THE DOHA ROUND AGRICULTURAL TARIFF-CUTTING FORMULAE AND TARIFF ESCALATION

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Abstract

Tariff escalation, the phenomenon where tariffs rise along the processing chain, is a long-standing market access issue, especially for the developing countries in view of the urgency for them to develop value-adding, processing industries. In the ongoing agricultural negotiations, there is an agreement among the WTO Members to "effectively" address the issue. How this is going to be done, however, has not as yet been discussed in a concrete manner. With the objective of contributing technical inputs to this process, this study quantifies, for selected product pairs and markets, changes in tariff escalation following the application of three recent tariff-cutting formulae as proposed by the G-20, EU and the US, and discusses some negotiating options. On the former, it finds that all three tariff-cutting formulae reduce tariff escalation considerably, but do not eliminate the gaps. On the question of how tariff escalation may be addressed in the negotiations, over and above the reductions resulting from the formula cuts, the analysis finds that agreements have to be reached on two key building blocks. One, whatever formula is identified, a listing of processed products and their corresponding primary products is required for applying the formula. These could be 20-25 processed products, about 100 tariff lines, and about 150-200 tariff lines for the corresponding primary products. Two, an agreement would be needed on a threshold, or a de minimis level, within which to contain the tariff escalation for the products identified. The de minimis level could be, for example, 5 percentage points of tariff wedge between primary and processed products for the developed countries and 10 percentage points for the developing countries. It will then be relatively straightforward to determine the required adjustment factors for tariff reduction rates, over and above the formula rates. An alternative idea, to negotiate a single adjustment factor or a multiple, as proposed in the 2003 Harbinson text, is found to be fraught with technical problems.

I. INTRODUCTION

Tariff escalation is a phenomenon where tariffs rise along the processing chain such that tariffs on the processed products (e.g. refined sugar) are higher than on the corresponding primary products (e.g. raw sugar). Such an escalating tariff structure creates greater protection for the processing sector in the importing country. For exporters, on the other hand, this acts as a disincentive for exporting processed products. For this reason, tariff escalation is seen as one of the impediments for developing value-adding, processing industries. This is an issue for the developing countries in particular because of their much greater need for

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industrialization. Moreover, global trade in the processed products has been growing relatively faster than in primary products.

Given the importance of the topic, many studies have been conducted on the quantification of the extent of tariff escalation (TE), notably in the context of the impact of the Uruguay Round (UR), and on what may be done to reduce the phenomenon. On the whole, almost all studies have shown that TE remains widespread despite the reductions in tariffs in the UR. One of the most comprehensive analysis of TE was conducted by FAO in 1997 (Lindland 1997; Lindland 1998), covering close to 300 agricultural commodities and two stages of processing beyond the primary level. The three import markets analysed were the EU, Japan and US. The study found that although there was a widespread reduction in the (bound) tariff wedges between processed and primary products following the UR, over 50% of the commodity pairs examined would still have escalating bound tariffs after the full implementation of the UR commitments, with an average nominal tariff wedge of 17%. The highest post-UR bound tariff escalation was found in the dairy, sugar, fruit, tobacco and hides and skins sectors.

Similar results were found in other studies. For OECD countries, it was documented that the reduction of tariffs on processed products was lower than on primary products (OECD 1996; OECD 1997). A recent UNCTAD study (UNCTAD 2003) evaluated TE for 12 agricultural commodity pairs by averaging nominal tariffs for different processing stages in the Quad markets (Canada, the EU, Japan, and the US). It found that, with a few exceptions, the post-UR tariffs escalate not only between raw and semi-finished but also between semi-finished and finished products. On average, the escalations in Canada, Japan and the EU were higher between raw and finished products, while in the US the highest average escalation was found between semi-finished and finished goods. An earlier USDA study (USDA 2001) also showed TE in agricultural markets not only in the developed but also in the developing countries. Elamin and Khaira (2004) have also quantified TE for several product groups and extended the analysis to assess the impact of some tariff cutting formulae, including the one proposed in the Harbinson draft modalities. Finally, the study by the Swedish Board for Agriculture (Burman and others, 2001) is fairly comprehensive in covering several grounds on tariff escalation, including some estimates on the impact on effective protection.

Consistent with these studies that showed widespread TE in the post-UR period, many negotiating proposals have called for eliminating or reducing TE as an explicit goal within the market access pillar of the Doha Round negotiations.

The latest official text on negotiations, the Hong Kong Declaration of December 2005, in its Annex A (para 17) under "other elements" of market access, states as follows: "There has been no further material convergence on the matters covered by paragraphs 35 and 37 of the July 2004 Framework text. The same may be said for paragraph 36 on tariff escalation, albeit that there is full agreement on the need for this to be done, and a genuine recognition of the particular importance of this for commodities exporters." Although this text speaks of lack of convergence, the fact is that hardly any concrete proposal has been tabled so far on TE. The latest official position – as of January 2005 - remains the agreement reached in the 2004 Framework to find a formula.[2]

The Harbinson modalities text of March 2003 was more specific on this topic. The relevant text, in the para following tariff reduction formula (para 8), reads as follows: "In applying this

[2] In para 36 of the Framework, this is expressed as follows: "tariff escalation will be addressed through a formula to be agreed".

formula, where the tariff on a processed product is higher than the tariff for the product in its primary form, the rate of tariff reduction for the processed product shall be equivalent to that for the product in its primary form multiplied, at a minimum, by a factor of [1.3]".[3] In other words, whenever the formula results in positive tariff escalation, a factor of [1.3] will be applied to reduce the gap. This, rather concrete, proposal was however not carried forward in the subsequent texts.

