**Market access for non-agricultural products**

# The impact of the Doha Round on African economies: A simulation exercise

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**Abstract:**

This paper proposes an extensive data simulation exercise on the likely impact of the non agricultural market access liberalisation. We propose real options for various formula coefficients, paragraph 8 flexibilities and the treatment of unbound tariffs. Furthermore, we propose an empirical work, by putting together a combination of databases and a methodology allowing to assess systematically and exhaustively, for African countries suspected to apply tariff formula reduction on NAMA negotiations and for each of the six-digit level lines of the Harmonised System classification (hereafter, HS-6 level), the AVE of the binding overhang, and the impact on applied duties of any cut in bound protection. This paper proposes also some indications concerning the likely economic impact of this round on African economies. We show that an ambitious formula would provide greater access to the developed countries' markets for African producers. However, this kind of formula has an important inconvenient for African countries in the sense that it could accelerate the desindustrialisation of African countries and limit the incentives to diversify their economies.

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## 1. Introduction

NAMA negotiations are mandated under the Doha Ministerial Declaration, which WTO members agreed to in November 2001. The aim is to reduce border measures to trade, especially *tariffs*, and other barriers to market access for industrial exports.

The negotiations cover all goods not covered under the Agreement on Agriculture. The products are essentially industrial but WTO members are also negotiating on natural resources, including fisheries, forests, gems and minerals. The aim of the negotiations is to continue the process of industrial trade liberalization that started with the first General Agreement on Trade and Tariffs in 1947 and continued since through periodic rounds of negotiations.

Under the GATT, countries engaged in a series of tariff negotiation rounds to liberalize trade in goods. By the time the WTO was established in 1995, the successive rounds of liberalization had achieved considerable tariff reduction, particularly amongst developed countries. In the negotiations, countries made requests and offers to reduce tariffs in particular sectors. GATT members were allowed flexibility to choose which sectors to liberalize and by how much—developing countries were allowed greater flexibility. Today, the tariff structures of developed and developing countries are different. Developing country tariff structures are characterized by high average tariffs. Developed country tariffs, on the other hand, are characterized by low average tariffs with high tariffs and tariff peaks (very high tariffs that are three times the national average) for some sectors.

Tariff escalation is also an issue in developed countries: a situation where tariffs are structured so as to gradually rise as products go from their raw state to a more processed good. For instance, tariffs on aluminium will typically be lower than tariffs on imported cars made with aluminium. This serves the interests of developed countries who aim to import raw materials at low costs from developing countries for their industries, and to export value-added products. Tariff peaks are used to protect jobs and investment in their manufacturing industries. The result is that industrialization in developing countries is made difficult.

This paper proposes an extensive data simulation exercise on hypothetical options for various formula coefficients, paragraph 8 flexibilities and the treatment of unbound tariffs. This paper presents an empirical work, by putting together a combination of databases and a methodology allowing to assess systematically and exhaustively, for African countries suspected to apply tariff formula reduction on NAMA negotiations and for each of the six-digit level lines of the Harmonised System classification (hereafter, HS-6 level), the AVE of the binding overhang, and the impact on applied duties of any cut in bound protection.

This paper is structured as follow. After this introduction, section two presents the current situation on the NAMA negotiations and the main results that Members have negotiated in Honk Kong during the last WTO Ministerial Conference. In the third section, we present our methodology and the various scenarios retained to run theses simulations. In the fourth section, we highlight the mains results from this tariff simulation exercise. The fifth section gives some indications concerning the likely economic impact of this round on African economies. At least, the last section concludes this paper.

## 2. Honk Kong and the state of play in the NAMA negotiations

*The proportionality between NAMA and agricultural market access negotiation*

The most significant Hong Kong contribution to the NAMA debate was paragraph 24 of the Ministerial Declaration, which instructs negotiators in Geneva to ensure that there is "a comparably high level of ambition in market access for agriculture and NAMA," adding that this ambition "is to be achieved in a balanced and proportionate manner consistent with the principle of special and differential treatment." This language responds to two key developing country concerns. The first is their view that the negotiations must narrow the current gap in market access for agricultural and industrial products and therefore a greater effort is required in reducing agricultural tariffs than those affecting industrial goods. In contrast, most industrialized countries, and the EU in particular, have repeatedly said that unless developing countries start moving on NAMA (and services), further progress will not be possible in agriculture.

The second major developing country concern has to do with the proportionality of the effort involved in cutting industrial tariffs, which tend to be far higher in developing countries. A number of them have argued that the tariff reduction formula should allow them to make smaller cuts than developed countries since Members agreed from the start that developing countries would have the right to 'less than full reciprocity in reduction commitments'.

The Hong Kong Declaration confirms that tariffs will be reduced according to a 'Swiss formula,' which cuts high tariffs more steeply than low ones. However, it leaves open the number of coefficients that would be used in order to reflect the 'less than full reciprocity' principle. The number of coefficients remains extremely divisive, with the US insisting that even a slightly higher coefficient for developing countries should result in a reduction of other flexibilities, while Argentina, Brazil and India argue for multiple coefficients tied to a country's existing average tariff, as well as full access to the additional 'special and differential treatment' flexibilities contained in paragraph 8 of the July 2004 Framework Agreement's NAMA annex. Several other Swiss formula-inspired proposals are also on the table. Other objectives put forward by developed Members and some developing

Members as being part of the Doha NAMA mandate are: harmonization of tariffs between Members; cuts into applied rates; and improvement of South-South trade. However, these objectives have been challenged by other developing Members who believe that, on the contrary, they are not part of that mandate.

*A Swiss formula will be used to reduce the tariff and the importance of Special and differential treatment for developing countries*

During the informal discussions, many Members engaged in an exchange on the basis of an approach with two coefficients. In the context of such debates, the coefficients which were mentioned for developed Members fell generally within the range of 5 to 10, and for developing Members within the range of 15 to 30, although some developing Members did propose lower coefficients for developed Members and higher coefficients for developing Members. In addition, a developing country coefficient of 10 was also put forward by some developed Members. However, while this discussion of numbers is a positive development, the inescapable reality is that the range of coefficients is wide and reflects the divergence that exists as to Members' expectations regarding the contributions that their trading partners should be making.
African countries with bound rates exceeding 35 per cent are affected by these reductions. These are: Botswana, Egypt, Morocco, Namibia, South Africa, Swaziland and Tunisia.

The Ministerial Declaration reaffirms the importance of:
(i) Special and differential treatment;
(ii) Less than full reciprocity, and;
(iii) Paragraph 8 of the NAMA Framework

The special and differential treatment flexibilities in paragraph 8 include the possibility for developing countries to exempt a small number of tariff lines from reductions, or to make less than formula cuts on a higher number of products.

A central issue concerning the paragraph 8 flexibilities has been the question of linkage or non-linkage between these flexibilities and the coefficient in the formula. A view was expressed that the flexibilities currently provided for in paragraph 8 are equivalent to 4-5 additional points to the coefficient in the formula, and as a result there was need to take this aspect into account in the developing country coefficient. In response, the argument has been made by many developing Members that those flexibilities are a stand alone provision as reflected in the language of that provision, and should not be linked to the coefficient. Otherwise, this would amount to re-opening the NAMA framework.

Some of those Members have also expressed the view that the numbers currently within square brackets are the minimum required for their sensitive tariff lines, and have

expressed concern about the conditions attached to the use of such flexibilities, such as the capping of the import value. In response, the point has been made by developed Members that they are not seeking to remove the flexibilities under paragraph 8, and therefore are not re-opening the NAMA framework. They further point out that the numbers in paragraph 8 are within square brackets precisely to reflect the fact that they are not fixed and may need to be adjusted downwards depending on the level of the coefficient. In addition, the need for more transparency and predictability with regard to the tariff lines which would be covered by paragraph 8 flexibilities has been raised by some of these Members. Some developing Members have also advanced the idea that there should be the option for those developing Members not wanting to use paragraph 8 flexibilities to have recourse to a higher coefficient in the formula in the interest of having a balanced outcome.

*The sensitive issue of Unbound Tariff Lines: A mark up approach is retained*

The concept of tariff binding is central to multilateral negotiations on market access, under the GATT and now under the WTO. Countries do not make commitments in terms of applied protection, but instead in terms of the ceiling above which they commit not to raise their applied duty. This has proved an efficient way to make commitments possible and to create a cumulative process of market access liberalisation. The immediate impact of a market access liberalisation agreement on world trade is related to its translation in terms of applied protection. Assessing such impact requires a detailed knowledge of the level of both applied and bound duties.

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 African 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%.

There has been progress on the discussion of unbound tariff lines. Some Members have stressed that their unbound tariff lines with high applied rates are also sensitive and due consideration should be given to those lines. There now appears to be a willingness among

[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.

several Members to move forward on the basis of a non-linear mark-up approach to establish base rates, and in the case of some of these Members, provided that such an approach yields an equitable result. A non-linear mark-up approach envisages the addition of a certain number of percentage points to the applied rate of the unbound tariff line in order to establish the base rate on which the formula is to be applied. There are two variations of such an approach. In one case, a constant number of percentage points are added to the applied rate in order to establish the base rate. The other variation consists of having a different number of percentage points depending on the level of the applied rate. In other words, the lower the applied rate the higher the mark-up and the higher the applied rate, the lower the mark-up.

There is also one proposal on the table of a target average approach where an average is established through the use of a formula, with the unbound tariff lines expected to have final bindings around that average. On a practical level, in their discussions on unbound tariff lines, Members have been referring mostly to the constant mark-up methodology to establish base rates. In the context of such discussions, the number for the mark-up has ranged from 5 to 30 percentage points. Once again the gap between the two figures is wide, but Members have displayed willingness to be flexible.

*Market Access for LDCs (paragraph 10 of the NAMA framework)*

In the discussions on this subject, it was noted that the Committee on Trade and Development in Special Session is examining the question of duty-free and quota-free access for non-agricultural products originating from LDCs. Consequently, there is recognition by Members that the discussions in that Committee would most probably have an impact on this element of the NAMA framework, and would need to be factored in at the appropriate time. Members agree to open 97% of their market in duty free quota free market access.

## 3. NAMA's simulations methodology: Product coverage and treatment of unbound tariffs

These simulations were made at the tariff line level (HS6). For each country, we matched the NAMA bound tariffs with the applied ones, for which there is more lines (the mark-up methodology is described below). Then we applied a Swiss formula on the bound tariffs with different coefficients. The results gave us the magnitude of the cuts on the bound tariffs. By comparing the different new bound tariffs with the applied ones at the tariff line level, we were able to capture the real impact on the applied tariffs. Indeed, a reduction on a tariff line where the difference with the applied one is important (water in the tariff) will not have any effect on the applied one, if the new bound tariff is higher than the applied. We present below the detailed methodology.

*Product coverage*

The product coverage is limited to non-agricultural products, i.e. all products not included in the WTO Agreement on Agriculture. The definition of HS subheadings considered as non-agricultural is given in Table 1 for the HS 1992, HS 1996 and HS 2002 nomenclatures. This definition has been used regularly in applications and analysis using IDB or CTS data. HS Chapters 98 and 99, which are reserved for special uses of the Contracting Parties to the HS Convention were excluded in the analysis. According to document TN/MA/S/14, Table 1, the product coverage is organized as follow.

