing countries. In terms of preferences, the EBA is equivalent to the Cotonou agreement for ACP least developed countries, but for the other ACP countries, the GSP would mean an increase in the tariff they face for their exports to the EU[15].

Considering the current situation I implement a drastic counterfactual to the EPA scenario where no EPA is signed and all ACP countries are transfer to the GSP[16] scheme (least developed countries are granted EBA).

Importer	Sector	Exporter	
		Odvg	SSA
Dvd	AgriFood	0.00	0.00
	AgroFood	0.03	0.05
	Fish	0.00	0.01
	Other	0.00	0.00

Table 7 Percentage tariff change from ACP GSP on average applied tariffs by sector and region (reference weight group aggregating method)

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[13]   I consider that the delayed implementation for sugar, rice and bananas has ended, and include the end of the product protocols in the pre-experiment. Indeed in the case of sugar, from 1 October 2009 to 30 September 2015: ACPs have free access to the EU market the only restriction being an automatic safeguard clause for non-LDC ACPs (Commission Regulation (EC) No 828/2009 of 10 September 2009 laying down detailed rules of application for the marketing years 2009/2010 to 2014/2015 for the import and refining of sugar products of tariff heading 1701 under preferential agreements). Since 1 January 2006, the "Everything But Arms" initiative grants duty-free quota-free access for bananas from Least Developed Countries (LDCs) to the EU market. Non-LDC ACP countries benefit from duty-free and quota-free access under the EPA trade regime since 1 January 2008. All ACP banana exporters concluded negotiations on a full or interim EPA at the end of 2007.

[14]   Note that the GSP plus scheme is not considered.

[15]   Most countries that have signed Interim EPA (IEPA) so far are non least developed countries African countries highly dependent for a very concentrated part of their exports on their preferential access to the European market: Ivory Cost (banana and cocoa), and Ghana (cocoa) for Western Africa, Cameroon (banana) for Central Africa, Bostwana, Swaziland, Zimbabwe (cattle) and Mozambique for Southern Africa, Kenya (textile) and Seychelles (fish) for Eastern Africa. Some African least developed countries such as Burundi, Rwanda, Tanzania, Uganda, Mozambique, Madagascar and Lesotho also signed.

[16]   http://trade.ec.europa.eu/doclib/docs/2009/april/tradoc_143051.pdf

Overall, the increase in the tariffs applied by the EU would mean a 5% increase in equivalent average tariffs on «Agrofood» exports to all Developed Countries (Table 7). Nevertheless, this average increase hides the fact that impacts would be concentrated on the few non LDC ACP countries and on some specific sectors as illustrated in Annex 10, of which sugar (+251% for Mauritius, + + 229% for Zimbabwe) or vegetables and fruits (+19% Central Africa, +11% Western Africa).

Taking into account this counterfactual illustrates what non LDC ACP countries have to loose from nor signing the Interim Agreements and explains why most did.

2.9. Testing interactions

All the possible interactions between the previously presented scenarios are also tested and the changes of the macroeconomic variables are compared with proper counterfactual scenarios "without" each the agreement which serves as a reference scenario. From each interaction we find what has been seen with the "DDA+DFQF", that the interaction effect of two scenarios counts and that it is not a mere sum of what happens in the two scenarios alone.

3. Results

3.1. Comparative impacts on GDP and welfare

As found in previous studies such as Bouët et al. 2005, global gains from trade liberalization are small, even at the multilateral level. In my study, they amount globally to a maximum of $60 billion of GDP growth or $30 billion welfare growth (respectively 0,14 per cent of 2004 World GDP or 0,11 per cent of 2004 World Welfare), reached with a combination of a DDA and a DFQF (Table 8 and 9).

	Per Cent change in GDP (vol)							Absolute increase in GDP volume ($ bln)						
	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	0.12	0.02	0.13	0.00	0.00	0.00	0.00	40.60	7.61	46.41	-0.02	-0.07	0.61	-0.08
Emerging Economies	0.26	0.00	0.26	0.00	0.00	0.00	0.00	7.56	0.06	7.68	-0.02	-0.06	-0.07	0.00
Other developing economies	0.09	0.01	0.10	0.00	0.00	0.00	0.00	2.15	0.28	2.32	-0.01	-0.02	0.04	0.00
Northern Africa	0.46	0.01	0.47	0.00	0.00	-0.01	0.00	1.27	0.01	1.28	0.00	0.00	-0.03	0.00
Subsaharan Africa	0.09	0.25	0.32	0.04	0.12	0.10	-0.01	0.47	1.33	1.69	0.20	0.65	0.54	-0.05
World	0.13	0.02	0.14	0.00	0.00	0.00	0.00	52.05	9.29	59.38	0.16	0.51	1.09	-0.13

Table 8 Impacts of scenarios on GDP (volume)

These low prospects of gains from trade liberalization are found in similar studies with the MIRAGE model but differ from other more positive estimations of the World Bank and GTAP or HRT models for several reasons (Bouët 2005, Anderson et al. 2005) : First, the studies using the MAcMap database (most studies with MIRAGE) take into account a precise measurement of protection worldwide especially taking into account the trade preferences, regional agreements, the gap between applied and bound protection (Bouët et al 2008). Secondly, the choice of conservative estimation of behavioral parameters (lower, more realistic, elasticities of substitution for developing countries) yields lower trade flows and thus lower gains from liberalization (Bouët 2007) especially in terms of Welfare. More complex theoretical assumptions (such as the imperfect mobility of factors allowed in MIRAGE) hamper reallocation of factors according to the comparative advantage and thus decrease gains (Gérard 2008). Third, like all static simulations, my results lack the "dynamic gains of liberalization" (to start with, the increase in factor supply) which increase the results in dynamic simulations.

