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THE COSTS AND BENEFITS OF DUTY-FREE, QUOTA-FREE MARKET ACCESS FOR POOR COUNTRIES: WHO AND WHAT MATTERS

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Abstract: This paper examines the potential benefits and costs of providing duty-free-quota-free market access to the least-developed-countries (LDCs), and the effects of extending eligibility to other small and poor countries. Using the MIRAGE computable general equilibrium model, it assesses the impact of scenarios involving different levels of coverage for products, recipient countries, and preference-giving countries on participating countries, as well as competing developing countries that are excluded. The main goal of this paper is to highlight the role that rich and emerging countries could play in helping poor countries to improve their trade performance and to assess the distribution of costs and benefits for developing countries and whether the potential costs for domestic producers are in line with political feasibility in preference-giving countries.

JEL Classifications: D58; F13; F17;

Key Words: CGE modeling, trade policy, duty-free market access, technical barriers to trade, preference erosion.

Introduction

The globalization surge of the past three decades mostly missed the poorest countries in the world. While other developing countries were able to ride the wave, the share of today's least developed countries (LDCs) in global exports fell by two-thirds from 1970 to 2000, twice as much as the fall in their share of global income.¹ In broad terms, there are two principal sources of the LDCs' poor export performance: severe supply-side challenges, resulting from a lack of sound institutions and policies, inadequate infrastructure, and a paucity of physical and human capital; and implicit discrimination against their exports in rich-country trade policies. Progress is being made in a number of countries in addressing the supply-side challenges, but these problems will not be solved easily or quickly. The second source of poor export performance in poor countries should be more amenable to reform, as it requires only that richer countries open their markets to countries accounting for a tiny share of global trade. Opening markets for LDC exports is now even more important and more urgent as a result of the global financial crisis and the increased demand for trade protection around the world.

The high-income members of the Organization for Economic Cooperation and Development (OECD), and increasingly advanced developing countries as well, provide preferential market access for developing countries. But even the more generous programs for LDCs often contain exceptions and the exceptions are usually concentrated in a narrow range of products where LDCs have comparative advantage, especially agricultural commodities (often sugar, rice, meat, and dairy) and labor-intensive manufactures, such as textiles, apparel, and footwear. The effects of these politically-driven exclusions are further magnified by the structural weaknesses in the economies of LDCs, which are generally not very diversified. Thus, even a small number of product exclusions can rob preference programs of much of the potential benefit. In addition to the remaining formal barriers, preferential arrangements have rules of origin that restrict international sourcing of inputs and that is an acute concern in poorer countries with a high degree of specialization in the manufacturing sector, and limited ability to create the backward and forward linkages required by many origin regimes.²

To boost LDC engagement in global markets as a tool of poverty reduction, UN members agreed in the 2000 Millennium Declaration that developed countries should provide duty-free, quota-free (DFQF) market access for LDCs. That Millennium Development Goal (MDG) was reaffirmed at the World Trade Organization (WTO) ministerial in Hong Kong in 2005, except that U.S. negotiators insisted on limiting it to 97 percent of tariff lines. At the same time, the communiqué also called on developing countries "in a position to do so" to provide expanded preferential access for LDCs.

This study assesses four broad questions around improved market access for poor countries:

¹ Data is for today's list of LDCs (because the list changed over time) and is from the United Nations Comtrade database and the International Monetary Fund's *International Financial Statistics*.

² In assessing the potential to expand poor-country exports, it is important to keep in mind that administrative and regulatory barriers also arise outside the preference programs themselves. Most notably for some LDCs in Africa, sanitary and phytosanitary standards to protect human, plant, and animal safety frequently block agricultural exports because many poor countries lack the capacity to certify compliance.

- How much would LDCs gain from 100 percent versus 97 percent DFQF market access in OECD markets?
- How would the distribution of gains and losses change if eligibility for DFQF access were extended to additional small and poor countries?
- How much would LDC gains rise if Brazil, China, and India also provide full market access?
- What would be the effect of improved access on producers in preference-giving countries?

Previous analyses have assessed the impact of such preferential agreements granted to LDCs. Ianchovichina, Mattoo and Olarreaga (2001) use the GTAP model (Hertel, 1997) and the fourth version of the GTAP database (1995) to measure the gains and losses for a Sub-Saharan Africa countries' group (the 37 poorest countries aggregated together) if they receive DFQF market access from the Quad countries (Canada, European Union, the United States and Japan). Bora, Cernat and Turrini (2002) worked on simulating the elimination of all tariff and non tariff barriers imposed against LDCs in order to confirm the benefits for LDCs of the EBA initiative and underline the potential impact of a coordinated action of Quad countries. They showed that this larger preferential initiative provides ten times the welfare gains of the EBA alone. They conduct their analysis on the basis of a newer GTAP database than Ianchovichina, Mattoo and Olarreaga. Thanks to a higher level of disaggregation in the more recent database, authors are able to highlight the importance of sensitive sectors such as rice, sugar or wearing apparel in the improvement of LDCs' market access, including both African and Asian countries. All those studies show the potential benefits for preference-receiving LDCs, and insignificant losses for preference-giving countries imports from LDCs are such a small share of imports and consumption. Finally, Vanzetti and Peters (2009) focus on the role of sensitive products and the gains from an extension of product coverage of preferential arrangements. All these studies emphasize the role of rich countries, especially the European Union in granting better market access for poorer countries at little or no cost to their own producers.

Four key things distinguish our work from these earlier studies. First, we go beyond the Quad countries and examine the potential impact when the large and fast-growing emerging markets also provide improved market access to the LDCs. Second, we pay close attention to the potential for preference erosion when existing preference arrangements are changed. Third, we use the MIRAGE model and the carefully compiled and detailed MacMAPs-HS6 database. Finally, unlike previous analyses, we use an explicit political-economy welfare function to identify the sensitive products that are likely to be excluded if DFQF access is provided for only 97 percent of tariff lines, as proposed in Hong Kong. More ad hoc methods may underestimate the negative impact of such exclusions, as explained by Jean et al. (2010). The political economy model developed by Jean et al. (2010) assumes that governments optimize their objective function by choosing sensitive sectors that minimize the social cost. We employ this methodology to treat the small number of tariffs lines that are defined as sensitive in our scenarios with 97 percent tariff line coverage³. To preview the results, the analysis confirms the

³ To see the detailed tariffs lines obtained by this procedure, please refer to the Annex Table 2

conclusion from previous research that a DFQF initiative limiting product coverage to 97 percent of tariff lines provides very few benefits for LDCs. And, the gains from full access are multiplied if the large emerging markets join the initiative. But the evidence does not support two of the chief concerns about expanded preferential access for those countries. First, sub-Saharan Africa generally stands to gain, not lose, if OECD countries, including the United States, provide 100 percent DFQF market access for all LDCs; and other developing countries, such as Pakistan, do not suffer from preference erosion. Second, preference-giving countries do not suffer market disruption from removing exclusions for sensitive products, such as sugar or dairy. The adjustments are greater, however, if DFQF market access is extended to a broader group of small and poor countries.

Before explaining the methodology used in the paper, Box 1 presents key trade characteristics of LDCs⁴ that are useful in interpreting the results of our analysis

⁴ . As will be explained in more detail, the reliability of the data regarding some of the LDCs means that some countries are included in more aggregated regions. Our aggregation choices are explained in the main text.

Box 1: Key factors in LDC trade performance

Country or region	Sectors ¹	Share in country's total exports(%)	Relative comparative advantage ²	Average protection faced ³ (%)
Bangladesh	Textiles	35.7	12.6	13.8
	Wearing apparel	30.3	12.2	12.9
	Leather	4.6	4.6	13.8
Madagascar	Foods products	10.6	6.6	5.2
	Textiles	8.9	3.1	1.5
Malawi	Other crops	24.9	64.9	52.3
	Coal, oil, gas	16.8	2.1	3.9
Rest of Africa	Other. mfd. products	21.8	0.5	1.2
	Chemical products	7.6	0.7	1.3
Rest of South East Asia	Coal, oil, gas	41.4	5.3	0.6
	Wearing apparel	15.9	6.4	5.9
	Textiles	11.3	4.0	7.8
Senegal	Chemical products	21.1	2.0	1.2
	Foods products	14.7	9.1	24.9
	Other. mfd. products	12.2	0.3	6.1

¹ these are GTAP sectors

²

$$RCA_{ri} = \frac{X_{ri}}{\sum_j X_{rj}} / \frac{\sum_s X_{si}}{\sum_j \sum_s X_{sj}}$$

with r the reporter and s its partners, i(j) the sectors.

³ OECD sectoral tariffs are weighted by the share of each partner in total exports.

The above table underscores that for many LDCs, comparative advantage and exports are relatively concentrated in a few sectors and in many cases (Bangladesh in textile and wearing apparel; Malawi in tobacco (other crops)) they face unusually high levels of protection.

The table below gives a further idea of the high degree of inter-industry specialization in many LDCs. The inter-industry specialization index (see footnote 4 for its construction) shows that all of them have high degrees of specialization in comparison with developed countries (around 0.20-0.25 for France, Germany, the US and even China 0.33). As reflected in Note 4, a high level of this index means that LDCs are dangerously specializing in few products, so their trade is dramatically affected by changing conditions in their export markets.

Box 1(cont.)

Specialization and commodity dependence of LDC trade

DFQF recipients (LDCs)	Specialization index	Sectors	Share in total exports(%)	Relative Comparative advantage
Bangladesh	0.693	Textiles	35.733	12.550
		Apparel	30.329	12.199
		Services	12.764	1.226
		Leather	4.603	4.644
		Foods products	4.359	2.702
Ethiopia	0.727	Transport	18.061	4.120
		Services	17.914	1.721
		Other crops	12.657	32.947
		Sugar	9.287	60.082
		Trade	8.197	3.569
Madagascar	0.659	Coal, oil, gas	19.915	2.530
		Sugar	15.336	99.212
		Foods products	10.609	6.576
		Transport	9.107	2.078
		Textiles	8.890	3.122
Malawi	0.846	Sugar	42.192	272.961
		Other crops	24.915	64.855
		Coal, oil, gas	16.803	2.135
		Other mfd. products	2.514	0.052
		Cotton, wool, silk	2.227	5.833
Mozambique	0.674	Metals	51.946	18.640
		Services	20.284	1.948
		Sugar	5.152	33.328
		Foods products	4.627	2.868
		Transport	3.712	0.847
Rest of Africa	0.470	Coal, oil, gas	44.560	5.662
		Other mfd. products	21.810	0.451
		Chemical products	7.602	0.729
		Minerals	0.000	0.718
		Metals	3.259	1.169
Rest of South East Asia	0.620	Coal, oil, gas	41.399	5.260
		Apparel	15.888	6.391
		Textiles	11.259	3.954
		Other. mfd. products	9.231	0.191
		Services	7.052	0.677
Senegal	0.479	Services	22.069	2.120
		Chemical products	21.118	2.025
		Food products	14.711	9.119
		Other mfd. products	12.240	0.253
		Transport	10.395	2.372

3

$$IIS_r = \frac{1}{2} \cdot \sum_i \left| \frac{x_{ri}}{\sum x_{ri}} - \frac{m_{ri}}{\sum m_{ri}} \right|$$

With this formula, we obtain the inter-industry specialization indicator that the higher it is, the more the trade balance is based on a small number of sectors, and conversely, the lower it is, it provides a better distribution of comparative advantages, and therefore a balance of export performance.

Methodology

The MIRAGE (Modeling International Relationships in Applied General Equilibrium) model is a multi-sector, dynamic, multi-region computable general equilibrium (CGE) model devoted to trade policy analysis. The model is extensively described in Decreux and Valin (2007) and the implications of its features compared with other CGE models are analyzed in Bouët (2008).

Why choose a general equilibrium model? The partial equilibrium methodology has advantages in terms of being more transparent in its assumptions and easier for non-experts to understand. But both have a role and we incorporate both here, comparing the CGE results to those from Laborde (2008) using detailed data and a partial equilibrium approach.

