Do Sensitive Products Undermine Ambition?

David Vanzetti and Ralf Peters[1]
Australian National University and UNCTAD

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Abstract

The long-running WTO negotiations remain unresolved. Agriculture is the main stumbling block. Members have agreed to linear tariff reductions within bands, but proposed exemptions for sensitive products, while providing for much needed flexibility, threaten to undermine the ambition.

A detailed partial equilibrium global agricultural trade model is used to analyse the likely impact of exemptions from the formula tariff reductions. Applying one third of the formula cuts to the five per cent of lines with the highest tariffs increases the final developed country average agricultural tariff from 16 to 24 per cent but the negative impacts on trade and welfare are less dramatic.

JEL subject codes F13, Q17.
Key words: agriculture, trade, tariffs, WTO

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[1] Crawford School of Economics and Government, Australian National University, Canberra and Trade Negotiations and Commercial Diplomacy Branch, UNCTAD, Geneva. The views expressed are those of the authors, and do not necessarily represent the views of the United Nations or its member states. Contact: david.vanzetti@anu.edu.au.

Introduction

Sensitive products remain a contentious element in the WTO agricultural negotiations because although they provide necessary flexibility, they have the potential to undermine the overall ambition. Ironically, the greater the ambition, the greater the potential effects of exemptions for sensitive products to undermine it. On the other hand, it has repeatedly been shown that WTO members require some flexibility to protect politically sensitive sectors.

Members have agreed on the approach to tariff cuts. There shall be linear cuts within four bands, with the higher tariffs attracting greater reductions. To date the specific thresholds and tariff reductions have not been agreed, although in recent months the likely range appears to have narrowed. Developed and developing country groups would have different thresholds and linear reductions. Members have also agreed on the need for exemptions for so-called sensitive products. Countries will be able to designate their own products, but not agreed is the number of such exemptions, nor their treatment. Sensitive products will not be totally exempted from tariff reductions, and countries that make use of such exemptions will be required to provide additional access in some alternative fashion such as increasing the import or tariff rate quota where these exist. A formula for increasing the quota as compensation for a lesser tariff reduction has not been agreed.

As to be expected, opinions vary on the selection and treatment of sensitive products. The United States has proposed a very low number of tariffs (1 per cent), as it maintains its exporters require a real improvement in market access if they are to forgo domestic support as called for by other members. The G10 group of agricultural importers, such as Japan and Switzerland, which have high tariffs, are pressing for a high proportion of tariffs and lower reductions. The G-20 group of developing countries, which includes China, Brazil and India, have taken an offensive position on agricultural tariffs of developed countries. The G-33 group of developing countries with defensive interests focuses on flexibilities for developing countries.

In this paper we review the current positions on sensitive products and examine the conflicting proposals. One way out of the impasse may be to increase the import quotas.[2] In particular we look at how increasing the flexibility undermines the trade and welfare effects.

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[2] Members have not yet been able to agree on the method or magnitude of specifying quotas as compensation for exemptions.

We also comment on the compensatory expansion of quotas as outlined in the Chairman's draft and assess its feasibility.

Other models have been used to analyse sensitive products. Using the general equilibrium model GTAP a World Bank study (Anderson et al. 2006) shows that global welfare gains shrink by three quarters with the inclusion of 2 per cent and 4 per cent sensitive products in developed and developing countries, respectively. The substantial reduction in welfare gains reflects an ambitious base scenario that does not allow for exemptions under the special product provision. Developing countries welfare gains are positive in that scenario but they lose as a group in the scenarios with exemptions. A study undertaken by UNECA (Ben Hammouda et al. 2007) also shows that exemptions have a negative impact on developing and African countries' welfare though the impact is smaller and the group's welfare remains positive. Polaski (2006) also uses a version of the GTAP model. In a scenario with linear cuts of 36 and 24 per cent for developed and developing countries, respectively, the latter experience welfare losses and flexibilities (only for developing countries) have only a modest impact on the results. This result is a consequence of the initially low level of ambition for developing country cuts.

