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Ben Hammouda, Hakim; Karingi, Stephen; Oulmane, Nassim; Lang, Rémi and Sadni Jallab, Mustapha
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Abstract

This paper examines the implications for African economies of the possible outcomes from the ongoing agriculture negotiations in the Doha Round. The paper defines scenarios that capture key elements of the modalities negotiations and undertakes simulations using a global dynamic general equilibrium model to examine the impact of multilateral agricultural trade reforms on African economies. The scenarios vary in their level of ambition in the market access pillar through both the level of tariff cuts in the different tiers and the level of sensitive sectors defined both for developed and developing economies. Results show that ambitious coefficients in the market access pillar remain the best outcome for Africa. Even what might seem to be an insignificant definition of sensitive products for developed countries erodes potential benefits from deep tariff cuts for African countries. This suggests that utilizing sensitive products tariff lines by developed countries not only dampens the expected positive outcomes for agriculture negotiations in favour of Africa but could also actually wipe out such gains. The results further confirm findings of other studies showing that tariff cuts for agricultural goods yield higher gains than elimination of subsidies, and this applies mainly to net food importing developing countries. Thus, reduction of subsidies should go hand-in-hand with agricultural tariff reductions in order to ensure win-win outcomes.

JEL Codes: Q17, D6, C68, N57

Key words: Agriculture in International Trade, Welfare Economics, Computable General Equilibrium Models, Africa.

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I. INTRODUCTION

The question of market access is of crucial importance for Africa. African countries have continued to put emphasis on this question since the establishment of the World Trade Organization (WTO), in which African countries are playing an increasingly dynamic role. The question of market access is especially crucial for their development agenda, this is attributable to the restricted nature of African markets and to the need for the continent to open up to export markets in order to support growth dynamics and efforts to diversify production structures.

Since negotiations began under the Doha Round, African countries have sought to lay down an ambitious reform agenda, particularly in the agricultural sector, which remains highly protected. Tariffs applied to agricultural imports by the Organization for Economic Cooperation and Development (OECD) countries are too high on average. There is also wide dispersion in tariff levels, and a significant number of tariff peaks are applied to some of the more highly protected products.

For several reasons, agriculture is very important to developing countries and to Africa in particular. First, it represents the main source of employment, accounting for nearly 70 per cent of the total in the least developed countries (LDCs), 30 per cent in the middle-income countries and just 3 per cent in the developed countries.[1] In addition to employment, agriculture continues to play a key role in most of these countries economic growth profiles. Consequently, the cultivation of subsistence crops helps provide food and ensures food security for the people. At the same time, export crops account for a sizeable proportion of export revenues in many African countries. Finally, agriculture plays a crucial role in poverty reduction strategies because the majority of poor people live in the rural areas.

These reasons generally explain the importance given to the agricultural sector by African countries in the context of international trade negotiations. Improving the current conditions of the international markets in agricultural products and giving more attention to their concerns could lead to a better integration of their economies in the global market place and promote economic growth.

The objective of this article is to assist African countries in formulating concrete proposals in relation to market access for agricultural products. Accordingly, an effort will be made to identify the most appropriate formulas for African economies that would allow for greater liberalization of OECD markets while at the same time providing African countries with the means to sustain their agricultural development and ensure their food security.

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1 Several studies show the importance of the agricultural sector in developing countries and in Africa. See, for example:
- FAO, *Agriculture towards 2015*, Rome 2000.
- OECD, *Agricultural policy reform: Development and prospects*, Paris 2000.

After this introduction, main factors at play in agricultural development in Africa will be described. The third section highlights the specificities of market access in agriculture. The fourth section, reviews the studies that have been undertaken on the subject. The fifth section, describes the model used in this study, followed by a discussion of the various scenarios adopted. The seventh section is a discussion of the results obtained. The main conclusions of the study are presented in the last section.

II. PROFILE OF AGRICULTURAL DEVELOPMENT IN AFRICA

Soon after attaining independence, African countries gave primacy to agriculture in their development strategies. Thus, from the late 1960s and during the 1970s, most of them sought to put in place new agricultural policies and to embark on their green revolution. It should be noted that, for the most part, the colonial policies had favoured export crops at the expense of subsistence crops. The focus of agricultural modernization in Africa was thus on increasing agricultural productivity and ensuring food security.

Agriculture modernization required a high level of public investment, and particularly in institutional structures with the establishment of a considerable number of enterprises specializing in rural development, rural infrastructure, support for agricultural research and the promotion of new agricultural technologies, and the provision of low-cost financing, seeds and fertilizers to rural communities. The modernization of agriculture was considered a necessary and essential prerequisite to Africa's economic take-off. Increased agricultural productivity was to lead to better incomes for peasants and consequently expand the rather restricted markets of these countries. In addition, agricultural development was to provide a market for the chemical industries and for intermediate and capital goods. Higher yields from agriculture would provide the necessary inputs for the production of foodstuffs and for all activities relating to the first-stage transformation of agricultural products. The modernization of agriculture was thus viewed as an absolute necessity in development strategies because of its effects on the rest of the economy. Governments had taken care of most of the financing necessary for such modernization. The improvement in the prices of raw materials exported by these countries in the 1970s enabled them to sustain these policies.

However, the early 1980s witnessed a wind of change. First, from the point of view of ideology, there was a paradigm shift with an upheaval of the Keynesian economics theories that had dominated economic thinking and development policy stances since the end of the Second World War. A new intellectual context was gaining ground, in which the market became the prime mover in the economic sphere. This consensus called into question state interventionism in so far as it created price distortions that were at the root of the imbalances of developed and developing economies. Furthermore, the early 1980s was also characterized by the debt crisis which beset most African countries. This debt crisis led to the adoption of structural adjustment programmes aimed at reducing domestic and external deficits. Restoring equilibrium required the State to disengage from economic activities and to allow the market a more prominent role in the economic sphere. In the agricultural sector in particular, the new policies adopted in the 1980s were characterized by a far-reaching review of such interventionism and a move to try out the capacity of private stakeholders to assume responsibility for and guarantee the revival of agricultural production.

Some years down the line, it had to be acknowledged that these new choices in agricultural development have not yielded the desired effects. Instead, there was a sharp increase in food deficits in many African countries. In 1997, the world trade in agricultural products increased four fold by reference to the late 1970s, reaching a global value of nearly $US460 billion.[2] The position of developing countries in world trade worsened, with their share of global imports increasing from 28 per cent in 1974 to 37 per cent in 1997 accompanied by a slight increase in exports, which rose from 30 to 34 per cent of the total over the same period. These developments led to a rapid deterioration in these countries' balance of trade in food products, with a deficit of nearly $US13 billion in 1997. At the same time, there was a sharp drop in food aid to net importing countries. LDCs were particularly hard hit and food insecurity rose markedly in these countries. Their exports decreased considerably while their food imports accounted for an increasingly significant share of their trade balances, reaching in some cases nearly 20 per cent of the total.[3] Developing countries thus began to witness a severe agricultural crisis and food crisis during the 1980s and 1990s.

While African countries were significantly reducing their support and all forms of subsidies for their rural communities, this was mostly increasing in the developed countries. It is estimated that the OECD countries granted almost $US370 million to their farmers in 1997, which represents more than six times the amount going to development aid.[4] The subsidies continued to increase thereafter, even though official figures show a decrease over the last few years. This increase has benefited all aspects of agricultural production in these countries. It is estimated that agricultural support has increased by 28 per cent in the OECD countries since 1997.[5] Half of these subsidies are from European Union countries, and Japan accounts for nearly 39 per cent. Support to farmers is not limited to these countries. United States farmers received nearly $US28 billion in subsidies in 2000, and the new US Farm Bill of 2002 commits the US Government to granting $US 180 billion in subsidies over a ten-year period.

All these factors reveal the skewed and unbalanced nature of the world markets in agricultural products. Over and above the production differential, which is in their favour, developed countries have consistently increased the support extended to their large-scale farmers. The situation has entailed adverse consequences not only for the agricultural exports of African countries but also for their production and consequently, their food security. These developments explain the importance attached by these countries to agriculture negotiations.

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2 See FAO, *Agriculture, trade and food security: Issues and options in the forthcoming WTO negotiations from the perspectives of developing countries*, Rome 1999.

3 See, for example:
- UNCTAD, *Trade and development report 2002*, Geneva 2002;
- UNCTAD, *The least developed countries report 2001 and 2002*, Geneva 2001 and 2002.

4 See UNDP, *Human development report 2002*, New York 2002.

5 See UNDP, *Mettre le commerce international au service de tous*, New York 2003.

There is now a renewed awareness within the international community as to the role of agriculture in poverty reduction. The majority of people (more than 75 per cent) living on less than $US1 a day live in the rural areas in which agriculture is the main economic activity and the main source of income. Strengthening agricultural competitiveness is now at the top of the agenda for the African countries in their poverty reduction strategy. Market access issues are therefore of the utmost importance in terms of their impact on the competitiveness of both domestic as well as external African agricultural markets.

III. MARKET ACCESS AND AGRICULTURAL DEVELOPMENT IN AFRICA

Agriculture is the catalyst for the economy and contributes to the livelihoods of the majority of the population (between 40 and 90 per cent according to the Food and Agriculture Organization (FAO) in 2004). Furthermore, the majority of the population lives in rural areas where malnutrition is on the rise. In this context, the results of the agriculture negotiations are of crucial importance to these countries because the improvement of this sector is one of the main ways of bringing about poverty reduction. Market access, though not enough in itself, is a necessary condition for agricultural and rural development in Africa. There are other constraints that have an adverse effect on rural development in Africa, such as rural infrastructures and mechanisms of agricultural financing. In contrast to the trade in non-agricultural goods, the variation in global prices is far too susceptible to external factors such as the level of harvests in the main producer countries and the trend of the shift in demand structure. The impact of the climate in the industrialized countries wheat prices, for instance, is well known, as is the effect of growth and changing food consumption patterns in China followed the economic progress in that country.

For most agricultural products, however, market access is a major constraint that restricts rural development in Africa. Both market access conditions "border measures" and domestic support measures such as export subsidies vitiate the capacity of African countries to develop their agricultural sectors. The potential to develop a competitive production capacity in Africa is eroded by these measures, and particularly for "temperate" agricultural commodities such as maize, wheat, meat, sugar, rice and some vegetables and fruit.[6] Most African countries have the potential to produce at least some of these products. Trade in these products is greatly distorted by the agricultural policies of the developed countries, both in terms of border measures (tariffs, quotas, non-tariff measures) and support for exports as well as domestic support. According to OECD estimates, protection of markets at border points (tariffs and quotas) represents, on average less than 50 per cent of the total support granted to farmers in the OECD countries.[7] These measures have the effect of reducing the international competitiveness of African producers and of closing the doors to their access to developed countries' markets, especially because they have a negative effect on international prices. The reduced competitiveness partly explains the fact that Africa has become a net importer of agricultural goods since the 1980s.