The advantage of general over partial equilibrium models is that they take into account the economy-wide effects of trade liberalization, not just the sectoral changes induced by tariff changes. Specifically, when tariffs are lowered, the sector production contracts, decreasing demand for factors of production used extensively in that sector, as well as the remuneration of those factors. This, in turn, affects production in other sectors, which cannot be observed in the partial equilibrium framework. Trade liberalization also implies a decrease in tariff revenues for importing countries, which can involve contraction in services or public transfers.⁵ All these economic-wide effects need to be evaluated to appreciate the full impact of trade liberalization. In addition, the MIRAGE model incorporates recursive dynamics (Bouët 2008), which involves simulating the trade shock over a period of 10 years (considered as a benchmark) to reflect global economic changes resulting from changes to capital stocks or land supply due to changes in remuneration.

Here, simulations are run until 2020 to measure the long-term impact of the policy scenarios. The model is applied using data on the economic structure and trade of 113 countries in 57 sectors from the Global Trade Analysis Project (GTAP) database version 7 (Narayanan and Walmsley, 2008), and data on trade policies, including preferential tariff levels, from the MACMapHS6 version 2 database (Boumellassa, Laborde, and Mitaritonna, 2009).⁶

While these tools have been widely used in numerous assessments of global or regional trade agreements, specific modifications have been done for this study. First, the tariff data set has been updated so that the baseline reflects important trade policy changes since MACMapHS6 was last updated in 2004 (see next section). Second, the trade matrix was adjusted to discriminate between "real" trade and virtual (or potential) trade. Our focus on LDCs requires particular care in the use of the data because of weaknesses and gaps in reporting by those countries and the problems are compounded in the case of potential exports that are blocked by prohibitive tariffs in importing countries.

⁵It is important to underline that in most cases the main resource for LDC governments is tariff revenues.

⁶ The MACMapHS6 database has the most detailed information available on market access barriers and preferential trading arrangements, including bound and applied tariffs under World Trade Organization rules, and preferential tariffs arising from reciprocal regional trade agreements or unilateral preference programs, such as those studied here.

To make the modeling and analysis tractable, the data have been aggregated into 36 countries or regions and 28 sectors, with a focus on LDCs and the products they export. The geographic and sectoral composition are shown in Annex Table 1. Our aggregation program is based on four criteria of selection to justify why some countries of interest are included in larger regions: the availability of the data, the reliability of the data, export and country specialization similarities, and consideration of existing preferential programs.

First, the geographic coverage is constrained in the sense that it depends on the availability of good quality, recent input-output tables. The GTAP database does not supply consistent information for all countries but presents data for regional aggregates⁷. The second issue is the reliability of existing data and some obvious inconsistencies can be identified that should be corrected.

For example, in the case of potential exports that are currently blocked by prohibitive tariffs, the trade matrix in the GTAP database allows for the possibility of trade creation by using constructed trade values instead of zeroes. To illustrate, the trade matrix of the GTAP database includes "virtual" merchandise trade flows related to travel expenditures: rather than treating them as an export of services, so that the expenses of a Japanese tourist in Cambodia are translated in the database as a dutiable export of the consumed goods from Cambodia to Japan. But these "virtual" trade flows can be problematic in our assessment when it creates non-negligible exports from a LDC to an OECD country after removal of a high tariff on a specific commodity. For instance, the GTAP database displays a virtual export of processed rice of about \$100,000 by Senegal to Japan to avoid a zero and allow for the possibility of exports if Japan's 340 percent tariff on rice were removed. Based on the model parameters (Armington elasticities for imperfect substitutes), however, the elimination of the duty can lead to a 15-fold increase in Senegalese exports of rice to Japan. Unfortunately, this flow is purely artificial and there is no way of knowing whether trade liberalization would boost Senegalese exports or by how much, given high transportation costs and other constraints. Due to the magnitude of the shock, this sort of problem could lead to significant bias in our results.

To address the problems created by constructed trade values, we split the GTAP trade matrix into two categories: real trade flows, based on the trade data inputs to the GTAP database by Mark Gehlhar, and virtual ones.⁸ Tariffs, and their elimination, will affect only the former category and since the liberalization is by more developed and advanced developing countries that have good data, this is not a problem for our analysis. In addition, we have checked the quality of the input-output tables for key products in the LDC countries we focus on to avoid important mistakes due to data quality problems. For instance, the GTAP7 database shows that 15 percent of the production cost of processed rice in Senegal is due to imported wheat and 0 percent to the local paddy rice. This mistake in the construction of the IO table will also lead to serious problems in the CGE assessment since it implies that Senegal can export rice without

⁷ The list of GTAP aggregates is following: Rest of Oceania, Rest of East Asia, Rest of Southeast Asia, Rest of South Asia, Rest of North America, Rest of South America, Rest of EFTA, Rest of Former Soviet countries, Rest of Europe, Rest of Western Asia, Rest of Western Africa, Rest of Central Africa, Rest of Eastern Africa, Rest of North Africa, Rest of South African Customs Unions. These regions include some of the least developed countries.

⁸ See the description of the database at https://www.gtap.agecon.purdue.edu/databases/trade_data.asp.

producing it and simply by importing wheat. We fix such issues by reallocating the intermediate consumption to the appropriate sector in the IO table.

Unfortunately, since the poorest countries have the least-available and lowest-quality data, many of the LDCs that we are interested in examining are either missing or have only partial data and can be included only on a weighted basis in larger regional aggregates. To illustrate, consider the aggregated region of “rest of Africa”. This region is composed of heterogeneous states, including LDCs such as Benin, Guinea, Mali, Liberia, Sierra Leone, Burundi or Rwanda but also some vulnerable economies that are not eligible for DFQF programs, such as Cameroon, Kenya, Namibia or Swaziland. But, all these countries are already included in sub regional zones in the GTAP database. There are only two LDCs that could be isolated: Uganda and Tanzania but they suffer from severe unreliability of the data, since the latest IO tables date back to 1992. With those caveats, we tried to select for special analysis a range of LDCs from Africa (Ethiopia, Madagascar, Malawi, Senegal) and Asia (Bangladesh, Laos/Cambodia⁹) that produce a range of products, both clothing and agricultural products. Similar factors around regional and export diversity drove the decision on which other small and vulnerable economies, and which preference-giving countries to isolate in the analysis. For preference-giving countries, the aggregation program is clearly conducted by the similarity of trade policies and by the perspective given for any preferential agreement. For instance, Australia and New Zealand belong to the same free trade zone and apply the same preferential agreements. Furthermore, one of our main objective is to accentuate the role of emerging markets in helping the LDCs, thus Brazil, China, India, Korea, Mexico and Turkey are treated separately.

The Baseline

The first issue is to identify where we are now with respect to LDC market access. The Millennium Declaration approved by UN members in 2000 called for developed countries to provide DFQF market access for LDCs on essentially all products. The ministerial communiqué released by the WTO in Hong Kong in 2005 reaffirmed this commitment, but, at the insistence of U.S. negotiators, defined “essentially all products” as 97 percent of tariff lines.¹⁰

Most of Europe has already opened markets for 100 percent of exports from LDCs, as have Australia and New Zealand.¹¹ Japan and Canada provide access for over 98 percent of products for LDCs, while the United States provides duty-free access for only around 80 percent of products for LDCs outside sub-Saharan Africa and Haiti, and South Korea’s preference program for LDCs covered only 75 percent of tariff lines at the time the analysis was done.¹² Among other OECD countries, Turkey provides DFQF access for most products outside agriculture and Mexico does not yet have a preference program. India and China also adopted preference

⁹ Laos and Cambodia are two Asian LDCs with similar export profiles that have been grouped into one region because of data issues.

¹⁰ See, for example, the analysis in Oxfam International (2005).

¹¹ We ignore the fact that the EU program excludes armaments as they are commercially insignificant.

¹² In January 2010, South Korea raised the product coverage of its program to 85 percent tariff lines and announced that it will further raise the coverage to 95 percent by 2012.

programs for LDCs in recent years. These programs are described in more detail in Elliott (2009). Finally, at the WTO ministers' meeting in Geneva in December 2009, Brazil announced that it would introduce a program in 2010, rather than waiting for the conclusion of the Doha Round, as it had earlier insisted.¹³

Since the MAcMapHS6 version 2 database is based on 2004 data, we needed to update the database to reflect relevant trade policy changes occurring since then, including:

- expanded duty-free access for LDCs in
 - o Japan
 - o South Korea
 - o India
 - o China
 - o Switzerland
 - o Turkey
- the phasing out of the implementation period for the protocol products in the EU27 for the EBA (rice, sugar, bananas)
- implementation of free trade agreements between
 - o the United States and Central America and the Dominican Republic (CAFTA-DR)
 - o India and South Asian neighbors (SAFTA)
 - o the Economic Partnership Agreements between the EU27 and ACP countries that have signed an agreement or at least an interim agreements.

The Scenarios

In order to explore a range of possible outcomes, we analyzed 4 different scenarios:

- A. 97% of tariff lines liberalized by OECD countries for LDCs.
- B. 100% DFQF given by OECD countries to LDCs.
- C. 100% DFQF given by OECD countries to LDCs. and other designated countries (small and vulnerable economies - SVEs -).
- D. 100% DFQF given by OECD countries plus Brazil, China, and India to LDCs.

All scenarios are implemented in 2010.

In the first scenario, liberalization only applies to 97% of tariff lines and preference-giving countries are free to select the products excluded. In this case, we use the political economy criterion developed by Jean et al., (2010) to select the tariff lines excluded from liberalization. This approach is central to this study in the sense that it is more realistic to assume that giving-countries optimize their trade policies, taking into account politically-sensitive products¹⁴. It is

¹³ See his statement at http://www.wto.org/english/thewto_e/minist_e/min09_e/min09_statements_e.htm.

¹⁴ The initial model of Jean et al (2010) concerns only agricultural products. Actually, one important assumption of their modeling is that the share of agricultural dutiable imports in total expenditure of importers is small. In our context, some manufactured products are included in the list of potential sensitive products, but obviously this assumption is also respected: in implementing the simplified version of the Jean et al. (2010) criteria, we just assume that for each product imported from LDCs, the share in total expenditures is small to have the parameter

based on a political economy approach where the government (common agent) gives protection to economic sectors (multi-principals) against financial transfers and maximizes a function which includes national welfare and these financial transfers. As a result of this model, the government is supposed to select lines which maximize a political economy indicator depending positively on the height of the tariff and the magnitude of imports¹⁵.

Here, it is important to point out that if the method of Jean et al (2010) is a rigorous approach, two conceptual limits have to be remembered.

First, governments maximize a welfare objective function without taking into account changes in foreign trade policies. Thus the Jean et al. (2010) approach considers that each country makes its choices independently from the rest of the world. This can be interpreted as each country being small and a price taker on its imports.

Second, in the model of Jean et al. (2010) the prediction is that a single tariff applies to each product from all trade partners. But in reality, the pre-DFQF regime embodies a host of bilateral and regional trade agreements that stipulate different levels of bilateral tariffs. The interpretation of the Jean et al. (2010) model used here is adjusted to accommodate this dimension. In the present approach, we consider that each pair product-exporter is a differentiated product in the CES function.

With the Mirage model simulations, it is possible to underline some interesting results that would be generated by these different scenarios, and in particular the distribution of potential gains and losses in terms of exports, production variation and social welfare. Welfare variation in this model is estimated on the basis of the Hicksian concepts of equivalent variation¹⁶. In addition to the impact on different groups of preference beneficiaries, we are also interested in the impact on production in the preference-giving countries. The remaining tariff peaks in developed countries are the result of lobbying by powerful political constituencies, so, in order to assess the political feasibility of various scenarios, it is important to analyze the impact in those countries as well.

Before exploring and analyzing the results, it is important to emphasize the implications of using Armington elasticities, which assume that imported and domestic products are heterogeneous and, therefore, that substitution between them is more limited than with homogeneous products. That, in turn, means that the predicted values of the trade changes (in response to prices variation) are smaller than those implied by models with homogeneous

“1-s” in Jean et al. (2010) article close to 1, the import demand elasticity becoming the same for all goods under the CES assumption.

