Direct measure of protection: a rehabilitation

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Abstract:

This paper aims at rehabilitating **direct** measures of protection. Arguments in favour of a measurement of protection at the most detailed level are considered firstly. Detailed information raises aggregation issues. It also raises issues related to the practical implementation of the methodology: a very detailed analysis – conducted at the tariff line level – will hardly be applied on an exhaustive basis and one has to check whether a calculation at the HS6 level introduces or not large and systematic biases. Thus, agreggation procedures and implementation issues will also be tackled. Finally we use all this tariff information in order to evaluating national protection averages, the importance of tariff peaks, degree of discrimination between exporters, and international similarities between protection structures.

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1 INTRODUCTION

There is now a consensus on the evidence that improving market access is still an « *unfinished business* » (WTO, 2002). Protection levels remain high in certain sectors and induced distortions are sizeable. Least developed countries are severely affected by tariff peaks in sensitive products, in agriculture and in labour intensive manufactures. Hoeckman et al. (2001) record more than 1,000 HS6 positions affected by tariff peaks[1] in the Quad. Distortions may be magnified not only by the dispersion of national protection levels across sectors, but also by the existence of an intricate network of regional agreements and trade preferences. Lastly, even if the magnitude of internal support in agriculture is a concern for negotiators, reducing barriers at the border is the source of larger export and welfare gains for developing countries (Hoeckman et al., 2002). But what is the precise impact of such barriers remains an avenue for research: new trade arrangements are permanently added to the "*spaghetti bowl*"; the precise impact of these preferences remains unclear; the degree of bounding may matter; there might be a substitution between protection instruments, etc. This is why the profession should pay attention to a reliable measure of protection levels.

Recent developments in the literature on protectionism have emphasized the use of indirect measures, such as border effect (see Head & Mayer, 2001, for example) or residuals of gravity equations (Wall, 1999). This is a very useful avenue of research, because it allows to capture non tariff barriers. At the same time, it is generally too aggregated to provide useful information for policy purposes, and what is exactly captured remains subject to scrutiny. Alternatively, Bradford (2003) is implementing a methodology relying on a detailed comparison of prices within the OECD (associated with the PPA project) in order to derive price differentials between domestic and world market. The ratio of these two prices (the nominal protection ratio) would be the right information on protectionist attitudes. Still, such methodology is limited to countries in which price data is available (ie OECD countries), it hardly relies on recent data, and it captures all hindrances to trade and not only those that can be impacted by policy.

Against this background, this paper aims at rehabilitating **direct** measures of protection. Arguments in favour of a measurement of protection at the most detailed level are considered firstly. Detailed information raises aggregation issues. It also raises issues related to the practical implementation of the methodology: a very detailed analysis – conducted at the tariff line level – will hardly be applied on an exhaustive basis and one has to check whether a calculation at the HS6 level introduces or not large and systematic biases. Thus, agreggation procedures and implementation issues will also be tackled. Finally we use all this tariff information in order to evaluating national protection averages, degree of discrimination between exporters, and international similarities between protection structures.

2 TACKLING ARGUMENTS IN FAVOUR OF A DETAILED APPROACH

Using the MAcMaps information system (Bouët, Fontagné, Mimouni et Pichot, 2002), and relying on recent improvements of this system, we firstly address traditional arguments in favour of detailed approaches to evaluating trade policies.

Preferences granted by importers are intricate. A limited number of exporters bear the MFN tariff on their exporting markets, and such tariff should be considered as the "less unfavourable tariff" to be applied to any member of the WTO. Regional arrangements, bilateral agreements, preferential access granted to developing countries under the GSP scheme, specific schemes (ACP), and more recently various initiatives in favour of LDCs (AGOA, EBA, 99% initiative,…) make the picture even more complex.

This is why *protection should be measured on a bilateral basis*. We compare the level of national global protections (for all products and instruments) using bilateral versus MFN tariffs. In the first case, bilateral tariffs means applied preferential tariffs. The difference between the two measures provides a crude estimation of the degree of discrimination in international trade. Incidentally, it sheds light on the measurement error introduced in studies that do not address this issue (Messerlin, 2001 ou Francois Mc Donald et Nordström, 1995). Lastly, shocks of trade liberalisation should be simulated at the most detailed level. We compare the impact of a scenario of trade liberalisation on average protection, when the shock is applied at different levels of aggregation.

2.1 "Bilateralisating" protection data

Instruments used by importers are increasingly complex since the Uruguay round has aimed at replacing various non-tariff measures by tariffs (ad valorem, specific, tariff quotas).

The first step of our analysis is to present the true level of national protection at the border, as it is implied by the integration of all protectionist instruments and of all trading regimes (customs unions, free trade areas, preferential agreements…). Table 1 gives the global rate of real protection for 137 countries in 2000 by adding all instruments of which an ad valorem equivalent has been calculated. It includes specific tariffs, tariff quotas and anti-dumping. Such calculation relies on strong assumptions concerning the aggregation across countries and products. We are relying on those developed in MAcMaps, which will be described extensively below. We just ask the reader to skip provisionally this methodological issue.

[1] International definition : MFN rate >=15%

Table 1: global rate of protection – 2000 – Quad + countries (2001, %)

aus	15.2
bra	10.9
can	6.7
che	8.8
EU	3.9
ind	25.8
Jpn	10.7
Nor	6.4
Nzl	3.1
USA	4.3

(Source: MAc Maps)

The worldwide (simple) average of national border protections (as estimated by MAcMaps) is 11.6%; global market access ranges from 0% (Hong-Kong) to 84.8% (Bermuda). Roughly one half of the sample (47% of reporters) has an average protection above 10%, one tenth above 20%.

The protection of European Union' s countries is 3.9%, which is slightly lower [2] than the American one (4.3%), but substantially smaller than the Japanese one (10.7%). The latter figure must be explained, since it is generally expected that Japanese protection is much lower. Re-calculating the same average with national imports as weights, we get a 4.90% average. This exercise confirms that half of the observed average protection of Japan is due to the endogeneity bias: Japan is importing less in tariff lines that are more protected. This issue will be extensively addressed below.

These comparisons are based on a huge amount of information indeed, and we will restrict in what follows on an enlarged Quad, adding countries of interest in terms of protectionist attitude, namely Norway and Switzerland which are highly protectionist in agriculture and largely rely on specific tariffs, Australia and New-Zealand which are free-traders in contrast, and lastly two developing countries relying or not on regional arrangements: Brazil and India. According to our terminology, this group of eight countries is called "Quad+" and will be use as a methodological benchmark.

The previous orders of magnitude are however averages only. As already pointed out, the institutional architecture allows each country to impose a different level of protection to each national exporter. Firstly, countries sign custom unions, free trade areas, and unilaterally grant preferential access to certain categories of exporters. Second, some exporters may benefit from lower than average duty, just because of their specialisation, as importers very rarely rely on a uniform tariff across products. Third, unit

[2] If we had considered the European Union as a unique trading zone, the level of protection would have been higher than the US one, as a result free trading of each European country with all 14 others countries of the zone.

values of exports differ across exporters for the same item, what raises the issue of different ad valorem equivalents if one relies on bilateral unit values to compute these tariff equivalents.