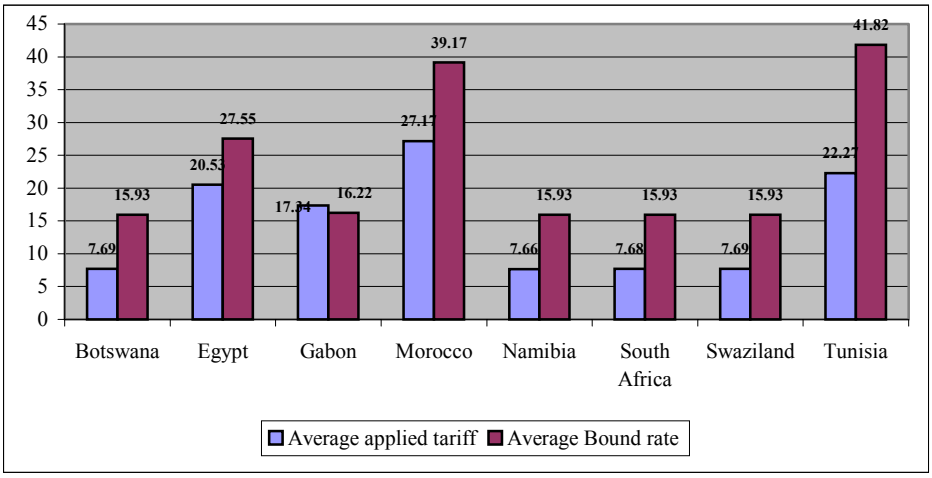
Table 1: Definition of non-agricultural products

| HS Chapter/Heading | Product Coverage |
|---|---|
| 3 | Fish and crustaceans, molluscs and other aquatic invertebrates |
| 5.09 | Natural sponges of animal origin |
| 15.04 | Fats and oils and their fractions, of fish or marine mammals, whether or not refined, but not chemically modified |
| 16.03 | Extracts and juices of meat, fish or crustaceans, molluscs or other aquatic invertebrates |
| 16.04 | Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs |
| 16.05 | Crustaceans, molluscs and other aquatic invertebrates, prepared or preserved |
| 23.01 | Flours, meals and pellets, of meat or meat offal, of fish or of crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption; greaves |
| 25-40 | Chemicals and Chemical Products |
| 41-64 | Raw Hides, Leather, Leather Goods, Etc.; Wood and Wood Products, Etc.; Pulp, Paper and Paper Products; Textiles and Articles Thereof; Footwear |
| 65-83 | Base Metals and Non-Metals |
| 84-97 | Machinery, Transport Equipment and Miscellaneous Manufactured Articles |

We didn't take into consideration the product exceptions as mentioned in the document TN/MA/S/14. Indeed, the list of these exceptions is still under negotiation process.

*The current tariff situation of the 8 African countries concerned by the formula*

Figure 1: Applied versus Bound Tariffs (in %)

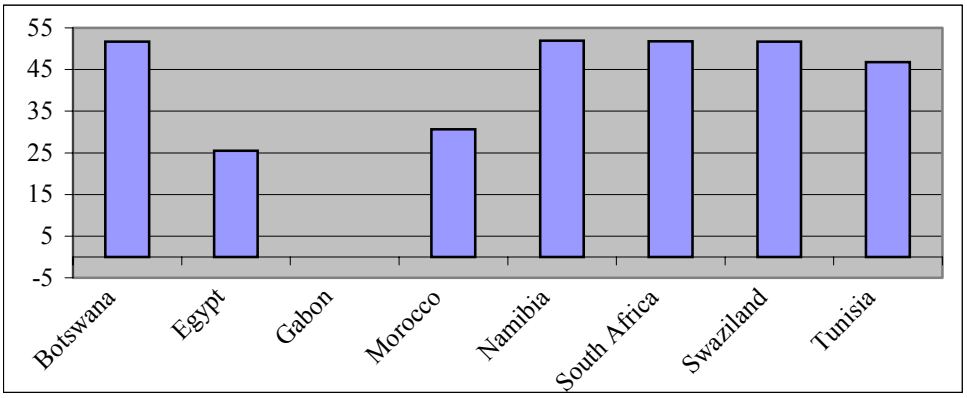



Author's computation

For these countries, the average MFN applied tariffs are relatively low in the SACU countries (around 6.7%). For the others countries, the average of the MFN applied rates are more important. This is particularly the case for Morocco, Egypt and Tunisia where the rates are superior to 20%.

As we already mentioned, these countries have to apply the formula to reduce their apply tariffs. The question is in which extent the tariff reduction cut will affect the MFN applied rates? In other words, what should be the percentage cut reduction of the average bound tariff to impact the MFN applied rates. The following figure gives us this information. It gives us the policy space that these countries enjoy in terms of tariff reduction. Morocco and Egypt are the countries which should undergo a substantial decline of their policy space. Indeed, let's take the case of Egypt, if the MFN bound tariff are reduced to 25%, this reduction will directly affect the MFN applied tariffs. For Morocco, it is 30%. As far as the African countries are concerned by the formula, a decrease of 50% of the average bound tariff will consequently affect the average MFN applied tariffs.

Figure 2: Policy Space in terms of percentage cut of the bound tariffs

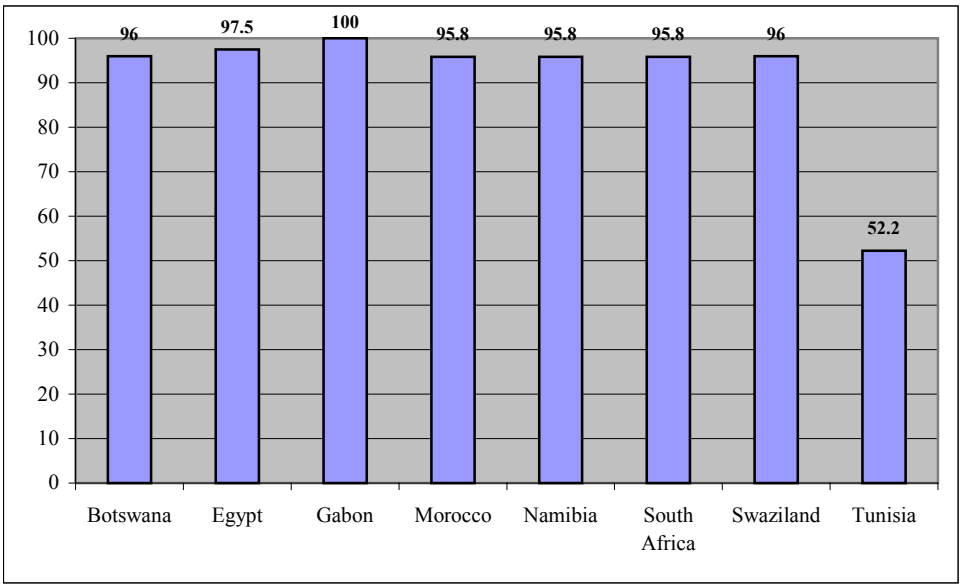



*Parameters and various simulations definitions*

In this paper, the countries subject to the simulations are African countries concerned by the reduction cut formula. As we already mentioned, the criteria used to identify these countries is the level of the binding coverage. Indeed, countries with a binding coverage rate above 35% are concerned by these reductions. One can easily establish the binding coverage as the percentage of subheadings that are fully bound. This is done by dividing the number of bound subheadings by the total number of standard HS subheadings. For Africa, 8 countries are concerned. Figure 3 gives an overview of the binding coverage for concerned African countries based on the CTS.[2]

[2] The CTS includes all WTO Members' consolidated certified concessions on goods. In some cases, the most recent certifications may not yet have been included; in some other cases, uncertified rectifications, modifications and transpositions have already been included. These concern mostly HS 1996 transpositions.

Figure 3: The African countries concerned by the formula (Binding coverage for selected African countries, in % of the total tariff lines)




Author's computation

For the simulation, we applied a traditional Swiss formula: $T_1 = \frac{a \times T_0}{a + T_0}$

With $T_1$ is the new bound tariff, $T_0$, the initial bound rate and $a$, a coefficient to be determined. We propose to estimate the impact of the formula on the tariff structure by using a pool of coefficients within the range of 10 to 100. However, as the Hong Kong Ministerial text highlighted that the coefficients which were mentioned for developed Members fell generally within the range of 5 to 10, and for developing Members within the range of 15 to 30, we will focus more our analysis on these coefficients. Nevertheless, we will also simulate the impact of the tariff reduction if we integrate some new coefficients (higher to 30) to analyze the trade off between 30 and others coefficients.

For each Swiss formula coefficient, results were simulated on a line-by-line basis on each Member's tariff schedule. The data come from the official sources. For the bound tariffs, the data are taken from the Consolidated Tariff Schedules (CTS) and the Integrated Database (IDB). It gives us for each tariff line, the official bound tariff. For the MFN applied rates, we have referred to the TRAINS database. For each country, we have taken the most recent years. For Botswana, Gabon, Namibia, South Africa and Swaziland, the reference year is 2005. For Tunisia, it is 2004 and Morocco, it is 2003. For Egypt, the most recent year available is 2002.

For these countries, results were simulated for each coefficient under three scenarios:

i) No flexibility; i.e. the formula was applied to all tariff lines
ii) Paragraph 8a flexibility; i.e. less than formula cuts (defined as 50% of full formula cut) were applied to 10% of NAMA tariff lines, selected on the highest MFN applied rates.
iii) Paragraph 8b flexibility; i.e. 5% of NAMA tariff lines were excepted from the formula, selected on the highest MFN applied rates.

*How to take into consideration the unbound tariffs?*

The unbound mark-up was applied on the basis of the most recent applied tariff AVE for that tariff line for all applicable members. Simulations used two unbound simple non linear mark-up for each coefficient tested.

i) +5 percentage points
ii) +30 percentage points

*Paragraph 8 flexibilities*

The effects of both Paragraph 8a (less than formula cuts) and 8b (exceptions from formula cuts) were simulated on the formula results for each developing country tariff schedule, under each of the coefficients based on the following:

i) For paragraph 8a: Less than formula cuts were applied to the 10 percent of the lines with the highest 2005 MFN applied rates
ii) For paragraph 8b: Formula exemptions were applied to the 5 percent of lines with the highest 2005 MFN applied rates.

## 4. Impact on the tariff structure for selected African countries

The various simulations on the impact of different Swiss formula coefficients try to answer three major questions. First, according to the coefficients subject to discussions, what is the magnitude of the reduction on the bound tariffs? Then, we want to see if the mark-up proposals for unbound tariffs are a real issue for African countries. The third point is the choice between the two possible flexibilities. Could we identify one of them as a better choice for African countries? Is this choice related to the level of the Swiss formula coefficient? We will also analyze the new MFN average applied rate after the implementation of the various proposals. Indeed, the formula impacts the bound tariff but *in fine* we have to compare the new bound tariff with the current applied tariff. If the new bound tariff is under the current applied tariff, therefore the new bound tariff becomes the new applied tariff. If the new bound tariff is under the current applied tariff, we commonly

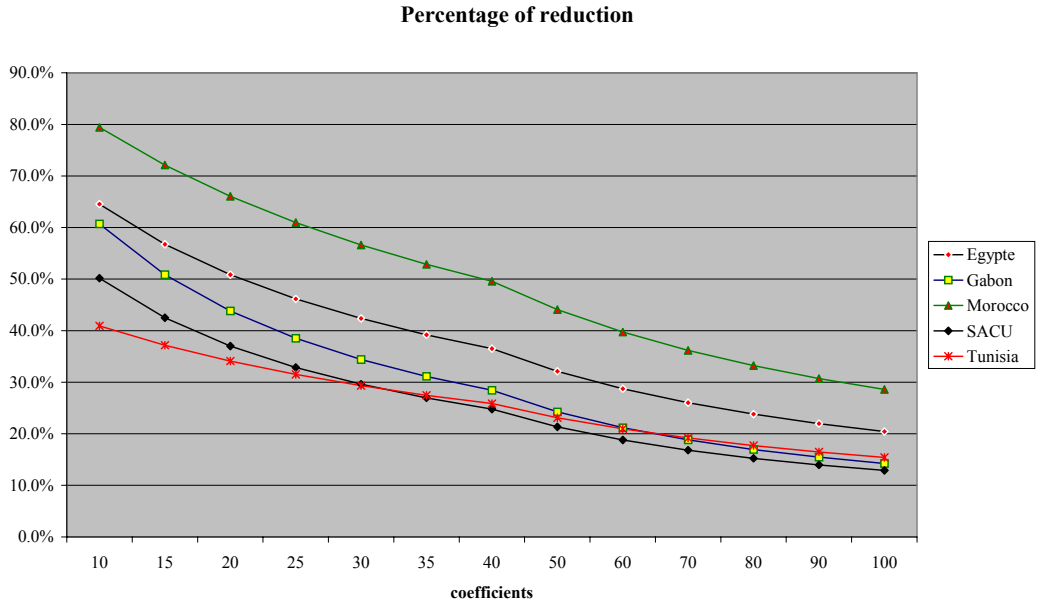
argue that there is “water in the tariffs”. This difference constitutes an important complication for the evaluation of non-agricultural tariff reform. Indeed, they are frequent wide divergence between the bound tariff and the tariff rate actually applied. This uncertainty does not exist for bound products, but here the impact of a given cut on applied duties depends on the gap between bound and MFN applied duties, adequately termed by Francois and Martin (2003) the "binding overhang".