6 On the other hand, Africa often enjoys favourable tariffs in terms of market access for "tropical" products, with the notable exception of cotton and, to a lesser extent, tobacco.

7 See "Domestic support: economics and policy instruments", in *Agriculture and the WTO"*, Harry de Gorter, Merlinda D. Ingco and Laura Ignacio, 2004.

This trend is a major source of concern in terms of food security. According to FAO (2004), the three most important agricultural products in Africa are wheat, maize and rice, which are three basic cereals that are essential for food security. Africa is also a huge importer of sugar, oils, poultry and milk products, which are commodities that are essential for food security in the continent and which Africa has considerable potential to produce. They are also commodities that benefit from heavy subsidies and from a high level of protection on the part of developed countries.

While the markets of industrial products have been subject to significant reductions, the markets of agricultural products have continued to benefit from a high level of protection, especially in the developed countries. The average level of customs duties for agricultural products thus dropped from 40 to 4 per cent between 1945 and 1995, while the average level for agricultural products was still in the region of 62 per cent.[8] However, these levels are even higher for so-called sensitive or strategic products in the OECD countries, such as wheat (214 per cent), barley (197 per cent) and maize (154 per cent). The negotiations under the Uruguay Round have sought to reduce this level of protection by converting all non-tariff barriers into tariff barriers and by reducing tariff barriers. However, African countries believe that these reductions are still too low and continue to represent significant barriers to the international market access of their exports. In spite of the commitment to reduce them, some duties on sensitive products have in fact considerably increased over the past few years.

African countries also raise the question of the tariff peaks and the tariff escalation that are applied by most of the OECD countries. This phenomenon particularly affects these countries because it is applied to a high proportion of their exports. It is calculated that at present more than half the tariff peaks are applied to agricultural products, agro-processing products and fishery products.[9] These tariff peaks sometimes exceed 100 per cent. For some products these peaks are even more elevated with nearly 180 per cent for bananas in the case of European Union countries, 550 per cent for groundnuts for Japan and 132 per cent for the United States of America. For other products such as sugar, rice, meat, milk products, vegetables and fish, the tariffs applied by the OECD countries are even higher, in the range of 600-900 per cent.

In addition to tariff peaks, African countries have to grapple with escalation. This phenomenon also creates difficulties for countries that are trying to avoid an international integration that is based on raw materials and are intent on diversifying their production structures through the transformation of their agricultural activities. Tariff escalation means that, the share of processed goods in the exports of the developing countries is still low, at below 5 per cent of the exports of food products from the LDCs and just 17 per cent of the total exports of the developing countries. Tariff escalation is applied by the

8 See UNPD (2003), op. cit.

9 See WTO and UNCTAD, *The post-Uruguay Round tariff environment for developing countries: tariff peaks and tariff escalation*, Geneva 1999.

OECD countries to products such as coffee, cocoa, oil seeds, fruit and vegetables.[10] In spite of their commitments to limiting tariff escalation, the levels of protection for first-stage processing products is still too high and currently stands at approximately 44 per cent for flour, 25 per cent for orange juice in the case of European Union countries, 30 per cent for refined sugar in the case of Japan and 42 per cent for milk in the case of United States of America.

Tariff protection levels in developed countries remain high, despite their commitment to reducing them under the Uruguay Round, and contrast with the levels of protection in African countries. Since the mid-1980s, African countries have undertaken important reforms within the framework of the structural adjustment programmes (SAPs) in order to eliminate non-tariff protection and reduce tariffs. Furthermore, export subsidies and domestic support measures depreciate the prices of agricultural commodities. These measures are mainly enforced by developed countries and mostly have a negative impact on the competitiveness of African countries in the agricultural sector – for domestic markets as well as exports. It is in this context that African countries are demanding greater market access for their agricultural and first-stage processing products within the framework of the international negotiations. Improving market access involves a significant reduction in customs tariffs and a drop in exports subsidies and domestic support measures that have a negative impact on trade.

10 See Shirotori Miho, *Notes on the implementation of the agreement on agriculture*, UNCTAD, Geneva 2000.

IV. A REVIEW OF THE LITERATURE

This section analyses the impact of the various scenarios of agricultural trade liberalization. The models that are the most favourable as well as the most probable for Africa are highlighted. First, we will analyse the impact of the different scenarios on sub-Saharan Africa; second, we will examine the results of the simulations on North Africa. [11]

4.1 The impact on sub-Saharan Africa

Our review of the literature indicates that for sub-Saharan Africa, the level of exports increases in line with the importance of the level of liberalization. The greater the level of liberalization, the more significant the increase in exports. This also applies to the economic welfare indicators, which increase in line with the level of liberalization. Moreover, these studies testify to the fact that exports increase with special and differential (S&D) treatment.

Similarly, studies show that the level of imports undergoes a similar development, though this is less than that of exports with S&D treatment. On the other hand, projections that do not take into account this S&D treatment (ECA 2004) show that for sub-Saharan Africa imports tend to increase more rapidly than exports when liberalization is more ambitious. Such a scenario would thus imply a worsening of the agricultural trade deficit of sub-Saharan Africa and thus greater dependence as well as deterioration in the external debt situation in the absence of S&D treatment.

In fact, it seems that the more ambitious scenarios offer better prospects for African countries. These results surely explain the position of these countries during multilateral negotiations and the fact that they opt for substantial reforms in the agricultural sector.

4.2 The impact on North Africa

Our review of the literature emphasizes that North Africa will benefit from agricultural trade liberalization even in the case of modest reform scenarios. Liberalization scenarios of agricultural market access seem to have a relatively more significant impact on North Africa than on sub-Saharan Africa. Unlike sub-Saharan Africa, North Africa seems to gain in terms of national revenue and welfare, even in the case of a limited opening-up of market access, as demonstrated by the scenarios of "modest" and "little" reforms put forward by ECA (2004). In the case of reciprocal liberalization (without S&D treatment), North

11 A more comprehensive overview of the literature may be found in: "Exclure l'Afrique des marchés? Evaluation de l'accès aux marchés pour les pays africains", United Nations Economic Commission for Africa, Addis Ababa, Ethiopia, forthcoming, 2004.

Africa would be the second largest beneficiary in terms of welfare (after Oceania). This is without doubt, due to the impact of the drop in prices on the consumer's surplus.

The simulations also tend to show that North Africa would see its agricultural trade rise sharply in the case of significant liberalization. In terms of welfare, any reform that so much as eliminates exports subsidies will affect North Africa more adversely than sub-Saharan Africa. The world regions that would be most affected by this type of reform are precisely North Africa and the Middle East. This can be clearly explained by the marked dependence of North Africa on imports of food products.

4.3 What lessons can be learnt in terms of trade policy?

The analysis of the different scenarios tends to show that Governments of the African countries could be forced to choose between giving greater importance to tariff revenues on the one hand – which would amount to protecting local producers in the face of a rise in imports – and on the other, giving greater importance to the consumer's surplus. In fact, projections show that significant liberalization is favourable to the consumer's surplus but unfavourable in terms of tariff revenues. Significant and rapid liberalization could also prejudice some local producers that are less competitive than the international competition. Limited liberalization and S&D treatment, as already noted, seem to lead to a more limited decrease in tariff revenues and less rapid increase in imports. On the other hand, an increased opening-up seems to have a more positive result in terms of welfare and also seems to have a (less evident) positive impact on the level of exports.

What emerges from this review of the literature is that an improvement in sub-Saharan Africa's trade position in agricultural products can only flow from ambitious scenarios that, as such, are capable of realizing the pro-development commitments made by WTO members at the Doha Conference. Moreover, these studies show that if ambitious scenarios bring significant benefits to North Africa, then the subregion can also benefit in the case of more modest scenarios.

Table 1: Results of the simulations on agriculture – North Africa

1Formulas	Scenario/ Studies	2Welfare	3GDP	4Exports	5Imports	Tariff revenues
Linear	"little reform", Ben Hammouda and Osakwe, ECA 2004	+ $US197 million (*)	0.0% (#)	-	-	-
	"modest reform", Ben Hammouda and Osakwe, ECA 2004	+ $US391 million (*)	0.3% (#)	-	-	-
Linear with elimination of tariff peaks and S&D treatment	"Harbinson", Peters and Vanzetti, UNCTAD 2004	$US 1040 million for the developing countries	-	17% for developing countries	-	-1% for developing countries
Linear with S&D treatment	"Conservative scenario", Peters and Vanzetti, UNCTAD 2004	Target: $US 742 million for the developing countries	-	10% for developing countries	-	Non available for North Africa but 4% for developing countries
Linear + tariff harmonization + S&D treatment	"Cancun", or blended formula, Peters and Vanzetti, UNCTAD 2004	$US 163 million for the developing countries	-	13% for developing countries	-	15% for developing countries
Total liberalization	"full liberalization", Ben Hammouda and Osakwe, ECA 2004	+ $US 578 million (*)	0.9% (#)	-	-	-
Non-linear (USA)	"Ambitious", Peters and Vancetti, UNCTAD 2004	$US 5752 for the developing countries	-	32% for developing countries	-	- 46% for developing countries

(*) Impact on the change in market access of products excluding the impact caused by the change resulting from domestic measures.

Table 2: Results of the simulations on agriculture – sub-Saharan Africa

6Formulas	Scenario/ Studies	7Welfare	8GDP	9Exports	10Imports	Tariff revenues
Linear	"*little reform*", Ben Hammouda and Osakwe, ECA 2004	- $US 367 million (*)	- 0.3% (#)	-	-	-
	"*modest reform*", Ben Hammouda and Osakwe, ECA 2004	- $US 314 million (*)	- 0.2% (#)	-	-	-
Linear with elimination of tariff peaks and S&D treatment	"*Harbinson*", Peters and Vanzetti, UNCTAD 2004	$US 1040 million for developing countries - $US 199 million for LDCs	-	+ 17% for developing countries and 30% for LDCs	-	- 1% for developing countries, + 2% for LDCs
Linear with S&D treatment	"*Conservative scenario*", Peters and Vanzetti, UNCTAD 2004	$US 742 million for developing countries; - $US 83 million for LDCs	-	Non available for North Africa but 10% for developing countries, 21% for LDCs	-	Non available for North Africa but 4% for developing countries, +1% for LDCs
Linear + tariff harmonization	"*Cancun*", or blended formula, Peters and Vanzetti, UNCTAD 2004	$US 163 million for developing countries; $US 141 million for LDCs	-	+ 13% for developing countries and + 22% for LDCs	-	- 15% for developing countries and 1% for LDCs
Total liberalization	"*full liberalization*", Ben Hammouda and Osakwe, ECA 2004	+ $US 1269 million (*)	0.3% (#)	-	-	-
Non-linear (USA)	"*Ambitious*", Peters and Vanzetti, UNCTAD 2004	+ $US 5752 million for developing countries; + $US 1045 million for LDCs	-	32% for developing countries, 51% for LDCs	-	- 46% for developing countries, - 30% for LDCs

Source: Table drawn up by the authors.