For example, the G-20 text of 7 July 2005 proposed that "as provided for in the Framework" an additional formula shall be established to reduce TE in developed countries. It was also said that the products in which TE, in terms of increased effective protection, exist, will need to be identified. Thus the text entertains the idea of an additional formula, but specific to reducing TE in developed countries only. Second, the text specifically mentions effective protection, which is a very different concept from nominal tariff escalation that most other texts refer to. It also says that these products need to be identified, which is both a very important and a difficult task indeed, as will be discussed towards the end of this paper.

In the 24 August 2003 WTO draft text for Cancun, it was said that TE "will be effectively addressed". What it means by "effectively" is anybody's guess. The 13 September 2003 Cancun text was more specific: "The issue of tariff escalation will be addressed by applying a factor of […] to the tariff reduction of the processed product in case its tariff is higher than the tariff for the product in its primary form". This is similar to the Harbinson proposal on the factor of [1.3]. Several important texts however did not mention TE. These include *inter alia* the EC-US text of August 2003, the October 2003 text of G10, the October 2005 text of the ACP Group and the US text of October 2005.

A related proposal is on the treatment of TE for tropical products. Various texts include a language that calls the developed countries in particular for, in implementing market access commitments, providing for greater improvement of opportunities and terms of access for agricultural products of particular interest to the developing countries, including the "fullest liberalization of trade in tropical products, whether in primary or in processed form". For tropical products at least, therefore, several proposals are clear that there should be no tariff escalation. What are tropical products however are yet to be pinpointed.

Ultimately, given the vague language in the Hong Kong text, the key guideline for the ongoing negotiations would be the proposal in the 2004 Framework which speaks of a formula to be negotiated: "tariff escalation will be addressed through a formula to be agreed". The question is what could be that formula?

Following this introduction of the issue and negotiating proposals, Section II of the paper outlines a method for quantifying TE and discusses the data base used and the products covered. Section III then presents the results of the likely impact of the new tariff cutting formulae on TE. Section IV addresses the question of what may be done in the negotiations to address TE. Section V summarizes the main observations.

[3] In the WTO negotiating texts, a square bracket [ ] indicates texts proposed but not agreed to as yet.

II. METHODOLOGY AND THE TARIFF DATA USED

Measuring tariff escalation

Most studies quantify TE on the basis of the bound tariffs. This is a simpler method as all that is required in terms of statistics is the bound tariffs. Some studies have extended this analysis by using applied tariffs to analyse the extent of TE in practice. The other extension that is sometimes done is using trade (import) weights to average tariffs, bound or applied, where many tariff lines define a product and so averaging is required (e.g. several oilseeds and oils). Lastly, some studies have attempted to measure TE also using the concept of effective protection (e.g. Lindland 1997; Burman and others 2001). Effective protection is obviously a better indicator of trade protection than is nominal protection, especially where a processed product is produced from multiple, rather than a single, primary products. In practice however it is very difficult to compute effective protection for large number of products or tariff lines as this requires input-output coefficients.

The analysis presented below is based on nominal bound tariffs, those prevailing at the end of the UR implementation period and those resulting from formula cuts. This is the simplest thing to do and this is also what is useful in the context of the negotiations where the focus is on reducing bound tariffs, and not on applied rates or effective protection.

As in the 1997 FAO study, nominal tariff escalation is measured in this paper on the basis of nominal tariff wedge, the difference in tariffs between a processed and a primary product. Nominal tariff wedge (TW) for a given period is defined as:

$$TW = T - t$$

where T is tariff on the processed product and t is tariff on the primary product. Three situations can be characterized based on the tariff wedge:

- Tariff escalation: $TW > 0$
- Tariff de-escalation: $TW < 0$
- Tariff parity (neither escalation nor de-escalation): $TW = 0$.

The impact of a trade round, e.g. the Doha Round, on nominal tariff escalation is measured as follows (with subscript "0" referring to the base period and "1" for the TW after applying formula cuts):

$$\Delta TW = TW_1 - TW_0$$

where,

ΔTW is the change in the tariff wedge due to the Round
TW_0 is the tariff wedge before the formula cuts (end of the UR)
TW_1 is the tariff wedge after formula cuts.

Depending on the signs of TW_0 and ΔTW, four outcomes can be characterized as follows:

$TW_0 > 0$ and $\Delta TW < 0$ = a *decrease* in nominal tariff escalation
$TW_0 > 0$ and $\Delta TW > 0$ = an *increase* in nominal tariff escalation

$TW_0 < 0$ and $\Delta TW < 0$ = an *increase* in nominal tariff de-escalation
$TW_0 < 0$ and $\Delta TW > 0$ = a de*crease* in nominal tariff de-escalation

The case that is mostly discussed in the literature and the one that the WTO proposals have been referring to is the first one, i.e. a situation where TE exists in the base case ($TW_0>0$) and the objective is to see that this escalation is reduced or eliminated in the Doha Round (i.e. $\Delta TW < 0$ or $\Delta TW = 0$). The outcome that is not desired is the second one where a positive TE further escalates following tariff cuts. The last two cases have specific economic meanings but are not of concern in the negotiations.

The data used

The analysis covers a sample of 11 countries, eight of which are developing (Brazil, Egypt, India, Indonesia, Pakistan, Philippines, Sri Lanka and Turkey) and three are developed (the EU, Japan and the US). For these countries, tariff escalation is quantified for the base period, which is the end of the Uruguay Round implementation period, and following the application of three tariff cutting formulae proposed by the US, G-20 and EU in October 2005. Table 1 shows the three formulae. All the tariff data used in this paper are the same as that used for assessing tariff-cutting formulae in another recent paper (Sharma 2006). What follows is a summary of the data base used, assumptions made and the limitations, which are described in more detail in the other paper.

The starting point of the analysis is the conversion of non-*ad valorem* tariffs into *ad valorem* equivalents (AVEs). This was done following the method agreed by the WTO Members in 2005 and using the databases on tariffs and trade referred to in that agreement, which include the IDB, COMTRADE and CTS databases. The AMAD and WITS databases were also used to fill up the gaps. Despite the efforts made with great care, many complex tariffs could not be converted, in particular those belonging to the HS-2 (meats) and HS-4 (dairy) groups. The analysis is based on 8-digit HS level for the three developed countries and on 6-digit HS level for the eight developing countries. The numbers of tariff lines used were roughly 1700, 1400 and 1700 for the EU, Japan and US respectively and around 600 lines for the developing countries.