In terms of comparative gains, a combination of the Doha Development Agenda and the Duty Free Quota Free Market Access, the most ambitious scenario in terms of tariff cuts, results in higher global gains both in terms of Welfare and GDP. But the gains from the DDA are mostly driven by the gains of Developed countries whereas an ambitious DFQF rebalances the gains towards SSA.

	Per Cent change							Absolute increase ($ bln)						
	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	0.12	0.01	0.12	0.00	0.00	0.00	0.00	33.64	1.90	34.63	-0.09	-0.17	1.05	0.00
Emerging Economies	-0.06	-0.01	-0.06	0.00	0.00	-0.01	0.00	-1.03	-0.16	-1.11	-0.02	-0.08	-0.12	0.00
Other developing economies	0.00	0.03	0.02	0.00	0.00	-0.01	0.00	0.07	0.48	0.33	-0.02	-0.04	-0.16	0.00
Northern Africa	-0.28	0.01	-0.27	0.00	0.00	-0.03	0.00	-0.56	0.01	-0.55	0.00	0.00	-0.06	0.00
Subsaharan Africa	0.03	0.66	0.65	0.03	0.12	-0.01	-0.03	0.14	2.77	2.71	0.14	0.51	-0.03	-0.12
World	0.10	0.02	0.11	0.00	0.00	0.00	0.00	32.26	5.01	36.00	0.01	0.22	0.67	-0.12

Table 9 Welfare gains

It should be noted that the welfare growth of the "DDA+DFQF" scenario is not the arithmetic sum of the welfare growth of each of those scenario alone. This discrepancy can be attributed to the fact that some of the gains from preferential access with "DFQF" are lost as a result from multilateral liberalization and erosion of preferences. What is noteworthy is that except for Developed countries, gains from "DDA+DFQF" are systematically less than from "DFQF" alone, even for Emerging Economies. This illustrates two crucial points: first, simulating interactions is necessary to grasp the complicated effects of simultaneous trade agreements; secondly any preferential trade agreement is jeopardized by increased trade liberalization as a consequence of erosion of preferences.

In the case of the sub-Saharan Africa, I find that a DDA brings a negative change in terms of trade which is more than compensated by the high positive change in terms of trade of the DFQF scenario for the DDA+DFQF (Table 10).

	Per cent change						
	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	0.04	-0.04	0.00	0.00	0.00	0.01	0.00
Emerging Economies	-0.27	-0.03	-0.29	0.00	-0.01	-0.01	0.00
Other developing economies	-0.07	0.07	-0.04	0.00	-0.01	-0.03	0.00
Subsaharan Africa	-0.15	1.51	1.25	0.05	0.13	-0.13	-0.06
Northern Africa	-1.21	0.01	-1.20	0.00	0.00	-0.06	0.00

Table 10 Terms of trade changes

Two factors contribute to the changes in terms of trade:

First, the sub-Saharan African region as a whole is a net food importing zone, especially processed and a net raw agricultural exporter. In the DDA scenario world prices of Agro food industries increase by 0.23% which is the highest increase, when prices of raw agricultural exports decrease. In the DFQF scenario, the increase in processed food prices is only by 0.9% and other prices increase more, as highlighted in Table 11.

	Per Cent change						
Sector	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Agriculture raw food staples	-0.03	1.05	0.91	0.02	0.00	-0.01	0.00
AgroFood industries	0.23	0.09	0.31	0.01	0.00	0.01	-0.01
Other	-0.05	0.01	-0.05	0.00	0.00	0.00	0.00
Fishing	0.09	0.37	0.42	0.01	0.03	0.02	0.00

Table 11 World price changes

Secondly, as for the other developing economies, in the DDA, sub-Saharan African countries benefitting from high preference margins experience an erosion of preferences as found in Bouët 2008, which means that the price they get from their exports decreases as a result of increased competition, whereas the price sub-Saharan African producers get for exports of raw agricultural products in the DFQF scenario increase by 12% as a results from increased preferences (Table 4).

	Per Cent change						
Sector	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Agriculture raw food staples	-0.07	12.55	11.68	0.25	0.12	0.08	-0.05
AgroFood industries	-0.13	2.88	2.48	0.24	0.41	0.06	-0.40
Fishing	0.32	6.19	6.11	0.32	0.79	0.39	-0.07
Other	-0.17	0.58	0.35	0.06	0.23	-0.17	-0.05

Table 11 Change in Sub-Saharan African export prices

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Looking at welfare changes at the regional level, we find in line with Bouët, Laborde, Dienisch and Elliott (2010) that an ambitious DFQF scenario has a positive impact on least developed countries, a slight positive impact on Developed countries and a slight negative impact on Emerging Economies (Table 8). According to my classification of regions, sub-Saharan Africa seems to be benefitting the most in terms of welfare.

As for the understanding of those results, I wish to highlight the fact that interpretation of the figures can lead to diverging conclusion: In terms of percentage change of GDP volume, developing countries may be the winner from multilateral liberalization (DDA or DDA+DFQF) since GDP in volume increase more in Developing countries than Developed countries (respectively 0.19% and 0.12% in "DDA+DFQF"). But turning to the absolute increase in GDP volume which is 47 billion US$ for developed countries and only 13 billion US$ for developing countries, I come to the opposite conclusion that Developed countries benefit the most from multilateral and bilateral trade liberalization. Furthermore, looking at the repartition of the population worldwide to take into account the headcounts, I come to the conclusion that even in the "DDA+DFQF" scenario, 20% of the worldwide population in developed countries obtain 78% of the gains (31$/capita), when the 80% of the world population living in developing countries only gain 22% of the gains (2.2$/capita).