V. THE MODEL

The model used in this study is a simplified version of the Global Trade Analysis Project (GTAP) model (Hertel (1997)).[12] This multi-regional and static general equilibrium model functions by assuming that there is perfect competition and constant returns to scale. It reflects bilateral trade patterns, international transport profit margins and the protection rates for imports by country and by sector. The GTAP model also enables the calculation of trends in production, consumption, trade and economic welfare caused by external shocks, especially those linked to trade, such as the shifts in transaction costs. The version used in this study is based on Tom Rutherford's GTAP in the General Algebraic Modelling System (GAMS). This version is almost identical to the one developed by Hertel except that it introduces a few modifications, which include replacing the Committee for Economic Development (CED) hypothesis for the function of the final consumption with a simple Cobb-Douglass function. Nonetheless, we have opted for a CES function.[13]

5.1 Production

The producers of a given sector in a given country make a product intended for the domestic and the foreign market. This production assumes that there are no returns to scale. Production is carried out based on five production factors (skilled and unskilled workers, capital, land and natural resources), as well as intermediate consumption. The level of the intermediate consumption involved is assumed to be proportional to the level of production. In line with Armington's (1969) formulation, the intermediate consumption is an aggregate of domestic and imported varieties. The producers thus minimize costs linked to the production factors using Leontief's production function between intermediate consumption and value-added inputs. This is assumed to be a constant elasticity of substitution (CES) between the different production factors. The different markets are assumed to be in pure and perfect competition.

5.2 The final demand

The standard GTAP version distinguishes between government demand and private demand. We have ignored this hypothesis and we assume that the final demand comes from one single regional representative agent. It collects all the revenue generated in the economy. This revenue is distributed between the final demand and savings. In line with the GTAP model, we assume that a fixed amount of the revenue is allocated to savings. The regional agent maximizes its welfare function by distinguishing

12 The full description of the model can be found in Hertel (1997).

13 In this study we have used the GTAP 5.4 version. Version 6 of the database is not available at the time of writing this study but would be better suited to support the impact of our scenarios on the African economies.

between domestic and foreign goods in line with Armington's (1969) hypothesis for the same sector and distributes the consumption between the sectors according to a CES function.

5.3 Bilateral trade

In each region there are two types of demand for imported goods: the final good and the intermediate good.[14] The import aggregate is thus the sum of the two components. This aggregate is a CES function of the imports from all partner countries. Bilateral trade is thus subject to two types of tax (export tax and customs duty), and a transport cost. The transport cost is assumed to be proportional to the volume of trade. The transport sector is assumed to be a service sector that is set up in perfect competition by the producers of all the regions, with an Armington specification and a constant elasticity of substitution. The level of imports of a given product from a given country in a given region is thus determined by minimizing import costs given the free on board (FOB) prices.

5.4 The aggregate adopted

We present the geographical and sectoral aggregate in the annexes.

14 In GTAP there are three, including the public good.

VI. THE SCENARIOS ADOPTED

This section aims to develop various liberalization scenarios and to analyse their potential impact on Africa, using the model presented in the previous section. Using those scenarios, the potential effects of different results of the agriculture negotiations on African economies will be tested. The simulations will, of course, take into account the negotiations in terms of border measures (tariffs and quotas) and also the reforms negotiated under the WTO on the other two pillars, which are domestic measures and export subsidies. Because of their impact on international prices, domestic measures and export subsidies can affect the market access conditions for African countries.

6.1 The African position and the Kigali Consensus

Member countries of the African Union (AU) have voiced their opinion on multilateral trade negotiations by means of the "Kigali Consensus on the post-Cancun Doha work programme", which was adopted in Kigali, Rwanda on 28 May 2004. Rather than setting target reduction figures or putting forward tariff-reduction formulas, the AU countries emphasize their "anxiety and concern" with the use of Derbez's mixed formula. The Kigali declaration stresses that "any tariff-reduction formula should fully take into account the needs and concerns of the African countries relating to development". Nevertheless, the Kigali Consensus provides some markers for the negotiations and these include the following objectives:

- Greater consideration of the importance of preferential access to the markets for developing countries;
- Greater market access for the agricultural products of the African countries, including processed products (reduction of tariff escalation and peaks);
- Special products to be unilaterally selected by the African countries as well as the establishment for the developing countries of a special safeguard mechanism (SSM) whose use and duration would need to be negotiated;
- The domestic support provided by the developed countries to their producers should be substantially reduced;
- The elimination of support measures for export competition;
- LDCs should be exempt from all reductions;
- There is a consensus that the developed countries' subsidies for cotton production and exports should be eliminated;
- There should be a detailed examination of the non-tariff obstacles that are severely impeding the market access of the agricultural products of African countries, including the obstacles associated with sanitary and phytosanitary measures (SPS) and technical barriers to trade (TBT).

6.2 The framework established by the July Agreement

Following the launch of the Doha Round, the WTO member countries have recently reached an agreement on a text that establishes the broad outline of a framework in which negotiations should take place as of September 2004. The "July package" is not very clear on agricultural issues, particularly in comparison with the detailed text on negotiations for non-agricultural products. Annex A of the text of the "July package" framework agreement shows some progress in the negotiations on the three pillars, which are domestic support, export competition and market access.[15] The most notable aspects of this agreement for African countries include the eventual elimination of all export subsidies, greater market access under provisions that are still to be negotiated, a decrease in domestic support measures, the establishment of particular safeguards for developing countries and an exemption on reductions for LDCs.[16]

First pillar: domestic support

The text calls for substantial reductions in trade-distorting domestic support. A harmonizing approach that uses a tiered formula will be negotiated. The maximum level of support in the blue category will be capped. Reductions will take place using bound rates. The aggregate level of domestic support will be reduced by 20 per cent following the first year of implementation. To a certain extent all products will be affected by this reduction in domestic support. Developing countries will benefit from S&D treatment by means of less ambitious support reducing targets phased over a longer period. The Doha Declaration proposes "substantial reductions in trade-distorting domestic support". Developing countries will benefit from the S&D treatment by means of less ambitious targets for reducing support measures and a longer implementation period.

In these scenarios, the authors propose to reduce domestic support by 50 per cent.

Second pillar: export subsidies

The Doha Declaration advocates "reduction of, with a view to phasing out, all forms of export subsidies". As a result of the negotiations, the members agree to establish detailed conditions for phasing out all forms of export subsidies and disciplines relating to all export measures that have a similar effect by a feasible deadline (export credits, insurance guarantees). The proposal here is to phase out export subsidies.

15 While the text recognizes the importance of cotton to the economic development of certain African countries, it refers these trade issues to the agriculture negotiations (Annex A). This is contrary to the demand of the African countries, which had called for the establishment of special conditions to deal with this sector.

16 For a preliminary evaluation and overview of the agreement, see: Agritrade news update: "the July 31st 2004 WTO Agreements on Agriculture: a critical review"(www.agricta.org); ICTSD, "Agriculture: 'remarkable turn-around' from Cancun". (www.ictsd.org.weekly/04-08-03/story2.htm).

Third pillar: market access

The July Agreement does not establish any kind of formula. It only makes the following provision: "To ensure that a single approach for developed and developing country Members meets all the objectives of the Doha mandate, tariff reductions will be made through a tiered formula that takes into account their different tariff structures". The LDCs would be exempt from all tariff reduction commitments. The tariff reductions would be made using bound rates, with deeper cuts in higher tariffs. The number of groups, the thresholds for the definition of the groups, as well as the type of reduction methodology (use of a Swiss or Uruguay type formula), remain under negotiation. The text of the Agreement specifies that there should be "deeper cuts in higher tariffs, while the type of formula, the number of bands and their thresholds remain under negotiation".

The Agreement envisages the existence of a category of "sensitive products" to which lesser reductions could be applied. While the exact conditions of S&D treatment remain to be established, the text does nonetheless allude to proportionality, which would allow developing countries to implement lesser tariff reduction over longer periods of time.[17] For developing countries, the case is made for a number of "special products", meeting the criteria of food security, secure livelihoods and rural development. More flexible treatment could be given to such products under conditions that remain to be established. The text alludes to an eventual limit on tariffs, though this principle remains to be negotiated. For many African countries, the concept of "special product" is a means of self-defence against inexpensive imports and against import subsidies in particular. These "special products" would act as a hedge as those countries open- up considering the adverse impact that a more ambitious liberalization process could have on the vulnerability of their economies and their high dependence on agriculture.

All the scenarios to be tested are based on the Harbinson formula, which belongs to the category of *tiered formulas* and has elements for each pillar. It puts forward linear reductions per tariff band that have a quite similar result to the Swiss formulas. This formula also harmonizes tariff structures but is more flexible and readable than an "ordinary" Swiss formula because a simple adjustment of the bands can greatly change the results of the formula.

6.3 The various scenarios tested

Four scenarios have been tested in this study:

1. A scenario based on a first tiered formula (S1)

This scenario includes a linear formula for quota-free tariffs, reductions in export subsidies and domestic subsidies and S&D treatment for the developing countries. The developed countries should apply a

17 As already indicated, the LDCs will be exempt from all reduction commitments.

linear formula that has reduction rates ranging from 40 to 60 per cent; they should reduce their export subsidies by 100 per cent and their domestic subsidies by 50 per cent. Developing countries will apply a linear formula with less significant tariff reduction, which will range from 25 to 40 per cent.

Table 3: Reduction coefficients associated with limits

Initial base rate for developed countries	Reduction rate for developed countries	Initial base rate for developing countries	Reduction rate for developing countries
>90%	a=60%	>120	a=40%
[15%-90%]	a=50%	[60%-120%]	a=35%
<15%	a=40%	[20%-60%]	a=30%
		<20%	a=25%

2. A scenario with the application of a tiered formula that also includes sensitive products (S2)

This scenario follows the guidelines of the scenario above and also includes sensitive products. The maximum number of lines dealing with these products is set at 5 per cent. The choice of products and the lines to be excluded is arbitrary and the method adopted is as follows: the most highly taxed lines will probably not be affected by the tariff reductions. For this reason, no tariff reduction has been applied to the 5 per cent of the lines for which the tariffs are the highest. The bands are adjusted for mathematical reasons and those initially presented in the Harbinson formula make the tariff reduction formula non-continuous.

Table 4: Reduction coefficients associated with the Harbinson formula

Initial base rate for developed countries	Reduction rate for developed countries	Initial base rate for developing countries	Reduction rate for developing countries
>90%	65%	>120	45%
[15%-90%]	55%	[60%-120%]	40%
<15%	45%	[20%-60%]	35%
		<20%	30%

3. A cocktail formula: The application of a linear formula for all the countries with an adjustment coefficient for the developed countries (S3)

This scenario tests a tiered formula that takes on board more fully the interests of the developing countries. A linear formula would be applied to the developed countries and developing countries. The only difference is that an adjustment coefficient ofφ would be applied to the developed countries. The reduction coefficients proposed in this formula would be less restrictive for the developing countries

and would lead to a significant reduction of the tariffs of both the developed and developing countries, though to less than proportional extents. The developed countries should also eliminate all forms of export subsidies and reduce their domestic support by 50 per cent. The developing countries, for their part, should reduce their export subsidies by 70 per cent and their domestic support by 20 per cent.

