ASSESSMENT OF THE DOHA ROUND AGRICULTURAL TARIFF CUTTING FORMULAE

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Abstract

This paper assesses recent tariff-cutting formulae proposed by the US, G-20 and EU against such goals or criteria like ambition, proportionality, harmonization and effective market access. The formulae are applied to eight developing (Brazil, Egypt, India, Indonesia, Pakistan, Philippines, Sri Lanka and Turkey) and three developed countries (the EU, Japan and the US). The analysis shows that as regards the "ambition" goal, the US formula cuts the bound tariffs the most, by between 43-56% on average for the developing and between 60-64% for the developed countries. The rates of reduction by the G-20 and EU formulae are markedly lower. Second, on the proportionality criterion (i.e. that the developing countries reduce tariffs by no more than 2/3rd of the average cut of the developed countries), the G-20 formula meets this target on average and also for most developing countries individually, while both the US and EU formulae do not. Third, all three formulae reduce tariff dispersions considerably by virtue of the harmonizing feature of the formulae. Fourth, as regards effective market access, the US formula squeezes the tariff overhang the most. Moreover, on average, about 33% of tariff lines of the eight developing countries were found to be affected with the US formula (affected defined as when a new bound rate is lower than the recent applied rate), and 17% by the G-20/EU formulae. For three developed countries, the percentage tariff lines affected by the US, G-20 and EU formulae are about 60%, 51% and 44%. As tariff structures differ so markedly across the WTO Members, it is very difficult, or virtually impossible, to satisfy all the main goals or criteria with one formula and two sets of parameters for the two groups of countries. Having tariff structure-specific formula is not feasible when there are so many different tariff structures and so the best that can be done is to chose the best possible parameters for a formula and hope that the outcomes turn out to be as close to the objectives as possible.

I. INTRODUCTION

Tariff reduction has been a contentious issue and continues to be so, both on the agricultural and non-agricultural products. This is a reflection of strong and divergent "offensive" and "defensive" interests of the WTO Members. After over a year of negotiations in fairly general terms around the elements of the 2004 August Framework Agreement (Framework in short), some concrete proposals on tariff cutting formula were tabled in October 2005. In Hong Kong WTO Conference, however, only one of the several

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parameters that define the formula was agreed to – that there will be four bands or tiers. So there is still much left to be agreed during 2006.

One of the difficulties in agreeing to a tariff reduction formula is the relationship that this has on other elements of the market access package. For example, flexibility is an aspect sought by many countries and so for them an agreement on a tariff formula would be conditioned on the flexibility in sensitive products. Some other elements of market access follow from the choice of a tariff formula itself, notably tariff escalation and the erosion of preference margins. In some cases, it will be very difficult to meet all these goals from a single formula.

The purpose of this paper is to assess the implications of the tariff-cutting formulae. As said above, some concrete proposals have been made in October 2005 that include most if not all of the parameters necessary for such analyses. Three such proposals analysed in this paper are by the US, G-20 and EU. The analysis covers 11 Members: three developed (EU, Japan and US) and eight developing countries (Brazil, Egypt, India, Indonesia, Pakistan, Philippines, Sri Lanka and Turkey).

Three proposals are assessed in this paper.

The **US formula** in the market access proposal of 10 October 2005 has four tiers for both the developed and developing countries. It includes all parameters for developed countries but tariff reduction rates and the level of the tariff cap for developing countries were left blank. For the analysis in this paper, these values are assumed based on the standard 2/3rd rule, i.e. the reduction rates for developing countries are 2/3rd of those for the developed countries (shown in italic in Table 1). The tariff cap of 112.5% is assumed using the same principle (3/2 times the 75% proposed for developed countries). One feature of this formula different from the other two is harmonization of tariffs even within individual tiers, with a range of reduction rates for tariffs within the tier, e.g. 55 to 65% in tier 1, rather than one single reduction rate as in other proposals. This feature is implemented in the analysis in this paper.

The **G-20 formula** of October 2005 also has four tiers for both country groups, with different threshold ranges and reduction rates (Table 1). The width of the tiers is narrower for the developed than for the developing countries. Bound tariffs are to be capped at 100% for developed and 150% for developing countries.

The **EU formula** of 28 October 2005 is identical to the G-20 proposal for the developing countries, with one exception that there is a provision for flexibility in reduction rates in the lowest tier (Table 1). Reduction rates within a given range can vary as long as the specified average for the tier is attained. Similar flexibility is also proposed for developed countries in the lowest tier. Other than that, the EU formula has wider thresholds and lower reduction rates compared with the US and G-20 formulae.

Following this introduction, Section II discusses the tariff data and the criteria used for assessing the impact of the tariff cutting formulae. Section III is the substantive part of the paper and reports the results of the application of the tariff cutting formulae. Section IV summarizes the main findings.

Table 1: Tariff-cutting formulae proposed by the US, G-20 and EU
(tariff 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.

II. THE TARIFF DATA AND CRITERIA FOR EVALUATING THE FORMULAE

The tariff data used for the analysis

For this paper, the conversion of non-*ad valorem* tariffs into *ad valorem* equivalents (AVEs) was undertaken following the method agreed to by the WTO Members in 2005 and using the database referred to in that agreement. Despite the efforts made with great care, many tariff lines could not be converted. In particular, tariff lines belonging to the HS-2 (meats) and HS-4 (dairy) are the most difficult ones to convert. These are also the product categories where mega tariffs are known to exist in the tariff schedules of the developed countries in particular. This means that the actual average overall bound tariffs for some of these countries should be somewhat higher than those reported in this paper.

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. Thus, the analysis of the bound tariffs is based

on 1695, 1368 and 1727 tariff lines for the EU, Japan and US respectively. For that part of the analysis that required matched bound and applied tariffs, the tariff lines used are somewhat fewer as several of the applied tariffs could not be converted.

All the tariff data as well as the trade data required for these conversions came from the WITS site, IDB, Comtrade, and in some cases the AMAD. For example, applied tariffs are from the IDB database and were available at the same level of disaggregation as imports. Bound tariffs are available in the CTS dataset within the WITS database.