This binding overhang means that reductions in bound tariffs will not always bring about corresponding reductions in applied rates and hence increases in market access. The phenomenon of binding overhang is widely associated with developing-country tariffs, but it is also prevalent in developed countries as well (Martin and Wang 2004). The binding overhang can change radically the outcome of a given tariff-cutting formula. To the extent that the gap between MFN and bound tariffs is far from uniform across products (especially in developed countries), it is difficult to gauge a priori how much it would interfere with the application of a given formula.

*The mark-up issue*

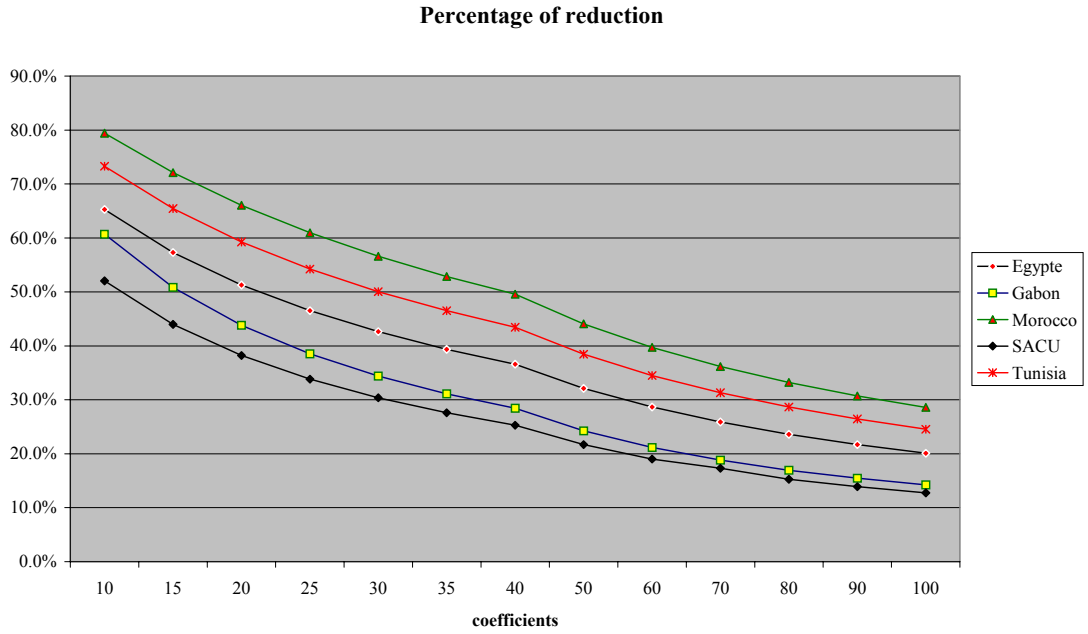
As most of these eight countries have a high binding level, the question of the mark-up level doesn’t appear as a main issue at this average level. However, for a country like Tunisia, with a binding level of 52.2% of NAMA tariff lines, this issue is critical. With a mark-up of 5, effective cut is 50% but this cut jumps to 60% with a mark-up of 30, using a coefficient of 30. Figure 6 shows that if we apply the formula only on effective bound tariffs, the level of reduction for Tunisia fall to less than 30%, using a coefficient of 30. However, it doesn’t mean that Tunisia should advocate for a mark-up of 5. On the contrary, a mark-up of 30 will provide to Tunisia, as for the other 7 African countries, a higher policy space.

Figure 4: Percentage of tariff reduction without binding



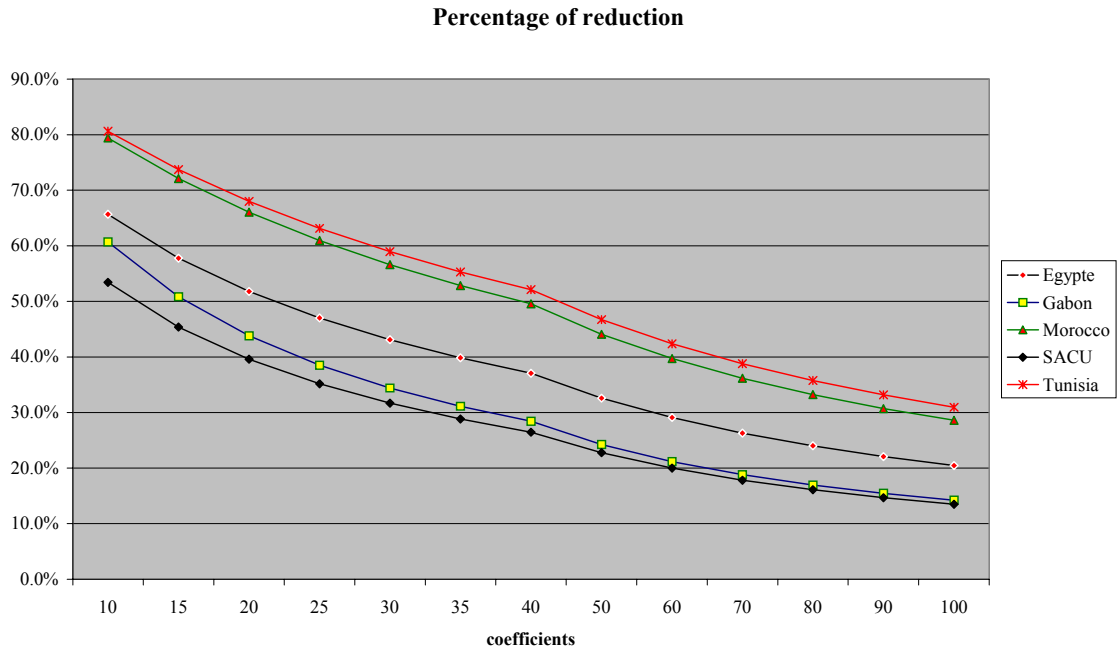

We applied the formula in different cases (only on bound tariffs, on bound and unbound with 5 and 30 points non linear mark-up). For a Swiss formula with a coefficient of 10 (strong effect), the average reductions vary between around 80% for Morocco and around 50% for SACU. For a coefficient of 40, the reductions levels are varying between 50% and 20%. The two next figures illustrate this result with a mark-up of 5 and 30.

Figure 5: Percentage of tariff reduction with a binding mark-up of 5




These results show that the reductions are significant on bound tariffs and undermine the policy space for African countries. The question of the coefficients appears to be a real issue for these countries. Even if the current negotiations based on the July package and the Hong Kong ministerial declaration focused on Swiss formula coefficients comprised between 15 and 30 for developing countries, the texts specified that some developing countries asked for higher coefficients. Therefore, it is interesting to note that higher coefficient have a significant impact on the level of tariffs reduction, offering more policy space for the developing countries. For example, in the case of Morocco, a hypothetical coefficient of 100 reduces the percentage cuts to less than 30% in both mark-up cases.

Figure 6: Percentage of tariff reduction with a binding mark-up of 30




*What kind of flexibility?*

The previous results highlighted the impact of the formula on applied tariff lines. The July package and the Hong Kong declaration allow two kinds of flexibilities: The first, called paragraph 8a flexibility is defined as 50% of full formula cut applied to 10% of NAMA tariff lines. The second one, paragraph 8b flexibility, implies an exclusion from the cuts of 5% of NAMA tariff lines. In both cases, the sensitive lines were selected on the base of the highest MFN applied rates.

- *The impact of the tariff reduction on the bound tariff*

The results are obviously different for the countries, but they offer a common characteristic. According to their different tariffs structures, each country has a turning point where it becomes better in terms of policy space to apply the paragraph 8A flexibility (10% less than Swiss formula cuts) rather than the paragraph 8B (5% exclusion). Therefore, it is more than important to identify these turning points and compare what are the trade off between the two forms of flexibilities.

For Egypt, for a 5 or 30-markup coefficient, it becomes better to use paragraph 8A than paragraph 8B flexibilities when the Swiss formula coefficient move from 15 to 20. Indeed,

in such a case, Egypt will implement lesser tariff cut reduction and could conserve more policy space in terms of bound tariff reduction. However, these figures differ for the other countries as we will explain below; Indeed, for Gabon, with an unbound mark-up coefficient equals to 5, our tariff simulations show that it is always better to use the paragraph 8A flexibilities. In other words, it is better for Gabon to opt for less than formula cuts to the 10 percent of the lines with the highest applied rates. Still for Gabon, with an unbound mark-up coefficient equals to 30, it become better to use paragraph 8A flexibilities rather than 8B when the Swiss formula coefficient move from 15 to 20. In this case, it is optimal to exclude 5% of the tariff lines the highest in order to keep more policy space in the bound tariff.

Concerning Morocco, with an unbound mark-up coefficient equals to 5, it becomes better to exclude 5% of the highest tariff lines when the Swiss formula coefficient change from 20 to 25. However, with an unbound mark-up coefficient equals to 30 and when the Swiss formula coefficient is at 20, it becomes better to exclude 5% of the highest tariff lines. For the case of SACU countries, with an unbound mark-up coefficient equals to 5 or 30 and when the Swiss formula coefficients change from 15 to 20, it appears better to exclude 5% of the highest tariff lines.

Our simulation exercise highlights also that for Tunisia, with an unbound mark-up coefficient equals to 5 and when the Swiss formula coefficient change from 20 to 25, it is better to use paragraph 8A than paragraph 8B flexibilities. Indeed, this choice will reduce the magnitude of the bound tariff cut reduction. However, we have identified that when the unbound mark-up coefficient is 30 associated with a Swiss formula coefficient equals to 35, it is much better to use paragraph 8A than paragraph 8B flexibilities

To sum up the impact of the different proposals on the bound tariffs, one should stressed that for all the cases, with a coefficient of 30 and below, the final bound tariffs will be lower than the current applied tariffs. Essentially, the countries concerned will not just lose policy space, but will have to prepare for substantial economic adjustments. This means the economic impacts cannot be ignored when considering the NAMA issues. Our simulations show also that though marginal in some cases, the issue of the coefficients (>30) for developing countries is still relevant. As for the mark-up, it is a significant issue as we have seen with the case of Tunisia. On the flexibilities, with a low mark-up paragraph 8(a), it leads to slightly lower cuts. On the contrary, with a higher mark-up, SACU and Tunisia appear to be better of with Para 8(b) flexibilities.