The tariff reduction formula proposed would be of the following type:

$$t_1 = (1-a) \times t_0 \times \varphi$$

whereby t_1 = the new applied tariff rate; t_0 = the initial tariff; a= the tariff reduction coefficient; and φ would be equal to 1 for the developing countries and φ would be equal to $\frac{a}{(1-a)(a+t_0)}$ for the developed countries.

4. A cocktail formula that takes into account sensitive and special products (S4)

This scenario takes scenario 3 as the starting point and includes sensitive and special products. The developing countries should also identify these special products (necessary to their development) that would be exempt from tariff reductions. The number of lines exempt under the special products category would be set at 5 per cent. The developed countries should also eliminate all forms of export subsidies and reduce their domestic support by 50 per cent. The developing countries, for their part, should reduce their export subsidies by 70 per cent and their domestic support by 20 per cent.

Figure 1: The coktail formula

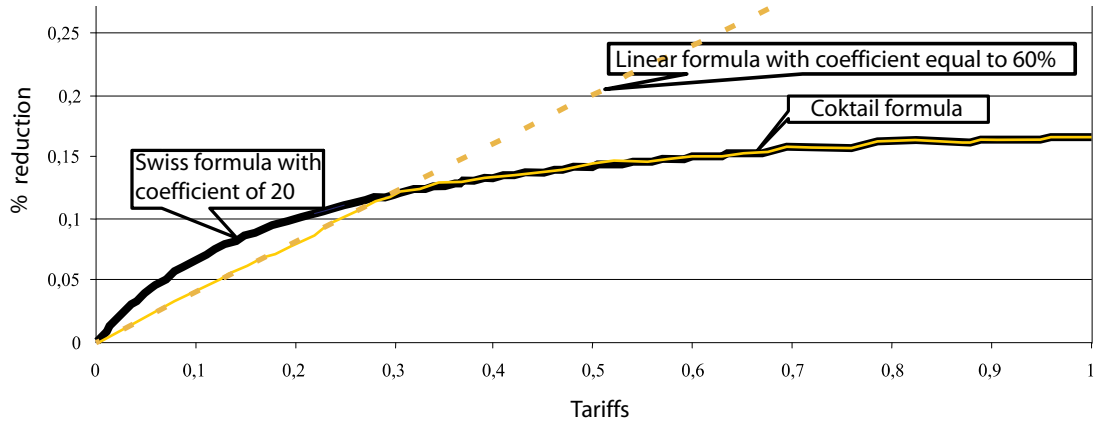


Table 5: Designation of the agriculture scenarios

Designation		Agriculture
11	S1	Tiered Harbinson-type formula
12	S2	Tiered formula including sensitive products
13	S3	Cocktail formula
14	S4	Cocktail formula including sensitive and special products

VII. THE IMPACT OF THE SCENARIOS ON THE TARIFF STRUCTURES

On a global scale, the average rate of protection in agriculture may seem relatively low. However, a high level of heterogeneity becomes apparent when such protection is broken down by geographic area or by product. The protection also varies according to whether subsidies are taken into account or not.

Table 6: Global protection in agriculture

Type of protection	15United States	16Canada	17European Union	Japan
Tariffs	8.8	30.4	32.6	76.4
Subsidies	10.2	16.8	10.4	3.2
18 Total	19.9	52.3	46.4	82.1

Source: Cline 2004

7.1 The current tariff structure

7.1.1 Average initial structure by product and tariff peaks in sub-Saharan Africa

By examining the level of protection facing agricultural exports from sub-Saharan Africa by product, it emerges that certain products are highly protected. Exports of cereals, meat, milk, rice, beverages, tobacco and sugar are subject to rates in excess of 30 per cent and sometimes more than 200 per cent.

Table 7: Tariffs applied to sub-Saharan exports (as %)

	Sectors	EU	USA	Developing	Developed	Row
1	Rice	81.795	5.299	15.225	0.727	199.564
2	Cereals	38.716	0.693	6.628	7.102	18.845
3.	Other-cereals	3.901	21.517	20.98	2.528	23.719
4.	Vegetables	14.684	4.688	22.958	1.861	36.983
5.	Sugar	77.097	52.879	21.371	4.746	45.139
6.	Oilseeds	0.466	17.692	17.381	0.561	88.322
7.	Milk	62.934	30.591	29.501	90.808	118.756
8.	Fishing	12.261	0.654	46.948	0.035	4.475
9.	Vegetable oil	11.408	4.269	8.772	6.361	57.651
10.	Meat	76.869	4.556	23.677	24.156	167.687
11.	Mnfcs	1.499	1.005	5.571	2.57	5.006
12.	Svces	0	0	0.005	0.022	0.188
13.	Food	21.161	10.161	8.329	13.244	23.712

Source: GTAP 5.4

Breaking down such protection by destination reveals that the European Union and the rest of the world, (which includes Japan) apply the highest tariffs to sub-Saharan Africa. These countries protect their rice, sugar, meat (168 per cent for the rest of the world) and milk (63 per cent for the EU and 119 per cent for the rest of the world). Milk is highly protected by all the developed countries, especially by the developed countries of the Cairns group.

7.1.2 Average initial structure by product and tariff peaks for North Africa

The agricultural exports of North Africa are subject to a structure and levels of protection similar to those of sub-Saharan Africa. The exports of cereals, meat, milk, rice, beverages, tobacco and sugar are subject to very high rates that can reach 237 per cent.

Table 8: Tariffs applied to North African exports (in %)

Sr. No.	Sectors	EU	USA	Cairns developing	Cairns developed	ROW
1.	Rice	67.021	5.013	14.95	0.485	35.375
2.	Cereals	52.359	1.907	6.854	26.947	112.188
3.	Other cereals	3.223	21.517	17.955	2.5	32.185
4.	Vegetables	14.857	4.688	19.002	1.87	52.664
5.	Sugar	76.204	53.446	15.988	7.476	60.736
6.	Oilseeds	0.036	17.692	10.609	0.491	49.297
7.	Milk	33.15	14.957	56.324	45.233	99.505
8.	Fishing	11.524	0	1.2	0	6.708
9.	Vegetable oil	11.355	4.269	12.347	6.679	33.703
10.	Meat	62.707	4.958	21.25	14.736	236.621
11.	Mnfcs.	3.379	4.656	5.362	2.06	6.107

Source: GTAP 5.4

As in the case of sub-Saharan Africa, the EU and the rest of the world (including Japan) apply the highest tariff peaks to North Africa. In comparison with sub-Saharan Africa, these countries protect their rice and milk less in relation to North Africa and their cereals more (52 and 112 per cent respectively). Sugar and meat (236 per cent for the rest of the world) are the most highly protected sectors. This study now focuses on the impact of the liberalization scenarios on the tariff structure

7.2 Post reform tariff structure

7.2.1 The impact of the scenarios on the tariff structure of the partners of sub-Saharan Africa

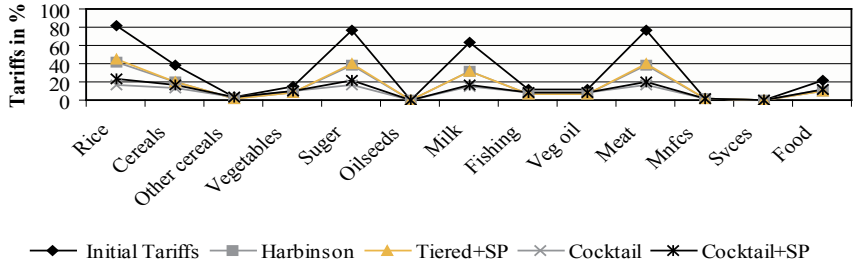
The figures below show variously, each region protection growth rates relation to sub-Saharan Africa. Two general conclusions can be drawn. The global protection rate drops considerably in the case of the cocktail formulas (S3 and S4). What stands out about these scenarios is that they include S&D

treatment to the benefit of the African countries. In the case of the scenarios with sensitive products (S2 and S4), the drop in the protection rate is restricted.

(a) The impact of the scenarios on EU protection

Clearly, these scenarios including the application of a Swiss "cocktail" formula (S3) reduce protection the most, especially in such highly protected sectors as rice, cereals, sugar, milk and meat. The choice of an ambitious formula tends to accentuate the difference between the initial tariff rate and the final tariff rate as the initial tariff rate increases, and this means that the most significant reductions occur with the high tariff rates. These scenarios thus have a stronger effect on high tariffs than on low. As Figure 2 shows, these scenarios are very effective for addressing the tariff peaks faced by a number of African countries.

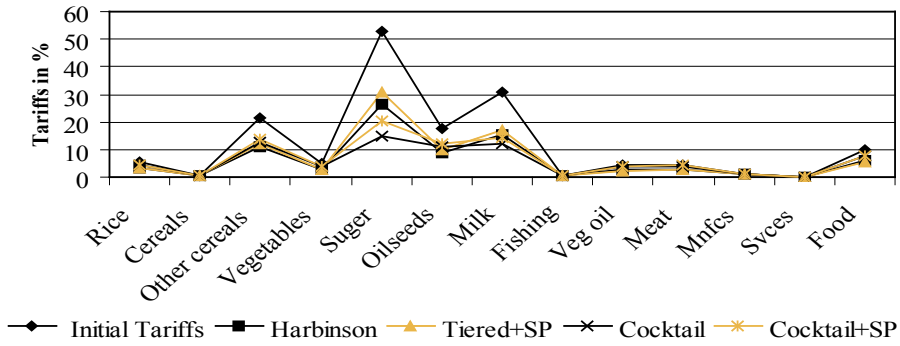
Figure 2: Evolution of the tariff structure applied by the EU in relation to sub-Saharan Africa



The third scenario provides yet the best access for all products. Consideration of the sensitive products (S2 and S4) reduces the drop in protection. However, this effect comes into play at far more disaggregated level, more particularly where the tariff lines peak.

