

# Unrestricted Market Access For Sub-Saharan Africa: How much is it worth and who pays?

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## **Abstract:**

Initiatives to improve market access for the poorest countries have recently been announced by the European Union, Japan, and the United States. This paper assesses the impact of these initiatives and others that might be taken on a subset of 37 Sub-Saharan African countries (SSA-37) of these initiatives and others that might be taken. We find that fully unrestricted access to all the QUAD countries would produce substantial gains for SSA-37, leading to a 14 percent increase in non-oil exports (\$2.5 billion) and boosting real incomes in SSA-37 by around 1 percent. Most of these gains would come from preferential access to the highly protected Japanese and European agricultural markets. The smallness of SSA-37 ensures that the costs of trade diversion for the QUAD, other developing countries and the world as a whole are negligible.

*JEL classification:* F11, F13

*Keywords:* Duty-free access, least developed countries, Sub-Saharan Africa.

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## Non-Technical Summary

Improved market access for the poorest countries is widely seen as necessary to support their development effort and also as a critical element of a new “Development Round” of multilateral trade negotiations. This paper assesses the implications for a subset of 37 Sub-Saharan African countries (SSA-37) and the rest of the world of the initiatives recently announced by the United States, Japan and the European Union, as well as other initiatives that might be taken.

Even if the United States were to grant completely unrestricted access to its market to all SSA-37 products (the most generous interpretation of the Africa Growth and Opportunity Act), there would be hardly any impact on SSA-37 - only a 0.4 percent increase in non-oil exports and hardly any change in welfare. This is because the US market is quite open already, and the areas in which it is not (e.g. apparel) are of limited export interest for SSA-37. Japan’s offer of free access to its markets for industrial products would produce even smaller gains. However, significant gains would arise from the proposed unrestricted access for “everything but arms” to the EU market – a \$513 million (2.8 per cent) increase in non-oil exports and a \$317 million (0.2 percent) improvement in welfare – arising largely from increased exports of agricultural products like meat, fibers and sugar. The largest gains for SSA-37 would come from eliminating all barriers in the entire QUAD (Canada, EU, Japan and US) – a \$2.5 billion (14 per cent) increase in non-oil exports and a \$1.8 billion (1.2 percent) increase in welfare – largely thanks to increased exports to the heavily protected Japanese market for certain cereal grains and meat.

What about the rest of the world? The impact on developing countries, who might fear the consequences of trade diversion, would be surprisingly small, because SSA-37 exports are not large enough to have a significant impact on prices in export markets. Even if SSA-37 were granted unrestricted access to the entire QUAD market, developing countries exports would decline by only \$650 million (0.04 percent). The preference-granting countries would generally suffer a decline in welfare, because the main impact of increased SSA-37 exports is not on consumer welfare but on tariff revenue, due to the displacement of imports from tariff-paying sources. The biggest loser would be Japan if it were to grant unrestricted preferential access for all SSA-37 products – welfare would decline by \$5.2 billion or 0.1 per cent. The world as a whole invariably loses from the preferential access initiatives, but the losses are concentrated in the rich countries and are small in absolute magnitude (less than 0.01 percent decline in the QUAD’s welfare).

To put the gains for SSA-37 in perspective, we find that if total factor productivity in SSA-37 could somehow be increased by 1.5 per cent, gains in welfare would be roughly equivalent to the gains from completely unrestricted access to the QUAD market.

Apart from assisting SSA-37, generating enthusiasm for a new round is a motive for the recent initiatives. Would SSA-37, having obtained preferential access to the QUAD market, view a new round of multilateral trade negotiations with enthusiasm or apprehension? We examine the impact on SSA-37 of a cut in the non-preferential levels of protection in all countries. Total exports of SSA-37 to the world would decline only slightly, due to improved access to developing country markets as well as a diversion of exports to other markets. But SSA-37 would lose a third of the welfare gains it obtains from (hypothetical) preferential access, due to the deterioration in its terms-of-trade – reflecting a shift of exports from the high-priced Japanese market to other relatively low-priced markets.

## 1. Introduction

Improved market access for the poorest countries is widely seen as necessary to support their development effort and also as a critical element of a new “Development Round” of multilateral trade negotiations. Japan, the European Union and the United States are among those who have recently announced initiatives, supported by multilateral institutions like the WTO and the World Bank. While the measures differ in coverage, conditions and clarity, they have one thing in common: improved access is to be *preferential*, i.e. only the poorest countries will benefit.

The purpose of this paper is twofold. First, to assess the value of alternative initiatives for a subset of 37 Sub-Saharan African countries, henceforth referred to as SSA-37. Our definition of SSA-37 excludes the Southern African Customs Union (SACU) and seven other Southern African countries (for a list of countries included in our SSA-37 definition see Table 1).<sup>1</sup> Second, to identify the implications of these initiatives for the rest of the world. Any liberalization is likely to benefit consumers in the preference granting countries. But preferential access for SSA-37 exports will necessarily divert trade away from other exporters, many of whom are likely to be in other developing countries. And will also lead to a loss in tariff revenue for the preference-granting country. We first depict these effects in a simple partial equilibrium model, and then empirically assess their importance using a computable general equilibrium model.

A case study of the impact on SSA-37 seems worthwhile for at least three reasons. First, all but three of the thirty seven countries in SSA-37 have been classified as Least Developed Countries (LDC) or Highly Indebted Poor Countries (HIPC), and are therefore likely to be part of any LDCs or HIPC initiative by the European Union, United States, Canada and Japan (the QUAD). This region, with a population of 500 million, has a GDP per capita of 320 dollars (or less than a dollar per day). Second, the legislation recently

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<sup>1</sup> We discuss the reasons for exclusion of some Sub-Saharan African countries from the SSA-37 region in the footnote to Table 1.

passed by the United States Congress grants completely unrestricted access<sup>2</sup> (no input requirements or rules of origin) to any African country with a GDP per capita below 1500 dollars. Only two of the thirty seven SSA-37 countries in our sample have a GDP above 1500 dollars (Gabon 4800 dollars and Seychelles 7000 dollars). Third, and this is an important practical reason, existing multi-country general equilibrium models, such as GTAP, which we use in this paper, provide a standard and readily-available country aggregate for SSA-37.

The precise coverage and status of the different initiatives is not clear. We choose to focus on five scenarios, each of which reflects in somewhat stark form, an initiative that is either underway or under consideration. These include duty and quota-free access for SSA-37 exports of:

- a) apparel to the US;
- b) all products to the US (widest interpretation of the Africa Growth and Opportunity Act);
- c) industrial products to Japan;
- d) all products except arms to the EU (latest proposal by the European Commission);
- e) all products to the US, EU, Canada and Japan , i.e. the QUAD.

We also carry out two further simulations designed to put preferential market access in perspective. The first examines the impact on SSA-37 of a cut in the non-preferential levels of protection in all other countries. The question we have in mind is whether SSA-37, having obtained preferential access to the QUAD market, would view a new round of multilateral trade negotiations with enthusiasm or apprehension.<sup>3</sup> The second simulation compares the implications for welfare in SSA-37 of an improvement in supply conditions with the implications of preferential access.

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<sup>2</sup> This is for an initial period of four years.

<sup>3</sup> The question seems relevant because improved access for least developed countries is being seen as a condition for a new round rather than as a result.

The paper is organized as follows. Section 2 describes the main effects of granting preferential access to SSA-37 using a partial equilibrium model. Section 3 describes briefly the pattern of SSA-37 exports in terms of products and destinations, and the current conditions of access. Section 4 discusses the assumptions and structure of the multi-country Computable General Equilibrium (CGE) model used to estimate the impact of preferential access. Section 5 presents the empirical estimates under alternative scenarios. Section 6 concludes.