Any analyst that has undertaken this exercise knows the pains that one has to go through in estimating tariff equivalent of non-ad valorem tariffs. In this exercise also, many difficulties were encountered in the conversion process, especially of mixed and compound tariffs. The list is longer, but the following bullets are illustrative of the difficulties encountered:

- Missing import values in both the IDB and Comtrade database 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 the units used for the specific bound tariffs. This was due to the use of different units such as “per item” in the case of the tariff and “per k.g.” in the case of the import unit value.
- Ambiguous units used for specific bound tariffs, such as “percentage volume of alcohol per hectoliter” or “Agricultural Component”.
- Different level of disaggregation for some countries and different from the IDB dataset from which import unit values had to be drawn.
- As the Comtrade data are available at the 6-digit level only, the 40/20 filter has to be handled with care.
- When tariffs are mixed with two specific components, different units given can not be always converted to the same unit.
- In order to be able to do the conversion of the non ad-valorem tariffs, the non-ad-valorem tariffs have to be broken down into their components and the units used in each case.
- Several EU tariffs are reported in different units for the same product. e.g. for the same 6-digit product there are one to three lines with volumes and quantities in different units. In order to carry out the 40/20 filter, different files have to be created for different units, so that the conversion of Comtrade unit values to IDB units is possible using one of the different units.
- Bound and applied tariff data do not always match. For example, in the case of Japan in particular, bound tariffs were at 6-digit and applied rates at higher levels. The analysis has been done at the 8-digit level by matching the 6-digit bound rates to the corresponding 8-digit applied rates – hence there are several same bound rates for different applied rates within particular HS-6 groups. For other countries this was not an issue as both the applied and bound rates were at the 8-digit level.

Assumptions and limitations

Although the recent tariff-cutting formulae have many parameters that were missing in the past, some assumptions had to be made. The following list some of the important assumptions made, as well as some limitations.

- The flexibility provision in the 4th tier of the EU formula is not implemented; rather, only the average cut rate specified in the proposal is used. This should not make much difference on the results for developing countries because they do not have many tariff lines in this tier. For the developed countries also, the overall average cut rate should be affected only marginally.

- Assumptions have been made about the number of tariff lines that are sensitive and special (SnP and SP products). Any assumption on these would be bold, given the wide divergence in positions currently. A total of 2% of tariff lines has been designated as SnP for the developed countries and a total of 6% of tariff lines as SnP/SP for the developing countries.[2] The effect of an alternative assumption, namely 5% SnP for the developed and 15% SnP plus SP for the developing countries has also been reviewed.[3]

- As Members have not as yet designated SnPs and SPs, the actual list is not known. For the analysis in this paper, it is assumed that these are the products that currently face the highest bound tariffs. This assumption makes sense because many of the commodities that have peak tariffs, especially in the OECD countries, are considered to be sensitive (and also have tariff quotas and special safeguards). For many developing countries, this approach may not because their tariffs are uniform, which makes it difficult to decide which tariff lines are sensitive or special. An alternative approach could be the gap between the bound and applied rates – the so-called "tariff overhang". Thus, smaller the gap, the more sensitive is the product in the context of tariff reductions. This was however not found to be a better basis, in particular for the developed countries, because tariff overhangs are often very small for tariff lines with very low bound tariffs. One can hardly call those products sensitive which historically faced little protection.

- For all SnP and SPs thus selected, tariffs were reduced by only 25% (or 1/4th) of the applicable formula rate in the tier in question. Thus, for example, if the tier reduction rate is 80%, the rate applicable to the SnPs will be 20% only.

- Analysis has been undertaken at the 6-digit HS level of tariffs for the developing countries and 8-digit HS level for the developed countries. This may introduce some bias, but very small, when summary statistics are compared across countries.

- Non *ad valorem* tariffs have been converted to *ad valorem* equivalents (AVEs) using the method agreed by the WTO Members in 2005. Despite a great deal of efforts, not all tariff lines could be converted, notably complex and some seasonal tariffs. In some cases, "sin products" like tobacco and alcohol are also excluded when tariffs on these products were prohibitively high.

- Average reduction rates are 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

[2] Given the 2% tariff lines as SnP for developed countries, the corresponding percentage for the developing countries would be 3%, when the standard 2/3rd rule is applied. An additional 3% is assumed for special products.

[3] The 15% for the developing countries comes from 7.5% as sensitive (the 2/3rd rule applied to 5% sensitive for developed countries) and an additional 7.5% as special product.

average. The two can produce markedly different outcomes depending on the tariff structure (see Box 1).

Box 1: Measuring the extent of tariff reduction – the averaging method matters

There is some confusion in the literature on how an overall change in tariff reduction is measured appropriately. The confusion is over "cuts in the average" versus the "average cuts". The former is the percentage change between two averages (e.g. bound tariff before and after reduction) while in the latter case the change is measured as the average of all individual percentage cuts, e.g. averaged over 600 reduction rates in the case of the HS-6 tariff lines. The two can give markedly different results, notably where dispersion in the tariff structure is high.

For the 11 countries covered in this paper, the difference in average reductions between the two methods is negligible for tariff profiles such as those of Pakistan and Sri Lanka because of their uniform tariffs. The difference for other developing countries is also small, typically in the 1-2% range only, on average. However, this is not the case for the EU, Japan and the US. For the EU and US, the difference is 13 percentage points averaged over the three formulae while it is as high as 20% in the case of Japan. Therefore, picking one method over the other can be a source of considerable controversy. Since the objective of the Framework is to achieve substantial market access for *all* products, the "average cut" method would be more appropriate. This is the method used in this paper.