(b) The impact of the scenarios on United States protection

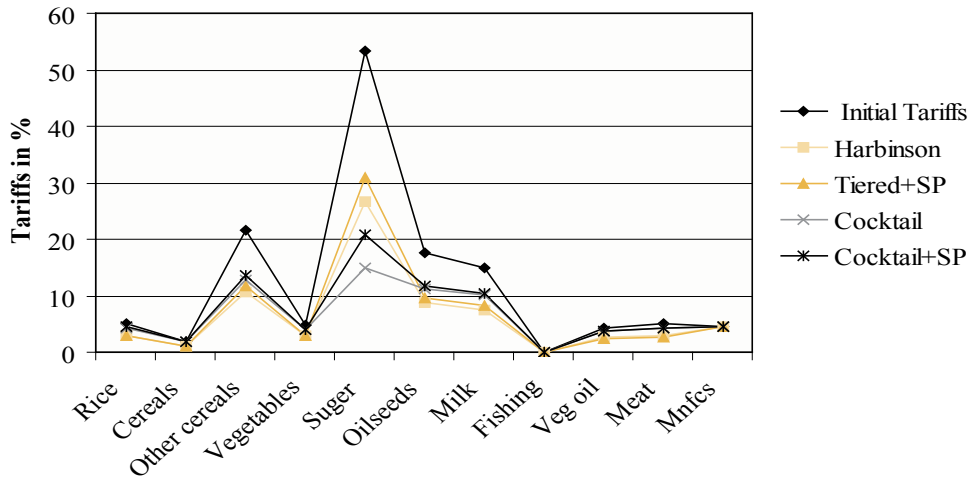
Figure 3: Evolution of the tariff structure applied by USA to sub-Saharan Africa



In this instance also, the scenario with an ambitious formula (S3) provides the best market access for sub-Saharan exports. However, this difference is only significant in the case of sugar and, to a lesser extent, milk. This is partly due to the very high level of the initial tariffs. In the case of the other sectors, the different scenarios improve market access in a similar way.

(c) The impact of the scenarios on the protection of the rest of the world and the Cairns group

Figure 4: Evolution of the tariff structure applied by the developed countries of the Cairns group to North Africa



The formula applying a linear function for all countries and allowing for an adjustment coefficient for the developed countries, most reduces protection by the partners of sub-Saharan Africa, whereas the scenarios including sensitive products have a lesser effect. However, this effect is highly significant for the developed countries of the Cairns group in the case of milk. Overall, the differences between the scenarios are moderate in the case of the other sectors and the other countries.

Figure 5: Evolution of the tariff structure applied by the developing countries of the Cairns group to sub-Saharan Africa

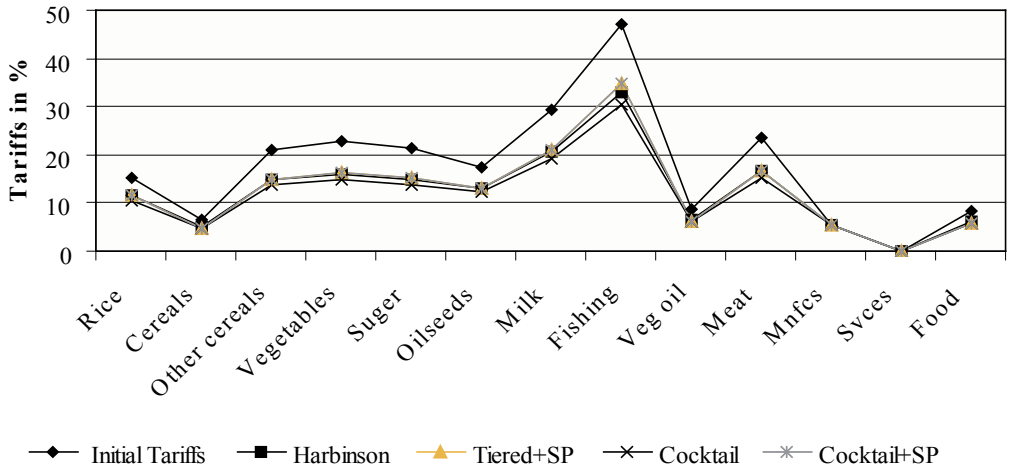
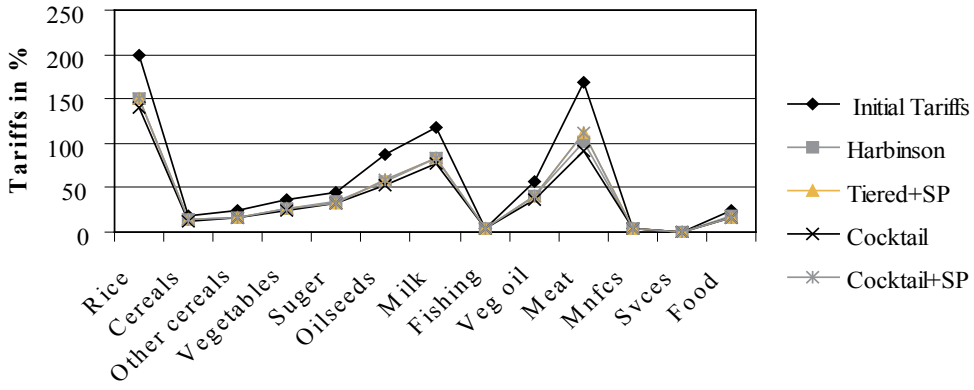


Figure 6: Evolution of the tariff structure applied by the rest of the world to sub-Saharan Africa

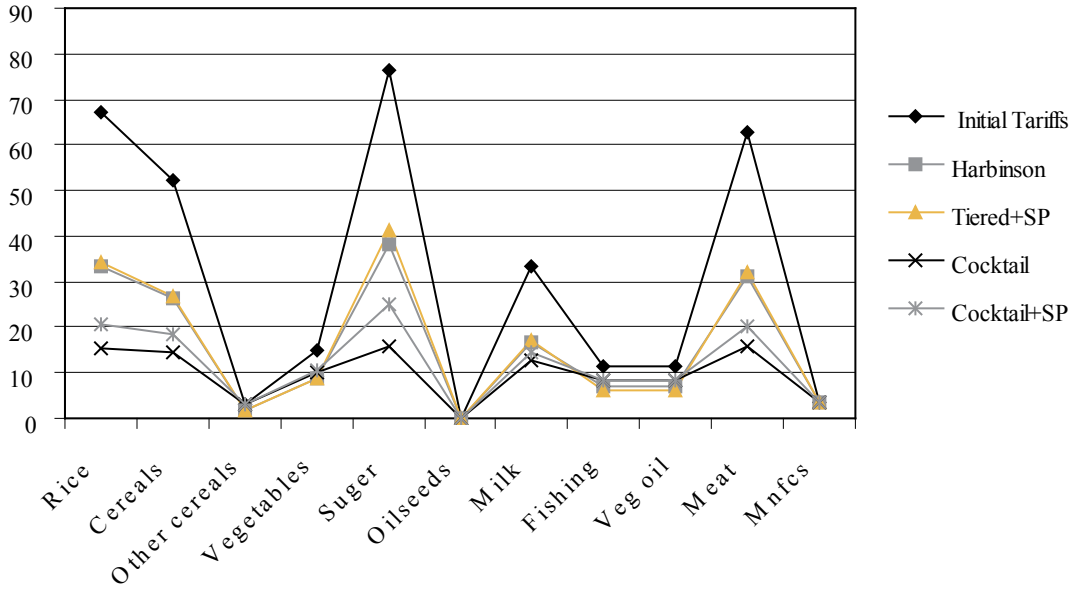


7.2.2 The impact of the scenarios on the tariff structure of North Africa's partners

(a) The impact of the scenarios on the EU protection

As in the case of sub-Saharan Africa, the ambitious scenario (S3) reduces protection the most, especially in the most protected sectors of rice, cereals, sugar and meat.

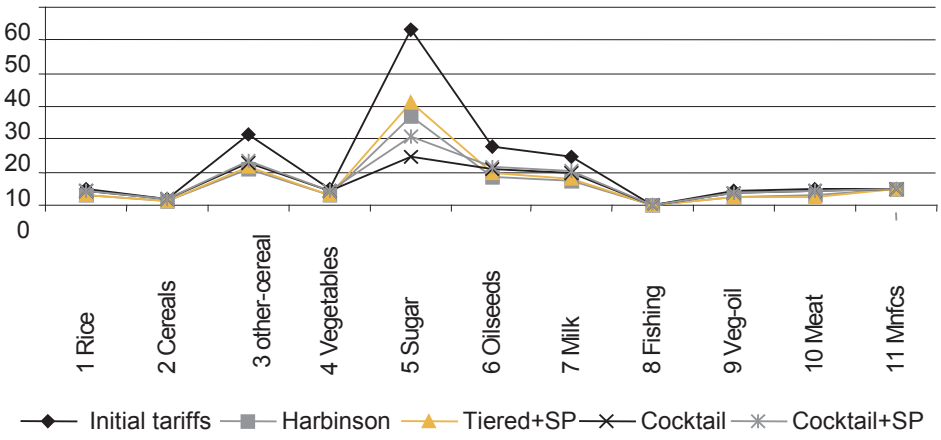
Figure 7: Evolution of the tariff structure applied by the EU to North Africa



This scenario also provides the best market access. The factoring of the sensitive products (S2 and S4) into the formulas can greatly attenuates the reduction effected by the formulas.

(b) The impact of the scenarios on United States protection

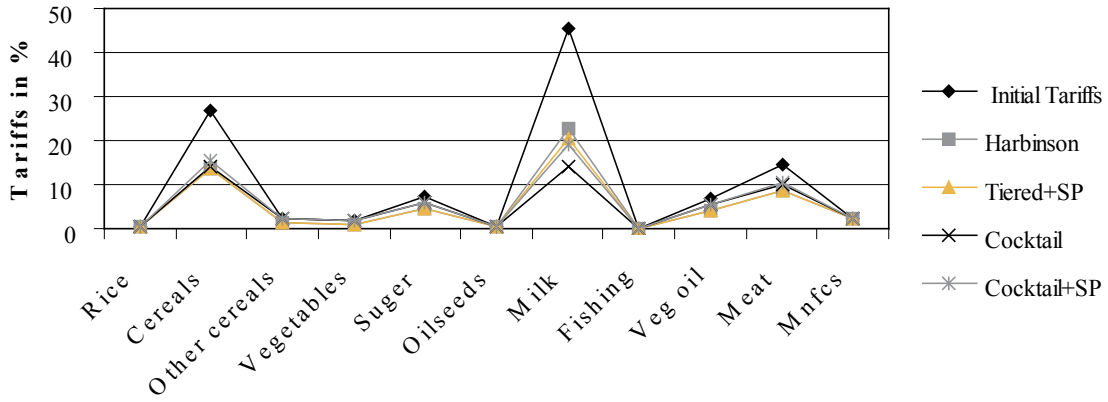
Figure 8: Evolution of the tariff structure applied by the United States to North Africa



The scenario that includes the application of an ambitious formula provides the best market access in the case of the tariffs applied by the United States to North African exports, especially in the sectors where the initial level of protection is highest. This type of formula makes for significant reductions in the sectors in which the tariff peaks are most prominent.