## 2. Unrestricted access for SSA-37: who wins and who loses?

The impact of granting unrestricted access on welfare in different groups of countries can be illustrated using a simple partial model. This is depicted in Figure 1. There are three countries: one developed country, one developing country (DC) and one Sub-Saharan African country (SSA-37). There is only one good, which is imported by the developed country and exported by both DC and SSA-37. Import demand is denoted by  $M$ , export supply of the DC is denoted by  $X^D$ , export supply of SSA-37 is denoted by  $X^S$  and total (world) export supply is denoted  $X^T$ .<sup>4</sup>

Imports to the developed country are subject to an exogenous tariff  $t$ , which is initially applied to imports from both DC and SSA-37. The tariff-inclusive export supplies of the DC and SSA-37 are denoted by  $X^D + t$  and  $X^S + t$ , adding up to total tariff-inclusive export supply of  $X^T$ . The original equilibrium price in the developed country,  $p_0^D$ , is determined where import demand equals total world supply.

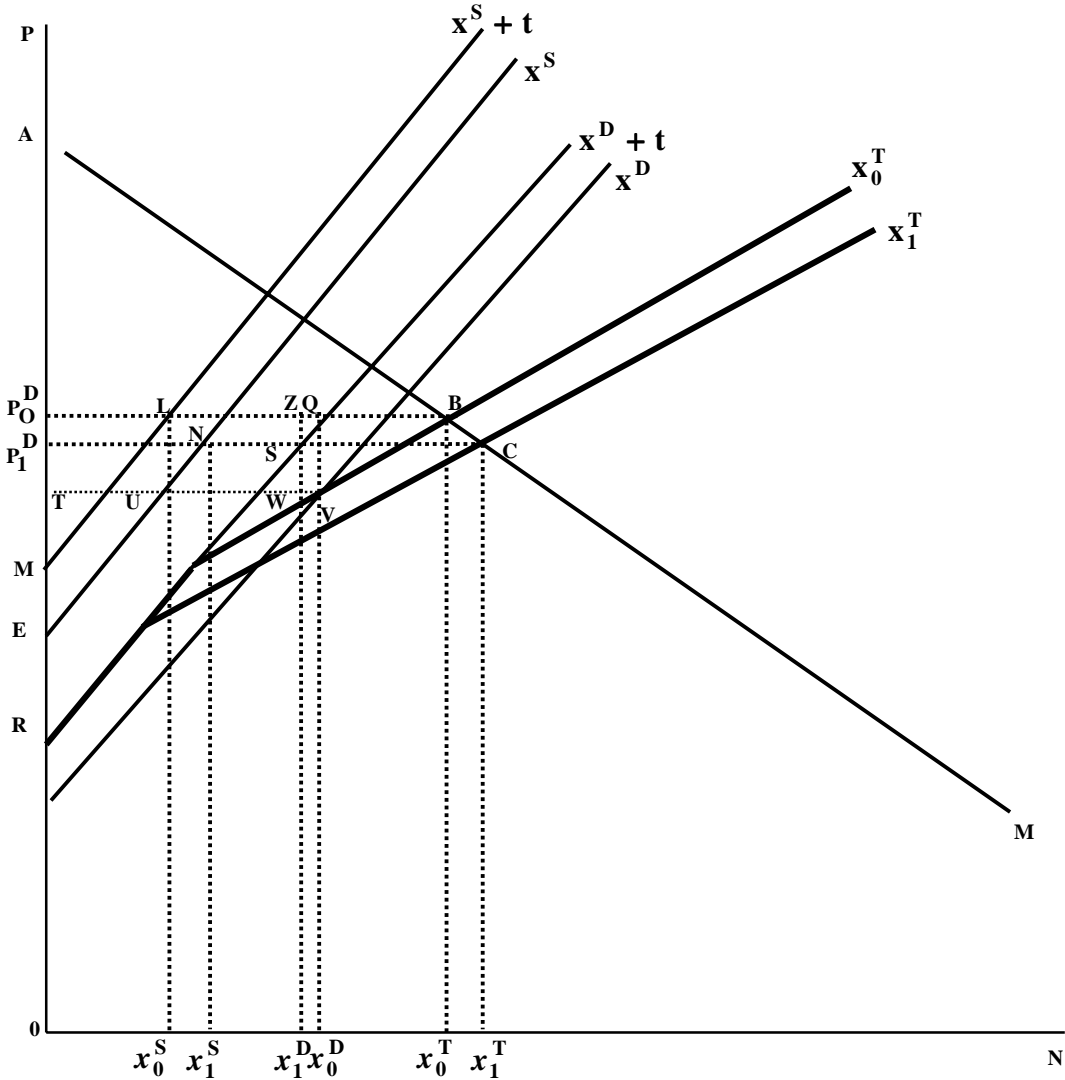
The initial export quantities of the DC and SSA-37 are respectively given by  $x_0^D$  and  $x_0^S$ , adding up to aggregate exports of  $x_0^T$ . Both developing country and SSA-37 exporters

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<sup>4</sup> For simplicity of exposition, let us assume that this product is not locally consumed in DC or SSA-37.

receive the same price for their exports,  $p_0^D - t$ , i.e. the developing country price net of the tariffs that they have to pay.

**FIGURE 1: PARTIAL EQUILIBRIUM EFFECT OF LDC PREFERENCES**



Now assume that SSA-37 exports can enter duty-free into the developed country market, so the relevant export supply for SSA-37 is  $X^S$  and the relevant aggregate export supply

is  $X_1^T$ . The new world price will be determined by the intersection of the import demand,  $M$ , with the new aggregate supply,  $X_1^T$ .

It is easy to show that  $p_1^D \leq p_0^D$ , so long as  $\frac{dX^S}{dp} > 0$ .<sup>5</sup> The intuition is straightforward.

At the original developed country price  $p_0^D$ , SSA-37 exporters increase the quantity supplied because they now receive a higher price than before, i.e.  $X^S(p_0^D) > X^S(p_0^D - t)$ . Hence, there will be an excess supply at the original price, inducing the price in the developed country to fall. But the decline in price will be less than the tariff reduction, so the price received by SSA-37 exporters will be higher than before, i.e.  $p_1^D > p_0^D - t$ . The price received by developing country exporters, on the other hand, will be lower than before, i.e.  $p_1^D - t < p_0^D - t$ .

The changes in producers' surplus for SSA-37 and DC, as well as the change in consumers' surplus and tariff revenue for the developed country, are depicted in Figure 1.

$$\text{Gain in producers' surplus for SSA-37} = p_1^D NE - p_0^D LM = p_1^D NUT$$

$$\text{Loss in producers' surplus for DC} = p_0^D QR - p_1^D SR = p_0^D QSp_1^D$$

$$\text{Gain in consumers' surplus for developed country} = p_0^D BCp_1^D$$

$$\text{Loss in tariff revenue for developed country} = p_0^D LUT + ZQVW = t(x_0^S + x_0^D - x_1^D)$$

Preferential access necessarily benefits the recipients, SSA-37, because they get a higher price for their exports, but it hurts those who are excluded, DC, because they get a lower price for their exports. The impact on the developed country is ambiguous, and depends on the relative strengths of the gain in consumers' surplus (due to trade creation) and the loss in tariff revenue (due to trade diversion). If SSA-37 is the least-cost source for a particular product, then the developed country and the world as a whole will necessarily

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<sup>5</sup> It is, of course, also required that the market equilibrium be stable.

gain from granting preferential access. If it is not, then the developed country and the world could lose from a preferential arrangement.