The different model applications show a common tendency. Within the group of developing countries there are net winners and losers from liberalisation, depending on initial trade and protection patterns. Developing countries as a group may gain or lose with a tendency for greater gains in more ambitious scenarios, especially if reductions in applied tariffs are specified. Countries that do not undertake reductions in applied tariffs tend to lose in these modelling exercises. Furthermore, the higher the initial ambition is the higher is the impact of exemptions. The exemptions can turn gains of developing countries into losses. Some developing countries such as net-food importers may be net-losers but could benefit in terms of lower losses from exemptions of sensitive products as the level of ambition is reduced.

Ambition versus flexibility
Flexibility was accommodated in the Uruguay Round by allowing countries to reduce some tariff lines by only 15 per cent so long as the average cut exceeds 36 per cent. However, the cuts were unweighted, so a 15 per cent cut on an initial tariff of 100 per cent could be offset, for example, by a 57 per cent on a 10 per cent initial tariff. As a result the improvement in market access was a lot less then it appeared at first. Agricultural exporters are keen to avoid this being repeated in the current round. On the other hand, importers are keen to retain such flexibility.

The Hong Kong Ministerial Declaration acknowledges the need 'to agree on the treatment of sensitive products' (WTO 2005, paragraph 7), which would be subject to lesser tariff cuts than specified by the formula.[3] Proposals for the number of sensitive products range from one per cent (G-20 and United States) to 15 per cent (G-10) of tariff lines. The European Union proposed eight per cent. A simulation undertaken by Australia (WTO 2006a) shows that the average reduction of applied tariffs using, for example, the G-20 formula with eight per cent of sensitive products would be less than one per cent in Brazil and less than five per cent in India. More recently, the Chair's draft modalities paper of 17 July 2007 suggested a range for sensitive products to be within the range of 4 to 6 per cent for developed countries and one third more for developing countries (WTO 2007, para. 53).

In addition to selection, also contentious is the treatment of sensitive products. Members have agreed that sensitive products would not be totally exempt from tariff cuts, and more recently the consensus seems to coalesce around reductions for developed countries of between one and two thirds of the formula cuts. This implies for example that a tariff of 100 per cent, that would perhaps be cut by (say) 75 per cent as it is in the top tier, would instead be reduced by between 25 and 50 per cent. For developing countries, the reduction would be "no less than two thirds" according to the suggestion put forward by the Chairman's draft.

To counter this erosion of ambition some countries have proposed that each designated sensitive product shall be subject to an expansion of the import quota as compensation. Indeed the Framework Agreement (WTO 2004) states that 'some MFN-based tariff quota expansion will be required for all such products'. The difficulties are well recognised. Where imports are a small proportion of domestic consumption, any increase in imports based on initial levels does little to improve market access. A variety of variables were put forward as a basis for expansion. These include: (i) domestic consumption, expressed in terms of physical units, (ii) current bound tariff quota volumes; and (iii) base year imports. These would give different results depending on the ratio of imports to the quota or to consumption. Nonetheless, the Chair's draft paper of 17 July refers to 'new access opportunities equivalent to no less than [4][6] percent of domestic consumption' (para. 57). The quota expansion is to be reduced if the quota is more than 10 or 20 per cent of consumption. Finally, the additional quota shall be allocated on an MFN basis.

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[3] The key documents in the negotiations are the Doha Ministerial Declaration (WT/MIN(01)/DEC/1), the Framework Agreement of 1 August 2004 (WT/L/579), sometimes called the July Framework, the Hong Kong Ministerial Declaration (WT/MIN(05)DEC), and the Revised Draft Modalities for Agriculture from July/August 2007 (TN/AG/W/4 and Corr.1).

The selection and treatment of sensitive products can make a significant difference to the level of ambition. The first task is to assess how different degrees of flexibility will affect liberalisation. We examine exemptions applying to the highest 1, 3, 5, 7 and 10 per cent tariffs in each country and report the changes in tariffs, trade and welfare effects. The results will depend somewhat on the formula reductions. As a benchmark we take a standard scenario as proposed in the draft modalities text (WTO 2007) with medium values where ranges were proposed., which is somewhere between the conservative EU proposal and the more ambitious US offer. We also look at quota expansion and assess whether this may compensate for the exemptions. The standard scenario, without exemptions, is described in table 1. There are five more with varying levels of exemptions.