- *The impact of the tariff reduction on the applied tariff*

On the base of the bound tariffs, we have seen that according to their different tariff structure, each country have a turning point where it becomes better to apply the paragraph

8A flexibility (10% less than Swiss formula cuts) instead of the paragraph 8B one (5% exclusion). Is this statement still valid when we look at the effects on the applied tariffs? The answer is no, as the cuts on the applied tariffs depend principally on the "water in the tariffs" which is not distributed across tariff lines in a homogeneous way, but according to the countries trade policy.

For Egypt, with an unbound mark-up coefficient equals to 5, it becomes better (less cuts) to use paragraph 8A flexibilities rather than 8B when the Swiss formula coefficient change from 25 to 30. With an unbound mark-up coefficient equals to 30, it is always better to exclude 5% of the highest tariff lines in order to keep more policy space in the bound tariff. For Gabon, with an unbound mark-up coefficient equals to 5 or 30, it is optimal to exclude 5% of the highest tariff lines. For the others countries, our simulations show that it is also better to use paragraph 8 A flexibilities when the tariff cut reduction is very high.

## 5. Impact on African economies: A CGE analysis

### 5.1. 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.

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 computable general equilibrium (GCE) model devised for static-comparative analysis of trade policy issues (Adams et al. 1997). 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 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.

#### 5.1.1. 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.

#### 5.1.2. 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.

#### 5.1.3. 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

[7] A complete description can be found in Hertel (1997).
[8] There are three in the GTAP model, including public goods.

a given country in a given region is then determined through minimization of the import cost at f.o.b. rates.

### 5.1.4. 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 database. 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 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 13 subregions with the various included African countries, and 27 sectors have been identified. For this simulation, our

[9] Bouet and Ali (2002) provide a more detailed explanation.

attention is to analyze the impacts of this NAMA round on African countries. The sectoral and regional aggregation are posted in the annexes of this paper.

### 5.2. The different scenarios tested

To assess the economic impact of the NAMA negotiations on African countries, 5 scenarios have been identified. The first scenario approximate the impact of a Swiss formula which include the minimum coefficients mentioned on the Honk Kong declaration. In this scenario, we did not take into consideration the S&D treatment. The scenario is still a Swiss formula, with maximum coefficients mentioned on the Honk Kong declaration. We do apply the S&D in this scenario. In the scenarios, we could introduce 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. The choice of products, and hence the choice of the lines to be excluded, is arbitrary. For this study, we could proceed 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 reduction given by the formula.

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)% |

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

The following table summarizes and identifies the various scenarios.

Table 2 : The reference scenarios

| Scenarios | Developing countries | Developed countries |
|---|---|---|
| S1 | $t_1 = \frac{[10] \times t_0}{[10] + t_0}$ | $t_1 = \frac{[5] \times t_0}{[5] + t_0}$ |
| S2 | $t_1 = \frac{[30] \times t_0}{[30] + t_0}$ | $t_1 = \frac{[10] \times t_0}{[10] + t_0}$ |
| S2-8a | Paragraph 8a flexibility; i.e. less than formula cuts (defined as 50% of full formula cut) were applied to 10% of NAMA tariff lines, selected on the highest MFN applied rates. | No flexibility |
| S2-8b | Paragraph 8b flexibility; i.e. 5% of NAMA tariff lines were excepted from the formula, selected on the highest MFN applied rates. | No flexibility |
| S3 | All developing countries bind their tariff lines. They don't apply the formula. They will only bind their tariff; the mark up could be equal to 2.5. | $t_1 = \frac{[5] \times t_0}{[5] + t_0}$ |

### 5.3. The economic impacts

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

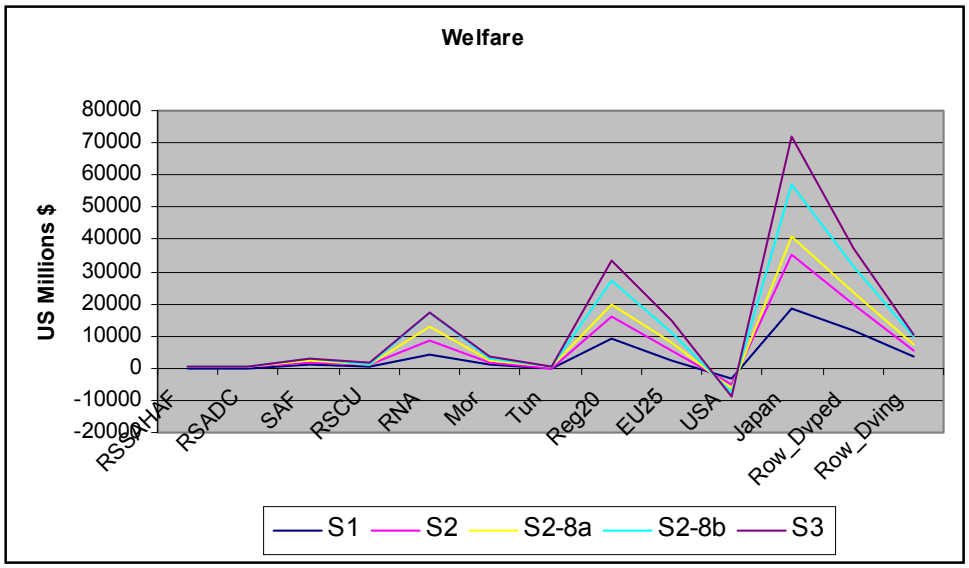
8.1 The welfare impact

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. 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, 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 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 ambitious liberalization process.

Figure 7: The equivalence variation of welfare




Source : GTAP-6 simulation

## 8.2 Impact on revenue and value added

*Impact on revenue*

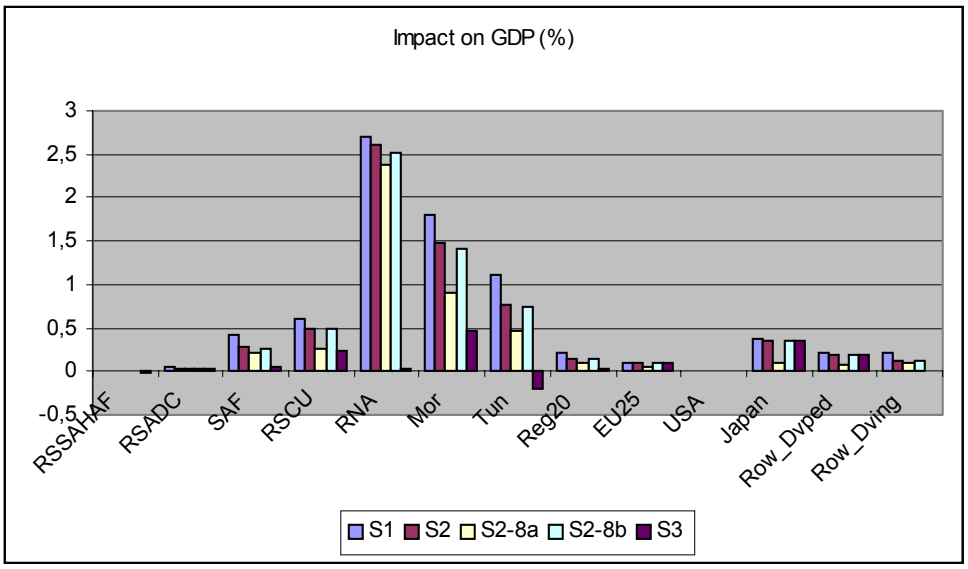
The results show that Africa would benefit from an increase in revenue regardless of the scenario and this is mainly due to gains made in terms of value added. Worldwide, it is the

region that would see the sharpest GDP growth. The scenario based on an ambitious formula would lead to the sharpest growth in GDP.

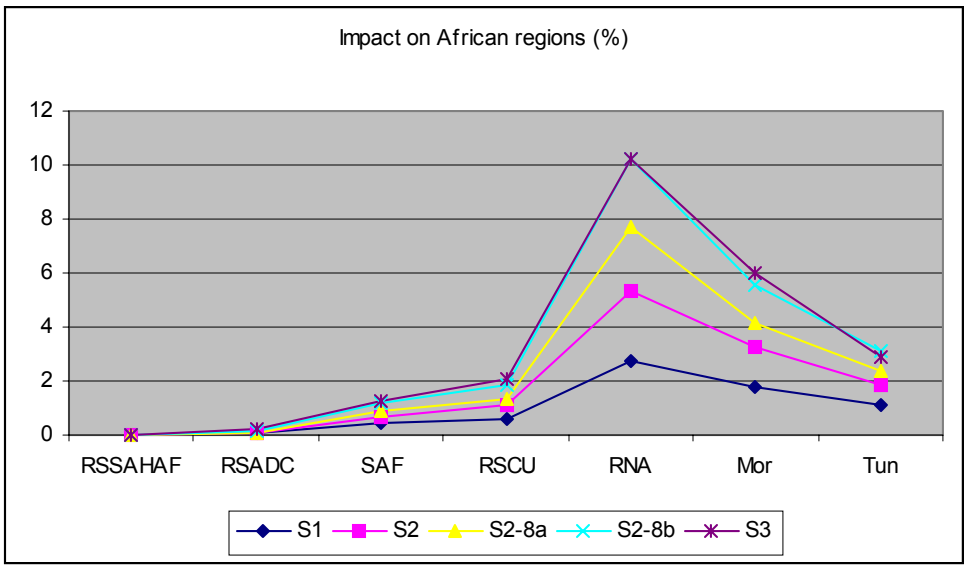
On a global level, production would increase the most in North Africa. Regardless of the scenario, production in the region would increase, which is quite significant. North Africa's GDP growth can be partly explained by a very significant increase in the value added in some of the sectors in which North 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 8: Evolution of the GDP according to the various scenarios
(% change in relation to the initial situation)




Source: GTAP-6 simulation



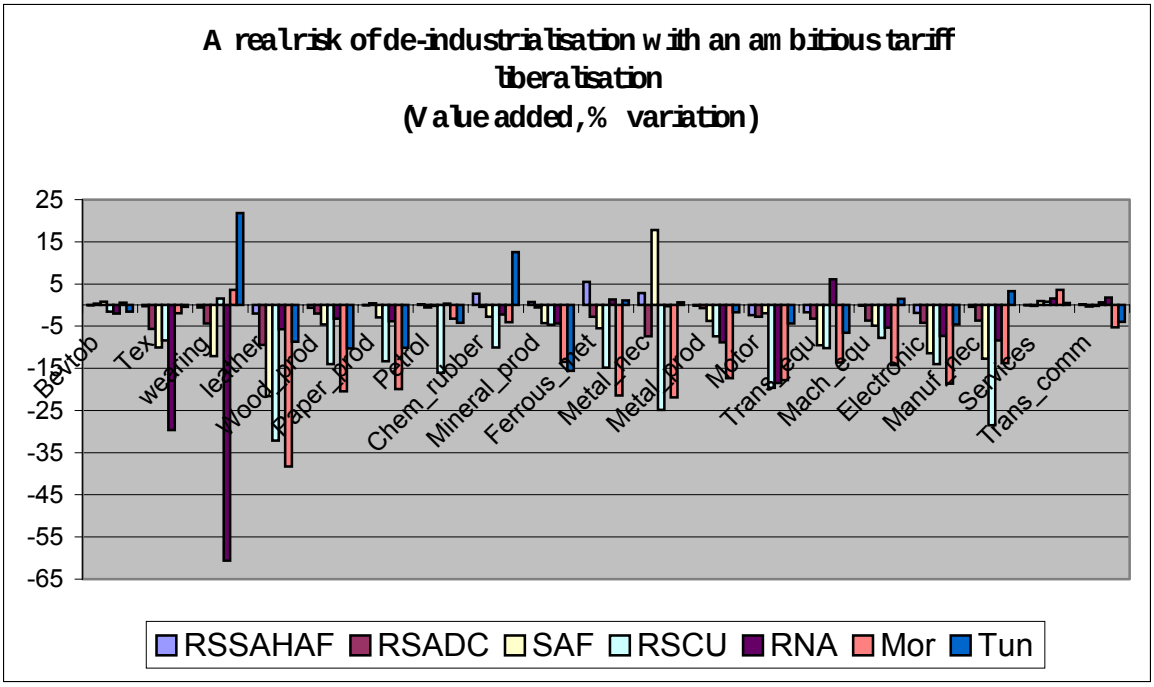

*Impact on value added: a real risk of de-industrialisation*

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, 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. De-industrialisation is of major concern in discussions related to trade. Even without considering the potential impacts of an ambitious liberalisation, the issue of de-industrialisation in some countries within particular regions have been of major concern. 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 figure 9.