How important the gains and losses are for different countries is ultimately an empirical question, and to address this question, we will use a multi-country Computable General Equilibrium (CGE) model. But the smallness of SSA-37 - it accounts for a less than 1 percent share of QUAD imports - suggests that any impact of preferential access on the welfare of other countries and the world is unlikely to be large.

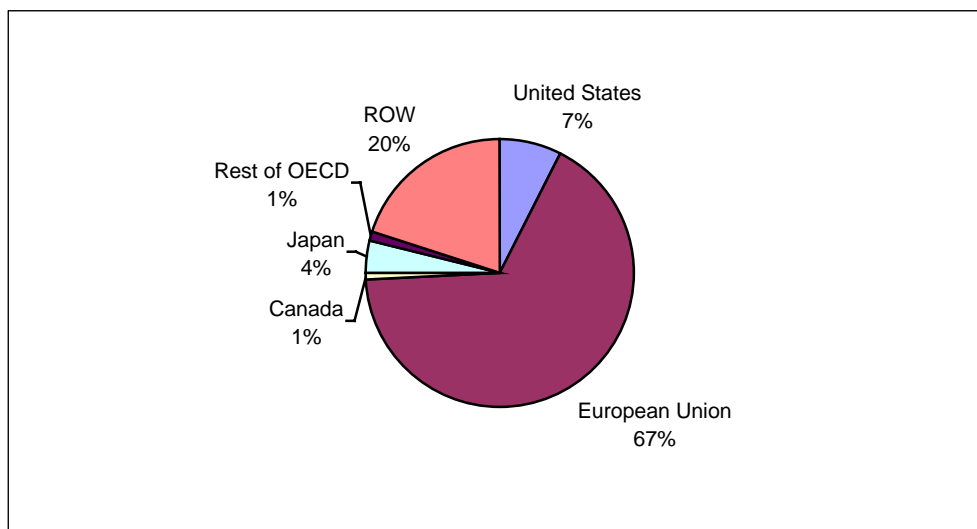
### **3. The pattern of Sub-Saharan Africa exports**

In 1995, SSA-37 exported 31.5 billion dollars worth of merchandise other than oil. About two-thirds of exports went to the European Union, around 7 percent to the United States and a fifth to other developing countries (ROW in Figure 2 below). Canada, Japan and other developed countries together accounted for only 6 percent of SSA-37 exports (4 percent for Japan, 1 for Canada and 1 for the rest of the OECD). Thus, almost 80 percent of SSA-37 exports were concentrated in the QUAD.

Oil exports accounted for around 43 percent of SSA-37's total merchandise exports (explained by Nigeria's presence in the SSA-37 aggregate). Nearly half of the oil was exported to the United States and about a third to the European Union. However, since oil is subject to hardly any protection in the QUAD countries, its presence has little impact on our simulations (see Table 2).



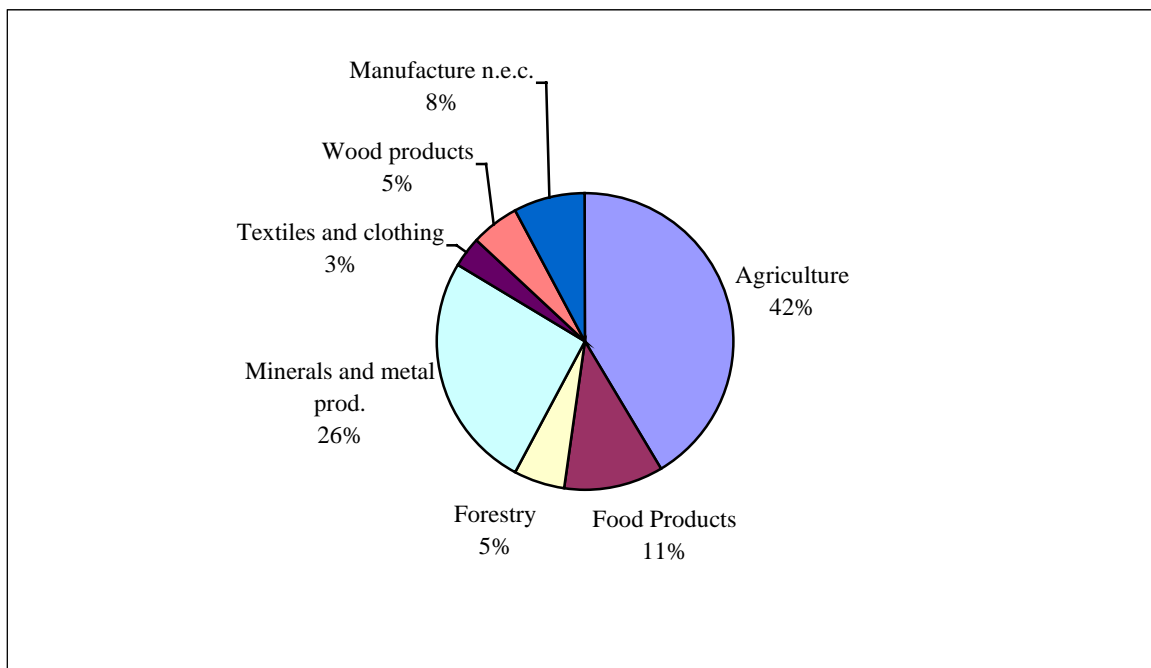
**FIGURE 2: GEOGRAPHIC PATTERN OF SSA-37 NON-OIL EXPORTS<sup>A</sup>**



<sup>a</sup>Figures exclude service exports  
Source: Version 4 of GTAP database.

As can be seen from Figure 3, agricultural products dominate SSA-37 exports with a value of around 8 billion dollars – accounting for 42 percent of non-oil exports. Within agriculture, the main export products from the region are crops, consisting mostly of cocoa, tea, coffee and spice exports to the EU, worth almost 4 billion dollars. Mineral and mineral products (mostly non-metal) are also significant, and the bulk again go to the EU (see Table 3). Food products, mainly consisting of fish preparations, constitute important exports to the European Union and Japan. In the light of the US proposal offering unrestricted access for exports of apparel, note that textiles and clothing represent only about 3 percent of SSA-37’s non-oil exports, suggesting that the gains for SSA-37 from the US initiative would not be large – unless of course the levels of protection in the US were particularly high.

**FIGURE 3: PRODUCT COMPOSITION OF SSA-37 NON-OIL EXPORTS<sup>A</sup>**



<sup>a</sup>Figures exclude service exports.

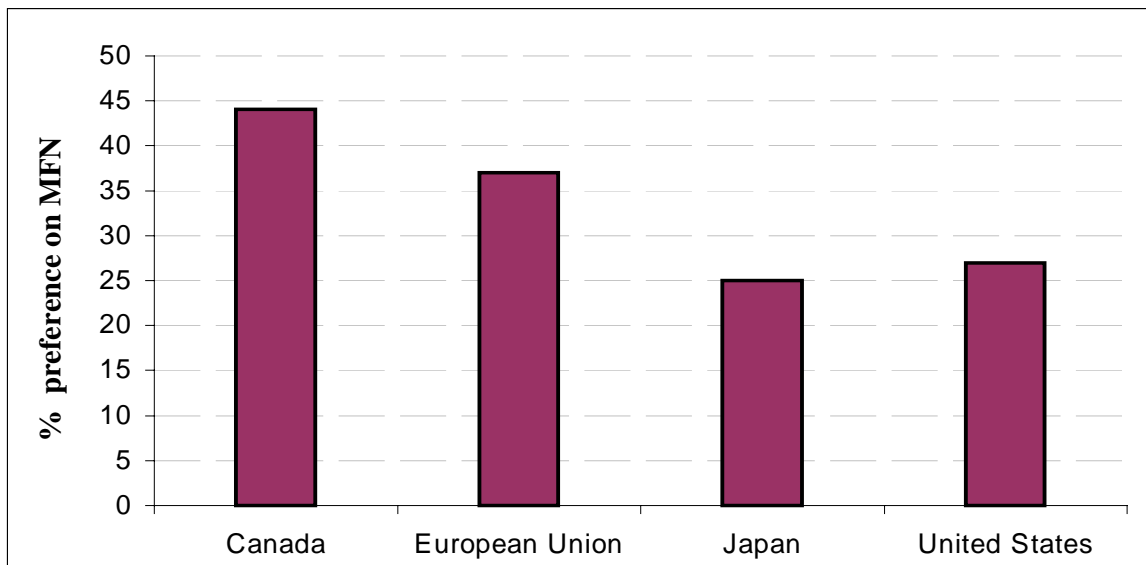
Source: Version 4 of GTAP database.