Various difficulties were encountered in the conversion process (Sharma 2006). These included: missing import values for the years used for the calculation of the weighted import values; inability to convert either the IDB or the COMTRADE import unit value into units used for the specific bound tariffs; ambiguous units used for specific bound tariffs, such as "percentage volume of alcohol per hectoliter" or "agricultural component"; different levels of disaggregation for some countries and different from the IDB dataset from which import unit values had to be drawn; tariffs mixed with two specific components with different units; different units used for the same products, complicating the application of the agreed 40/20 filter; and bound and applied tariffs not matching all the time.

The following were some of the key assumptions made, which also speaks of the limitations of the data base. First, the flexibility provision in the 4th tier of the EU formula was not implemented; rather, only the average cut rate specified in the proposal was used. Second, assumptions were made about the number of tariff lines that are sensitive and special (SnP and SP) products. A total of 2% of the tariff lines were assumed to be SnPs for the developed countries and 6% as SnPs plus SPs for the developing countries. It was assumed that these are

Table 1: Tariff-cutting formulae proposed by the US, G-20 and EU
(all cuts are linear)

US Proposal

	Developed countries			Developing countries		
		Cuts at (%)			Cuts at (%)	
	Threshold (bound tariff)	lowest end	highest end	Threshold (bound tariff)	lowest end	highest end
Tier 1	> 60	85	90	> 60	*57*	*60*
Tier 2	> 40 to = 60	75	85	> 40 to = 60	*50*	*57*
Tier 3	> 20 to =40	65	75	> 20 to =40	*43*	*50*
Tier 4	0 to 20	55	65	0 to = 20	*37*	*43*
	Tariff cap	75		Tariff cap	*112*	

Note: The parameters in the last two columns shown in italic are assumed - reduction rates are 2/3rd of the corresponding rates for the developed countries while tariff cap is set at 3/2rd of 75%.

G20 proposal

	Developed countries		Developing countries	
Tier	Threshold (bound tariff)	Cut rate (%)	Threshold (bound tariff)	Cut rate (%)
Tier 1	>75	75	>130	40
Tier 2	> 50 to =75	65	> 80 to =130	35
Tier 3	> 20 to =50	55	> 30 to =80	30
Tier 4	0 to 20	45	0 to =30	25
	Tariff cap	100	Tariff cap	150

EU proposal

	Developed countries		Developing countries	
	Threshold (bound tariff)	Cut rate (%)	Threshold (bound tariff)	Cut rate (%)
Tier 1	> 90	60	> 130	40
Tier 2	> 60 = 90	50	> 80 = 130	35
Tier 3	> 30 = 60	45	> 30 = 80	30
Tier 4	0 to 30	35 (20-40)	0 = 30	25 (10-40)
	Tariff cap	100	Tariff cap	150

Source: Negotiating proposals, October 2005.

the products that currently face the highest bound tariffs. Third, for these SnPs and SPs, tariffs were reduced by 25% (or 1/4th) of the applicable formula reduction rate in the respective tier to which these products fall into. For example, if the tier reduction rate is 80%, the rate applicable to the SnPs will be 20% only. Lastly, average reduction rates were measured as the average of the individual reduction rates for all tariff lines, i.e. these are average cut rates, and not the cuts in the average.

The products chosen for the TE analysis are shown in Table 2. These are fairly prominent product pairs in many TE studies. Most of them are also products of export interest of developing countries. A prominent product missing here is hides, skins and leather for which appropriate tariff data did not exist (moreover, leather is classified as industrial product in the WTO classification and subject to different tariff cutting formula).

Table 2: Primary and processed product pairs covered in the analysis

Product group	Primary	Processed
Cocoa	Cocoa beans (HS1801)	Coca powder, butter, paste and chocolate (HS1803 to HS1806)
Coffee	Green coffee (HS0901 (0901 11, 0901 12))	Roasted coffee (HS 09012100, 090122000)
Fruits	Fruits (HS0804 to HS0810)	Fruit juices and fruit products (HS2007 to 2009)
Sugar	Raw sugar **(**HS170111, 170112)	Refined white sugar (HS170199)
Oilseeds	Various oilseeds (HS1201 to 1207)	Vegetable oils (HS1507 to 1522)
Grains	Various grains (HS1001 to 1008, excluding rice)	Processed grain products (HS1101 to 1109)
Rice	Paddy and brown (husked) rice (HS100610, 100620)	Milled rice (HS100630, 100640)

III. THE RESULTS

Tariff escalation at the end of the Uruguay Round

Table 3 shows average bound tariffs for primary and processed products, and the resulting tariff wedges (TW), for the base period (i.e. end-UR). It shows that for the three developed countries taken together, TE (positive TW) existed for 16 of the 21 cases (3 countries times 7 product pairs) and de-escalation in the other five (sugar in the EU, Japan and US and oilseeds in Japan and US). There is a large variation in TWs across products and countries. The simple average TW for the 5-6 products with positive TW is 14% for the EU, 59% for Japan and 5% for the US.

Some comments on the bound tariffs would be helpful here. In some cases, the relatively high average bound rates are mainly due to 1-2 mega tariffs in the product group while most of the rest of the tariffs are very low or zero. For example, the 18% average bound rate on US oilseeds is due to two lines with tariffs of 164 and 132% (groundnuts) while tariffs on the remaining 16 oilseeds are close to zero. Similarly, for the US, as well as the other two developed countries, the relatively high average tariff on processed cocoa products is due to chocolates. Likewise, in the case of Japan, the 61% average bound rate on oilseeds is due to four tariff lines with 287% tariff on average while tariff rates on rest of the oilseeds are zero. Some similar pattern is also found in the EU tariffs. In the processed oil products for example, while most tariffs are zero, 4-5 lines have mega tariffs, e.g. vegetable margarine and olive oils. For the developed countries in particular, one also finds several instances of negative tariff wedges, mostly on products that have farm policies aimed at supporting farmers, e.g. sugar in the EU.