Criteria for assessing the formulae

The impact of tariff reductions can be assessed at several levels, like on genuine market access opening and trade expansion, and ultimately on welfare, agricultural development and poverty. These are typically done with global trade models and there are many papers that have do done so. The purpose of this paper is more modest. It evaluates the formulae on the basis of a number of criteria that have often been discussed during negotiations and are stressed in the negotiating proposals also. The following criteria are covered in the paper.[4]

Ambition - The Doha Round declarations often speak of achieving "substantial" improvement in market access, both overall and for all tariff lines. Although effective market access results from changes in applied tariffs (see below), negotiations are primarily about the bound tariffs. Thus, "ambition" may be assessed in terms of the depth of the reduction in bound tariffs. In the Uruguay Round (UR), the targets were 36% cut for developed and 24% for developing countries. One benchmark for the Doha Round – given the repeated use of the word "substantial" – could be *exceeding* the UR targets significantly, e.g. by 50%, , which means average reduction rates of 46% for the developed and 36% for the developing countries.

Proportionality – This refers to the principle enshrined in the Special and Differential Treatment of the WTO Agreements. Notably in the AoA, 2/3rd is the most common rule

[4] The tariff data used for the analysis in this paper were also used for assessing the implications of the tariff cutting formulae on tariff escalation, which is yet another important element of market access. See Ramesh Sharma, *The Doha Round Agricultural Tariff-Cutting Formulae and Tariff Escalation*, paper prepared for FAO workshop on *WTO Rules for Agriculture Compatible with Development*, 2-3 February 2006, Commodities and Trade Division, FAO, Rome, January 2006.

followed, i.e. reduction rates for the developing countries should be 2/3rd or less than for the developed countries. This could be the target for judging "proportionality".

Flexibility – This is also mentioned in the Framework and stressed in several proposals. It refers to the degree to which a particular formula allows some flexibility in choosing which tariffs to reduce more and which ones to reduce less. The UR formula was considered flexible in that it was based on the minimum-average principle. This was also proposed in the Harbinson modalities of March 2003, but was subsequently rejected. In more recent tariff cutting proposals, the flexibility element is envisaged to come through exceptions made for sensitive and special products. WTO Members are divided on the degree of such flexibility, some supporting more flexible modalities while others for less.

Progressivity and harmonization - Although not a goal in itself, this objective is implicit in the Framework approach of reducing higher tariffs more than lower tariffs. This would result into narrower tariff dispersion for individual countries, as well as contribute to reducing tariff escalation if tariffs on processed products are higher than on primary products. All tariff-cutting formulae have some harmonizing element – the question is one of the degree. This criterion can be assessed on the basis of the standard deviation of the tariffs.

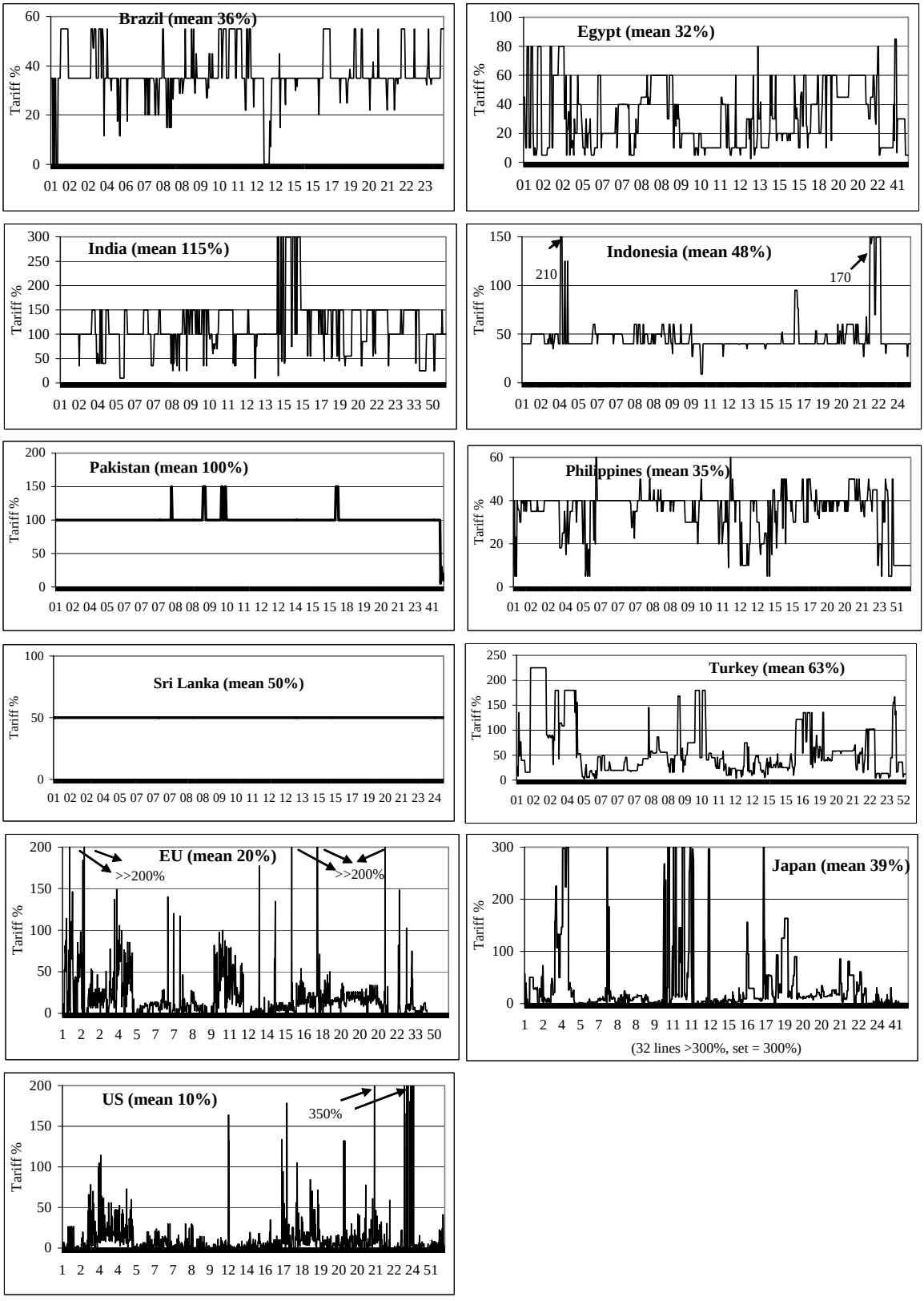
Effective market access – As said above, the negotiations are about reducing bound tariffs which may or may not create effective market access. Where bound tariffs are high relative to applied rates, reductions of the former may not lead to the lowering of the latter and so effective market access is not realized. Where statistics on both bound and applied tariffs are available, it is straightforward to assess whether reduced bound tariffs also lead to lower applied rates. Two indicators are used in this paper for this – the impact on the gap between the bound and applied tariffs ("tariff overhang") and the number of tariff lines affected in the sense that the new bound rates fall below the applied tariffs for recent periods.