By comparing the changes in GDP in volume (Table 8) across my different scenarios, I find that other options do deliver as much as DDA for sub-Saharan Africa. Indeed, an ambitious regional integration (in the form of several regional or one sub-Saharan African free trade agreements) could bring up to $650 mln dollars to sub-Saharan Africa when a DDA would bring $470 mln dollars. Nevertheless preferential access to all OECD and some emerging economies members (DFQF) fosters much more gains than any other options, including regional integration.

3.2. Comparative impacts on production and trade structure

Beyond GDP and welfare results, I compare the structure of production, the composition and destination of exports. As expected they vary across regions and sectors and according to the level of trade integration, and its modalities.

In terms of exports structure, initially, sub-Saharan Africa is the only region in the world exporting more "Agrifood" products than "Agrofood" products. Considering the stake of agricultural-led growth, the trade integration process should be coherent with the objective of increased value added in agriculture.

ratio "Agrifood"/"Agrofood" in total exports

20

	initial	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	43%	43%	43%	43%	43%	43%	43%	43%
Emerging Economies	60%	58%	60%	58%	60%	60%	60%	60%
Other developing economies	59%	56%	59%	57%	59%	59%	59%	59%
Subsaharan Africa	133%	134%	175%	174%	130%	125%	132%	139%
North of Africa	64%	65%	64%	65%	64%	64%	64%	64%
World	49%	49%	51%	50%	49%	49%	49%	49%

Table 12 Change in the structure of agricultural exports by regions

Looking at the evolution of the ratio of processed agricultural products in the exports of sub-Saharan African countries presented in Table 12, the "DFQF" and "DFQF+DDA" scenarios greatly foster unprocessed agricultural exports. The ratio of unprocessed agricultural products over processed products increases from 133% to 174% in total exports. Thus additional agricultural exports created by trade integration are composed of 81% of unprocessed for "DFQF". On the contrary, regional integration tend to increase the ratio of processed agricultural goods in total agricultural exports. The additional agricultural exports created in the "Regional FTA" scenario are composed of only 19% unprocessed agricultural goods, and 28% in the "SSA FTA" scenario.

	ratio "Agrifood"/"Agrofood" in total production							
	initial	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	27%	27%	27%	27%	27%	27%	27%	27%
Emerging Economies	90%	90%	90%	90%	90%	90%	90%	90%
Other developing economies	52%	52%	52%	52%	52%	52%	52%	52%
Subsaharan Africa	116%	116%	127%	126%	116%	115%	116%	116%
North of Africa	140%	140%	140%	140%	140%	140%	140%	140%
World	32%	32%	32%	32%	32%	32%	32%	32%

Table 13 Change in the structure of agricultural production by regions

Table 13 illustrates the fact that the structure of production doesn't necessarily change in the same way the structure of exports does, since changes in production depend on changes in the exports and imports structure. Nevertheless, in the end, the structure of production is crucial to take into account, to make sure the value addition is captured in the economy.

	ratio "Agrifood"/"Agrofood" in SSA exports by destination							
	initial	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Developed	146%	146%	198%	197%	145%	146%	143%	155%
Emerging Economies	922%	907%	993%	991%	920%	938%	920%	920%
Other developing economies	455%	445%	496%	481%	458%	465%	454%	453%
North of Africa	463%	412%	500%	452%	464%	468%	460%	462%
Subsaharan Africa	52%	52%	59%	58%	51%	49%	52%	52%
All except SSA	168%	168%	216%	216%	167%	168%	164%	178%

Table 14 Change in the structure of agricultural exports from SSA by regions of destination

The pattern of sub-Saharan African agricultural exports and production observed in Table 11 and 12 can be further explained in light of the structure of the destination exports market presented in the Table 14. Indeed, I find that the only destination market where sub-Saharan Africa exports more processed agricultural goods than unprocessed goods is the regional market. The ratio change drastically depending on the destination market, ranging from only 10% of agricultural exports to Emerging Economies being processed to 66% of agricultural exports to other Sub-Saharan African countries being processed. Three factors impact the evolution of the exports structure from increased trade integration. First, depending on the destination to which market access is granted, structure of additional exports follow the existing structure of exports to that destination. Hence, regional trade tend to foster more processed exports than trade to Emerging Economies or even Developed countries. Secondly, evolution in the tariff structure does a play a role. For instance, by setting all tariff to zero, regional integration means that cuts on processed goods are higher than cuts on raw products because of the existing tariff escalation (Table 1). The structure of exports tend to change according to those respective tariff cuts. Indeed, following those tariff cuts the ratio of processed to unprocessed agricultural exports increases slightly. Third, competition from other exporters receiving similar preferences or benefiting from the same increased liberalization have a crucial impact. In the case of DFQF, other least developed countries from the Asian region also benefit from the 100% market access. They are major competitors. As a consequence, structure of trade towards developed countries and emerging economies is reorientated towards raw agricultural products.

3.3. Sensitivity to interactions of different trade integration levels

Could a combination of regional integration with DDA and DFQF be the best solution?

What are the impacts of the EPA vs. GSP scenarios on overall results ?

3.4. Heterogeneity of the country level impact

Sub-Saharan African countries are far from being homogeneously affected by the different forms of trade liberalization simulated. Despite similar initial preferential schemes, sub-Saharan African countries benefit from a very wide range of preferential margins.

