How the Doha Round could support the African Industry? [1]

Hakim Ben Hammouda

Stephen Karingi

Nassim Oulmane

Mustapha Sadni Jallab

Revised Version: 21st January 2007

United Nations Economic Commission for Africa

African Trade Policy Center

Forthcoming to: *Journal of Economic Development*

Abstract:

This study provides a quantitative evaluation of the Doha Round in terms of the market access for industrial products and the possible consequences of the trade liberalization process. It analysis the impact of the reforms put forward by the July Package concluded in Geneva. The tariff reduction scenarios under review fit in with the commitments undertaken in the July Package. All four scenarios reviewed are based on a Girard formula. The first, third and fourth scenarios are ambitious, whereas the second is more conservative. Scenarios 1, 3 and 4 differ in the way they factor in special and differential (S&D) treatment. In terms of impact, the simulations show that a liberalization scenario based on an ambitious, non-linear Girard formula would be a less desirable alternative for Africa. It would allow for increases in the welfare and production of the African countries but would not boost African exports.

JEL Classification : F13

[1] This paper should be attributed to the authors. It is not meant to represent the position or opinions of the United Nations or its Members, nor the official position of any UN staff member. Corresponding Author: Mustapha Sadni Jallab, Trade, Finance and Economic Development Division, United Nations Economic Commission for Africa, P.O. Box 3005, Addis Ababa, Ethiopia, Phone: 251-115-44-52-12; Fax: 251-115-51-30-38, e-mail: msadni-jallab@uneca.org.

1. INTRODUCTION

The issue of market access is a crucial one for Africa. Ever since the World Trade Organization (WTO) came into force, and, subsequently, with their increasingly dynamic role in that institution, African countries have placed this matter high on the agenda. The importance of market access in development probably stands out more visibly in the case of Africa than in much of the rest of the world. This situation is explained by the restricted nature of Africa's markets and the need for the continent to rely on export markets in order to support growth and diversification efforts.

Market access for industrial products is a key factor for African countries. Even though industrial tariffs have decreased sharply for several years, world markets continue to witness high tariffs for some of the sectors, which are sensitive for African countries because they are labour-intensive sectors. At the same time, African countries are also adversely affected by high tariffs on industrial goods, which hamper their efforts to diversify their economies. Alongside the opening-up of developed-country markets, African countries yearn for more protection mechanisms to foster their development in the industrial sphere. Integrating Africa's economies into the globalizing international arena and achieving rapid economic growth will depend upon improved global market conditions for industrial commodities and more attention being given to Africa's concerns.

The present study is aimed at assisting African countries to formulate concrete proposals in regard to market access for non-agricultural commodities. Accordingly, we will endeavour to identify the most appropriate formulas for African countries - those that are apt to allow for greater liberalization of developed-country markets while offering ample opportunity for African countries to develop their industries and to diversify.

After the introduction, the main factors at play in Africa's industrial sector are discussed. The third section of the study deals with the specificities of market access for industrial commodities. In the fourth section, we present an overview of the studies that have been conducted on this topic. The model used is presented in section five. The set of scenarios considered are reviewed in section six, followed by a discussion of the results obtained. The last section contains our main conclusions.

II. OVERVIEW OF AFRICA'S INDUSTRIAL SECTOR

At independence, and particularly from the early 1960s, African countries embarked on industrial development models that were underpinned by import substitution. This strategy was aimed at replacing the importation of a basket of consumer goods with local production. It was also the genesis of industrial modernization efforts across the continent, along with diversification of production structures and a departure from structures that were too reliant on the exportation of primary commodities.

The industrial-development experience in developing countries has been fairly varied. Some of the emerging economies in South-East Asia were able to maintain high levels of growth and to build up dynamic industrial sectors, which proved to be competitive in the global market place.

The momentum thus achieved enabled them to become major exporters in the international markets and to improve their global reach. In contrast, most African countries had a fitful start in their industrial development. Among the factors that led to this situation, we can mention heavy protection of enterprises under import-substitution schemes, which resulted in a generally poor performance of their investments. The economic slump of the 1980s and subsequent withdrawal of the State signaled the demise of some of the bloated loss-making enterprises, which had been largely dependent on grants from government.

A sharp increase in imports, occasioned by trade liberalization and the removal of barriers under the structural adjustment programmes (SAPs) also brought in its wake additional pressures in terms of equilibrium in the macroeconomic domain. Consequently, neither the export of manufactures from those countries nor indeed their share of the value of world trade benefited from their liberalizing to the external markets. This outcome has engendered a theoretical controversy concerning the relationship between international trade and growth[1]. This controversy has pointedly shown that the relationship between liberalization and growth is not as simple as the mainstream theory had suggested during the 1980s. What emerges, on the contrary, is a complex and multi-faceted relationship. Indeed there are several factors at play in the analysis of the relationship between development strategies and trade policy. Among these may be mentioned the integration structure of countries in the global trade flows, income elasticity, and the patterns of comparative advantage. In this context, it is clear that the countries which had opted for a global profile based on new-technology-intensive commodities benefited more than those which – as with most of the African countries – remained tied to international trade relations based on labour-intensive production or on primary commodities.

However, the global trade structure and recent patterns of comparative advantage are not the only contributing factors to the disparities between the developing countries in terms of trade flows in manufactured goods and the growing marginalization of Africa. In that connection, we must also consider the market-access policies pursued by industrialized countries, which also explain the poor returns to African countries of the world trade in manufactured goods. Recent studies have shown that these policies have favoured new-technology-intensive commodities, which predominate in the developed-country exports and underpin their competitive edge vis-à-vis labour-intensive and primary commodities exported from African countries. These market-access policies today constitute a major obstacle in African countries' industrial development and confine them to a production structure based on primary commodities. Consequently, African countries now consider market access for non-agricultural products as a key issue in the new round of negotiations. The momentum for their industrial development, and their transition and diversification strategy, which is focused on fostering a more dynamic and competitive role in the international markets, are likely to benefit from greater liberalization.

[1] This controversy was set off by a significant contribution by Dani Rodrik and Francisco Rodriguez: "Trade policy and economic growth; a skeptic's guide to the cross-national evidence", Working Paper 7081, National Bureau of Economic Research, April 1999. See also, on the same topic,, the response of Srinivasan T.N. and Bhagwati J., Outward-orientation and development: are the revisionists right? Economic Growth Center Discussion Paper, No. 806, New Haven, CT,Yale University, September 1999. This issue has been revisited recently in the WTO World Trade Report 2003, Geneva 2003.

III. MARKET ACCESS AND INDUSTRIAL DEVELOPMENT IN AFRICA

The issue of market access for industrial commodities is a crucial one for African countries. This issue arises at three levels. The first relates to average tariffs applied on exports from these countries. Here, it should be noted that the tariffs applied on industrial commodities have declined sharply over the past few decades, from 15 per cent on average during the 1950s to 4 percent during the Uruguay Round. This downward trend in tariff levels on industrial commodities has also affected developing countries such as Brazil, Chile, India, Mexico, whose average rates over the same period fell, respectively, from 71 per cent to 32 per cent, 46 per cent to 34 per cent, 41 per cent to 27 per cent, and 35 per cent to 25 per cent.

This trend has been marked by major disparities, in that for example, the average weighted rate applied by OECD countries on developing – country exports within the framework of the most-favoured-nation (MFN) clause (3.4 per cent) is four times what they apply between themselves. In addition, the developed countries have reduced by half their tariffs on industrial exports from developed countries while the reduction for products from the developing countries has been only by one-third. Thus, the average weighted rate applied by the developed countries among themselves has been in the region of 3 per cent while that applied on imports from developing countries has been around 5 per cent. These data reveal a sharp decline in industrial tariffs over a period of several years. This decline has obviously been more marked in the developed countries than in African countries, some of which have continued to protect their industrial sector in an effort to address the productivity divide that separates them from the developed countries. It should also be noted, however, that the reduction of tariffs on industrial commodities has benefited developed countries more than developing countries.

The second aspect of the question of market access relates to tariff peaks – which have reached 15 per cent and above – applied by developed countries. These peaks particularly affect developing-country exports and more so, exports from African countries such as food products, textiles and clothing, footwear, rubber products and electronic equipment. Tariffs reaching up to 900 per cent for certain products are applied on labour-intensive goods in respect to which developed-country enterprises encounter daunting obstacles and are a source of emerging comparative advantages for developing countries.[2] Although developed countries have granted tariff protection and preferences, and particularly for least developed countries (LDCs), these do not include some of the labour-intensive goods, which are affected by high tariffs. Thus, according to a World Bank study, 11 per cent of these countries' exports towards the four major international markets (the United States, Canada, the European Union and Japan) are faced with excessive tariffs whereas these markets account for only 4 per cent of total trade flows from the LDCs.[3]

The third aspect of the issue of market access pertains to the escalation of customs duties. Just like tariff peaks, tariff escalation adversely affects exports from the developing countries and more so in the labour-intensive sector. Thus, for instance, customs duties applied by Japan on

[2] See Erich Supper, The Post-Uruguay Round tariff environment for developing country exports: tariff peaks and tariff escalation, in UNCTAD, Positive agenda and future trade negotiations, Geneva, 2000.

[3] See B. Hoekman, Ng Francis and Marcello Ollarreaga, Eliminating excessive tariffs on exports of Least Developed Countries. Policy Research Working Paper 2064, World Bank,. Washington 2001.

rubber shoes can be as high as 260 per cent. This escalation poses a major hurdle to diversification in the developing-country economies. In most cases, the brunt of these pressures is borne by wage levels to enable developing-country exporters to break even.

Thus, despite the tariff reductions applied on industrial commodities and preferential treatment extended to them, exports of African countries continue to face major obstacles in accessing developed-country markets. Imbalances in the tariff reductions, the tendency towards escalation, and tariff peaks, all weigh heavily on competitiveness of products from developing countries and so are at the very core of WTO negotiations.

IV. OVERVIEW OF THE LITERATURE

What are Africa's interests in the current round of negotiations on access to non-agricultural trade? The issue is important in view of the fragility of Africa's industrial sector and the public-sector and external-trade imbalances obtaining in many of the countries of the region. Three kinds of criteria can be used to analyse the impact of a formula, namely, the impact on welfare and domestic output; the fluctuation of tax revenues; and the fluctuation of the trade balance.

Welfare creation is the key element of any macroeconomic policy. Whether there is a greater surplus accruing to the consumer or to the producer, the point is that the negotiations should generate a net surplus. No less significant in the analysis of various scenarios is to assess the profile of tax revenues, primarily because many African countries experience recurrent budget deficits, and also because a decline in revenue has an adverse impact on the effectiveness of public policy. It should be noted that for some of the countries, particularly in sub-Saharan Africa (SSA), customs revenues account for a significant portion of institutional levies[5]. A drastic reduction of the revenue base in these circumstances is all the more unsustainable because reaching agreement could entail major socio-economic adjustment costs. A traditional objective of economic policy is also to maintain external equilibrium. Given the huge structural imbalances facing many of the countries in the region, the current round of trade negotiations must not further worsen Africa's trade balance. Two main articles dealing with Africa could be used as benchmarks for our analysis. Bchir, Fontagné and Jean (2004) proposed a CGE assessment of multilateral liberalisation of non-agricultural market access. Scenarios considered include the so-called Girard proposal (with alternative choices for the involved coefficient), the removal of tariff peaks and complete liberalisation. They proposed a special assessment of the likely impact of this round for developing countries. They used various form of the Swiss Formula. They introduced this tariff data in a static version of the MIRAGE model[2].

In order to assess the potential impact of the various proposals under consideration in the WTO, Fernandez de Cordoba, Laird and Vanzetti (2005) have selected four scenarios that do not entirely correspond to specific proposals, but rather have been chosen to highlight the spread of policy options. These four scenarios they call 'free trade' (full tariff liberalisation in the NAMA sector), Hard and Soft liberalisation formula proposals (WTO proposal included in the Framework for Establishing Modalities in Market Access for NAMA Products corresponding to

[5] ECA, Economic Report on Africa, 2004, Addis Ababa, Ethiopia.

[2] The complete and detailed technical specification of MIRAGE model can be found in Bchir et al (2002). This reference had been integrated in the bibliography.

the Annex B of the draft Cancún Declaration), and a 'simple mix' originally proposed by India corresponding to a linear cut formula with a capping for tariff peaks. Cordoba, Laird and Vanzetti (2005) used the GTAP 5.3b database and model to undertake the economic simulations, modified by the authors to take greater account of preferences and the percentage or *ad valorem* equivalent of specific rates of duty.

4.1 Impact on sub-Saharan Africa

In general, the simulations both in Bchir, Fontagné and Jean (2004) and in Cordoba, Laird and Vanzetti (2005) indicate that the non-linear scenarios pose a clear risk to sub-Saharan African countries in terms of a dramatic decline in the customs-revenue base, negative welfare impacts and domestic production, and a decline in the external trade balance as a result of an increase in imports as we can see in Tables 1 and 2. More than simply an adjustment cost, these scenarios point to a structural shock which could deeply affect the region's economies and in other ways weaken them. Other scenarios, which are linear or semi-linear in nature, offer more favourable prospects.