III. RESULTS: IMPACT OF THE TARIFF-CUTTING FORMULAE

Current tariff profiles

The starting point in the assessment of the formulae is examination of the tariff profiles or structures because how a formula impacts on the tariffs is largely determined by the tariff structure. Figure 1 plots tariff profiles of the 11 Members covered. These are bound tariffs at the end of the UR implementation period, and so the base for further cuts, plotted against HS numbers at the two-digit levels (HS-2). The differences in the overall simple average bound rates as well as the structure (dispersion) are striking. The averages range from just over 30% for Brazil, Egypt and the Philippines to about 60% for Turkey and to 100% and above for India and Pakistan. Among the developed countries, the averages are relatively low for the US (10%) and EU (20%). The average bound tariff for Japan is 39%. Although the graphs are not as revealing due to some peaks, several of these profiles are characterized by a single uniform tariff for a large proportion of the tariff lines, e.g. 100% for both India and Pakistan and 35% for Brazil. About 25% of the tariff lines (at the HS-8 level) of the EU, Japan and the US are duty-free, which also do not show clearly in the figures.

Figure 1: Tariff structure (bound tariffs) of 11 WTO Members



Note: The x-axis shows HS-2 numbers and the y-axis shows bound rates.

How a particular formula impacts on the tariff structure, however, depends on how tariff lines are distributed vis-à-vis the tiers and thresholds of the formula. This is shown in

Table 2 in terms of the percentage of tariff lines that fall in each of the four tiers of the three formulae. Thus, for example for Egypt, all tariff lines are concentrated in tiers 3 and 4 (42% and 58% respectively) of the G-20 formula, and thus tariffs will be cut by 30% and 25%. By contrast, under US proposal, while 50% of the Egyptian tariffs fall in tier 4, 27% are in tier 2 and 20% in tier 3. As a result, Egypt's tariffs would be subjected to higher cuts under the US proposal.

Table 2: Distribution of tariff lines by tiers in the three formulae
(% of total lines falling into respective tiers)

Country	Proposal	Tier 1	Tier 2	Tier 3	Tier 4	Total	Duty free 1/	# of tariff lines
Brazil	US	0	17	78	6	100	2	614
	G-20/EU	0	0	91	9	100	2	614
Egypt	US	5	27	20	48	100	0	592
	G-20/EU	0	1	42	58	100	0	592
India	US	86	5	7	2	100	0	668
	G-20/EU	37	49	11	4	100	0	668
Indonesia	US	5	26	69	1	100	0	564
	G-20/EU	3	1	94	2	100	0	564
Pakistan	US	99	0	0	1	100	0	572
	G-20/EU	2	97	0	1	100	0	572
Philippines	US	0	10	75	15	100	0	575
	G-20/EU	0	0	74	26	100	0	575
Sri Lanka	US	0	100	0	0	100	0	570
	G-20/EU	0	0	100	0	100	0	570
Turkey	US	29	25	20	26	100	0	607
	G-20/EU	15	8	41	36	100	0	607
EU	US	7	5	14	75	100	25	1695
	G-20	4	5	16	75	100	25	1695
	EU	2	5	9	85	100	25	1695
Japan	US	13	5	12	70	100	18	1368
	G-20	12	4	14	70	100	18	1368
	EU	11	2	8	79	100	18	1368
US	US	2	2	5	91	100	24	1727
	G-20	2	1	6	91	100	24	1727
	EU	1	1	4	94	100	24	1727

Note: The numbers are percentage of tariff lines that fall in particular tiers. This is determined by the tariff structure of the country vis-à-vis the threshold parameters in the formula. As reduction rates are different for different tiers, the overall average reduction is determined by the distribution of the tariff lines across the tiers.
1/ Although shown separately here for the purpose of illustration, duty free tariff lines are included in tier 4.

In the case of Pakistan, while most of the tariffs fall under tier 2 of the G-20 proposal (subject to 35% cut), these fall into tier 1 under the US proposal (and subject to 58% cut). The overall result for Pakistan is almost fully determined by these cuts. Similar is the case with India. As the EU proposal for the developing countries is identical to that of the G-20, the outcomes are also the same.[5]

[5] As said earlier, the flexibility element in the EU proposal in tier 4 is not implemented in these applications, but this would have only negligible impact on the overall averages.

The depth of the tariff cuts and the new bound rates

Table 3 shows reduction rates following the application of the various formulae. These were averaged as explained in Box 1, i.e. average of the reduction rates for all tariff lines. These results follow readily from the parameters of the tariff cutting formula (Table 1) and the particular tiers to which the bulk of the tariff lines fall into (Table 2). Under the G-20 formula, the cut rates range between 27 and 34% for the developing countries and between 45 and 50% for the developed countries, with simple averages of 29% and 48% respectively for the two country groupings. With the US formula, the corresponding reductions are in the range of 43-56% and 60-64% for the two groups, with simple averages of 48% and 62% respectively. The EU formula results into markedly lower cuts for the developed countries, in the 35-38% range, or 12 percentage points lower on average than the G-20 formula and 26 percentage points lower than the US formula. Put in a different way, the EU proposal gives the same average reduction rate as was intended in the UR (i.e. 36% for developed countries).