¹⁵ It is noteworthy that the pre-DFQF protection structure needs to be a political optimum in order to calibrate the model and choosing sensitive products is done in a way that minimizes political welfare losses. We model here a process under which governments maximize their objective function under the constraint that DFQF is given to some partners with only 3% of tariff lines still taxed. Consequently the post-DFQF equilibrium is suboptimal compared to the initial case, but it is a new optimum under this new constraint.

¹⁶The Hicksian equivalent variation is defined as the monetary amount that would need to be given to the representative agent in order to reach the same level of welfare in the free trade case as under initial prices.

products. Moreover the levels of these elasticities are equal to those used by the GTAP model, but are less than those used by the LINKAGE model at the World Bank. Thus, the Mirage model is quite conservative.

The Impact of 100 percent Market Access in OECD Countries for LDCs

Previous studies by Berisha-Krasniqi, Bouët, Laborde and Mevel (2008), among others, demonstrated that tariff peaks in rich countries are concentrated in a few tariff lines and, therefore, 97 percent duty-free access provides very little benefit.¹⁷ That result was confirmed by this analysis, which shows no LDC gaining even as much as one-tenth of one percent in additional exports from 97 percent product coverage. For similar reasons, including that LDC exports are relatively concentrated, 97 percent coverage by more advanced developing countries also results in relatively small export gains. For that reason, in the discussion that follows, we focus on the scenarios involving 100 percent DFQF market access. The results in terms of overall export changes for all scenarios are presented in Annex Table 3.

In this section, we will focus on the results when OECD countries provide 100 percent DFQF market access, and we examine the effects both for those benefiting from DFQF market access and others that might suffer preference erosion.¹⁸ Table 1 shows the change in exports and overall welfare for one Asian and four African LDCs, as well as two aggregates containing LDCs—Rest of Southeast Asia, which includes Cambodia and Laos (as well as oil exporter Brunei), and Rest of Africa, which contains a mix of LDCs, as well as other low- and middle-income countries, making it particularly difficult to interpret.

Table 1: World Average protection rates on LDCs exports, before and after DFQF

DFQF recipients (LDCs)	Initial Average protection on LDC exports ^[1]	Average protection on LDC exports after 100% DFQF	Variation (%)
Bangladesh	5.5%	3.3%	-39.848
Ethiopia	9.7%	9.7%	-0.009
Madagascar	1.7%	1.7%	-0.326
Malawi	18.3%	6.3%	-65.508
Mozambique	4.8%	4.8%	-0.010
Rest of Africa	5.4%	5.1%	-3.976
Rest of South East Asia	1.9%	1.2%	-34.788
Senegal	5.8%	5.8%	-0.01

¹⁷See, for example, Hoeckman B, Ng F and Olarreaga M, 2002, *Eliminating Excessive Tariffs on exports of Least Developed Countries*

¹⁸ Annex Table 3 shows the results for additional economy-wide variables for all countries and regions in the database for the two central scenarios: where only the OECD provides 100 percent DFQF market access for LDCs, and where Brazil, China, and India do so as well.

These figures illustrate how DFQF can generate relatively large reductions in average tariff for some LDCs. Average tariffs are weighted by the share of each sector in the national production (and not exports to avoid bias due to tariffs) and that means that countries that are most dependent on one or two sectors where they have a strong comparative advantage and face relatively high tariffs will experience sharper declines in the average protection rate that they face and that will allow them to boost their exports relatively more (Bangladesh, Malawi). Conversely, when the countries are relatively more diversified, or they concentrated in sectors with relatively low tariffs, such as some minerals, the impact will be less. For instance, if Mozambique should not expect a large decrease in the average tariff because more than half its exports are metals, which face low tariffs already. The same can be said for Senegal, which is specialized in manufactured goods (chemical or food products) that generally face low tariffs. Conversely, Malawi is strongly specialized in non-manufactured tobacco (other crops), imports of which are highly taxed by the United States. It is important to underline that if emerging markets are included in the analysis, the case of Senegal, for instance, will be improved by the removal of Indian tariffs on chemical products that will boost Senegalese exports.

Table2: Percentage change in Key Variables in 2020 from OECD implantation of 100% DFQF for LDCs (sorted by change in welfare).

DFQF Recipients	Exports	Welfare	Otherdeveloping countries	Exports	Welfare
Malawi	12.97	2.65	Mauritius	0.03	0.02
Rest of South East Asia	2.52	0.95	Central America	0.14	0.01
Ethiopia	1.35	0.29	South Africa	0.02	0.00
Bangladesh	4.16	0.29	Rest of Asia and Oceania	0.00	0.00
Mozambique	0.39	0.17	Middle East and North Africa	0.01	0.00
Senegal	1.16	0.15	Nigeria	0.01	0.00
Rest of Africa	0.08	0.03	Rest of Eastern Europe	0.00	0.00
Madagascar	-0.03	-0.02	Sri Lanka	-0.01	0.00
			China	-0.03	0.00
			India	-0.01	0.00
			Pakistan	-0.04	0.00
			Philippines	-0.01	0.00
			Vietnam	-0.01	-0.01
			Brazil	-0.03	-0.01
			Bolivia	-0.03	-0.01
			Indonesia	-0.03	-0.01
			Rest of Latin America	-0.05	-0.01
			Paraguay	-0.04	-0.03

Turning to changes in exports and welfare, the model suggests that Madagascar might suffer very small losses, but all other LDCs for which we have data show gains from 100 percent DFQF access in OECD markets. It is also notable, given the concerns about the extension of U.S.

preferences to Asian apparel exporters that the export losses in Madagascar in this scenario come in agriculture, not the apparel sector. Additional details on the potential implications of these changes for sub-Saharan African LDCs are discussed in Box 2 at the end of this section. Moreover, these small losses are reversed if the major emerging markets also provide duty-free, quota-free market access (see discussion below and Annex Table 4).

Overall, Malawi is the biggest gainer by far because of an unusual set of circumstances—a relatively high dependence on tobacco exports facing an unusually high, 350 percent, tariff in the U.S. market, which leads to a sharp increase in exports of that product. Thus, this case also underscores the need for complementary government policies to guard against increased export concentration and commodity dependence when trade barriers are lifted.

The reported gains for the rest of Africa region are noticeably smaller than for the individual African LDCs and this could be due to the fact that only a subset of countries in the aggregation are LDCs that receive expanded access. As expected, an examination of more detailed results for Southeast Asia shows that the gains are mostly due to increased exports of apparel to the U.S. market, as are the gains for Bangladesh. The sectoral change in exports, by country or region, for this scenario is shown in Annex Table 5. The increased export of apparel from Southeast Asia probably represents mostly exports from Cambodia, since Laos is small and has very little export capacity and Brunei, the third country in that aggregate, exports mostly oil and faces low tariffs.

What is also notable in Table 2 is that other competing countries that might be expected to suffer from preference erosion—Mauritius, South Africa, and Central America—instead show gains, albeit very small. And for other developing countries, if they suffer losses at all, estimated losses fall well below one-tenth of one percent of total exports or national income.

To put the potential gains in some perspective, we can compare them to two other sets of results—general equilibrium estimates of the welfare gains from global free trade, and partial equilibrium estimates of the export gains of moving from 97 percent to 100 percent product coverage in the context of a feasible Doha Round outcome (based on what was on the table in the summer of 2008 when the talks collapsed).

With respect to the gains from global free trade, Bouët (2008) uses the same MIRAGE model and estimates that global free trade would produce average welfare gains of around 0.8% of national income for low-income countries. In contrast to unilateral trade preferences in OECD markets, global free trade would bring additional gains from access to other developing-country markets, as well as from these countries' liberalization of their own markets. Thus, it is notable that the estimated benefits from 100 percent market access for LDCs show welfare gains well above the level estimated for global free trade for Malawi and Southeast Asia, and of more than a third of that level for Bangladesh and Ethiopia.

While they are the only technique for showing the global distribution of gains and losses from changes in trade policy, computable general equilibrium models have features that make the size of the estimates quite conservative. To suggest the range of possible benefits, Table 3 contrasts the CGE results for LDCs with estimates from Laborde (2008), which uses a less

conservative, partial equilibrium, approach that takes into account only potential changes in demand in the liberalizing countries, and not potential supply constraints in the exporting countries.¹⁹ In addition to using a different estimation method, the Laborde results are in the context of the WTO's Doha Round and thus cover only the 32 WTO members.

The partial equilibrium analysis suggests that total LDC exports could increase as much as \$2 billion, or 17 percent. The largest relative gains in both sets of estimates go to Malawi, as well as the Asian LDCs that face tariff peaks on their exports of apparel to the U.S. market. Other African LDCs see smaller gains, but that is not surprising since they generally have good access in their major markets. The partial equilibrium estimates of gross gains are also available for other LDCs that are members of the WTO and those show large gains for Benin and Sierra Leone, and gains of a quarter or more, relative to base-year exports, for Maldives, Nepal, and Niger (Laborde 2008, p. 22).

Table 3: Percentage Variation in Exports for two scenarios in two models

	100 % OECD DFQF		100 % OECD + MICS ^b	
	General Equilibrium	Partial Equilibrium ^a	General Equilibrium	Partial Equilibrium
Bangladesh	4.16	28.96	4.82	38.55
Cambodia ^c	2.52	31.27	2.55	32.96
<i>Clothing</i>	19.49	n.a.	19.51	n.a.
Ethiopia	1.35	n.a.	2.24	n.a.
Madagascar	-0.03	-0.74	0.57	20.61
Malawi	12.97	215.08	13.91	240.41
Mozambique	0.39	16.29	1.41	128.11
Senegal	1.16	8.46	9.38	64.83
All WTO LDCs ^d (%)	n.a.	16.97	n.a.	44.36
All WTO LDCs ^b (million dollars)		2 108		7 731

n.a. = not available.

a. Canada, Japan, Norway, Switzerland, United States; the EU is excluded because it provides 100 percent DFQF.

b. The CGE model includes South Korea and Mexico in OECD, while the partial equilibrium includes them with Brazil, China, and India as middle-income countries.

c. In the CGE model, the results are for the regional aggregate, "rest of South East Asia," which includes Laos and Brunei, as well as Cambodia, which dominates exports.

d. The partial equilibrium estimates are in the context of a Doha Round agreement and thus only include WTO LDCs.

Finally, it should be noted that neither the general nor the partial equilibrium estimates account for rules of origin or other administrative obstacles that can block access, even when traditional trade barriers are eliminated. Thus, the benefits are likely underestimated because they assume full access in the EU market, despite restrictive rules of origin in the EBA program

¹⁹ In this model, LDCs have no supply constraints and react perfectly to the increased demand for their products when barriers are removed. See Fontagne, Laborde, and Mitaritonna (2008) for details.

that are known to inhibit exports.²⁰ But the benefits of moving to 100 percent DFQF access in other markets would also be less than estimated here if programs for LDCs create or retain similar obstacles. That underscores the importance of including changes to restrictive rules of origin, as recommended by the CGD Working Group on Global Trade Preference Reform.²¹

Box 2 The Impact on Africa of 100 percent DFQF Market Access in the United States

Currently, Asian LDCs are outside of the more generous regional preference programs offered by the United States and because the GSP program that is available to them excludes apparel, they are among the biggest potential gainers from the adoption of 100 percent DFQF access in the U.S. market. But the potential increase in competition raises concerns among existing preference beneficiaries, especially in sub-Saharan Africa, where a handful of countries have been able to take advantage of AGOA to increase apparel exports. Unfortunately, our ability to explore these issues in the detail we would like is inhibited by lack of data: of the five major African apparel exporters (accounting for 90 percent of exports under AGOA), we have disaggregated data for only one LDC, Madagascar, as well as for Mauritius. Kenya, Lesotho, and Swaziland are included in the Rest of Africa aggregate.

The results that we have do not suggest that African apparel exporters will systematically lose out. More disaggregated results do show modest reductions in African apparel exports to the United States, generally in a range of one to one and a half percent of current exports. But if U.S. reform is embedded in broader global reform, as modeled here, sub-Saharan African exporters gain access in other markets as trade flows adjust globally.