	Per Cent change							Absolute change ($ bln)						
	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP	DDA	DFQF	DDA DFQF	Reg FTA	SSA FTA	EPA	GSP
Botswana	0,39	-0,02	0,37	0,01	-0,09	-0,04	-0,02	0,02	0,00	0,02	0,00	-0,01	0,00	0,00
CentralAf	-0,20	0,01	-0,20	0,01	-0,10	-0,28	-0,02	-0,05	0,00	-0,05	0,00	-0,02	-0,07	0,00
Ethiopia	0,03	0,00	0,04	0,00	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Mada	-0,35	2,35	1,80	0,00	0,06	-0,18	-0,04	-0,01	0,08	0,06	0,00	0,00	0,01	0,00
Malawi	-0,37	1,55	0,99	0,01	-0,73	0,13	0,04	-0,01	0,03	0,02	0,00	-0,01	0,00	0,00
Mauritius	-0,15	0,06	-0,07	0,03	0,64	-1,68	-1,73	-0,01	0,00	0,00	0,00	0,03	0,08	-0,08
Mozambique	0,04	0,30	0,28	-0,32	0,22	0,14	0,00	0,00	0,02	0,01	-0,02	0,01	0,01	0,00
Nigeria	0,35	-0,03	0,33	-0,24	0,33	0,45	0,00	0,14	-0,01	0,13	-0,09	0,13	0,17	0,00
RoEastAf	0,05	0,52	0,45	0,03	0,12	0,11	0,00	0,02	0,24	0,21	0,01	0,06	0,05	0,00
RoSACU	-0,41	0,01	-0,36	0,16	0,47	0,31	-0,08	-0,02	0,00	-0,02	0,01	0,03	0,02	0,00
RoWestAf	-0,01	0,15	0,12	-0,32	0,25	0,13	0,00	0,00	0,07	0,06	-0,16	0,13	0,07	0,00
Senegal	0,08	5,90	5,50	0,06	0,08	-0,21	0,00	0,01	0,46	0,43	0,00	0,01	0,02	0,00
SthAfrica	0,05	0,03	0,08	0,02	0,39	0,09	0,00	0,09	0,06	0,14	0,04	0,68	0,16	0,00
SthCentAf	-0,26	0,16	-0,11	0,01	0,09	-0,55	0,00	-0,05	0,03	-0,02	0,00	-0,02	0,11	0,00
Tanzania	0,10	16,27	15,73	0,07	0,07	-0,11	0,00	0,01	1,73	1,67	0,01	-0,01	-0,01	0,00
Uganda	0,09	0,61	0,56	0,06	0,07	-0,06	0,00	0,01	0,04	0,03	0,00	0,00	0,00	0,00
Zambia	-0,04	0,31	0,24	-0,33	0,04	-0,10	0,01	0,00	0,01	0,01	0,01	0,00	0,00	0,00
Zimbabwe	-0,09	0,22	0,09	0,02	-1,26	0,65	-4,00	0,00	0,01	0,00	0,00	-0,04	0,02	-0,02
Nb of losers	9	2	4	4	13	12	7							

Table 15 Welfare impacts for the SSA regions

In terms of welfare, table 14 shows that DFQF reduces the number of loosers the most, since only two non LDC countries loose (Bostwana and Nigeria)

Compared with the preferences margins, I find that countries benefiting from a high initial preference margins face erosion of preferences with any trade liberalization at the multilateral level. But countries with a high initial negative margin such as those specialized in the exports of highly protected agricultural products are offered new opportunities. The extent to which each country is able to grasp those opportunities depends on its level of competitiveness. Since many sub-Saharan Africa export similar products, and are in competition with Asian LDCs for some products, the distributional impacts within the region are highly contrasted.

Concluding remarks

The shifting trade context induces complex challenges and opportunities for Sub-Saharan African countries pursuing agricultural export led growth. As such, general equilibrium modeling is a convenient way to assess impacts of trade policies in a consistent framework. Many simulations in the past have considered sub-Saharan African interests and constraints, and have highlighted important

features of trade liberalization such as the erosion of preferences and the issue of tariffs peaks and tariff escalation. But there is not yet a definitive conclusion on the impact of multilateral trade liberalization on sub-Saharan Africa. What are the new results from this study?

First, sub-Saharan African countries benefiting from high preference margins will experience erosion of preferences with any trade liberalization at the multilateral level. An ambitious DFQF does offer opportunities to increase agricultural exports that can compensate for some of the negative effects of a DDA. A rough analysis of these preliminary results could thus lead to the conclusion that increased multilateral liberalization is the most advisable trade policy for the sub-Saharan African region considering its overall positive impacts.

But further analysis of those results shows that the opportunities offered by DFQF are concentrated on raw agricultural exports. As a consequence, the scenario most favorable for overall increase in exports which is multilateral liberalization in the form of a combined DDA and DFQF also encourages sub-Saharan African countries to specialize in raw agricultural products. This trend is not coherent with the view that sub-Saharan African countries should not only diversify their export products but also capture more value added on their exports. On the contrary, regional integration within sub-Saharan Africa, albeit not increasing exports volumes to the same extent as multilateral liberalization, does promote agro-industrial trade within sub-Saharan African countries, bringing equivalent gains to sub-Saharan African countries than a simple DDA. My results thus highlight that there is a trade-offs in terms of exports volume or value added between a regional and multilateral trade liberalization.

The implication of those results is that in order for a multilateral integration, even preferential such as the "DFQF", to be coherent with sub-Saharan African countries's stake to capture more value added in agriculture, sub-Saharan African countries need to first increase their competitiveness. Regional integration could be a way to do so, since it would enable most countries to combine increased exports volume and increase value added captured.