The pattern of protection that SSA-37 exports currently face is shown in Table 2 – the construction of which is described in the next section. A large number of products from SSA-37 already enter the QUAD duty-free, either because the MFN tariff is zero or as a result of existing preferential schemes.<sup>6</sup> These schemes vary in the advantage that they confer on poor countries (Figure 4).<sup>7</sup>

<sup>6</sup> There are in fact a large number of tariff lines for which MFN or preferential tariffs are zero – a fact that is hidden by the level of aggregation in Table 2.

<sup>7</sup> Note that these average preferences are tariff-weighted, which gives a larger weight to preferences where MFN tariffs are higher. The simple average preferences are 53 percent in Canada, 69 in the European Union, 57 percent in Japan and 54 percent in the United States. The smaller magnitude of tariff-weighted preferences illustrates the fact that products with high MFN tariffs tend to have low LDC preferences.

**FIGURE 4: AVERAGE LDC PREFERENCE IN QUAD**



Source: WTO, GTAP, authors' calculations

Canada appears on average to give a preference of more than 40 percent on its existing MFN tariffs while Japan grants a preference around 25 percent. The EU's average preference margin of close to 37 percent includes the preferences under the Lomé convention (the greater of the LDC and Lomé preferences applies).<sup>8</sup>

A number of products in the QUAD have both high MFN tariffs and limited preference margins, as can be seen from Table 2, and offer significant room for improvement of market access for SSA-37. The EU has the largest number of such categories, which include cereals, livestock, meat and dairy products, plant based fibers, and sugar-related sectors. For cereals,<sup>9</sup> SSA-37 faces an average import-weighted tariff of 50 percent tariff (including LDC and Lomé preferences), with the highest nominal tariff, 174 percent, imposed on oats (HS classification 100400). For livestock, meat and dairy products,

<sup>8</sup> For an excellent discussion of the relative importance of Lomé preferences see Kennan and Stevens (1997).

<sup>9</sup> At the 6-digit level of the HS classification, this category includes rye, barley, oats, maize, grain sorghum, buckmeat, millet, and canary seed. SSA-37 exports are mostly of rye, barley and oats (80 percent).

SSA-37 faces an average import-weighted tariff of 50 percent in the EU, with the highest nominal tariff, 114 percent, applied to bovine meat (HS classification 02629).<sup>10</sup>

The US applies high tariffs to the tobacco and sugar-related sectors, and to wearing apparel. For wearing apparel, the average import-weighted MFN tariff is 11.6 per cent, and the LDC preferences (which apply to most of SSA-37) bring it down marginally to 11.4 per cent. Japan imposes high tariffs on cereals and the livestock, meat and dairy products category. The most striking case is of cereals on which the average MFN tariff is 471 percent.<sup>11</sup> The extent of LDC preference in cereals is rather limited (25 percent), which implies that the tariff faced by SSA-37 exporters is on average 390 percent. Livestock, meat and dairy products are subject to an average MFN rate of 71 percent and an average LDC rate of 62 percent. Canada has high tariffs on wearing apparel with the average MFN rate of 18 per cent and the average LDC rate of 16.3 per cent.

It is evident from Table 3, that it is precisely when MFN tariffs are high that the preferences granted by the QUAD through various schemes is low. Furthermore, this descriptive analysis has shown that any meaningful market access initiative for SSA-37 would need to include agriculture and food products. These represent more than 50 percent of SSA-37 non-oil exports and are also the most highly protected in QUAD markets.<sup>12</sup>

#### **4. A multi-country CGE model**

The GTAP model (Hertel, 1997) is widely used for trade policy analysis. It is a standard global applied general equilibrium model that assumes perfectly competitive markets and constant returns to scale technology. The model has a sophisticated representation of consumer demands via a constant difference of elasticities (CDE) functional form and a

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<sup>10</sup> Note that even though there is an LDC (plus ACP) average preference of 18 percent for the category of livestock, meat and dairy products, no preference is granted for bovine meat (HS classification 02629).

<sup>11</sup> As discussed in the next section these are import-weighted tariffs that include tariff equivalents of non-tariff measures.

supply side that emphasizes the role of inter-sectoral factor mobility in the determination of sectoral output. Product differentiation between imports and domestic goods, and imports by region of origin allows for two-way trade in each product category, depending on the ease of substitution between products from different regions.

At the macroeconomic level, each region's final demand is governed by a representative, regional household which allocates regional income across private consumption, government expenditure and savings according to a Cobb Douglas utility function. Land, labor, capital and the natural resources in a region are unchanged and fully employed. The returns to these factor inputs accrue to the households in the region in which they are employed. Global savings must equal global investment, which is allocated across regions in order to equate expected rates of return. The price of the global investment good is chosen as the numeraire.

The GTAP model is solved in order to determine the endogenous changes in output and trade flows as a result of the proposed trade policy changes. The model maintains all of the restrictions imposed by economic theory: changes in consumer demand add up to changes in total spending; each region's total exports equal total imports of these goods by other regions, less shipping costs; each region's income is determined by spending on its output and tax revenues.

We apply the model to an aggregated version of Version 4 GTAP data base (McDougall *et al.*, 1998). It combines detailed bilateral trade, transportation and protection data accounting for inter-regional linkages among economies and input-output data bases accounting for inter-sectoral linkages within countries. The regional aggregation features the QUAD regions: the European Union, the United States, Canada, and Japan, Sub-Saharan Africa (excluding Southern African Customs Union (SACU) countries and Rest of Southern Africa; see footnote to Table 1), an aggregate region representing all other

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<sup>12</sup> See OECD (1997) and Hoekman, Ng and Olarreaga (2000) for detailed descriptions of the extent and structure of tariff preferences to developing countries in the QUAD.

developed economies and a region of all developing countries except the poorest Sub-Saharan African countries. The sectoral aggregation is shown in Table 2.

The import tariffs in GTAP are averages of MFN applied tariff rates obtained at the tariff line level and aggregated up to the GTAP concordance using trade-weights. In the case of agricultural products, where non-tariff barriers have played a very important role, the distortions, particularly in the grains, livestock, and dairy product areas for the OECD countries, were characterized using work by Tsigas (1998). For non-OECD countries, indirect estimates of protection (including through non-tariff barriers) were derived using OECD data and protection information from the GTAP version 3 data base. The version 4 GTAP data base is designed to capture some of these large distortions in agricultural trade.