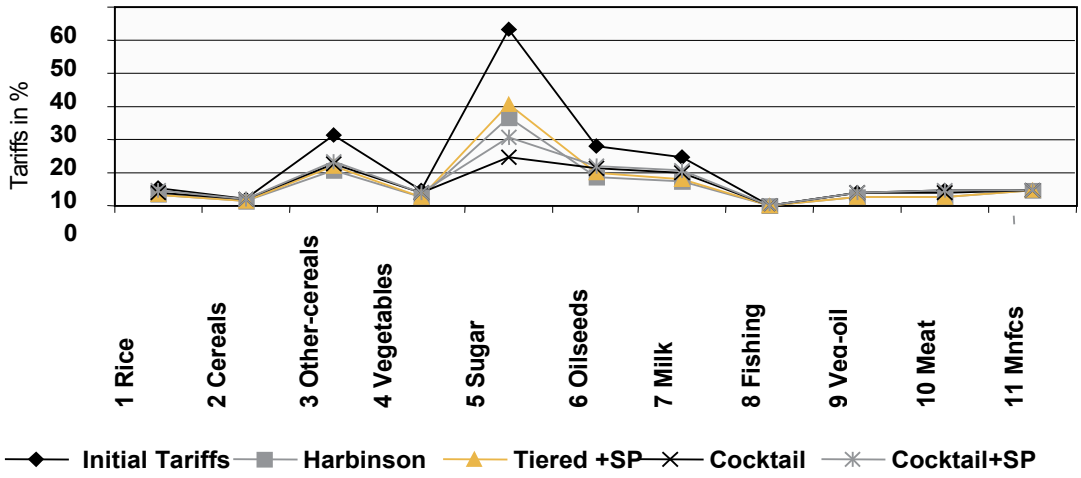
(c) The impact of the scenarios on the protection of the rest of the world and the Cairns group

Figure 9: Evolution of the tariff structure applied by the developed countries of the Cairns group in North Africa



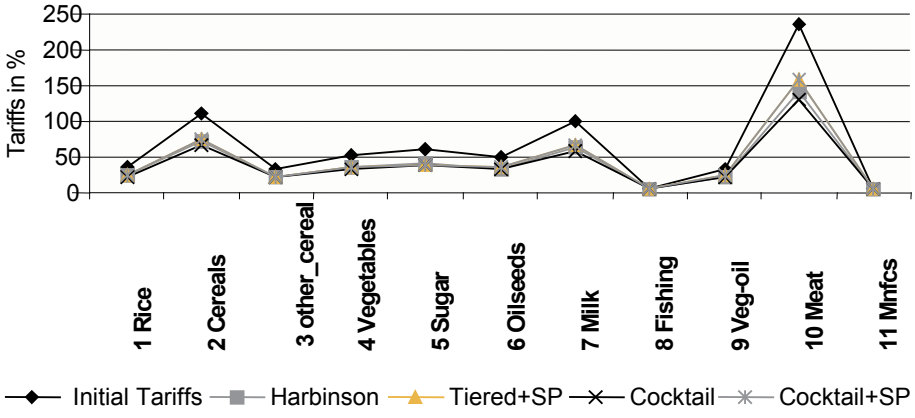
The analysis of the effects of the various scenarios on the products shows that the tiered formula, which more fully takes on board the interests of the developing countries (S3), offers the greatest reduction of the tariff peaks applied by the developed countries of the Cairns group. On the other hand, the Harbinson and tiered formulas offer greater reductions when the tariffs are relatively low. This is due to the fact that the "cocktail" formula focuses more on the high tariffs, as can be seen both in the case of the developed countries (Figure 9) and the developing countries (Figure 10) of the Cairns group.

Figure 10: Evolution of the tariff structure applied by the developing countries of the Cairns group to North Africa



The diagram below illustrates this phenomenon even more clearly. The tariffs applied by the rest of the world to non-African products are relatively higher than those applied by the other regions. As in the case of the other regions, the linear formula into which is factored an adjustment coefficient for the developed countries reduces the tariff structure more significantly.

Figure 11: Evolution of the tariff structure applied by the rest of the World to North Africa



For Africa as a whole, the least favourable scenarios are those that include categories of "sensitive products".[18] These products are subject to less significant tariff reduction.

In conclusion, for both sub-Saharan Africa and North Africa, the formula that includes the application of a linear formula for all countries with the application of an adjustment coefficient for the developed countries, provides greater market access when the tariffs are relatively high, whereas the Harbinson and tiered formulas have a greater effect on the lower tariffs. The reduction coefficients proposed in this ambitious formula would be less restrictive for developing countries and would undoubtedly lead to greater reductions in the tariffs of developed and developing countries, albeit to less than proportional extents. In addition, the introduction of sensitive products into the formulas significantly reduces the market access obtained by the formulas, particularly when applied at disaggregated levels of the tariff schedules.

The tariff implications of the Doha Round should be especially significant for such products as sugar, meat, rice and cereals and, to a lesser extent, livestock, fish and food products. All the scenarios confirm this argument as long as the sensitive products are not included in the formula. The inclusion of a large number of sensitive products can significantly reduce the scope of the agreement, especially in the case of the access of African exports to the markets of the developed countries. It must also be emphasized that the "cocktail" formula has a much greater impact on the high tariffs of the developed countries than the other formulas.

18 In the simulations, the level of sensitive products was set at 5 per cent. In future, it could be interesting to study the results when using different percentages.

VIII. THE IMPACT OF THE SCENARIOS ON AFRICAN ECONOMIES: LESSONS LEARNT

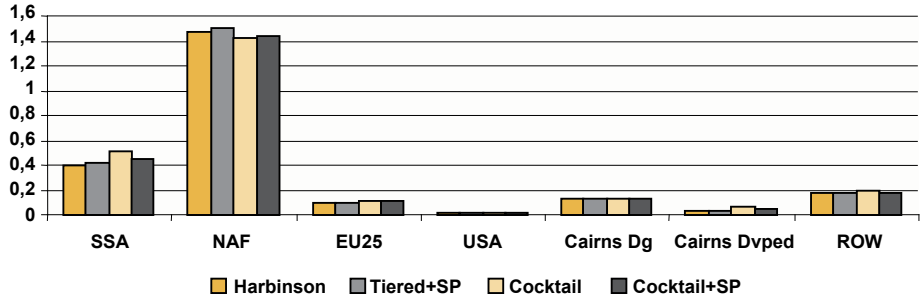
8.1 The effects on income and on production structures: GDP and value added

In the following analysis of the impact of the various scenarios on production structures, the focus is on the particular impact on the growth of real value added by sector and GDP.

8.1.1 GDP growth in Africa

The foregoing simulations show that the whole of Africa would experience considerable GDP growth. On average, North Africa's GDP would increase by 1.4 per cent, whereas in sub-Saharan Africa, the growth rate would be less significant at between 0.4 and 0.5 per cent. However, these growth rates are among the highest in comparison to other regions. The ambitious scenario (applying for all countries a linear function into which is factored an adjustment coefficient for developed countries), which does not include sensitive products, would make for greater GDP growth. Obviously, this scenario applied a "harmonizing" formula to the tariff scales of the developed countries so that the highest tariffs, or the peaks, became the most significantly reduced, whereas the tariffs of the developing countries were reduced to a lesser degree.

Figure 12: Impact of the different scenarios on the GDP (variation in %)



8.1.2 Real value added

The diagrams below show the growth of value added using the various liberalization scenarios. In the case of sub-Saharan Africa, it is evident that ambitious scenarios using for all countries a linear formula into which is factored an adjustment coefficient for developed countries, would make for increased value

added in those sectors where the initial level of protection is highest hence the very large increase in the value added of products such as sugar, milk and meat. On the other hand, a tiered formula with the introduction of sensitive products would offer the least beneficial scenario to sub-Saharan Africa in terms of real value added.

The same pattern applies to North Africa, though more sectors would suffer a drop in the value added. As in the case of sub-Saharan Africa, however, the sectors that had the highest levels of initial protection would witness a very considerable increase in their value added with the application of ambitious tariff liberalization formulas. With the application of an ambitious formula that does not include sensitive products, such sectors as meat, fish and milk stand to gain in value added.

It thus emerges that, in Africa, products that stand to gain the most in real value added attract the highest tariffs. In decreasing order, value added would increase in the following sectors:

- Meat
- Sugar
- Oil seeds; and
- Rice.

As observed in the previous section, these groups of products are currently among the most highly taxed.

Figure 13: Evolution in the value added in sub-Saharan Africa

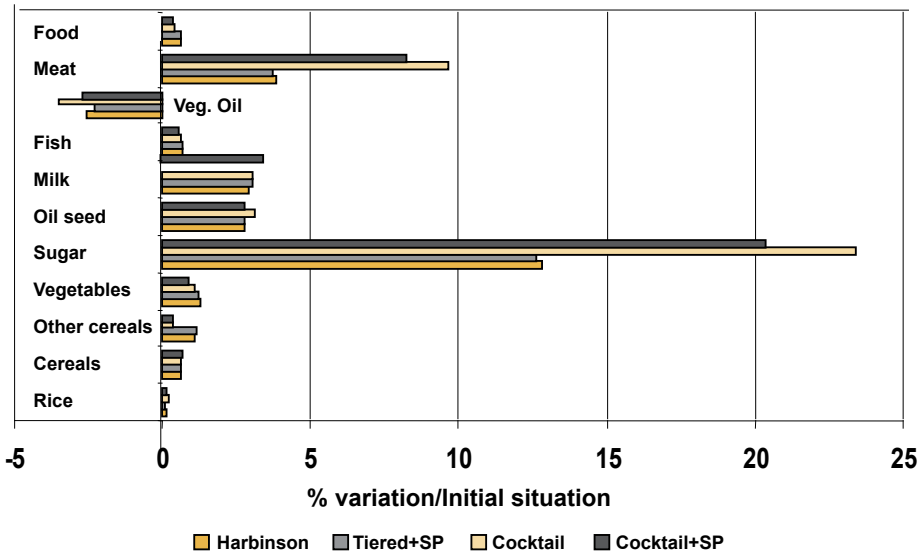
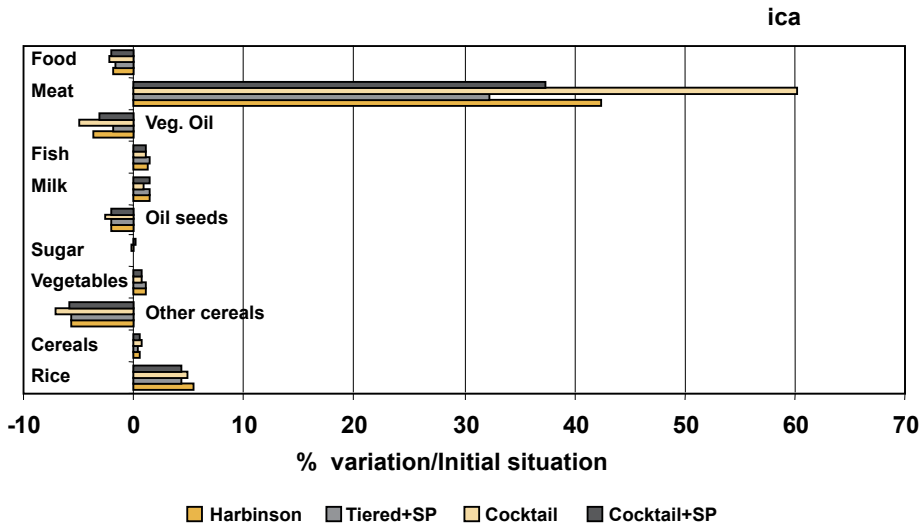


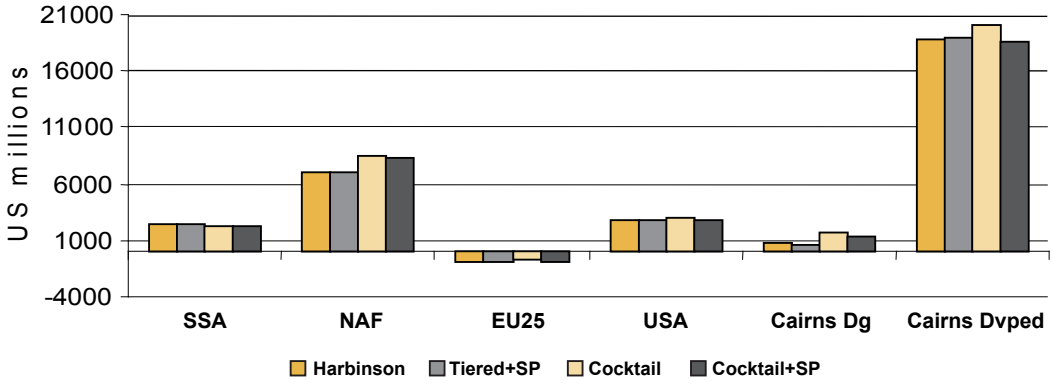
Figure 14: Evolution in the value added of North Africa



8.2 The impact of liberalization on welfare

This section deals with the impact of the simulations on the welfare of African countries.