Figure 9: The real value added by product (variations in % in relation to the initial situations)




Source: GTAP-6 simulation

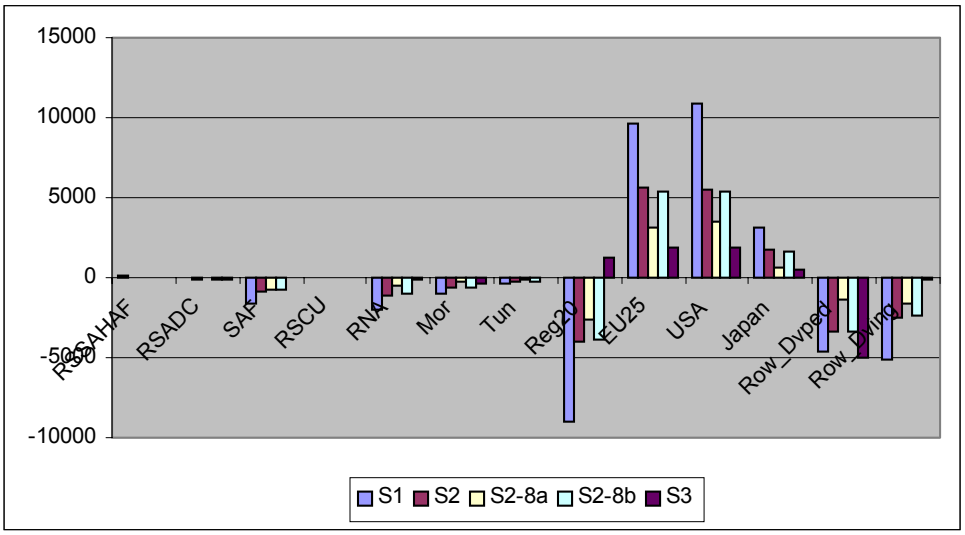
### 8.3 Impact on the trade structure

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. Africa's share in world exports dropped in value from 6.3 per cent in 1980 to 2.5 per cent in 2000.[3]

[3] 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 10: Variations in the trade balance ($US million)



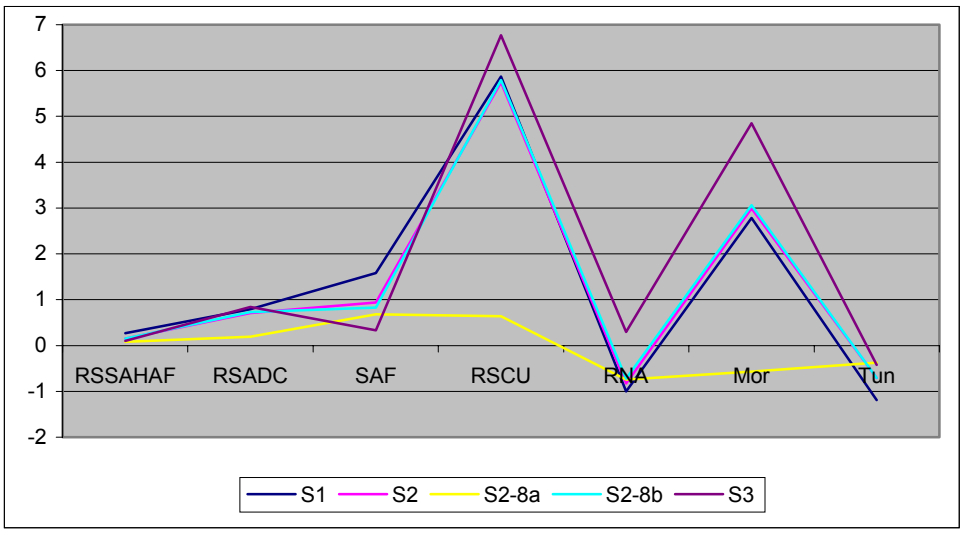

Regardless of the scenario adopted, Africa would see a rise in its imports of industrial products. However, this rise is often more pronounced in the absence of a significant level of S&D treatment (scenario 2a, 2b). Scenario 1 leads to a significant growth of industrial imports in both sub-Saharan Africa 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 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 11: The variations in the terms of trade (%)




Source: GTAP-6 simulation

## 6. 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 of the impact of the reforms put forward by the Hong Kong Ministerial Declaration. The tariff reduction scenarios under review fit in with the commitments undertaken in the ministerial declaration. All the scenarios reviewed are based on a Swiss formula. The first scenario is ambitious, whereas the others are more conservative. Scenarios 2 differ in the way they include the S&D treatment. (Paragraph 8a versus 8b flexibilities)

This analyse emphasizes the fact that Africa would benefit from the liberalization process provided that there is a significant tariff cut reduction implemented by developed countries[4]. Our tariff simulation exercise has shown that 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. This formula should guarantee a significant level of S&D treatment for the developing countries.

In terms of economic impact, the simulations show that a liberalization scenario based on an ambitious 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. This kind of formula has an important inconvenient for African countries. Indeed, it could accelerate the de-industrialisation of African countries and limit the incentives to diversify their economies.

[4] 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.

## ANNEXES

### Sectoral Aggregation

| No. | Code | Description | old sectors |
|---|---|---|---|
| 1 | **Agri_Res** | | Paddy rice; Wheat; Cereal grains nec; Vegetables, fruit, nuts; Oil seeds; Sugar cane, sugar beet; Plant-based fibers; Crops nec; Cattle,sheep,goats,horses; Animal products nec; Raw milk; Wool, silk-worm cocoons; Forestry; Fishing; Coal; Oil; Gas; Minerals nec. |
| 2 | **Meat_Cattle** | | Meat: cattle,sheep,goats,horse. |
| 3 | **Meat_Product** | | Meat products nec. |
| 4 | **VegetableOil** | | Vegetable oils and fats. |
| 5 | **Dairy_Prod** | | Dairy products. |
| 6 | **Rice_Manuf** | | Processed rice. |
| 7 | **Sugar** | | Sugar. |
| 8 | **Food_prod** | | Food products nec. |
| 9 | **Bevtob** | | Beverages and tobacco products. |
| 10 | **Textiles** | | Textiles. |
| 11 | **Wearing** | | Wearing apparel. |
| 12 | **Leather** | | Leather products. |
| 13 | **Wood_prod** | | Wood products. |
| 14 | **Paper_prod** | | Paper products, publishing. |
| 15 | **Petrol** | | Petroleum, coal products. |
| 16 | **Chem_rubber** | | |
| 17 | Chemical,rubber,plastic prods. | | |
| 17 | **Mineral_prod** | | Mineral products nec. |
| 18 | **Ferrous_met** | | Ferrous metals. |
| 19 | **Metal_nec** | | Metals nec. |
| 20 | **Metal_prod** | | Metal products. |
| 21 | **Motor** | | Motor vehicles and parts. |
| 22 | **Trans_equ** | | Transport equipment nec. |
| 23 | **Mach_equ** | | Machinery and equipment nec. |
| 24 | **Electronic** | | Electronic equipment. |
| 25 | **Manuf_nec** | | Manufactures nec. |
| 26 | **Services** | | Electricity; Gas manufacture, distribution; Water; Construction; Trade; Financial services nec; Insurance; Business services nec; Recreation and other services; PubAdmin/Defence/Health/Educat; Dwellings. |
| 27 | **Trans_comm** | | Transport nec; Sea transport; Air transport; Communication. |

**Geographical Aggregation**

*AFRICA*

| | | |
|---|---|---|
| **SSA: Sub-Saharan Africa** | | |
| 1 | **RofSSA** | Madagascar; Uganda; Rest of Sub-Saharan Africa. |
| 2 | **SADC** | Malawi; Mozambique; Tanzania; Zambia; Zimbabwe; Rest of SADC. |
| **NA: North Africa** | | |
| 3 | **Afr_NAMA**[5] | Morocco; Tunisia; {Botswana; Rest of South African CU}; South Africa, Rest of North Africa. (apply the formula) |

*DEVELOPED COUNTRIES*

4 **EU25** Austria; Belgium; Denmark; Finland; France; Germany; United Kingdom; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal; Spain; Sweden; Cyprus; Czech Republic; Hungary; Malta; Poland; Slovakia; Slovenia; Estonia; Latvia; Lithuania.

5 **USA** United States.

6 **Japan** Japan.

7 **ROW_Dvped** Australia; New Zealand; Hong Kong; Korea; Taiwan; Singapore; Canada; Rest of North America; Rest of FTAA; Switzerland; Rest of EFTA; Russian Federation.

*DEVELOPING COUNTRIES*

8 **G20_rep** China; Indonesia; Philippines; Thailand; India; Mexico; Venezuela; Argentina; Brazil; Chile; Uruguay; Rest of South America; Central America.

9 **ROW_Dving** Rest of Oceania; Rest of East Asia; Malaysia; Vietnam; Rest of Southeast Asia; Bangladesh; Sri Lanka; Rest of South Asia; Colombia; Peru; Rest of Andean Pact; Rest of the Caribbean; Rest of Europe; Albania; Bulgaria; Croatia; Romania; Rest of Former Soviet Union; Turkey; Rest of Middle East.

[5] African countries concerned by the tariff reduction cut formula.

