

MARKET ACCESS IN NON-AGRICULTURAL GOODS: WHAT IS AT STAKE IN THE DEVELOPMENT ROUND?

Comment [HB1]: Il manque aussi l'évolution des tarifs après les divers scénarios

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Abstract

The Doha ministerial declaration concerning market access for non-agricultural products states that negotiations should aim, by modalities to be agreed, to reduce or as appropriate eliminate tariffs, including the reduction or elimination of tariff peaks. This study proposes a CGE assessment of the impact of various modalities of such liberalisation. Scenarios considered include the Girard's proposal (with alternative choices for the involved coefficient), the removal of tariff peaks and complete liberalisation. A special and differential treatment (SDT) for developing countries is also considered. Existing preferential trade arrangements are taken into account exhaustively, based on the *MAcMap* database, and tariff cuts are computed at the HS-6 product level. In addition, in order to assess properly the context in which such liberalisation is likely to take place, a pre-experiment simulation is carried out, including the MFA, China and Russia accession to the WTO, and the extension of AGOA to all sub-Saharan African countries. The impact of these scenarios is finally assessed using MIRAGE, a CGE model incorporating imperfect competition used here in its static version. The results show that liberalising non-agricultural market access is welfare improving at the world level, but that this is mainly due to the removal of tariff peaks. Cross-country distributive impacts prove significant, and are strongly altered by granting developing countries with a SDT.

JEL Classification: D58; F12; F13

Key Words: Market access; Doha Development Agenda; Tariff peaks; Computable General Equilibrium model.

1. INTRODUCTION¹

Cancún's failure crudely recalled how difficult striking a deal between 150 countries over some 20 issues is. A negotiation is a research for a compromise, though, and success mainly depends on the deal found for a handful of sensitive topics, and of the underlying balance of offensive and defensive interests for the main categories of countries. Market access for non-agricultural products is certainly among these important items. Doha's Ministerial declaration states that negotiations should aim "by *modalities to be agreed*, to reduce or as appropriate eliminate tariffs, including the reduction or *elimination of tariff peaks, high tariffs*, and tariff escalation, as well as non-tariff barriers, in particular on products of export interest to developing countries. Product coverage shall be comprehensive and *without a priori exclusions*. The negotiations shall take fully into account the special needs and interests of developing and least-developed country participants, including through *less than full reciprocity in reduction commitments*, (...)".

This agenda for liberalisation of market access for non-agricultural products is ambitious, and the underlying stakes deserves specific attention. This is the aim of this study. Special emphasis is put on developing countries. Development is supposed to be the focus of the Doha Round –as reflected inter alia by the above-cited extract of the Ministerial declaration–, developing countries are almost unanimous in calling for a wide-ranging special and differential treatment (SDT). Nevertheless, many developing countries are reluctant to liberalising market-access for non-agricultural products, and others condition any progress in this area to an improved access to developed countries' market for agricultural products. Do these positions really reflect mixed gains for developing countries as a result of non-agricultural liberalisation, why and according to which pattern? These are the main questions we aim at answering.

Regarding non-agricultural products, one of the key item of the agenda is to define a general formula cutting tariffs on a systematic basis, without excluding a special and differential treatment (SDT) for developing countries, namely less than reciprocal commitments. Such formula approach is rather pragmatic: given the number of interested parties in the negotiation, any means allowing to simplify the negotiation will be preferred (Francois and Martin, 2003). This is why the main proposals made so far have all attempted to propose original formulas.

The US proposal for non agricultural products –branded as "A Tariff-Free World"– suggests using a tariff equaliser (a Swiss formula in practice) driving to a maximum tariff of 8% in 2010, before implementing a second –linear– tariff reduction to zero over 2010-2015. The Japanese formula would allow members to reduce their trade-weighted tariff average to a target level, the coefficient of reduction being increasing with the initial averages. The China's proposal is a more complex Swiss formula taking into account the simple average of the base rates, and a definition of peaks in proportion of this average rate. The European formula defines two intervals of initial tariffs, and applies a formula of reduction within these intervals. In addition, tariff peaks (above 50%) would be all compressed to 25%. Lastly, the

¹ The authors would like to thank Mondher Mimouni (ITC) for his work on MAcMap.

Girard proposal is based on a Swiss formula in which the coefficient of reduction is depending on the initial average rate. Laird et al. (2003) compare the six main proposals.

This formula approach raises various issues. First, since it is applied to *ad valorem* duties or *ad valorem* equivalent of specific duties², the latter equivalents have eventually to be calculated even in the manufacturing sector for certain importers. Second, formulas will be implemented on a tariff line basis. Hence, it is important to model tariff reduction at the detailed level in order to avoid aggregation bias (Martin et al., 2003). Third, formula allowing developing countries to limit their commitments have to be envisaged. In total, how the choice of a formula impacts world trade, factor incomes and welfare of groups of countries interested in the negotiation remains unclear.

Against this background, rather than sticking on specific proposals that will anyway hardly match the conclusion of the ongoing negotiations, this paper aims at addressing 6 scenarios authorising to highlight the main issues at stake in the Development Round. A first scenario is cutting all tariff peaks down to 15%, with the exception of agriculture. A second scenario completely removes tariffs in the non-agricultural sector. The three subsequent scenarios are based on the Girard proposal's formula, using three alternative values for the B coefficient. Lastly, we consider the impact of granting SDT to developing countries. For the sake of simplicity, this is treated as the possibility for developing countries not to reduce their tariffs (combined with a central Girard proposal for developed countries). This latter scenario can also be interpreted as giving priority, for developing countries, to binding tariff on a wider basis, and closer to their applied level. Since the central proposal on the table of the last Ministerial was omitting nuisance tariffs, contrary to US or EU proposals, we do not address this issue here.³

In order to qualify better the results, we rely on information at the most detailed level of existing information, considering various elements such as *ad valorem* tariffs, specific duties, and tariff quotas. *Ad valorem* equivalents of all these instruments are derived from the *MAcMap* database.⁴ We define scenarios at the HS-6 product level. Our liberalisation hypotheses are translated in terms of protection variations, using ad-valorem equivalents for each of these instruments, on a bilateral basis for 137 countries and 220 suppliers. The impacts of these scenarios are then assessed using *MIRAGE*⁵, a CGE model incorporating imperfect competition and horizontal product differentiation. The model is used in its static version. With the exception of protection data, for which *MAcMap* is used as a source, as described above, the model is calibrated using the GTAP 5.3 database (Dimaranan and McDougall, 2002).

² With the exception of the American proposal which aims at directly reducing specific tariffs.

³ See Fontagné *et al.*, 2003, for a detailed analysis of nuisance tariffs.

⁴ Market Access Map is a database of trade barriers jointly developed by ITC and CEPII. A detailed presentation of the methodology used in calculating ad-valorem equivalents is presented in Bouët et al. (2004), available on www.cepii.fr.

⁵ Modeling International Relationships in Applied General Equilibrium.

There are of course limitations associated with such an approach: this exercise will consider cutting *applied* tariffs, whereas negotiations deal with bound tariffs⁶. As some countries have bounded tariffs much above the applied rate, the final reduction in tariffs is more limited than simulated here (see e.g. Walkenhorst and Dihel, 2002). An alternative approach based on standard the GTAP model (static, multi-region, multi-sector, under perfect competition) and data is proposed in Lippoldt and Kowalski (2003).

It is finally worth stressing that this exercise does not aim at giving an evaluation of the gains to be expected for the Round. Other items of the Agenda listed above, such as Singapore issues, are not included here; but their modelling is generally ad hoc⁷. More importantly, our central set of simulation does not capture the gains associated to increased market access, domestic support and export subsidies in agriculture (FAPRI, 2002; Francois *et al*, 2003; Bouët *et al*, 2003; Hoekman *et al*, 2002-b). In the same way, gains to liberalisation in services should be added; but here, we are collectively missing reliable data. In contrast to the current exercise, simulations focusing on the potential gains from the whole Round add all these elements and obtain much higher gains at the world level (World Bank, 2003). We believe that non-agricultural market access deserves a specific analysis, and this is why it is treated separately. Now, this approach of course raises the question of the separability of the topics, not in terms of negotiation (by definition, topics are tied by the single undertaking principle), but in terms of analysis: does adding the impacts found separately for different topics provide with a satisfactory proxy of the global impact? Or, equivalently, does the impact of liberalisation in one field strongly depend on the outcome in other fields? In order to sort this out, the sensitivity analysis presented here includes introducing agricultural liberalisation in the pre-experiment. Since the results show that this does not modify substantially the assessed impact on non-agricultural liberalisation, this validates our assumption that studying separately non-agricultural market access is worthwhile, even though the negotiation covers a large variety of other topics.

The paper is organised as follows. Section 2 presents the model used to simulate the scenarios. Section 3 presents the experiment design and stresses how the baseline has been defined. Section 4 presents the results of the simulations. Section 5 provides with a sensitivity analysis. Section 6 draws the first conclusions.

2. THE MIRAGE MODEL

This Section proposes a very brief overview of the MIRAGE model.⁸ The main characteristics of the model concern the assumptions made about products quality ranges, imperfect competition, and capital. Dynamic aspects are not evoked here since they are not mobilised for this paper. We keep the model as simple as possible in order to authorise the deepest breakdown in terms of sectors and regions.