Table 1 Standard liberalisation scenario

Scenario	Countries	Tariffs	Export subsidies	Domestic support
		%	*%*	*%*
	Developed countries	If >75, -70 If >50 and ≤75, -63 If >20 and ≤50, -57 If ≤ 20, -50.	-100	EU –80, US and Japan -70 others -55
	Developing countries	If >130, -47 If >80 and ≤130, -42 If >30 and ≤80, -38 If ≤ 30, -33.	-100	-55
	LDCs	0	0	0

The exemptions are selected by tariff levels at the 6-digit level, with the assumption being that the most sensitive industries attract the highest tariffs.[4] In developing countries the percentage difference between applied and bound rates was takes as the criteria with products having the lowest difference being selected as sensitive products. This reflects the likely approach that developing countries apply the flexibilities in such a way to make as little changes in their applied rates as possible. The sensitive products in developing countries were not selected among maize, rice and wheat because these products were in all scenarios

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[4] An alternative approach is to select products according to tariff revenue, which combines the tariff and the trade flows. However, a possible anomaly with this approach is that sensitive products with prohibitive tariffs, such as Japanese rice, have low tariff revenue and are not selected. The approach that is adopted by Anderson et al (2006) is to take the tariff revenue forgone through implementation of the formula as the selection rule.

determined as special products (SP) which were totally exempted from any tariff cuts or quota expansions.[5]

The model

To assess the impact of WTO agricultural trade policy reform we use ATPSM, a static global agricultural trade model jointly developed by UNCTAD and FAO. The model distinguishes between bound and applied tariffs and includes tariff rate quotas (where the tariff rate depends on whether imports exceed a specified quota), two important features of the post Uruguay Round tariff structure. The model results are driven by changes in policy variables (tariffs, export subsidies, domestic support and tariff rate quotas) which determine changes in domestic prices, consumption and production. This in turn leads to a change in imports and exports, which feed into world prices. The model solves by finding a set of world prices that equate global imports and exports. Intersectoral effects are captured through cross-elasticities, but there are no constraints on the use of resources such as capital, labour or water. Nor is there account of changes in stocks. Imports are assumed to be homogeneous, with consumers and importers indifferent to the source of their products.[6] The results indicate the effects of the policy changes assuming a constant base, 2002-2004. There is no account of exogenous growth over the implementation period. The model is well-documented (Peters and Vanzetti 2004) and is downloadable from the UNCTAD website.[7] One limitation is the model commodity coverage, shown in Appendix 1, which does not include all the products covered by the Agreement on Agriculture. For example, wool is not included. However, the included commodities account for most of global agricultural trade.

The data

Price and production data are an average of 2002 to 2004 and are compiled from FAO statistics. Elasticities are from FAO's World Food Model. These are based on a trawling of the literature and are not econometrically estimated specifically for the model. Some of the elasticities were modified by the authors to reflect homogeneity, symmetry and other conditions. Inquota tariffs, outquota tariffs and global quotas, notified to the WTO, are obtained from the AMAD database where available and aggregated to the ATPSM commodity level. For the quad countries plus Norway and Switzerland *ad valorem* equivalents have been calculated based on the guidelines agreed to at the Mini-Ministerial in Paris in May 2005. Export subsidy data are notified to the WTO and modified by UNCTAD

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[5] Special products can be designated by developing countries only but their selection is most likely subject to criteria related to food security, livelihood security and rural development.
[6] An Armington approach is used on the demand side to differentiate domestic and foreign products, but there is no differentiation between imports from different sources.
[7] The standard version of ATPSM is downloadable from www.unctad.org/tab.

(Peters 2006). Bilateral trade flow data relate to 2004 and are from the United Nations Comtrade database. These are used to allocate global quotas to individual countries. The WTO/ITC/UNCTAD World Tariff Profile database is the source of information on applied and bound tariffs. Ad valorem equivalent tariffs are, however, calculated using the Paris Mini-Ministerial method for agricultural products so that the placement in the tiers is correct. Data can be accessed through the WITS software.

The present version of the model covers 150 individual countries plus two regions, the European Union, which includes 25 countries, and the Rest of World, which includes those countries, mostly small island economies, not covered explicitly. Developing countries include Republic of Korea, and Taiwan, Province of China. A third group is the 50 least developed countries. There are 35 commodities in the ATPSM data set, including meat, diary products, cereals, sugar, edible oils, vegetables, fruits, beverages, tobacco and cotton (see Appendix 1). This includes many tropical commodities of interest to developing countries, although many of these have relatively little trade by comparison with some of the temperate products.