SUMMARY TABLES: ECONOMIC IMPACT OF THE LIBERALISATION

Table 3: Equivalent variation in welfare in US million dollars

| **EV** | **S1** | **S2** | **S2-8a** | **S2-8b** | **S3** |
|---|---|---|---|---|---|
| RSSAHAF | 163,45 | 88,52 | 52,31 | 83,85 | 41,04 |
| RSADC | 162,79 | 144,7 | 41,63 | 149,01 | 168,48 |
| SAF | 1114,28 | 700,37 | 512,9 | 643,03 | 187,11 |
| RSCU | 436,14 | 412,2 | 67,01 | 412,93 | 445,84 |
| RNA | 4464,11 | 4386,77 | 3997,48 | 4250,18 | 163,96 |
| Mor | 1028,88 | 919,09 | 242,15 | 901,08 | 755,33 |
| Tun | 100,67 | 81,05 | 58,48 | 77,24 | -79,76 |
| Reg20 | 8980,62 | 7257,19 | 3705,43 | 7147,85 | 6371,84 |
| EU25 | 2182,15 | 3455,46 | 2190,17 | 3483,55 | 3635,32 |
| USA | -3395,31 | -1603,18 | -1118 | -1554,69 | -922,67 |
| Japan | 18741,66 | 16388,31 | 5757,81 | 16274,2 | 14872,4 |
| Row_Dvped | 11444,47 | 8093,48 | 4126,01 | 8001,53 | 5558,08 |
| Row_Dving | 3297,71 | 2356,99 | 1704,57 | 2259,01 | 1050,84 |

Table 4: Variation in GDP, and variation in relation to the initial situation

| **qgdp** | **S1** | **S2** | **S2-8a** | **S2-8b** | **S3** |
|---|---|---|---|---|---|
| RSSAHAF | 0,01 | 0,01 | 0,01 | 0 | -0,01 |
| RSADC | 0,05 | 0,04 | 0,02 | 0,04 | 0,04 |
| SAF | 0,42 | 0,28 | 0,21 | 0,27 | 0,05 |
| RSCU | 0,6 | 0,5 | 0,25 | 0,48 | 0,24 |
| RNA | 2,71 | 2,61 | 2,37 | 2,51 | 0,02 |
| Mor | 1,8 | 1,47 | 0,9 | 1,4 | 0,46 |
| Tun | 1,12 | 0,76 | 0,47 | 0,74 | -0,19 |
| Reg20 | 0,22 | 0,14 | 0,1 | 0,14 | 0,04 |
| EU25 | 0,1 | 0,1 | 0,05 | 0,1 | 0,11 |
| USA | 0,01 | 0,01 | 0 | 0,01 | 0,01 |
| Japan | 0,37 | 0,36 | 0,1 | 0,36 | 0,36 |
| Row_Dvped | 0,22 | 0,19 | 0,08 | 0,19 | 0,2 |
| Row_Dving | 0,21 | 0,13 | 0,11 | 0,13 | 0 |

Table 5: Variation in the trade balance, in US million dollars

| **DTBAL** | **S1** | **S2** | **S2-8a** | **S2-8b** | **S3** |
|---|---|---|---|---|---|
| RSSAHAF | 65,97 | 35,76 | 14,21 | 38,1 | 35,86 |
| RSADC | -50,9 | -65,72 | -12,55 | -69,11 | -90,71 |
| SAF | -1565,98 | -889,11 | -735,44 | -804,74 | -46,87 |
| RSCU | -22,96 | -20,4 | -6,26 | -20,82 | -15,48 |
| RNA | -2010,49 | -1104,44 | -480,53 | -1012,21 | -105,01 |
| Mor | -939,93 | -678,3 | -285,74 | -656,33 | -321,95 |
| Tun | -399,66 | -215,28 | -119,16 | -210,41 | 46,97 |
| Reg20 | -8969,02 | -4048,2 | -2582,5 | -3890,25 | 1283,6 |
| EU25 | 9633 | 5570,29 | 3112,66 | 5384,09 | 1912,48 |
| USA | 10813,81 | 5547,84 | 3488,83 | 5352,63 | 1846,16 |
| Japan | 3102,17 | 1726,78 | 641,6 | 1658,99 | 480,15 |
| Row_Dvped | -4569,9 | -3322,39 | -1402,9 | -3342,51 | -4960,2 |
| Row_Dving | -5086,11 | -2536,84 | -1632,2 | -2427,43 | -65,02 |

Table 6: Variation in terms of trade, % variation in relation to the initial situation

| **tot** | **S1** | **S2** | **S2-8a** | **S2-8b** | **S3** |
|---|---|---|---|---|---|
| RSSAHAF | 0,27 | 0,15 | 0,08 | 0,15 | 0,1 |
| RSADC | 0,79 | 0,71 | 0,19 | 0,73 | 0,84 |
| SAF | 1,58 | 0,94 | 0,68 | 0,83 | 0,33 |
| RSCU | 5,87 | 5,74 | 0,64 | 5,79 | 6,77 |
| RNA | -1 | -0,83 | -0,74 | -0,72 | 0,3 |
| Mor | 2,78 | 2,99 | -0,57 | 3,06 | 4,85 |
| Tun | -1,19 | -0,71 | -0,37 | -0,71 | -0,42 |
| Reg20 | 0,03 | 0,2 | -0,02 | 0,21 | 0,56 |
| EU25 | -0,23 | -0,18 | -0,06 | -0,18 | -0,19 |
| USA | -0,35 | -0,2 | -0,13 | -0,2 | -0,16 |
| Japan | 0,74 | 0,31 | 0,35 | 0,28 | -0,04 |
| Row_Dvped | 0,41 | 0,2 | 0,14 | 0,19 | -0,06 |
| Row_Dving | -0,05 | 0,01 | -0,03 | 0,02 | 0,16 |

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

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**EGYPT**

| Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied | Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *10* | Bound | Without | 19.64 | 27.55 | 6.46 | 64.6% | | *30* | Bound | Without | 19.64 | 27.55 | 10.28 | 42.4% | |
| *10* | 5 | Without | 20.53 | 27.49 | 6.53 | 65.3% | 6.28 | *30* | 5 | Without | 20.53 | 27.49 | 12.79 | 42.6% | 11.43 |
| *10* | 5 | 8(B) | 20.53 | 27.49 | 7.87 | 61.5% | 7.63 | *30* | 5 | 8(B) | 20.53 | 27.49 | 13.74 | 40.0% | 12.49 |
| *10* | 5 | 8(A) | 20.53 | 27.49 | 7.32 | 63.2% | 7.17 | *30* | 5 | 8(A) | 20.53 | 27.49 | 14.50 | 38.3% | 13.36 |
| *10* | 30 | Without | 20.53 | 28.14 | 6.53 | 65.7% | 6.28 | *30* | 30 | Without | 20.53 | 28.14 | 12.79 | 43.1% | 11.43 |
| *10* | 30 | 8(B) | 20.53 | 28.14 | 8.35 | 61.9% | 7.66 | *30* | 30 | 8(B) | 20.53 | 28.14 | 14.84 | 40.5% | 12.54 |
| *10* | 30 | 8(A) | 20.53 | 28.14 | 7.36 | 63.6% | 7.20 | *30* | 30 | 8(A) | 20.53 | 28.14 | 14.65 | 38.8% | 13.42 |
| *15* | Bound | Without | 19.64 | 27.55 | 7.63 | 56.7% | | *35* | Bound | Without | 19.64 | 27.55 | 10.82 | 39.2% | |
| *15* | 5 | Without | 20.53 | 27.49 | 8.60 | 57.3% | 8.06 | *35* | 5 | Without | 20.53 | 27.49 | 13.78 | 39.4% | 12.20 |
| *15* | 5 | 8(B) | 20.53 | 27.49 | 9.81 | 53.9% | 9.31 | *35* | 5 | 8(B) | 20.53 | 27.49 | 14.67 | 37.0% | 13.21 |
| *15* | 5 | 8(A) | 20.53 | 27.49 | 9.68 | 54.5% | 9.27 | *35* | 5 | 8(A) | 20.53 | 27.49 | 15.64 | 34.7% | 14.20 |
| *15* | 30 | Without | 20.53 | 28.14 | 8.60 | 57.8% | 8.06 | *35* | 30 | Without | 20.53 | 28.14 | 13.78 | 39.9% | 12.20 |
| *15* | 30 | 8(B) | 20.53 | 28.14 | 10.48 | 54.4% | 9.35 | *35* | 30 | 8(B) | 20.53 | 28.14 | 15.89 | 37.5% | 13.27 |
| *15* | 30 | 8(A) | 20.53 | 28.14 | 9.75 | 55.0% | 9.32 | *35* | 30 | 8(A) | 20.53 | 28.14 | 15.82 | 35.2% | 14.26 |
| *20* | Bound | Without | 19.64 | 27.55 | 8.75 | 50.8% | | *40* | Bound | Without | 19.64 | 27.55 | 11.27 | 36.5% | |
| *20* | 5 | Without | 20.53 | 27.49 | 10.26 | 51.3% | 9.46 | *40* | 5 | Without | 20.53 | 27.49 | 14.64 | 36.6% | 12.85 |
| *20* | 5 | 8(B) | 20.53 | 27.49 | 11.37 | 48.2% | 10.63 | *40* | 5 | 8(B) | 20.53 | 27.49 | 15.47 | 34.4% | 13.82 |
| *20* | 5 | 8(A) | 20.53 | 27.49 | 11.58 | 47.9% | 10.95 | *40* | 5 | 8(A) | 20.53 | 27.49 | 16.64 | 31.6% | 14.90 |
| *20* | 30 | Without | 20.53 | 28.14 | 10.26 | 51.8% | 9.46 | *40* | 30 | Without | 20.53 | 28.14 | 14.64 | 37.1% | 12.85 |
| *20* | 30 | 8(B) | 20.53 | 28.14 | 12.20 | 48.7% | 10.68 | *40* | 30 | 8(B) | 20.53 | 28.14 | 16.80 | 34.8% | 13.89 |
| *20* | 30 | 8(A) | 20.53 | 28.14 | 11.68 | 48.4% | 11.00 | *40* | 30 | 8(A) | 20.53 | 28.14 | 16.84 | 32.1% | 14.96 |
| *25* | Bound | Without | 19.64 | 27.55 | 9.60 | 46.2% | | *50* | Bound | Without | 19.64 | 27.55 | 11.97 | 32.1% | |
| *25* | 5 | Without | 20.53 | 27.49 | 11.63 | 46.5% | 10.53 | *50* | 5 | Without | 20.53 | 27.49 | 16.06 | 32.1% | 13.91 |
| *25* | 5 | 8(B) | 20.53 | 27.49 | 12.65 | 43.7% | 11.64 | *50* | 5 | 8(B) | 20.53 | 27.49 | 16.81 | 30.2% | 14.81 |
| *25* | 5 | 8(A) | 20.53 | 27.49 | 13.16 | 42.6% | 12.25 | *50* | 5 | 8(A) | 20.53 | 27.49 | 18.29 | 26.6% | 15.93 |
| *25* | 30 | Without | 20.53 | 28.14 | 11.63 | 47.0% | 10.53 | *50* | 30 | Without | 20.53 | 28.14 | 16.06 | 32.6% | 13.91 |
| *25* | 30 | 8(B) | 20.53 | 28.14 | 13.63 | 44.2% | 11.69 | *50* | 30 | 8(B) | 20.53 | 28.14 | 18.31 | 30.6% | 14.88 |
| *25* | 30 | 8(A) | 20.53 | 28.14 | 13.29 | 43.2% | 12.31 | *50* | 30 | 8(A) | 20.53 | 28.14 | 18.54 | 27.1% | 15.99 |