As noted above, Madagascar is the only significant African LDC apparel exporter for which there is data and, while Madagascar is also the only country that does not gain from 100 percent DFQF market access in OECD countries, that result is not due to preference erosion in apparel. As shown in annex table 4, there is essentially no change in Madagascar's exports of apparel under this scenario. As also shown in that table, Mozambique, which is not currently a major exporter of apparel, would see a small gain, as would South Africa, a non-LDC. Mauritius, a major exporter and non-LDC, would see a very small loss, while Ethiopia, Malawi, and Senegal, which export very little apparel, would shift resources from that sector to others. It is also important to note, however, that rules of origin are not addressed here and the recently announced changes to those rules in the European Union are important in allowing adjustment to occur in that market as well.

Moreover, 100 percent product coverage is of benefit to Africa generally because benefits are currently narrowly concentrated in a few countries and products, mainly oil, and full coverage would eliminate the exclusions on agricultural exports.¹ To the degree that there are losses from expanding preferences for all LDCs, it would be preferable to address these through targeted measures to increase competitiveness or to compensate the adjustment, rather than discriminating among LDCs.

²⁰ Additional benefits might now be realized as a result of the EU's announcement of new, less restrictive rules of origin under the EBA program, especially with respect to fish and apparel.

²¹ Information on the working group, as well as the final report, may be found at http://www.cgdev.org/section/initiatives/_active/reformingtradepreferences/global_trade_preference_reform.

What Happens if the OECD Extends 100 Percent Access to Other Small, Poor Countries?

We tested a different scenario for extending eligibility for DFQF market access in OECD countries beyond LDCs, where other small and vulnerable economies (SVEs) are included in the preferential program. More precisely, the additional small and vulnerable countries that fall below the World Bank's low middle-income (per capita) threshold with total national incomes below \$50 billion, which excludes Pakistan and Vietnam because they are large, become DFQF recipients.

In addition, to test the sensitivity of the results to the country classification chosen, we implemented a fifth scenario that extends DFQF to all low-income-Countries (including VietNam and Pakistan in spite of their relatively large size). This scenario may also be of interest because both the EU and United States are considering extending some additional market access to Pakistan in the wake of last summer's floods.

Table 4 shows the estimated change in exports for potential beneficiaries, as well as those left out, under each scenario and compares them to the LDC-only scenario. In general, extending DFQF market access to other low-income countries, even when Pakistan and Vietnam are included, entails generally small losses for both LDC beneficiaries and excluded countries, and, when they are included, large gains for Pakistan and Vietnam. There are losses for Sri Lanka, the Philippines, and Central America, but they remain well under one-half of one percent in those cases. Unfortunately, the benefits for the smaller low-income countries are harder to assess because of data limitations, with only Pakistan and Vietnam having sufficient information available to assess the impact in detail. The increase in exports for the rest of Africa region could be due to increased benefits for low-income countries in that region.

Extending DFQF market access to other small and low middle-income countries creates large export gains for those countries for which we have data, especially Paraguay (17%) and Sri Lanka (21%). The African, Central American, and Latin American residual regional aggregates also gain, presumably because they include small, low middle-income countries that would gain from additional access. But this scenario leads to modest reductions in the gains for Asian LDCs and either larger declines in gains or outright losses for African LDCs, including of more than 1 percent of exports for Ethiopia and Madagascar. The inclusion of low income countries, especially from Latin America and Asia, will expand the scope of products on which African LDCs will face increased competition, particularly in agriculture. Preference erosion losses also increase for other developing countries, though they are relatively small except for Mauritius.

Table 4: Percentage Change in Export Volume in 2020 in Scenarios Where OECD Grants 100% DFQF

Region	B_ LDCs only	C_ OtherSVEs	All LICs ⁽¹⁾
LDCs			
Bangladesh	4.16	3.46	3.38
Ethiopia	1.35	-0.49	0.90
Madagascar	-0.03	-2.28	-0.70
Malawi	12.97	4.71	11.15
Mozambique	0.39	-0.48	0.21
Senegal	1.16	0.80	1.12
Rest of South East Asia	2.52	2.40	2.25
Rest of Africa	0.08	0.49	0.29
Low-income countries			
Pakistan	-0.04	-0.05	11.90
Vietnam	-0.01	-0.06	18.00
AdditionalSVEs			
Bolivia	-0.03	3.46	-0.02
Paraguay	-0.04	16.95	-0.03
Sri Lanka	-0.01	20.94	-0.27
Otherdeveloping countries			
Brazil	-0.03	-0.12	-0.07
China	-0.03	-0.06	-0.10
India	-0.01	-0.04	0.04
Indonesia	-0.03	-0.07	0.02
Mauritius	0.03	-1.96	-0.35
Nigeria	0.01	0.03	0.03
Philippines	-0.01	-0.07	-0.17
South Africa	0.02	-0.02	0.04
Central America	0.14	0.83	-0.02
Middle East and North Africa	0.01	3.51	0.00
Rest of Asia and Oceania	0.00	0.00	0.08
Rest of Eastern Europe	0.00	0.12	0.10
Rest of Latin America	-0.05	0.78	-0.07

(1) additional scenario included all the LICs

How Important is Improved Access in Large, Emerging Markets?

For some countries, particularly in Africa, extension of full market access by large emerging markets would significantly expand the potential gains from unilateral preference programs. In these scenarios, we include as emerging markets China and India, which have implemented partial duty-free preferences for LDCs, and Brazil, which also recently announced that it will introduce a program soon.²² China announced a few years ago that it would provide duty-free, quota-free access on 440 tariff lines for 30 sub-Saharan African with which it has diplomatic relations and then announced an expansion of that in late 2009 to 95 percent of tariff lines. It also offers DFQF on a smaller number of tariff lines to Asian LDCs with whom it has relations. India's programs provide DFQF market access on 85 percent of tariff lines and partial duty reductions on another 9 percent, phased in over several years. The announcement by Foreign Minister Celso Amorim Geneva last year said that Brazil would begin providing duty-free access for LDCs on 80 percent of items by the end of 2010 and then increase coverage to "all tariff lines" over four years.²³

Unfortunately, we do not have full information on these programs and we have to make some assumptions to identify the products likely to be excluded in the partial product coverage scenario, which could skew the results somewhat. From what we do know about these programs, the political economy and the range of import-sensitive products appear to be similar to what we find in OECD countries. Thus, China's original list of covered products excluded cotton, sugar, most fruits and vegetables, and a number of textile and apparel products. India includes sugar and cotton, but excludes a number of other agricultural products and offers no or only partial preferences on many textile and apparel products. Textiles and apparel were also raised as sensitive by industry groups in Brazil.²⁴

The analysis suggests that meaningful impact on LDC exports and welfare (Table 5 and Annex Table 4) will result only if emerging markets also provide 100 percent product coverage.

²² Turkey is included as a member of the OECD in those simulations.

²³ Because Minister Amorim's statement also refers to the Hong Kong communiqué, it is not entirely clear whether the commitment is to eventually cover 100 percent or 97 percent of tariff lines. See his statement on the WTO website at http://www.wto.org/english/thewto_e/minist_e/min09_e/min09_statements_e.htm.

²⁴ On China, see Minson (2007); for a comparison of China and India, drawing on the political economy literature, see Engel (processed); and on Brazil, see *Bridges Weekly Trade News Digest*, Vol. 10, Number 41, December 6, 2006.

Table 5: Comparing the Percentage Change in Export Volume in 2020 when Brazil, China, and India also grant 100% DFQF to LDCs

LDCs	OECD only	OECD + EMs
Malawi	12.97	13.91
Senegal	1.16	9.38
Bangladesh	4.16	4.82
Rest of South East Asia	2.52	2.55
Ethiopia	1.35	2.24
Mozambique	0.39	1.41
Madagascar	-0.03	0.57
Rest of Africa	0.08	0.22

EMs	OECD only	OECD + EMs
Brazil	-0.03	0.00
China	-0.03	-0.02
India	-0.01	0.64

Otherdeveloping countries	OECD only	OECD + EMs
Bolivia	-0.03	-0.04
Central America	0.14	0.14
Indonesia	-0.03	-0.03
Mauritius	0.03	0.05
Middle East and North Africa	0.01	0.00
Nigeria	0.01	-0.13
Pakistan	-0.04	-0.06
Paraguay	-0.04	-0.03
Philippines	-0.01	-0.02
Rest of Asia and Oceania	0.00	0.01
Rest of Eastern Europe	0.00	0.01
Rest of Latin America	-0.05	-0.04
South Africa	0.02	0.03
Sri Lanka	-0.01	-0.05
Vietnam	-0.01	-0.01

Focusing on the 100 percent product coverage scenario where emerging markets join OECD countries, this is the only scenario examined where Madagascar shifts from small losses to small gains. This scenario also results in more marked increased gains for several other LDCs in Africa, particularly Ethiopia, Mozambique, and Senegal, with more modest additional benefits for the Asian LDCs. The African regional aggregate also sees a large relative gain, though it remains small in absolute terms.

The partial equilibrium estimates in Table 2 show a similar distribution of gains, but of a much larger magnitude. In this scenario, exports from Madagascar, Mozambique, and Senegal could increase by as much as 21 percent, 128 percent, 65 percent, respectively, compared to increases of 10 percent or less in the general equilibrium modeling. Overall, the partial equilibrium estimates for all WTO LDCs suggest an average increase in exports of up to 44 percent, worth an additional \$8 billion for these countries.

Perhaps the most interesting result in the general equilibrium analysis is that all three emerging markets granting 100 percent DFQF market access improve their position relative to the scenario where only the OECD grants DFQF market access to LDCs. Other developing countries see little or no preference erosion as a result of the expanded access for LDCs (Table 4).

What is the Impact of 100 percent DFQF Market Access for OECD Countries?

The overall conclusion regarding the impact on preference-giving countries—both developed and developing—is that it is small. Annex Table 3 shows the results from the CGE model for changes in exports, GDP, and welfare, among other indicators, and they are indistinguishable from zero for all preference-giving countries when 100 percent DFQF for LDCs is given, either by the OECD only, or OECD plus Brazil, China, and India. Table 5 shows the sector-specific variation in production for preference-giving countries and, while the impact often exceeds the average, economy-wide impact (not surprisingly), there is only a handful of cases where production declines rise to even as much as 0.5 percent.

For the OECD countries not already granting 100 percent product coverage, the most sensitive products are often agricultural products subject to tariff-rate quotas to help control supply and prop up prices. The expressed concern, whether in Japan for rice and dairy, Canada for dairy and poultry, or sugar in the United States, is that expanded market access for LDCs will destabilize the price support programs. It is true, that the estimated reductions for agricultural products that are commonly controlled through quantitative restrictions could be suppressed because the model cannot completely address the prospects for trade creation in cases where little or no trade currently exists. Still, one would not expect large gains for potential LDC exporters of commodities such as meat and dairy products because it would be difficult for poor countries to meet rich-country food safety standards for these products. And in other sectors, the prospects for significant supply expansion are limited.

To explore one example in more detail, are the CGE results in Table 6 and Annex Table 5, which show very little change in either exports or U.S. production of sugar from providing 100 percent DFQF for LDCs, plausible? While the estimate of no change in production is influenced by the restrictions imposed on trade creation in cases of zero trade, a brief survey of LDC exporters and markets also suggests there is little reason to expect a large surge in U.S. imports if sugar is included in DFQF for LDCs. Currently, only two African LDCs—Malawi and Mozambique—have access to the U.S. market under the historical quota allocation system and their quotas are small. Only two other African LDCs—Ethiopia and Zambia—have had exportable sugar surpluses in recent years. But African sugar producers tend to be relatively high-cost and transportation costs are also high.²⁵ The European Union is also the traditional market for African exporters, though some of those exports could shift to the American market since the reform of the EU sugar regime (forced by a WTO complaint by Brazil) reduced the internal price from 50 percent higher to roughly the same level as in the United States.

²⁵ The exception to this is Sudan, which is planning large investments in sugar production with the aim of boosting output ten-fold. But Sudan is currently excluded from U.S. preference programs and the U.S. market by comprehensive foreign policy sanctions over human rights and democracy issues.