Some markets include production quotas. These include EU raw sugar and dairy products, Canadian dairy and poultry and Japanese rice and dairy. In the absence of better information, in most cases the rent is assumed to be 20 per cent, with the exception of EU sugar (30 per cent).[8] These quotas are quite significant, with implicit rent (quantity times price times assumed percentage rent) on these products alone amounting to $13 billion. The significance of production quota rents is that changes in domestic prices driven by tariff changes may have no effect on production until all the rent has been eroded.

The results

First, we present initial and final bound and applied tariffs under alternative assumptions regarding exemptions for each WTO members. Later we show the trade and welfare effects of various degrees of flexibility.

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[8] The EU dairy quota rent estimate of 20 per cent is supported by Requillart, V., INRA http://www.defra.gov.uk/foodrin/milk/supplychainforum/capinfluences.pdf, and the OECD's PEM model.

Changes in tariffs

**Table 2. Initial and final tariffs at various levels of exemptions for sensitive products**

	Initial	**SP 0%**	**SP 1%**	**SP 3%**	**SP 5%**	**SP 7%**	**SP 10%**
	%	*%*	*%*	*%*	*%*	*%*	*%*
European Union	21.6	8.2	10.2	11.3	12.1	12.8	13.5
United States	6.2	2.7	3.4	3.8	4.0	4.1	4.3
Japan	31.3	10.6	13.2	16.6	18.4	19.6	21.1
Canada	15.4	5.4	7.3	8.8	10.0	10.7	11.1
Switzerland	64.7	20.9	30.7	32.9	34.6	36.2	38.5
Norway	148.6	45.0	55.3	59.5	63.5	67.4	72.6
WTO Developed	48.5	15.6	20.2	22.3	24.0	25.4	27.1
WTO Developing	59.7	39.1	39.3	39.7	40.2	40.5	41.0
WTO Developing applied	17.2	15.0	15.1	15.3	15.4	15.5	15.6

Source: Simple averages derived from WTO/ITC/UNCTAD World Tariff Profiles 2006; but WTO CoA method used to calculate AVEs; data in table 2 based on entire tariff universe of agricultural products; analysis below based on ATPSM coverage of agricultural products (see Appendix 1).

Table 2 shows initial and final tariffs at varying levels of sensitive products, including zero. Norway and Switzerland's sensitive levels are two percentage points above the other developed countries because they have more than 30 per cent of their initial tariffs in the top tier.[9] Developing countries have one third more sensitive tariffs than developed countries (and than indicated in the table). Tariffs are bound, except for the last row which shows applied tariffs for developing countries. For developed countries bound and MFN applied tariffs are practically the same. The first row shows that the European Union has an initial simple average tariff of 22 per cent, and this would be reduced to 8 under the tariff cutting formula used here if there were no exemptions for sensitive products. However, as the exemptions are increased as indicated, the average tariff rises to 14 per cent. For most countries shown here the formula cuts reduce average tariffs to around 30 to 40 per cent of the base, while the ten per cent exemptions raise the average to between a half and three quarters. This is reflected in the average for developed countries as a group, where the initial average of 48 is reduced to 16 per cent under the formula cuts and 27 per cent with 10 per cent of tariff lines exempted. The significant impact of a relatively small number of exemptions on the average tariff in developed countries results from the typical developed country tariff schedule with most tariffs bound at low levels and some very high tariffs (figure 1).

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[9] This follows a suggestion in the Draft Modalities text (WTO 2007) paragraph 54.