Table 3: End-Uruguay Round average bound tariffs on primary and processed products
(the third rows, TWs or tariff wedges, are the differences between the two bound rates)

	Brazil	Ergypt	India	Indonesia	Pakistan	Philippines	Sri Lanka	Turkey	EU	Japan	US
Cocoa											
Primary	35	20	100	40	100	40	50	25	0	0.0	0.0
Processed	33	43	130	40	100	40	50	62	17	42.7	13.0
TW	-2.4	23	30	0	0	0	0.0	37	17	43	13
Coffee											
Primary	35	10	125	43	100	40	50	50	4	0.0	0.0
Processed	35	40	133	40	100	40	50	50	8	12.0	1.6
TW	0.0	30	8	-3	0	0	0.0	0.0	4	12	2
Sugar											
Primary	35	20	150	95	150	50	-	135	406	397.2	90.5
Processed	35	20	150	95	150	50	-	135	36	79.7	54.9
TW	0.0	0.0	0.0	0	0	0	-	0.0	-370	-318	-36
Fruits											
Primary	36	56	84	47	100	40	50	62	8	9.4	5.1
Processed	35	60	120	52	100	43	50	58	19	19.2	10.7
TW	-0.9	3.9	36	5	0	3	0.0	-4.1	11	10	6
Oilseeds											
Primary	34	16	106	39	100	39	50	19	0	60.5	18.2
Processed	35	21	210	40	100	38	50	29	29	5.8	4.6
TW	0.3	5	104	1	0	-1	0.0	9.5	29	-55	-14
Grains											
Primary	46	8	84	38	117	38	50	180	30	66.2	1.1
Processed	48	17	131	37	100	36	50	43	34	153.4	2.8
TW	2	9	47	-1	-17	-2	0.0	-137	4	87	2
Rice											
Primary	55	20	80	-	100	-	50	45	40	702.2	2.5
Processed	55	20	75	-	100	-	50	45	60	847.4	5.3
TW	0.0	0.0	-5.0	-	0	-	0.0	0.0	20	145	3

Note: A positive TW indicates tariff escalation, and a negative TW tariff de-escalation, in percentage points.
Source: Author.

In the case of the developing countries, of the 53 cases (eight countries times seven product groups, with three cases missing), there was tariff escalation in 17 cases in the base period, de-escalation in 11 and tariff parity (i.e. neither escalation nor de-escalation) in 25 cases (Table 3). The high frequency of tariff parity is due to fairly uniform tariff structure, i.e. the bound tariffs on both processed and primary products are same or similar. This is so for Sri Lanka in all the seven product pairs as well as mostly so for Pakistan. Of the 17 cases with tariff escalation, the tariff wedge exceeds 10 percentage points in seven cases. These are four cases for India and two each for Egypt and Turkey. Thus, one may conclude that the incidence of significant tariff escalation at the end of the UR is about 15%.

Impact of the formula cuts on tariff escalation

Table 4 presents tariff wedges (TWs) - the difference in bound tariffs between the processed and primary products – for the EU, Japan and US. The first column is the TW for the base period (UR) (same as in Table 3). The following three pairs of columns show both the TW and ΔTW, following formula cuts. The former measures the difference in tariffs between a primary and processed product while ΔTW measures a change in the TW between the base period and after formula cuts, and is an indicator of TE. Of the total of 21 cases (3 countries times seven product pairs), five pairs have negative TWs (tariff de-escalation) both in the base period and following the formula cuts. In all these cases, tariff de-escalations narrow down after tariff reductions (ΔTW>0), which follows from the formulae. For example, the (negative) TW of 36% for the US sugar in the base case became 33% with the US formula cut. The decline in the TWs is notably marked for sugar in the EU and Japan, from the very

Table 4: Tariff wedges and changes in tariff wedge between primary and processed products following tariff cuts (EU, Japan and US markets)

Market	Product	End UR	US formula cuts		G-20 formula cuts		EU formula cuts	
		TW	TW	ΔTW	TW	ΔTW	TW	ΔTW
EU	Cocoa	17.1	5.5	-11.6	8.2	-8.9	10.6	-6.5
	Coffee	4.1	1.7	-2.4	2.3	-1.8	2.7	-1.4
	Sugar	-369.6	-66.8	302.8	-85.9	283.8	-79.7	289.9
	Fruits	11.0	3.4	-7.6	5.3	-5.7	7.0	-4.0
	Oilseeds	28.8	4.9	-24.0	6.8	-22.1	7.7	-21.1
	Grains	3.9	2.3	-1.6	2.8	-1.1	3.1	-0.8
	Rice	20.4	1.8	-18.6	6.8	-13.6	9.4	-10.9
Japan	Cocoa	42.7	8.4	-34.3	14.1	-28.6	20.2	-22.5
	Coffee	12.0	4.6	-7.4	6.6	-5.4	7.8	-4.2
	Sugar	-317.5	-61.8	255.8	-76.3	241.2	-65.3	252.2
	Fruits	9.8	2.9	-6.9	4.6	-5.2	6.2	-3.6
	Oilseeds	-54.7	-4.4	50.3	-12.0	42.7	-17.3	37.4
	Grains	87.2	14.3	-72.9	17.8	-69.5	17.6	-69.6
	Rice	145.2	0.0	-145.2	0.0	-145.2	0.0	-145.2
US	Cocoa	13.0	4.8	-8.2	7.0	-6.0	8.4	-4.6
	Coffee	1.6	0.6	-1.0	0.9	-0.7	1.1	-0.6
	Sugar	-35.5	-33.2	2.3	-41.4	-5.9	-32.8	2.7
	Fruits	5.6	2.8	-2.8	3.9	-1.7	4.0	-1.6
	Oilseeds	-13.5	-7.3	6.3	-9.5	4.0	-9.2	4.3
	Grains	1.7	0.6	-1.1	0.9	-0.8	1.1	-0.6
	Rice	2.8	1.0	-1.8	1.6	-1.3	1.8	-1.0