⁶ With the exception of the US proposal in agriculture.

⁷ See Lippoldt and Kowalski (2003) on trade facilitation, for instance.

⁸ A detailed presentation of Mirage is available in Bchir *et al.* (2002).

Demand

The demand side is modelled in each region through a representative agent, whose utility function is intra-temporal, with a fixed share of the regional income allocated to savings, the rest used to purchase final consumption. Below this first-tier Cobb-Douglas function, consumption trade-off across sectors is represented through a LES-CES function. Each sectoral sub-utility function is a nesting of CES functions, comparable to the standard nested Armington – Dixit-Stiglitz function, with two exceptions. Firstly, products originating in developing countries and in developed countries are assumed to belong to different quality ranges. Their substitutability is therefore assumed to be weaker than the substitutability between products from the same quality range, i.e. between products originating in different developed (developing) countries. Secondly, domestic products are assumed to benefit from a specific status for consumers, making them less substitutable to foreign products than foreign products between each other, within a given quality range.

Supply

Production makes use of five factors: capital, labour (skilled and unskilled), land and natural resources. The first three are generic factors, whereas the last two are specific ones. The production function assumes perfect complementarity between value added and intermediate consumption. The sectoral composition of the intermediate consumption aggregate stems from a CES function. For each sector of origin, the nesting is the same as for final consumption, meaning that the sector bundle has the same structure for final and intermediate consumption.

The structure of value added is intended to take into account the well-documented skill-capital relative complementarity. These two factors are thus bundled separately, with a lower elasticity of substitution (0.6), while a higher substitutability (elasticity 1.1) is assumed between this bundle and other factors.

Constant returns to scale and perfect competition are assumed to hold in agricultural sectors. In contrast, firms are assumed to face increasing returns to scale (through a constant marginal cost and a fixed cost, expressed in output units) in industry and services. In those sectors, firms compete *à la Cournot*, with zero conjectural variations, no Ford effect, and no strategic interaction. Each firm enjoys some market power, and sets its mark-up depending on the extent of product differentiation in the sector, but also of its own market share. This modelling captures the pro-competitive effect of trade liberalisation.

Capital, markets clearing and macroeconomic closure

Capital is assumed to be obtained by assembling intermediate inputs with the same nesting as intermediate consumption. Only the share coefficients differ, and no factor service is required. The capital good is the same whatever the use sector, and capital is assumed to be perfectly mobile across sectors within each region. The basic principles in modelling investment decisions are that the economy-wide level of investment is savings-driven, and that the allocation of investments across sectors stems from sectoral capital rates of return.

At the region-wide level, the capital stock is assumed to be constant in the core simulations of this paper. However, given the potentially high impact on welfare of the assumption made in this respect (see e.g. Francois et al., 1995), the sensitivity analysis includes an alternative

modelling, where the real interest rate is held constant, while the region-wide capital stock is endogenous.

Production factors are assumed to be fully employed, but imperfect mobility is assumed for some production factors so as to take better into account the problems caused by reallocation effects. Installed capital is immobile and market clearing only concerns savings and investment. Natural resources are also perfectly immobile and may not be accumulated. The prices of those last two factors may thus differ among sectors of use. Both types of labour, as well as land, are assumed to be perfectly mobile among sectors. Except capital, all factors are immobile internationally.

As to macroeconomic closure, the current balance is assumed to be exogenous (and equal to its initial value), while real exchange rates are endogenous.

3. EXPERIMENT DESIGN AND PRE-EXPERIMENT SIMULATION

In order to provide with a basis for the simulation exercise, the alternative agendas of tariff cuts considered need to be translated into scenarios, that is in quantified changes of trade barriers in each sector, for each bilateral trade flow between regions. This exercise is carried out here using the *MAcMap* database.

MAcMap (see Bouët et al., 2002, 2004) provides with a measure of ad-valorem tariffs, and of the ad-valorem equivalent of specific tariffs, tariff quotas and anti-dumping duties, at the bilateral level for 137 countries with 220 partners. Preferential arrangements are taken into account in a quasi-exhaustive way. This information is available at the HS-6 digits or tariff line level, according to the country (i.e. at least for 5,000 products). This description of trade barriers, besides its precision, preserves the bilateral dimension of the information, contrarily to what is commonly done in applied modelling. This information refers to applied protection in 2001, and it replaces in our initial database the information given in the GTAP 5.3 database.

This information about applied protection is complemented by a measure of the ad-valorem equivalent (AVE) of MFN duties for each country at the HS-6 digits level. MFN duties are not included in the model itself, but they are used to build the scenarios.

All the scenarios presented below share the following characteristics. They are based on a systematic rule of evolution of the *ad-valorem* tariff equivalent of the four protection instruments (ad-valorem tariffs, specific duties, tariff quotas, anti-dumping duties) considered as a whole. This rule of evolution is conditional to the initial level of the *ad-valorem* tariff equivalent. The calculation is first made separately for each product, at the HS-6 digits level. The liberalisation hypotheses are only applied to non-agricultural products, according to the WTO definition. The liberalised ad-valorem equivalent tariffs obtained as a result of these calculations are then aggregated in the model's classification, in order to make it possible to carry out simulations.

Practically, six scenarios are considered:

- (a) Peaks elimination: peak tariffs in non-agricultural products, i.e. *ad valorem* equivalent tariffs above 15%, are replaced by a 15% AVE tariff.

- (b) Complete liberalisation: tariffs are completely removed for all non-agricultural products.
- (c) Girard 1: tariff cut according to the formula included in Girard's proposal, using a coefficient $B=1$.
- (d) Girard 2: Girard's proposal, coefficient $B=2$.
- (e) Girard 0.65: Girard's proposal, coefficient $B=0.65$.
- (f) Girard 1, North only: Girard's proposal, coefficient $B=1$, tariff cut limited to developed countries.

Scenario (a) corresponds to "eliminating excessive protection", in the words of Hoekman *et al.* (2002). It is intended to assess the actual influence of tariff peaks on non-agricultural trade. Scenario (b) is given for the sake of comparison.

The last four scenarios correspond to variants of the tariff-cutting formula included in the proposal circulated by Ambassador Girard. This formula is defined as:

$$T_1 = \frac{B \times t_a \times T_0}{B \times t_a + T_0}$$

Where B is a coefficient common to all countries, and t_a is the country average protection. In applying this formula, we calculate t_a as the average *ad valorem* equivalent of tariffs applied in non-agricultural products. The average is calculated according to the *MAcMap* aggregation methodology (see Bouët *et al.*, 2002, 2004): countries are gathered in reference groups using a clustering analysis, and imports of the reference groups are used as weights in calculating the average, in order to minimise the endogeneity bias.

WTO negotiations deal with bound tariffs. We do not have this information readily available here, but we use instead MFN tariffs. Girard formula is thus applied to MFN tariffs, giving a lowered MFN, for each country and each product. The liberalised applied tariff is then calculated as the minimum, between the initial applied tariff and the liberalised MFN tariff. In other words, for partners benefiting from a preferential margin in a given market, the liberalisation of their market access, if any, is not as large as it is for MFN tariffs.

Scenario (f), where tariff cuts are limited to developed countries, is considered for two main reasons. Firstly, it is likely that developing countries are entitled to benefiting from a SDT, which can materialise through longer implementation period, but also through lower domestic market liberalisation commitments. Secondly, the binding overhang, i.e. the difference to one of ratio of bound to applied MFN tariffs, is close to zero in most developed countries, but is frequently high in developing countries (Bacchetta and Bora, 2001). As a result, it is likely that, for many developing countries, an agreement under the Doha Round would mainly entail consolidating industrial protection, rather than lowering applied duties. In both these respects, the scenario considered here should be considered as an extreme case, and allow bounds to be given for entailed impacts.

The protection data we rely on deal with year 2001, while any agreement in the Doha Round is unlikely to be enforced before 2006 at the very best. In order to fill this gap, a pre-

experiment simulation is carried out, which includes a bunch of policy changes that are known to be going to take place in the meantime:

- 2004 EU's enlargement. The 10 acceding countries are supposed to adopt the Common External Tariff and to face the same tariffs faced by before 2004 by the EU;
- MFA dismantling. The corresponding quota rents are removed;
- entry of China and Russia to the WTO. No change is made in the protection they apply, for the sake of simplicity, but their exports are assumed to face no more than the MFN tariff, in each market;
- full application of AGOA. In 2001, only a few African countries were qualified for benefiting from this Act, while the majority of them will be qualified in 2005. Accordingly, we adopt a simplifying assumption, by assuming that sub-Saharan African countries face a zero protection in the US market.⁹

The equilibrium of the world economy obtained as a result of this pre-experiment simulation is used as the benchmark for subsequent simulations.