Table 6: Percentage Change in Production Volume from implementing 100% DFQF for LDCs*

Sector	ANZ	Canada	EFTA	EU	Japan	Mexico	Turkey	US	Brazil	China	India
Fish	-0,01	-0,01	0,00	0,00	-0,01	0,00	-0,00	0,00	0,00	-0,01	-0,10
Leatherproducts	0,02	-0,01	0,02	0,00	0,02	0,01	0,09	0,05	-0,08	-0,01	0,47
Milk	-0,05	-0,03	-0,01	-0,01	-0,01	0,01	0,02	-0,10	-0,00	0,01	-0,00
Oilseeds	-0,97	-0,57	0,48	-0,17	-0,38	-0,45	-1,56	-0,99	-0,41	-0,33	-0,07
Othercereal grains	0,04	-0,06	-0,01	-0,00	-0,01	0,01	-0,12	0,04	0,17	0,01	0,05
Othercrops	0,02	-0,40	0,14	0,03	-0,03	-0,14	-0,66	-0,76	-0,05	-0,03	-0,14
Rice	0,03	0,09	0,29	0,13	-0,00	-0,00	-0,32	0,04	0,00	0,00	0,10
Sugar	-0,15	0,01	-0,54	0,21	-0,35	0,01	0,06	0,01	0,15	-0,17	0,03
Textile	-0,27	-0,57	0,05	0,07	-0,03	-0,22	0,08	-0,45	-0,09	-0,11	0,21
Vegetable and fruit	0,04	0,05	-0,00	0,00	0,01	0,00	0,06	0,03	0,01	0,00	-0,62
Vegetableoils and fats	-0,51	-0,91	-1,36	-0,24	-0,27	-0,07	0,03	0,02	-0,50	-0,46	-0,20
Wearingapparel	-0,10	-0,01	0,02	0,03	-0,00	-0,03	0,03	-0,13	-0,06	-0,21	0,41

*For OECD countries, when only they implement; for emerging markets, when they implement along with OECD.

To explore further the potential for market disruption from increased African sugar exports, we applied a simple partial equilibrium analysis to this sector. Table 7 shows the impact on domestic production and prices from two scenarios, one where U.S. imports of sugar increase by 100,000 short tons, which would have almost no impact on U.S. prices and production, and a second with increased imports of 300,000 short tons, which would reduce production by 6 percent and average prices by 10 percent, to 20 cents per pound.²⁶ Though there is no economic justification for the U.S. price-support program for sugar, these estimates suggest that at least some expansion of access is possible, without major disruption of the market, as long as that remains the political goal of the minority that controls policy.

Another sensitive sector for the United States is apparel and, here, both the CGE and partial equilibrium (Table 2 and Annex Table 5) results do show relatively large increases in apparel exports by Bangladesh and Southeast Asia (mostly by Cambodia). But, again, the impact on U.S. production is small, -0.45 percent for textiles and -0.13 for clothing. If removal of tariffs led to increased imports that are two to three times higher than estimated in the CGE model, closer to what is suggested by the partial equilibrium model (Table 1), and if the impact on production is proportional, it would still be in a range of one to two percent.²⁷

There are two major reasons for the relatively limited impact on U.S. production. First, the increase in imports from the Asian LDCs is offset to some extent by small decreases in exports spread among a large number of other exporters. Secondly, LDCs tend not to compete in the same product lines as American producers, who are generally far more technology sophisticated and capital-intensive. This is illustrated by the fact that Bangladesh's apparel exports are equal to 12.4 percent of the volume of U.S. production, but only 2.75% of the value.

²⁶ The estimates were done using the partial equilibrium model in Hufbauer and Elliott (1994).

²⁷ The estimated 4 percent increase in Bangladeshi exports from the CGE model, shown in Table 1 is for all exports to all countries. As shown in Annex Table 4, the increase in exports of textiles and clothing, most of which would be to the United States, is nearly 13 percent. The partial equilibrium estimates of increased exports are a bit more than twice that figure for Bangladesh and roughly 50 percent higher for Cambodia.

Table 7: Effects of enlarging the U.S. Sugar Quota

Estimated levels after altering quota	Scenario 1	Scenario 2
New Import Price (calculated, dollars/short ton)	414.3	376.1
New Import Volume (assumed, '000 short tons)	1,500.0	1,700.0
New Domestic Price (calculated, dollars/short ton)	421.6	395.0
New Domestic Output (calculated, '000 short tons)	8,318.9	8,000.1
Base yearlevels (year)		
Import Price (dollars/short ton)	437.0	
Import Volume (WTO quota level, '000 short tons)	1,400.0	
Domestic Price (dollars/short ton)	437.0	
Domestic Output ('000 short tons)	8,500.0	
Elasticities and intercepts used for calculations (see Hufbauer and Elliott)		
(i) DomesticDemand		
Own-Price Elasticity (Edd)		
Cross-Price Elasticity (Edm)	-1.33	
	1.30	
(ii) DomesticSupply		
Own-Price Elasticity (Es)		0.60
(iii) Import Demand		
Own-Price Elasticity (Emm)		
Cross-Price Elasticity (Emd)	-3.78	
	3.69	
(iv) Equation Intercepts		
ln(a)		
ln(b)		9.23
ln(c)		5.40
		7.79

Source for model and parameters: Gary Clyde Hufbauer and Kimberly Ann Elliott, *Measuring the Costs of Protection in the United States*, Washington: Institute for International Economics, 1994, p. 81

Source for data: U.S. Department of Agriculture, U.S. Sugar and Sweeteners: Recommended Data, online at <http://www.ers.usda.gov/briefing/sugar/data.htm>.

Conclusions

Unilateral trade preference programs were created four decades ago to stimulate exports and help developing countries diversify their economies as part of their development strategies. Through preferences, but also regional and multilateral negotiations, many developing countries succeeded spectacularly in using trade as a tool of development, but the least developed countries lagged for a variety of reasons. The duty-free, quota-free market access initiative was developed to give these countries a boost.

While significant progress has been made toward the goal of improved market access for LDCs since the Millennium Declaration embraced it in 2000, much also remains to be done. This analysis helps to identify the distribution of potential costs and benefits from further progress. Several key conclusions that should inform policies in G20 countries stand out:

- There are still significant benefits for LDCs from removing the remaining barriers they face in OECD countries, but only if all products are covered. Since both rich-country tariff peaks and LDC exports are relatively concentrated, excluding as few as three percent of tariff lines, as proposed by the United States at the WTO ministerial meeting in Hong Kong in 2005, reduces the benefits to basically zero.
- Although it has nearly full access in its main markets, including in the United States under AGOA, sub-Saharan Africa can still gain from 100 percent DFQF market access that eliminates remaining agricultural restrictions in the U.S. markets.
- The gains for LDCs, especially in Africa, are significantly enhanced if Brazil, China, and India also provide 100 percent DFQF market access.
- There is little evidence of significant losses for other competing developing countries that are not LDCs, including Pakistan or Sri Lanka, nor is there evidence of net losses for Africa from the United States extending DFQF market access to Asian LDCs.
- The LDCs account for a trivial share of global exports, the reason for the initiative, and preference-giving countries thus have little to fear from extending full market access to them. The quantitative results show that the expected impact on welfare, exports, and domestic production are very small to zero, including for the quota-controlled agricultural products excluded by Canada, Japan, and the United States, as well as textiles and apparel in the latter case.
- Relative to the scenario where only the OECD does so, the large emerging markets do *better* if they also grant 100 percent DFQF market access to LDCs.

- Extending DFQF access to other low-income countries (by the World Bank definition) has little impact on existing LDC beneficiaries or preference-giving countries, but big benefits for Pakistan and Vietnam if they are included.²⁸
- Extending DFQF to other small and poor (lower middle-income) countries has large benefits in some cases for those countries, but at the expense of existing LDC beneficiaries, especially in Africa, and also entails higher costs for preference-giving countries.

The context around these potential gains is also important, however. In particular, they assume full utilization of available market access, but that does not happen for a number of reasons. It did not happen under the EU's Everything But Arms program in the past because of rules of origin that are highly restrictive in some sectors and prevent LDC exporters being able to take advantage. The value of U.S. and other reforms in the future will also depend on what kind of rules they choose to implement.

Whether African fish and clothing exports respond to the change in EU rules of origin will tell us something about the importance of complementary policies to support full utilization of preference programs. We know that policies outside preference programs themselves, such as sanitary and phyto-sanitary standards²⁹ affect agricultural trade in importing countries, and that inadequate infrastructure and excessive red tape in LDCs, are often at least as important as traditional border measures in suppressing LDC exports. Aid for trade and reforms to improve investment climates in the exporting countries need to be addressed before preference programs can reach their full potential.

But providing market access is a step that this analysis suggests would be both beneficial for LDCs, and low-cost for preference-giving countries. UN Secretary General Ban Ki Moon just designated 2010 as the "year of development" and called for accelerated efforts to achieve the Millennium Development Goals. The ongoing economic crisis in many rich countries contributed to rising protectionist pressures in those countries and could make this proposal seem less feasible. But the analysis here underscores the small effects on production in preference-giving countries and the crisis should not be an excuse for delaying achievement of the goal of providing duty-free, quota-free market access for LDCs by rich countries, as well as by Brazil, China, India, and other developing countries "in a position to do so."

²⁸ Note, however, that Pakistan recently moved into the World Bank's low-middle income category and Vietnam is expected to do so, possibly as soon as this year.

²⁹ Disdier, Fontagné and Mimouni (2004) analyze the impact of sanitary and phyto-sanitary (SPS) rules, as well as technical barriers to trade (TBT). They show that SPS and TBT have a significant impact on LDCs exports especially from the EU market. Actually they've shown that despite the fact that other OECD countries enforce more SPS rules, those imposed by the EU impede more LDCs exports on agricultural products. Obviously these SPS and TBT rules are often legitimate, but they can also be protectionist.

Annex Table 1: Regions and Sectors Used in the Model

Regions	Sectors
Australia New Zealand	Agrofood (aggregate)
Bangladesh*	Animal and meatproducts
Bolivia**	Beverage and tobaccoproducts
Brazil	Chemicalrubber plastic products
Canada	Coal oilgas
Central America***	Cotton woolsilkforestry
China	Fish
EFTA	Industry (aggregate)
Ethiopia*	Leatherproducts
EU	Metals
India	Milk
Indonesia	Oilseeds
Japan	Othercereal grains
Korea South	Other crops (includes raw tobacco)
Madagascar*	Otherfoodproducts
Malawi*	Othermanufacturedproducts
Mauritius	Otherminerals
Mexico	Other services
Middle East and North Africa	Rice
Mozambique* ;	Services
Nigeria	Sugar
Oil exporting countries	Textile
Pakistan	Trade
Paraguay**	Transport
Philippines	Vegetable and fruit
Rest of Africa***	Vegetableoils and fats
Rest of Asia and Oceania	Wearingapparel
Rest of Eastern Europe	Wheat
Rest of Latin America***	
Rest of South East Asia*	
Senegal*	
South Africa	
Sri Lanka**	
Turkey	
US	
Vietnam	

* Least developed countries

** Other small and poor countries

*** Region includes LDCs and/or other small and poor countries

Annex Table 2: List of sensitive products at the HS6 level, defined from the model of Jean and al. (2010)

(the first 35 products are reported)