Table 2 provides “MFN” import weighted tariffs of version 4 of GTAP for each of the QUAD countries, as well as the LDC tariffs offered by QUAD countries. LDC tariffs (including Lomé preferences in the case of the EU) have been calculated as follows. First, we filtered the MFN and LDC tariff data communicated by each of the QUAD members to the Integrated Data Base of the WTO and the Trade Policy Review (in the case of the EU) in 1999 to transform it from the 6-digit Harmonized System to the 15 categories of our GTAP aggregation (we exclude services as they are not included in the preferential access initiatives). Then a preference margin was calculated for these 15 categories. The preference margin calculated from WTO tariff data was then applied to the GTAP import-weighted “MFN” tariffs in order to obtain the LDC tariff rates reported in Table 2.<sup>13</sup>

Even though not all the SSA-37 countries in our sample are LDC countries, they were all treated as beneficiaries of LDCs preferential regimes in our simulations.<sup>14</sup> The non-LDC countries are Cote d’Ivoire, Cameroon, Gabon, Ghana, Kenya, Nigeria, Senegal and Seychelles – of which only Gabon, Nigeria and Seychelles are not HIPC countries. In the

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<sup>13</sup> Note that the preferential margin obtained from the WTO was calculated using simple averages whereas MFN tariffs in GTAP are import weighted tariffs.

case of the EU, we assume that all the SSA-37 countries in our sample benefit not only from LDC preferences, but also ACP preferences. This has the effect of understating the gains that would arise from removing all barriers in our simulations.

## **5. Implications of alternative initiatives**

As noted above, we examine each scenarios, based respectively on duty and quota-free access for SSA-37 exports of:

- a) apparel to the US;
- b) all products to the US (widest interpretation of the Africa Growth and Opportunity Act);
- c) industrial products to Japan;
- d) all products except arms to the EU (latest proposal by the European Commission);
- e) all products to the US, EU, Canada and Japan , i.e. the QUAD.

In each case, we look at the impact on exports and welfare of SSA-37, as well as other regions, and the impact on tariff revenue in the preference-granting countries. Recalling the discussion in Section 2, we would expect the initiatives to result in an increase in exports and welfare of SSA-37. Other developing country exports are likely to suffer from the decline in prices in developed country markets. The impact on developed country welfare depends on the relative magnitudes of the increase in consumer surplus and the decline in tariff revenue. It is, however, important to keep in mind that general equilibrium models capture more sophisticated interactions than those described in the simple partial equilibrium framework of section 2.

In all simulations, tariffs (or tariff equivalents) on services and oil exports are kept constant. The different initiatives do not include services exports. Furthermore, by

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<sup>14</sup> Table 1 lists the countries classified as LDC, HIPC and those in our SSA-37 set.

freezing tariffs on oil, we are controlling for the presence of Nigeria in our Sub-Saharan African aggregate. In any case, tariffs on both oil and services are very low in the QUAD, and so imposing this condition has little impact on the results.

The main results are displayed in Tables 4, 5, 6. The gains to SSA-37 from unrestricted access to the US market for apparel are small: \$33.7 million or a 0.2% increase in non-oil export revenue.<sup>15</sup> This result reflects the fact that exports of apparel from SSA-37 account for a small share of African exports (less than 3 percent), and even significant increases do not make a big difference to aggregate exports. The apparel sector is likely to expand, with the share of real value added generated in the sector increasing by a little over 3 per cent. The reallocation of resources into apparel (and textiles) is likely to cause a small contraction in a range of other sectors (Table 7). The welfare gains to SSA-37 are also small, around \$24 million (0.02 percent).<sup>16</sup> The loss in tariff revenue for the US is negligible - \$14m or 0.06% of total tariff revenue.

Even if the US were to grant duty-free access to all SSA-37 products – the most generous interpretation of the Trade and Development Act - the impact on export revenue and welfare of SSA-37 remains small. The gains are only about twice the gains arising from free access for apparel. In terms of sectoral value added, the expansion is still mostly in the apparel sector, with a small increase in the value added also in the sugar-related sectors. The result is not surprising given that these are really the only sectors where SSA-37 faces significant barriers in the US market.

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<sup>15</sup> We also evaluate the extent to which our results might change if we add Mauritius and the other six Southern African countries to the thirty seven Sub-Saharan African countries as potential beneficiaries of unrestricted market access for their exports of apparel to the US. Welfare and non-oil export revenues of SSA-37 increase by \$112 m. (0.06%) and \$192 m. (0.6%), respectively, compared to the estimates in Tables 4 and 5. Note that the above changes in welfare and export revenue remain relatively modest. Moreover, these are upper bound estimates given that we assume that Mauritius exporters will not be facing any type of rules of origin.

<sup>16</sup> These welfare gains come not only from increased producers' surplus (as shown in Figure 1), but from the induced reallocation of resources within distorted economies, e.g. from the protected importable sector to the exportable sector. Fukase and Martin (2000) show that these effects can explain as much as a third of the gains in a country like Vietnam.



Japan's recent proposal to allow free access to its markets for industrial products from least developed countries would produce even smaller gains for SSA-37. The Japanese industrial market is already quite open and further improvements in access are unlikely to prompt a surge in exports from SSA-37. Some expansion in sectoral value added is, nevertheless, likely to be witnessed in the two categories where Japan does protect, sugar and other food products. Japan would suffer a trivial loss in tariff revenue.

The proposed liberalization of access to the EU market could, however, lead to much larger gains: an increase of around \$513 million (2.8 per cent of non-oil exports) in export revenue and \$317 million (0.2 percent) in welfare, six times larger than the gains from free access to the US market. The largest expansion is witnessed by the plant-based fibers, livestock, meat and dairy products sectors, followed by the sugar-related sectors. The expansion in these sectors leads to a decline in real value added in a number of other sectors, including apparel, certain crops and leather products. The loss of EU tariff revenue is around \$777m (2 percent).

The most substantial gains for SSA-37 would arise, not unexpectedly, from the liberalization of the QUAD markets: a \$2.5 billion or 13.9 percent increase in non-oil export revenue (7 percent increase in total export revenue from goods and services).<sup>17</sup> The associated increase in welfare is close to \$1.8 billion (1.2 percent). Somewhat unexpected is that the source of the increase is primarily an expansion of agricultural exports to Japan by close to \$5b, in fact, at the expense of exports to some other markets, such as those of the European Union and other developing countries.<sup>18</sup> Japan loses \$7b or 22 per cent of its tariff revenue.

Interestingly, if the entire QUAD offers preferential access, the relative importance of the industrial sector in SSA-37 actually declines, as resources are drawn into the agricultural sectors. There is, however, diversification within agriculture. The biggest expansion in