Table 3 highlights this uneven distribution in agriculture[3], providing various statistics on the distributions of each importing country' bilateral *average* protections. The same information is provided in table 4 for manufactures. With the exception of India and Australia, this confirms that the subject of trade liberalisation negotiation is agriculture.

Table 3: Distribution of average bilateral protection across exporters: Quad+, 2001, %, Agriculture

Reporter	Max	Min	Mean	Median	Variance
AUS	185.1	0.0	13.1	3.1	6.3
BRA	20.4	0.0	12.4	12.5	0.1
CAN	102.3	0.0	15.5	6.6	4.0
EU	131.1	0.0	16.8	12.4	3.2
India	176.9	0.0	25.1	20.2	5.5
JPN	268.4	1.8	38.0	25.1	21.2
NOR	284.2	0.6	26.8	16.5	11.0
NZL	55.7	0.0	3.5	1.2	0.5
CHE	170.7	0.0	33.6	26.4	7.9
USA	51.7	0.0	12.0	10.3	0.9

Note: Weighted mean across products and simple mean over partners. Min, Max Median and Variance also refer to bilateral means for all agricultural products.

Some countries do not practice any trade discrimination amongst potential exporters as they do not administrate several trade regimes (no free trade area or custom union and no preferential regimes in favour of developing countries) and as inter-product tariff dispersion is zero. This is the case of free traders like Singapore and Hong-Kong, but also of Chile which taxed any import by a unique tariff of 8% and which had no preferential regime in 2000. On the other side, some countries like Egypt, Yugoslavia… impose very different rate of protection to different exporters...

[3] Classification on products along GTAP and IMF categories is provided in appendix.

Table 4 : Distribution of average bilateral protection across exporters: Quad+, 2001, %

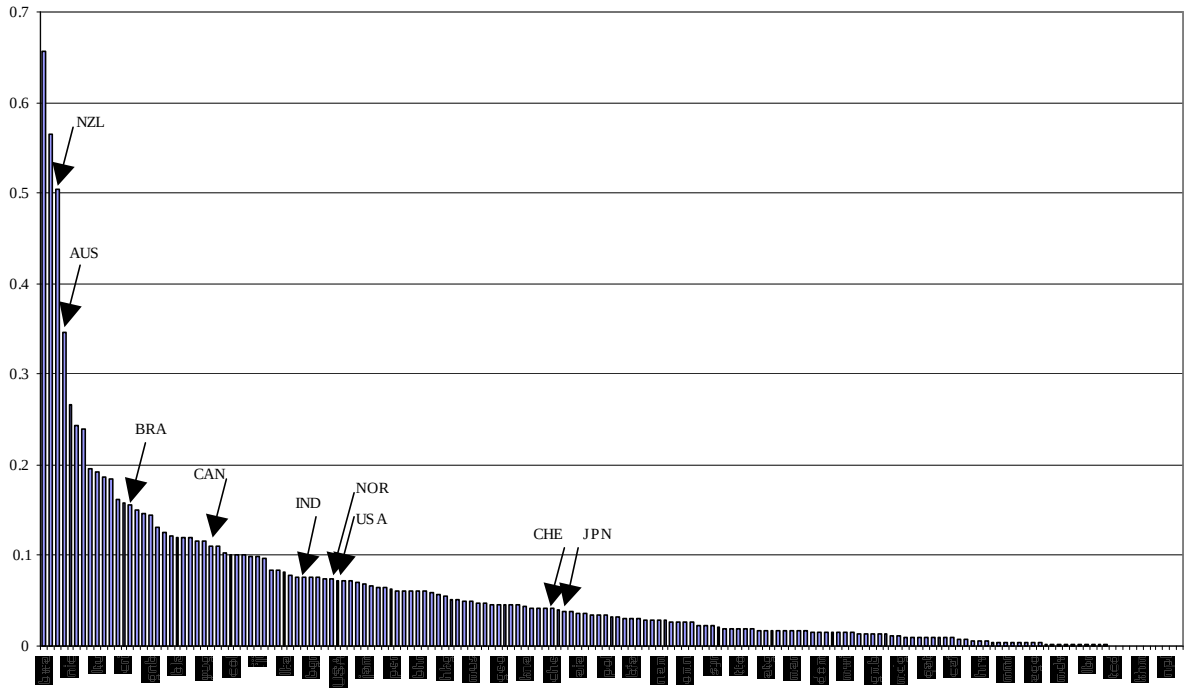
Industry

Reporter	Max	Min	Mean	Median	Variance
AUS	82.1	0.4	15.4	9.5	2.3
BRA	21.2	0.0	9.4	10.4	0.2
CAN	19.2	0.0	3.9	2.0	0.2
EU	10.0	0.0	1.3	0.0	0.1
India	99.5	0.3	25.9	26.6	0.8
JPN	51.5	0.0	3.8	1.4	0.5
NOR	14.8	0.0	0.9	0.1	0.0
NZL	20.8	0.0	3.5	2.3	0.2
CHE	9.0	0.0	1.3	0.2	0.0
USA	62.5	0.0	3.7	1.5	0.5

Note: Weighted mean across products and simple mean over partners. Min, Max Median and Variance also refer to bilateral means for all manufactured products.

Figure 1 presents this distribution of bilateral protection for European Union. For 67 among 185 exporting countries, France has a 0.0% rate of bilateral protection. For 33 other countries, this figure is strictly inferior to 1%. But for 19 exporters, it is greater than 10%, ranging from 10.6% for Honduras to 44.1% for Uruguay ! This last figure comes from tiny preferential margins granted by trade regime GSP and from the concentration of European peaks on products exported by Uruguay. Countries specialised in those products heavily protected by the EU are de facto granted limited access: this is also the case for Australia on the European market for instance.

Figure 1: Average bilateral protection levels, UE, 2001



2.2 Disentangling preferential access from specialisation

In the previous exercise, two dimensions were interacting when one aims are characterising the bilateral level of protection. An exporter will face an average tariff rate below the average either because it is granted preferential access (in terms of reduction compared to MFN tariff rates), or because this exporter is specialised in products facing limited barriers to trade in the destination market. In order to clearly identify what is the impact of preferential access per se, one must held the trade structure constant and change the tariffs. Indeed, specialisation is not of an exogenous nature: exporters are concentrating their resources in less protected products in their destination markets. But such outcome cannot be measured.

In order to focus on preferential access only, we must re-estimate the national level of protection taking into account only multilateral instruments (ad valorem and specific tariffs, tariff quotas but not anti-dumping duties) and the unique MFN regime. Table 2 gives this estimated multilateral protection for the same 10 countries of our Quad+ in 2000.

Table 2: MFN versus preferential tariffs

To be completed

(Source: MAc Maps)

Up to now, we have skipped aggregation and implementation issues in order to stick on the core motivation of our approach. It is time to clarify this point by examining the impact of selecting one scheme of aggregation. In principle, *protection should not be aggregated using national imports*, just because there is an obvious strong endogeneity bias. Despite this evidence, "weighted" averages are very often presented. Against this background we examine different weighting schemes, starting from the tariff line level, and compare the results. In a second step, we check whether doing calculations using the more tractable HS6 level for trade figures introduces a systematic and sizeable bias in the results.