In order to keep the model tractable and to allow for a large regional breakdown, we limit our analysis to 20 sectors, with a focus on non-agricultural goods, in particular in those where huge swings in protection levels have to be expected (such as wearing or leather). The detailed aggregation is provided in Appendix 1. 22 regions are considered. We aimed at identifying major players in the DDA: the Triad members, Canada, Mexico, ANZCERTA, Argentina, Brazil, China, India, Korea, the Tigers, South Asia, Hong-Kong Taiwan and Singapore, SACU, the rest of sub-Saharan African countries (hereafter SSA), the Maghreb, Russia, EFTA, Turkey, and the rest of the world¹⁰ (see details in Appendix 2). Initial average protection for these regions in our benchmark (*i.e.* after the pre-experiment changes) is shown in Table 1. Three groups of exporters are considered separately while measuring this average protection, in order to take into account preferential agreements, as well as differences in unit values (which influence the AVE of specific tariffs¹¹) and in export specialisations.¹²

Without any exception, protection is higher in textile-wearing-leather-shoes (hereafter referred to as textile-wearing, for the sake of simplicity) than in the rest of non-agricultural products, whatever the country and the group of partners. Protection in this sector is seldom inferior to 10%, and frequently above 15%, and developing countries do not face a lower protection than rich ones. In several instances, on the contrary, protection faced by developing countries is higher; this is due both to their specialisation in low unit value exports (for which

⁹ The protection planned in AGOA is not zero for all product, and this assumption may be considered as an optimistic proxy for the effect of AGOA. However, assuming 2001 level of protection to hold in 2005 would probably be worse.

¹⁰ The rest of the world is treated similarly to other regions in terms of tariffs, since we have information on roughly all countries (230 in total).

¹¹ The methodology used here uses the average export unit value of the reference group the exporter belongs to, as a basis for calculating AVE of specific tariffs.

¹² As mentioned above, sector specialisation is accounted for here through the export structure of the exporting country toward the reference group of the importing country.

specific tariffs have a higher AVE), and in product on which protection is higher (of course, this is likely to be highly endogenous).

For other non-agricultural products, protection in industrialised countries is very low (in most cases below 4%), in particular with respect to the poorest ones¹³, although the differences across partners remain limited. The contrast is strong with developing countries, which apply quite substantial protection for these products. Average protection faced by industrialised countries outreaches 10% in Argentina, Brazil, Maghreb, SSA, South Asia, and is as high as almost 32% in India.

Comment [S2]: expliquer l'exception ANZCERTA

Broadly speaking, average protection is clearly inferior in industrialised countries than in developing countries, and higher in the poorest countries. Beyond this general pattern, the Maghreb¹⁴ and most of all India clearly stand as the most protectionist areas.

¹³ ANZERTA stands as a clear exception to this rule, due to its substantial protection in products of interest for poor countries.

¹⁴ The Maghreb includes Algeria and Lybia, which are not WTO members. However, these countries trade relatively little, and as a consequence their protection is weakly weighted when calculating the average for the whole region.

Table 1: Initial average protection for non-agricultural products (AVE tariff duty, %)

Comment [S3]: revoir les intitulés de colonne, laisser un seul chiffre après la virgule, si possible, calculer en plus une moyenne par gpe de pays (ind, dc, poor) et pour le monde, trier les col par sect puis partner

		Textile-wearing, from:				Other industrial prod., from:			
		Industrialised	Developing	Poorest	World	Industrialised	Developing	Poorest	World
Industrialised ctries		8.6	8.3	7.8	8.3	2.9	2.2	1.5	2.7
of which:	EU25	8.2	7.1	6.5	7.2	3.3	2.2	1.8	2.8
	Japan	12.0	13.2	9.1	12.3	2.1	1.8	3.0	2.1
	US	9.7	10.7	10.7	10.3	2.0	1.7	0.6	1.9
	ANZCERTA	13.6	16.4	15.3	15.1	5.8	11.5	16.8	7.5
	Canada	11.8	13.6	13.7	12.8	2.9	1.9	0.9	2.6
	EFTA	1.4	6.5	3.8	4.0	3.5	3.3	1.5	3.4
	HKTaSgp	2.6	2.9	3.0	2.8	3.2	2.2	2.2	2.9
	Korea	10.7	11.8	10.6	11.2	6.5	6.0	6.5	6.4
Developing ctries		14.8	17.2	16.2	15.5	8.8	9.9	9.3	9.1
of which:	Argentina	19.3	18.4	19.5	19.0	13.0	10.5	10.6	12.4
	Brazil	18.3	18.1	17.4	18.2	12.6	9.2	6.9	11.4
	China	16.4	15.7	12.1	16.0	9.3	8.4	7.8	9.0
	Maghreb	33.1	36.8	35.2	34.4	16.0	17.0	18.1	16.4
	Mexico	12.3	26.4	27.5	18.5	8.3	15.7	16.7	10.1
	RoW	10.4	13.0	13.9	11.7	7.6	7.8	8.4	7.7
	RSAm	12.9	12.6	12.0	12.7	8.5	8.8	8.9	8.6
	Russia	16.9	18.8	20.3	17.8	10.0	9.5	11.4	9.9
	SACU	25.4	24.8	25.9	25.3	6.9	9.1	5.0	7.3
	Tigers	14.2	14.1	12.7	14.1	9.8	8.4	7.4	9.3
	Turkey	6.7	12.1	9.1	8.5	3.9	6.4	8.6	4.8
Poorest ctries		33.4	33.4	30.1	33.2	20.1	23.7	18.1	21.2
of which:	AFR	27.1	31.1	32.9	30.2	15.0	16.2	17.4	15.6
	INDIA	42.0	47.4	29.8	44.8	31.7	36.3	27.3	33.0
	SouthAsia	22.2	25.7	22.8	24.1	12.7	15.8	16.6	14.0
World		11.0	10.2	9.2	10.4	4.8	4.3	5.3	4.7

Source: MAcMap database, authors' calculations.

Note: Row headings indicate markets, country groups in column indicate exporters. "DCs" refers to developing countries, other than those included in the "poorest" group.

Given these large initial disparities in protection patterns, the liberalisation scenarios considered have quite different implications across countries (Table 2). Tariffs peaks elimination has virtually no impact on industrialised countries' protection, except in textile-wearing in Japan, Canada and ANZCERTA. In developing countries, it mainly results in a lower protection in textile and wearing. The only regions where the impact is important are the Maghreb and India, and to a lesser extent SSA and South Asia.

Applying the Girard formula with a coefficient $B=1$ has more widespread impact on protection. The impact is still rather weak in developed countries outside textile and wearing, but for this sector the harmonising effect is strong. The harmonising effect is also clear for developing countries, in spite of the presence of the initial average in the formula: for most countries, the final average protection level lies between 3% and 8% in other industrial products, and generally about one point more in textile and wearing. This represents a strong liberalisation, compared to the benchmark level of protection. Quite strikingly, for most developing countries, the resulting protection level does not depend much on the coefficient B chosen in applying the Girard formula. In fact, the regions for which this coefficient really matters are those with a high initial protection level, namely the Maghreb and India. However, it is noteworthy that these are average figures across partners and across products, and that the difference might be far higher in specific cases.

Table 2: Resulting average protection level for each liberalisation scenario, by market (AVE tariff duty, %)

Comment [S4]: res bizarres dans Girard pour AfSud (visiblement faux!). Complete lib'n donne des niveaux non négligeables. Je suppose que c'est à cause des prod exclus (agric peche extraction.)

		Textile-wearing					Other industrial prod.				
		Benchmark	(a) Peaks	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	Benchmark	(a) Peaks	(c) Girard 1	(d) Girard 2	(e) Girard 0.65
Industrialised ctries		8.3	7.7	1.6	1.8	1.4	2.7	2.4	1.3	1.4	1.2
of which:	EU25	7.2	7.1	1.3	1.4	1.2	2.8	2.7	1.2	1.3	1.1
	Japan	12.3	9.3	1.7	1.9	1.6	2.1	2.1	1.6	1.7	1.5
	US	10.3	9.3	2.0	2.3	1.8	1.9	1.8	0.9	1.0	0.7
	ANZCERTA	15.1	11.3	5.0	6.1	4.2	7.5	4.8	2.9	3.6	2.5
	Canada	12.8	11.1	2.2	2.4	2.0	2.6	2.3	1.2	1.4	1.1
	EFTA	4.0	3.4	0.3	0.3	0.2	3.4	2.9	2.6	2.6	2.6
	HKTaSgp	2.8	2.8	1.1	1.4	0.9	2.9	1.8	1.0	1.1	0.8
	Korea	11.2	11.2	3.7	4.5	3.2	6.4	6.3	3.5	4.2	3.0
Developing ctries		15.5	10.9	5.4	6.5	4.6	9.1	7.3	4.5	5.4	3.9
of which:	Argentina	19.0	14.3	7.1	8.7	5.9	12.4	11.2	6.0	7.5	5.0
	Brazil	18.2	14.3	7.0	8.7	5.8	11.4	10.1	5.4	6.8	4.5
	China	16.0	12.9	5.5	6.7	4.6	9.0	7.7	4.5	5.5	3.9
	Maghreb	34.4	13.6	11.0	13.2	9.4	16.4	10.9	8.2	10.1	6.9
	Mexico	18.5	10.1	5.7	6.8	4.9	10.1	8.2	5.0	5.9	4.4
	RoW	11.7	8.5	3.7	4.6	3.1	7.7	6.5	3.9	4.7	3.3
	RSAm	12.7	10.6	4.5	5.6	3.8	8.6	7.7	4.5	5.6	3.9
	Russia	17.8	12.0	5.4	6.6	4.5	9.9	9.2	5.2	6.5	4.3
	SACU	25.3	13.8	23.5	23.6	23.4	7.3	5.9	7.1	7.1	7.0
	Tigers	14.1	10.7	4.8	5.9	4.0	9.3	6.2	3.7	4.4	3.2
	Turkey	8.5	6.4	1.4	1.5	1.2	4.8	4.4	3.0	3.2	2.9
Poorest ctries		33.2	13.6	12.7	15.3	10.9	21.2	13.6	11.9	14.4	10.2
of which:	AFR	30.2	13.5	11.9	13.4	10.8	15.6	11.5	8.6	10.2	7.6
	INDIA	44.8	15.7	17.7	22.5	14.7	33.0	18.9	19.2	23.6	16.4
	SouthAsia	24.1	11.5	8.1	9.8	6.8	14.0	10.0	7.3	8.7	6.4
World		10.4	8.5	2.7	3.1	2.3	4.7	3.9	2.3	2.7	2.0

Source: MAcMap database, authors' calculations.