Table 3: Reduction rates after formula cuts and new bound tariffs

	Average reduction rate (%)			Average bound tariffs (%)			
Tariffs of:	With US formula	With G20 formula	With EU formula	Base (UR)	With US formula	With G20 formula	With EU formula
Brazil	45	28	28	36	20	26	26
Egypt	43	26	26	32	16	24	24
India	54	34	34	115	49	72	72
Indonesia	46	29	29	48	26	35	35
Pakistan	56	33	33	100	45	67	67
Philippines	44	27	27	35	20	25	25
Sri Lanka	51	29	29	50	25	36	36
Turkey	47	28	28	63	30	42	42
Average 8	48	29	29	60	29	41	41
EU	62	48	36	20	5.5	8.4	10.6
Japan	64	50	38	39	6.9	11.4	15.2
US	60	45	35	10	3.6	5.1	5.9
Average 3	62	48	36	23	5.3	8.3	10.6

Source: Author.

Table 3 also shows the actual levels of the bound tariffs before and after the formula cuts, which follow from the reduction rates discussed above.

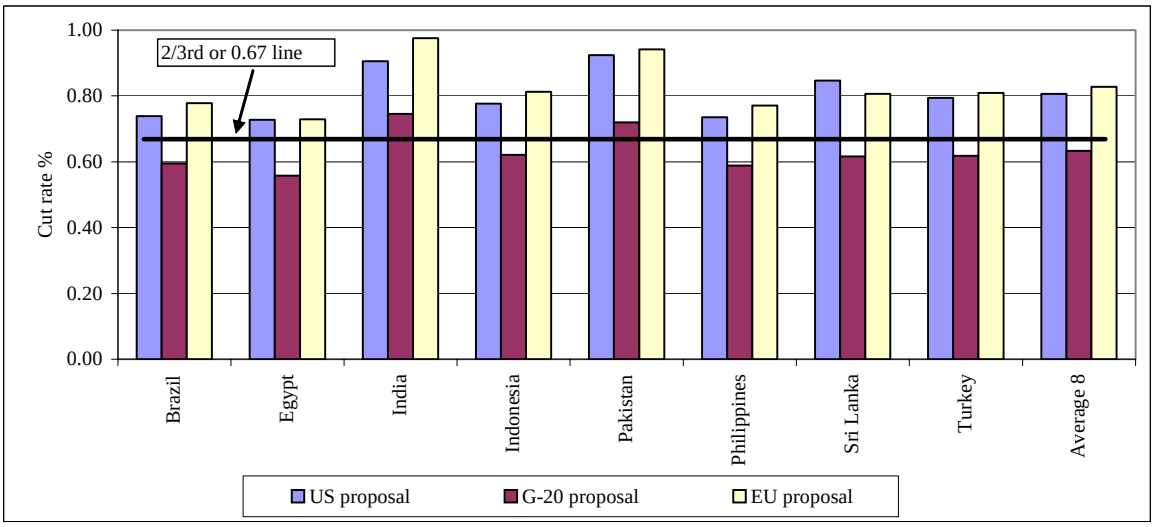
The “ambition” and “proportionality” goals

Are the outcomes “ambitious” enough, or “substantial” enough, as called for by the Framework and other texts? Assuming that tariff cuts in excess of 50% of the UR levels, which were 36 and 24% for the developed and developing countries, are substantial enough for the Doha Round, what can be said of the results above? The US formula is of course the most ambitious of all in an absolute sense and meets the above benchmark. However, note that this formula is also more ambitious for the developing countries, relatively speaking, with an average reduction rate for them that is twice the UR rate, compared with less than twice the UR rate for the developed countries (i.e. 62% actual reduction compared with 72%, which would have been twice the UR rate). The G-20 formula is not ambitious enough, in that the average reduction rates achieved for both the country groups fall short of the target of the UR rates plus 50%. Lastly, the EU formula manages to cut the tariffs of the developed countries by just 36% - the UR rate – and thus

short of the target assumed here. This is also the case for the developing countries. Of course, whether or not the WTO Membership finds these reductions to have met the standard of "substantial" market access set by the Doha mandate is very difficult to guess.

Figure 2 illustrates the outcome on the **proportionality** objective. It shows the ratios of the tariff reduction rates of the individual developing countries over the average cut rate of the developed countries (in this paper, the average for the EU, Japan and US). For the 2/3rd target to be met, the ratio has to be 0.67 or less. The figure shows that this objective is met very well on average for the 8 countries by the G-20 proposal. This is also the case for six of the eight countries – the target is not met for India and Pakistan.

Figure 2: Assessing "proportionality" – comparison of tariff reduction rates of eight developing countries against the average reduction rate for three developed countries



Note: The individual bars show the ratio of the reduction rate for each developing country over the average reduction rate for the developed countries (EU, Japan and US average), separately for the three proposals. The proportionality target is not met when the individual bars exceed the 2/3rd line (=0.67).

In contrast, both the US and EU formulae fail to meet the target. The US proposal does not meet the goal, neither on average nor for any individual country. For example, the proportionality factor for the developing countries under the US proposal is 0.83 (i.e. 52% over 63% average reduction rates for the two groups), markedly higher than the 2/3rd norm of 0.67. For India and Pakistan, the proportionality factor is over 0.9. The reason is simple to understand – the US proposal not only reduces the tariffs of the developed countries significantly, it also does so, and proportionately even more, for the developing countries. The EU proposal is also well off the mark on proportionality. Unlike the US formula, however, the EU formula reduces all tariffs much less, but it does not lower the developing country tariffs sufficiently from the standpoint of proportionately. In fact, Figure 2 shows that except for Sri Lanka, the EU formula deviates more on the 2/3rd target than the US formula.

Two observations are worth noting here. First, the developed country average used here is based on three Members, albeit very important ones from production and trade standpoints. The average reduction rate based on a larger sample of the developed countries may change the results somewhat. Second, it is also clear by now that it will be exceedingly difficult to find a formula that meets this 2/3rd benchmark in *outcome* for over 100

developing countries, given the different tariff structures and levels. It may be futile to even try to do so. What is obviously feasible is to have the 2/3rd rule in the formula parameters and hope that the *outcomes* are closer to the proportionality target.