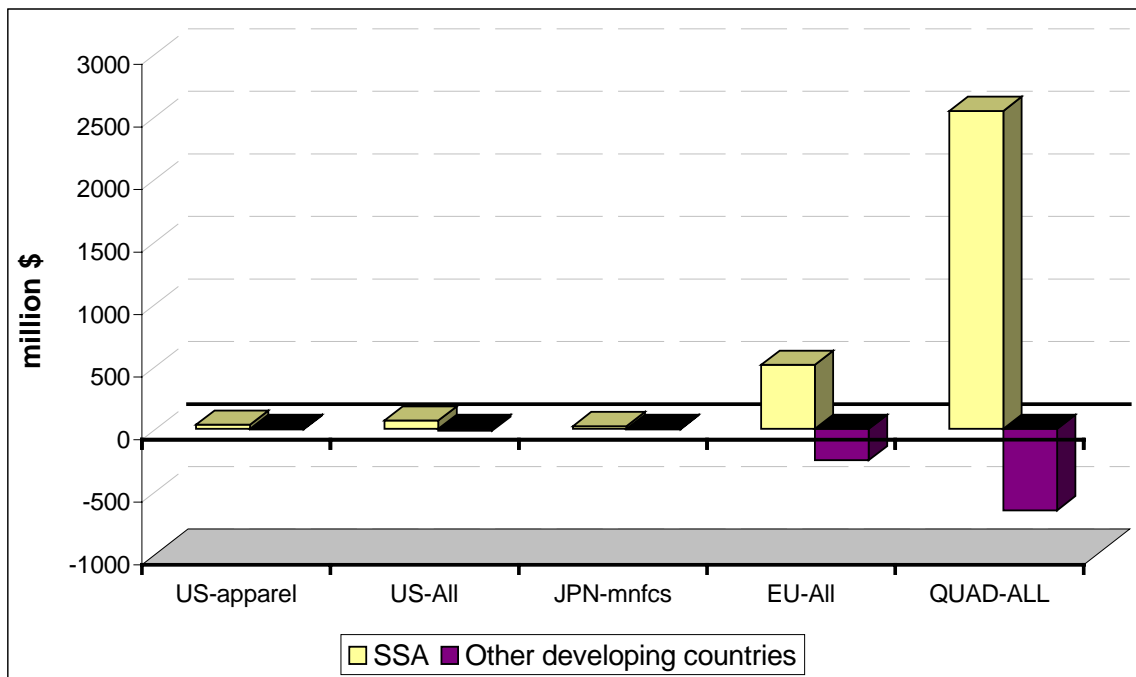
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<sup>17</sup> The percentage increase is comparable with that obtained by Hoekman, Ng and Olarreaga (2000). They use a partial equilibrium model to estimate the value of duty free access for least developed countries on products where they currently face tariffs above 15 percent. SSA-37 accounts for about half of the total exports of all least developed countries.

value added in SSA-37 comes in cereals grains, on which Japan currently imposes high tariffs for SSA-37, and even higher tariffs for the rest of the world. There is also an expansion in value added in categories of plant-based fibers and livestock, meat and dairy products.

What about the impact on the rest of the world? The impact on developing countries, who might fear the consequences of trade diversion, is surprisingly small, because SSA-37 exports are not large enough to have a significant impact on prices in export markets (see discussion in Section 2). As can be seen from Figure 5, even in the QUAD liberalization scenario, the loss in export revenue for other developing countries is only around 650 million dollars or less than 0.04 percent of their initial exports. In all five scenarios, the gains for SSA-37 in terms of export revenue outweigh the losses for other developing countries.

**FIGURE 5: EXPORT REVENUE CHANGES IN SSA-37 AND OTHER DEVELOPING COUNTRIES**



Source: GTAP, authors' calculations.

<sup>18</sup> The relative importance of Japan is consistent with recent results obtained by Bradford (2000).

The preference-granting country typically suffers a decline in welfare, because the main impact of increased in SSA-37 exports is not on consumer welfare but on tariff revenue as imports from tariff-paying sources are displaced. The US and the EU would lose small amounts from such trade diversion. Losses in Japan from liberalization of access for all products are larger, around \$5 billion, but have little impact on national welfare (around 0.1 percent).<sup>19</sup>

In all cases, world welfare is lowered by the granting of preferential access – largely because of the loss in tariff revenue. While this may suggest that preferential access is not a particularly efficient mechanism to assist SSA-37, there are two important considerations. First, the welfare gains accrue to the poorest countries, whereas the welfare losses are concentrated in the rich countries, and are small in relative terms: even full liberalization in the QUAD would lead to a less than 0.01 percent decline in the QUAD's welfare. Secondly, it is not certain that alternative means of assistance, e.g. through direct transfers, would materialize and that their impact on SSA-37 would be preferable to that of improved market access.

To put the gains in SSA-37 in perspective, we find that if total factor productivity in SSA-37 could be increased by 1.5 per cent, gains in welfare would be comparable to the gains from completely unrestricted access to the QUAD market. This, of course, raises the question of how such increases in productivity might be accomplished.

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<sup>19</sup> Since econometric evidence on the Armington elasticities of substitution is weak and results could be sensitive to their values (Gehlhar, 1994), we conducted a systematic sensitivity analysis (Arndt, 1996) with respect to the Armington parameters in GTAP -  $\sigma_D$  and  $\sigma_M \cdot \sigma_D$  specifies the elasticity of substitution between aggregate imports of commodity *i* and domestically produced *i*. We assume that  $\sigma_D$  has a uniform distribution in the interval  $[x/2, 2x]$ , where *x* is its value in the GTAP database.  $\sigma_M$  governs the substitutability between imports of commodity *i* from different regions. We assume that  $\sigma_M = 2\sigma_D$  as in GTAP (Zeitsch, *et al.*, 1991). The systematic sensitivity analysis suggests that the welfare results for all regions other than Sub-Saharan Africa are not very sensitive to the Armington elasticities. However, some results for SSA-37 could vary substantially. Using Chebyshev's inequality and the standard deviation from the systematic sensitivity analysis, we can be 75% sure that the welfare change (%) for SSA-37 lies in the interval [0,3].

Apart from assisting SSA-37, generating enthusiasm for a new round is one motive for the recent initiatives. Would SSA-37, having obtained preferential access to the QUAD market, gain from further global liberalization? We examine the impact on SSA-37 of a 25 percent cut in the non-preferential levels of protection in all countries. As shown in Table 8, exports to Japan decline significantly, due to the erosion of the (hypothetical) preferential access to the Japanese market. But the impact on total exports of SSA-37 to the world is insignificant (a 0.2 percent decline), largely due to a diversion of exports to other markets, and improved access to other developing country markets – to which exports would increase by 10 percent. In the aggregate, SSA-37 would suffer a loss in welfare of about \$525 million, due to the deterioration of SSA-37's terms-of-trade – reflecting a shift of exports from the high-priced Japanese market to other relatively low-priced markets. This implies that the assumed future global liberalization could reduce by 30 percent the welfare gains SSA-37 obtains from (hypothetical) unrestricted access to the QUAD.<sup>20</sup>

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<sup>20</sup> In all experiments we assume that subsidies in QUAD markets remain unchanged. Given the high level of subsidies on some agricultural commodities in the European Union and Japan, we conducted an additional experiment in which we removed all agricultural subsidies (export and producer) in the QUAD subsequent to granting preferential access to SSA-37. We find that this might generate additional benefits of around \$412 million for the SSA-37 region due to an increase in the prices of cereal grains and livestock for which the region is a net exporter.

## 6. Concluding remarks

Unrestricted access for all products to the entire QUAD market would produce significant benefits for SSA-37 – a \$2.5 billion (14 percent) increase in non-oil exports and a \$1.8 billion (1.2 percent) increase in welfare. Most of the gains would come from preferential access to the highly protected Japanese and European markets for agricultural products. In contrast, some of the less ambitious initiatives that have been announced would have hardly any effect. For instance, the elimination of barriers only in the United States market or only on industrial products in the Japanese market would not result in any meaningful gains for SSA-37.

Even if SSA-37 is granted fully unrestricted access to the QUAD market, the cost for other developing countries is small because SSA-37 exports are not large enough to have a significant impact on prices in export markets. The preference-granting countries would generally suffer a decline in welfare, because the loss in tariff revenue outweighs any gain in consumers' surplus, but this decline is of negligible magnitude.

There are important caveats to our analysis, most of which suggest that the gains to SSA-37 from preferential access may be smaller than we have estimated. First, we have almost certainly exaggerated the generosity of the announced initiatives. Duty-free access may have limited effects if accompanied by restrictive rules of origin, as in the recent US-African-Caribbean trade bill. For instance, exporters of apparel from Africa and the Caribbean are required, though in some cases only after a certain period of time, to use yarn and fabric imported from the US to be able to benefit from duty free access to the US market. This requirement may have a significant cost-increasing impact, particularly if enforced through cumbersome administrative procedures. The imposition of other conditions on access, such as those related to labour or environmental standards, could also erode the benefits of preferential access.