2.3 Shocks on detailed data

Liberalisation shocks should be assessed using detailed data: when a formula is used, either the threshold (tariff bands) or the level of tariff data at the detailed level matter. Reducing all tariff peaks to a 15% maximum has not the same meaning for a category comprising two products facing tariffs 10 % and 30% and representing 80% and 20% of imports respectively; at the product level the average protection of the category will be reduced by 3 percentage points from 14%, an average which is below the 15% threshold.

Thus, exercises concerning sectors comprising numerous tariff peaks request detailed information on tariffs and other measures.

When the formula is applied to the full set of tariff lines on a systematic basis, and if one relies on averages, of course the impact of implementing the formula at different levels of aggregation does not matter so much: averaging before reducing tariffs or reducing tariffs before calculating the average does not lead to very different results if the dispersion of tariffs across tariff lines is not too large. This can be checked by applying a Swiss formula (coefficient 20) to the observed protection of the Quad+ in 2001.

We observe the expected compression of tariffs with the formula, but averaged on all products and partners, the difference between aggregation levels is of second order, even if the tariff reduciton is decreasing in the aggregation level.

Table: Swiss formula (coeff. 20) applied to all products at the HS6/4/2 levels, Quad+, 2001 (%)

	Baseline	Swiss formula		
	HS6	HS6	HS4	HS2
UE	3.89	1.76	1.78	1.89
USA	4.35	2.49	2.52	2.63
Australia	15.20	5.91	5.95	6.23
Brazil	10.94	6.56	6.62	6.78
Canada	6.70	2.57	2.61	2.79
Switzerland	8.80	2.42	2.50	2.74
India	25.84	10.10	10.18	10.46
Japan	10.69	2.94	2.96	3.11
Norway	6.35	1.07	1.16	1.34

New-Zealand	3.12	2.31	2.34	2.43

Source: calculation on MAcMaps

However, this does not mean that aggregation procedures are clear-cut. We have to address this key issue now.

3 AGGREGATION PROCEDURES AND IMPLEMENTATION ISSUES

We limit our analysis in this section to a sub-sample of countries for which information on trade flows is available at the tariff line level used for notifications to the WTO. This authorises to compute tariff equivalents of specific tariffs and tariff quotas with precision. We will be forced to depart from this detailed level when we aim at drawing a complete picture of the protection in the world. In the latter case, the HS6 digit level must be used.

3.1 Aggregation procedures

We first need to calculate ad valorem equivalents (AEV) of all instruments. Thus, when all tariff instruments and trade flows are merged in the database, we first compute a tariff equivalent for each specific tariff, for every concerned tariff line. To do so, one has to rely on a **unit value**, and there are several possibilities. One can rely:

- on the bilateral unit value between exporter and importer;
- on the average unit value of imports from the country-group the exporter belongs to;
- on the average unit value of the importer;
- on the world unit value for the tariff position considered.

The very last solution is not practicable at the tariff line level since one misses information on trade at this detail level for numerous countries. Incidentally, it would anyway be a hardly tractable solution, given the different level of disaggregation of the HS6 by importing countries.

There are now at least 3 alternative procedures for aggregating AEV being calculated at the tariff line level. In any case, a **weighting scheme** has to be defined. We can use:

- a simple average on observed tariffs (lines with missing imports are excluded from the average);
- a weighted average using national imports;

- a weighted average using imports of a reference group.

At these two stages of calculation, we need to define a certain **country grouping**. One can rely on:

- ad hoc grouping (LDCs, other developing countries,…): this will be referred to in the following as the "development-level-group" solution;

- on a clustering analysis grouping countries according to their characteristics in terms of openness or specialisation;

- lastly, one can group countries according to the trade regime they do face (GSP, ACP, …): this is will be referred to below as the "preference-group" solution.

Concerning the first step (calculation of AVEs), we rely in this section alternatively on the *bilateral unit value* or on the average *unit value of imports from the "preference-group"* of countries the exporter belongs to. When this unit value will be missing, the average unit value of the importer will be used. This is explained in the table below: for Afghanistan, the average unit value of countries benefiting from the EBA initiative is considered. For the U.S., the average unit value of exports of countries facing MFN tariff in the EU market is considered. Etc.

Concerning the second step, in which computed all tariff equivalents have to be aggregated across products within sectors, we will alternatively rely on a *simple average* of tariff lines where imports are observed, and on a *weighted average based on "development-level" grouping*.

These approaches are exemplified in the table below. According to what we call by convenience a "full regional approach", we combine "preference reference" grouping for unit values with "development-level grouping" for aggregation. Conversely, the "bilateral approach" here combines bilateral unit values and a simple average limited to lines for which trade is recorded on a bilateral basis.

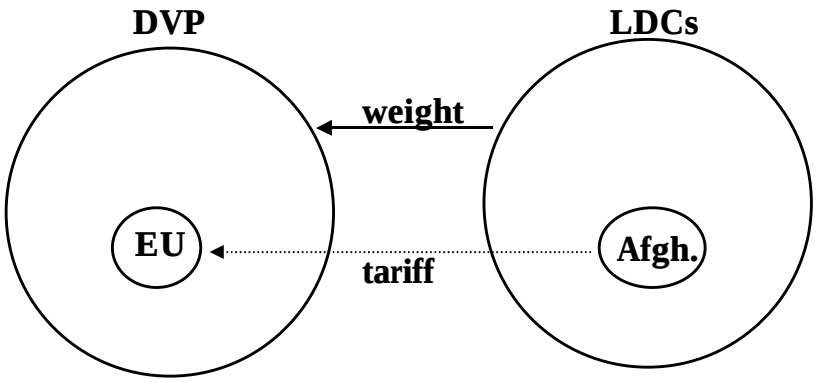
Table: two alternative schemes of calculation of aggregated ad valorem equivalents of protection instruments

	Tackling preferential regimes			Calculating AVEs		Aggregating products		
	Importer	Exporter [code]	Regime	Unit value	AVE based on	Im-ports	Weight	
Full regional approach	EU	Afghanist. [1]	EBA	UV1	UV_EBA	M1	(*M1*) MR_LDCs	
	EU	Brazil [2]	SGP	Missing	UVT	0	(*0*) MR_DVG	
	EU	USA [3]	MFN	UV3	UV_MFN	M3	(*M3*) MR_DVP	

	EU	Tunisia [4]	TUN	UV4	UV4	M4	(*M4*) MR_DVG	
	EU	Total [T]	-	UVT	-	-	-	
Bilateral approach and simple average	EU	Afghanist. [1]	EBA	UV1	UV1	M1	1	
	EU	Brazil [2]	SGP	Missing	UVT	0	0	
	EU	USA [3]	MFN	UV3	UV2	M3	1	
	EU	Total [T]	-	UVT	-	-	-	

We must stress that in the regional approach, instead, regional grouping is used to determine weights, while tariffs are computed on a bilateral basis. For instance, the tariff applied by EU to Afghanistan will be weighted by developed countries' imports in this product (reference group for EU is developed countries) from LDCs (reference group for Afghanistan): see graph below.