The foregoing analysis appears to commend to African countries the option of linear formulas, which would clearly be in their favour. These formulas will also have to take on board a special and differentiated (S&D) treatment to address divergent development approaches. At the same time, African countries would have to insist that the developed countries apply non-linear formulas in order to reduce tariff peaks and stem the escalation of customs duties.

4.2. Impact on North Africa

There is a noticeable contrast between the results of the simulations for North Africa and those for sub-Saharan Africa as indicated in Tables 1 and 2. Bchir, Fontagné and Jean (2004) found that welfare gains are more significant for North Africa, which also stands to benefit from liberalization in terms of the domestic product, with a favourable impact regardless of the scenario considered, and an increase in the domestic product. Conversely, liberalization could, as with sub-Saharan Africa, result in a marked decline in the revenue tax base. It is noteworthy, however, that S&D treatment and the heightened activity expected to flow from trade liberalization could hold back this trend, as is shown by the simulations drawn from the Indian scenario as indicated in Cordoba, Laird and Vanzetti (2005). In trade terms, the situation is more subtle depending on the scenarios of gains and losses, which can be on the higher side; in the "elimination of tariff peaks" scenario, North Africa should gain significantly in its trade balance. In all cases, the contrast with sub-Saharan Africa is striking in terms of export growth.

The previous researches showed also that the harmonizing formulas (Swiss Formula), which trigger more drastic reduction of the high tariffs and eliminate a large portion of the tariff peaks, mostly appear less attractive for North Africa outside the cases where, as with the Chinese formula, a large S&D component is introduced.

The foregoing analysis done by Bchir and al (2004) and Cordoba and al (2005) indicates that the linear scenarios are favourable to North Africa. This region gains more than does sub-Saharan Africa because of its more advanced industrial sector.

4.3. Lessons for the continent as a whole

Some common patterns emerge from these studies;

Bchir and al (2004) and Cordoba and al (2005) have shown that Sub-Saharan Africa will not gain much from the ongoing negotiations, however favourable the scenario may be. In an all-out liberalization scenario, the consequences could, in both revenue and trade terms, be unsustainable for the region. This means that Africa's industrial production structures are still fragile and so cannot withstand stiff competition from the developed countries.

On the other hand, Bchir and al (2004) and Cordoba and al (2005) have shown that sub-Saharan Africa should benefit more from the application of a linear formula with S&D treatment and elimination of tariff peaks. A semi-linear formula could also benefit the region. The non-linear, or harmonizing, formulas would be all the more harmful because they would not incorporate S&D. Cordoba and al (2005) have also shown that the stronger the S&D component, the better it would be for sub-Saharan Africa's interests.

Cordoba and al (2005) have also clearly indicated that North Africa would also benefit more from a linear formula. This advantage exceeds that for sub-Saharan Africa because of the level of industrial development. It is noteworthy that the region would benefit from the removal of tariff peaks.

Table 1: Breakdown of Fernandez de Córdoba, Laird and Vanzetti (2005) and Bchir, Fontagné and Jean (2004) simulations in different scenarios for sub-Saharan Africa

Fernandez de Córdoba, Laird and Vanzetti (2005) SUBSAHARAN AFRICA						
Scenario	Type of scenario	Welfare	GNP	Exports	Imports	Customs Revenues
Korea	Semi-linear	0.2%	-0.6%	2.9%	2.9%	-19.0%
China	Non-linear with S&D	0.2%	-01.8%	8.5%	8.5%	-56.0%
USA	Non-linear	0.2%	-2.6%	10.1%	10.1%	-71.0%
India	Linear S&D and tariff ceiling	0.4%	0.4%	2.8%	5.2%	-23.0%
WTO	Non-linear with S&D	0.5%	-0.6%	4.7%	8.8%	-46.0%
EU	Semi-linear with ceiling on peaks	0.3%	-1.6%	3.5%	6.6%	-46.0%
Korea	Semi-linear	0.2%	-0.6%	2.9%	2.9%	-19.0%
India	Linear, S&D and ceiling on peaks	0.4%	0.2%	2.8%	2.8%	-23.0%-
WTO	Non-linear with S&D	0.5%	-0.6%	4.7%	4.7%	-46.0%
China	Non-linear with S&D	0.2%	-1.8%	8.5%	8.5%	-56.0%
EU	Semi-linear, with ceiling on tariff peaks	0.3%	-1.6%	3.5%	3.5%	-46.0%
USA	Non-linear	0.2%	-2.6%	10.1%	10.1%	-71.0%
Bchir, Fontagné and Jean (2004) SUBSAHARAN AFRICA						
Scenario	Type of scenario	Welfare	GNP	Exports	Imports	Customs Revenues
Girard 1	NAF only, non-linear, medium coefficient, S&D	0.0%	Na	2.1%	-0.2%	Na
Elimination of tariff peaks	Elimination of tariff peaks	-0.2%	Na	5.6%	5.8%	Na
Girard 2	Non-linear, high coefficient	-0.4%	Na	4.3%	7.3%	Na
Girard 1	Non-linear, medium coefficient	-0.6%	Na	6.0%	9.0%	Na
Girard 0.65	Non-linear, low coefficient	-0.7%	Na	7.3%	10.2%	Na
Total liberalization	Total liberalization	-1.2%	Na	11.1%	15.7%	Na

Table 2: Breakdown of Fernandez de Córdoba, Laird and Vanzetti (2005) and Bchir, Fontagné and Jean (2004) simulations for North Africa

Fernandez De Córdoba, Laird and Vanzetti (2005), NORTH AFRICA						
Scenario	Type of scenario	Welfare	PNB	Exports	Imports	Customs Revenues
China	Non-linear with S&D	1.1%	0.9%	15.1%	15.1%	-35.0%
USA	Non-linear	0.9%	0.7%	21.7%	21.7%	-65.0%
Korea	Semi-linear	0.5%	0.7%	3.0%	3.0%	-3.0%
India	Linear, S&D and ceiling on peaks	0.7%	1.1%	2.2%	4.0%	-3.0%
WTO	Non-linear with S&D	1.1%	1.2%	8.6%	14..3%	-31.0%
EU	Semi-linear with ceiling on peaks	1.1%	0.6%	9.5%	17..3%	-40.0%
India	Liner, S&D and ceiling on peaks	0.7%	1.1%	2.2%	4.0%	-3.0%
China	Non-linear with S&D	1.1%	0.9%	15.1%	15.1%	-35.0%
Korea	Semi-linear	0.5%	0.7%	3.0%	3.0%	-3.0%
WTO	Non-linear with S&D	1.1%	1.2%	8.6%	14..3%	-31.0%
USA	Non-linear	0.9%	0.7%	21.7%	21.7%	-65.0%
EU	Semi-linear with ceiling on peaks	1.1%	0.6%	9.5%	17..3%	-40.0%
Bchir, Fontagné and Jean (2004) NORTH AFRICA						
Scenario	Type of scenario	Welfare	GNP	Exports	Imports	Customs Revenues
Elimination of peaks	Elimination of peaks	0.8%	Na	32.7%	17..9%	Na
Girard 2	Non-linear high coefficient	0.6%	Na	15.6%	15..9%	Na
Girard 1	Non-linear medium coefficient	0.4%	Na	18.1%	18..3%	Na
Girard 0.65	Non-linear low coefficient	0.2%	Na	20.1%	20.1%	Na
Total liberalization	Total liberalization	-0.4%	Na	41..3%	31.6%	Na
Girard 1 North Africa only, non-linear, medium-coefficient, S&D		0.1%	Na	-7.9%	-0.5%	Na

Source: Author's computations

V. THE MODEL AND THE AGGREGATION

The analysis of trade policy presupposes a consideration of the implications of the policy instruments for the production structure of the economy at the national and global levels. Trade policy instruments such as customs duties and quotas have direct and indirect effects on the relative prices of the goods produced in a given country. Just as the composition of goods and services produced in a country varies, the factor demand also varies. Consequently, it is not easy, for a given economy, to envisage a change in trade policy that affects only one sector. Various intersectoral factors and their relative weight in a given economy will always mean that the relative weight of the individual sectors will vary. This, by extension, affects the relative composition of the various factors of production by sector.

Sub-Saharan Africa would also gain more from the application of a linear formula with S&D and tariff reduction in specific sectors resulting from a change in trade policy by one or more countries. The general equilibrium model provides an analytical framework, which makes it possible to factor in the changes in production structure within and between sectors, and by extension the demand curves by factor of production. However, these models are necessarily limited in scope, and particularly the static models, which do not take into account the dynamic effects, brought about by a change in trade policy. A global trade analysis project (GTAP) model is a case in point. GTAP is a multi-regional general calculable equilibrium (GCE) model devised for static-comparative analysis of trade policy issues (Adams et al. 1997). It is now possible to pose dynamic versions of this model. It can be used to capture the effect of a trade policy shift, at the national bilateral or multilateral level, on production, factor utilization, volume of trade, and the induced welfare distribution between countries.

The model used for this study is a simplified version of the GTAP model[7] (Hertel, 1997). The multi-regional and static general equilibrium model proceeds on the assumption that there is perfect competition and constant returns to scale. It reflects bilateral trade flows, international transport margins, and levels of protection on imports by country and by sector. The GTAP model thus makes it possible to gauge production, consumption, trade and welfare patterns, which are determined by external shocks, and in particular, those linked to trade, such as changes in the cost of commercial operations.

5.1 Production

In a given country and sector, producers offer a product on the domestic or external market. The output is assumed to be without any returns to scale, and production is realized by using five factors, namely, skilled labour, non-skilled labour, capital, land, and natural resources, as well as intermediate goods and services. The intermediate-consumption level used is assumed to be proportional to the level of production. With an Armington formulation (Armington, 1969), intermediate consumption is an aggregate of local and external variations. Producers are thus able to minimize the factor costs on inputs under the production constraints, described in Leontief's formula, between intermediate consumption and value added. The different markets are taken to be in pure and perfect competition.

[7] A complete description can be found in Hertel (1997).

5.2. Final demand

The standard GTAP version makes a distinction between public-sector demand and private-sector demand. The income available is allocated between final consumption and saving. In keeping with GTAP, it is assumed that a fixed portion of income is allocated to savings. The regional economic actor maximizes the welfare function by making a distinction between local goods and foreign goods along the lines of Armington's hypothesis, and breaks down consumption by sector along the lines of the CES function.

5.3. Bilateral trade

For each region, there are two types of imports, namely, final goods and intermediate goods[8]. Aggregate imports are the sum of those two components. The aggregate is a CES function of imports from all trading partners. Bilateral trade flows are subject to two kinds of taxes, i.e. export levies and customs duties, and incur transport costs. The cost of transport is taken to be proportional to the trade volume. The transport sector is taken to be a service sector in perfect competition of all producers in each region with an Armington specification and a substitution elasticity of "1". The import level of a given product from a given country in a given region is then determined through minimization of the import cost at f.o.b. rates.

5.4. Aggregation and the data

The GTAP model is used in conjunction with the GTAP database. For this study, we have adopted version 6 of the database, which incorporates the MacMap database[9]. The base year for this version is 2001 and the version identifies 87 regions, 57 sectors and 5 factors of production.

For each individual or composite region (country or aggregate of countries), there are 57 sectors, which have data in the overall GTAP database. Not all countries are treated individually in GTAP. However, in order to ensure overall macroeconomic consistency, the database encompasses each of the economies worldwide. These are either treated individually or form part of a regional composite. Unfortunately few African countries are individually disaggregated in version 6 of the database. Most African countries are treated as part of a regional aggregate. For North Africa however, Morocco and Tunisia are treated individually. The rest of North Africa aggregate thus comprises Algeria, Egypt and Libya.

Bilateral trade data are an important component of the GTAP database. It is these bilateral trade flows that transmit trade policy and growth-related shocks from one country to another. Bilateral trade is also very relevant to the terms of trade. The global bilateral trade data are drawn from United Nations COMTRADE data. This is complemented by information on different countries' global trade or with aggregate bilateral trade statistics such as those of IMF, FAO and the World Bank.

Another main component of the GTAP database is the protection data set. These data are both explicit and implicit. They are explicit in the sense that tariff revenues or export revenues can be

[8] There are three in the GTAP model, including public goods.
[9] Bouet and Ali (2002) provide a more detailed explanation.

drawn from them, and they are implicit in that bilateral trade data are available at market rates as well as at the global rates. The MacMaps database provides for each importing country and each producer (by tariff line) a means of determining five ad valorem equivalents corresponding to the five instruments contained in the database, namely, ad valorem customs duties, specific tariffs, prohibitions, tariff quotas and antidumping laws.

For the present study, 87 regions have been aggregated into nine subregions with the various included African countries, and 27 sectors have been identified.