There is another reason why the gains for SSA-37 may be smaller. The announced initiatives have not targeted SSA-37 *per se*: not all of SSA-37 will benefit, and not only SSA-37 will benefit.<sup>21</sup> Some of the gains from preferential access for countries outside the region will be at the expense of SSA-37. For instance, a country like Bangladesh may be better equipped to take advantage of improved access to the EU in certain areas than SSA-37. The fact that a wider group of countries than SSA-37 benefit from preferential access also implies that we may have understated the impact on developing countries which are excluded from all initiatives.

The model has also abstracted from two sorts of difficulties. First, it assumed perfect factor mobility between sectors. In reality, difficulties in reallocating resources, for instance from mineral to meat production, may well dampen the short run supply response to new opportunities. Secondly, increased exports, especially to new and distant markets like Japan, require access to efficient transport and distribution networks, both of which are areas in which SSA-37 faces significant impediments.

Finally, our analysis has ignored important dynamic considerations. One aspect of this is the neglect of investment, especially foreign direct investment, which may well be encouraged by the different initiatives – provided, of course, other conditions such as political stability are satisfied. The other aspect we have ignored is the possibility of changing dynamic comparative advantage. Preferential access may provide SSA-37 with the time needed to learn-by-doing and become competitive in new areas. In contrast with the traditional infant industry protection which encouraged protection for the domestic market, the current initiatives have the virtue of encouraging production for the export market, and this may be more conducive to learning and spillovers of knowledge. Furthermore, since protection is granted, not by a pliable domestic government, but by foreign governments, domestic industry is likely to be confronted by a credible liberalization deadline. There may be merit in this argument, but there is also a downside. SSA-37 countries may be lured by current preferences to specialize in

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<sup>21</sup> Thus, the EU initiative includes only LDCs from SSA-37 and also LDCs from outside the region. The US initiative includes, in principle, all African countries but only some may fulfil the necessary conditions

products in which they do not have a global comparative advantage. As MFN tariffs decline over time (perhaps unpredictably) and preference margins are eroded, these countries could suffer significant adjustment costs, and be even worse off because they have foregone opportunities to learn-by-doing in areas where they do have a comparative advantage.

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– for instance Gabon and Seychelles in SSA-37 have incomes higher than the specified threshold.

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**Table 1: Countries included in different groups**

LDC	HIPC	SSA-37 <sup>a</sup>
Afghanistan, Angola, Benin, Burundi, Burkina Faso, Bangladesh, Bhutan, Central Africa, Chad, Congo, Comoros, Cape Verde, Djibouti, Eritrea, Ethiopia, Guinea, Gambia, Guinea Bissau, Equatorial Guinea, Haiti, Cambodia, Kiribati, Lao People's Democratic Republic, Liberia, Madagascar, Maldives, Mali, Myanmar, Mozambique, Mauritania, Malawi, Niger, Nepal, Rwanda, Sudan, Solomon Islands, Sierra Leone, Somalia, Sao Tome and Principe, Togo, Tuvalu, Tanzania, Uganda, Vanuatu, Yemen, Zaire, Zambia	Angola, Burundi, Benin, Burkina Faso, Bolivia, Central Africa, Chad, Cote d'Ivoire, Cameroon, Congo, Ethiopia, Ghana, Guinea, Guinea Bissau, Guyana, Honduras, Kenya, Lao People's Democratic Republic, Liberia, Madagascar, Mali, Myanmar, Mozambique, Mauritania, Malawi, Niger, Nicaragua, Rwanda, Sudan, Senegal, Sierra Leone, Somalia, Sao Tome and Principe, Togo, Tanzania, Uganda, Vietnam, Yemen, Zaire, Zambia	Benin, Burundi, Burkina Faso, Central Africa, Cote d'Ivoire, Cameroon, Chad, Congo, Comoros, Cape Verde, Djibouti, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Gambia, Guinea Bissau, Equatorial Guinea, Kenya, Liberia, Madagascar, Mali, Mauritania, Niger, Nigeria, Rwanda, Sudan, Senegal, Sierra Leone, Somalia, Sao Tome and Principe, Seychelles, Togo, Uganda, Zaire

<sup>a</sup>The SSA-37 aggregation we use does not include the Southern African Customs Union (Botswana, Lesotho, Namibia, South Africa and Swaziland). The reason for their exclusion is that these countries are neither LDC nor HIPC. The average GDP per capita for the region is around 3400 dollars (the exception being Lesotho with a GDP per capita of 500 dollars). We also exclude for data reasons the following Sub-Saharan African countries from the SSA-37 aggregation: Angola, Malawi, Mauritius, Mozambique, Tanzania, Zambia and Zimbabwe. The reason for this is that these countries are part of a single aggregated region in the GTAP data base and we cannot disentangle Mauritius, which is neither an LDC nor HIPC and which has a GDP per capita above 3500 dollars. Mauritius might benefit from a U.S. initiative, but because its GDP per capita is above \$1000 its exporters would have to face very restrictive rules of origin. Furthermore, because Mauritius is neither an LDC nor a HIPC, it will not be included in the "Everything but Arms" European proposal, the recent Japanese and Canadian initiatives, or the expected G-8 proposal. Mauritius represents around 20 percent of aggregate exports of this group of countries and more than 40 percent of these countries' exports of apparel to the world, which would have significantly biased our results in apparel.

**Table 2: MFN and Preferential LDC import-weighted tariffs in QUAD**

GTAP commodity classification	Canada		European Union		Japan		United States	
	MFN	LDC	MFN	LDC	MFN	LDC	MFN	LDC
Cereals	0.14	0.14	53.93	50.43	471.38	390.09	0.60	0.00
Vegetables, fruit and nuts	0.24	0.09	5.55	1.01	5.85	4.72	1.35	0.04
Plant-based fibers	3.19	3.19	50.00	50.00	42.00	0.00	0.08	0.08
Other crops	0.10	0.01	1.55	0.03	0.77	0.44	3.46	2.69
Livestock, meat and dairy products.	10.78	5.68	61.27	50.31	71.36	61.80	6.57	1.33
Forestry-Wood products-paper	0.47	0.00	2.03	0.00	0.60	0.03	0.53	0.00
Fishing	0.00	0.00	4.95	0.00	4.44	4.09	0.27	0.00
Oil-Gas-Petroleum	6.58	0.00	0.13	0.00	0.79	0.43	0.62	0.00
Mineral products	0.70	0.04	0.89	0.00	0.20	0.00	2.39	0.25
Beverage-tobacco-sugar	7.10	3.22	54.98	14.13	40.86	28.37	30.02	28.02
Other Food products	4.07	2.05	6.86	2.09	6.61	4.88	1.75	0.24
Textiles	5.58	3.80	4.96	0.00	3.27	0.38	7.33	7.14
Apparel	17.99	16.31	10.23	0.00	6.81	0.00	11.64	11.41
Leather	11.97	4.42	5.11	0.00	9.59	2.03	8.01	4.84
Other manufacturing	1.08	0.10	3.60	0.00	1.02	0.04	1.94	0.11
Services	0.00	0.00	0.02	0.02	3.21	3.21	0.00	0.00

Source: GTAP version 4 and authors calculations. Tariffs are weighted by total imports in each country.