Figure: Weighting scheme in the "full regional approach"



Using this methodology, we can exemplify the impact of alternative sets of assumptions on the diagnosis on protection.

Interestingly, countries that look like free-traders when one use a certain type of aggregating procedure appear much more protectionist when attention is paid to missing trade (see table ??). If for instance, in the clothing industry, the weighting scheme adopted hardly makes a difference in general, this is not the case for the textile industry. the Japanese, and to a lesser extent US, protection against developing exporters is much higher when one accounts for missing imports. Hence, **using a weighting scheme much more in line with hypothetical free trade flows leads to a magnified record of protection**. This is even more obvious when one considers agricultural products: the Canadian protection is 6 to 7 times larger against developing countries; the US protection is twice as large and up to 22 times larger against LDCs.

Table: Two schemes of aggregation for 3 categories of products and 3 exporting regions: Quad, 2001, AVE off all tariff instruments, %

		Agriculture			Clothing			Textile		
	Exporter	*DVP*	*DVG*	*LDC*	*DVP*	*DVG*	*LDC*	*DVP*	*DVG*	*LDC*
	Market									
	Canada	30.8	19.5	1.3	17.4	17.8	18.2	6.9	7.4	4.0
Regional	**EU**	12.6	12.0	0.3	11.0	7.9	0.0	5.8	3.6	0.0
weighting	**Japan**	12.6	10.2	1.4	7.6	3.0	0.5	4.9	4.4	0.5
	USA	9.9	8.6	20.8	12.4	13.7	15.3	7.9	9.5	9.7
	Canada	6.9	2.5	0.2	17.4	18.2	18.2	9.6	9.7	7.6
Simple	**EU**	11.7	9.3	0.5	10.6	10.0	0.0	6.7	6.2	0.0
average	**Japan**	9.1	7.0	3.6	8.2	3.3	0.0	6.0	3.8	0.3
	USA	4.8	3.4	0.9	12.6	15.0	15.3	7.9	8.3	8.2
	Canada	4.5	**7.8**	**6.3**	1.0	1.0	1.0	0.7	0.8	0.5
Ratio of	**EU**	1.1	1.3	0.5	1.0	0.8	.	0.9	0.6	.
averages	**Japan**	1.4	1.5	0.4	0.9	0.9	.	0.8	1.2	1.6
	USA	2.0	2.5	**22.3**	1.0	0.9	1.0	1.0	1.2	1.2

3.2 Implementation issues

One could hardly make such calculations at the tariff line level on an exhaustive basis, since this information is not available for trade figures. Thus, one has to rely on HS level data, and aggregate tariffs from the tariff line level to the HS6 level before doing any additional calculation. This raises at least three issues.

3.2.1 Different number of tariff lines within HS6 positions

The first issue is associated with the very different break down of HS6 positions in tariff lines by individual countries. It happens that certain countries very much disaggregate certain HS positions. Why is it so ? One could make the conjecture that disggregating and imposing a series of different tariffs or instruments on the various tariff lines within a given HS6 position is just a means of fine tuning protection for the corresponding category of products. It would be worthless to manage such intricate protection structures just for free trade purposes! This is why, tariff lines should be more numerous for HS6 products that are more protected. Would it be the case, one would obtain different simple averages by on tariff lines and on HS6 positions, and certainly much larger figures in the former case. This is illustrated in the table below, where the first and most protected HS6 position is broken down in more tariff lines than the other positions. In the following table, we apply this principle to the Quad and calculate simple averages using the two alternative schemes of aggregation in the two first columns. The difference in result is striking, in particular for Japan: using a simple average of tariff line-tariffs we get an average of 11%, to be compared with an average of 5% otherwise.

Table: hypothetical example of aggregation procedure

Average calculated on			
Tariff lines	HS6 positions	HS6	NTL
		100.00	50
			200
			150
			0
		10.00	20
			0
		13.33	25
29.88	21.97		15
			0
		5.00	10
			0
		1.00	2
			1
			0
		2.50	5
			0

Table: simple average AVE (all products) in the Quad (2001)

Market	Simple average of tariff lines	Simple average of HS6 tariffs, *not* corrected	Simple average of HS6 tariffs, corrected
USA	5.25	3.59	3.60
Japan	11.42	4.98	5.01
EU (incl. Intra)	4.61	2.40	2.49
Canada	6.08	4.03	4.11

3.2.2 Missing trade values

Now, there is an additional difficulty since bilateral trade can be simply missing for certain tariff lines (for instance those highly protected) within a given HS6 position. Depending on whether this missing trade is corrected for by imports of the reference group from the exporter, or not, we will get different results. A simple average calculated on HS6 positions for which this correction is made should highlight a higher average protection, just because of an endogeneity problem. This is exemplified by the comparison of the second (already commented) and third columns of the table above: in the last column, we replace the missing weight by the one calculated with the reference group the importer belongs to. Not surprisingly, with this much more satisfactory methodology, the average tariff is slightly larger.

3.2.3 Historical records

A very last issue is raised if one aims at using time series of protection. Indeed, trade figures vary over time, as well as unit values. This can be illustrated by the observed evolutions associated with the implementation of the Marrakech agreement. The UR is suspected to have involved an increase in tariff protection in certain sectors, eg agriculture or clothing, as a result of the tariffication of quantitative

instruments. We can check whether tariff protection has been reduced or not in these sensitive sectors during the implementation of the Marrakech agreement by computing the average protection over 1996-2001 for agriculture as well as for clothing vis-à-vis our country groups: developed, developing, LDCs. This will be done for the Quad+.

Concerning agriculture, we observe a marked reduction in Japanese and European protection vis-à-vis all exporters, in contrast to the United States. For Canada, an increase in the protection vis-à-vis developing countries is observed, and a decrease vis-à-vis other country groups. But the most striking evolution is the chaotic path of Swiss protection with the exception of LDCs exports. This very high instability is the result of numerous specific tariffs and fluctuating world prices.

Table yy: Average protection in agriculture by market and exporter, 1996-2001 (%)

Year	**Market** / *Exporter*	**Australia**	**Canada**	**Japan**	**Switz**	**USA**	**EU**
1996		2.3	35.0	15.5	32.7	9.6	18.3
1997		2.1	33.3	15.1	157.9	10.3	15.3
1998	*Developed*	2.2	33.9	13.9	118.2	11.0	13.3
1999		2.2	37.7	13.8	165.5	14.0	14.5
2000		2.0	30.4	12.6	353.2	10.2	12.7
2001		2.4	30.8	12.6	136.9	9.9	12.6
1996		0.8	16.5	11.4	30.9	9.7	14.2
1997		0.7	16.3	10.9	34.0	10.6	12.3
1998	*Developing*	0.8	16.1	10.6	42.2	10.0	11.5
1999		0.8	18.2	10.9	57.0	10.0	12.5
2000		0.8	17.4	10.3	159.0	9.1	12.0
2001		0.9	19.5	10.2	60.9	8.6	12.0
1996		0.1	5.2	2.0	17.4	19.7	3.6
1997		0.1	4.5	1.6	12.0	23.9	3.4
1998	*Least developed*	0.0	3.0	1.7	9.2	18.7	1.8
1999		0.0	2.0	1.9	11.9	22.2	1.2
2000		0.0	1.4	1.7	12.9	23.6	3.9
2001		0.0	1.3	1.4	16.9	20.8	0.3

Turning to the clothing industry, the protection is on a decreasing trend in Australia, Japan and Canada, whereas it is stable eleswhere.