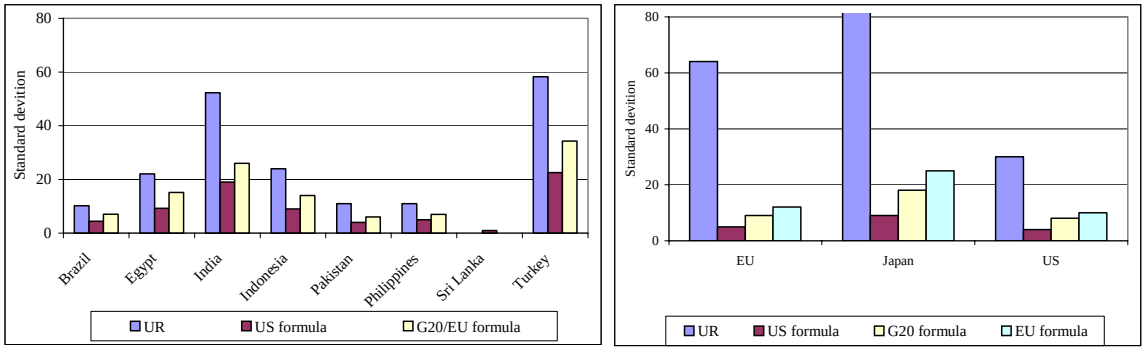
Harmonization – impact on tariff dispersion

Although not a goal in itself, progressivity is called for by the Framework in tariff-cutting formulae. This principle, i.e. reducing higher tariffs more than the lower tariffs, would lead to greater **harmonization** of tariffs. Such an outcome is also considered desirable in trade theory. All proposals on tariff-cutting formulae have this harmonizing element – the question is one of degree.

Harmonization is assessed here on the basis of the standard deviation (SD) of the tariffs before and after the cuts. An alternative indicator for this is the coefficient of variation (CoV).[6] The SD is a better indicator for our purpose than the CoV because the CoV at times shows opposite outcomes to the SD as average tariffs themselves are also affected significantly by the formulae.

Figure 3 shows SDs of the bound tariffs before and after the tariff cuts under the three proposals. The reductions in the SDs are marked, with the US formula reducing the dispersion significantly more than the G-20 formula, which is expected. For example, the US formula reduces SDs by between 54 and 64% for the eight developing countries (simple average reduction of 53%), while the corresponding range for the G-20 formula is 30- 50% (simple average of 35%). The degree of tariff harmonization is higher for the three developed countries, with the decline in the SDs of 90%, 80% and 74% on average with the US, G-20 and EU formulae. The sharp reductions in the SDs also lower the CoVs considerably but not as much as the SDs because mean tariffs also fell markedly in many cases, as discussed earlier.

Figure 3: Standard deviations of the tariffs before and after the formula cuts



Effective market access – implications for applied tariffs

Given the often large gaps between the average UR bound tariffs and applied rates for recent years, commonly known as "tariff overhang", it is generally held that deep cuts in the bound tariffs will be needed for effective market access to occur. The logic is that

[6] The CoV is the ratio of the standard deviation to mean (expressed in percentage form).

unless the current bound rates are not reduced below the recent applied rates, countries will not reduce their applied rates and thus create genuine market access. Table 4 shows these results for the 11 countries covered. To start with, at the end of the UR, the tariff overhang (simple difference between the bound and applied tariff) was 37 percentage points on average (60% bound minus 23% applied) for the eight developing countries and 12 percentage points on average (23% minus 11%) for the three developed countries. There is a large variation among the countries, with only 1 percentage point for the US, over 75 for India and Pakistan and 10-20 percentage points for Brazil, Egypt and Philippines.

Table 4: The impact of the formula cuts on tariff overhang

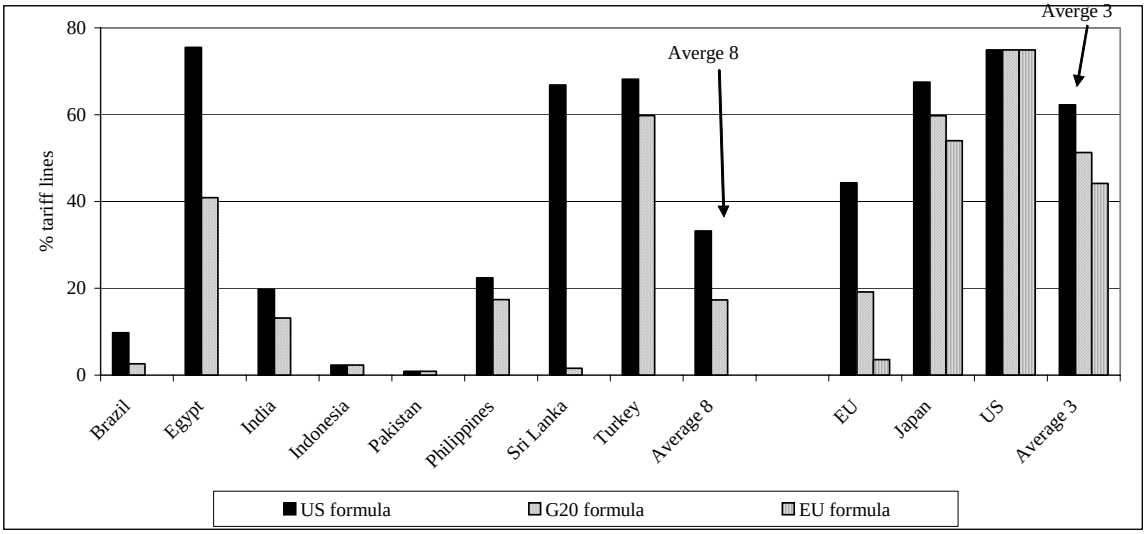
	------- Average bound tariffs (%) --------				Average	Tariff overhang (bound minus applied tariff, % points)			
Tariffs of:	Base (UR)	With US formula	With G20 formula	With EU formula	applied tariff (%)	Base (UR)	With US formula	With G20 formula	With EU formula
Brazil	36	20	26	26	13	23	7	13	13
Egypt	32	16	24	24	22	10	-6	2	2
India	115	49	72	72	39	76	10	33	33
Indonesia	48	26	35	35	9	39	17	26	26
Pakistan	100	45	67	67	20	80	25	47	47
Philippines	35	20	25	25	15	20	5	11	11
Sri Lanka	50	25	36	36	21	29	4	15	15
Turkey	63	30	42	42	45	18	-15	-2	-2
Average 8	60	29	41	41	23	37	6	18	18
EU	20	6	8	11	9	10	-4	-1	1
Japan	39	7	11	15	13	26	-6	-2	2
US	10	4	5	6	9	1	-6	-4	-4
Average 3	23	5	8	11	11	12	-5	-2	0

Note: The first four columns – the bound tariff rates – were reported earlier in Table 3 also. These are copied here to facilitate the reading of the table. The last four columns are tariff overhangs, computed as the difference between the various bound rates and the applied rates. Also note that the results for the developing countries are identical for the G-20 and EU formulae.
Source: Author.