Annexes

Annex 1 Mapping of the regional decomposition: 29 regions of which 18 from Sub-saharan Africa

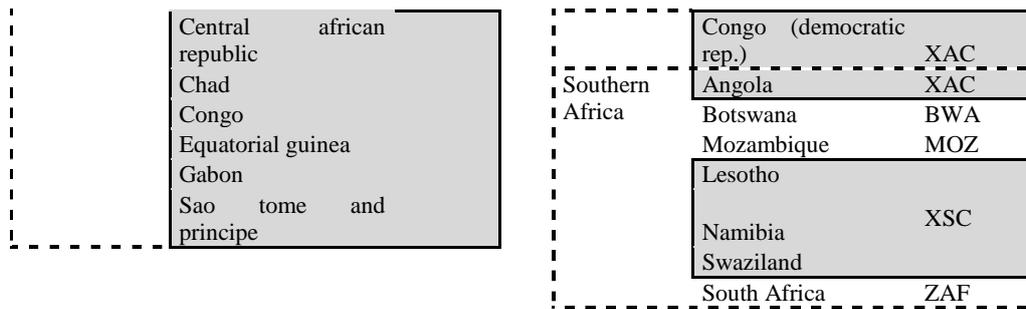| Simulation Regions	GTAP Description	Zones of interest
EU	AUT, BEL, DNK, FIN, FRA, DEU, GRC, HUN, IRL, ITA, LUX, NLD, POL, PRT, ESP, SWE, GBR, NOR, ROU, BGR	Developped
USA	USA	Developped
Japan	JPN	Developped
Rest of the World	AUS, NZL, XOC, CAN, XNA, CYP, CZE, EST, LVA, LTU, MLT, SVK, SVN, CHE, XEF, ALB, BLR, HRV, RUS, UKR, XEE, XER, KAZ, KGZ, XSU, ARM, AZE, GEO, IRN, TUR, XWS	Developed
Brazil	BRA	Emerging Economies
China	CHN	Emerging Economies
India	IND	Emerging Economies
Asian Tiger	HKG, KOR, TWN, MYS, SGP, THAI	Emerging Economies
Rest of Asia	XEA, KHM, IDN, LAO, MNR, PHL, THA, XSE, BGD, PAK, LKA, XSA	Other Developing Countries
Rest of Southern America	MEX,ARG,BOL,CHL,COL,ECU,PRY,PER,URY,VEN,XSM,CRI,GTM,NIC,PAN,XCA, XCB	Other Developing Countries
Northern Africa	EGY, MAR, TUN, XNF	Other Developing Countries
Bostwana	BWA	Sub-Saharan Africa
Ethiopia	ETH	Sub-Saharan Africa
Madagascar	MDG	Sub-Saharan Africa
Mozambique	MOZ	Sub-Saharan Africa
Mauritius	MUS	Sub-Saharan Africa
Malawi	MWI	Sub-Saharan Africa
Nigeria	NGA	Sub-Saharan Africa
Senegal	SEN	Sub-Saharan Africa
Tanzania	TZA	Sub-Saharan Africa
Uganda	UGA	Sub-Saharan Africa
South Africa	ZAF	Sub-Saharan Africa
Zambie	ZMB	Sub-Saharan Africa
Zimbabwe	ZWE	Sub-Saharan Africa
Rest of South Central Africa	XAC	Sub-Saharan Africa
Central Africa	XCF	Sub-Saharan Africa
Rest of Eastern Africa	XEC	Sub-Saharan Africa
Rest of South African Customs Union	XSC	Sub-Saharan Africa
Rest of Western Africa	XWF	Sub-Saharan Africa

Annex 2 Mapping of the sectoral decomposition: 28 sectors of which 20 agricultural

Definition	GTAP sector	Sector of interest
Paddy rice	pdr	Raw agricultural and food products
Processed rice	pcr	Raw agricultural and food products

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Wheat	wht	Raw agricultural and food products
Cereals	gro	Raw agricultural and food products
Cattle	ctl, cmt	Raw agricultural and food products
Milk	rmk	Raw agricultural and food products
Vegetable and Fruits	v_f	Raw agricultural and food products
Other crops	ocr	Raw agricultural and food products
Other animal product	oap	Raw agricultural and food products
Oilseeds	osd	Raw agricultural and food products
Sugar plants	c_b	Raw agricultural and food products
Plant based fiber	pfb	Raw agricultural and food products
Other food products	ofd	AgroFood industries
Other processed meat products	omt	AgroFood industries
Sugar	sgr	AgroFood industries
Bevarages and Tobacco	b_t	AgroFood industries
Fishing	fsh	Fishing
Dairy products	mil	Food staple
Textile	tex, wap, lea	Other
Wood and paper industry	frs, lum, ppp	Other
Other manufactured products	crp, nmm, omf	Other
Primary	coa, oil, gas, omn, p_c, i_s, nfm, fmp	Other
Services	ely, gdt, wtr, ofi, isr, obs, ros, osg, dwe	Other
Trade	trd	Other
Transport	atp, cmn, otp, wtp	Other
Transport and Equipment	mvh, otn, ele, ome, cns	Other

Annex 3: The sub-Saharan countries in GTAP 7 and the EPA regions

EPA regions	Country	GTAP 7 regions	EPA regions	Country	GTAP 7 regions
Western Africa	Nigeria	NGA	Esatern Africa	Ethiopia	ETH
	Benin			Madagascar	MDG
	Burkina faso			Mauritius	MUS
	Cape verde			Malawi	MWI
	Côte d'ivoire			Tanzania	TZA
	Gambia			Uganda	UGA
	Ghana			Burundi	
	Guinea	XWF		Comoros	
	Guinea-bissau			Djibouti	
	Liberia			Eritrea	
	Mali			Kenya	XEC
	Mauritania			Rwanda	
	Niger			Seychelles	
	Sierra leone			Somalia	
	Togo			Sudan	
	Senegal	SEN		Zambia	ZMB
Central Africa	Cameroon	XCF		Zimbabwe	ZWE