Table zz: Average protection in the clothing industry by market and exporter, 1996-2001 (%)

Year	**Market** / *Exporter*	**Australia**	**Canada**	**Japan**	**Switz**	**USA**	**EU**
1996		32.8	21.8	11.0	3.5	13.2	11.6

1997		30.1	20.8	10.8	3.2	13.2	11.5
1998	*Developed*	27.5	19.0	10.7	3.1	13.1	8.8
1999		27.6	18.3	10.0	3.0	12.9	11.6
2000		24.9	17.8	10.2	2.8	12.7	11.1
2001		22.3	17.4	7.6	2.7	12.4	11.0
1996		31.2	22.1	7.8	4.4	14.5	8.3
1997		28.5	21.5	7.5	3.8	14.6	8.3
1998	*Developing*	25.9	19.8	7.4	4.0	14.5	2.9
1999		25.8	18.9	6.8	3.8	12.9	8.8
2000		23.2	18.3	7.6	3.5	13.9	8.0
2001		20.6	17.8	3.0	3.3	13.7	7.9
1996		27.5	22.0	2.0	0.2	16.8	0.0
1997		24.7	21.4	1.4	0.1	16.6	0.0
1998	*Least developed*	22.1	19.9	1.7	0.1	16.3	0.0
1999		22.2	19.0	1.2	0.1	13.5	0.7
2000		19.6	18.5	1.3	0.1	15.5	0.0
2001		17.1	18.2	0.5	0.1	15.3	0.0

Against this background, an average of unit values over a given period of time can be used. Similarly, as far as trade weights are concerned, one can either rely on averages or on a reference year. In the latter case, we could decompose the impact of changes in tariffs and changes in trade values on the weighted average.

To illustrate this we experience two weighting schemes applied to the tariffs faced by our country groups on OECD markets, for 3 sectors: agriculture, clothing and textiles. The period 1996-2001 is once again considered.

Different mechanisms are potentially operating:

- first importers reluctant to trade liberalisation should concentrate their tariff reductions in the less dynamic products; alternatively, imports should increase mostly in products for which trade has been liberalised.

- second, unit values can change over time: in principle trade liberalisation should lead to an increase in world prices of the liberalised items; thus, using a weighting scheme based on current unit values should reduce the ad valorem equivalent of specific tariffs, and thus reinforce the observed tariff reduction.

The net effect of these various effects is a priori not determined: thus it remains an empirical matter.

In our exercise, the first weighting scheme is the one implemented in tables yy and zz: we use current unit values and current imports for each year. In the second weighting scheme, we use a constant weighting scheme combining constant unit values with a constant distribution of imports. We use a three year average.

One of the main results pointed out by the comparison of columns 'var' and 'const' in table ttt below is as follows:

- with fixed trade and unit values, one records a decrease in protection for textile / agriculture exported by LDCs

- in contrast, using current trade and unit values, this outcome would hardly be observed.

Without any change in the import structure or unit values, current tariffs faced by LDCs in agriculture should be one third of those faced in 1996: in fact, they are still representing three quarters of their initial level. For clothing and textile, tariffs should have been reduced, whereas we actually observe an increase: for textile tariffs have increased by 82% over the implementation of the Round[4].

In total, one could hardly say that LDCs have reaped the benefits of the previous round in these sectors so far.

Table ttt: Average protection of OECD markets faced by various country groups, according to 2 different weighting schemes (1996-2001, %)

		agriculture		clothing		textiles	
Year	*Country group*	var	const	var	const	var	const
1996		12.5	10.3	11.5	12.3	7.0	7.3
1997		11.8	9.9	11.8	12.2	7.1	7.2
1998	*Developing*	11.3	10.3	10.1	10.6	6.8	6.6
1999		12.0	9.1	11.1	11.4	6.5	6.5
2000		12.6	9.0	11.5	11.7	6.7	6.6
2001		11.2	9.5	10.6	10.9	6.4	6.5
1996		18.1	16.3	11.7	12.2	8.5	8.6
1997		22.9	15.6	11.8	11.9	8.3	8.3
1998	*Developed*	20.6	15.3	10.7	10.9	7.3	7.3
1999		24.9	15.2	11.4	11.5	7.0	7.2
2000		29.0	12.8	11.2	11.2	6.8	6.9
2001		19.8	12.6	10.7	10.8	6.6	6.5
1996		5.1	5.6	7.5	9.5	3.0	3.8
1997		5.9	5.3	8.0	9.4	3.4	3.8
1998	*Least developed*	3.3	3.5	8.2	9.3	4.2	3.9

[4] The re-tariffication process associated with the dismantling of quotas can partly explain this.

1999	3.7	3.2	7.6	8.0	4.0	3.1
2000	5.9	3.4	8.6	9.1	5.2	3.4
2001	3.9	1.9	8.3	8.9	5.5	3.2

4 AN EXTENSIVE COVERAGE OF DISAGGREGATED DATA

The previous sections have pointed out that a bilateral measure of protection at the most detailed level can be a reliable tool to address protection. On the other hand, using information on trade data at the tariff line level is not tractable on a systematic basis due to a lack of data. In the following we rely on a medium term solution – the MAcMaps system – in which all instruments are tackled at the tariff line level, but tariff equivalents are calculated using HS6 trade data. So doing, we get a systematic and bilateral database of trade barriers at the 6 digits level, covering all countries, which will be subject to various aggregation procedures minimising endogeneity biases. This section clarifies how on proceeds with the "intermediary" 6-digits database, using the last release: MacMap_2001.

In MAcMaps, reference groups are defined on the basis of a hierarchical clustering analysis, and they are common to the calculation of unit values and to the weighting procedure for the aggregation.

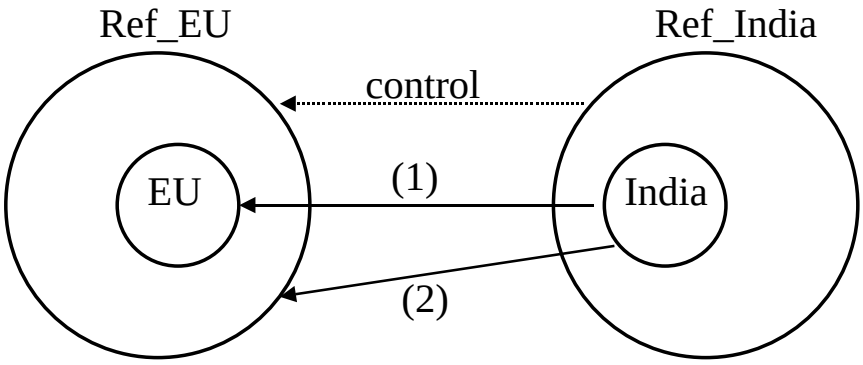
4.1 Unit values

At a first glance, AVEs in MAcMaps rely on bilateral unit values calculated on the HS6 level and applied on tariff lines; these values are calculated on a year-by-year basis. When the bilateral unit value is missing, we use the unit value of total exports of the exporter towards the reference group of countries the importer belongs to. In the figure below, if the unit value for Indian exports to the EU (1) cannot be calculated (no trade, or missing quantities), we use the average unit value of Indian exports to the reference group of countries EU belongs to (2). If the latter information is missing, we drop the tariff line.