Note: TW is tariff wedge, the difference in tariffs between primary and processed products. A combination of $TW_{UR}>0$ and $\Delta TW<0$ indicates a reduction in tariff escalation (see Section II). As an example, the EU cocoa case shows that TW_{UR} was 17.1 percentage points which fell to 5.5 percentage points with the US formula cuts, indicating a fall in tariff escalation of 11.6 percentage points.
Source: Author.

high levels in the base case to much smaller values. As said earlier, tariff de-escalation has economic meaning, but it is not an issue in the negotiations.

Of the remaining 16 cases with positive TWs, the TE fell in all 16 instances ($\Delta TW<0$). The average TWs fall markedly, notably with the US formula, followed by the G-20 and EU formulae. Note that TWs for rice in Japan are zero for all three formulae. This is because the very high UR bound tariffs on both groups of rice were capped at 75% under the US formula and at 100% under the G-20 and EU formulae, and thus the wedges are zero. For the 16 cases with positive TWs and escalation, the simple average of the TW fell from 25 percentage points in the base period to 4, 6 and 7 percentage points with the US, G-20 and EU formula respectively. Thus, one main conclusion is that the formulae reduce TE significantly but do not eliminate. Whether these reductions amount to the Framework's standard of "effectively" dealing with the phenomenon of the TE, or if something more needs to be done, is a matter for debate.

Table 5 shows changes in TWs following formula cuts for the eight developing countries.[4] As noted previously, there was tariff parity for 25 of the 53 product pairs in the UR itself. The formula cuts do not change this parity because tariffs on both primary and processed products

[4] Note that for the developing countries, the EU proposal is the same as the G-20 proposal, and so a separate analysis is not needed.

Table 5: Tariff wedges between primary and processed products in the base period and following the tariff cuts - eight developing countries

Product	End UR TW	US formula cuts TW	US formula cuts ΔTW	G-20/EU formula cuts TW	G-20/EU formula cuts ΔTW	End UR TW	US formula cuts TW	US formula cuts ΔTW	G-20/EU formula cuts TW	G-20/EU formula cuts ΔTW
	Brazil					Egypt				
Cocoa	-2.4	-1.2	1.3	-1.4	1.0	23.0	9.6	-13.4	15.6	-7.5
Coffee	0.0	0.0	0.0	0.0	0.0	30.0	14.8	-15.2	20.5	-9.5
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fruits	-0.9	-1.2	-0.3	-1.7	-0.8	3.9	3.1	-0.8	2.8	-1.2
Oilseeds	0.3	0.4	0.1	0.2	-0.1	5.2	3.2	-2.0	4.1	-1.0
Grains	1.7	-8.6	-10.3	-3.9	-5.6	8.9	4.6	-4.3	6.2	-2.7
Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	India					Indonesia				
Cocoa	30.0	10.6	-19.4	15.0	-15.0	0.0	0.0	0.0	0.0	0.0
Coffee	8.3	2.9	-5.4	4.2	-4.2	-3.3	-1.3	2.1	-2.3	1.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Fruits	35.9	13.3	-22.6	18.5	-17.3	5.4	1.7	-3.7	3.8	-1.6
Oilseeds	104.0	36.3	-67.7	43.4	-60.5	1.5	1.0	-0.5	0.9	-0.6
Grains	46.9	17.3	-29.6	20.5	-26.4	-1.0	-0.4	0.6	-0.9	0.2
Rice	-5.0	-2.2	2.8	-3.5	1.5	-	-	-	-	-
	Pakistan					Philippines				
Cocoa	0.0	-1.9	-1.9	0.0	0.0	-0.1	-0.3	-0.2	-0.1	0.0
Coffee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fruits	0.0	0.7	0.7	0.0	0.0	2.8	8.5	5.7	6.1	3.2
Oilseeds	0.0	-1.4	-1.4	0.0	0.0	-1.3	0.7	1.9	0.1	1.4
Grains	-16.7	-23.9	-7.2	-23.3	-6.7	-2.4	-2.4	-0.1	-2.4	-0.1
Rice	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
	Sri Lanka					Turkey				
Cocoa	0.0	0.0	0.0	0.0	0.0	36.6	13.6	-23.1	23.5	-13.1
Coffee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0
Fruits	0.0	0.0	0.0	0.0	0.0	-4.1	-1.8	2.3	-2.0	2.1
Oilseeds	0.0	0.0	0.0	0.0	0.0	9.5	4.4	-5.1	6.7	-2.9
Grains	0.0	0.0	0.0	0.0	0.0	-137.4	-52.9	84.5	-78.1	59.3
Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: See notes to Table 4 for explanations.
Source: Author.

are reduced by the same extent. Of the remaining 27 cases, there was TE in 17 cases in the base period and de-escalation in the other 10. Of the 17, the tariff wedge exceeded 10 percentage points, which may be considered to be significant, or more than *de minimis*, in seven instances only. The formula cuts reduce these wedges considerably. For example, the TW for these seven cases falls from 44 percentage points on average in the UR to 16 and 22 percentage points with the US and G-20/EU formulae respectively. This translates into reductions in TE, as measured with ΔTW, of 28 and 22 percentage points.

Whether these reductions are sufficient enough or not is a matter of judgement. Thus for example if the "desired" degree of TE is, say, 10 percentage points or less, the formula cuts are not enough and additional reductions will be needed with the use of a multiple factor like [1.3] or more as suggested in the Harbinson text.