Figure 1: Tariff structure in the EU
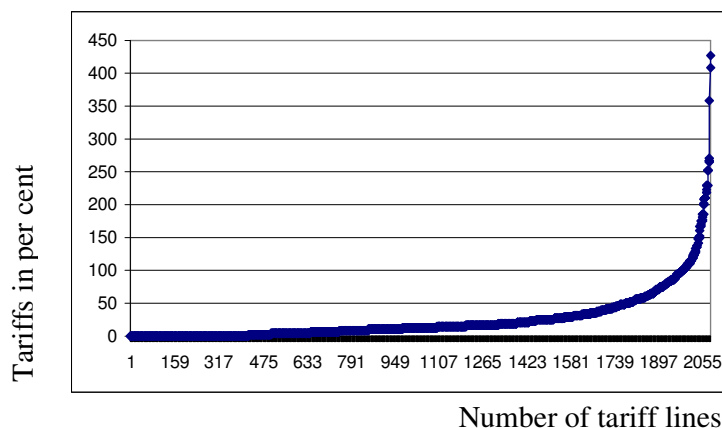
Source: UNCTAD calculation of ad valorem equivalent tariffs based on WTO CoA method (Paris Mini-Ministerial); five products with tariffs above 500% not shown.

Overall, the average tariff in each country seems to show a relatively linear relationship with the rate of exemptions, although the sharpest increase is between zero and one per cent. However, there is no indication that there is a particular threshold above or below which flexibility is disproportionately gained or ambition lost.

For developing countries, the exemptions for sensitive products have very little impact on average tariffs for the group as a whole. This is because developing countries have access to special products exemptions. The formula cuts reduce bound tariffs on average by a third, from 60 to 39 per cent, but the exemptions hardly change the average. For applied rates, the formula cuts tariffs from 17 to 15 per cent, with exemptions having little impact.

So far the results have been discussed in terms of simple average tariffs. This doesn't take account of the effect of trade flows, nor of the changes in trade flows in response to tariff reductions and exemptions. Imports are highly concentrated on a low number of tariff lines. Globally, 5 per cent of tariff lines account for 63 per cent of agricultural trade.[10] This figure is 53 per cent for developed countries and 67 per cement for developing countries. Thus, a few well chosen exemptions can potentially have a significant impact on trade flows.

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[10] This estimate is calculated by UNCTAD from TRAINS data at HS6 level.

However, the tariff lines with the large trade flows are not necessarily those with the highest tariffs. Indeed, prohibitive tariffs have no trade flows. In the European Union, for example, the trade weighted average at 15.7 per cent almost one quarter below the simple average (21.6 per cent). This results because the higher tariffs are given a relatively lower weight.

Trade impacts

The simulated modelling of trade flows in response to tariff reductions suggests there is relatively little reduction and global agricultural trade and welfare as exemptions for sensitive products increase, because the products with high trade flows are not those with the highest tariffs. The driving force is the increase in EU and Japanese imports, which amount to $14.8 billion and $4.3 billion under the zero exemptions and declines to $13.9 billion and $4.0 billion under 5 per cent exemptions, and to $12.7 billion and $3.5 billion under 10 per cent exemptions. The major increase in imports is wheat into the European Union, which amounts to $4.1 billion in the standard scenario without exemptions. The initial tariff on EU wheat is 56 per cent but this doesn't rank in the top five per cent of tariffs. Exemptions to formula tariff cuts for butter, milk powder and cheese have relatively little effect on the value of agricultural imports because initial imports are relatively small. In absolute values, EU beef and sugar imports comprise the most significant changes. For Japan milk powder, butter, rice and sugar are the exemptions that contribute most to the change in imports.

Table 3 Change in imports as exemptions increase

Region	Initial	Change in imports					
		SP 0%	SP 1%	SP 3%	SP 5%	SP 7%	SP 10%
	$m	$m	$m	$m	$m	$m	$m
European Union	31679	14805	14446	14312	13888	13418	12754
United States	22434	367	377	328	358	353	342
Japan	14748	4237	4233	4084	4006	4004	3532
Canada	6100	156	158	156	160	163	142
Switzerland	1272	584	412	396	384	370	358
Norway	747	362	320	309	309	309	293
Developed	89704	22073	21438	20990	20479	19961	18684
Developing	102350	383	316	414	270	203	116
World	200942	21949	21260	20922	20275	19695	18337

Source: ATPSM simulations

A similar picture holds for exports, which are shown in table 4 for selected countries. Additional world exports fall from $23 billion, 12 per cent of the base, to $18.4 billion as exemptions are increased to ten per cent. The figure of most interest is the decline in additional developing country exports, from $20.0 billion to $16.3 billion with ten per cent exemptions. The countries that are most advantaged by the improved market access are India and China, whose agricultural exports increase significantly off a relatively low base. Additional exports fall away in a relatively linear fashion as exemptions increase with roughly 2 per cent lower export increase for any additional 1 per cent sensitive product. .