**Table 3: Profile of SSA-37's Exports, 1995**

	United States	European Union	Canada	Japan	Other OECD Countries	Other Developing Countries
Cereals	0	19.2	0	10	3.2	25.1
Vegetables, fruit and nuts	5.5	478.2	0.4	3.4	10.1	95
Plant-based fibers	0.1	295.7	5.2	24.6	10.6	668.7
Other crops	347.5	3651.1	40.8	124.7	77.6	694.4
Livestock, meat and dairy products	5	55	0.2	2.9	0.5	136.2
Forestry-Wood products-paper	28.6	1378.4	1.7	97.7	14.8	371.9
Fishing	6.6	216.1	0.5	61.7	8.3	80.4
Oil-Gas-Petroleum	6224.3	4278.3	420.8	164.2	193	2231.4
Mineral products	430.8	3107.8	49	23.5	21.1	425.5
Beverage-tobacco-sugar	13.8	107.3	0.2	0.1	3.2	7
Other Food products	49.1	1432.9	10.7	233.8	13.2	162.8
Textiles	11.9	98.9	1.1	0.2	0.6	40.1
Apparel	51.5	143	2.5	0.6	0.7	3.2
Leather	6.9	241.1	0.9	0.9	0.7	30.6
Other manufacturing	315.2	1306.4	40.9	95.1	33.5	437.7
Services	604.8	1913.4	29.3	844.5	149.6	1802.4
Total	8101.8	18722.7	604.1	1687.7	540.7	7212.3

Source: GTAP ver 4, authors calculations.

**Table 4: Welfare Changes (Million \$ and percentages)**

	<b>US Apparel</b>	<b>US All Products</b>	<b>Japan Industrl Products</b>	<b>EU All Products</b>	<b>Quad All Products</b>
<i>United States</i>	-10.19 [-0.00%]	-21.85 [-0.00%]	-1.75 [-0.00%]	-23.33 [-0.00%]	-235.78 [-0.00%]
<i>European Union</i>	-4.53 [-0.00%]	-15.25 [-0.00%]	-3.93 [-0.00%]	-278.22 [-0.00%]	-580.53 [-0.01%]
<i>Canada</i>	0.52 [0.00%]	0.55 [0.00%]	-0.09 [-0.00%]	7.02 [0.00%]	33.72 [0.01%]
<i>Japan</i>	-0.54 [-0.00%]	0.33 [0.00%]	-5.58 [-0.00%]	2.72 [0.00%]	-5233.18 [-0.12%]
<i>Other OECD</i>	0.50 [0.00%]	-0.79 [-0.00%]	-0.47 [-0.00%]	7.15 [0.00%]	35.98 [0.00%]
<i>Other Developing countries</i>	-11.18 [-0.00%]	-16.01 [-0.00%]	-2.80 [-0.00%]	-95.52 [-0.00%]	293.62 [0.01%]
<i>SSA-37</i>	23.57 [0.02%]	49.17 [0.03%]	14.74 [0.01%]	316.57 [0.22%]	1786.36 [1.22%]
<b>Total</b>	-1.84 [-0.00%]	-11.3 [-0.00%]	0.12 [0.00%]	-63.62 [-0.00%]	-3489.14 [-0.01%]

Source: Simulations with GTAP

**Table 5: Change in Exports of SSA-37 to Different Markets**

	<b>US Apparel</b>	<b>US All Products</b>	<b>Japan Industrl Products</b>	<b>EU All Products</b>	<b>QUAD All Products</b>
	<b>Million \$</b>	<b>Million \$</b>	<b>Million \$</b>	<b>Million \$</b>	<b>Million \$</b>
<i>United States</i>	74.3	164.6	-4.5	-102.1	-350.0
<i>European Union</i>	-26.7	-65.1	-18.8	914.7	-1118.4
<i>Canada</i>	-0.6	-1.3	-0.4	-9.4	-36.0
<i>Japan</i>	-2.5	-5.8	52.7	-46.1	5020.1
<i>Other OECD</i>	-0.7	-1.6	-0.5	-13.3	-58.8
<i>Other Developing (ROW)</i>	-9.9	-23.4	-6.9	-224.8	-887.6
<b>Total<sup>a</sup></b>	<b>33.7</b> [0.2%]	<b>66.8</b> [0.4%]	<b>21.5</b> [0.1%]	<b>513.4</b> [2.8%]	<b>2542.9</b> [13.9%]

<sup>a</sup>Figures in parenthesis changes are expressed in terms of percentage of SSA-37 non-oil exports.

Source: Simulations with GTAP

**Table 6: Impact on Tariff Revenue in Different Countries (% changes)**

	<b>US Apparel</b>	<b>US All Products</b>	<b>Japan Industrl Products</b>	<b>EU All Products</b>	<b>Quad All Products</b>
<i>United States</i>	-0.06	-0.18	-0.19	0.01	-0.17
<i>European Union</i>	0.00	0.01	0.00	-1.78	-1.33
<i>Canada</i>	0.00	0.00	0.00	0.02	-0.06
<i>Japan</i>	0.00	0.00	-0.04	0.00	-21.92
<i>Other OECD</i>	0.00	0.00	-0.00	-0.03	0.01
<i>Other Developing Countries</i>	0.00	0.00	-0.00	-0.02	0.00
<i>SSA-37</i>	0.16	0.26	0.08	1.27	6.79
<b>Total</b>	<b>0.00</b>	<b>-0.01</b>	<b>-0.00</b>	<b>-0.18</b>	<b>-2.73</b>

Source: Simulations with GTAP

**Table 7: Sectoral Composition of the SSA-37 Economy: change in the share of real value-added**

	<b>US Apparel</b>	<b>US All Products</b>	<b>Japan Industrl Products</b>	<b>EU All Products</b>	<b>QUAD All Products</b>
Cereals	-0.01	-0.02	0.01	0.47	28.52
Vegetables, fruit and nuts	-0.02	-0.04	0.03	-0.1	-1.75
Plant-based fibers	-0.05	-0.16	-0.04	23.49	12.17
Other crops	-0.07	0.1	-0.04	-1.86	-9.8
Livestock, meat and dairy products	0	-0.01	0	2.52	1.45
Forestry-Wood products-paper	-0.07	-0.16	0	-1.28	-6.48
Fishing	-0.02	-0.05	-0.01	-0.32	-1.46
Oil-Gas-Petroleum	-0.05	-0.09	-0.03	-0.6	-3.04
Mineral products	-0.12	-0.21	-0.08	-2.02	-9.54
Beverage-tobacco-sugar	-0.01	0.3	0.02	0.59	-1.64
Other Food products	-0.07	-0.16	0.74	0.46	-4.69
Textiles	0.19	0.21	-0.02	-0.7	-2.87
Apparel	3.5	3.4	-0.05	-1.3	-3.08
Leather	-0.16	0.03	-0.1	-3.12	-13.41
Other manufacturing	-0.07	-0.16	-0.05	-1.44	-6.98
Services	0	-0.01	-0.01	-0.28	-1.3

Source: Simulations with GTAP.

**Table 8: Changes associated with a 25% cut in MNF Tariffs (post duty free access to QUAD for SSA-37)**

	<b>Welfare in (Million \$)</b>	<b>SSA-37 exports to: (Million \$)</b>
<i>United States</i>	13.3	248.95
<i>European Union</i>	2965.6	899.19
<i>Canada</i>	-170.1	21.29
<i>Japan</i>	9869.5	-2027.7
<i>Other developed countries</i>	1117.0	51.5
<i>Other developing countries</i>	15121.5	691.9
<i>SSA-37</i>	-525.5	
<b>Total</b>	<b>28364.5</b> <b>[ 0.11%]</b>	<b>-76.4</b> <b>[-0.19%]</b>

Source: Simulations with GTAP