VI. THE REFERENCE SCENARIOS

6.1. Past and recent history of NAMA on modalities to conduct the tariff-cutting exercise at multilateral level

In 2001, during the Doha Ministerial Conference of the WTO, the ministers agreed to launch tariff-cutting negotiations on all non-agricultural products. The aim is "to reduce, or as appropriate eliminate tariffs, including the reduction or elimination of tariff peaks, high tariffs, and tariff escalation, as well as non-tariff barriers, in particular on products of export interest to developing countries". Furthermore, they agreed, that these negotiations shall take fully into account the special needs and interests of developing and least-developed countries, and recognize that these countries do not need to match or reciprocate in full tariff-reduction commitments by other participants.

At the start, participants had to reach agreement on how ("modalities") to conduct the tariff-cutting exercise (in the Tokyo Round, the participants used an agreed mathematical formula to cut tariffs across the board; in the Uruguay Round, participants negotiated cuts product by product). The agreed procedures would include studies and capacity-building measures that would help least-developed countries participate effectively in the negotiations. The July 2004 Framework recognized that a formula approach is key to reducing tariffs, and reducing or eliminating tariff peaks, high tariffs, and tariff escalation. WTO Members agree that the Negotiating Group should continue its work on a non-linear formula applied on a line-by-line basis which shall take fully into account the special needs and interests of developing and least-developed country participants, including through less than full reciprocity in reduction commitments. During the last WTO Ministerial Conference, on the non-linear formula, there has been movement since the adoption of the NAMA July 2004 framework. There is a more common understanding of the shape of the formula that Members are willing to adopt in these negotiations. In fact, Members have been focusing on a Swiss formula. During the past few months, much time and effort has been spent examining the impact of such a formula from both a defensive and offensive angle. In terms of the specifics of that formula, there are basically two variations on the table: a formula with a limited number of negotiated coefficients and a formula where the value of each country's coefficient would be based essentially on the tariff average of bound rates of that Member, resulting in multiple coefficients.

African countries argue that the formula should reflect a country's overall tariff profile, and that coefficients incorporated into the formula for developing countries should be "sufficiently

higher" than those associated with developed countries, "resulting in higher percentage reductions for developed countries." That is the reason why, African countries prefer the second option in the sense that it procures more policy space. The Girard Formula is linked to this second option. The overall tariff reduction this formula would impose would be, in percentage terms, "proportional amongst developed and developing countries," unlike the "simple Swiss formula."

6.2. The July 2004 framework agreement and the base formula

The July framework agreement states that "a formula approach is key to reducing tariffs, and reducing or eliminating tariff peaks, high tariffs, and tariff escalation".[10] It also states "that the Negotiating Group should continue its work on a non-linear formula applied on a line-by-line basis which shall take fully into account the special needs and interests of developing and least-developed country participants, including through less than full reciprocity in reduction commitments".

The scenarios we have set out to test are all based on the formula enunciated by Ambassador Girard (Girard, TN/MA/W/35/rev1). The application of the formula will be based on the following elements: base rate – reduction or elimination of duties on all non-agricultural goods[11] on the basis of bound rates after full implementation of the concessions in place. However, for the non-bound positions, the base rate for the start of tariff cuts will be twice the most-favoured-nation rate applied.[12] The countries with bound rates exceeding 35 per cent are affected by these reductions. These are: Botswana, Egypt, Morocco, Namibia, South Africa, Swaziland and Tunisia.

Non-ad valorem duties will be converted into ad valorem equivalents; harmonized system nomenclature (SH):

All duties applied to non-agricultural products will be reduced line by line according to the formula applied to the base rates:

$$t_1 = \frac{B \times t_a \times t_0}{B \times t_a + t_0}$$

t is the final rate, to be bound in ad valorem terms
t_0 is the base rate
t_a is the average of the base rates [13]

[10] See WTO doc. WT/L/579.
[11] All products not targeted by the WTO Agriculture Agreement.
[12] When MFN tariffs applied during the base year is below 2.5 per cent, the base rate applied is 5 per cent.
13 The computation of tariff lines should not be distorted by disaggregation of the tariff lists of Members. In order to reduce distortion resulting from the different number of tariff lines on the lists of Members, the harmonized system (HS) of nomenclature, which is an international standard with up to six HS figures, will serve as the basis for computing tariff rates. The tariff rate is to be computed in two stages:

B is a coefficient having a unique value, to be determined by the participants[14].

Special and differential treatment in the July Package

The July framework agreement stipulates that developing-country participants shall have longer implementation periods for tariff reductions. In addition, they shall be given the following flexibility:

- Applying less than formula cuts to up to {10} per cent provided that the cuts are no less than half the formula cuts and that these tariff lines do not exceed {10} per cent of the total value of a Member's imports; or

- Keeping, as an exception, tariff lines unbound, or not applying formula cuts for up to {5} per cent of tariff lines provided they do not exceed {5} per cent of the total value of a Member's imports.

6.3. The scenarios tested

For this study, we have tested a number of scenarios as given below[15].

The first scenario is constructed on the basis of the July framework agreement and incorporates a non-linear formula with a "B" coefficient equal to "1", applied to all countries. That suggests a drastic reduction of the high tariffs for all countries. In addition, this scenario incorporates an S&D for the developing countries as stipulated in the July Package, which excludes 5 per cent of the tariff lines from any cuts, and 10 per cent of the tariff lines would only apply half of the formula cuts[16]

The second scenario also adopts a non-linear Girard formula, but with a "B" coefficient equal to 3, applied to all countries. This implies a less drastic tariff reduction. In addition, this scenario includes the same S&D component for the developing countries as in scenario 1.

In scenario three, the S&D is even more sizeable. A non-linear formula is applied, with different coefficients. Thus, for the developed countries, the formula applied has a "B" coefficient equal to "1", and for the developing countries, B equals 3. This implies that the tariff reduction would be

---

(i) The simple arithmetic rate of ad valorem equivalents at the level of the tariff line is used to calculate the tariff line for each sub-position to six HS digits corresponding to non-agricultural products.

(ii) This rate at the level of the position to six HS figures is then taken as the basis for computation of the simple tariff rate for each Member.

[14] AS an exception, participants with a binding coverage of non-agricultural tariff line, of less than {35} per cent would be exempt from making tariff reductions through the formula. Instead, we except them to bind {100} per cent of non-agricultural tariff lines at an average level that does not exceed the overall level of bound tariffs for all developing countries after full implementation of current concessions (27.5 per cent}.

[15] The S&D component is expressed either on the basis of higher Girard coefficients, or through lists of products excluded from tariff cuts.

[16] It should be noted that the least-developed country participants are not to be bound to make reduction commitments. However, it is expected of them that as a contribution to the current round of negotiations, they should substantially increase the level of their binding commitments.

less significant for the developing countries. The explicit S&D as stipulated in the July Package is also applied. In this scenario therefore, the S&D is applied to both the coefficient of the formula and the lines to be totally exempted from tariff cuts.

Finally, the fourth scenario is based on a non-linear Girard formula where B = 1 for all countries. This implies significant cuts in customs duties. The S&D in this case is reinforced by the doubling of the offer made under the July Package, i.e. 10 per cent of the lines that are exempt from tariff cuts and 20 per cent of the lines that would only apply half of the formula cuts.

6.4. S&D in the scenarios

In the scenarios, we have introduced S&D in the form of two components. The first component excludes 5 per cent of the tariff lines from any reduction. The second excludes 10 per cent of the tariff lines, up to 50 per cent of the liberalization flowing from the formula. Applying a double-edged S&D as stipulated in the July Package corresponds to 10 per cent of the lines being excluded, and 20 per cent being reduced, from liberalization flowing from the formula.

The choice of products, and hence the choice of the lines to be excluded, is arbitrary. For this study, we have proceeded on the assumption that the "most taxed" lines are also most likely not to be affected by the tariff reductions. We have therefore excluded from all tariff reductions 5 per cent of the lines with the highest tariffs. Where the second S&D component was to be applied, we have identified 10 per cent of the lines among the 95 per cent remaining which had the highest tariffs. To these lines, we have applied half of the formula reduction.

Table 3: Reduction coefficient applied according to initial line taxation percentage

Lines	Reduction coefficient
85% of the lines	Applying formula, reduction by X%
5% of the lines (the most taxed)	Exclusion from all reductions
10% of the lines (the most taxed)[17]	Reduction by (X/2)%

The following table summarizes and identifies the various scenarios

Table 4: The reference scenarios

Scenarios	Tariffs applied
Girard Formula with B=1+July SD	S1
Girard Formula with B=3+July SD	S2
Girard Formula with B=1	S3
Girard Formula with B=1+2 times July S&D	S4

In the following section, we analyze the impact of the scenarios on the tariff structures. To complete this analysis, we have used the general calculable equilibrium model (GTAP version 6), which incorporates the MacMaps database.

[17] In this scenario, the 5% of the most taxed lines are not taken into account.

VII. IMPACT OF THE SCENARIOS ON THE TARIFF PROFILES

The structure of applied and bound tariffs in the international negotiations should be understood in order to have a better idea of the effects of liberalization on developing countries. In this context, it should be noted that in the industrial sphere, most of the OECD tariffs are bound, whereas most of the tariffs applied by African and Asian countries are not bound[18]. However, developing countries have sought, throughout the Uruguay Round, to increase the proportion of the bound tariffs, though most of their tariff lines are still unbound. Alongside the general commitments, the developing countries have sought, in the Uruguay Round, to open up their frontiers more amply through sectoral negotiations in order to completely remove tariff barriers (the so-called "zero-for-zero" objective). Following these negotiations, between 10 per cent and 30 per cent of tariffs on agricultural products have been bound at 0%.

The next section starts off with a discussion of the current tariff structure. This will enable us to highlight the tariff peaks confronting African exporters, and to deduce which countries and for which sectors market access presents the most challenges.

The second point deals with the impact of the scenarios on tariff structures. This should bring out the expected effects of the scenarios on market access for African countries.

7.1 The current tariff structure

7.1.1 The global tariff structure

The MacMaps database can be used to measure market access bilaterally and in a disaggregated manner. This measurement tool was devised to take in the main protection instruments, such as specific and ad valorem duties, antidumping regulations, prohibitions, tariff quotas and standards at the very detailed level of HS10 and taking into account the range of discriminatory regimes. MacMaps measures market access for 223 exporting countries in 137 importing markets, by tariff lines for the year 2001. From this very detailed information, any sectoral or geographical aggregation can be made, using a procedure, which minimizes the endogeneity angle while taking into account the importance of the products on the global markets.

On the basis of this database, we have measured the initial tariff structure, bilaterally, for some of the countries and regions. The average global tariff for exports of industrial products is around 6.22 per cent. It is noteworthy that there have been major tariff reductions on industrial products over a number of decades and this market is clearly more open than the market for agricultural products.

A tariff of 4.57 per cent is applied to Africa as against the rest of the world (ROW). This tariff is slightly lower where African exporters are seeking developed-country markets. Indeed, this average tariff level is around 4.23 per cent in regard to the tariffs applied by developed countries on African exports. Europe and the United States apply lower tariffs than the average for developed countries (1.31 per cent and 1.69 per cent respectively).

[18] See Joseph François, Hans van Meijl; and Franck van Tongeren, Economic implications of trade liberalization under the Doha Round, CEPll, No. 20, December 2003.

This is explained by the various preferential facilities extended to African countries. The tariffs applied in the intra-African domain are among the highest and constitute a bottleneck to the continent's economic integration. In general terms, developing countries apply high industrial tariffs, because of the need to protect their industrial sector and support the diversification of their economies.

However, even though the average tariff levels suggest that Africa enjoys privileged access to a number of markets including developed-country markets, there are important exceptions in regard to industrial products, and particularly in the labour-intensive sectors where developing-country competition is also intensifying.

Table 5: Initial (bilateral) average tariff structure

	Importer						
Exporter	Developed countries	Developing countries	EU25	Japan	USA	Africa	World
Developed country	8.34%	10.50%	5.93%	4.82%	1.03%	*16.62%*	6.51%
Developing country	6.19%	11.10%	3.10%	4.20%	2.92%	*19.38%*	5.75%
EU25	6.77%	9.26%	0.00%	4.65%	2.82%	*16.46%*	6.49%
Japan	5.21%	11.46%	4.82%	0.00%	2.33	*15.58%*	7.12%
USA	5.66%	8.33%	4.60%	3.41%	0.00	*14.63%*	6.61%
Africa	*4.23%*	*9.16%*	*1.31%*	*2.87%*	*1.69*	*16.86%*	*4.57%*
World	6.36%	9.89%	3.88%	4.35%	2.62	*17.18%*	6.22%

Source: MacMaps

7.1.2 Initial average tariff structure by product

The average industrial tariff for the United States of America is 1.69 per cent. Despite the relatively low average, industrial tariffs applied in the United States frequently peak. In fact, the tariffs applied in textiles, processed dairy products and sugar are way above the average tariff level.

Europe presents slightly lower tariff levels (1.31 per cent), which belies the fact that European tariffs in textiles and clothing, against exports of sub-Saharan Africa, are prohibitive. However, in regard to these products, North Africa enjoys more significant preferences than sub-Saharan African countries.