The role of the tariff caps and SnP/SP exemptions

All the above results were based on the assumption that 2% tariff lines of the developed countries are SnPs and 6% of the developing countries are SnPs plus SPs. The question asked here is what difference does it make if no exemptions were made at all for these tariff lines? The only source of the difference in the results (i.e. in TWs and ΔTWs) under the two scenarios is some tariff lines falling under the SnP/SP category in one case while full

reduction rate is applied in the other scenario. In the case of the developed countries, such differences were noted particularly for the three product pairs where tariff de-escalation was found, namely sugar, rice and oilseeds. The reason was that the tariffs on primary products were very high to start with relative to those on the processed products, and so the former were classified as

SnP. As a result, in the "with-SnP" scenario, the new bound rates on primary products remained much higher after formula cuts, leading to larger de-escalation. In other words, because of the SnP assumption, tariff de-escalation continued to be higher. Other than for these three groups of products with high tariffs, the difference in TWs and ΔTWs between the two scenarios was very small.

In the case of the developing countries, tariff parity was the rule rather than exception in 50% of the cases. As for the rest, there were far fewer changes in TWs and ΔTWs between the two scenarios. This does not mean that there were no differences in new bound rates between the with-SnP/SP and without-SnP/SP scenarios. With so many high tariff lines, this is bound to happen. However, as the bound rates were same, TWs were zero and so there were no changes in tariff escalation. As an example, in the case of the US formula cuts, Indonesia's bound tariffs on both raw and white sugar fell from 95% in the UR to 81% under the with-SnP scenario and 41% under without-SnP scenario. But the tariff wedge did not change – it was zero before as well as after the cuts.

What was very important, however, was the role of the tariff caps. The importance of tariff caps in determining the overall reduction rates, as well as for individual tariff lines, was stressed in Sharma (2006). In many cases, the provision to cap tariffs was effective in capping many mega tariffs to the levels of 100% or 75%, depending on the formula. As a result, large wedges in the UR scenario virtually disappeared after the formula applications because with capping, the new bound tariffs on both the processed and primary products were same. The main message is that tariff caps play very important role in eliminating tariff escalation when bound tariffs are very high.

IV. THE NEGOTIATIONS: WHAT MIGHT BE DONE TO TARIFF ESCALATION?

The latest official position on the table (2004 Framework) is to address TE through a formula to be agreed. The only instance of a concrete idea on this was the Harbinson proposal to use a negotiated multiple to further reduce tariffs on processed products wherever tariffs escalate after formula cuts. How feasible is this and how it may be implemented?

As will be clear from this section, even this seemingly simple idea is difficult to implement in practice without some further parameters that need to be agreed to. In what follows, two key building blocks that are essential for addressing TE in the ongoing negotiations are discussed: a list of tariff lines or processed products that will be the subject of the adjustment; and the nature of the adjustment factor itself.

Listing of products for addressing tariff escalation

The analysis in this paper was done for seven product groups, covering many tariff lines, ranging from 4-6 lines in the case of rice to over 100 lines in the case of oils and fruits. One could define the entire HS-10 as primary products (primary grains and rice) and the entire

HS-11 as the corresponding processed products, as was done in this paper. But this does not always work, notably for processed products that are derived from multiple primary products, and where more than one processing stages are involved. Many such product chains are found in meat and dairy groups. For example, the following product chain involves at least three stages of processing: live animals, carcasses, fresh cut meats and further processed meats. In such cases, the tariff lines to be identified for targeting TE could run into 100s. Where does one begin and end in such situations? That this is indeed a difficult task becomes clear when one considers that trade negotiators, despite many years of trade talks, have not been able to agree to even a list of tropical products, something that should have been much simpler.

Without such a list to start with, there is nothing to apply the TE formula to. Given that there are potentially hundreds if not thousands of tariff lines that may be called processed, especially if several levels of processing are taken into consideration, an agreement would be needed on a list of processed products for targeting TE. As the exercise is about comparing tariffs on primary and processed products, a list of the corresponding primary products is also essential. The list of the processed products can not be Member-specific, as is identified for tariff concessions like in sensitive and special products, because a processed product is a processed product irrespective of the membership. Refined sugar for example can not be a processed product for one importing country and a primary product for the other. An expert panel could draw the list of such products. However, given the member-driven nature of the negotiations, all interested Members could be asked to submit a list of a limited number of processed products for the purpose of TE, for example 100 tariff lines at the HS-6 level (about 25-30 products) as processed as well as the corresponding primary products. To prepare a final, common, list, a computer could be asked to select the most common 100 tariff lines for processed and about 150-200 corresponding lines as primary. These would be the products that would be targeted for containing TE.

Reducing tariff escalation for the identified processed products

As said above, the only concrete proposal so far on this is that in the Harbinson text of March 2003.[5] In what follows, this proposal is illustrated with an example, along with an alternative, and perhaps a better, approach. As will be evident, there are several practical complications that one faces in implementing even a seemingly simple formula.

Table 6 shows a concrete example for a product chain, cocoa and products. In this case, the cocoa beans, the primary product, undergoes through two stages of processing – 1st stage processing into cocoa paste, butter and powder, and a 2nd stage processing into chocolates. Addressing TE where a product undergoes through more than one stage of processing is one complication, because a decision is needed on whether all the stages are to be considered or some stage is ignored. For example, should chocolates be included in the cocoa product chain? Second, for the work to be manageable, tariff lines may need to be grouped into categories of homogenous primary and processed products. This will be required for averaging bound tariffs and for implementing reductions. In the cocoa example, all chocolate products (17 tariff lines) are considered to be one category of 2nd stage processed product (chocolates). This simplifies considerably the application of a formula. The alternative, treating all 17 lines differently and computing separate tariff wedge etc, is not impossible to

[5] "In applying this formula, where the tariff on a processed product is higher than the tariff for the product in its primary form, the rate of tariff reduction for the processed product shall be equivalent to that for the product in its primary form multiplied, at a minimum, by a factor of [1.3]", paragraph 8 of the Harbinson modalities, March 2003.