**GABON**

| Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied | Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *10* | Bound | Without | 18.44 | 16.22 | 6.07 | 60.7% | | *30* | Bound | Without | 18.44 | 16.22 | 10.28 | 34.4% | |
| *10* | 5 | Without | 17.34 | 16.22 | 6.07 | 60.7% | 6.0 | *30* | 5 | Without | 17.34 | 16.22 | 10.28 | 34.4% | 9.87 |
| *10* | 5 | 8(B) | 17.34 | 16.22 | 6.58 | 57.7% | 6.4 | *30* | 5 | 8(B) | 17.34 | 16.22 | 10.57 | 32.7% | 10.13 |
| *10* | 5 | 8(A) | 17.34 | 16.22 | 6.68 | 56.7% | 6.6 | *30* | 5 | 8(A) | 17.34 | 16.22 | 11.29 | 27.8% | 10.87 |
| *10* | 30 | Without | 17.34 | 16.22 | 6.07 | 60.7% | 6.0 | *30* | 30 | Without | 17.34 | 16.22 | 10.28 | 34.4% | 9.87 |
| *10* | 30 | 8(B) | 17.34 | 16.22 | 6.88 | 55.7% | 6.4 | *30* | 30 | 8(B) | 17.34 | 16.22 | 11.07 | 32.7% | 10.13 |
| *10* | 30 | 8(A) | 17.34 | 16.22 | 6.67 | 56.7% | 6.6 | *30* | 30 | 8(A) | 17.34 | 16.22 | 11.29 | 27.8% | 10.87 |
| *15* | Bound | Without | 18.44 | 16.22 | 7.63 | 50.9% | | *35* | Bound | Without | 18.44 | 16.22 | 10.82 | 31.1% | |
| *15* | 5 | Without | 17.34 | 16.22 | 7.63 | 50.9% | 7.44 | *35* | 5 | Without | 17.34 | 16.22 | 10.82 | 31.1% | 10.12 |
| *15* | 5 | 8(B) | 17.34 | 16.22 | 8.05 | 48.3% | 7.83 | *35* | 5 | 8(B) | 17.34 | 16.22 | 11.09 | 29.6% | 10.35 |
| *15* | 5 | 8(A) | 17.34 | 16.22 | 8.38 | 45.9% | 8.20 | *35* | 5 | 8(A) | 17.34 | 16.22 | 11.89 | 24.2% | 11.16 |
| *15* | 30 | Without | 17.34 | 16.22 | 7.63 | 50.9% | 7.44 | *35* | 30 | Without | 17.34 | 16.22 | 10.82 | 31.1% | 10.12 |
| *15* | 30 | 8(B) | 17.34 | 16.22 | 8.43 | 48.3% | 7.83 | *35* | 30 | 8(B) | 17.34 | 16.22 | 11.61 | 29.6% | 10.35 |
| *15* | 30 | 8(A) | 17.34 | 16.22 | 8.38 | 45.9% | 8.20 | *35* | 30 | 8(A) | 17.34 | 16.22 | 11.89 | 24.2% | 11.16 |
| *20* | Bound | Without | 18.44 | 16.22 | 8.75 | 43.8% | | *40* | Bound | Without | 18.44 | 16.22 | 11.27 | 28.4% | |
| *20* | 5 | Without | 17.34 | 16.22 | 8.75 | 43.8% | 8.48 | *40* | 5 | Without | 17.34 | 16.22 | 11.27 | 28.4% | 10.32 |
| *20* | 5 | 8(B) | 17.34 | 16.22 | 9.12 | 41.6% | 8.81 | *40* | 5 | 8(B) | 17.34 | 16.22 | 11.52 | 27.0% | 10.53 |
| *20* | 5 | 8(A) | 17.34 | 16.22 | 9.62 | 38.2% | 9.35 | *40* | 5 | 8(A) | 17.34 | 16.22 | 12.38 | 21.2% | 11.40 |
| *20* | 30 | Without | 17.34 | 16.22 | 8.75 | 43.8% | 8.48 | *40* | 30 | Without | 17.34 | 16.22 | 11.27 | 28.4% | 10.32 |
| *20* | 30 | 8(B) | 17.34 | 16.22 | 9.55 | 41.6% | 8.81 | *40* | 30 | 8(B) | 17.34 | 16.22 | 12.06 | 27.0% | 10.53 |
| *20* | 30 | 8(A) | 17.34 | 16.22 | 9.61 | 38.2% | 9.35 | *40* | 30 | 8(A) | 17.34 | 16.22 | 12.38 | 21.2% | 11.40 |
| *25* | Bound | Without | 18.44 | 16.22 | 9.60 | 38.5% | | *50* | Bound | Without | 18.44 | 16.22 | 11.97 | 24.2% | |
| *25* | 5 | Without | 17.34 | 16.22 | 9.60 | 38.5% | 9.26 | *50* | 5 | Without | 17.34 | 16.22 | 11.97 | 24.2% | 10.63 |
| *25* | 5 | 8(B) | 17.34 | 16.22 | 9.93 | 36.6% | 9.55 | *50* | 5 | 8(B) | 17.34 | 16.22 | 12.18 | 23.0% | 10.81 |
| *25* | 5 | 8(A) | 17.34 | 16.22 | 10.55 | 32.3% | 10.20 | *50* | 5 | 8(A) | 17.34 | 16.22 | 13.15 | 16.6% | 11.78 |
| *25* | 30 | Without | 17.34 | 16.22 | 9.60 | 38.5% | 9.26 | *50* | 30 | Without | 17.34 | 16.22 | 11.97 | 24.2% | 10.63 |
| *25* | 30 | 8(B) | 17.34 | 16.22 | 10.40 | 36.6% | 9.55 | *50* | 30 | 8(B) | 17.34 | 16.22 | 12.76 | 23.0% | 10.81 |
| *25* | 30 | 8(A) | 17.34 | 16.22 | 10.55 | 32.3% | 10.20 | *50* | 30 | 8(A) | 17.34 | 16.22 | 13.15 | 16.6% | 11.77 |

**MOROCCO**

| Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied | Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *10* | Bound | Without | 27.12 | 39.17 | 7.94 | 79.4% | | *30* | Bound | Without | 27.12 | 39.17 | 16.93 | 56.6% | |
| *10* | 5 | Without | 27.17 | 39.17 | 7.94 | 79.4% | 7.04 | *30* | 5 | Without | 27.17 | 39.17 | 16.93 | 56.6% | 13.69 |
| *10* | 5 | 8(B) | 27.17 | 39.17 | 9.55 | 75.4% | 8.66 | *30* | 5 | 8(B) | 27.17 | 39.17 | 18.08 | 53.7% | 14.85 |
| *10* | 5 | 8(A) | 27.17 | 39.17 | 8.74 | 77.4% | 7.84 | *30* | 5 | 8(A) | 27.17 | 39.17 | 18.65 | 52.3% | 15.41 |
| *10* | 30 | Without | 27.17 | 39.17 | 7.94 | 79.4% | 7.04 | *30* | 30 | Without | 27.17 | 39.17 | 16.93 | 56.6% | 13.69 |
| *10* | 30 | 8(B) | 27.17 | 39.17 | 9.94 | 75.4% | 8.64 | *30* | 30 | 8(B) | 27.17 | 39.17 | 18.93 | 53.8% | 14.83 |
| *10* | 30 | 8(A) | 27.17 | 39.17 | 8.74 | 77.4% | 7.84 | *30* | 30 | 8(A) | 27.17 | 39.17 | 18.64 | 52.3% | 15.41 |
| | | | | | | | | | | | | | | | |
| *15* | Bound | Without | 27.12 | 39.17 | 10.81 | 72.1% | | *35* | Bound | Without | 27.12 | 39.17 | 18.42 | 52.8% | |
| *15* | 5 | Without | 27.17 | 39.17 | 10.81 | 72.1% | 9.33 | *35* | 5 | Without | 27.17 | 39.17 | 18.42 | 52.8% | 14.61 |
| *15* | 5 | 8(B) | 27.17 | 39.17 | 12.28 | 68.5% | 10.80 | *35* | 5 | 8(B) | 27.17 | 39.17 | 19.50 | 50.2% | 15.69 |
| *15* | 5 | 8(A) | 27.17 | 39.17 | 11.90 | 69.4% | 10.42 | *35* | 5 | 8(A) | 27.17 | 39.17 | 20.29 | 48.2% | 16.49 |
| *15* | 30 | Without | 27.17 | 39.17 | 10.81 | 72.1% | 9.33 | *35* | 30 | Without | 27.17 | 39.17 | 18.42 | 52.8% | 14.61 |
| *15* | 30 | 8(B) | 27.17 | 39.17 | 12.81 | 68.5% | 10.78 | *35* | 30 | 8(B) | 27.17 | 39.17 | 20.42 | 50.2% | 15.68 |
| *15* | 30 | 8(A) | 27.17 | 39.17 | 11.90 | 69.4% | 10.42 | *35* | 30 | 8(A) | 27.17 | 39.17 | 20.29 | 48.2% | 16.48 |
| | | | | | | | | | | | | | | | |
| *20* | Bound | Without | 27.12 | 39.17 | 13.19 | 66.0% | | *40* | Bound | Without | 27.12 | 39.17 | 19.72 | 49.6% | |
| *20* | 5 | Without | 27.17 | 39.17 | 13.19 | 66.1% | 11.04 | *40* | 5 | Without | 27.17 | 39.17 | 19.72 | 49.6% | 15.38 |
| *20* | 5 | 8(B) | 27.17 | 39.17 | 14.54 | 62.7% | 12.39 | *40* | 5 | 8(B) | 27.17 | 39.17 | 20.73 | 47.1% | 16.39 |
| *20* | 5 | 8(A) | 27.17 | 39.17 | 14.53 | 62.7% | 12.38 | *40* | 5 | 8(A) | 27.17 | 39.17 | 21.73 | 44.6% | 17.39 |
| *20* | 30 | Without | 27.17 | 39.17 | 13.19 | 66.1% | 11.04 | *40* | 30 | Without | 27.17 | 39.17 | 19.72 | 49.6% | 15.38 |
| *20* | 30 | 8(B) | 27.17 | 39.17 | 15.20 | 62.7% | 12.37 | *40* | 30 | 8(B) | 27.17 | 39.17 | 21.73 | 47.1% | 16.38 |
| *20* | 30 | 8(A) | 27.17 | 39.17 | 14.53 | 62.7% | 12.38 | *40* | 30 | 8(A) | 27.17 | 39.17 | 21.72 | 44.6% | 17.38 |
| | | | | | | | | | | | | | | | |
| *25* | Bound | Without | 27.12 | 39.17 | 15.21 | 61.0% | | *50* | Bound | Without | 27.12 | 39.17 | 21.89 | 44.1% | |
| *25* | 5 | Without | 27.17 | 39.17 | 15.21 | 61.0% | 12.48 | *50* | 5 | Without | 27.17 | 39.17 | 21.89 | 44.1% | 16.64 |
| *25* | 5 | 8(B) | 27.17 | 39.17 | 16.45 | 57.9% | 13.72 | *50* | 5 | 8(B) | 27.17 | 39.17 | 22.79 | 41.9% | 17.54 |
| *25* | 5 | 8(A) | 27.17 | 39.17 | 16.75 | 57.1% | 14.02 | *50* | 5 | 8(A) | 27.17 | 39.17 | 24.13 | 38.6% | 18.87 |
| *25* | 30 | Without | 27.17 | 39.17 | 15.21 | 61.0% | 12.48 | *50* | 30 | Without | 27.17 | 39.17 | 21.89 | 44.1% | 16.64 |
| *25* | 30 | 8(B) | 27.17 | 39.17 | 17.21 | 57.9% | 13.70 | *50* | 30 | 8(B) | 27.17 | 39.17 | 23.90 | 41.9% | 17.53 |
| *25* | 30 | 8(A) | 27.17 | 39.17 | 16.74 | 57.1% | 14.01 | *50* | 30 | 8(A) | 27.17 | 39.17 | 24.12 | 38.5% | 18.86 |