The United States		The European Union		Canada	
hs6	excluded products	hs6	excluded products	hs6	excluded products
240120	TOBACCO PARTLY OR WHOLLY STEMMED OR STR	010111	PURE BRED BREEDING HORSES	040510	BUTTER EXCL. DEHYDRATED BUTTER AND GHEE
620520	MEN'S OR BOYS' SHIRTS OF COTTON EXCL. K	010119	LIVE HORSES EXCL. PURE BRED FOR BREEDIN	040690	CHEESE EXCL. FRESH CHEESE INCL. WHEY C
240110	TOBACCO NOT STEMMED OR STRIPPED	010210	PURE BRED BREEDING BOVINES	020714	FROZEN CUTS AND EDIBLE OFFAL OF FOWLS OF
611020	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	010290	LIVE BOVINE ANIMALS EXCL. PURE BRED FOR	180690	CHOCOLATE AND othr PREPARATIONS CONTAIN
611030	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	010310	PURE BRED BREEDING SWINE	190190	PREPARATIONS OF FLOUR MEAL STARCH OR M
610910	T SHIRTS SINGLETs AND othr VESTS OF CO	010391	LIVE PURE BRED SWINE WEIGHING inf 50 KG	230990	PREPARATIONS OF A KIND USED IN ANIMAL FE
610510	MEN'S OR BOYS' SHIRTS OF COTTON KNITTED	010392	LIVE PURE BRED SWINE WEIGHING sup 50 KG	190120	MIXES AND DOUGHS OF FLOUR MEAL STARCH
620193	MEN'S OR BOYS' ANORAKS INCL. SKI JACKET	010410	LIVE SHEEP	210690	FOOD PREPARATIONS N.E.S.
170199	CANE OR BEET SUGAR AND CHEMICALLY PURE S	010420	LIVE GOATS	611780	MADE UP CLOTHING ACCESSORIES KNITTED OR
620342	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	010511	LIVE FOWLS OF SPECIES GALLUS DOMESTICUS	650590	HATS AND othr HEADGEAR KNITTED OR CROC
610610	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	010512	LIVE DOMESTIC TURKEYS WEIGHING inf = 185 G	040110	MILK AND CREAM OF A FAT CONTENT BY WEIGH
620530	MEN'S OR BOYS' SHIRTS OF MAN MADE FIBRES	010519	LIVE DOMESTIC DUCKS GEESE TURKEYS AND	821192	KNIVES WITH FIXED BLADES OF BASE METAL
610343	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	010592	LIVE FOWLS OF THE SPECIES GALLUS DOMESTI	850680	PRIMARY CELLS AND PRIMARY BATTERIES ELE
620343	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	010593	LIVE FOWLS OF THE SPECIES GALLUS DOMESTI	020713	FRESH OR CHILLED CUTS AND EDIBLE OFFAL O
620293	WOMEN'S OR GIRLS' ANORAKS INCL. SKI JAC	010599	LIVE DOMESTIC DUCKS GEESE TURKEYS AND	160232	PREPARED OR PRESERVED MEAT OR MEAT OFFAL
230990	PREPARATIONS OF A KIND USED IN ANIMAL FE	010600	LIVE ANIMALS EXCL. HORSES ASSES MULES	020726	FRESH OR CHILLED CUTS AND EDIBLE OFFAL O
610832	WOMEN'S OR GIRLS' NIGHTDRESSES AND PYJAM	020110	FRESH OR CHILLED BOVINE CARCASSES AND HAL	020727	FROZEN CUTS AND EDIBLE OFFAL OF TURKEYS
620630	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	020120	FRESH OR CHILLED BOVINE CUTS UNBONED E	020711	FRESH OR CHILLED FOWLS OF THE SPECIES GA
611241	WOMEN'S OR GIRLS' SWIMWEAR OF SYNTHETIC	020130	FRESH OR CHILLED BOVINE MEAT BONELESS	020712	FROZEN FOWLS OF THE SPECIES GALLUS DOMES
620640	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	020220	FROZEN BOVINE CUTS UNBONED EXCL. CARCA	020725	FROZEN TURKEYS OF THE SPECIES DOMESTICUS
610620	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	020230	BONELESS FROZEN MEAT OF BOVINE ANIMALS	160231	PREPARED OR PRESERVED MEAT OR OFFAL OF T
610520	MEN'S OR BOYS' SHIRTS OF MAN MADE FIBRES	020312	FRESH OR CHILLED HAMS SHOULDERS AND CUT	020900	PIG FAT FREE OF LEAN MEAT AND POULTRY F
621111	MEN'S OR BOYS' SWIMWEAR EXCL. KNITTED O	020319	FRESH OR CHILLED MEAT OF SWINE EXCL. CA	160220	PREPARATIONS OF LIVER OF ANY ANIMAL EXC
611130	BABIES' GARMENTS AND CLOTHING ACCESSORIE	020322	FROZEN HAMS SHOULDERS AND CUTS THEREOF	160100	SAUSAGES AND SIMILAR PRODUCTS OF MEAT
620920	BABIES' GARMENTS AND CLOTHING ACCESSORIE	020329	FROZEN MEAT OF SWINE EXCL. CARCASSES AND	021090	MEAT AND EDIBLE OFFAL SALTED IN BRINE
610469	WOMEN'S OR GIRLS' TROUSERS BIB AND BRAC	020410	FRESH OR CHILLED LAMB CARCASSES AND 1/2 C	010111	PURE BRED BREEDING HORSES
620413	WOMEN'S OR GIRLS' SUITS OF SYNTHETIC FIB	020421	FRESH OR CHILLED SHEEP CARCASSES AND 1/2	010600	LIVE ANIMALS EXCL. HORSES ASSES MULES
620452	WOMEN'S OR GIRLS' SKIRTS AND DIVIDED SKI	020422	FRESH OR CHILLED CUTS OF SHEEP UNBONED	020110	FRESH OR CHILLED BOVINE CARCASSES AND HAL
610722	MEN'S OR BOYS' NIGHTSHIRTS AND PYJAMAS O	020423	FRESH OR CHILLED BONELESS CUTS OF SHEEP	020120	FRESH OR CHILLED BOVINE CUTS UNBONED E
620930	BABIES' GARMENTS AND CLOTHING ACCESSORIE	020430	FROZEN LAMB CARCASSES AND 1/2 CARCASSES	020130	FRESH OR CHILLED BOVINE MEAT BONELESS
620822	WOMEN'S OR GIRLS' NIGHTDRESSES AND PYJAM	020441	FROZEN SHEEP CARCASSES AND 1/2 CARCASSES	020210	FROZEN BOVINE CARCASSES AND 1/2 CARCASSES
611120	BABIES' GARMENTS AND CLOTHING ACCESSORIE	020442	FROZEN CUTS OF SHEEP UNBONED EXCL. CAR	020220	FROZEN BOVINE CUTS UNBONED EXCL. CARCA
620463	WOMEN'S OR GIRLS' TROUSERS BIB AND BRAC	020443	FROZEN BONED CUTS OF SHEEP	020230	BONELESS FROZEN MEAT OF BOVINE ANIMALS
620453	WOMEN'S OR GIRLS' SKIRTS AND DIVIDED SKI	020450	FRESH CHILLED OR FROZEN MEAT OF GOATS	020311	FRESH OR CHILLED CARCASSES AND 1/2 CARCAS
610463	WOMEN'S OR GIRLS' TROUSERS BIB AND BRAC	020500	MEAT OF HORSES ASSES MULES OR HINNIES	020312	FRESH OR CHILLED HAMS SHOULDERS AND CUT

Annex Table 2 (continued): List of sensitive products at the HS6 level, defined from the model of Jean and al. (2010)

(the first 35 products are reported)

Japan		Brazil		China	
hs6	excluded products	hs6	excluded products	hs6	excluded products
170199	CANE OR BEET SUGAR AND CHEMICALLY PURE S	520100	COTTON NEITHER CARDED NOR COMBED	271000	PETROLEUM OILS AND OILS OBTAINED FROM BI
100630	SEMI MILLED OR WHOLLY MILLED RICE	240120	TOBACCO PARTLY OR WHOLLY STEMMED OR STR	081340	DRIED PEACHES PEARS PAWPAWS TAMARINDS
030490	FROZEN FISH MEAT WHETHER OR NOT MINCED	750210	NICKEL NOT ALLOYED UNWROUGHT	151790	EDIBLE MIXTURES OR PREPARATIONS OF ANIMA
420310	ITEMS OF CLOTHING OF LEATHER OR COMPOSI	520300	COTTON CARDED OR COMBED	400122	TECHNICALLY SPECIFIED NATURAL RUBBER `TS
640110	WATERPROOF FOOTWEAR INCORPORATING A PROT	410431	FULL GRAINS AND GRAIN SPLITS OF BOVINE A MEDICAMENTS CONSISTING OF TWO OR MORE CO	400121	SMOKED SHEETS OF NATURAL RUBBER
640610	UPPERS AND PARTS THEREOF EXCL. STIFFENE	300390	GOAT OR KIDSKIN LEATHER DEHAired PREPA	151620	VEGETABLE FATS AND OILS AND THEIR FRACTI
030510	FISH MEAL FIT FOR HUMAN CONSUMPTION	410620	MEN'S OR BOYS' SHIRTS OF MAN MADE FIBRES	151590	FIXED VEGETABLE FATS AND OILS AND THEIR
030410	FRESH OR CHILLED FILLETS AND othr FISH	620530	MEDICAMENTS CONSISTING OF MIXED OR UNMIX	281820	ALUMINIUM OXIDE EXCL. ARTIFICIAL CORUND
640699	PARTS OF FOOTWEAR EXCL. OUTER SOLES AND	300490	JUTE AND othr TEXTILE BAST FIBRES RAW	510529	WOOL COMBED EXCL. THAT IN FRAGMENTS `O
420340	CLOTHING ACCESSORIES OF LEATHER OR COMPO	530310	INPUT OR OUTPUT UNITS FOR DIGITAL AUTOMA	852290	PARTS AND ACCESSORIES OF SOUND REPRODUCI
030374	FROZEN MACKEREL `SCOMBER SCOMBRUS SCOMB	847160	PARTS OF ELECTRICAL APPARATUS FOR LINE T	121299	FRUIT STONES AND KERNELS AND othr VEGET
640192	WATERPROOF FOOTWEAR COVERING THE ANKLE	851790	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	030379	FROZEN FRESHWATER AND SALTWATER FISH EX
640191	WATERPROOF FOOTWEAR COVERING THE KNEE W	611020	BOVINE AND EQUINE LEATHER DEHAired PRE	400129	NATURAL RUBBER IN PRIMARY FORMS OR IN PL
030729	SCALLOPS INCL. QUEEN SCALLOPS OF THE G	410439	MULTIPLE `FOLDED` OR CABLED YARN OF JUTE	870324	MOTOR CARS AND othr MOTOR VEHICLES PRIN
640620	OUTER SOLES AND HEELS OF RUBBER OR PLAS	530720	SHEEP OR LAMBSKIN LEATHER WITHOUT WOOL	190490	CEREALS IN GRAIN FORM PRE COOKED OR OTH
420330	BELTS WAISTBELTS AND SHOULDER BELTS OF	410520	FROZEN DOGFISH AND othr SHARKS	271113	BUTANES LIQUEFIED EXCL. OF A PURITY OF
420321	SPECIAL SPORTS GLOVES OF LEATHER OR COM	030375	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	120740	SESAMUM SEEDS WHETHER OR NOT BROKEN
640199	WATERPROOF FOOTWEAR COVERING NEITHER THE	611030	BOVINE AND EQUINE LEATHER DEHAired TAN	271119	GASEOUS HYDROCARBONS LIQUEFIED N.E.S.
100610	RICE IN THE HUSK `PADDY` OR ROUGH	410429	MEN'S OR BOYS' NIGHTSHIRTS AND PYJAMAS O	400700	VULCANIZED RUBBER THREAD AND CORD EXCL.
100620	HUSKED OR BROWN RICE	610729	TOBACCO NOT STEMMED OR STRIPPED	190211	UNCOOKED PASTA NOT STUFFED OR othrWISE
170191	REFINED CANE OR BEET SUGAR CONTAINING A	240110	CANE OR BEET SUGAR AND CHEMICALLY PURE S	200919	ORANGE JUICE WHETHER OR NOT CONTAINING
170112	RAW BEET SUGAR EXCL. ADDED FLAVOURING O	170199	GOAT OR KIDSKIN LEATHER DEHAired MINER	030559	DRIED FISH SALTED NOT SMOKED EXCL. CO
010310	PURE BRED BREEDING SWINE	410612	SHUTTERS BLINDS INCL. VENETIAN BLINDS	330129	ESSENTIAL OILS WHETHER OR NOT TERPENELE
010410	LIVE SHEEP	392530	T SHIRTS SINGLETS AND othr VESTS OF CO	842649	MOBILE CRANES AND WORKS TRUCKS FITTED WI
010420	LIVE GOATS	610910	MEDICAMENTS CONTAINING ANTIBIOTICS NOT	151710	MARGARINE EXCL. LIQUID
010519	LIVE DOMESTIC DUCKS GEESE TURKEYS AND	300320	MEN'S OR BOYS' OVERCOATS RAINCOATS CAR	810510	COBALT MATTES AND othr INTERMEDIATE PRO
010599	LIVE DOMESTIC DUCKS GEESE TURKEYS AND	620113	MEN'S OR BOYS' SHIRTS OF COTTON KNITTED	051191	PRODUCTS OF FISH OR CRUSTACEANS MOLLUSC
010600	LIVE ANIMALS EXCL. HORSES ASSES MULES	610510	FOOTWEAR WITH OUTER SOLES OF RUBBER OR P	410512	SHEEP OR LAMBSKIN LEATHER WITHOUT WOOL
020110	FRESH OR CHILLED BOVINE CARCASSES AND HAL	640419	WOMEN'S OR GIRLS' TROUSERS BIB AND BRAC	281830	ALUMINIUM HYDROXIDE CARBONIZED WOOL NEITHER CARDED NOR COMB
020120	FRESH OR CHILLED BOVINE CUTS UNBONED E	620462	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	510130	CIGARETTES CONTAINING TOBACCO
020130	FRESH OR CHILLED BOVINE MEAT BONELESS	610349	TRACK SUITS OF SYNTHETIC FIBRES KNITTED	240220	FROZEN SALMONIDAE EXCL. PACIFIC SALMON
020210	FROZEN BOVINE CARCASSES AND 1/2 CARCASSES	611212	TYRE CORD FABRIC OF HIGH TENSILE POLYEST	030329	FRESH OR CHILLED CABBAGES KOHLRABI KAL
020220	FROZEN BOVINE CUTS UNBONED EXCL. CARCA	590220		070490	