Table 6: Bound tariffs and tariff wedges for cocoa and products

HS-8	description	UR bound tariff (%)	G-20 Tier 1/	G-20 formula cut: Cut rate	G-20 formula cut: New bound (%)	Change in TE (% points)
18010000	Cocoa beans	0	4	0.45	0	-
18031000	Cocoa paste - not defatted	5	4	0.45	3	-
18032000	Cocoa paste - defatted	10	4	0.45	6	-
18040000	Cocoa butter, fat and oil	0	4	0.45	0	-
18050000	Cocoa powder	13	4	0.45	7	-
18061010	Chocoletes - Containing added sugar	22	3	0.55	10	-
18061020	- - Containing added sugar	22	3	0.55	10	-
18062011	- - - - Containing added sugar	93	1	0.75	23	-
18062019	- - - - Containing added sugar	93	1	0.75	23	-
18062021	- - - - Containing added sugar	93	1	0.75	23	-
18062029	- - - - Containing added sugar	93	1	0.75	23	-
18062031	- - - - Containing added sugar	93	1	0.75	23	-
18062032	- - - - Containing added sugar	93	1	0.75	23	-
18063100	- - Filled	10	4	0.45	6	-
18063210	Chocolate confectionery	20	3	0.55	9	-
18063221	Chocolate confectionery	30	3	0.55	14	-
18063222	Chocolate confectionery	20	3	0.55	9	-
18069010	Preparations containing not less than	37	3	0.55	17	-
18069021	Preparations containing not less than	37	3	0.55	17	-
18069022	Preparations containing not less than	37	3	0.55	17	-
18069031	Preparations containing not less than	37	3	0.55	17	-
18069032	Preparations containing not less than	37	3	0.55	17	-
		---------- Simple averages ----------				
	Primary (cocoa beans - 1 tariff line)	0	-	0.45	0	-
	1st stage processed (paste, butter, powder, 4 tariff lines)	7	-	0.45	4	-
	2nd stage processed (chocoletes, 17 tariff lines)	51	-	0.61	16	-
		---------- Tariff wedges (TWs) ----------				TE = ΔTW
	Between primary and 1st stage processed	7	-	-	4	-3
	Between primary and 2nd stage processed	51	-	-	16	-35
	Between 1st stage and 2nd stage	44	-	-	13	-31

Note:
1/ These are the tiers of the G-20 formula, with Tier 1 including the highest tariff lines, and so on. TW is tariff wedge, the difference in the bound tariffs between a processed and primary product. TE is tariff escalation, or ΔTW, before and after a formula cut.
Source: Author.

implement but will not be manageable. This is a complication that will recur in numerous product chains.

The third and fourth columns in Table 6 show UR bound tariffs and the tier to which the tariffs belong to in the G-20 tariff-cutting formula, which is assumed here for the illustration. The next column shows the corresponding reduction rates (based on the G-20 formula) while the sixth column is the resulting new bound rates. The bottom segment of the table shows summary statistics - simple averages of the tariffs and reduction rates, as well as computed TWs and tariff escalation (ΔTW). In this example, the end-UR TW is 7 percentage points between cocoa beans and 1st stage products, 51 percentage points between cocoa beans and 2nd stage products, and 44 percentage points between the 1st and 2nd stage products. With the G-20 formula cuts, the TWs are reduced to 4, 16 and 13 percentage points while tariff escalation (ΔTW) itself falls by 3, 35 and 31 percentage points, respectively.

According to the Harbinson proposal, a further adjustment is made whenever TWs are positive after formula cuts. In this example, all three TWs are positive. Assume that a multiple of 1.3 is agreed, which means reducing the tariff on a processed product by 1.3 times the tariff on the corresponding primary product. There is a technical glitch in the formula as stated and a problem with the proposed formula itself.

The glitch is that the formula does not work where the bound tariff on the primary product is zero (as is the case with cocoa beans in the above example) because in this case a reduction rate is not defined (tariff reduced from 0% to 0%) and so there is nothing to multiply the 1.3 factor with. One finds many product pairs in the tariff data where this is the case, notably in the case of the developed countries due to many duty free tariff lines. Presumably, the Harbinson text refers to the reduction rate of the tier to which the primary product falls into. It has to be that. In the cocoa example, this is 0.45 or 45%. Thus, the tariff on the processed product is reduced by 1.3*45 or 58.5%.

The problem with the Harbinson proposal is that there is no "the" single multiple that produces a desired outcome in all situations. In the cocoa case for example, a multiple of 1.3 will of course reduce the TW between the primary and 1st stage processed products because the reduction rate on the processed products is now 58.5%. However, this reduction will be very small (a TW of 2.9 after the adjustment, versus 3.8 before) as there was no reduction in the primary product (bound tariff being zero to start with). Higher multiples, like 1.9, will reduce the TW considerably. A multiple of 2.2 will fully eliminate the TE in this case.

The case of the pair of cocoa beans and chocolates illustrates that smaller multiples like 1.3 do not always reduce TE. This is because the formula reduction rate for the chocolates, 61%, is higher than 45%*1.3. In this case, TE begins to decline only with a multiple of 1.5 or more while a factor of 1.8 will reduce TW by 50% over and above the formula cuts.

These examples illustrate the problem with the Harbinson proposal of negotiating a single multiple factor for addressing TE. Put simply, there is no such number that works in all the situations.

In view of this, an alternative approach is proposed here, which is to negotiate a threshold within which to contain TE. This threshold may be called a *de minimis* level. Thus, the TWs for all identified product pairs are reduced to within the *de minimis* level of, say, 5 percentage points for the developed countries and 10 percentage points for the developing countries. In this case, the multiple discussed above becomes a variable rather than a fixed number.