4. SIMULATION RESULTS

Multilateral liberalisation is generally expected to increase world import prices for the products experiencing largest liberalisation. Indeed, liberalisation tends to increase the demand for imports, therefore inducing an upward pressure on their price. Such a price increase is indeed observed for all scenarios for machinery, other transport equipment, electronic, and metal product (Table 3). However, this is not the case for several other sectors, an in particular for textiles, wearing and leather products: as a result of complete liberalisation (scenario (b)), their average world import price is decreased by respectively 1.4%, 3% and

1.6%. Although to a more limited extent, price declines are also found in several other manufacturing sectors. But the cases of textile, wearing and leather are the most striking, both because the price decline is higher in these sectors, and because their higher initial level of protection might have been expected to lead to higher price increases. How to interpret such an outcome is a key issue for understanding the remaining of the results.

Protection in non-agricultural products is far higher in developing than in developed countries (see Table 1). As a result, imports surge in various developing countries (e.g. Brazilian imports record a 30% increase in volume, and Indian exports a 60% increase). Given that current balance is held constant, this entails real exchange rate depreciation in several developing countries (in particular India, Maghreb, South Asia, SSA, and Brazil), hence a negative impact on their export prices. However, textile, wearing and leather are among the main exporting sectors for a large number of developing countries. And reciprocally, developing countries originate a large part of world exports in these sectors. As a consequence, the concomitant real depreciation of several developing countries induces a kind of crowding out effect: the competitive advantage drawn by each region is limited by the depreciation of the others. This may be interpreted as a heightened price competition in the sector. As a result, although access is liberalised in the main market, prices turn out to decrease. Since this mechanism originates in the own liberalisation of developing country, the price decrease is higher, the deeper the liberalisation. In contrast, world import prices increase in textile, wearing and leather when no market access liberalisation is assumed in developing countries (scenario (f)).

Table 3: Impacts on world import prices (% change)

	(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only
Primary						
Progcrops	-0.43	-1.57	-0.86	-0.66	-0.99	0.03
OtherAg	-0.24	-0.79	-0.44	-0.35	-0.51	-0.01
Livestock	-0.09	-0.46	-0.28	-0.23	-0.31	-0.20
Primary	-0.36	-1.20	-0.64	-0.50	-0.74	0.19
Manufacturing						
Textiles	-0.45	-1.36	-0.69	-0.52	-0.81	0.11
Wearing	-1.14	-2.92	-1.40	-1.05	-1.65	0.47
Leather	-0.49	-1.63	-0.70	-0.46	-0.87	0.53
WoodPap	-0.07	-0.26	-0.20	-0.19	-0.21	-0.28
Chem	0.01	-0.11	-0.05	-0.04	-0.06	-0.10
FerMetals	-0.05	-0.36	-0.09	-0.02	-0.14	0.19
MetalsNec	-0.35	-1.41	-0.70	-0.56	-0.80	-0.29
MetalProd	0.02	0.02	0.11	0.14	0.10	0.07
MotorVeh	0.00	-0.19	-0.16	-0.18	-0.15	-0.33
TrspEqNec	0.10	0.11	0.07	0.06	0.08	-0.16
Electronic	0.04	0.27	0.25	0.28	0.23	-0.10
Machinery	0.15	0.31	0.22	0.20	0.23	-0.02
OtherManuf	-0.29	-0.74	-0.26	-0.13	-0.35	0.30
Services						
ServOth	0.06	0.30	0.15	0.11	0.18	-0.01
Transp	-0.09	-0.21	-0.14	-0.13	-0.15	-0.08
BusServ	0.02	0.28	0.10	0.05	0.14	-0.08

Source: Authors' simulations.

Note: The world GDP price is used as the numeraire.

Let us now consider the impacts of the various scenarios in detail. Eliminating tariff peaks elimination gives raise to an asymmetric liberalisation, as illustrated in Table 2. While protection is hardly decreased in industrialised countries (by 0.6 percentage points in textile-wearing, by 0.3 points in other manufacturing products), average tariff cuts are significant in developing countries (4.6 points in textile, 1.8 points elsewhere), and most of all in the poorest ones, where the average cut reaches almost 8 points in other industrial products, and almost 20 points in textile-wearing. Not surprisingly, Maghreb and India experience especially large average liberalisation under this scenario. Developing regions decrease substantially their protection while the decrease is insignificant in industrialised regions since they have already few tariffs peaks in non-agricultural products. As a result, several developing regions experience substantial import surges (27% in India, 18% in Maghreb, 10% in South Asia) (Table 4). Given the current balance constraint, these countries also experience real exchange rate depreciation, allowing their exports to increase substantially (Table 5).

Table 4: Impacts on industrial imports (in volume), per country (% change)

		(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only
Initial level							
Triad		109.4	1.2	9.7	6.3	5.6	6.8
of which:	EU25	39.1	1.2	12.8	8.2	7.4	8.8
	Japan	15.2	3.4	16.5	11.3	10.2	12.1
	US	55.2	0.6	5.7	3.6	3.1	4.0
Oth_Ind		48.6	0.9	6.8	4.1	3.4	4.5
of which:	ANZCERTA	4.3	2.3	13.2	7.6	6.1	8.7
	Canada	12.3	-0.1	0.5	0.5	0.6	0.4
	EFTA	7.1	0.5	1.4	0.8	0.6	0.9
	HKTaSgp	17.6	1.4	6.2	3.9	3.3	4.4
	Korea	7.3	1.1	20.6	11.5	9.3	13.0
DC		65.9	4.1	17.3	10.4	9.0	11.5
of which:	Argentina	1.9	3.0	26.9	13.2	10.5	15.2
	Brazil	3.6	5.3	30.9	16.2	13.2	18.4
	China	12.9	2.3	20.0	13.1	11.4	14.3
	Maghreb	2.5	17.9	31.6	18.3	15.9	20.1
	Mexico	6.3	1.4	6.0	3.1	2.7	3.4
	RoW	11.5	2.1	11.2	6.5	5.3	7.4
	RSAm	6.6	1.7	12.4	7.1	5.8	8.0
	Russia	3.1	2.4	17.2	10.4	8.4	11.7
	SACU	1.7	4.3	14.4	1.9	1.7	2.0
	Tigers	13.1	8.2	22.8	15.5	13.9	16.6
	Turkey	2.6	2.2	4.8	3.5	3.4	3.6
Poorest		6.6	14.8	35.7	17.3	13.2	20.2
of which:	AFR	2.4	5.8	15.7	9.0	7.3	10.2
	INDIA	2.4	27.3	61.7	26.3	18.5	31.9
	SouthAsia	1.8	10.4	28.7	16.7	14.2	18.5
World		230.5	2.4	12.0	7.3	6.3	8.1

Source: Authors' simulations.

Note: Initial levels are expressed in tens of billions of 1997 US dollars.

Table 5: Impacts on industrial exports (in volume), per country (% change)

	(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only	
Triad	119.7	1.5	9.5	6.0	5.3	6.6	4.4
of which: EU25	46.4	1.5	10.2	6.1	5.2	6.8	3.9
Japan	31.4	2.8	12.7	8.6	7.7	9.2	6.8
US	41.9	0.6	6.2	4.0	3.4	4.3	3.1
Oth_Ind	46.5	1.2	8.1	4.8	4.0	5.4	3.4
of which: ANZCERTA	1.9	7.5	25.0	16.0	13.7	17.5	14.4
Canada	12.0	-0.3	-0.6	-0.2	0.1	-0.4	-0.8
EFTA	7.2	0.0	-1.0	-1.1	-1.3	-1.0	-1.8
HKTaSgp	16.0	1.9	10.0	6.2	5.3	6.9	4.5
Korea	9.3	1.5	19.5	11.1	9.1	12.5	8.6
DC	50.6	4.2	18.1	11.1	9.7	12.1	5.1
of which: Argentina	0.7	9.4	56.5	26.3	21.7	30.1	0.7
Brazil	2.3	3.9	30.7	15.1	12.1	17.3	1.9
China	15.6	2.0	17.5	12.1	10.8	13.0	5.7
Maghreb	0.8	32.7	41.3	18.1	15.6	20.1	-7.9
Mexico	6.5	1.2	5.4	2.7	2.3	3.0	-1.1
RoW	5.0	2.2	11.3	6.5	5.2	7.4	0.6
RSAm	2.2	2.8	18.5	10.8	9.0	12.1	1.7
Russia	2.5	1.6	13.4	9.2	7.9	10.1	2.7
SACU	1.6	3.7	13.2	1.8	1.5	2.0	0.1
Tigers	12.2	7.7	24.3	15.9	14.0	17.2	13.9
Turkey	1.3	9.8	13.9	9.6	9.2	10.0	-2.9
Poorest	4.7	15.3	40.9	19.4	14.8	22.7	3.3
of which: AFR	0.7	5.6	11.1	6.0	4.3	7.3	-2.1
INDIA	2.5	20.9	53.2	22.8	16.2	27.5	4.2
SouthAsia	1.4	10.5	34.3	20.2	17.5	22.2	4.6
World	221.5	2.4	11.8	7.2	6.2	7.9	4.3

Source: Authors' simulations.