Figure 15: Evolution of the welfare (equivalent variation)



Regardless of the formula used, market liberalization leads to an improvement in both welfare in North Africa and in sub-Saharan Africa. However, the improvement in welfare is greater in North Africa when

an ambitious tariff reduction formula is applied. It emerges that the most ambitious scenario offers the best welfare gains for Africa as a continent. This is partly due to the fact that in this scenario there are greater increases in subsidies and this means that resource allocation is easier in the absence of market access restrictions (for example, imported inputs can become less expensive).

On a global level, the developed countries of the Cairns group benefit the most from an improvement in their welfare which stands to gain considerably with the application of an ambitious formula. As can be seen in Figure 20, such growth is largely the result of a marked improvement in their terms of trade (+0.35 per cent with an ambitious formula).

The European Union would be the only region that would suffer a drop in welfare. This is partly explained by deterioration in the terms of trade but also an increase in the global prices of agricultural goods following liberalization. It should also be remembered that the liberalization scenarios also factor in the elimination of export subsidies that would lead to deterioration in consumer's welfare.

8.3 The impact of the various scenarios on trade

The following section looks at the potential impact of the various liberalization scenarios on trade. First, the changes that could occur in the trade structure of African economies will be examined before looking at the terms of trade.

8.3.1 The impact of the scenarios on imports and exports

In varying degrees, all the scenarios show an increase in exports and a decrease in imports in Africa as a whole for the sectors whose value added increases (milk and sugar for sub-Saharan Africa, cereals for North Africa). On a continental level, there is a greater increase in the volume of exports with an ambitious scenario that includes a significant reduction in tariff peaks. This scenario should also be the most favourable in terms of export revenue. A tiered formula excluding sensitive products is the second best scenario for exports in Africa as a whole. Exports would increase less with the Harbinson formula than with an ambitious formula. The increase in exports would be greatly reduced with the introduction of sensitive products. This shows the importance of reducing tariff peaks and opening up market access to allow African exporters to benefit more from international trade.

Once again, the increases in exports are greatest for those products that are subject to tariff peaks. On a continental level, the increase in the volume of exports should be greater for oil, meat, sugar, cereals, milk and rice with the application for all countries of a linear formula into which is factored an adjustment coefficient for developed countries. These sectors are subject to the highest tariff peaks. An ambitious formula would provide the greatest reduction of such peaks.

Scenarios that include ambitious agricultural liberalization are the most favourable for major African exporters. A "cocktail" formula, with the application of a harmonizing formula for the tariffs of the developed countries, could lead to significant increases in exports for these countries. On the other hand, the inclusion of sensitive products could eliminate these increases and even lead to losses in terms of the volume of exports. However, in countries such as Morocco and Tunisia, several sectors would slightly suffer from ambitious liberalization. While the variation in the volume of their exports is positive in the case of an ambitious scenario, it is slightly less than in the case of a more modest liberalization scenario. For these countries, the best scenarios in terms of the variation in exports are those that include sensitive products, and this can easily be explained by the erosion of their tariff preferences in the case of a tariff overhaul.

Imports in most sectors would increase. Nevertheless, all the scenarios show a decrease for products that were initially the most highly protected in the markets of the OECD countries. This is logical to the extent that the real value added of these products improves and their production increases along with national export capacities. Once all things are equal for these products, the local production replaces the imports. Another explanation for this drop in imports is the increase in commodity prices of which makes national products more competitive than imports.

Figure 16 : Evolution of sub-Saharan imports

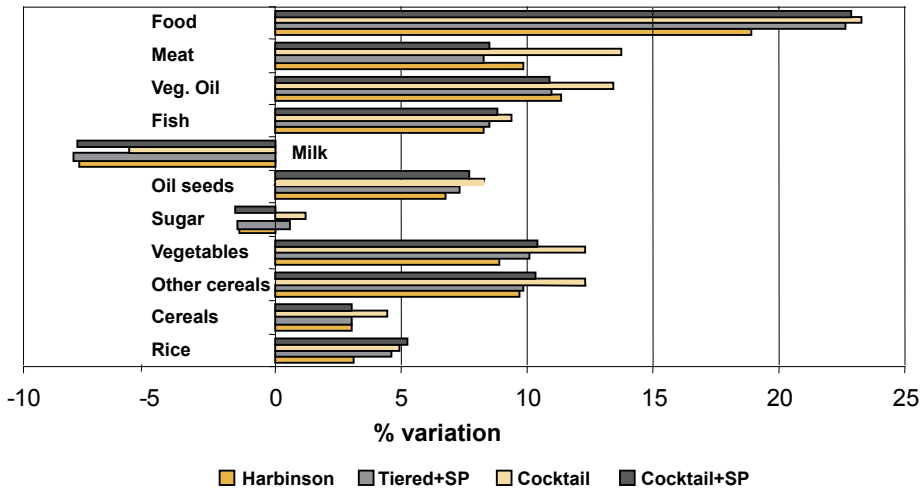


Figure 17: Evolution of North African imports

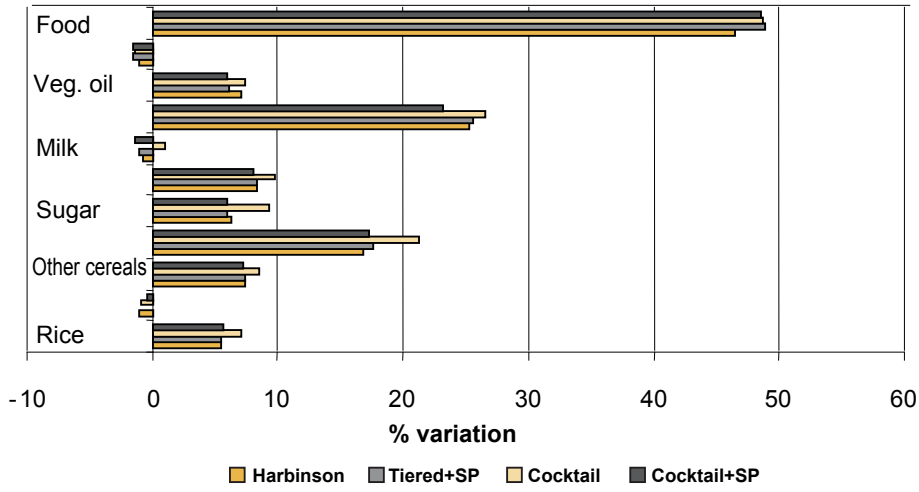


Figure 18: Evolution of sub-Saharan exports

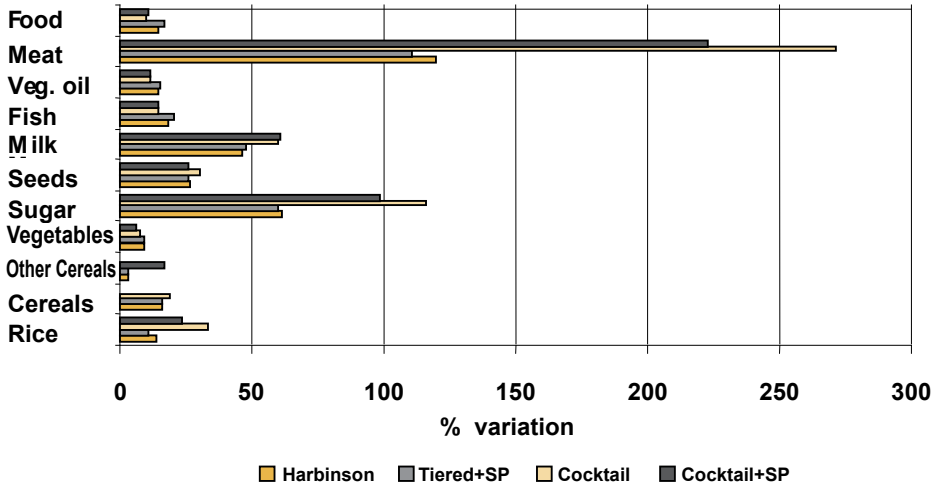


Figure 19: Evolution of North African exports

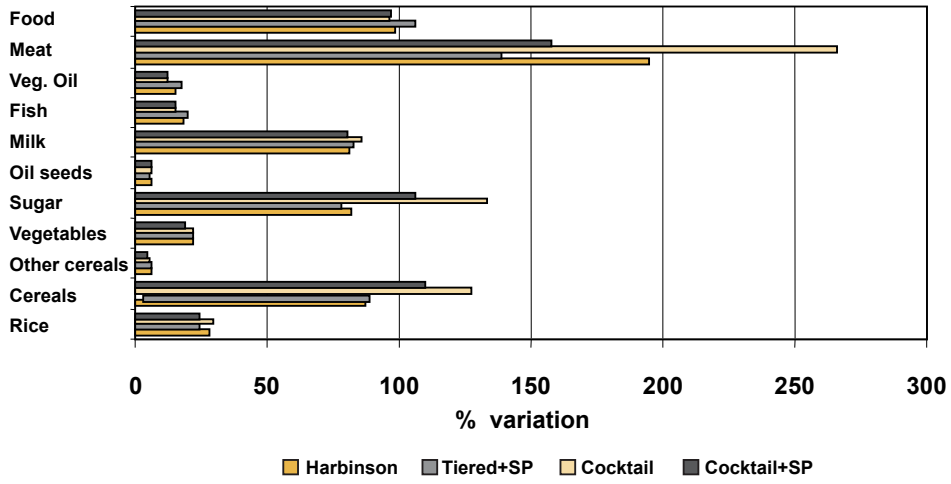
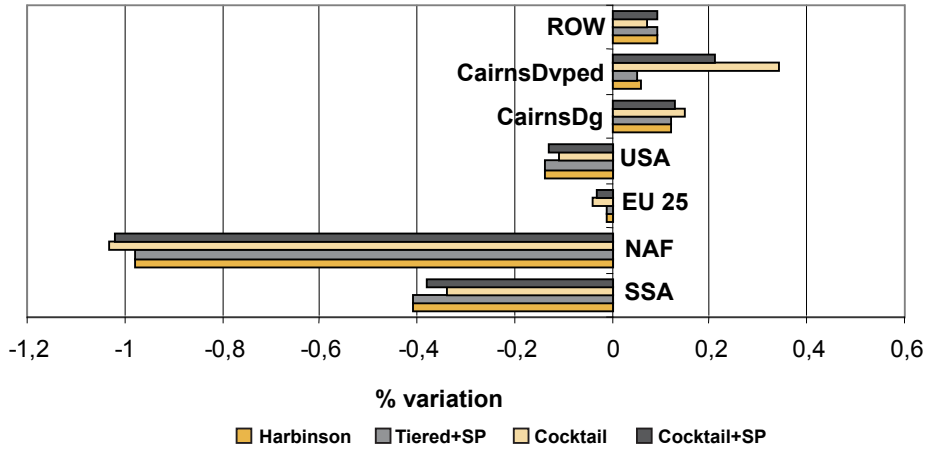