Table 4 Change in exports as exemptions increase

Region	Initial	Change in exports					
		SP 0%	SP 1%	SP 3%	SP 5%	SP 7%	SP 10%
	$m	$m	$m	$m	$m	$m	$m
Brazil	21776	3367	3210	3109	3002	2866	2789
China	8348	3008	2858	2847	2742	2685	2426
India	4152	3086	2893	2748	2630	2545	2463
Argentina	7896	1306	1285	1259	1235	1198	1129
Australia	10636	1116	1080	1044	1019	969	860
United States	33989	662	583	547	507	564	406
WTO Developed	79841	1883	1769	1705	1525	1352	777
WTO Developing	116745	20032	19134	18609	17960	17314	16337
World	200942	23436	22382	21760	20866	19993	18379

Source: ATPSM simulations

Welfare

Changes in exports do not reflect the costs of producing for exports. A more complete measure is welfare which is measured here as the change in producer and consumer surplus plus change in government revenue from tariffs and expenditure on export subsidies and domestic support. This is shown in table 5. The first observation is that welfare gains diminish as exemptions increase for most countries in table 5. This is also true for global gains. However, this is not the case for many developing countries, as many are net agricultural importers who lose from increasing prices of imports or benefit from preferences. For this reason many developing countries prefer a less ambitious approach, as reflected in their negotiating positions. ACP countries for example proposed the least ambitious tariff reduction formula, including for developed country cuts, among all member states.

Looking at specific countries, the exemptions have a big impact on the welfare gains for Japan, Canada and Switzerland, but less so for the European Union, the United States and Norway. This reflects the particular combinations of tariff cuts and trade flows. For developed countries as a whole the reduction in welfare gains is almost a quarter, from $12.4 billion to $10.4 billion, as exemptions increase to ten per cent.

Table 5 Change in welfare as exemptions increase

	SP 0%	SP 1%	SP 3%	SP 5%	SP 7%	SP 10%
	$m	$m	$m	$m	$m	$m
European Union	6511	6482	6372	6234	6037	5944
United States	1001	1097	1091	1115	1127	1089
Japan	3068	2891	2634	2459	2440	2224
Canada	289	237	205	177	134	111
Switzerland	1148	752	728	710	664	654
Norway	647	601	590	578	574	539
WTO Developed	12456	11939	11479	11151	10881	10387
WTO Developing	-1605	-1389	-1161	-899	-722	-688
World	13484	12725	12307	12041	11795	11321

Source: ATPSM simulations

Producer impacts

In addition to trade and welfare effects, policy makers are also concerned about particular groups in society. Agricultural producers are one such group, as they are large in number and contain many of the poorer members of society. Hence, it is useful to look at how producers fare from trade liberalisation. There are two contrasting effects to consider. A fall in a country's tariff will tend to reduce domestic prices and make producers worse off. However, a reduction in other countries' tariffs will lead to an increase in world prices which will flow through to domestic prices. Whether the negative domestic effect outweighs the positive world price effect depends mainly on the reduction in one's own tariff. In many developing countries there is no change in applied tariff because of the gap between bound and applied rates. In such cases producers are worse off from an increase in exemptions because world prices do not rise as much as otherwise.

In addition to price movements, there are also quantity effects and changes in costs of production. Producer surplus is a measure of the returns to producers after accounting for these factors, and is shown in table 6. Developing country producer surplus is reduced from

$22.4 billion in the no exemption scenario to $20.5 billion with five per cent and $18.6 billion with ten per cent. Data for the more populous developing countries are also shown. Agricultural producers in these countries would be better off in the absence of exemptions for sensitive products. The reverse is true for producers in the agricultural importing countries, including the European Union, Japan, Switzerland and Norway. In these countries it is the consumers who from increased exemptions because domestic prices are substantially maintained.