Note: Initial levels are expressed in tens of billions of 1997 US dollars.

A full liberalisation of trade in non-agricultural products (a “World Free of Tariffs”, scenario (b)) would increase world trade in volume by 12%. This is almost five times as much as the increase resulting from tariff peaks elimination, but only approximately two times more than under the Girard proposal. The similarity of outcomes across the Girard proposal's application with different B coefficients is remarkable: this means that this coefficient, which determines how much initial average protection by country is taken into account when applying the tariff cut formula, does not make a sizeable difference in terms of aggregate trade impact. In contrast, limiting tariff cuts to developed countries almost halves trade creation.

The distribution of import creation in industrial products across countries closely follows the hierarchy of initial protection: in each scenario except the last one, the highest import increases are registered in India (with a 62% increase in volume following complete liberalisation), followed by the Maghreb and South Asia. Logically, these high-protection countries are also those where the choice of B coefficient in the Girard formula matters most. India, for instance, would register a 32% import increase in volume with $B=0.65$, to be compared to 19% for $B=2$. Imports increases are also fairly strong in Brazil, Argentina, the Tigers and China, outreaching 20% as a consequence of full liberalisation. South Korea is the only developed country where the import surge reaches a similar magnitude. In average, excluding the last scenario, the increase rate of industrial imports turns out to be twice as large in intermediate developing countries than in the poorest ones, and twice as large in developed countries than in intermediate developing countries. And this hierarchy is even more pronounced as a result of tariff peaks elimination. Scenario (f) is the only one exhibiting strongly different results. The application of the Girard formula to rich countries alone logically leads to import increases being concentrated in rich countries.

Comment [SJ5]: pourquoi cette augmentation forte pour les Tigres ??? auraient-ils été inclus dans les pays riches ???

EFTA, Turkey, Canada and Mexico are characterised by very weak import creation. Involved in a deep preferential trade arrangement with a large neighbour, these countries had already largely opened their domestic market for industrial products. Since these arrangements are reciprocal, the mirror image of this effect is a low increase in industrial exports, since multilateral liberalisation entail for these countries an erosion of preferences on their main export market.

Broadly speaking, the impacts observed on exports (Table 5) are strongly linked to those for imports. Since the current is held constant, any ex-ante import surge over and above the export increase would entail real depreciation, hence further (industrial and agricultural) export growth. This is why strong export growth is registered in countries such as Indian, South Asia and the Maghreb, and not because liberalisation would ex-ante create a strong increase in the foreign demand addressed to their products. As a result, industrial exports raise for the poorest developing countries by large amount, above 40% under full liberalisation. Still, export creation is strongly concentrated in few regions exhibiting large initial industrial net exports: Japan, the EU, Hong-Kong – Taiwan – Singapore, China and the Tigers. These six regions account for approximately two-thirds of industrial export creation under full liberalisation. When liberalisation is limited to developed countries, export creation is of course more limited, but this is most of all the case for developing countries. For countries such as Mexico, Turkey or Maghreb, this translates into a reduction in industrial exports, as a result of the erosion of preferences they benefit from on their main export market.

Table 6: Impacts on terms of trade, by region (% change)

		(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only
Triad							
of which:	EU25	0.45	1.03	0.40	0.20	0.53	-0.48
	Japan	0.72	2.83	1.74	1.47	1.92	0.92
	US	0.11	0.14	-0.06	-0.12	-0.02	-0.52
Oth_Ind							
of which:	ANZCERTA	-0.76	-1.89	-1.31	-1.16	-1.41	-1.52
	Canada	-0.04	-0.31	-0.25	-0.22	-0.26	-0.39
	EFTA	0.14	0.39	0.19	0.13	0.23	-0.04
	HKTaSgp	0.07	1.24	0.70	0.58	0.79	0.16
	Korea	0.57	1.30	0.95	0.93	0.96	0.05
DC							
of which:	Argentina	-0.23	-2.79	-1.51	-1.07	-1.81	0.41
	Brazil	-1.00	-4.09	-2.36	-1.92	-2.67	0.42
	China	-0.39	-1.61	-0.24	0.15	-0.50	1.93
	Maghreb	-2.46	-5.37	-3.42	-2.93	-3.78	0.12
	Mexico	-0.34	-1.89	-0.98	-0.75	-1.14	-0.12
	RoW	-0.31	-1.63	-0.77	-0.52	-0.93	0.78
	RSAm	-0.55	-2.92	-1.71	-1.35	-1.94	0.35
	Russia	-0.42	-0.60	-0.17	-0.06	-0.22	0.93
	SACU	-0.58	-1.88	-0.16	-0.16	-0.17	0.36
	Tigers	-0.59	-1.01	-0.77	-0.68	-0.83	-1.14
	Turkey	0.48	-0.27	-0.15	-0.08	-0.19	0.05
Poorest							
of which:	AFR	-1.26	-3.90	-2.31	-1.90	-2.59	0.01
	INDIA	-4.02	-7.06	-2.89	-1.64	-3.72	1.20
	SouthAsia	-1.94	-4.18	-2.30	-1.79	-2.66	1.04

Source: Authors' simulations.

The impacts on terms of trade are fairly contrasted across categories of countries. Broadly speaking, except in scenario (f) liberalisation improves terms of trade in developed countries, and deteriorates them for developing countries. This reflects the fact that, given their higher initial protection level, liberalisation entails higher ex ante import creation than export creation, for developing countries. A real depreciation is therefore necessary in order to maintain the current account balance. This is especially the case for poorest developing countries, as well as for the Maghreb and Brazil, which suffer from a several point deterioration. While such an outcome is expected for these net industrial importers with a high initial protection level, it is more surprising to observe that even countries such as China or the Tigers also suffer from terms of trade deterioration. This has to do with the above-mentioned price lowering observed in textile-wearing-leather-shoes. In this sense, terms of

trade deterioration in these countries most of all results from increased competition on their export markets (since many of their competitors lower their export prices).

Except when they benefit from a SDT (scenario (f)), SSA countries are adversely affected in welfare terms in all scenarios (Table 7). This is the result of preferences erosion (in particular for textiles and clothing in the EU and US market), and of the relative price decline of their main export products (primary and agricultural products). Contrarily to above-mentioned countries such as EFTA, Turkey, Mexico and Canada, the preferences initially benefit from are not reciprocal. eroded by multilateral liberalisation. As a result, multilateral liberalisation does not carry much new export opportunities for SSA countries, while they suffer from heightened competition on their main export market, namely the EU. Since they are initially large net industrial importers, a significant real depreciation is necessary to restore external equilibrium, although initial protection in these countries is lower than for instance, in South Asia. The more ambitious the liberalisation at the world level, the more pronounced the impact. The welfare loss can be large. The equivalent variation of income reaches -1% for SSA countries in the scenario of complete liberalisation.

In total, a slight welfare loss is observed for LDCs as well as for other developing countries, with the exception of the last scenario (SDT). This largely stems from product price changes, and from the terms of trade deterioration involved for developing countries, as described above. Developing countries open substantially their own markets, given their high initial level of protection, but their specialisation, similar from one another and often oriented toward the primary sector, make it even more difficult to create new exports without substantially depreciating their real exchange rate. In addition, the negative competitive shock resulting from lowered protection often induces a decrease in the number of varieties produced domestically, for most industrial sectors. This has a negative impact on consumers' welfare, which is not necessarily balanced by the easier access to foreign products.

As a matter of fact, excepted in the last scenario, the bulk of the gains accrue to developed regions. These gains mainly stem from an improved access to export market, entailing sizeable terms of trade gains. "Offensive interests" are thus dominant here, in particular as far as Asian developed countries are concerned. The number of domestic firms generally raises, thus increasing the variety of goods available to the consumers, who in addition also benefit from an easier access to foreign goods (although this effect is weak, due to the limited magnitude of initial protection). In the production of non-agricultural goods characterised by increasing returns to scale, increased output also translates into efficiency gains.

This very uneven distribution of the global welfare gains associated with a multilateral liberalisation of trade in non-agricultural products must not be considered as a case for protectionism. As already stressed, gains associated to liberalisation in agriculture and services are missing here, and dynamic gains should be envisaged. Moreover, it has to be checked whether the set of assumptions considered here bears any responsibility in such outcome.