**SACU (Botswana, Namibia, South Africa and Swaziland)**

| Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied | Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *10* | Bound | Without | 6.78 | 15.93 | 5.02 | 50.2% | | *30* | Bound | Without | 6.78 | 15.93 | 8.83 | 29.6% | |
| *10* | 5 | Without | 7.66 | 15.71 | 5.21 | 52.0% | 2.95 | *30* | 5 | Without | 7.66 | 15.71 | 9.12 | 30.4% | 5.13 |
| *10* | 5 | 8(B) | 7.66 | 15.71 | 7.05 | 48.0% | 4.49 | *30* | 5 | 8(B) | 7.66 | 15.71 | 10.48 | 27.4% | 6.18 |
| *10* | 5 | 8(A) | 7.66 | 15.71 | 5.99 | 49.9% | 2.95 | *30* | 5 | 8(A) | 7.66 | 15.71 | 10.78 | 25.9% | 5.13 |
| *10* | 30 | Without | 7.66 | 16.76 | 5.21 | 53.4% | 2.95 | *30* | 30 | Without | 7.66 | 16.76 | 9.12 | 31.7% | 5.13 |
| *10* | 30 | 8(B) | 7.66 | 16.76 | 7.43 | 48.0% | 2.97 | *30* | 30 | 8(B) | 7.66 | 16.76 | 11.24 | 27.4% | 5.16 |
| *10* | 30 | 8(A) | 7.66 | 16.76 | 5.99 | 49.9% | 2.97 | *30* | 30 | 8(A) | 7.66 | 16.76 | 10.78 | 25.9% | 5.16 |
| | | | | | | | | | | | | | | | |
| *15* | Bound | Without | 6.78 | 15.93 | 6.37 | 42.5% | | *35* | Bound | Without | 6.78 | 15.93 | 9.36 | 27.0% | |
| *15* | 5 | Without | 7.66 | 15.71 | 6.60 | 44.0% | 3.74 | *35* | 5 | Without | 7.66 | 15.71 | 9.67 | 27.6% | 5.41 |
| *15* | 5 | 8(B) | 7.66 | 15.71 | 8.29 | 40.3% | 5.12 | *35* | 5 | 8(B) | 7.66 | 15.71 | 10.94 | 24.8% | 6.37 |
| *15* | 5 | 8(A) | 7.66 | 15.71 | 7.66 | 41.1% | 3.74 | *35* | 5 | 8(A) | 7.66 | 15.71 | 11.46 | 22.8% | 5.41 |
| *15* | 30 | Without | 7.66 | 16.76 | 6.60 | 45.4% | 3.74 | *35* | 30 | Without | 7.66 | 16.76 | 9.67 | 28.8% | 5.41 |
| *15* | 30 | 8(B) | 7.66 | 16.76 | 8.80 | 40.3% | 3.77 | *35* | 30 | 8(B) | 7.66 | 16.76 | 11.76 | 24.8% | 5.44 |
| *15* | 30 | 8(A) | 7.66 | 16.76 | 7.66 | 41.1% | 3.77 | *35* | 30 | 8(A) | 7.66 | 16.76 | 11.46 | 22.8% | 5.44 |
| | | | | | | | | | | | | | | | |
| *20* | Bound | Without | 6.78 | 15.93 | 7.39 | 37.0% | | *40* | Bound | Without | 6.78 | 15.93 | 9.81 | 24.8% | |
| *20* | 5 | Without | 7.66 | 15.71 | 7.64 | 38.2% | 4.33 | *40* | 5 | Without | 7.66 | 15.71 | 10.13 | 25.3% | 5.64 |
| *20* | 5 | 8(B) | 7.66 | 15.71 | 9.21 | 34.8% | 5.58 | *40* | 5 | 8(B) | 7.66 | 15.71 | 11.33 | 22.7% | 6.53 |
| *20* | 5 | 8(A) | 7.66 | 15.71 | 8.94 | 34.7% | 4.33 | *40* | 5 | 8(A) | 7.66 | 15.71 | 12.05 | 20.1% | 5.64 |
| *20* | 30 | Without | 7.66 | 16.76 | 7.64 | 39.6% | 4.33 | *40* | 30 | Without | 7.66 | 16.76 | 10.13 | 26.5% | 5.64 |
| *20* | 30 | 8(B) | 7.66 | 16.76 | 9.81 | 34.8% | 4.36 | *40* | 30 | 8(B) | 7.66 | 16.76 | 12.19 | 22.7% | 5.67 |
| *20* | 30 | 8(A) | 7.66 | 16.76 | 8.94 | 34.7% | 4.36 | *40* | 30 | 8(A) | 7.66 | 16.76 | 12.05 | 20.1% | 5.67 |
| | | | | | | | | | | | | | | | |
| *25* | Bound | Without | 6.78 | 15.93 | 8.19 | 32.9% | | *50* | Bound | Without | 6.78 | 15.93 | 10.52 | 21.3% | |
| *25* | 5 | Without | 7.66 | 15.71 | 8.46 | 33.8% | 4.77 | *50* | 5 | Without | 7.66 | 15.71 | 10.86 | 21.7% | 6.02 |
| *25* | 5 | 8(B) | 7.66 | 15.71 | 9.92 | 30.6% | 5.91 | *50* | 5 | 8(B) | 7.66 | 15.71 | 11.93 | 19.4% | 6.78 |
| *25* | 5 | 8(A) | 7.66 | 15.71 | 9.95 | 29.8% | 4.77 | *50* | 5 | 8(A) | 7.66 | 15.71 | 12.99 | 16.0% | 6.02 |
| *25* | 30 | Without | 7.66 | 16.76 | 8.46 | 35.2% | 4.77 | *50* | 30 | Without | 7.66 | 16.76 | 10.86 | 22.8% | 6.02 |
| *25* | 30 | 8(B) | 7.66 | 16.76 | 10.60 | 30.6% | 4.81 | *50* | 30 | 8(B) | 7.66 | 16.76 | 12.88 | 19.4% | 6.05 |
| *25* | 30 | 8(A) | 7.66 | 16.76 | 9.95 | 29.8% | 4.81 | *50* | 30 | 8(A) | 7.66 | 16.76 | 12.99 | 16.0% | 6.05 |

**TUNISIA**

| Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied | Swiss formula coefficient | Unbound Markup | Fexibility | Average Applied | Initial average bound | New average bound | Average reduction | New average applied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *10* | Bound | Without | 22.45 | 41.82 | 4.10 | 40.9% | | *30* | Bound | Without | 22.45 | 41.82 | 8.76 | 29.3% | |
| *10* | 5 | Without | 22.27 | 34.75 | 7.33 | 73.3% | 6.51 | *30* | 5 | Without | 22.27 | 34.75 | 15.02 | 50.1% | 12.90 |
| *10* | 5 | 8(B) | 22.27 | 34.75 | 9.36 | 69.2% | 8.24 | *30* | 5 | 8(B) | 22.27 | 34.75 | 16.54 | 47.0% | 14.13 |
| *10* | 5 | 8(A) | 22.27 | 34.75 | 8.16 | 71.6% | 7.34 | *30* | 5 | 8(A) | 22.27 | 34.75 | 16.89 | 46.3% | 14.77 |
| *10* | 30 | Without | 22.27 | 46.70 | 8.06 | 80.6% | 7.03 | *30* | 30 | Without | 22.27 | 46.70 | 17.68 | 58.9% | 13.96 |
| *10* | 30 | 8(B) | 22.27 | 46.70 | 11.39 | 76.3% | 8.74 | *30* | 30 | 8(B) | 22.27 | 46.70 | 20.97 | 55.5% | 15.08 |
| *10* | 30 | 8(A) | 22.27 | 46.70 | 8.91 | 79.2% | 7.88 | *30* | 30 | 8(A) | 22.27 | 46.70 | 19.68 | 55.6% | 15.95 |
| *15* | Bound | Without | 22.45 | 41.82 | 5.57 | 37.2% | | *35* | Bound | Without | 22.45 | 41.82 | 9.55 | 27.5% | |
| *15* | 5 | Without | 22.27 | 34.75 | 9.82 | 65.4% | 8.73 | *35* | 5 | Without | 22.27 | 34.75 | 16.28 | 46.5% | 13.79 |
| *15* | 5 | 8(B) | 22.27 | 34.75 | 11.69 | 61.6% | 10.30 | *35* | 5 | 8(B) | 22.27 | 34.75 | 17.71 | 43.6% | 14.93 |
| *15* | 5 | 8(A) | 22.27 | 34.75 | 10.97 | 63.1% | 9.88 | *35* | 5 | 8(A) | 22.27 | 34.75 | 18.33 | 42.4% | 15.80 |
| *15* | 30 | Without | 22.27 | 46.70 | 11.06 | 73.7% | 9.53 | *35* | 30 | Without | 22.27 | 46.70 | 19.36 | 55.3% | 14.94 |
| *15* | 30 | 8(B) | 22.27 | 46.70 | 14.38 | 69.7% | 11.07 | *35* | 30 | 8(B) | 22.27 | 46.70 | 22.63 | 52.1% | 15.95 |
| *15* | 30 | 8(A) | 22.27 | 46.70 | 12.25 | 71.7% | 10.72 | *35* | 30 | 8(A) | 22.27 | 46.70 | 21.56 | 51.6% | 16.90 |
| *20* | Bound | Without | 22.45 | 41.82 | 6.80 | 34.1% | | *40* | Bound | Without | 22.45 | 41.82 | 10.24 | 25.9% | |
| *20* | 5 | Without | 22.27 | 34.75 | 11.85 | 59.3% | 10.42 | *40* | 5 | Without | 22.27 | 34.75 | 17.38 | 43.5% | 14.56 |
| *20* | 5 | 8(B) | 22.27 | 34.75 | 13.59 | 55.7% | 11.86 | *40* | 5 | 8(B) | 22.27 | 34.75 | 18.74 | 40.7% | 15.62 |
| *20* | 5 | 8(A) | 22.27 | 34.75 | 13.28 | 56.4% | 11.85 | *40* | 5 | 8(A) | 22.27 | 34.75 | 19.60 | 39.0% | 16.60 |
| *20* | 30 | Without | 22.27 | 46.70 | 13.60 | 68.0% | 11.34 | *40* | 30 | Without | 22.27 | 46.70 | 20.84 | 52.1% | 15.76 |
| *20* | 30 | 8(B) | 22.27 | 46.70 | 16.91 | 64.2% | 12.72 | *40* | 30 | 8(B) | 22.27 | 46.70 | 24.11 | 49.0% | 16.67 |
| *20* | 30 | 8(A) | 22.27 | 46.70 | 15.09 | 65.5% | 12.84 | *40* | 30 | 8(A) | 22.27 | 46.70 | 23.24 | 48.1% | 17.60 |
| *25* | Bound | Without | 22.45 | 41.82 | 7.85 | 31.5% | | *50* | Bound | Without | 22.45 | 41.82 | 11.42 | 23.1% | |
| *25* | 5 | Without | 22.27 | 34.75 | 13.56 | 54.2% | 11.79 | *50* | 5 | Without | 22.27 | 34.75 | 19.22 | 38.4% | 15.84 |
| *25* | 5 | 8(B) | 22.27 | 34.75 | 15.19 | 51.0% | 13.12 | *50* | 5 | 8(B) | 22.27 | 34.75 | 20.45 | 36.0% | 16.76 |
| *25* | 5 | 8(A) | 22.27 | 34.75 | 15.22 | 50.9% | 13.45 | *50* | 5 | 8(A) | 22.27 | 34.75 | 21.72 | 33.4% | 17.64 |
| *25* | 30 | Without | 22.27 | 46.70 | 15.78 | 63.1% | 12.80 | *50* | 30 | Without | 22.27 | 46.70 | 23.36 | 46.7% | 17.13 |
| *25* | 30 | 8(B) | 22.27 | 46.70 | 19.08 | 59.5% | 14.04 | *50* | 30 | 8(B) | 22.27 | 46.70 | 26.61 | 43.9% | 17.87 |
| *25* | 30 | 8(A) | 22.27 | 46.70 | 17.54 | 60.2% | 14.56 | *50* | 30 | 8(A) | 22.27 | 46.70 | 26.09 | 42.2% | 18.69 |