Japan applies tariff levels in the range of 2.33 per cent on industrial products. This figure, too, appears quite low, but it should be noted that the tariffs applied on textiles and processed agricultural products are, respectively, three to six times the average.

Table 6: Tariffs applied on products from North Africa (%)

Importers	Row	Cairns developed	Cairns developing	China	Japan	USA	EE25	NAF	ASS
Agri Res	5	0	0.8	3.1	0.8	0.2	0.5	14.6	5.4
Meat, livestock	188	0	3.1	0	0	0	139.1	0	24.9
Meat product	3.8	29.7	0	0	0	4.3	6.1	44.1	22.6
Vegetable oils	7.4	0.1	9.8	12.5	2.2	0.3	73.5	5.8	16.6
Dairy product	5.9	0.6	3.9	0	0	18.3	15.3	1.8	20.8
Processed rice	13.7	0	0.4	0	0	3.4	38.8	7.6	7.5
Procesed sugar	16.4	3.7	3.8	0	52.1	10	7.9	9.4	3.1
Food product	6.8	3.5	28.7	23.2	7.7	2.6	1.6	8.3	27.2
Beverages, tobacco	39.9	14	143.6	41.4	37.5	9.3	11.7	23.7	21.7
Textiles	9.6	11.8	15.7	10.6	7.1	9	0.2	10.5	12.9
Clothing	10.1	18.4	21.8	10.1	10.5	11.3	0.1	55.5	21.6
Leather	7.5	12.1	7.2	9.8	12,8	5.4	0.1	13.9	21.2
Wood products	7.1	3.5	10.9	10.5	0.4	0.1	0.1	14.9	12.6
Paper products	4.7	0.5	6.4	10.9	0.2	0.1	0.1	8.5	10.9
Potroleum products	4.9	0	0.5	7.3	2.4	1.2	0.9	0.9	6.1
Chemicals	17.4	0.1	5	6	0.4	0.3	0.6	8.3	16.2
Minerals	12.2	2.3	8.9	21.1	0	2.1	0.1	10.3	13.1
Ferrousmetals	7.8	0.1	4.3	4	0	0.9	6.9	14.1	5
Metals nec	2.8	0	0.3	2.7	0	1.6	0	9.9	9.2
Metal products	6.2	3.3	14.6	11.1	0	0.2	0,1	13.9	12
Motor Vehicle & parts	7.6	3,8	7.2	17.2	0	0.7	0	24	3.8
Trans equ	3.6	0.2	4.7	0	0	0	0.7	1.1	9.7
Mech equ	0.6	0	1.7	8.3	0	1.6	0.1	21.3	1.4
Electronics	4.8	1.1	9.3	11.3	0	0.2	0.1	9.9	10.8
Manuf_nec	3.5	1.8	12.1	24.2	0	0.5	0.1	21.6	22.3

Table 7: Tariffs applied on SSA products (%)

Importers	Row	Cairns Developed	Cairns developing	China	Japan	USA	EU25	NAF	SSA
Agri_Res	12	0	1.3	2.2	0.2	0.2	1.1	7	5.
Meat, livestock	53	0	1.6	17.3	0	0.4	80.6	3.6	13.
Meat Products	15.3	34.18	4.6	14.3	0.4	0.1	5.6	0	19.4
Vegetable-oils	24.8	0.88	2.8	6.4	3.8	0	0.1	0	4.
Dairy product	11.7	0	2.2	0	1.5	8.3	10	9.2	14.5
Refined rice	0.8	0	1.3	0.9	0	0	11.5	0	13.9
Processed sugar	16.8	0.28	0.8	0	0	22.1	113.6	0	21.2
Food products	5.8	0.6	16	21	3.6	2.1	0.1	20.2	10
Beverages,tobacco	31.2	2.48	3.3	0	16.2	0.4	1	14	35.1
Textiles	13.9	13.8	6.4	10.5	3.1	12.6	0.2	11.3	6.3
Clothing	11.3	17.3	13	21.5	6.1	11.2	0.1	26.6	10.8
Leather	9.8	5.9	7.5	10.5	1.9	1.3	0	26.5	11.2
Wood products	7.7	1	2.8	0.6	0.7	0.18	0	25	6
Paper products	5	0.7	0.1	2.4	0.1	018	0.1	15.9	5.3
Petroleum	4.5	0	1.3	7	0.2	1	0	12.4	4
Chemicals	23.7	1	1.7	31.3	0.2	0.3	0	13.7	11.6
Minerals	11.9	1.7	3.4	19.4	0	0.5	0.3	15.3	5.6
Iron	23.3	0	1.7	4.7	3.2	0	0	8.3	3.5
Metals	3.8	0	1.2	3.6	1.7	0.3	0.2	0.7	7.6
Metalic_products	8.3	2.3	3.4	9.3	0	0.4	0.1	24.4	10.7
Motor vehicles&parts	7	5.3	1.8	0.4	0	0.2	0.3	21.8	10.2
Trans_equ	8.7	0.2	0	34.9	0	0	1	4.7	6.2
Mach_equ	5.1	0.1	1.5	11.3	0	0.5	0.2	4.2	5.2
Electronics	7.1	1.48	2.4	12.4	0	0.6	0.1	10.6	5.4
Manuf_nec	16.48	1.2	1.1	20.3	0.1	0.3	0	15.9	14.6

Source: Author's computations from GTAP-6 database

It is clear that beneath the relatively low average tariffs, developed countries apply quite high tariffs on many of the sectors, which happen to hold comparative advantage for African countries. Herein lies the vexed question of tariff peaks which African countries have constantly raised over the years and which poses a veritable obstacle to their development and to their industrial diversification efforts.

7.1.3. Tariff peaks

Africa has to deal with fairly low average tariffs but coupled with tariff peaks on some products. A breakdown of the protection regimes by destination shows that the European Union, Japan and the United States apply the highest tariffs against the African countries. These countries have in place heavy protection regimes for textiles, processed agricultural products and sugar industries. The developed countries of the Cairns Group also protect their textile industry. The tariff levels applied against Africa are rather low, at 0.2 per cent. However, the picture in so far as Africa's exporters are concerned shows that sub-Saharan African countries are faced with particularly high tariffs. Indeed, the tariffs applied by the Cairns Group on exports of sub-Saharan Africa are

13.9 per cent for textiles, and 11.3 per cent for clothing. The figure is as high as 21.8 per cent for products from North Africa.

7.2. The tariff structure after the reforms

The impact of the scenarios on the global tariff average

The analysis of the new tariff structure obtained from the various simulations show that the impact of the negotiations should be significant for Africa's industrial exporters. The scenarios integrating a low Girard coefficient allow for a significant reduction of the tariffs applied by the developed countries on African products.

Table 8 and 9 clearly show that non-linear-formula reductions would, under certain conditions, allow for a significant improvement in market access for African products in developed-country markets. It is also clear that, whatever the reference scenario used, Africa can expect deep tariff cuts by the developed countries. It is noteworthy, however, that the tariffs applied by developed countries would considerably diminish with the application of an ambitious formula (i.e. first, third or fourth scenario). By ambitious formula, is meant a formula, which incorporates a low Girard coefficient for developed countries or substantial special and differentiated treatment for developing countries, or both. This special and differentiated treatment may be both explicit (where a portion of the tariff lines is excluded from all tariff reduction) and implicit (where a Girard >1 coefficient is applied to the developing countries, such that the magnitude of the reduction is diminished). This category of modalities would offer the developing countries better access to developed-country markets while giving them some leeway to pursue their economic policies. Indeed, to the extent that the tariff cuts that the developing countries would concede were less restrictive, they would be able to maintain a portion of their tariffs and hence their revenues from tariffs, which, it should be noted, is the main revenue base for many of the African countries.

The application of an ambitious formula by the developed countries would result in tariff escalation and a significant reduction in the tariffs applied by these countries.

While the results indicate that the average tariff reduction is low, the application of a non-linear formula means a sharp reduction of tariff peaks on the most taxed products for Africa (i.e. chemicals, agro-processing industries, sugar industry, cotton industry, iron and steel, metal products, minerals and energy).

The reduction is more significant with a more ambitious formula. Although the tariff reductions are lower on average tariffs because of their initial level, the reductions should be more significant on tariff peaks. The tariff implications of the Doha Round should be particularly sensitive for textiles. Indeed, our simulations show that the tariff peaks in this sector, which affect many African countries, should disappear with the application of an ambitious formula. In this case, the tariffs applied on textiles in the United States of America would drop from 11.74 per cent to 2.5 per cent [19]. The abolition of the Multi-Fibre Agreement would, nonetheless, considerably limit the positive impact of the tariff reductions (ECA, 2005).

[19] See annex for a more complete description of the tariffs.

Table 8: Tariff structure by reference to the various scenarios (tariffs applied to North Africa exports, percentage)

	Developed countries					China					Japan					USA					EU 25				
Importers	S0	S1	S2	S3	S4	S0	S1	S2	S3	S4	S0	S1	S2	S3	S4	S0	S1	S2	S3	S4	S0	S1	S2	S3	S4
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	1.8	2.6	1.8	1.8	38.8	5.1	12	5.1	5.1
Sugar	3.7	2.7	3.3	2.7	2.7	0	0	0	0	0	52.1	8.5	19.1	8.5	8.5	10	1	2.4	1	1	7.9	1.2	2.7	1.2	1.2
Food products	3.5	2	2.8	2	2	23.2	16.2	19.3	19.3	12.7	7.7	6	7	6	6	2.6	1.4	2	1.4	1.4	1.6	0.9	1.3	0.9	0.9
Bevtob	14	5.5	9.2	5.5	5.5	41.4	24.6	30.2	30.2	15.4	37.5	21.6	30.1	21.6	21.6	9.3	4.3	6.7	4.3	4.3	11.7	6.6	9.3	6.6	6.6
Textiles	11.8	4.2	7.4	4.2	4.2	10.6	7.7	9.1	9.1	7.7	7.1	6.1	6.7	6.1	6.1	9	3.4	5.8	3.4	3.4	0.2	0.1	0.2	0.1	0.1
Clothing	18.4	4.6	9.2	4.6	4.6	10.1	6.7	8.2	8.2	7	10.5	8.2	9.6	8.2	8.2	11.3	3.8	6.8	3.8	3.8	0.1	0.1	0.1	0.1	0.1
Leather	12.1	4.9	8.1	4.9	4.9	9.8	5.7	7.9	7.9	5.7	12.8	9.7	11.6	9.7	9.7	5.4	2.3	3.7	2.3	2.3	0.1	0.1	0.1	0.1	0.1
Wood products	3.5	2.2	2.9	2.2	2.2	10.5	6.1	8.5	8.5	6.1	0.4	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Paper products	0.5	0.4	0.5	0.4	0.4	10.9	6.8	9.1	9.1	6.8	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Petroleum	0	0	0	0	0	7.3	4.6	6.1	6.1	4.6	2.4	2.3	2.4	2.3	2.3	1.2	0.9	1.1	0.9	0.9	0.9	0.8	0.9	0.8	0.8
Chem rubber	0.1	0.1	0.1	0.1	0.1	6	2.8	4.3	4.3	4.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.2	0.2	0.6	0.5	0.6	0.5	0.5
Mineral products	2.3	1.6	2	1.6	1.6	21.1	15.3	15	15	15.3	0	0	0	0	0	2.1	1.3	1.7	1.3	1.3	0.1	0.1	0.1	0.1	0.1
Ferrous met.	0.1	0.1	0.1	0.1	0.1	4	2.7	3.5	3.5	2.7	0	0	0	0	0	0.9	0.7	0.8	0.7	0.7	6.9	5	6.1	5	5
Metal nec.	0	0	0	0	0	2.7	1.9	2.3	2.3	1.9	0	0	0	0	0	1.6	1.3	1.4	1.3	1.3	0	0	0	0	0
Metal products	3.3	2	2.7	2	2	11.1	6.2	8.8	8.8	8.7	0	0	0	0	0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0
Motor	3.8	1.8	2.8	1.8	1.8	17.2	10.8	13.3	13.3	11.3	0	0	0	0	0	0.7	0.5	0.6	0.5	0.5	0	0	0	0	0
Trans_equ	0.2	0.2	0.2	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.6	0.6	0.6	0.6
Mach_equ	0	0.8	1	0.8	0.8	8.3	5.8	8.6	8.6	8.4	0	0	0	0	0	1.6	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Electronics	1.1	0	0	0	0	11.3	4.8	6.7	6.7	4.8	0	0	0	0	0	0.2	1.4	1.5	1.4	1.4	0.1	0.1	0.1	0.1	0.1
Manuf-nec	1.8	1.3	1.6	1.3	1.3	24.2	17.2	20.4	20.4	17.2	0	0	0	0	0	0.5	0.4	0.5	0.4	0.4	0.1	0.1	0.1	0.1	0.1