	Congo (democratic rep.)	XAC
	Angola	XAC
Southern Africa	Botswana	BWA
	Mozambique	MOZ
	Lesotho	
	Namibia	XSC
	Swaziland	
	South Africa	ZAF

Central african republic
Chad
Congo
Equatorial guinea
Gabon
Sao tome and principe

Annex 4: Top 20 tariff cuts for SSAn agricultural exports in the DDA scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the DDA scenario	Initial trade (10^6 \$)
Malawi	USA	Exports Crops	-60.79	-0.32	0.20	55.58
Rest of Eastern Africa	Asian Tigers	Oilseeds	-67.71	-0.71	0.34	20.40
Rest of Eastern Africa	Rest of the World	Cattle	-19.01	-0.02	0.08	209.06
Rest of Eastern Africa	Rest of the World	Exportable Crops	-35.08	-0.06	0.12	132.19
Rest of Western Africa	Japan	Other Food products	-41.10	-0.02	0.04	130.66
Rest of Western Africa	Nigeria	Other Food products	-25.96	-0.07	0.19	67.00
Rest of Western Africa	Nigeria	Vegetables and Fruits	-50.00	-0.50	0.50	8.35
Rest of Western Africa	Nigeria	Beverages and Tobacco	-64.50	-0.90	0.50	3.48
South Africa	Asian Tigers	Vegetables and Fruits	-52.39	-0.10	0.09	71.54
South Africa	Asian Tigers	Other Food products	-50.22	-0.07	0.07	69.67
South Africa	Asian Tigers	Sugar	-52.13	-0.11	0.10	40.92
South Africa	Japan	Other Food products	-47.21	-0.06	0.07	64.97
South Africa	Japan	Vegetables and Fruits	-49.54	-0.06	0.06	43.01
South Africa	Japan	Sugar	-30.25	-0.36	0.83	28.46
South Africa	Nigeria	Beverages and Tobacco	-59.73	-0.69	0.47	21.27
South Africa	Nigeria	Other Food products	-35.26	-0.16	0.30	16.81
South Africa	Rest of the World	Vegetables and Fruits	-31.51	-0.04	0.09	203.83
South Africa	Rest of the World	Other Food products	-15.98	-0.02	0.12	153.94
South Africa	Rest of the World	Beverages and Tobacco	-17.71	-0.06	0.29	75.39
Zimbabwe	USA	Exports Crops	-66.51	-0.37	0.18	14.06

Annex 5: Top 20 tariff cuts for SSAn agricultural exports in the DFQF scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the DFQF scenario	Initial trade (10^6 \$)
Malawi	India	Vegetables and Fruits	-100	-0.44	0.00	3.45
Malawi	Rest of South America	Other Food products	-87	-0.26	0.04	8.44
Malawi	Rest of the World	Other Food products	-15	-0.02	0.14	63.84
Malawi	USA	Other Food products	-100	-0.52	0.00	55.58
Mozambique	India	Vegetables and Fruits	-100	-0.31	0.00	23.85
Mozambique	India	Sugar	-100	-1.00	0.00	2.43
Rest of Eastern Africa	Asian Tigers	Oilseeds	-94	-0.99	0.06	20.40
Rest of Eastern Africa	India	Vegetables and Fruits	-45	-0.16	0.20	9.61

Rest of Eastern Africa	Japan	Exports Crops	-84	-0.06	0.01	53.14
Rest of Eastern Africa	Rest of South America	Exports Crops	-41	-0.07	0.10	29.19
Rest of Eastern Africa	Rest of the World	Cattle	-46	-0.05	0.06	209.06
Rest of Eastern Africa	Rest of the World	Oilseeds	-46	-0.04	0.05	94.94
Rest of Western Africa	Asian Tigers	Oilseeds	-65	-0.23	0.12	5.43
Rest of Western Africa	India	Vegetables and Fruits	-50	-0.16	0.17	157.55
Rest of Western Africa	India	PlantFib	-95	-0.09	0.01	47.91
Rest of Western Africa	Japan	Other Food products	-14	-0.01	0.05	130.66
Tanzania	India	VegFruits	-100	-0.31	0.00	67.55
Tanzania	India	PlantFib	-100	-0.10	0.00	13.04
Tanzania	India	Exports Crops	-100	-0.78	0.00	2.79
Uganda	USA	Exports Crops	-100	-0.15	0.00	17.36

Annex 6: Top 20 tariff cuts for SSAn agricultural exports in the DDA+DFQF scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the DDA+ DFQF scenario	Initial trade (10⁶ $)
Malawi	USA	Exports Crops	-100	-0.52	0.00	55.58
Mozambique	India	Vegetables and Fruits	-100	-0.31	0.00	23.85
Rest of Eastern Africa	AsianTig	Oilseeds	-98	-1.02	0.02	20.40
Rest of Eastern Africa	Rest of the World	Cattle	-47	-0.05	0.06	209.06
Rest of Eastern Africa	Rest of the World	Exports Crops	-36	-0.07	0.12	132.19
Rest of Eastern Africa	Rest of the World	Oilseeds	-53	-0.05	0.04	94.94
Rest of Western Africa	India	Vegetables and Fruits	-50	-0.16	0.17	157.55
Rest of Western Africa	India	PlantFib	-95	-0.09	0.01	47.91
Rest of Western Africa	Japan	Other Food products	-50	-0.03	0.03	130.66
Rest of Western Africa	Nigeria	Other Food products	-26	-0.07	0.19	67.00
Rest of Western Africa	Nigeria	Vegetables and Fruits	-50	-0.50	0.50	8.35
South Africa	AsianTig	Vegetables and Fruits	-52	-0.10	0.09	71.54
South Africa	AsianTig	Other Food products	-50	-0.07	0.07	69.67
South Africa	AsianTig	Sugar	-52	-0.11	0.10	40.92
South Africa	Japan	Sugar	-30	-0.36	0.83	28.46
South Africa	Nigeria	BevTobac	-60	-0.69	0.47	21.27
South Africa	Rest of the World	Vegetables and Fruits	-32	-0.04	0.09	203.83
South Africa	Rest of the World	BevTobac	-18	-0.06	0.29	75.39
Tanzania	India	Vegetables and Fruits	-100	-0.31	0.00	67.55
Zimbabwe	USA	Exports Crops	-67	-0.37	0.18	14.06