In the cocoa example of Table 6, assuming a *de minimis* threshold of 5%, no adjustment is needed in the case of the TE between the primary and 1st stage processed products because the TW is 3.8%, below the 5% level. On the other hand, the TW between the primary and 2nd stage processed products is 16.5 percentage points after the G-20 formula application, which means an adjustment is required. In this case, a reduction rate of 90% is required to reduce the TW to within 5 percentage points (the G-20 cut rate was 61%). In terms of the Harbinson formula, this translates into a multiple of 2 (45%*2 = 90%). As a third example, the TW between the 1st stage and 2nd stage processed products is 12.5 percentage points after the G-20 formula application. The required reduction rate in this case to meet the *de minimis* target is 85%, which implies a multiple of 1.88.

This example illustrates yet another issue to be settled. Note that there are two reduction rates for the 2nd stage processed products: 90% when compared with the primary product; and 85% when compared with the 1st stage processed products. Similar cases will arise whenever a product chain involves more than a single stage of processing. In order to address TEs between multiple pairs of primary and processed products, the reduction rate for the product

in the last stage of processing has to be the highest of all the reduction rates, i.e. 90% and not 85% in the above example.

In conclusion, it appears very difficult to implement the Harbinson-type formula based on a single negotiated multiple, given the wide range of tariff wedges that are found in the tariff profiles. It is also clear that for applying this or other formula there has to be a target level of TE to be attained. In view of these problems, the alternative method suggested above appears more attractive. Bringing tariff wedges to within some agreed *de minimis* threshold would be an "effective" response to the phenomenon of escalating tariffs in line with the spirit of the Framework.

IV. SUMMARY

Effectively dealing with tariff escalation (TE) is one of the stated goals within the market access pillar of the ongoing WTO negotiations. This follows from the recognition that escalating tariffs acts as disincentive for exporting processed products, notably by developing countries where the need for developing value-added, processing economic activities is urgent. In this context, this study analysed the implications on TE of three tariff-cutting formulae and discussed some approaches for addressing TE in the negotiations. The analysis covered seven product pairs and 11 countries, three developed (EU, Japan and US) and eight developing. The following are the key findings of the study.

First, and in common with several previous studies, TE continues to remain for many product pairs even after the full implementation of the Uruguay Round tariff cuts. For the three developed countries covered here, escalation of bound tariffs was found for 16 of the 21 cases (3 countries times 7 product pairs) examined. The simple average tariff wedge (the difference in bound tariffs between the processed and primary products) for the seven product pairs was 14% for the EU, 59% for Japan and 5% for the US. For these countries, tariff de-escalation, i.e. tariff on a primary product is higher than on the corresponding processed product, was also fairly common for products for which there is a farm policy, e.g. sugar. In the case of the developing countries, tariff parity – i.e. the same tariff rate for both the primary and processed products - was more common, reflecting uniform tariff structures. Tariff escalation was found in about 30% of the total cases, with significant escalation (10 percentage points or more) in half this number.

Second, all tariff-cutting formulae reduce TE. In the case of the developed countries, with 16 cases of TE, the simple average tariff wedge fell from 25 percentage points in the base period to 4, 6 and 7 percentage points with the US, G-20 and EU formulae. Thus, one robust finding was that these formulae reduce TE significantly but do not eliminate. Whether these reductions measure up to the Framework's standard of "effective", or if additional adjustments need to be done, is something that can be debated. Similarly, tariff de-escalations where these existed were squeezed further following the formula cuts. In the case of the developing countries, tariff escalation in the base period was significant (tariff wedge exceeding 10 percentage points) in seven of the 53 cases analysed. For these cases, the base tariff wedge of 44 percentage points on average fell to 16 and 22 percentage points with the US and G-20/EU formulae respectively, which translate into 28 and 22 percentage points reductions in TE itself.

Third, tariff caps in the formula proposals were found to play an important role in containing or eliminating tariff escalations. As a result of these caps, many mega tariffs were reduced to

the level of the cap for both the processed and primary products, thus eliminating TE. The role played by the exemptions for sensitive and special products is less clear. Where both primary and processed tariff lines are sensitive, TE will not be affected because all tariffs are reduced uniformly. In some cases, the two tariff lines fall into different tiers of the tariff cutting formula and so tariff wedges are affected after the formula cuts.

Lastly, on how TE might be addressed in the negotiations, the analysis showed that there are two key building blocks that are required to start with: i) a list of products (and tariff lines) that would be the subject of further adjustment for containing TE; and ii) a threshold within which all tariff wedges are to be contained. One of the important conclusions reached is that no formula or method will work unless there is a list of "TE products" to start with.

Agreeing to a list of "TE products" is not going to be simple, given the long-standing difficulty experienced in the GATT/WTO negotiations to agree to a seemingly simpler list of tropical products. Unlike with tropical products, many TE products will have to include import-sensitive products also. But such a list is essential. An idea proposed in this paper is to request all interested Members to submit a list of 100 tariff lines for processed products (about 25-30 products) as well as the corresponding lines for primary products. A computer could then be asked to select the most common, say 20-25, processed products for addressing TE.

Once selected, it is relatively straightforward to adjust the tariff reduction rates so that tariff wedges are within a limit. One option is to make a one-time adjustment using a negotiated number like [1.3] as suggested in the Harbinsion text wherever TE persist (perhaps significant ones) after formula cuts, and leave it there irrespective of the resulting degree of TE. This proposal, i.e. using a single negotiated number, is fraught with practical problems. Instead, an alternative, and a better one, would be for the Members to agree to contain TE, as measured by tariff wedges, within a *de minimis* level, which could be, for example, 5 percentage points for the developed and 10 percentage points for the developing countries, or some similar numbers. In this case, the Harbinson-type adjustment factor becomes variable instead of a fixed number. Containing TE within low levels would be the "effective" response to this long-standing issue.

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