Source: GTAP-6 simulation
S0 = Initial tariffs

Table 9: Tariff structure by reference to the various scenarios (tariffs applied to sub-Saharan African exports, percentage)

Importers	Cairns dvped.					Cairns dvg.					China					Japan					USA					EU 25				
	Initial Tariffs	S1	S2	S3	S4	Intitial Tariffs	S1	S2	S3	S4	Initial Tariffs	S1	S2	S3	S4	Initial Tariffs	S1	S2	S3	S4	Initial Tariff	S1	S2	S3	S4	Initial Tariff	S1	S2	S3	S4
Rice	0	0	0	0	0	1.3	1	1.2	1.2	1	0.9	0.8	0.9	0.9	0.8	0	0	0	0	0	0	0	0	0	0	11.5	1.5	3.6	1.5	1.5
Sugar	0.2	0.1	0.2	0.1	0.1	0.8	0.5	0.6	0.6	0.5	0	0	0	0	0	0	0	0	0	0	22.1	2.1	5.3	2.1	2.1	113.6	16.8	39	16.8	16.8
Food products	0.6	0.3	0.5	0.3	0.3	16	10.9	13	13	10.9	21	14.7	17.5	17.5	11.5	3.6	2.8	3.3	2.8	2.8	2.1	1.1	1.6	1.1	1.1	0.1	0.1	0.1	0.1	0.1
Bevtob	2.4	0.9	1.5	0.9	0.9	3.3	1.8	2.1	2.1	1.9	0	0	0	0	0	16.2	9.3	13	9.3	9.3	0.4	0.2	0.3	0.2	0.2	1	0.6	0.8	0.6	0.6
Textiles	13.8	4.9	8.6	4.9	4.9	6.4	4.7	4.7	4.7	4.7	10.5	7.6	9	9	7.6	3.1	2.6	2.9	2.6	2.6	12.6	4.8	8.2	4.8	4.8	0.2	0.1	0.1	0.1	0.1
Clothing	17.3	4.3	8.7	4.3	4.3	13	8.9	10.6	10.6	8.9	21.5	14.3	17.4	17.4	14.9	6.1	4.7	5.6	4.7	4.7	11.2	3.7	6.7	3.7	3.7	0.1	0	0	0	0
Leather	5.9	2.4	3.9	2.4	2.4	7.5	4.1	5.9	5.9	5.8	10.5	6.1	8.5	8.5	6.1	1.9	1.4	1.7	1.4	1.4	1.3	0.6	0.9	0.6	0.6	0	0	0	0	0
Wood products	1	0.6	0.9	0.6	0.6	2.8	1.5	2.5	2.5	2.1	0.6	0.3	0.5	0.5	0.3	0.7	0.7	0.7	0.7	0.7	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0
Paper products	0.7	0.6	0.7	0.6	0.6	0.1	0.1	0.1	0.1	0.1	2.4	1.5	2	2	1.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Petrol	0	0	0	0	0	1.3	1.1	1.2	1.2	1.1	7	4.4	5.9	5.9	4.4	0.2	0.2	0.2	0.2	0.2	1	0.7	0.9	0.7	0.7	0	0	0	0	0
Chem. rubber	1	0.7	0.9	0.7	0.7	1.7	1	1.4	1.4	1	31.3	14.6	22.7	22.7	23	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0	0	0	0	0
Mineral products	1.7	1.1	1.4	1.1	1.1	3.4	1.8	2.6	2.6	3.4	19.4	14.1	13.8	13.8	14.1	0	0	0	0	0	0.5	0.3	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Ferrous met.	0	0	0	0	0	1.7	1	1.3	1.3	1.3	4.7	3.2	4.1	4.1	3.2	3.2	3.1	3.1	3.1	3.1	0	0	0	0	0	0	0	0	0	0
Metal	0	0	0	0	0	1.2	0.8	1	1	0.8	3.6	2.6	3.2	3.2	2.6	1.7	1.6	1.6	1.6	1.6	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Metal nec.	2.3	1.4	1.9	1.4	1.4	3.4	2.5	2.9	2.9	2.5	9.3	5.2	7.3	7.3	7.2	0	0	0	0	0	0.4	0.3	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1
Motor	5.3	2.5	3.9	2.5	2.5	1.8	1.2	1.5	1.5	1.2	0.4	0.2	0.3	0.3	0.2	0	0	0	0	0	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2
Trans_equ	0.2	0.1	0.2	0.1	0.1	0	0	0	0	0	34.9	21.3	28.8	34.9	28.1	0	0	0	0	0	0	0	0	0	0	1	0.8	0.9	0.8	0.8
Mach_equ	0.1	1	1.2	1	1	1.5	1.5	2	2	1.9	11.3	6.3	9.4	9.4	9.2	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.2	0.1	0.1	0.1	0.1
Electronics	1.4	0.1	0.1	0.1	0.1	2.4	1.1	1.3	1.3	1.1	12.4	6.4	9	9	6.4	0	0	0	0	0	0.6	0.4	0.5	0.4	0.4	0.1	0.2	0.2	0.2	0.2
Manuf-nec	1.2	0.9	1.1	0.9	0.9	1.1	0.8	1	1	0.8	20.3	14.5	17.2	17.2	14.5	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0	0	0	0	0

Source : GTAP-6 simulation

7.3.2 Geographical pattern of the tariff structure

Analysis of the tariff structure also shows a slight difference between North African countries and sub-Saharan African countries that can be explained by two factors.

The first factor is linked to the preferential treatment granted by a large number of developed countries to sub-Saharan exports. Furthermore, there has been a certain level of industrial development in the North African countries, which have become quite competitive in certain sectors in relation to the developed countries. For this reason, North African countries are willing to defend their industrial activities by maintaining high tariffs on their exports.

North African exporters must cope with high tariffs in the chemical industries, the metal products industries and the motor industries, with tariffs of 7.13, 5.19 and 9.23 per cent respectively. The textiles and clothing industry is also subject to high tariffs, which are approximately 6 per cent for textiles and 5.65 per cent for clothing. Processed agricultural products are subject to the highest taxes, which reach 10.08 per cent on average. A significant reduction in these tariffs following the trade liberalization process should lead to the development of the industrial sector in North Africa given that these products represent the main source of industrial exports.

The simulations carried out on the basis of the various tariff scenarios show that the textiles and clothing industry could benefit from substantial reductions with the application of a non-linear reduction scenario that includes a differential between the developed and the developing countries. This scenario would lead to a reduction of approximately 70 per cent of the tariffs in these sectors and would promote the development of the textiles industries in North Africa. The other scenarios, which have a GIRARD coefficient of 3, are too conservative and would not bring about any changes in the tariff structure.[3]

Overall, the simulations carried out for North Africa's partners show contrasting results.

Regardless of the formula used, access to the EU market will hardly be affected because of the low initial level of the European tariffs. Access to the other developed markets (including Japan and the USA) will be much more affected and the decreases in the tariffs will be considerable if an ambitious formula is applied. With the introduction of significant S&D treatment (doubling the number of lines exempt in the July Package), the impact of the agreement on North Africa's tariffs seems limited. However, the inclusion of S&D treatment on the excluded lines (explicit) and also on the formula coefficient (implicit, greater than 1) would leave the developing countries with room to manoeuvre. The access to the sub-Saharan markets for North African producers will be slightly improved.

The impact of the scenarios on the tariff structure of sub-Saharan Africa will be analysed in a similar way to North Africa, allowing for identification of the industrial sectors that should benefit from the trade liberalization process.
Exporters in sub-Saharan Africa are subject to high tariffs on products in the chemical industries (9.52 per cent), metal products (10.51 per cent), motor vehicles and parts (11.39 per cent) and

[3] This scenario does not include the consequences of the dismantling of the MultiFibre Arrangement.

products from the sugar industry (7.17 per cent). In the case of some countries, including Malawi, Mozambique, South Africa, Tanzania and Zimbabwe, the European Union applies a prohibitive tariff in excess of 92 per cent. The products from the textiles and clothing industry are also subject to high tariffs, which are greater than 8 per cent on average. For example, Malawi and the countries of the South African Development Community (SADC) must cope with significant tariff peaks that can be as high as 19 per cent in the case of the USA and the Cairns group of developed countries. However, the highest tariffs are applied to processed agricultural products. The tariff average in the global market rises to 13.7 per cent but many sub-Saharan exporters must cope with numerous tariff peaks. These high tariffs restrict the industrial development of sub-Saharan Africa.

The simulations highlight the fact that the high tariffs faced by sub-Saharan exporters would be significantly reduced if an ambitious formula were applied that included S&D treatment for the developing countries. This type of scenario would also allow for a reduction in the tariff peaks.

VIII. THE IMPACT OF THE JULY AGREEMENT ON THE AFRICAN ECONOMIES

This section looks at the impact of the scenarios on the African economies, with particular focus on the effects of the tariff reductions on welfare, GDP and the trade structure.

8.1 The welfare impact

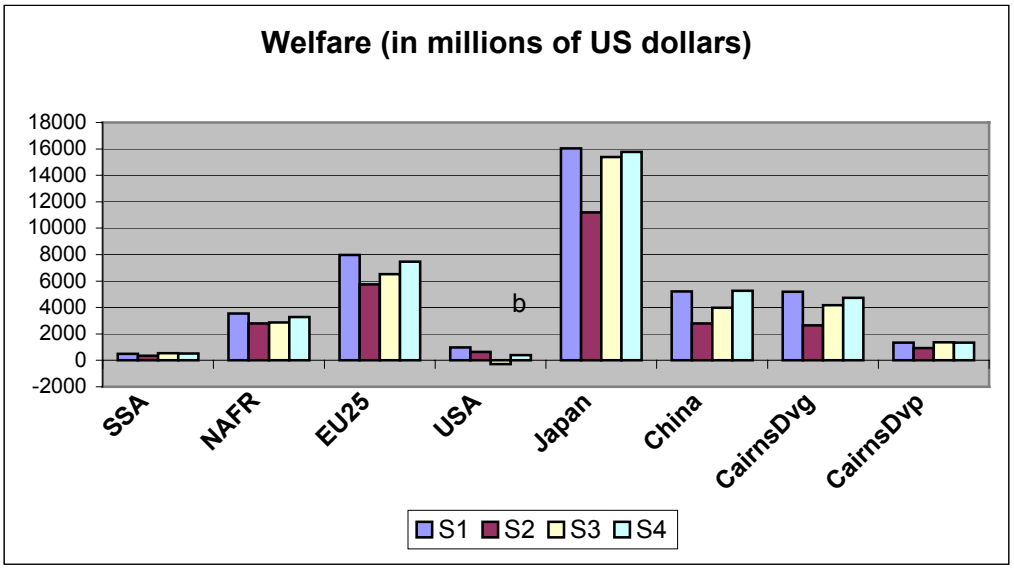
The simulations highlight the fact that the continent would gain more in terms of welfare in the case of the ambitious liberalization scenarios and a significant S&D component. North Africa is the region that would benefit the most from the tariff reductions brought about by the various scenarios. By comparing the results obtained using the various formulas, it emerges that the first scenario would offer better prospects for Africa. Africa would make greater welfare gains with the application of a scenario that leads to a high level of liberalization of the developed countries' customs tariffs. The application of a coefficient of 1 to the non-linear formula applied by these countries would lead to welfare growth in excess of 30 per cent in comparison to the application of a conservative formula (scenario 2, in which B=3).

On a global level, Japan would benefit the most in terms of welfare due to an improvement in its terms of trade and also to a drop in the global prices of Japanese imports.

With the application of an ambitious formula, other regions in the world would see their welfare increase considerably. It is noteworthy, however, that the third scenario, which includes S&D treatment implicitly and explicitly, leads to a significant diminution in welfare in the case of the USA.

The simulations highlight the fact that any tariff reduction based on an ambitious Girard formula could lead to a substantial increase in the welfare of all regions. However, an ambitious formula that included a significant S&D component would have the same effects in terms of welfare and would offer more flexibility to the developing countries. It should be noted that the African countries would benefit more from a liberalization process based on the linear formulas.