At the same time, we calculate the unit value of exports between the reference groups of exporter and importer for each HS6 position. In our example it means that the control-unit value is the one associated with exports from the reference group of India to the reference group of the EU. In a very last step, we just control whether the unit value calculated (bilateral or not) makes sense: if it is more than 5 times larger or more than 5 times smaller than the control-unit value, we just take the latter as the right figure to calculate the bilateral AVE.

Notice than the same specific tariff applied by a given importer on a given tariff line to exporters having different unit values will be transformed in two different AVEs.

Figure: Calculating scheme of unit values in MAcMaps

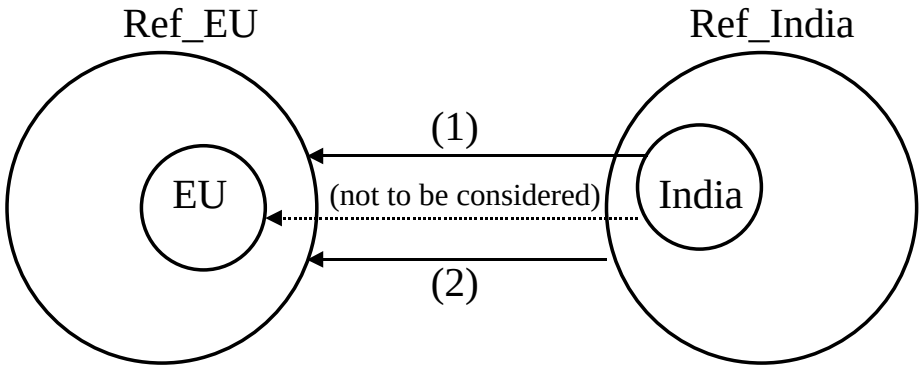


4.2 Weighted average

Then comes the aggregation procedure and how weights are defined. In MAcMaps, we proceed as follows. We do *not* use the bilateral imports, in order to minimise the aggregation bias. On the contrary, we consider imports of the reference group the importer belongs to, from the exporter under consideration (1). In the figure below, it means that we consider Indian exports to the reference group the EU belongs to.

If this trade value is missing (if India does not export to the latter reference group), we rely on the exports of the reference group of the importer towards the one of the importer (2). In our example, it means that we consider exports from the reference group of India to the reference group of the EU, for this product.

Figure: Calculating scheme of unit values in MAcMaps



5 INSIDE TRADE POLICIES: NEW EVIDENCE OF DISTORSIVE POLICIES

Protection is not only a figure: x%. Trade policies are structured in order to reap the benefits of loopholes in the agreements. Tariff reduction has led to non tariff barriers in the past. Then, the cancellation of non-tariff barriers and the process of re-tariffication have led to a complex system of tariff quotas and to highly discriminatory specific tariffs. The reduction in tariffs is now leading to an increased use of anti-dumping, noticeably by developing countries. Lastly, Rounds of tariff reduction have not

succeeded in erasing tariff peaks that are highly distorsive. In total, there may be substitution or complementarity between instruments.

i) *Tariff peaks are generally underestimated*. We provide a new and systematic measure of the importance of tariff peaks of which coverage and frequency indices are not the adapted measures. We substitute 15% tariff to the observed tariff for each HS6 position having an ad valorem equivalent of all instruments above 15%. In a second step we calculate a new average the country using this new set of tariffs. The importance of tariff peaks is provided by the comparison of the two figures.

ii) *Instruments may be substitute or complements.* We estimate correlation between protectionist instruments (ad valorem tariff, specific tariff, quota tariff rate) for a selected sample of countries.

iii) *There are idiosyncrasies in the structures of protection of similar countries*. We try to identify similarities or idiosyncrasies in the national structures of trade policies by using a correlation analysis. We try to construct groups of countries of which protection is similar. Since similar countries highlight idiosyncrasies, we conclude that factor endowments and the related Stolper-Samuelson effect do not fully explain trade policies. There is room for an approach in terms of political economy addressing the determinants of these idiosyncrasies.

5.1 Tariff peaks

We substitute a 15% tariff to each tariff equivalent above 15% (international definition of tariff peaks) and calculate the resulting new average protection of importers. The resulting reduction in average protection provides a rough estimate of the impact of tariff dispersion. In our sample, very large reductions are obtained for India, Japan and Australia in absolute terms.

Table: Impact of replacement of all tariff peaks by 15% tariffs (2001, %)

Importer	Observed Average tariff (%)	Average tariff after peak cancellation (%)	Percentage point reduction in average protection	Reduction in average tariff (%)
aus	15.2	7.5	-7.7	50.9
bra	10.9	10.0	-0.9	8.6
can	6.7	3.1	-3.6	54.0
che	8.8	2.9	-5.9	67.6
EU	3.9	2.3	-1.6	40.2
ind	25.8	12.8	-13.0	50.4
jpn	10.7	3.6	-7.1	66.3
nor	6.4	1.2	-5.2	81.6

nzl	3.1	3.0	-0.2	5.2
USA	4.3	3.3	-1.1	24.7

Note : Calculation made at the HS6 level

The bilateral impact of such hypothetical liberalisation is highly uneven for some reporters: the absolute reduction in tariffs ranges from zero to 27 percentage points of average bilateral tariffs for EU imports, or zero to 38 percentage points for Canada, or zero to 57 percentage points for Norway. This much less the case for the U.S.. Lastly, since New-Zealand hardly discriminates among exporters and lacks tariff peaks, reductions are negligible. Thus, we can conclude that EU is not more protectionist than the US on average; this is due to various preference schemes, authorising preferred exporting countries to circumvent tariff peaks. Any cancellation of tariff peaks has therefore very asymmetric effects on EU trade partners.

Table: Percentage point reduction in average bilateral protection associated with a substitution of 15% tariffs to tariff peaks (2001)

		reporter									
		UE	USA	aus	bra	can	che	ind	jpn	nor	nzl
Exporter	UE	.	1.4	5.6	1.0	5.6	7.0	13.6	6.5	6.9	0.1
	USA	3.1	.	1.8	1.0	1.8	8.4	12.1	4.6	6.2	0.1
	aus	27.5	3.7	.	0.6	12.3	15.3	7.8	13.2	28.9	0.6
	bra	9.1	6	0.9	.	9.4	13	14.5	21.3	16.9	0.5
	can	5.3	0.4	5.6	1.1	.	10.6	6.1	2.8	5.6	0.1
	che	2.5	0.9	0.6	0.2	7.0	.	19.5	3.3	1.2	0.0
	ind	1.8	1.2	2.2	0.4	0.9	1.8	.	6.2	2.0	0.9
	jpn	0.2	0.2	4.5	1.0	0.2	0.3	14.3	.	0.2	0.0
	nor	2.4	0.4	21.3	0.5	2.9	0.4	8.2	0.4	.	0.1

	nzl	39.8	8.6	3.9	3.4	38.2	47.7	4.9	16.8	57.2	.