The results for India and Maghreb might seem puzzling. While these regions are the two most protectionist ones and present some similarities in their exports structure (strongly oriented toward textiles and clothing), they exhibit opposite outcomes: India features as the greatest loser in all scenarios, whereas Maghreb is the greatest winner in the first scenario. This explanation is mainly twofold. Firstly, liberalisation entails higher consumer gains in Maghreb because initial protection is very inefficient, with not only a high average level, but also a strong contrast across products and partners. Scenario (a), for instance, involves a

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decrease of the standard deviation of protection across partners and sectors from 0.25 to 0.09 in Maghreb (as compared to a decrease from 0.23 to 0.13 in India). Secondly, the adjustment in India entails a large output decrease in several fragmented sectors (chemistry, ferrous and metals products, other metal products, motor vehicles, other transport equipments and wood and paper). Since these are sectors where adjustment takes place mainly through changes in the number of firms and varieties, this leads to a large decrease in the number of domestic varieties, with negative consequences for consumers' surplus.

Turning to factor rewards, and contrary to the fears of impoverishment of blue collars facing competition from the low-wages countries, no sizeable impact on unskilled labour compensation is found in the North (Table 8). The impact is negligible in the U.S. and in Europe, and slightly positive in Japan under the central Girard scenario. Second, the competitive mechanisms identified above translate into a negative impact of unskilled labour in developing countries, especially in Africa. Once again, escaping from these unfortunate outcomes requires an asymmetric liberalisation process, as in our last scenario. To some extent, this is a justification of the SDT conceded so far to the developing countries in the successive rounds.

A diagnosis in terms of global change in welfare of an economy is not sufficient. Changes in real incomes by production factor within each economy must also be considered. Low-skilled workers are of particular interest, since this factor is the main source of income for the bulk of poor households. Since unskilled labour is abundant in developing countries, the textbook expected outcome (following in particular the Stolper-Samuelson theorem) is that liberalisation should raise the real wages of unskilled workers. This is not the type of outcome recorded here, though. Unskilled relative wages do not decline in developing countries –on the contrary, the fall is stronger for skilled real wages-, but their small relative gain does not compensate the already mentioned aggregate losses. Broadly speaking, the distributive impact of the shock does not appear to be sizeable, whatever the scenario.

Table 7: Impacts on welfare, per country (equivalent variation, % change)

		(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only
	Initial level (GDP)						
Triad	1,953	0.07	0.21	0.12	0.10	0.14	0.01
of which: EU25	752	0.08	0.21	0.10	0.07	0.12	-0.05
Japan	406	0.13	0.51	0.35	0.31	0.37	0.23
US	795	0.04	0.09	0.05	0.04	0.05	-0.03
Oth_Ind	235	0.12	0.31	0.21	0.19	0.23	0.02
of which: ANZCERTA	43	0.13	-0.13	0.03	0.07	0.00	-0.06
Canada	58	0.01	-0.01	0.00	0.01	-0.01	-0.07
EFTA	38	0.05	0.14	0.06	0.03	0.08	-0.04
HKTaSgp	51	0.15	0.91	0.49	0.39	0.57	0.12
Korea	44	0.30	0.79	0.59	0.57	0.60	0.16
DC	512	0.02	-0.51	-0.16	-0.07	-0.22	0.10
of which: Argentina	31	0.01	-0.46	-0.20	-0.13	-0.25	0.03
Brazil	72	-0.03	-0.38	-0.16	-0.12	-0.20	0.03
China	84	-0.10	-0.93	-0.33	-0.17	-0.43	0.43
Maghreb	20	0.81	-0.39	0.38	0.57	0.23	0.05
Mexico	39	0.09	-0.36	-0.02	0.04	-0.07	-0.07
RoW	90	-0.03	-0.66	-0.28	-0.17	-0.35	0.19
RSA	44	-0.13	-1.05	-0.53	-0.40	-0.62	0.05
Russia	44	0.03	0.18	0.25	0.26	0.25	0.31
SACU	13	0.00	-0.48	0.08	0.07	0.08	0.09
Tigers	55	0.13	-0.45	-0.11	-0.03	-0.17	-0.34
Turkey	19	0.16	0.11	0.06	0.04	0.07	0.00
Poorest	74	-0.35	-1.30	-0.44	-0.24	-0.58	0.11
of which: AFR	20	-0.18	-1.23	-0.59	-0.42	-0.70	-0.02
INDIA	39	-0.47	-1.38	-0.34	-0.11	-0.51	0.14
SouthAsia	15	-0.30	-1.18	-0.48	-0.32	-0.60	0.20
World	2,775	0.06	0.05	0.06	0.07	0.06	0.03

Source: Authors' simulations.

Note: Initial levels are expressed in tens of billions of 1997 US dollars.

The type of broad assessment carried out should obviously be considered very carefully, and much caution is necessary when it turns to drawing any policy conclusion. The assessed impact necessarily depends on numerous hypothesis and parameter, and it requires an in-depth sensitivity analysis. In the present case, competitive pressures and how developing countries' exports react to price movements is a central piece in the explanation. Hence the need to address the robustness of the results to changes in the trade elasticity as well as, and may be more importantly, in the structure of the model.

Table 8: Impacts on the real wages of unskilled labour, by region (% change)

		(a) Peaks elimination	(b) Complete liberalization	(c) Girard 1	(d) Girard 2	(e) Girard 0.65	(f) Girard 1, North only
Triad		0.08	0.26	0.15	0.12	0.17	0.02
of which:	EU25	0.10	0.23	0.10	0.06	0.13	-0.08
	Japan	0.20	0.81	0.55	0.50	0.59	0.39
	US	0.02	0.03	0.01	0.00	0.01	-0.07
Oth_Ind		0.15	0.57	0.40	0.37	0.42	0.12
of which:	ANZCERTA	0.12	-0.30	-0.03	0.05	-0.08	-0.11
	Canada	-0.04	-0.16	-0.11	-0.08	-0.12	-0.18
	EFTA	0.10	0.27	0.14	0.10	0.16	-0.02
	HKTaSgp	0.15	1.67	1.00	0.85	1.11	0.48
	Korea	0.47	1.45	1.07	1.03	1.10	0.49
DC		-0.12	-1.01	-0.37	-0.20	-0.48	0.30
of which:	Argentina	0.02	-0.59	-0.28	-0.18	-0.35	0.05
	Brazil	-0.22	-1.04	-0.55	-0.44	-0.63	0.11
	China	-0.14	-1.09	-0.16	0.09	-0.34	1.02
	Maghreb	0.37	-1.61	-0.47	-0.14	-0.71	-0.01
	Mexico	-0.02	-0.66	-0.19	-0.09	-0.27	-0.11
	RoW	-0.25	-1.54	-0.76	-0.54	-0.90	0.25
	RSAm	-0.27	-1.69	-0.85	-0.63	-1.00	0.16
	Russia	-0.16	-0.46	-0.06	0.05	-0.13	0.52
	SACU	-0.13	-0.81	0.04	0.04	0.04	0.16
	Tigers	0.06	-0.25	-0.04	0.03	-0.08	-0.37
	Turkey	0.04	-0.24	-0.19	-0.17	-0.20	0.07
Poorest		-0.76	-2.14	-0.80	-0.46	-1.04	0.30
of which:	AFR	-0.44	-2.00	-1.01	-0.75	-1.18	0.04
	INDIA	-1.09	-2.53	-0.75	-0.31	-1.07	0.41
	SouthAsia	-0.51	-1.45	-0.56	-0.34	-0.73	0.49
World		0.03	0.00	0.06	0.07	0.04	0.09

Source: Authors' simulations.

Comment [HB7]: L'analyse de sens se contente de d'une comparaison entre le modèle central et les variante voir remarque 6

5. SENSITIVITY ANALYSIS

In what follows, we use as a benchmark the results obtained in the previous section with the Girard proposal (coefficient 1). Accordingly, the first column in Table 9 and Table 10 (entitled 'Mirage') simply reproduces column (c) in Table 4 and Table 7.

The first issue is trade elasticities. The values used in our benchmark simulations are those used in the GTAP model¹⁵ (Hertel, 1997). As pointed out for instance by Harrison et al. (1997), differences in (Armington type) substitution elasticities strongly influence the assessed impact of multilateral liberalisation, in terms of trade but also of welfare, and it is arguable whether higher elasticities should not be used. To test for the sensitivity of the results in the present case, an alternative simulation is carried out using doubled values for all substitution elasticities between products in the model. A back of the envelope calculation would double the change in world exports if one doubles the elasticity. This is roughly what we get there, with now a 12% increase in world exports under the central Girard scenario, despite slight departures from this rule of thumb on a country-by-country basis. With an expected 15% increase in exports for developing countries and twice as much for LDCs, the trade response should be large enough to overcome the adverse effects encountered so far. This is not the case however: whereas losses in welfare are reduced for LDCs as a whole and driven to zero for the rest of developing countries, our results remain qualitatively unchanged. Gains are concentrated in the North, and there are still sizeable welfare losses in SSA. Countries for which this larger responsiveness of exports is really worth are those having offensive interests in non-agricultural products: the Maghreb, the Tigers and India.