Figure 1: The equivalence variation of welfare



Source: GTAP-6 simulation

8.2 Impact on revenue and value added

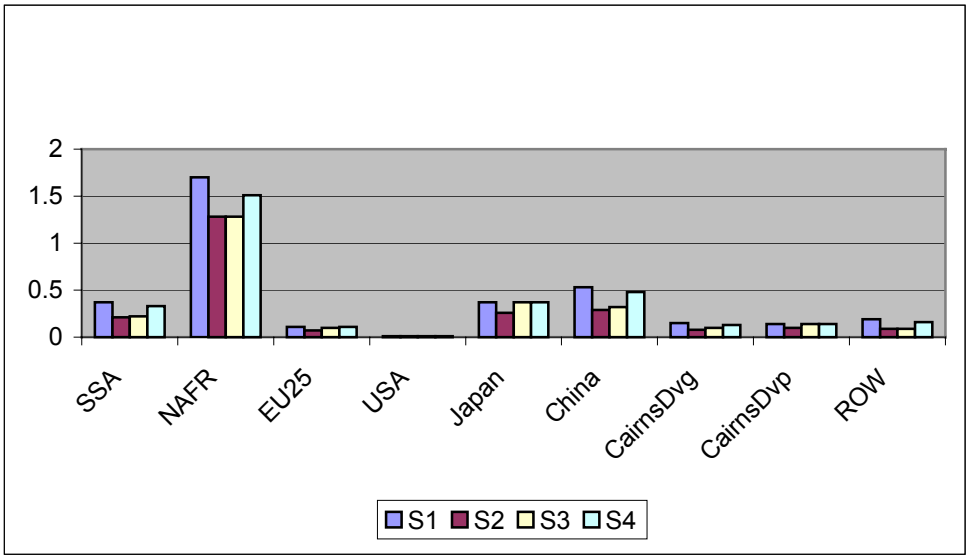
Impact on revenue

The results show that Africa would benefit from an increase in revenue regardless of the scenario and this is mainly due to gains made in terms of value added. Worldwide, it is the region that would see the sharpest GDP growth. The scenario based on an ambitious formula (Girard with B=1), which includes S&D treatment as provided for by the July Agreement, would lead to the sharpest growth in GDP.

On a global level, production would increase the most in North Africa. Regardless of the scenario, production in the region would increase by at least 1.2 per cent, which is quite significant. In contrast, the rate of increase in production would be 0.2 per cent on average in sub-Saharan Africa, 0.3 per cent in Japan, 0.4 per cent in China, 0.2 per cent in the Cairns group of countries, and 0.25 per cent in the rest of the world (ROW), with the GDP in the USA remaining unchanged. North Africa's GDP growth can be partly explained by a very significant increase in the value added in some of the sectors in which North Africa has comparative advantages, such as vegetable oil, the rice processing sector, metal products, transport and equipment.

In the case of all the scenarios, the GDP gains are superior or equal to the world averages (except for the USA) but the growth gap is too wide to allow for Africa rallying in relation to the rest of the world.

Figure 2: Evolution of the GDP according to the various scenarios (% change in relation to the initial situation)



Source: GTAP-6 simulation

Impact on value added

Table 10 gives a detailed break down of the pattern of the value added by sector. African countries are largely dependent on two or three primary products, for the export market, which form the basis of their foreign exchange, and they must cope with the problem of the short-term instability of prices, which is considerable for industrial products. The results show that there is a net increase in the value added in some sectors. In the case of North Africa, we may mention, vegetable oils, the rice processing sector, petroleum, metals, electronics and the transport and equipment sector. In the case of sub-Saharan Africa, the increase in value added products would be in sugar, beverages and tobacco, metal products and the transport and equipment sector. Only the ambitious scenarios significantly improve the value added in some sectors. Similarly, the GDP improves significantly when the tariff reduction is effected using an ambitious formula.

A conservative formula does not significantly improve the value added, nor does it allow for growth in industrial production. Overall, Africa can expect a revenue gain greater than that obtained on average by its partners. However, a close reading of the results qualifies this observation: the growth gap with the rest of the world is too great to envisage Africa reaching the level of development of the developed countries, and the value added gains are concentrated in the agro-industrial sectors, the sugar industry and transport-and-equipment. With the application of a non-linear tariff reduction formula, the Doha Round should therefore lead Africa towards strengthening its agricultural specialization rather than as shown in table 10. However, an ambitious non-linear formula that incorporates a significant S&D component would be a less desirable alternative for African countries.

Table 10: The real added value by product (variations in % in relation to the initial situations)

	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	SSA	NAFR	SSA	NAFR	SSA	NAFR	SSA	NAFR
Agri. Res	-0.38	-0.5	-0.22	-0.21	-0.29	-0.21	-0.45	-0.39
Meat cattle	51.54	18.3	27.03	5.97	50.45	17.75	52.2	17.2
Meat product	-3.24	-1.34	-1.62	-0.37	-1.74	-0.34	-3.32	-1.57
Vegetable oil	-4.11	76.76	-2.11	24.02	-2.64	75.03	-4.26	73.99
Dairy products	-7.02	-1.58	-3.61	-0.14	-4.54	-0.26	-3.5	-2.28
Rice manuf.	-4.5	5.92	-2.35	5.3	-2.31	3.27	-4.55	3
Sugar	34.15	-0.23	22.01	0.02	34.48	-0.11	34.66	-0.03
Food products	-2.01	-0.34	-1.04	0.17	-1.58	0.07	-2.1	0.24
Bevtob	-0.04	0.15	0	0.21	0.37	0.19	0.04	0.04
Textiles	-5.34	-6.33	-3	-4.08	-3.19	-5.26	-5.57	-6.65
Clothing	-0.26	-12.36	-0.67	-12.2	-0.16	-13.8	-0.15	-11.86
Leather	-6.84	-4.42	-7.78	-2.09	-8.95	-3.02	-7.17	-4.35
Wood products	-3.69	-1.29	-2.11	-0.37	-2.93	-0.43	-3.71	-1.63
Paper products	-3.15	-3.59	-1.5	-1.44	-1.78	-1.54	-3.1	-1.69
Petroleum	-2.78	0.27	-1.28	0.21	-1.55	0.12	-2.9	-0.16
Chem. Rubber	-4.95	-1.1	-2.62	-0.45	-3.17	-0.66	-5.38	0.1
Mineral products	-5.15	-1.62	-2.55	-0.65	-2.79	-0.73	-2.45	-0.62
Ferrous met.	-6.96	-2.41	-3.37	-1.05	-4.58	-0.75	-6.64	-1.61
Metal nec.	2.72	0.18	0.86	-0.22	-1.09	-0.33	1.58	-1.44
Metal prod.	-7.81	-7.24	-1.43	-1.3	-1.68	-1.35	-2.83	-3.57
Motor	-3.43	-4.05	-2.32	-2.09	-3.36	-2.23	-1.91	-4.62
Trans. Equ	6.27	0.36	1.91	0.1	0.6	-0.29	4.89	-0.72
Mach. Equ	-4.4	-1.21	-2.33	-0.87	-3.7	-1.2	-5.42	-3.13
Electronics	-5.56	-1.37	-2.88	0.71	-4.36	-1.03	-6.43	-2.67
Manuf. Nec	-0.31	-1.79	-0.43	-1.22	-1.52	-2.54	-0.06	-6.15
Services	0.6	1.04	0.28	0.68	0.25	0.73	0.51	0.95
Trans. Comm	0.49	0.44	0.21	0.3	0.07	0.26	0.36	0.29

Source: GTAP-6 simulation

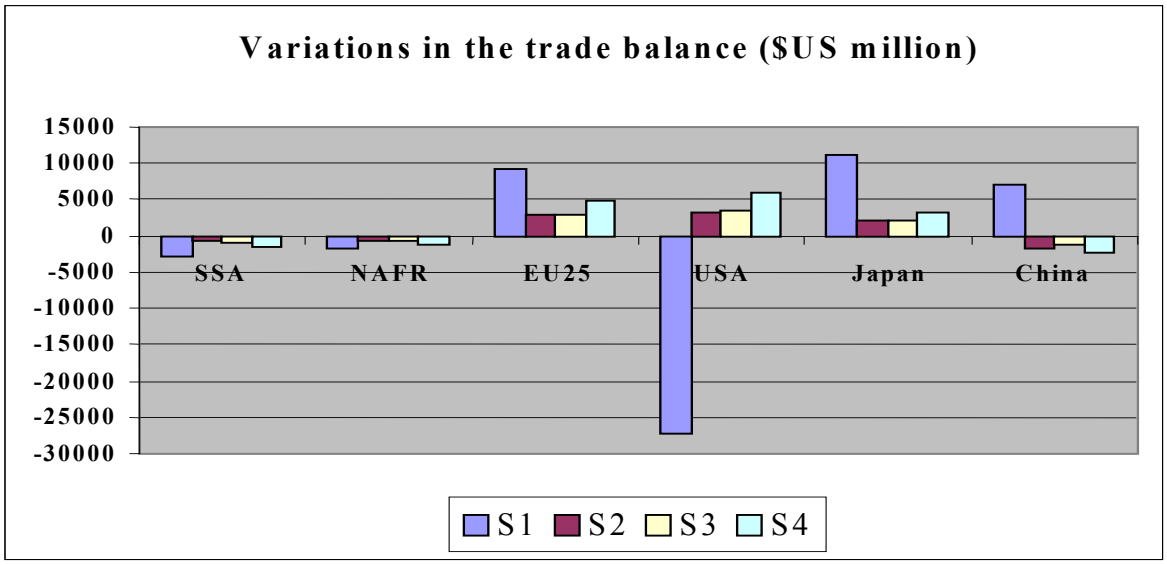
8.3 Impact on the trade structure

Africa has hardly benefited from the explosion in exports of manufactured goods because the proportion of these in its total exports, which was 30 per cent in 2000, has only risen ten percentage points in relation to the 1980 figures (UNCTAD: 2003). Africa's share in world exports dropped in value from 6.3 per cent in 1980 to 2.5 per cent in 2000.[4]

[4] Africa's exports of manufactured articles grew by 6.3 per cent per year but this apparently high growth rate is approximately half that of Asia (14 per cent) and of Latin America (approximately 12 per cent). It is attributable to a sharp rise in the exports of semi-finished articles that are highly reliant on manpower and the resources of a small number of countries, particularly Mauritius (clothing) and Botswana (rough diamonds). In sub-Saharan Africa, Lesotho, Namibia and Swaziland have increased the value of their exports of manufactured products. In North Africa, exports also rose in Morocco and Tunisia, from less than two million dollars in 1980 to almost five million in 2000 in the case of Morocco and to 4.5 million in the case of Tunisia. On the other hand, in Nigeria, the Democratic Republic of Congo, Sierra Leone and Zambia there was a sharp drop in the value of the exports of manufactured articles over the same period.

Africa will not benefit from greater integration of its economy in world trade. Regardless of the scenario adopted, the trade balance would remain slightly in deficit. The application of a non-linear formula would have a negative effect on the trade balance; industrial imports would increase more than exports (in value terms). There would certainly be deterioration in Africa's terms of trade and this would be worse in the case of North Africa. There is a real concern here. The application of a non-linear formula would lead to a slight decline in the trade balance, which is why African countries have continued to advocate a liberalization process based on a linear formula. However, this result is static and any criticism is only partly valid. It would thus be important to look at the pattern of the trade balance in a dynamic context.

Figure 3: Variations in the trade balance ($US million)

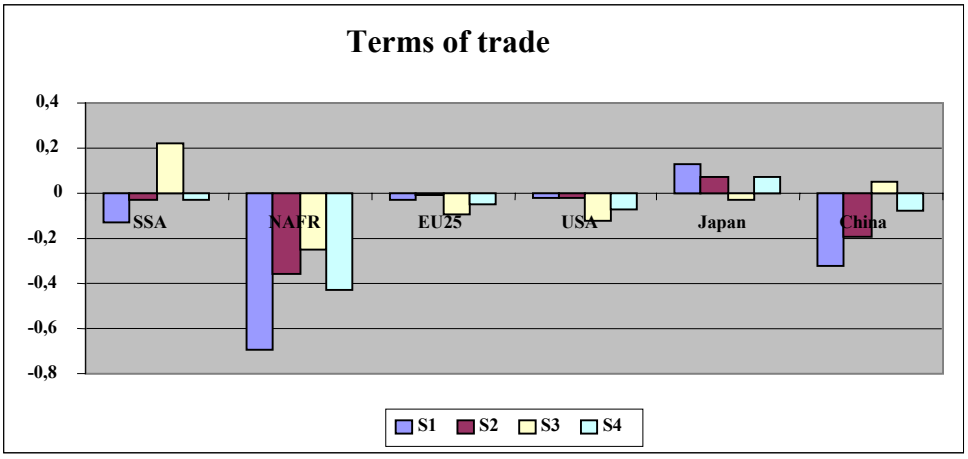


Regardless of the scenario adopted, Africa would see a rise in its imports of industrial products. However, this rise is even more pronounced in the absence of a significant level of S&D treatment (scenario 1). Scenario 1 leads to a significant growth of industrial imports in both sub-Saharan Africa and North Africa. This result can be explained by the fact that the tariff reductions of African countries would be greater without S&D treatment and this would promote new exports in the African market.

On a global level, it must be emphasized that the main beneficiaries of a non-linear liberalization process would be Japan and Europe. The opening up of external markets would benefit the European Union considerably and would consolidate its position as the leading trade power.

The Doha Round should bring about an improvement in Africa's position in world trade if the tariff reductions are effected on the basis of a non-linear Girard formula. Nevertheless, with this type of formula, the trade structure should evolve in such a way as to benefit the region's external balance and debt relief.