Annex Table 2 (continued): List of sensitive products at the HS6 level, defined from the model of Jean and al. (2010)

(the first 35 products are reported)

India		Mexico		Turkey	
hs6	excluded products	hs6	excluded products	hs6	excluded products
080131	FRESH OR DRIED CASHEW NUTS IN SHELL	240120	TOBACCO PARTLY OR WHOLLY STEMMED OR STR	170111	RAW CANE SUGAR EXCL. ADDED FLAVOURING O
080620	DRIED GRAPES	240110	TOBACCO NOT STEMMED OR STRIPPED	240120	TOBACCO PARTLY OR WHOLLY STEMMED OR STR
071390	DRIED SHELLED LEGUMINOUS VEGETABLES WH	611030	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	120740	SESAMUM SEEDS WHETHER OR NOT BROKEN
270900	PETROLEUM OILS AND OILS OBTAINED FROM BI	620520	MEN'S OR BOYS' SHIRTS OF COTTON EXCL. K	090240	BLACK FERMENTED TEA AND PARTLY FERMENTED
071310	DRIED SHELLED PEAS `PISUM SATIVUM` WHE	620342	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	170310	CANE MOLASSES RESULTING FROM THE EXTRACT
280920	PHOSPHORIC ACID AND POLYPHOSPHORIC ACIDS	610910	T SHIRTS SINGLETS AND othr VESTS OF CO	240110	TOBACCO NOT STEMMED OR STRIPPED
080290	NUTS FRESH OR DRIED WHETHER OR NOT SHE	121299	FRUIT STONES AND KERNELS AND othr VEGET	100890	CEREALS EXCL. WHEAT AND MESLIN RYE BA
071339	DRIED SHELLED BEANS `VIGNA AND PHASEOLU	620462	WOMEN'S OR GIRLS' TROUSERS BIB AND BRAC	080232	FRESH OR DRIED WALNUTS SHELLED AND PEEL
071331	DRIED SHELLED BEANS OF SPECIES `VIGNA M	630622	TENTS OF SYNTHETIC FIBRES EXCL. FLY SHE	240130	TOBACCO REFUSE
090111	COFFEE EXCL. ROASTED AND DECAFFEINATED	620630	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	151229	COTTON SEED OIL AND ITS FRACTIONS WHETH
071320	DRIED SHELLED CHICKPEAS WHETHER OR NOT	121190	PLANTS PARTS OF PLANTS SEEDS AND FRUIT	200570	OLIVES PREPARED OR PRESERVED othrWISE
890120	TANKERS	650590	HATS AND othr HEADGEAR KNITTED OR CROC	120720	COTTON SEEDS WHETHER OR NOT BROKEN
720449	WASTE AND SCRAP OF IRON OR STEEL `ECSC`	030343	FROZEN SKIPJACK OR STRIPE BELLIED BONITO	090930	CUMIN SEEDS
090240	BLACK FERMENTED TEA AND PARTLY FERMENTED	611020	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	200799	JAMS JELLIES MARMALADES PUREES OR PAS
170111	RAW CANE SUGAR EXCL. ADDED FLAVOURING O	620193	MEN'S OR BOYS' ANORAKS INCL. SKI JACKET	121190	PLANTS PARTS OF PLANTS SEEDS AND FRUIT
130190	NATURAL GUMS RESINS GUM RESINS AND BAL	610510	MEN'S OR BOYS' SHIRTS OF COTTON KNITTED	100590	MAIZE EXCL. SEED
151110	CRUDE PALM OIL	030420	FROZEN FISH FILLETS	091099	SPICES N.E.S. EXCL. MIXTURES OF DIFFERE
710310	PRECIOUS STONES AND SEMI PRECIOUS STONES	621133	MEN'S OR BOYS' TRACK SUITS AND othr GAR	090700	CLOVES WHOLE FRUIT CLOVES AND STEMS
270799	OILS AND othr PRODUCTS OF THE DISTILLAT	620343	MEN'S OR BOYS' TROUSERS BIB AND BRACE O	091010	GINGER
080250	FRESH OR DRIED PISTACHIOS WHETHER OR NO	611010	JERSEYS PULLOVERS CARDIGANS WAISTCOAT	200811	GROUND NUTS PREPARED OR PRESERVED N.E.S
151620	VEGETABLE FATS AND OILS AND THEIR FRACTI	620113	MEN'S OR BOYS' OVERCOATS RAINCOATS CAR	050400	GUTS BLADDERS AND STOMACHS OF ANIMALS O
151190	PALM OIL AND ITS FRACTIONS WHETHER OR N	030342	FROZEN YELLOWFIN TUNAS	080290	NUTS FRESH OR DRIED WHETHER OR NOT SHE
151590	FIXED VEGETABLE FATS AND OILS AND THEIR	620293	WOMEN'S OR GIRLS' ANORAKS INCL. SKI JAC	121299	FRUIT STONES AND KERNELS AND othr VEGET
080212	FRESH OR DRIED ALMONDS SHELLED AND PEEL	621111	MEN'S OR BOYS' SWIMWEAR EXCL. KNITTED O	200580	SWEETCORN `ZEA MAYS VAR. SACCHARATA` PR
090700	CLOVES WHOLE FRUIT CLOVES AND STEMS	620530	MEN'S OR BOYS' SHIRTS OF MAN MADE FIBRES	200899	FRUIT NUTS AND othr EDIBLE PARTS OF PL
071333	DRIED SHELLED KIDNEY BEANS `PHASEOLUS V	610130	OVERCOATS CAR COATS CAPES CLOAKS ANO	210690	FOOD PREPARATIONS N.E.S.
080420	FRESH OR DRIED FIGS	620213	WOMEN'S OR GIRLS' OVERCOATS RAINCOATS	090610	CINNAMON AND CINNAMON TREE FLOWERS EXCL
870323	MOTOR CARS AND othr MOTOR VEHICLES PRIN	611420	SPECIAL GARMENTS FOR PROFESSIONAL SPORT	091030	TURMERIC `CURCUMA`
080132	FRESH OR DRIED CASHEW NUTS SHELLED	610610	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	081090	KIWIFRUIT TAMARINDS CASHEW APPLES JAC
081310	DRIED APRICOTS	030759	OCTOPUS `OCTOPUS SPP.` FROZEN DRIED S	090111	COFFEE EXCL. ROASTED AND DECAFFEINATED
520100	COTTON NEITHER CARDED NOR COMBED	160590	MOLLUSCS AND AQUATIC INVERTEBRATES PREP	120760	SAFFLOWER SEEDS WHETHER OR NOT BROKEN
440349	TROPICAL WOOD SPECIFIED IN THE SUBHEADIN	621210	BRASSIERES OF ALL TYPES OF TEXTILE MATER	071320	DRIED SHELLED CHICKPEAS WHETHER OR NOT
870390	MOTOR CARS AND othr VEHICLES PRINCIPALL	610729	MEN'S OR BOYS' NIGHTSHIRTS AND PYJAMAS O	080620	DRIED GRAPES
090230	BLACK FERMENTED TEA AND PARTLY FERMENTED	620690	WOMEN'S OR GIRLS' BLOUSES SHIRTS AND SH	081310	DRIED APRICOTS

Annex Table 3: Percentage Change in Total Export Value in 2020 in Selected DFQF Scenarios

(see text for scenario definitions)

Region	97% to LDC from OECD markets (A)	100% to LDC from OECD markets (B)	100% to LDC and SVE from OECD markets (C)	100% to LDC from OECD markets + Emerging (D)	Additional scenario with LICs
ANZ	0.00	-0.01	0.01	-0.02	-0.04
Bangladesh	0.06	4.16	3.46	4.82	3.38
Bolivia	0.00	-0.03	3.46	-0.04	-0.02
Brazil	0.00	-0.03	-0.12	0.00	-0.07
Canada	0.00	-0.01	0.00	-0.01	-0.02
C Am	0.00	0.14	0.83	0.14	-0.02
China	0.00	-0.03	-0.06	-0.02	-0.10
EFTA	0.00	0.01	0.08	0.00	0.08
Ethiopia	0.02	1.35	-0.49	2.24	0.90
EU	0.00	-0.01	0.32	-0.01	0.12
India	0.00	-0.01	-0.04	0.64	0.04
Indonesia	0.00	-0.03	-0.07	-0.03	0.02
Japan	0.00	0.00	0.04	0.00	0.49
Korea South	0.00	-0.09	-0.07	-0.09	0.41
Madagascar	0.01	-0.03	-2.28	0.57	-0.70
Malawi	0.01	12.97	4.71	13.91	11.15
Mauritius	0.00	0.03	-1.96	0.05	-0.35
Mexico	0.00	-0.01	-0.02	-0.01	-0.01
MENA	0.00	0.01	3.51	0.00	0.00
Mozambique	0.00	0.39	-0.48	1.41	0.21
Nigeria	0.00	0.01	0.03	-0.13	0.03
Oil Xers	0.00	0.00	0.01	0.00	0.03
Pakistan	0.00	-0.04	-0.05	-0.06	11.90
Paraguay	0.00	-0.04	16.95	-0.03	-0.03
Philippines	0.00	-0.01	-0.07	-0.02	-0.17
Rest of Africa	0.00	0.08	0.49	0.22	0.29
Rest of AO	0.00	0.00	0.00	0.01	0.08
Rest of EE	0.00	0.00	0.12	0.01	0.10
Rest of LA	0.00	-0.05	0.78	-0.04	-0.07
Rest of SEA	0.05	2.52	2.40	2.55	2.25
Senegal	0.00	1.16	0.80	9.38	1.12
South Africa	0.00	0.02	-0.02	0.03	0.04
Sri Lanka	0.00	-0.01	20.94	-0.05	-0.27
Turkey	0.00	0.04	0.92	0.04	0.30
US	0.00	0.03	0.13	0.04	0.04
Vietnam	0.00	-0.01	-0.06	-0.01	18.00

Annex Table 4: Percentage Change in Economy-Wide Variables in 2020 from Implementing 100 percent DFQF for LDCs