But the parameterisation of the model is not the only usual suspect. We must now address the robustness of results to a change in the structure of the model.

An alternative departure from our initial set of assumption is to switch from imperfect to perfect competition. By getting rid of increasing returns and variety effects, the corresponding simulation (reported in the third column of Table 9 and Table 10) allows several issues referred to above to be clarified. World exports increase is higher than in the benchmark simulation. As far as the developing world is concerned, this is a particularly pronounced change for Brazil, China and India. Still, the benefits reaped by SSA countries, in terms of exports, remain limited. All in all, LDCs see their welfare loss concentrated on SSA, while the remaining developing countries are globally better off, in particular China. Latin America remains on the negative side however. By difference, these results show that a significant part of the losses previously found for many developing countries is largely linked to the decline in the number of domestic firms and varieties in several manufacturing sectors. Even apart from these aspects, though, the difficulties to be faced by SSA countries if they are not conceded asymmetrical trade liberalisation remain apparent.

Comment [HB8]: Est ce que l'histoire de la variété évoqué avant joue un rôle ici

Comment [S9]: Page: 18
je ne comprend pas ce résultat, j'attendais le contraire et un examen plus approfondi des résultats ne m'a guère aiguillé sur le pourquoi du comment...

¹⁵ More specifically, for each sector, the Armington elasticity of substitution used in the GTAP model to describe the sourcing choice between different origins (including the domestic one) is used here as the default value to describe the sourcing between different foreign providers (substitution between domestic and imported product is described at a previous level, with an elasticity value divided by the square root of 2).

Table 9: Compared impacts on industrial exports of the Girard proposal (B=1) under different model's specifications, per country (% change in volume)

		Mirage	Sigma x 2	Perfect comp'n	No vertical diff'n	K endog	Mirage, after agric lib'n
Triad		6.10	10.55	7.03	7.63	6.23	6.03
of which:	EU25	6.36	11.13	8.20	8.29	6.30	6.24
	Japan	8.57	14.68	8.08	10.13	9.45	8.46
	US	4.00	6.92	4.95	5.06	3.78	3.98
Oth_Ind		4.54	7.49	5.30	5.21	5.37	4.68
of which:	ANZCERTA	13.57	26.75	14.32	17.41	13.49	13.88
	Canada	-0.35	-1.02	0.37	-0.30	-0.79	-0.33
	EFTA	-0.98	-2.37	-0.71	-0.88	-1.01	-0.27
	HKTaSgp	6.28	9.59	6.98	6.90	8.03	6.33
	Korea	10.96	19.50	12.34	12.16	13.08	10.95
DC		9.12	15.87	11.37	11.95	9.41	9.12
of which:	Argentina	21.41	42.60	22.58	22.82	20.08	21.93
	Brazil	14.37	28.70	19.91	18.52	12.60	14.15
	China	11.72	19.57	17.89	18.18	12.69	11.62
	Maghreb	11.14	22.11	14.99	14.75	10.53	10.65
	Mexico	2.40	5.08	3.45	3.93	1.02	2.41
	RoW	5.29	9.30	7.52	7.47	5.53	5.35
	RSAm	7.05	13.72	10.14	10.46	4.99	7.03
	Russia	5.85	9.75	7.51	7.73	6.31	5.89
	SACU	1.85	3.01	3.22	2.20	2.46	2.03
	Tigers	14.46	23.39	11.87	14.76	15.94	14.66
	Turkey	9.48	20.15	10.60	10.10	10.57	9.20
Poorest		14.96	29.29	21.37	21.02	13.86	14.92
of which:	AFR	3.90	7.04	5.99	5.43	2.71	3.90
	INDIA	22.63	43.80	31.85	31.46	20.64	22.45
	SouthAsia	20.37	34.63	27.73	27.80	20.51	20.37
World		6.86	11.97	8.28	8.71	7.14	6.86

Source: Authors' simulations.

Another possible change in the structure of the model is to get rid of the vertical differentiation of products. *MIRAGE* is assuming that products are differentiated according to their origin (North, South) into two qualities (resp. low, high). One might criticise such assumption on the ground of intra-firm trade, international sub-contracting, outsourcing practices, etc. After all, one does not care where his sportswear has been produced, given it is the fashionable brand. We contemplate the relaxation of such assumption in the columns 'non vertical differentiation' of Table 9 and Table 10. Not surprisingly, relaxing such assumption has a clear positive impact on exports from the South. The main winners here are Brazil, China, the Maghreb, South Asia and India. This is not enough, however, to reverse the conclusions of our central scenario. We do not depart from our uneven case in which the

South as a whole hardly reaped welfare gains from a liberalisation in non-agricultural products, due to adverse terms of trade effects.

Table 10: Compared impacts on welfare of the Girard proposal (B=1) under different model's specifications, per country (equivalent variation, % change)

		Mirage	Sigma x 2	Perfect comp'n	No vertical diff'n	K endog	Mirage, after agric lib'n
Triad		0.12	0.14	0.09	0.13	0.46	0.12
of which:	EU25	0.10	0.11	0.09	0.11	0.35	0.09
	Japan	0.35	0.40	0.25	0.37	1.79	0.35
	US	0.05	0.06	0.03	0.05	-0.02	0.04
Oth_Ind		0.21	0.37	0.23	0.27	0.91	0.20
of which:	ANZCERTA	0.03	0.32	0.00	0.15	-0.11	0.01
	Canada	0.00	0.04	-0.04	0.00	-0.24	0.00
	EFTA	0.06	0.07	0.16	0.06	0.11	0.05
	HKTaSgp	0.49	0.56	0.53	0.59	2.23	0.49
	Korea	0.59	1.03	0.65	0.68	3.21	0.56
DC		-0.16	0.05	0.05	-0.11	-0.80	-0.16
of which:	Argentina	-0.20	-0.08	-0.11	-0.24	-2.09	-0.22
	Brazil	-0.16	-0.06	-0.04	-0.14	-3.01	-0.18
	China	-0.33	-0.31	0.25	-0.41	1.18	-0.33
	Maghreb	0.38	1.74	0.69	0.60	-1.43	0.39
	Mexico	-0.02	0.23	0.04	0.09	-1.84	-0.02
	RoW	-0.28	-0.14	-0.06	-0.19	-0.43	-0.27
	RSAm	-0.53	-0.45	-0.26	-0.43	-2.76	-0.54
	Russia	0.25	0.51	0.32	0.34	0.61	0.25
	SACU	0.08	0.10	0.14	0.19	0.15	0.07
	Tigers	-0.11	0.39	0.00	-0.10	1.32	-0.14
	Turkey	0.06	0.13	0.16	0.11	0.73	0.03
Poorest		-0.44	-0.14	-0.08	-0.39	-1.93	-0.44
of which:	AFR	-0.59	-0.33	-0.35	-0.42	-1.92	-0.59
	INDIA	-0.34	-0.03	0.02	-0.37	-2.36	-0.33
	SouthAsia	-0.48	-0.17	0.03	-0.41	-0.81	-0.48
World		0.06	0.14	0.09	0.09	0.20	0.06

Source: Authors' simulations.

A last change in the structure of the model is worth testing. In our six scenarios, the comparative static was assuming a fixed stock of capital, while its reward was adjusting. In columns 'K endogenised', we reverse this by assuming within each region, that capital stock is endogenous, while the real return to capital is held constant. For a given region, the impact of such closure is mainly linked to the ex-ante impact on the marginal productivity of capital. Broadly speaking (given the weak distributive impact of the shock studied here), this results in practice in a magnification of the magnitude of welfare changes, whatever their sign.

Welfare gains are magnified, as well as welfare losses in the South. The exceptions are China and the Tigers.

Finally, the results might also be sensitive to the design of the simulation exercises, and not to the structure of the model or its parameterisation. Indeed, we consider trade liberalisation in non-agricultural products alone, negotiations concern other aspects, and in particular agricultural products. This might influence the assessment, mainly because agricultural liberalisation has an impact on trade specialisation and on the sectoral allocation of resources. In order to control this possible influence, while still focusing on the item of the Agenda we are interested in, we introduce agricultural liberalisation in the pre-experiment. This is done in the last column of Table 9 and Table 10: all instruments of protection in agriculture (tariffs, domestic support, export subsidies) are halved in all countries in the pre-experiment (in addition to Russian and Chinese accession, the dismantling of MFA quotas, and after the introduction of the New Farm Bill, the Agenda 2000 and the 2003 decoupling of the CAP). This last change hardly affects the results. Such outcome does not mean that there are no additional gains to liberalising agriculture. But these gains are already incorporated in the pre-experiment, hence not visible in our simulation focusing on agricultural products, and the results show that studying separately agricultural and non-agricultural product does not introduce any significant bias.

In total, this sensitivity analysis has not, so far, reversed the conclusions of the previous section: liberalisation gains are unevenly shared among countries, with a clear North-South divide.