Figure 4: The variations in the terms of trade



Source: GTAP-6 simulation

Table 11: Variation of exports by reference to the various scenarios

Exporter	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	SSA	NAFR	SSA	NAFR	SSA	NAFR	SSA	NAFR
Agri. res	-1.95	-1.63	-1.33	-1.17	-2.61	-2.53	-2.25	-3.15
Meat cattle	484.69	3064.46	252.26	908.9	464.18	2879.99	480.33	2946.47
Meat product	6.92	-0.75	3.97	-5.42	2.55	-4.19	5.75	-2.43
Vegetable oil	-11.02	366.22	-5.39	113.12	-10.81	353.03	-11.67	356.05
Dairy prod.	19	10.12	9.9	4.47	9.69	8.02	11.18	5.86
Rice manuf.	-18.33	7.99	-14.8	6.81	-17.49	4.23	-18.49	4.42
Sugar	192.27	-40.08	122.22	-33.1	187.92	-40.77	188.98	-40.63
Food products	-3.65	1.1	-1.99	0.06	-4.91	-1.03	-4.02	-0.13
Bevtob	3.89	9.46	1.98	4.69	1.55	7.34	3.29	8.88
Textiles	5.8	16.42	2.69	10.06	2.89	8.36	5.15	13.7
Wearing	14.99	30.73	7.82	21.39	9.24	17.81	14.09	26.41
Leather	-2.11	-4.19	-1.41	-2.1	-6.45	-6.01	-3.33	-4.88
Wood products	-0.86	5.08	-0.65	2.18	-2.68	1.58	-1.8	3.19
Paper products	-2.87	4.05	-1.4	1.43	-2.42	0.95	-1.25	1.82
Petrol	0.14	0.51	-0.01	0.07	-0.55	-0.13	-0.07	-0.69
Chem. rubber	10.28	11.65	4.1	4.34	2.42	3.71	8.96	8.86
Mineral products	-2.8	3.67	-1.58	1.36	-2.66	0.67	-1.64	0.83
Ferrous met	0.6	12.9	-0.16	4.62	-1.78	7.45	0.47	8.44
Metal nec.	3.11	12.33	1.03	3.02	-0.93	2.73	1.95	5.29
Metal products	6.63	9.1	2.87	2.89	1.32	2.17	5.16	3.8
Motor	3.26	6.46	0.56	2.64	-1.01	1.52	0.2	5.35
Trans equ.	15.44	6.01	5.65	2.15	4.06	1.12	13.69	4.09
Mach. equ.	3.58	8.47	1.16	2.65	-0.96	1.92	2.06	4.8
Electronics	4.64	5.28	1.52	-0.05	-0.85	0.95	3.33	2.93
Manuf. nec.	3.83	3.58	1.58	1.23	-0.63	1.26	1.81	3.49
Services	-0.14	0.04	-0.26	-0.29	-1.45	-0.7	-0.87	-0.63
Trans. comm.	1.55	-0.09	0.56	-0.28	-0.16	-0.46	0.88	-0.5

Source : GTAP-6 simulation

IX. CONCLUSION

Africa has been confronted by the decreasing importance of its exports in world trade. The World Bank's (2003) studies show that, while world trade in non-fuel products has increased at an annual rate of 11.9 per cent since the early 1960s, Africa's exports only grew by 4.5 per cent over the same period. WTO member countries have decided to shape the Doha Round into a round for developing countries. At the heart of the new Doha programme is the question of access in developed-country markets, which has been a key point for the developing countries for decades.

This study provides a quantitative evaluation of the Doha Round in terms of the market access for industrial products and the possible consequences of the trade liberalization process. It analysis the impact of the reforms put forward by the July Package concluded in Geneva. The tariff reduction scenarios under review fit in with the commitments undertaken in the July Package. All four scenarios reviewed are based on a Girard formula. The first, third and fourth scenarios are ambitious, whereas the second is more conservative. Scenarios 1, 3 and 4 differ in the way they factor in S&D treatment.

This study emphasizes the fact that Africa would benefit from the liberalization process provided that there is a significant level of non-reciprocal S&D treatment.[5] S&D treatment is an essential component of a tariff structure that benefits industrial development in Africa. This new tariff structure should also promote the integration of African countries in world trade and accelerate the diversification process of African economies and their competitiveness. It should re-launch the industrial development process in the continent by guaranteeing a certain level of protection for African businesses and allowing for a greater opening up of the developed countries' markets to African products.

The results also highlight the fact that only the application of an ambitious formula would provide greater access to the developed countries' markets for African producers. An ambitious formula is one in which the coefficient B would be equal to or less than 1 for the developed countries. This formula should guarantee a significant level of S&D treatment for the developing countries if the coefficient B is greater than 1 and it should also include the S&D treatment in accordance with the terms of the July Agreement, excluding part of the tariff lines from any (or part) reduction.

In terms of impact, the simulations show that a liberalization scenario based on an ambitious, non-linear Girard formula would be a less desirable alternative for Africa. It would allow for increases in the welfare and production of the African countries but would not boost African exports.

A simple and transparent formula approach is key to reducing tariffs, and reducing or eliminating tariff peaks, high tariffs, and tariff escalation. The basic non-linear formula used to derive the tariff reduction rates could be an extended Swiss formula with special coefficients associated with the country. The extended formula could be this kind of formula. Two ways of introducing

[5] The application of a linear formula by the developing countries would allow for a reduction in tax losses due to liberalization and would ensure greater industrial development.

special and differential treatment modalities could also be introduced, namely the value of the special coefficient and the tariff lines exempted from tariff reductions. The first element constitutes what can be referred to as *implicit* S&D while the second element implies *explicit* S&D. The magnitude of the tariff reductions that must be effected by each country are linked to the level of the coefficient of the formula.

The tariffs would be cut so that $t_1 = \frac{B \times a \times t_0}{B \times a + t_0}$, where t_1 is the final bound tariff, t_0 the initial one and *a,* the coefficient of the tariff cut reduction. Here B is what we call the special coefficient of the formula. We can easily see that if B=1, this formula is a pure Swiss formula that the EU and US are looking for in this negotiation.

An alternative to this formula could be envisaged with a Swiss type formula incorporating each country's tariff average. In this case, $t_1 = \frac{B \times t_a \times t_0}{B \times t_a + t_0}$, where t_1 is the final bound tariff, t_0 the bound base rate, t_a the average of the current bound rates and B the coefficient of the formula. The coefficient B will be modulated to reflect the ambition in other areas relevant to market access agreed to this round. All non-ad valorem duties shall be converted to ad valorem equivalents before the adoption of the formula, and bound in ad valorem terms.

These two proposals could be the most appropriate because:

- They are based on the current tariff profile;
- They have an element of progressivity in national tariffs;
- There is a clear component concerning 'the less than full reciprocity commitments'; and
- The liberalizing effect could be adjusted by variations in the coefficient 'B'.

Particular sensitivities of developing countries could be attended to longer implementation periods, less than formula cuts for some tariff lines and the exclusion of some tariff lines from any formula cut.

ANNEXES

Breakdown of sectoral aggregates

Old	New	sectors
Code	Code	Description
Agri_res	Pdr	Paddy rice
	Wht	Wheat
	Gro	Cereal grains nec
	v_f	Vegetables. fruit. nuts
	Osd	Oil seeds
	c_b	Sugar cane. sugar beet
	Pfb	Plant-based fibers
	Ocr	Crops nec
	Ctl	Cattle.sheep.goats.horses
	Oap	Animal products nec
	Rmk	Raw milk
	Wol	Wool. silk-worm cocoons
	Frs	Forestry
	Fsh	Fishing
	Coa	Coal
	Oil	Oil
	Gas	Gas
	Omn	Minerals nec
Meat cattle	Cmt	Meat: cattle.sheep.goats.horse
Meat product	Omt	Meat products nec
Vegetable oil	Vol	Vegetable oils and fats
Dairy prod	Mil	Dairy products
Rice manuf.	Pcr	Processed rice
Sugar	Sgr	Sugar
Food prod.	Ofd	Food products nec
Bevtob	b_t	Beverages and tobacco products
Textiles	Tex	Textiles
Wearing	Wap	Wearing apparel

Leather	Lea	Leather products
Wood prod.	Lum	Wood products
Paper prod.	Ppp	Paper products. publishing
Petrol	p_c	Petroleum. coal products
Chem. rubber	Crp	Chemical.rubber.plastic prods
Mineral prod.	nmm	Mineral products nec
Ferrous met.	i_s	Ferrous metals
Metal nec.	Nfm	Metals nec
Metal prod.	Fmp	Metal products
Motor	mvh	Motor vehicles and parts
Trans equ.	Otn	Transport equipment nec
Mach. equ.	Ome	Machinery and equipment nec
Electronic	Ele	Electronic equipment
Manuf. nec.	Omf	Manufactures nec
Services	Ely	Electricity
	Gdt	Gas manufacture. distribution
	Wtr	Water
	Cns	Construction
	Trd	Trade
	Ofi	Financial services nec
	Isr	Insurance
	Obs	Business services nec
	Ros	Recreation and other services
	Osg	PubAdmin/Defence/Health/Educat
	Dwe	Dwellings
Trans. comm.	Otp	Transport nec
	Wtp	Sea transport
	Atp	Air transport
	Cmn	Communication

Breakdown of geographical aggregates

Code	Code	Description
Sub-Saharan Africa (SSA)	bwa	Botswana
	xsc	Rest of South African CU
	mwi	Malawi
	moz	Mozambique
	tza	Tanzania
	zmb	Zambia
	zwe	Zimbabwe
	xsd	Rest of SADC
	mdg	Madagascar
	uga	Uganda
	xss	Rest of Sub-Saharan Africa
North Africa (NA)	mar	Morocco
	tun	Tunisia
	xnf	Rest of North Africa
EU 25	aut	Austria
	bel	Belgium
	dnk	Denmark
	fin	Finland
	fra	France
	deu	Germany
	gbr	United Kingdom
	grc	Greece
	irl	Ireland
	ita	Italy
	lux	Luxembourg
	nld	Netherlands
	prt	Portugal
	esp	Spain
	swe	Sweden
	cyp	Cyprus
	cze	Czech Republic
	hun	Hungary
	mlt	Malta
	pol	Poland
	rom	Romania
	svk	Slovakia
	svn	Slovenia
	est	Estonia
	lva	Latvia
	ltu	Lithuania

USA		
	usa	United States
JAPAN	jpn	Japan
CHINA	chn	China
CAIRNS Dvp	idn	Indonesia
	mys	Malaysia
	phl	Philippines
	tha	Thailand
	col	Colombia
	arg	Argentina
	bra	Brazil
	chl	Chile
	ury	Uruguay
	zaf	South Africa
CAIRNS Dvg	aus	Australia
	nzl	New Zealand
	can	Canada
ROW	xoc	Rest of Oceania
	hkg	Hong Kong
	kor	Korea
	xea	Rest of East Asia
	sgp	Singapore
	vnm	Vietnam
	xse	Rest of Southeast Asia
	bgd	Bangladesh
	ind	India
	lka	Sri Lanka
	xsa	Rest of South Asia
	mex	Mexico
	xna	Rest of North America
	per	Peru
	ven	Venezuela
	xap	Rest of Andean Pact
	xsm	Rest of South America
	xca	Central America
	xfa	Rest of FTAA
	xcb	Rest of the Caribbean
	che	Switzerland
	xef	Rest of EFTA
	xer	Rest of Europe
	alb	Albania
	bgr	Bulgaria
	hrv	Croatia

rus	Russian Federation
xsu	Rest of Former Soviet Union
tur	Turkey
xme	Rest of Middle East
twe	Taiwan

Impact of the liberalization scenarios on the economies

Equivalent variation in welfare in US million dollars

Welfare	S1	S2	S3	S4
SSA	489.02	337.24	543.41	514.98
NA	3545.99	2789.59	2860.91	3274.92
EU 25	7978.18	5756.61	6531.25	7455.25
USA	968.01	640.32	-288.49	394.76
Japan	16028.35	11188.01	15383.12	15773.95
China	5206.81	2797.09	3971.77	5273.14
Cairns Dvg	5202.17	2636.81	4177.07	4726.42
Cairns Dvp	1329.69	923.13	1374.53	1349.92
ROW	7399.4	3610.24	4798.55	6601.9

Variation in GDP, and variation in relation to the initial situation

GDP	S1	S2	S3	S4
SSA	0.37	0.21	0.22	0.33
NA	1.7	1.28	1.28	1.51
EU 25	0.11	0.07	0.1	0.11
USA	0.01	0.01	0.01	0.01
Japan	0.37	0.26	0.37	0.37
China	0.53	0.29	0.32	0.48
Cairns Dvg	0.15	0.08	0.1	0.13
Cairns Dvp	0.14	0.1	0.14	0.14
ROW	0.19	0.09	0.09	0.16

Variation in the trade balance, in US million dollars

Trade balance	S1	S2	S3	S4
SSA	-2796.5	-748.35	-870.52	-1455.7
NA	-1729.12	-524.69	-611.83	-1194.07
EU 25	9225.91	2824.78	2982.08	4860.17
USA	-27254.95	3102.69	3401.77	5935
Japan	11107.16	2052.38	2029.07	3299.34
China	6980.48	-1817.72	-1084.01	-2251.9
Cairns Dvg	5516.09	-1942.44	-1871.86	-2648.73
Cairns Dvp	2851.44	-133.33	-648.35	-415.96
ROW	-3900.51	-2813.32	-3326.34	-6128.16

Variation in terms of trade, % variation in relation to the initial situation

Terns of trade	S1	S2	S3	S4
SSA	-0.13	-0.03	0.22	-0.03
NA	-0.69	-0.36	-0.25	-0.43
EU 25	-0.03	-0.01	-0.09	-0.05
USA	-0.02	-0.02	-0.12	-0.07
Japan	0.13	0.07	-0.03	0.07
China	-0.32	-0.19	0.05	-0.08
Cairns Dvg	0.63	0.3	0.59	0.61
Cairns Dvp	-0.08	-0.07	-0.08	-0.09
ROW	-0.06	-0.01	0.07	-0.02

Source: Simulations carried out by the authors using GTAP-6

BIBLIOGRAPHY

Abreu M. (1996). Trade in manufactures. The outcome of the Uruguay Round and developing countries interests. in W. Martin and Alain Winters. eds. The Uruguay Round and the Developing countries. Cambridge University Press. Cambridge.