5.2 Idiosyncrasies in the structures of protection

To be completed

5 Conclusion

To be completed

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7 APPENDIX

7.1 Average rate of protection : all countries in MAcMaps (2001,%)

Reporter	Prot.	Reporter	Prot.	Reporter	Prot.
European Union	3.9	Equatorial Guinea	14.1	Norway	6.4
United States of America	4.3	Grenada	7.9	Nepal	14.8
Albania	7.9	Guatemala	6.2	New Zealand	3.1
United Arab Emirates	4.3	Guyana	8.8	Oman	7.7
Argentina	10	Hong Kong	0	Pakistan	19
Armenia	1.9	Honduras	8.4	Panama	8.3
Antigua and Barbuda	10.1	Croatia	7.5	Peru	12.7
Australia	15.2	Hungary	8.8	Philippines	7.5
Azerbaijan	10.6	Indonesia	6.3	Papua New Guinea	17.5
Benin	8.8	India	25.8	Poland	11.7
Burkina Faso	8.8	Iran	5.5	Paraguay	7.9
Bangladesh	24.5	Iceland	5	Qatar	4.8
Bulgaria	11	Israel	4.7	Romania	11
Bahrain	10.7	Jamaica	7.8	Russian Federation	11.6
Bahamas	34	Jordan	12.3	Rwanda	8.2
Bosnia and Herzegovina	2.9	Japan	10.7	Saudi Arabia	14.4
Belarus	12	Kazakstan	3.6	Sudan	4.6
Belize	7.6	Kenya	12.8	Senegal	8.8
Bermuda	84.8	Kyrgyzstan	5.9	Singapore	0.3
Bolivia	8	Cambodia	21	Solomon Islands	29.2
Brazil	10.9	Saint Kitts and Nevis	11.3	El Salvador	5.5
Barbados	11.4	Korea	7.1	Suriname	7.7
Brunei Darussalam	17.4	Kuwait	4.6	Slovakia	13.9
Bhutan	13.5	Lao People's Democratic Rep	12.3	Slovenia	7.9
Central African Republic	13.4	Lebanon	7.9	Seychelles	26.1
Canada	6.7	Libyan Arab Jamahiriya	39.2	Syrian Arab Republic	25.2
Switzerland	8.8	Saint Lucia	10.3	Chad	13.4
Chile	8	Sri Lanka	9.3	Togo	8.8
China	18.3	Lithuania	3.2	Thailand	16.4
Côte d'Ivoire	8.9	Latvia	2.2	Tajikistan	8.3
Cameroon	13.4	Morocco	28.7	Turkmenistan	4.7
Congo	13.4	Moldova, Rep.of	2.8	Trinidad and Tobago	9.6
Colombia	19.1	Madagascar	2.5	Tunisia	20.3
Costa Rica	4	Maldives	24.2	Turkey	7
Cuba	8.8	Mexico	11.2	Taiwan	6.4
Cyprus	16.6	The former Yugoslav Rep. of	8.8	Tanzania, United Rep. of	10.3
Czech Republic	16.1	Mali	8.8	Uganda	7.2
Dominica	9.2	Malta	9.4	Ukraine	8.8
Dominican Republic	6.9	Myanmar	6.1	Uruguay	9
Algeria	15.6	Mozambique	8.6	Uzbekistan	9.1
Ecuador	30.4	Mauritania	11.2	Saint Vincent	9.9

Egypt	21.6	Mauritius	16.7	Venezuela	10.5
Estonia	1	Malawi	10.6	Viet Nam	11.6
Ethiopia	12.6	Malaysia	21.7	Yemen	12.8
Gabon	14.2	Niger	8.8	Yugoslavia	10.1
Georgia	10	Nigeria	23.8	Zambia	12.7
Ghana	36.3	Nicaragua	5.9	Zimbabwe	15.6
Guinea-Bissau	8.8				

7.2 Preferential agreements covered by importer

Antigua and Barbados

CARICOM

Argentina

MERCOSUR

Armenia

CIS

Azerbaijan

CIS

Australia

GSP, LDC, SPARTECA (Hong Kong, Korea, Singapore, Taiwan), Canada, New Zealand, Malaysia, Papua New Guinea

Bahamas

CARICOM

Bahrain

GCC

Bangladesh

Bangkok Agreement, SAPTA

Barbados

CARICOM

Belarus

CIS, EAEC

Belize

CARICOM

Benin

WAEMU

Bhutan

SAPTA

Bolivia

Peru, Panama, Argentina, Brazil, Uruguay, CAN

Bosnia

European Union

Botswana

SADC, European Union, SACU

Brunei Darussalam

ASEAN

Brazil

MERCOSUR

Burkina Faso

WAEMU

Cambodia

ASEAN

Cameroon

CEMAC

Canada

GSP, LDC, Commonwealth Caribbean Countries , Chili, NAFTA, Australia, Israel, New Zealand

Chad

CEMAC

Colombia

Chili, Peru , CAN

Congo Rep. of

CEMAC

Costa Rica

CACM , Dominican Republic, Mexico, Panama

Ctrl. African Rep.

CEMAC

Czech Republic

European Union, Slovakia, LDC

Cyprus

European Union

Dominica

CARICOM

Ecuador

CAN

Egypt

COMESA

El Salvador

CACM

Equatorial Guinea

CEMAC

Estonia

BAFTA

Ethiopia

COMESA

European Union

GSP, ACP, LDC, Everything but Arms, OCT, EEA, CAN, CACM, Countries fighting drugs, Andorra, Algeria, Czech Republic, Egypt, Israel, Jordan, Morocco, Poland, TunisiaSouth Africa, Switzerland, Syria, Latvia, Lithuania, Estonia, Slovenia, Faroe Islands, Macedonia, Gaza, Cyprus, Turkey, Malta, Mexico, Bulgaria, Slovakia, Romania, Hungary, Croatia, Lebanon

Gabon

CEMAC

Georgia

CIS, Armenia, Azerbaijan, Kazakhstan, Kyrgyztan, Russian Federation , Turkmenistan, Ukraine

Grenada

CARICOM

Guatemala

CACM

Guinea-Bissau

WAEMU

Guyana

CARICOM

Honduras

CACM

Hungary

GSP, European Union

Iceland

EEA, Morocco, Macedonia, Gaza, Mexico, Slovenia, Slovakia, Turkey, Bulgaria, Czech Republic, Estonia, Hungary, Israel, Latvia, Lithuania, Poland, Romania