Table 6 Change in producer surplus as exemptions increase

| | SP 0% | SP 1% | SP 3% | SP 5% | SP 7% | SP 10% |
	$m	$m	$m	$m	$m	$m
European Union	-28471	-28006	-27420	-27168	-26798	-26354
United States	-6045	-5865	-5729	-5712	-5604	-5597
Japan	-10446	-8694	-7854	-6743	-6429	-6048
Canada	-1020	-836	-684	-557	-304	-282
Switzerland	-2749	-1536	-1470	-1421	-1314	-1297
Norway	-1508	-1295	-1263	-1225	-1195	-1120
Brazil	2897	2771	2695	2622	2534	2456
China	4448	4297	4252	4132	4012	3461
India	3482	3385	3068	3031	2999	2907
Argentina	1124	1121	1099	1079	1048	990
WTO Developed	-51562	-47390	-45367	-43659	-42434	-41509
WTO Developing	22407	21702	20974	20532	19987	18560
World	-26696	-23309	-22072	-20893	-20291	-20899

Source: ATPSM simulations

New access opportunities

Given their influence on world trade, it is useful to look at some of the EU and Japanese imports in more detail. The commodities selected for exemption are listed in table 7. The initial, final and exempted tariffs for 5 per cent sensitive products are shown in the first three columns. The tariffs are aggregated from the six digit level.[11] The Chair's draft refers to "new access opportunities" of four to six per cent of consumption where products are selected as sensitive, although this would not apply where the initial import share of consumption is more

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[11] For the analysis in this paper selection of SPs and formula application took place at the 6-digit level. It has not yet been decided in the negotiations whether the designation of sensitive products can be made from 6-digit tariff lines as suggested by e.g. the Cairns group or at a more disaggregated level as suggested by the sensitive products proponents such as EU.

than 10 or 20 per cent. This dispensation would apply to sheep meat, wheat and rice for the European Union and milk concentrates, sugar and coffee for Japan, as shown in the sixth column of the table. The seventh column shows the required expansion, calculated here as 5 per cent of consumption. This compares with the final two columns which are the estimated increase in imports with the final and reduced tariff cut. For example, in the first row the required TRQ expansion for EU bovine meat is 209 kt but the estimated increase in imports exceeds this even with the one third tariff cut (426 kt). Where EU imports are less than 20 per cent of consumption, the increase in market access exceeds the required amount for bovine meat and sugar but not for butter and milk concentrates. For Japan, the expansion of butter and rice is inadequate. However, in no case does the exemption reduce the share of imports from above to below the five per cent threshold. The notion of a tariff rate quota of five per cent of consumption, which was used as a basis for TRQs in the Uruguay Round, bears little relationship to compensation for lower tariff cuts.

Table 7 Change in tariffs and imports for selected EU and Japanese products

	Initial	Final without SP	Final with 5% SP	Consumption	Imports	Import share of consumption	Required TRQ expansion range	Change in imports without SP	Change in imports with 5% SP
	%	%	%	kt	kt	%	kt	kt	kt
European Union									
Bovine meat	77	24	39	4184	194	5	209	489	426
Sheep meat	61	20	25	2513	1358	54	126	244	211
Milk, conc.	110	35	59	50022	3039	6	2501	1	0
Butter	115	35	88	2069	116	6	103	61	2
Wheat	57	21	21	13803	5241	38	690	29549	29543
Rice	51	19	27	6132	1280	21	307	248	248
Sugar, raw	48	16	36	588	13	2	29	3085	1501
Sugar, refined	76	24	36	20844	12	0	1042	4258	3663
Japan									
Milk, conc.	173	52	91	321	46	14	16	76	51
Butter	463	139	355	87	4	5	4	0	0
Rice	503	151	364	8044	654	8	402	43	43
Sugar, raw	146	44	112	2479	1514	61	124	806	242
Coffee, proc.	106	33	80	34	25	73	2	16	6

Source: ATPSM simulations

The problem for some commodities, including EU dairy products, is the existence of production quotas. These imply that a given change in domestic price driven by tariff

reduction will have no impact on production and imports. Up to a point, in the absence of other policy changes, a change in tariffs will only change the production quotas rents, with only a limited change in imports.