Annex 7: Top 20 tariff cuts for SSAn agricultural exports in the Regional FTA scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the Regional FTA scenario	Initial trade (10⁶ $)
Rest of SACU	Rest of Southern Africa	Beverage and tobacco	-83	-0.23	0.05	67.50
Rest of Eastern Africa	Rest of Eastern Africa	Other exportable crops	-100	-0.11	0.00	47.62
Rest of Eastern Africa	Rest of Eastern Africa	Other food products	-100	-0.10	0.00	28.36
Rest of Eastern Africa	Rest of Eastern Africa	Vegetables and Fruits	-100	-0.17	0.00	16.41
Rest of western Africa	Nigeria	Beverage and tobacco	-100	-1.40	0.00	3.48
Rest of western Africa	Nigeria	Cattle	-100	-0.19	0.00	40.37

Rest of western Africa	Nigeria	OilFats	-100	-0.69	0.00	6.16
Rest of western Africa	Nigeria	Other food products	-100	-0.26	0.00	67.00
Rest of western Africa	Nigeria	Vegetables and Fruits	-100	-1.00	0.00	8.35
Rest of western Africa	Rest of western Africa	OilFats	-100	-0.04	0.00	75.12
Rest of western Africa	Rest of western Africa	Other food products	-100	-0.08	0.00	213.22
Rest of western Africa	Rest of western Africa	Plant for fibers	-100	-0.05	0.00	182.43
Rest of western Africa	Rest of western Africa	Vegetables and Fruits	-100	-0.12	0.00	39.14
South Africa	Mozambique	Other food products	-100	-0.19	0.00	33.10
South Africa	Mozambique	Vegetables and Fruits	-100	-0.22	0.00	16.56
South Africa	Rest of Southern Africa	Beverage and tobacco	-55	-0.13	0.10	86.37
Tanzania	Rest of Eastern Africa	Other exportable crops	-100	-0.21	0.00	17.88
Tanzania	Rest of Eastern Africa	Other food products	-100	-0.28	0.00	28.25
Uganda	Rest of Eastern Africa	Other exportable crops	-100	-0.11	0.00	35.71
Zimbabwe	Rest of Southern Africa	Sugar	-100	-0.20	0.00	15.86

Annex 8: Top 20 tariff cuts for SSAn agricultural exports in the SSA FTA scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the SSA FTA scenario	Initial trade (10^6 $)
Mozambique	Malawi	Exports Crops	-100	*-0.22*	0.00	26.13
Rest of SACU	Rest of Southern Africa	Beverage and Tobacco	-100	*-0.28*	0.00	67.50
Rest of Eastern Africa	Rest of Eastern Africa	Other food crops	-100	*-0.11*	0.00	47.62
Rest of western Africa	Nigeria	Other food crops	-100	*-0.26*	0.00	67.00
Rest of western Africa	Nigeria	Cattle	-100	*-0.19*	0.00	40.37
Rest of western Africa	Nigeria	Vegetable and Fruits	-100	*-1.00*	0.00	8.35
Rest of western Africa	Nigeria	Beverage and Tobacco	-100	*-1.40*	0.00	3.48
Rest of western Africa	Rest of central africa	Other food crops	-100	*-0.24*	0.00	34.31
Rest of western Africa	Rest of western Africa	Other food crops	-100	*-0.08*	0.00	213.22
Rest of western Africa	Rest of western Africa	PlantFib	-100	*-0.05*	0.00	182.43
South Africa	Mauritius	Sugar	-100	*-0.80*	0.00	10.32
South Africa	Mozambique	Other food crops	-100	*-0.19*	0.00	33.10
South Africa	Nigeria	Beverage and Tobacco	-100	*-1.16*	0.00	21.27
South Africa	Nigeria	Other food crops	-100	*-0.46*	0.00	16.81
South Africa	Rest of Eastern Africa	Sugar	-100	*-0.31*	0.00	20.16
South Africa	Rest of Southern Africa	Beverage and Tobacco	-100	*-0.23*	0.00	86.37
South Africa	Zimbabwe	Cereals	-100	*-0.25*	0.00	61.75
South Africa	Zimbabwe	Other food crops	-100	*-0.29*	0.00	30.27
South Africa	Zimbabwe	Exports Crops	-100	*-0.60*	0.00	13.29
Tanzania	Rest of Eastern Africa	Other food crops	-100	*-0.28*	0.00	28.25

Annex 9: Top 20 tariff cuts for SSAn agricultural exports in the EPA scenario

Exporters	Importers	Sectors	Tariff cut (as % of initial tariff)	Equivalent tariff reduction	Tariff in the SSA FTA scenario	Initial trade (10^6 $)
Mauritius	EU	Other food products	-33	-0.03	0.05	0.12
Nigeria	EU	Exports Crops	-52	-0.01	0.01	0.73
Nigeria	EU	Other food products	-63	-0.07	0.04	0.45
Rest of Central Africa	EU	Vegetable and Fruits	-26	-0.04	0.10	0.21
Rest of Esatern Africa	EU	Exports Crops	-22	-0.02	0.05	1.22
Rest of Esatern Africa	EU	Other food products	-40	-0.03	0.04	1.34