The last three columns in the table show the impact on the tariff overhang after the formula cuts. As expected, the US formula squeezes the overhang the most, from 37 to 6 percentage points on average for the eight developing countries. Two of these countries (Egypt and Turkey) face effective reductions in applied rates as the new average bound rates dip below the recent average applied rates. Considerable overhang is also squeezed for India and Pakistan, from 76 to 10 for India and from 80 to 25 for Pakistan. These are indeed significant cuts. As noted previously, the G-20 formula (as well as the EU formula for developing countries) also reduces the overhangs but relatively less. Only Turkey faces effective reduction in applied rates with these formulae, and by only 2 percentage points. In the case of the developed countries, all three face the prospect of effective reductions in applied rates with the US and G-20 formulae, but only the US with the EU formula.

Figure 4 presents the results for an additional indicator of effective market access – the percentage of tariff lines affected by the formula cuts. “Affected” is defined here as those tariff lines for which the new bound rates, following the tariff cuts, dip below the recent applied rates. For the eight developing countries, about 33% of the tariff lines are affected with the US formula and 17% by the G-20/EU formula. The variation is wide as can be seen in the figure, from only 1-2% tariff lines affected for India and Pakistan to over 65% for Egypt

Figure 4: Percentage of tariff lines affected by formula cuts



Note: For the eight developing countries, the EU results (not shown) are the same as the G-20 results. "Affected" lines are defined as those tariff lines for which new bound rates after formula cuts are lower than recent applied rates.
Source: Author.

and Turkey. Very few tariff lines are also affected for Indonesia despite the fact that Indonesian bound tariffs are not too high, but because applied rates are fairly low.

It is also interesting – and pertinent – to note that for some countries both US and G-20/EU formulae lead to similar outcomes (India, Pakistan), while for others the outcomes are sharply different (e.g. Sri Lanka). This has to do with the tariff structure vis-à-vis the thresholds of the two formulae. This aspect of the tariff structure was discussed early on in Section II (Table 2).

For the three developed countries, the percentage tariff lines affected by the US formula are large – about 60% on average, and as high as 75% for the US itself. The G-20 formula affects 51% of the lines on average and only 44% with the EU formula.

The role of assumptions on the number of SnPs and of tariff caps

The results reported so far were based on the assumption that only 2% of the total tariff lines (about 34 lines at 8-digit HS level) are sensitive for developed countries and 6% lines (about 40 lines at the 8-digit HS level) are sensitive and special products for developing countries.[7] Given the wide divergence in negotiating positions on this point, any assumption on SnPs and SPs could be "heroic" at this stage. However, these are not unreasonable assumptions to start with. The impact of an alternative assumption, 5% and 15% respectively for the developed and developing countries, has also been examined and reported here.[8] Also reported below is the role of the proposed tariff caps.

[7] It is assumed that developing countries have 3% lines as sensitive (using the standard 2/3rd rule) and another 3% as special products.
[8] The 15% for the developing countries comes from 7.5% as sensitive (the 2/3rd rule applied to 5% sensitive for developed countries) and 7.5% as special.

One thing is obvious that the overall tariff reduction rates are lower, and new bound rates higher, when more lines are designated as sensitive and special. However, the difference in the overall averages (i.e. on reduction rates and new bound rates) due to assumptions about 2% or 5% SnP would be very small because of the 98% or 95% weight that the non-SnP tariff lines carry in the overall averages, in contrast to 2% or 5% weight that the SnP category carries.[9] This was what all the results show.

While this is the case for the overall averages, the SnP exemption does indeed matter greatly for market access for the SnP products themselves. As assumed in this analysis, the SnP/SP products undergo only 25% of the cuts that the rest of the tariff lines are subjected to. As a result, market access is greatly compromised. The intention of the negotiators is to offset this by creating market access in other ways, notably with TRQs. Whether or not these equivalent quotas will represent substantial market access is a different matter.[10] This is potentially an important issue for market access if many countries designate as sensitive those tariff lines that have currently TRQs because first TRQs affect a large share of domestic production and second because there are problems with the administration of the TRQs.

Table 5 shows for the three developed countries new bound rates following tariff cuts, and corresponding reduction rates (last two columns), for the 2% and 5% tariff lines that are designated as sensitive. The impact of designating alternative numbers of tariff lines as SnP can be read by comparing the average bound rates and reduction rates for the two assumptions. The differences are fairly small generally. What is important, however, is the role that tariff caps play. For example, for Japan, reduction rates for SnP2% and SnP5% are identical or almost the same because the tariff caps became effective for all SnP tariff lines, whether only 2% or 5%. In other words, in this case, the proposal on tariff capping has dominated the results, rather than the 2 or 5% assumption. Where tariff caps were not as binding, as in the case of the US tariffs, there are some differences in the two results.

In summary, given the small weights (e.g. 2% or 5% of tariff lines) that the SnP group carries, the overall average reduction rates or new bound tariffs are hardly affected. What is significant, however, is that the new bound rates for all the SnP lines are reduced considerably, and so by design. To what extent this compromises market access depends on how TRQs are created and administered. Lastly, what is very important is the role that tariff caps play in the presence of SnPs. Without the caps, mega tariffs will continue.