Achterbosch. T. Van Tongeren. F. et de Bruin. S. (2003) Trade Preferences for Developing Countries. The Hague: LEI

Amjadi A. U.Reincke et A.J.Yeats (1996). Did external barriers cause the marginalization of Sub-Saharan Africa in world trade? *World Bank Discussion Paper*. No. 348. Banque Mondiale. Washington D.C.

Anderson. K. B. Dimaran. J. Francois. T. Hertel. B. Hoekman et W. Martin (2001). The Costs of Rich (and Poor) Country Protection to Developing Countries. *CIES discussion paper*. Adelaide

Armington P. (1969). "A theory of demand for products distinguished by place of production". IMF Staff Papers. Vol.16(1)

Baldwin R. E. Multilateral liberalization (1987). in J. M. Finger and A. Olechowski. eds. The Uruguay Round: A Handbook for the multilateral negotiations. World Bank. Washington DC

Baldwin. R.E. et J.F. Francois (1999). Applied Issues in Dynamic Commercial Policy Analysis. Cambridge and New York: Cambridge University Press.

Bchir, M. H. Decreux, Y. Guérin, J-L and Jean, S. 2002 "MIRAGE, a Computable General Equilibrium Model for Trade Policy Analysis" CEPII working paper December, N 2002-17

Bchir M. H., Fontagné. L. et Jean. S. (2004). "Market access in non-agricultural goods: what is at stake in the development round?" CEPII

Beghin. J. et A. Aksoy (2003). Agricultural Trade and the Doha Round: Lessons from Commodity Studies. CARD Briefing Paper 03-BP 42

Ben Hammouda. H.. Osakwe. P. (2004). "Trade liberalization under the Doha Development Agenda: options and consequences for Africa" UNECA

Bergsten C.F. (1999). "The Global trading system and the developing countries in 2000". Working Paper 99-6. *The Institute for International Economics*. Washington. D.C.

Bouët. A. L. Fontagné. M. Mimouni. et X. Pichot (2001). Market Access Maps: A Bilateral and Disaggregated Measure of Market Access. *CEPII Working Paper*. No. 01-18

Cline. W. R. (2002). An Index of Industrial Country Trade Policy Toward Developing Countries. Center for Global Development. Washington. Working Paper No. 14

CNUCED (1997). The Uruguay Round and its follow-up: Building a positive agenda for development. Nations Unies. New York et Genève

Collier P. et J.W. Gunning (1999). "Explaining African Economies Performance". *Journal of Economic Literature*. Vol. 37

Dimaranan B.. Hertel T. et Keeney R.. OCDE domestic support and developing countries. WIDER Discussion Paper

Dimaranan. B. V. et McDougall. R. A. (2002). Global Trade Assistance and Production: The GTAP 5 Data Base. Center for Global Trade Analysis. Purdue University. West Lafayette

Economic Commission for Africa (2002). Economic Report on Africa 2002: Tracking Performance and Progress. Addis Ababa: ECA

Economic Commission for Africa. Trade liberalization under the Doha Development Agenda: Options and consequences for Africa. Forthcoming Erich S. The Post-Uruguay Round tariff environment for developing country exports: tariffs peaks and tariffs escalation. in UNCTAD. Positive agenda and future trade negotiations. Geneva 2000.

Fernandez de Córdoba Santiago, Laird Sam, Vanzetti David (2005) Trick or Treat? Development Opportunities and Challenges in the WTO Negotiations on Industrial Tariffs, *The World Economy* 28 (10), 1375–1400.

Finger. J.M. U. Reincke. et M. Ingco (1996). The Uruguay Round: Statistics on Tariffs. Concessions Given and Received. World Bank: Washington

Fontagné. L. Guérin. J.L.. et Jean. S.. (2003)."Market access liberalization: scenarios and assessment". CEPII

François J. et Martin W. (2002). Formula approaches for market access negotiations. *Tinbergen Institute Discussion paper*

Francois. J. et Martin. W. (2003). Formula Approaches for Market Access Negotiations. *The World Economy* 26. 1-28

François. J. Meijl. HV. et Franck Van Tongeren (2003). Economic implications of trade liberalization under the Doha Round. CEPII. No. 20

Francois. J. H. van Meijl et F. van Tongeren (2003a). Trade liberalization and developing countries under the Doha round. CEPR discussion paper DP4032

Francois. J. H. van Meijl et F. van Tongeren (2003b). Economic benefits for the Netherlands in the Doha Round. The Hague: LEI

Francois. J.F. et A. Strutt (1999). "Post Uruguay Round Tariff Vectors For GTAP Version 4." Erasmus University manuscript

Francois. J.F. et D. Spinanger (2001). "Greater China's Accession to the WTO: Implications for International Trade/Production and for Hong Kong." paper prepared for the Hong Kong Trade Development Council

Francois. J.F. B. J. McDonald et H. Nordstrom (1996). Liberalization and Capital Accumulation in the GTAP Model. Purdue University: *GTAP Technical Paper No. 7*. GATT (1994). Agricultural Agreement. Geneva

Francois. J.F. B. McDonald et H. Nordstrom (1996b). "Trade liberalization and the capital stock in the GTAP model." *GTAP consortium technical paper*

Goldin I.. Knudsen O. et Van der Mensbrugghe D. (1993). Trade liberalisation: Global economic implications. OCDE et Banque Mondiale. Paris

Global Economic Prospects (2004): Realizing the Development Promise of the Doha Agenda.

Hertel 1996 Hertel. T. ed.. (1996). Global Trade Analysis. Cambridge University Press: Cambridge MA

Hertel. T. W. (1997). Global Trade Analysis Modelling and Applications. Cambridge University Press. New York

Hinkle. L. E. A. Herrou-Aragon. et K. Kubota. (2003). How Far did Africa's First Generation Reforms Go? An Intermediate Methodology for Comparative Analysis of Trade Policies. World Bank. Africa Region Working Paper Series No. 59a. Volume 1

Hoekman B. et Olarreaga M. (2002). Eliminating excessive tariffs on exports of least developed countries. *Policy Research Working Papers 2604*. World Bank. Washington DC

Ianchovichina. E. A. Mattoo et M. Olarreaga (2000) Unrestricted Market Access for Sub-Saharan Africa: How much is it worth and who pays? *World Bank Working Paper*. Washington DC IFPRI (2003) Tell Me Where It Hurts An' I'll Tell You Who To Call. Washington DC

International Labour Organization. (2000). HIV/AIDS in Africa: The Impact on the World of Work. Geneva: ILO

International Monetary Fund (2002). World Economic Outlook. Washington DC. pp. 81-91

International Organization for Migration. (1999). Return of Quali. ed African National Programme. Fact Sheet. July

Kerkelä. L. J. Niemi et R. Vaittinen (2000). Renegotiating the Lome Convention. Trade Policy Schemes and their Effects for African Regions. Helsinki: School of Economics and Business Administration

Krueger A. (1999). "The developing countries and the next round of multilateral trade negotiations". The World Economy. Vol.22. No. 7

Laird S. et A. Yeats. Quantitative methods for trade barrier analysis. MacMillan. London.

Laird S. Fernandez de Cordoba S. et Vanzetti D. Market access proposals for Non-Agricultural products. Mimeo. UNCTAD

Laird S. (1998). Multilateral approaches to market access negotiations. WTO-TPRD Staff Working Paper. TPRD. Geneva

Laird. S. Fernandez de Cordoba. S. et Vanzetti. D. (2003). "Market access proposals for Non-Agricultural Products" UNCTAD

Low P. et A. Mattoo (2003). Approaches to further liberalization of trade in services. in W. Martin et M. Pangestu. eds. Options for global trade reform. Cambridge Press University. Cambridge

Martin W. et Hertel T.W. (1999). "Developing country interests in liberalising Manufactures Trade". Report prepared for the Second Annual Conference on Global Economic Analysis, Denmark

Martin W. et Winters A. (1995). «The Uruguay Round and the Developing Countries ». World Bank Discussion Paper No. 307. Banque Mondiale. Washington D.C.

Martin. W. (2003). Developing Countries' Changing Participation in World Trade. The World Bank Research Observer. vol. 18. No. 2

McDonald. S. et Walmsley. T. (2003). Preferential Trade Agreements and the Optimal Liberalization of Agricultural Trade. 6th Conference on global Economic Analysis. The Hague June 12-14

Meijl. H. Van et F. van Tongeren. F. (2002). The Agenda 2000 CAP Reform. World Prices and GATT-WTO Export Constraints. *European Review of Agricultural Economics* 29 (4). 445-470

Nguyen T. Perroni C.et Wigle R. (1993). « An evaluation of the Draft Final Act of the Uruguay Round". *Economic Journal*. 103 (421). pp.1540-49

OCDE (2001) Medium-term Impact of Agricultural Trade Liberalization in OCDE Countries on the Food Security of Non- Member Economies. Paris

OCDE (2002). Regional Integration in Africa. Paris: OCDE

OCDE (2003). Agricultural Policies in OECD Countries: Monitoring and Evaluation 2003. Paris Ottaviano. G.I.P. and D. Puga (1998). Agglomeration in the global economy: A survey of the 'New Economic Geography'. *World Economy*. vol. 21. pp. 707-21

Oxfam. (2002). Cultivating Poverty: The Impact of US Cotton Subsidies on Africa. Oxfam Briefing Paper. Oxfam International

Pritchett. L. (1996). « Measuring outward orientation in LDC's : Can it be done ?". *Journal of Development Economics*. Vol.49 (2)

Rodriguez. F. And D. Rodrik. (2001). Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Literature. In: Bernanke. B.. Rogof . K. (Ed.). NBER Macro Annual 2000. Cambridge. Mass: MIT Press.

Rodrik. D. (2001). The Global Governance of Trade as if Development Really Mattered. Background Paper. United Nations Development Programme

Safardi. R. et Laird S. (1996). « The Uruguay Round and Developing Countries ». *Journal of World Development*. Vol.24. No. 7

Smith. M.A.M. (1976). "Trade. Growth. and Consumption in Alternative Models of Capital Accumulation." *Journal of International Economics* 6: 385-388. November

Smith. M.A.M. (1977). "Capital Accumulation in the Open Two-Sector Economy." *The Economic Journal* 87: 273-282

Srinivasan. T.N. et J.N. Bhagwait (1980). "Trade and Welfare in a Steady-State." Chapter 12 in J.S. Chipman and C.P Kindelberger. eds. Flexible Exchange Rates and the Balance of Payments. Amsterdam: North-Holland

Stern R. M. (1976). Evaluating alternative formulas for reducing industrial tariffs. *Journal of World Trade Law*. No. 10 pp. 50-64

Townsend. Terry (2002). "Government measures and the world cotton industry" Washington DC: ICAC (Intergovernmental Cotton Advisory Committee)

UNCTAD (2001). Improving Market Access for Least Developed Countries. see web source http://www.unctad.org/en/docs// poditctncd4.en.pdf

UNDP (2002). Human Development Report 2002. New York. United Nations Development Programme

UNDP (2003). Make International Trade a Service to all. New York. United Nations Development Programme

Van Tongeren. F. and Jikun Huang (eds.) (2004). China's food economy in the early 21st century and the implications for EU countries. LEI: The Hague

Walkenhorst. P. et Dihel. N. (2003). Tariff Bindings. Unused Protection and Agricultural Trade Liberalization. OECD Economic Studies

World Bank (2000). Can Africa Claim the 21st Century? Overview. World Bank. Washington DC.

World Bank (2003). Global Development Finance: Striving for Stability in Development Finance. World Bank. Washington DC

WTO (2003). "International Trade Statistics 2003". Geneva: World Trade Organization

WTO and UNCTAD (1999). The Post-Uruguay Round Tariff Peaks and Tariff Escalation. World Trade Organization