Rest of Esatern Africa	EU	Vegetable and Fruits	-12	-0.01	0.08	0.30
Rest of SACU	EU	Other food products	-39	-0.07	0.11	0.62
Rest of Western Africa	EU	Exports Crops	-41	-0.01	0.01	8.67
Rest of Western Africa	EU	Oilseeds	-32	-0.01	0.02	0.38
Rest of Western Africa	EU	Other food products	-33	-0.02	0.04	9.76
Rest of Western Africa	EU	Vegetable and Fruits	-17	-0.01	0.06	0.21
South Africa	EU	Beverage and Tobacco	-45	-0.13	0.16	0.06
South Africa	EU	Exports Crops	-45	-0.05	0.06	1.15
South Africa	EU	Meat	-37	-0.02	0.03	1.04
South Africa	EU	Oilseeds	-68	-0.07	0.03	0.06
South Africa	EU	Other food products	-43	-0.08	0.10	0.75
South Africa	EU	Sugar	-54	-0.11	0.10	5.11
South Africa	EU	Vegetable and Fruits	-45	-0.08	0.10	2.33
Zimbabwe	EU	Exports Crops	-53	-0.08	0.07	11.12

Annex 10: Top 20 tariff increases for SSAn agricultural exports to the EU in the GSP scenario

Exporters	Importers	Sectors	Tariff increase (% initial tariff)	Equivalent ad valorem tariff increase	Tariff in the GSP scenario	Initial trade (10^6 $)
Mauritius	EU	Other Food products	13	0.01	0.09	0.12
Mauritius	EU	Sugar	251	0.26	0.37	0.11
Nigeria	EU	Other Food products	2	0.00	0.11	0.45
Rest of Central Africa	EU	Oilseeds	2	0.00	0.09	0.00
Rest of Central Africa	EU	Other Food products	6	0.01	0.18	0.02
Rest of Central Africa	EU	Vegetables and Fruits	19	0.03	0.16	0.21
Rest of Eastern Africa	EU	Oilseeds	0	0.00	0.04	1.16
Rest of Eastern Africa	EU	Other Food products	3	0.00	0.07	1.34
Rest of Eastern Africa	EU	Vegetables and Fruits	0	0.00	0.09	0.30
Rest of SACU	EU	Cereals	9	0.01	0.18	0.00
Rest of SACU	EU	Meat	1	0.00	0.06	0.01
Rest of SACU	EU	Other Food products	10	0.02	0.19	0.62
Rest of SACU	EU	Sugar	228	0.21	0.30	0.13
Rest of SACU	EU	Vegetables and Fruits	1	0.00	0.19	0.02
Rest of Western Africa	EU	Exports Crops	0	0.00	0.03	8.67
Rest of Western Africa	EU	Oilseeds	3	0.00	0.04	0.38
Rest of Western Africa	EU	Other Food products	2	0.00	0.06	9.76
Rest of Western Africa	EU	Vegetables and Fruits	11	0.01	0.08	0.21
Zimbabwe	EU	Other Food products	14	0.01	0.09	0.01
Zimbabwe	EU	Vegetables and Fruits	7	0.01	0.13	0.02

Annex 11: List of beneficiaries from preference schemes

Modified from Carrere, C., De Melo, J., 2010, "The Doha Round and Market Access for least developed countriess: Scenarios for the EU and US Markets", Journal of World Trade, Janvier 2010, Volume 44, Issue 1, p. 251-290

Categories of preferences			Countries
Sub-saharan African least developed countries			Angola, Benin, Burkina Faso, Burundi, (Cape Verde), Central Africa, Chad, Comoros, Congo (DR), Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea Biss., Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, S.Tome Princ, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zambia
Sub-saharan African non least developed countriess			Botswana, Cameroon, Congo, Gabon, Ghana, Ivory Coast, Kenya, Mauritius, Namibia, Nigeria, Seychelles, Swaziland, Zimbabwe
			+ South Africa
Other Pacific least and Caribean Cotonou countries	least developed countries		Haiti, Kiribati, Solomon Island, Timor, Tuvalu, Vanuatu, Samoa
	non least developed countries		Antigua,Bahamas, Barbados, Belize, Cook Islands, Cuba, Dominica, Dominican R., Micronesia, Fiji, Grenada, Guyana, Jamaica, Marshall Island, Nauru, Niue, Palau, Papua N.G., St.Ch.&Nevis, St Lucia, St Vincent, Surinam, Tonga, Trinidad ,Tobago
Other least developed countriess being granted EBA			Afghanistan, Bangladesh, Bhutan, Cambodia, Lao PDR, Maldives, Myanmar, Nepal, Yemen
Other GSP countries (non exhaustive list)			Algeria, Argentina, Armenia, Azerbaijan, Bahrain, Belarus, Bolivia, Brazil, Brunei, Chile, China, Colombia, CostaRica, Ecuador, Egypt, ElSalvador, Georgia, Guatemala, Honduras, India, Indonesia, Iran, Iraq, Jordan, Kasakhstan, Kuwait, Kyrgyz,Republic,Lebanon, Malaysia, Mayotte, Mexico, MoldovaMongolia, Montserrat, Morocco, Nicaragua, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Qatar, Russia, SaudiArabia, SriLanka, Syria, Thailand, Tunisia, U.A.Emirates, Ukraine, Uruguay, Uzbekistan, Venezuela, Vietnam

Scenario with EPA: All EPA countries are granted the same preferences (SSA least developed countries, SSA non least developed countries and Other Pacific and Caribean Cotonou countries).

Annex 12 Impacts of liberalization on the GDP

Annex 13 Impacts of liberalization on the tariff revenue

Annex 14 Impacts of liberalization on the exports value

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