6. CONCLUSION

This paper considers various scenarios of interest in the context of liberalisation of market access in non-agricultural products in the Development Round, and assesses their impact using *MIRAGE*, a CGE model conceived to study trade policies. The approach, based on detailed information (as provided by *MAcMap*), intends to provide a more accurate evaluation of the gains associated with trade liberalisation: working at too aggregated a level, or using biased aggregators, might minimise the gains (Martin *et al.*, 2003), while missing trade preferences might lead to significantly overstate the gains to be expected from the conclusion of the Round, and to misstate the distribution of the impact across countries.

The six scenarios considered here are based on a systematic rule of evolution of the ad-valorem tariff equivalent of protection tabulated at the 6-digit level of the HS nomenclature, which is conditional to the initial level of the ad-valorem equivalent tariff. They cover three specific issues: tariff peaks, the value of the B parameter in the Girard formula, and special and differential treatment for developing countries.

Concerning the first issue, and contrary to the popularised view that tariff protection has vanished, we stress that there is still scope for liberalisation even in industrial sectors. This is why dismantling tariff peaks would impact significantly world trade. However, even a conservative “Girard approach”, with a B coefficient equal to 2, would provide much more trade gains than such eradication of peaks.

As far as the B coefficient is concerned, we would not recommend spending too much time in the negotiation to handle such issues. Compared to gains to be obtained by making progress

on other fronts (such as agriculture or services), it is not clear that the return on investment would be very large.

Lastly, the SDT, in its extreme formulation considered here (namely the possibility conceded to developing countries of binding only their tariffs, without cutting applied duties), reaches its objective of limiting adverse moves in prices. However, we point out to a reduction in South-South trade, as well as general equilibrium effects limiting even imports in the North under such scenario. These two mechanisms largely limit the benefits to be expected from the SDT.¹⁶ However, with the SDT, welfare losses in the South vanish, due to less unfavourable moves in terms of trade.

These results should not come as a surprise to many trade economists; but the value added of this paper is to authorise tackling such issues in a CGE model, while relying on detailed information for tariffs. Our results pointing out to adverse terms of trade effects and welfare losses in the South will also lead trade economists to identify a handful of suspects: improper trade elasticity, imperfect competition, vertical differentiation of products, absence of capital accumulation, and resources flying towards the agricultural sector. The sensitivity analysis conducted here addresses all these potential explanations of our slight departure from the conventional wisdom that trade and welfare go hand in hand. Qualitatively, our results are not reversed however, even though assuming perfect competition limits the occurrence of negative figures.

Additional gains to the conclusion of the Round have to be kept in mind when looking at the rather pessimistic outcomes of our exercise. Gains associated to the liberalisation in agriculture and services should be very large, as the potential benefits of progress to be made on other topics such as trade facilitation, for instance. More generally, it is well known that opening the economy is the very source of positive externalities. Opening the economy is also a self-binding decision of governments aiming at conducting a series of reforms. Hence, policy recommendations suggested by our results should contemplate capacity building, adjustment programs and diversification of exports as the relevant tools; not protectionism.

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¹⁶ It is not worth stressing that in addition, countries gain first of all to their own liberalization. This long term outcome also limit the benefits of the SDT.

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Appendix 1: Sector aggregation

Comment [SJ10]: Il faudrait présenter ce tableau avec une seule ligne par secteur du modèle, et donnant l'un à la suite de l'autre le nom des secteurs GTAP qui y sont inclus.

Code	GTAP sector	Sector of the model	Type of competition (Perfect/Imperfect)
pdr	Paddy rice	Progcrops	Perfect
wht	Wheat	Progcrops	Perfect
gro	Cereal grains nec	Progcrops	Perfect
v_f	Vegetables, fruit, nuts	OtherAg	Perfect
osd	Oil seeds	Progcrops	Perfect
c_b	Sugar cane, sugar beet	Progcrops	Perfect
pfb	Plant-based fibers	Progcrops	Perfect
ocr	Crops nec	Progcrops	Perfect
ctl	Cattle, sheep, goats, horses	Livestock	Perfect
oap	Animal products nec	Livestock	Perfect
rmk	Raw milk	Livestock	Perfect
wol	Wool, silk-worm cocoons	OtherAg	Perfect
for	Forestry	OtherAg	Perfect
fsh	Fishing	OtherAg	Perfect
col	Coal	Primary	Perfect
oil	Oil	Primary	Perfect
gas	Gas	Primary	Perfect
omn	Minerals nec	Primary	Perfect
cmt	Meat: cattle, sheep, goats, horse	Livestock	Imperfect
omt	Meat products nec	Livestock	Imperfect
vol	Vegetable oils and fats	OtherAg	Imperfect
mil	Dairy products	Livestock	Imperfect
pcr	Processed rice	Progcrops	Imperfect
sgr	Sugar	Progcrops	Imperfect
ofd	Food products nec	OtherAg	Imperfect
b_t	Beverages and tobacco products	OtherAg	Imperfect
tex	Textiles	Textiles	Imperfect
wap	Wearing apparel	Wearing	Imperfect
lea	Leather products	Leather	Imperfect
lum	Wood products	WoodPap	Imperfect
ppp	Paper products, publishing	WoodPap	Imperfect
p_c	Petroleum, coal products	Primary	Imperfect
crp	Chemical, rubber, plastic prods	Chem	Imperfect
nmn	Mineral products nec	Primary	Imperfect
i_s	Ferrous metals	FerMetals	Imperfect
nfm	Metals nec	MetalsNec	Imperfect
fmp	Metal products	MetalProd	Imperfect
mvh	Motor vehicles and parts	MotorVeh	Imperfect
otn	Transport equipment nec	TrspEqNec	Imperfect
ele	Electronic equipment	Electronic	Imperfect
ome	Machinery and equipment nec	Machinery	Imperfect
omf	Manufactures nec	OtherManuf	Imperfect
ely	Electricity	ServOth	Imperfect
gdt	Gas manufacture, distribution	ServOth	Imperfect
wtr	Water	ServOth	Imperfect
cns	Construction	ServOth	Imperfect
trd	Trade	ServOth	Imperfect

otp	Transport nec	Transp	Imperfect
wtp	Sea transport	Transp	Imperfect
atp	Air transport	Transp	Imperfect
cmn	Communication	BusServ	Imperfect
ofi	Financial services nec	BusServ	Imperfect
isr	Insurance	BusServ	Imperfect
obs	Business services nec	BusServ	Imperfect
ros	Recreation and other services	ServOth	Imperfect
osg	PubAdmin/Defence/Health/Educat	ServOth	Imperfect
dwe	Dwellings	ServOth	Imperfect

Appendix 2 Country aggregation

Comment [SJ11]: Idem que pour tableau précédent : une ligne par zone du modèle

Code	GTAP country	Region in the model
aus	Australia	ANZCERTA
nzl	New Zealand	ANZCERTA
chn	China	China
hkg	Hong Kong	HKTaSgp
jpn	Japan	Japan
kor	Korea	Korea
twm	Taiwan	HKTaSgp
idn	Indonesia	Tigers
mys	Malaysia	Tigers
phl	Philippines	Tigers
sgp	Singapore	HKTaSgp
tha	Thailand	Tigers
vnm	Vietnam	SouthAsia
bgd	Bangladesh	SouthAsia
ind	India	INDIA
lka	Sri Lanka	SouthAsia
xsa	Rest of South Asia	SouthAsia
can	Canada	Canada
usa	United States	US
mex	Mexico	Mexico
xcm	Central America, Caribbean	RSAm
col	Colombia	RSAm
per	Peru	RSAm
ven	Venezuela	RSAm
xap	Rest of Andean Pact	RSAm
arg	Argentina	Argentina
bra	Brazil	Brazil
chl	Chile	RSAm
ury	Uruguay	RSAm
xsm	Rest of South America	RSAm
aut	Austria	EU25
bel	Belgium	EU25
dnk	Denmark	EU25
fin	Finland	EU25
fra	France	EU25
deu	Germany	EU25
gbr	United Kingdom	EU25
grc	Greece	EU25
irl	Ireland	EU25
ita	Italy	EU25
lux	Luxembourg	EU25
nld	Netherlands	EU25
prt	Portugal	EU25
esp	Spain	EU25
swe	Sweden	EU25
che	Switzerland	EFTA
xef	Rest of Eur Free Trade Area	EFTA
alb	Albania	RoW
bgr	Bulgaria	RoW
hrv	Croatia	RoW

cze	Czech Republic	EU25
hun	Hungary	EU25
mlt	Malta	EU25
pol	Poland	EU25
rom	Romania	RoW
svk	Slovakia	EU25
svn	Slovenia	EU25
est	Estonia	EU25
lva	Latvia	EU25
ltu	Lithuania	EU25
rus	Russian Federation	Russia
xsu	Rest of Former Soviet Union	RoW
cyp	Cyprus	EU25
tur	Turkey	Turkey
xme	Rest of Middle East	RoW
mar	Morocco	Maghreb
xfn	Rest of North Africa	Maghreb
bwa	Botswana	AFR
xsc	Rest of South Afr C Union	SACU
mwi	Malawi	AFR
moz	Mozambique	AFR
tza	Tanzania	AFR
zmb	Zambia	AFR
zwe	Zimbabwe	AFR
xf	Other Southern Africa	AFR
uga	Uganda	AFR
xss	Rest of Sub-Saharan Africa	AFR
xrw	Rest of World	RoW