Region	Value of exports		GDP (volume)		Real effective XR		Terms of trade		Welfare	
	OECD only	WithEMs	OECD only	WithEMs	OECD only	WithEMs	OECD only	WithEMs	OECD only	WithEMs
Australia New Zealand	-0.01	-0.02	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Bangladesh	4.16	4.82	0.17	0.24	0.97	1.15	0.86	1.02	0.29	0.37
Bolivia	-0.03	-0.04	0.00	0.00	-0.01	-0.01	-0.02	-0.02	-0.01	-0.01
Brazil	-0.03	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01
Canada	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central America	0.14	0.14	0.00	0.00	0.04	0.04	0.04	0.04	0.01	0.01
China	-0.03	-0.02	0.00	0.00	-0.01	-0.01	0.00	-0.01	0.00	-0.01
EFTA	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethiopia	1.35	2.24	0.21	0.31	0.52	0.78	0.52	0.81	0.29	0.43
EU	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
India	-0.01	0.64	0.00	-0.02	-0.02	-0.17	-0.01	-0.14	0.00	-0.03
Indonesia	-0.03	-0.03	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
Japan	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
Korea South	-0.09	-0.09	0.04	0.04	-0.01	-0.02	0.00	0.00	0.11	0.11
Madagascar	-0.03	0.57	-0.01	0.04	-0.02	0.26	-0.02	0.22	-0.02	0.14
Malawi	12.97	13.91	1.21	1.40	3.80	4.26	3.98	4.44	2.65	2.99
Mauritius	0.03	0.05	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Mexico	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Middle East and North Africa	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mozambique	0.39	1.41	0.15	0.41	0.17	0.67	0.17	0.61	0.17	0.52
Nigeria	0.01	-0.13	0.00	-0.05	0.00	-0.05	0.00	-0.08	0.00	-0.11
Oilexporting countries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pakistan	-0.04	-0.06	0.00	-0.01	-0.02	-0.03	-0.01	-0.02	0.00	-0.01
Paraguay	-0.04	-0.03	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.03	-0.03
Philippines	-0.01	-0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.01
Rest of Africa	0.08	0.22	0.02	0.05	0.04	0.11	0.02	0.08	0.03	0.08
Rest of Asia and Oceania	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.02
Rest of Eastern Europe	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of Latin America	-0.05	-0.04	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
Rest of South East Asia	2.52	2.55	0.42	0.43	0.77	0.79	0.52	0.53	0.95	0.97
Senegal	1.16	9.38	0.15	0.92	0.31	2.52	0.26	2.35	0.15	1.13
South Africa	0.02	0.03	0.00	0.00	-0.01	-0.02	0.00	0.00	0.00	0.00
Sri Lanka	-0.01	-0.05	0.00	-0.01	-0.01	-0.02	0.00	-0.01	0.00	-0.01
Turkey	0.04	0.04	0.00	0.00	-0.02	-0.02	-0.01	-0.01	0.00	0.00
US	0.03	0.04	0.00	0.00	-0.01	-0.01	-0.02	-0.02	0.00	0.00
Vietnam	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00

XR = exchange rate; Ems = emerging markets (Brazil, China, India)

Annex Table 4 (continued): Percentage Change in Economy-Wide Variables in 2020 from Implementing 100 percent DFQF for LDCs

Regions	Import Variation (%)	Added Value(%)
Australia New Zealand	0.00	0.00
Bangladesh	3.48	0.14
Bolivia	-0.03	-0.00
Brazil	-0.04	-0.00
Canada	-0.01	-0.00
Central America	0.11	0.00
China	-0.02	-0.00
EFTA	0.01	0.00
Ethiopia	0.84	0.22
EU	0.00	0.00
India	-0.01	-0.00
Indonesia	-0.03	-0.00
Japan	0.00	-0.00
Korea South	-0.09	0.13
Madagascar	-0.03	-0.00
Malawi	8.96	1.71
Mauritius	0.02	0.00
Mexico	0.00	0.00
Middle East and North Africa	0.00	0.00
Mozambique	0.35	0.14
Nigeria	0.00	0.00
Oilexporting countries	0.00	-0.00
Pakistan	-0.02	-0.00
Paraguay	-0.04	-0.01
Philippines	-0.01	-0.00
Rest of Africa	0.08	0.02
Rest of Asia and Oceania	0.00	0.00
Rest of Eastern Europe	0.00	0.00
Rest of Latin America	-0.05	0.00
Rest of South East Asia	3.82	0.35
Senegal	0.59	0.16
South Africa	0.02	0.00
Sri Lanka	0.00	0.00
Turkey	0.03	0.00
US	0.02	0.00
Vietnam	0.00	0.00

Annex Table 5: Percentage Change in Export Volume in 2020 When OECD Provides 100% DFQF

Sector	LDCs						
	Bangla	Ethiopia	Madag	Malawi	Mozamb	RoSEA	Senegal
Agrofood	1.99	5.79	0.03	14.16	4.12	-3.54	6.47
Industry	5.01	-3.11	-0.06	-8.46	-0.64	3.33	-1.05
Animal and meatproducts	-5.58	-3.03	0.16	-28.10	-4.03	-6.20	-4.24
Beverage and tobacco	-2.01	3.90	0.04	-4.55	-0.32	-1.88	-0.32
Chemicalrubber plastic products	-3.95	-1.56	0.02	-11.33	4.95	-4.37	-1.27
Coal oilgas	-5.80	-0.01	-0.02	-5.38	-0.45	-2.05	-0.18
Cotton woolsilkforestry	-4.34	-0.55	0.11	-24.93	-3.35	-2.42	-1.75
Fish	-1.92	-0.44	0.00	-7.67	-0.32	2.02	-0.71
Leatherproducts	-2.47	-4.68	0.26	-19.35	-0.88	-3.98	-0.13
Metals	-6.64	-3.17	0.06	-14.70	-0.71	-6.34	-1.48
Milk	812.46	3583.82	-0.13	-18.47	8.40	-5.25	-1.60
Oilseeds	24.09	12.92	-0.31	-18.77	14.92	-2.66	-1.49
Othercereal grains	-1.27	2.13	0.08	-15.51	3.17	-2.09	-2.24
Othercrops	33.98	-2.63	-1.09	63.41	31.55	-3.64	-2.06
Otherfoodproducts	-2.34	11.55	0.09	-10.05	-0.16	-3.56	-0.64
Othermanufacturedproducts	-5.17	-2.72	0.04	-13.60	-0.37	-3.50	-0.76
Otherminerals	-1.26	-0.75	0.01	-4.59	-0.10	-1.02	-0.30
Other services	-3.60	-1.78	0.04	-12.38	-0.48	-3.62	-1.06
Rice	50.16	-1.24	0.47	-15.12	-1.19	-4.54	-0.56
Services	-3.64	-1.65	0.03	-10.18	-0.44	-3.44	-0.98
Sugar	-3.16	0.20	0.67	-11.63	-1.13	-3.83	-2.43
Textile	5.52	0.82	-0.32	-21.07	-1.81	16.13	-1.50
Trade	-4.16	-1.77	0.01	-12.04	-0.31	-4.08	-0.93
Transport	-4.17	-1.45	0.02	-8.76	-0.34	-3.04	-0.80
Vegetable and fruit	71.00	-1.48	0.17	-18.87	-1.22	-2.84	-1.57
Vegetableoils and fats	-2.47	-11.43	-0.60	-18.91	1.06	-5.34	102.21
Wearingapparel	8.17	-2.53	0.04	-18.11	0.65	19.49	-1.64
Wheat	-3.39	-4.23	0.00	-21.46	0.00	-1.37	0.00

Annex Table 5 (continued)

Sector	Other Developing Countries														
	Bolivi a	Central America	Indo- nesia	Mauri - tius	Nigeri a	Pakis- tan	Para- guay	Philip- pines	Restof Africa	Rest of E. Asia	Rest of E.Europ e	Restof LatAm.	South Africa	Sri Lanka	Vietnam
Agrofood	-0.12	-0.26	-0.23	0.16	0.12	-0.09	-0.09	-0.55	1.18	-0.18	0.00	-0.23	0.08	-0.01	-0.07
Industry	0.03	0.32	0.00	-0.01	0.00	-0.06	0.06	0.01	-0.02	0.01	0.00	0.05	0.01	-0.01	0.00
Animal, meatproducts	0.04	-0.19	0.02	-0.54	-0.04	0.16	0.25	0.11	0.83	0.27	-0.14	0.14	0.11	0.04	-0.07
Beverages, tobacco	0.02	-0.09	0.51	-0.01	0.01	0.02	0.04	0.02	-0.08	0.20	0.00	0.03	0.04	0.03	0.17
Chemical, rubber, plastic products	0.05	-0.22	0.05	0.07	0.01	0.06	0.04	0.09	-0.09	0.00	-0.01	0.05	0.13	0.06	0.20
Coal, oil, gas	0.06	-0.01	-0.19	-0.03	0.00	-0.05	0.12	-0.12	0.04	-0.09	-0.01	0.00	-0.03	0.00	0.00
Cotton, wool, silk, forestry	-0.01	0.03	0.12	-0.20	0.50	0.60	0.08	0.09	-0.52	-0.03	0.35	0.25	0.09	0.08	-0.05
Fish	0.05	-0.09	0.01	0.01	0.00	0.02	0.04	0.10	-0.02	0.02	0.00	0.02	-0.03	0.03	0.08
Leatherproducts	0.11	-0.30	0.03	-0.04	0.03	0.05	0.10	0.01	-0.25	0.13	0.01	0.14	-0.03	0.03	-0.01
Metals	0.11	-0.35	0.04	-0.03	0.02	-0.03	0.07	-0.01	-0.13	-0.01	0.01	0.11	-0.07	0.04	0.10
Milk	-0.04	-0.21	0.14	0.10	0.29	-0.10	-0.02	-0.02	0.19	0.12	-0.04	0.02	0.23	-0.04	0.22
Oilseeds	-1.78	-1.31	-0.72	-0.33	0.99	-18.84	-0.15	-3.09	96.04	-0.68	-0.78	-0.01	1.81	-0.77	-2.87
Othercereal grains	0.02	0.09	0.02	0.28	0.03	0.10	0.06	0.13	-0.15	0.56	0.08	0.14	0.28	0.04	0.26
Othercrops	-0.21	-1.12	-0.52	-0.41	-0.01	-0.12	-0.20	-0.40	-0.26	-0.16	-0.32	-1.11	0.03	0.05	-0.17
Otherfoodproducts	0.06	-0.15	-0.02	-0.06	0.00	-0.08	-0.01	-0.05	-0.10	0.01	-0.02	0.03	0.05	-0.05	-0.15
Othermfd.products	0.04	-0.22	0.06	-0.05	-0.01	0.04	0.05	0.02	-0.07	-0.01	0.00	0.07	0.03	0.03	0.00
Otherminerals	-0.01	-0.07	0.00	-0.01	0.00	0.02	0.06	0.00	-0.03	0.00	0.00	0.01	-0.02	0.01	-0.01
Other services	0.07	-0.18	0.04	-0.03	0.00	0.04	0.06	0.03	-0.09	0.00	0.00	0.08	-0.03	0.02	0.01
Rice	0.01	0.05	0.17	-0.27	0.14	0.12	0.03	0.17	0.37	0.06	0.06	0.12	0.19	0.10	0.13
Services	0.07	-0.17	0.04	-0.02	0.00	0.03	0.06	0.03	-0.08	0.00	0.00	0.08	-0.03	0.02	0.01
Sugar	-0.07	-0.23	-0.28	0.27	0.32	0.23	0.27	-0.43	0.31	0.15	0.09	0.30	-0.13	0.37	-0.17
Textile	-0.40	4.29	0.04	0.05	0.08	-0.12	0.01	-0.20	-0.25	0.33	0.02	-0.21	-0.07	-0.16	-0.08
Trade	0.06	-0.20	0.04	-0.03	-0.01	0.03	0.05	0.03	-0.09	-0.01	-0.01	0.07	-0.05	0.01	-0.01
Transport	0.07	-0.14	0.04	-0.01	0.01	0.03	0.06	0.02	-0.07	0.00	0.00	0.07	-0.03	0.02	0.00
Vegetable, fruit	0.07	-0.03	0.17	-0.20	0.07	0.25	0.08	0.26	-0.45	0.02	0.00	0.08	0.07	0.13	0.09
Vegetableoils, fats	-0.02	-0.64	-0.43	2.18	-0.15	-0.46	-0.24	-3.75	-2.05	-0.99	-0.77	-1.13	0.48	-0.14	0.43
Wearingapparel	-0.13	0.60	-0.02	-0.07	0.21	0.01	0.06	-0.08	-0.24	1.04	0.06	-0.01	0.06	-0.03	-0.13
Wheat	0.00	0.04	0.17	0.00	0.23	0.99	0.08	0.28	-0.51	0.05	0.06	0.15	0.23	0.07	0.07

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