India

Non-MFN, SAPTA , Bangkok Agreement

Indonesia

ASEAN

Israel

EFTA , European Union, Canada, Czech Republic, Hungary, Jordan, Poland, Slovakia, Slovenia, Turkey, United States

Ivory Coast

WAEMU

Jamaica

CARICOM

Japan

Non-MFN, GSP, LDC

Kazakhstan

CIS, EAEC, Kyrgyztan

Kenya

COMESA

Korea

LDC, Bangkok Agreement

Kuwait

GCC

Kyrgyztan

CIS, EAEC, Armenia, Georgia, Kazakhstan, Moldova, Russian Federation, Ukraine, Uzbekistan

Laos

ASEAN

Latvia

BAFTA

Lesotho

European Union, SADC, SACU

Lithuania

European Union, Czech Republic, Iceland, Norway, Poland, Slovakia, Slovenia, Switzerland , BAFTA

Macedonia

European Union

Madagascar

IOC, COMESA

Malawi

Non-MFN, COMESA, SADC, Zimbabwe

Malaysia

ASEAN

Maldives

SAPTA

Mali

WAEMU

Mauritius

COMESA, IOC, LDC, SADC

Mexico

Bolivia, NAFTA, Chile, Colombia, Costa Rica, Venezuela

Moldova

CIS, Romania

Monserrat

CARICOM

Morocco

Iraq, Libya, Algeria, LDC

Mozambique

SADC , South Africa

Myanmar

ASEAN

Namibia

European Union, SACU, SADC, COMESA

Nepal

SAPTA

New Zealand

GSP, LDC, SPARTECA, Australia, Canada, United Kingdom

Nicaragua

CACM, Mexico, Panama

Niger

WAEMU

Norway

GSP, EEA, EFTA, European Union, Czech Republic, Slovakia, Estonia, Latvia, Lithuania, Israel, Slovenia, Hungary, Romania, Poland, Turkey, Bulgaria, Macedonia, Morocco, Mexico, Gaza, LDC

Oman

GCC

Pakistan

SAPTA

Paraguay

MERCOSUR

Peru

CAN

Philippines

ASEAN

Poland

Non-MFN, GSP, GSP for LDC, European Union, EFTA, Czech Republic, Slovakia, Hungary, Slovenia, Bulgaria, Estonia, Faroe Island,Israel, Lithuania, Latvia, Romania, Turkey

Qatar

GCC

Romania

GSTP, EFTA, Protocol of 16, European Union, Bulgaria, Czech Republic, Hungary, Moldova, Poland, Slovakia, Slovenia, Turkey

Russian Federation

CIS, EAEC, Kyrgyztan

Rwanda

COMESA

Saint Lucia

CARICOM

Saudi Arabia

GCC

Senegal

WAEMU

Seychelles

COMESA

Singapore

ASEAN, LDC

Slovakia

Czech Republic, European Union, LDC

Sudan

COMESA

South Africa

SACU, SADC, European Union

Sri Lanka

Bangkok Agreement, GSTP, SAPTA

St Vincent – Gr.

CARICOM

St. Kitts Nevis

CARICOM

Suriname

CARICOM

Swaziland

COMESA, SACU, SADC, European Union

Switzerland

GSP, LDC, EFTA , European Union, Czech Republic, Slovakia, Estonia, Lithuania, Latvia, Macedonia, Mexico, Gaza, Faroe Islands, Slovenia, Romania, Poland, Israel, Hungary, China, Turkey, Macao, Korea (North), Brazil, Bulgaria, Morocco

Tajikistan

CIS, EAEC

Togo

WAEMU

Trinidad & Tobago

CARICOM

Turkey

European Union , LDC , EFTA , Israel, Romania, Hungary, Lithuania, Czech Republic, Slovak Republic, Bulgaria, Estonia

Turkmenistan

Georgia

Uganda

COMESA

Ukraine

CIS

United Arab Emirates

GCC

United States

GSP, GSP for LDC, CBI, ATPA, Non-MFN, AGOA, NAFTA, Israel

Uruguay

MERCOSUR

Uzbekistan

CIS, Kyrgyztan

Venezuela

CAN

Vietnam

ASEAN

Yugoslavia

European Union

Zambia

COMESA

Zimbabwe

COMESA, Botswana, Namibia, Malawi, South Africa

7.3 Agreements in working progress

LDCs: Mauritius, Singapore, Korea, Morocco, Czech Republic, Norway, Slovak Republic

Asia: MSG

Latin American Countries:

CARICOM : Venezuela / Colombia; Chile / Mexico; Chile / Costa Rica; Mexico / Israel; Israel / Mexico

European Countries:

Bosnia / Slovenia; Macedonia / Bulgaria; Bulgaria / Estonia; Latvia / Bulgaria; Bulgaria / Czech Rep; Bulgaria / Hungary; Bulgaria / Poland; Bulgaria / Romania; Bulgaria / Slovakia; Bulgaria / Slovenia; Estonia / Ukraine; Slovak / Turkey; Czech / Turkey; EFTA / Jordan; Lithuania / Turkey

Arab Countries: Turkey / Slovak**;** Turkey / Czech**;** Tunisia / European Union**;** Morocco / European Union**;** Algeria / Morocco**;** Morocco / Algeria**;** Morocco / Libya**;** Iraq / Morocco**;** Lebanon / Palestine; Lebanon / Iraq; Lebanon / Jordan; Lebanon / Syria; Lebanon / Egypt; Lebanon / Saudi Arabia; Lebanon / Sudan; Jordan / Tunisia; Jordan / Syria; Jordan / Saudi Arabia; Jordan / Morocco; Jordan / Lebanon; Jordan / Kuwait; Jordan / Egypt; Jordan / Bahrain; Jordan / AFTA; Jordan / Algeria; Jordan / Palestine; Jordan / Israel; Egypt / Arab League; Iraq / Arab League; Lebanon / Arab League; Saudi Arabia / Arab League; Syria / Arab League; Yemen / Arab League; Jordan / Arab League; Sudan / Arab League; Libya / Arab League; Morocco / Arab League; Tunisia / Arab League; Kuwait / Arab League; Bahrain / Arab League; Qatar / Arab League; Arab Emirates / Arab League; Oman / Arab League

7.4 Agreements in working process for which the information is not yet complete (some Annexes are missing):

Turkey / Slovenia; Turkey / Macedonia; Latvia / Turkey; Hungary / Turkey; Estonia / Faroe Islands; Estonia / Turkey; Faroe Islands / Iceland; Faroe Islands / Norway; Faroe Islands / Switzerland; EFTA / Croatia; EFTA / Turkey; Slovakia / Estonia; Slovakia / Israel; Slovakia / Latvia; Slovakia / Lithuania; Slovenia / Croatia; Slovenia / Estonia; Slovenia / Macedonia; Slovenia / Israel; Slovenia / Latvia; Slovenia / Lithuania; EFTA / Jordan; Dom. Rep. / CARICOM; CARICOM / Dom. Rep.; Bulgaria / Turkey; Bulgaria / Croatia; Croatia / Bulgaria; Jordan / EFTA; Turkey / Bulgaria