IV. SUMMARY

This paper assessed recent tariff-cutting formulae proposed by the US, G-20 and EU on the basis of such goals or criteria like ambition, proportionality, harmonization and effective market access. The formulae were applied to eight developing and three developed WTO Members. All the main results were based on the assumption that 2% of the total tariff lines will be sensitive products for the developed countries and 6% of the lines as sensitive

[9] For example, if the new average bound tariff for the SnP lines is 300% but only 20% for the non-SnP category, the overall average new bound rate is only 26% (300*0.02+20*0.98).

[10] Ramesh Sharma, *On the Equivalence of Tariffs and Quotas for Sensitive Products in the WTO Agricultural Negotiations*, paper prepared for FAO workshop on *WTO Rules for Agriculture Compatible with Development*, 2-3 February 2006, Commodities and Trade Division, FAO, Rome.

Table 5: The impact of alternative assumptions about SnP and tariff caps

		Bound tariff rates (%)					
			After reduction, with			Reduction rates (%)	
		Base (UR)	No SnP & no caps	With SnP & with caps	With SnP but no caps	With no SnP	With SnP
Impact on US tariffs							
Of US formula	SnP 2% lines	172	20	69	134	0.88	0.22
	SnP 5% lines	97	13	50	76	0.83	0.21
Of G-20 formula	SnP 2% part	172	45	85	140	0.73	0.18
	SnP 5% part	97	29	58	80	0.64	0.16
Of EU formula	SnP 2% part	172	71	86	147	0.57	0.14
	SnP 5% part	97	44	59	83	0.50	0.12
Impact on EU tariffs							
Of US formula	SnP 2% lines	246	25	75	191	0.90	0.22
	SnP 5% lines	146	16	67	113	0.88	0.22
Of G-20 formula	SnP 2% part	246	62	93	200	0.75	0.19
	SnP 5% part	146	36	75	118	0.75	0.19
Of EU formula	SnP 2% part	246	98	95	209	0.60	0.15
	SnP 5% part	146	63	79	125	0.54	0.14
Impact on Japan tariffs							
Of US formula	SnP 2% lines	537	54	75	416	0.90	0.23
	SnP 5% lines	376	40	75	292	0.89	0.22
Of G-20 formula	SnP 2% part	537	134	100	436	0.75	0.19
	SnP 5% part	376	94	100	306	0.75	0.19
Of EU formula	SnP 2% part	537	215	100	457	0.60	0.15
	SnP 5% part	376	150	100	320	0.60	0.15

Note: The table does not show averages for non-SnP tariff lines. The tariff structure of the developed countries is generally characterized by a smaller percentage of tariff peaks and a very large percentage of low tariffs. As a result, the non-SnP average values are typically small. For example, the new bound rates for the non-SnP tariff lines under various scenarios are in the 2-8% range for the US, 4-9% range for the EU and 6-14% range for Japan.
Source: Author.

plus special for the developing countries. For these lines, tariffs were reduced by only 25% of the applicable formula rate in the tier in question. The main observations are as follows.

First, as regards "ambition", which is expressed in the Framework as "substantial" market access for all tariff lines, the US formula is found to be most ambitious in terms of the depth of the tariff cuts, followed by the G-20 and EU formulae. The US formula reduced bound tariffs in the range of 43-56% on average for the eight developing countries and by 60-64% on average for the three developed countries. The corresponding average reduction rates for the G-20 formula were 27-34% and 45-50%. The EU formula is the same as the G-20 formula for developing countries; for developed countries, the EU formula lowers tariffs by about 37% on average. A benchmark for the "substantial" market access standard could be 50% more than the UR cuts, or 52% and 36% reduction rates for the two country groups. Against this benchmark, the US formula can be considered to be "over-ambitious" for both country groups, but more so, relatively, for the developing countries.

Second, on the proportionality criterion (i.e. the developing countries reduce tariffs by 2/3rd of the average cut of the developed countries), the G-20 formula meets this target on average and also for individual developing countries, with two exceptions (for India and Pakistan). On the other hand, the US formula does not meet the target, neither on average nor for any individual country. With the average cut rates of 32% and of 37% for the two country groups, the EU formula is way off the mark on proportionality.

Third, as regards harmonization of within-country bound tariffs, all formulae – by design – attain harmonization, with the US formula reducing the standard deviations of the bound tariffs the most. For the eight developing countries, the US formula reduced standard deviations by between 54 and 64% on average, compared with 30-50% reductions by the G-20 formula. The sharp cuts in the standard deviations also reduce the coefficients of variation considerably but not as much as the standard deviations because mean tariffs also fell markedly in many cases.

Fourth, the likely impact on effective market access was assessed on the basis of two indicators – the reduction in tariff overhang and the number of tariff lines affected by the formula cuts. On the first, the US formula squeezes the overhang the most. For example, for the eight developing countries, the average overhang of 37 percentage points in the base case (UR) is squeezed to only 6 percentage points, which is indeed a significant squeeze by any standard. The G-20 and EU formulae also reduce overhangs but relatively less. On the second indicator, about 33% of the tariff lines of the eight developing countries on average were affected with the US formula (affected defined as when new bound rates are lower than recent applied rates), and 17% by the G-20/EU formulae. The variation across the countries is wide. For the three developed countries, the percentage tariff lines affected by the US formula is large – about 60% on average, and as high as 75% for the US itself. The G-20 and EU formulae affect 51% and 44% of the tariff lines on average.

It is clear from this analysis as well as from similar other studies that tariff structures differ so markedly across the WTO Members that it is very difficult, or virtually impossible, to satisfy all the main goals like ambition, proportionality, flexibility and harmonization with a single formula and two sets of parameters. As a result, under the present “one-formula, two sets of parameters” approach, some countries will find that they will give in too much than others. On the other hand, with so many tariff structures, tariff structure-specific formulae would most likely not be feasible. As a result, the best that can be done is to chose the best possible parameters for the formula and hope that the outcomes turn out to be as close to the objectives as possible.

The assessment in this paper is based on a 8+3 sample of countries. A larger sample could alter some of the results but it is unlikely that the main qualitative findings will be different. In either case, the search for a tariff reduction formula that will be acceptable to all Members is understandably a difficult and contentious matter in view of the strong and divergent “offensive” and “defensive” concerns of the WTO Members.