Figure 20: Evolution of the terms of exchange



We observe a significant worsening in North Africa's terms of trade. The elimination of export subsidies, which applies to the European Union in particular, affects the countries of North Africa as their imports from the European Union increase. The price of imports increases markedly in relation to the growth of their exports. To a lesser extent, this applies to the countries of sub-Saharan Africa. On the other hand, both the developed and the developing countries of the Cairns group improve in their terms of trade.

The analysis of the results of the simulations for agricultural market liberalization reveals some significant results for the African countries in the current context of the multilateral trade negotiations.

First, it is quite clear that the elimination of the tariff peaks and an ambitious liberalization, obtained by means of the harmonizing formula, would have the most positive impact on Africa. The countries with the most competitive agricultural structures could obtain significant economic benefits from this type of liberalization scenario. Some countries could suffer from erosion in their tariff preferences and, in some cases, from opening up their own markets too quickly to international competition. Nonetheless, the losses brought about by the erosion in preferences seem relatively minor in most cases, especially in the context of the significant gains that other countries can reap using the same scenarios of ambitious liberalization. Finally, it seems advisable for countries whose national production may be challenged by a significant increase in imports to make use of the S&D treatment. Within the framework of the "July agreement", these countries can make use of the "special products" category that has been established to promote rural development.

IX. CONCLUSION

Examining the impact of the "July agreement" has shown the effect of agricultural market liberalization on African markets. From the analysis of the various tiered formulas, it emerges that the degree of openness would be the most important criterion enabling Africa to benefit from liberalization far more specifically, it appears that differentiation between developed countries and developing countries would bring African countries the highest gains. Furthermore, the cocktail formula involving the application to developed and developing countries of a linear formula including an adjustment coefficient of φ for the developed countries, offers the best prospects for the continent. In addition, the issue of the sensitive products must remain a central concern for African countries in the case of all the tiered formulas. The study shows that the inclusion of sensitive products would restrict the gains of African countries by maintaining the tariff peaks.

What is more, African countries must be particularly vigilant on other subjects under negotiation, especially the question of trade facilitation and the development of non-tariff barriers that can limit their access to OECD market.

ANNEXES: SECTORAL AND GEOGRAPHICAL AGGREGATES

Table 9: Sectoral aggregates

Rice	pdr	Paddy rice
	pcr	Processed rice
Cereals	wht	Wheat
	gro	Cereal grains nec
	ocr	Crops nec
Vegetables	v_f	Vegetables, fruit, nuts
Sugar	c_b	Sugar cane, sugar beet
	sgr	Sugar
Oil seeds	osd	Oil seeds
Milk	rmk	Raw milk
	mil	Dairy products
Fish	fsh	Fishing
Veg. oil	vol	Vegetable oils and fats
Meat	cmt	Meat: cattle,sheep,goats,horse
	omt	Meat products nec
Mnfcs	wol	Wool, silk-worm cocoons
	for	Forestry
	col	Coal
	oil	Oil
	gas	Gas
	omn	Minerals nec
	tex	Textiles
	wap	Wearing apparel

Mnfcs	lea	Leather products
	lum	Wood products
	ppp	Paper products, publishing
	p_c	Petroleum, coal products
	crp	Chemical,rubber,plastic prods
	nmm	Mineral products nec
	i_s	Ferrous metals
	nfm	Metals nec
	fmp	Metal products
	mvh	Motor vehicles and parts
	otn	Transport equipment nec
	ele	Electronic equipment
	ome	Machinery and equipment nec
	omf	Manufactures nec
Svces	ely	Electricity
	gdt	Gas manufacture, distribution
	wtr	Water
	cns	Construction
	trd	Trade
	otp	Transport nec
	wtp	Sea transport
	atp	Air transport
	cmn	Communication
	ofi	Financial services nec
	isr	Insurance
	obs	Business services nec
	ros	Recreation and other services
	osg	PubAdmin/Defence/Health/Educat
	dwe	Dwellings
Food	pfb	Plant-based fibers
	ctl	Cattle,sheep,goats,horses
	oap	Animal products nec
	ofd	Food products nec
	b_t	Beverages and tobacco products

Table 10: Geographical aggregates

Code	Code	Description
SSA	bwa	Botswana
	xsc	Rest of South Afr C Union
	mwi	Malawi
	moz	Mozambique
	tza	Tanzania
	zmb	Zambia
	zwe	Zimbabwe
	xsf	Other Southern Africa
	uga	Uganda
	xss	Rest of Sub-Saharan Africa
North Africa	mar	Morocco
	xnf	Rest of North Africa
EU25	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
	cze	Czech Republic
	hun	Hungary
	mlt	Malta
	pol	Poland
	svk	Slovakia
	svn	Slovenia
	est	Estonia

Code	Code	Description
EU25	lva	Latvia
	ltu	Lithuania
	cyp	Cyprus
USA	usa	United States
Cairns developing	idn	Indonesia
	mys	Malaysia
	phl	Philippines
	tha	Thailand
	col	Colombia
	arg	Argentina
	bra	Brazil
	chl	Chile
	ury	Uruguay
Cairns developed	aus	Australia
	nzl	New Zealand
	can	Canada
ROW	chn	China
	hkg	Hong Kong
	jpn	Japan
	kor	Korea
	twn	Taiwan
	sgp	Singapore
	vnm	Vietnam
	bgd	Bangladesh
	ind	India
	lka	Sri Lanka
	xsa	Rest of South Asia
	mex	Mexico
	xcm	Central America, Caribbean
	per	Peru
	ven	Venezuela
	xap	Rest of Andean Pact
	xsm	Rest of South America
	che	Switzerland
	xef	Rest of Eur Free Trade Area

Code	Code	Description
ROW	alb	Albania
	bgr	Bulgaria
	hrv	Croatia
	rom	Romania
	rus	Russian Federation
	xsu	Rest of Former Soviet Union
	tur	Turkey
	xme	Rest of Middle East
	xrw	Rest of World

Table 11: Impact of the four scenarios on the main macro-economic variables

Welfare	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	US Million Dollars
SSA	943,29	977,08	1386,44	1124,52	
NAF	2399,49	2468,52	2277,74	2306,76	
GDP					As %
SSA	0,4	0,41	0,51	0,45	
NAF	1,47	1,51	1,43	1,44	

Secoral trade balance	Sub-Saharan Africa				
	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	US Million Dollars
Rice	-6,87	-15,2	-6,62	-12,26	
Cereals	-8,69	-8,41	-16,95	-7,32	
Other cereals	123,98	130,18	1,13	1,32	
Vegetables	140,44	134,48	104,63	89,95	
Sugar	533,51	523,2	1019,05	876,26	
Oil seeds	61,93	59,95	70,73	59,86	
Milk	13,06	15,8	7,64	21,54	
Fish	30,22	33,27	23,05	22,96	
Oil	-66,21	-59,26	-93,12	-70,51	
Meat	237,29	223,13	611,03	515,09	
Food	149,69	178,36	-174,79	-136,32	

North Africa Sectoral trade balance					
	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	US Million Dollars
Rice	9,48	6,93	9,22	7,29	
Cereals	0,36	-36,52	20,58	-3,95	
Other cereals	-32,51	-32,18	-38,6	-32,65	
Vegetables	71,71	66,32	51,66	47,3	
Sugar	-49,46	-49,82	-47,41	-33,36	
Oil seeds	-13,65	-13,72	-15,83	-13,11	
Milk	2,83	6,64	-8,72	6,59	
Fish	18,16	19,91	14,27	14,33	
Oil	-53,87	-33,36	-68,76	-47,48	
Meat	-5,57	-7,92	1,93	-6,3	
Food	235,81	286,08	164,69	174,52	

Value added	Sub-Saharan Africa				
	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	As %
Rice	0,13	0,08	0,2	0,11	
Cereals	0,61	0,62	0,6	0,64	
Other cereals	1,08	1,13	0,32	0,3	
Vegetables	1,25	1,2	1,05	0,89	
Sugar	12,77	12,59	23,39	20,33	
Oil seeds	2,74	2,74	3,06	2,74	
Milk	2,9	3,01	3,05	3,42	
Fish	0,64	0,68	0,61	0,55	
Veg. oil	-2,57	-2,31	-3,52	-2,69	
Meat	3,84	3,67	9,62	8,19	
Food	0,59	0,6	0,39	0,32	

Value added	North Africa				
	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	
Rice	5,44	4,33	4,94	4,37	As %
Cereals	0,58	0,37	0,65	0,5	
Other cereals	-5,69	-5,58	-7,04	-5,87	
Vegetables	1,01	1	0,7	0,72	
Sugar	-0,09	-0,03	-0,24	0,1	
Oil seeds	-2,1	-2,01	-2,6	-2,1	
Milk	1,34	1,5	0,94	1,34	
Fish	1,33	1,43	1,12	1,14	
Veg. oil	-3,72	-1,76	-5	-3,09	
Milk	42,48	32,35	60,16	37,29	
Food	-1,8	-1,69	-2,14	-2,09	

Terms of trade	Harbinson	Tiered + SP	Cocktail	Cocktail+SP	As %
SSA	-0,41	-0,41	-0,34	-0,38	
NAF	-0,98	-0,98	-1,03	-1,02	
EU25	-0,01	-0,01	-0,04	-0,03	
USA	-0,14	-0,14	-0,11	-0,13	
CairnsDg	0,12	0,12	0,15	0,13	
CairnsDvped	0,06	0,05	0,34	0,21	
ROW	0,09	0,09	0,07	0,09	

Sources: Simulations done using GTAP 5.4.

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