Implications and conclusions

The change in agricultural exports in developing countries is driven by the change in imports in developed countries, principally the European Union and Japan. The exemption from formula cuts of the five per cent of tariff lines with the highest tariffs increases the average developed country tariff from 16 per cent to 24 per cent and reduces the estimated growth in developed country agricultural imports from an estimated $22 billion to $19 billion. There is little absolute impact on developing country imports, as the increase in imports under the most ambitious scenario is minimal, reflecting the gap between bound and applied tariff rates and exemptions for special products. On the export side the growth in developing country exports are reduced by 10 per cent, from $20 billion to $18 billion. Global welfare gains are likewise reduced from $13.5 billion to $12.0 billion but developing countries as a group are no worse off because many net food importers among them benefit from the reduced world price increases as tariff cuts are reduced. Producers in developing countries tend to lose from sensitive products.

The import quota expansion has the potential to compensate to some extent for tariff reductions but as it is envisaged in the Chairman's draft the effects are likely to be limited if an import share above 10 or 20 per cent exempted importers from expanding the quota. More problematic is another class of products where imports are a very small share of consumption. In such cases the formula tariff cut would not bring imports up to the five per cent share, and the tariff rate quota would become non-binding.

Do sensitive products undermine ambition? Most agricultural importers seem to require some flexibility to protect political sensitive agricultural industries. Although this flexibility undermines ambition to some extent, the impacts estimated here suggest this flexibility may be a reasonable price to pay to get an agreement. Provisions for sensitive products make a significant difference to average tariffs but the trade and welfare impacts are less affected. This depends, however, on the selection of sensitive products which is uncertain since countries have not yet publicised their strategy. Anderson et al. (2006) find a higher negative impact of sensitive products on global gains which are probably partly due to their selection rule that is a combination of tariff height and imports.

Trade reform brings about an improved use of resources, which implies more can be produced for less. Most of the allocative efficiency benefits are captured by the countries undertaking the liberalisation, although exporters also gain from improved market access. However, while the efficiency gains are unambiguously positive, the main effects are distributional, with rising prices leading to a transfer from consumers, and perhaps taxpayers, to producers. Whether the overall effects are beneficial depends on the weight policy makers attach to the various groups. In developed countries it seems hard to justify support to producers on economic, social or environmental grounds, but in developing countries many producers are poor, and support for them may be justified on social grounds. This favours higher domestic prices for agricultural products. On the other hand, many countries are primarily net food importers and have a sizeable share of poor urban consumers who are favoured by low prices. Such countries may prefer the status quo, especially if they receive preferential access to protected markets. Whether the poor are better or worse off following trade liberalisation is an empirical question beyond the scope of this paper, but one which policy makers in individual countries need to consider.

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Appendix

Appendix 1: ATPSM Commodities

Livestock	Cocoa beans
Bovine meat	Cocoa, processed
Sheep meat	Tobacco leaves
Pig meat	Oilseeds, temp.
Poultry	Oilseeds, trop.
Milk, concentrated	Vegetable oils
Butter	Pulses
Cheese	Tomatoes
Hides & skins	Roots & tubers
Wheat	Apples
Rice	Citrus fruits
Barley	Bananas
Maize	Other tropical fruits
Sorghum	Tea
Sugar, raw	Rubber
Sugar, refined	Cotton
Coffee, green	
Coffee, processed	

Appendix 2: ATPSM Model Documentation

The Agricultural Trade Policy Simulation Model (ATPSM) is a comparative static partial equilibrium global trade model with the following features:

1. A simultaneous equation system for all countries specifying production, consumption, exports and imports that respond to domestic price changes, given a policy changes, complete price transmission and perfectly competitive markets.

2. Tariff rate quotas and quota rents;

3. Distinction between bound and applied tariff rates.

4. Stocks remain unchanged.

The standard equation system for all countries has four equations:

$$(1) \quad \hat{D}_{i,r} = \eta_{i,i,r}\left[\hat{P}_{w_i}\left(1+\frac{\Delta t_{c\,i,r}}{1+t_{c\,i,r}}\right)\right] + \sum_{\substack{j=1 \\ i \neq j}}^{J} \eta_{i,j,r}\left[\hat{P}_{w_j}\left(1+\frac{\Delta t_{c\,j,r}}{1+t_{c\,j,r}}\right)\right];$$

$$(2) \quad \hat{S}_{i,r} = \varepsilon_{i,i,r}\left[\hat{P}_{w_i}\left(1+\frac{\Delta t_{p\,i,r}}{1+t_{p\,i,r}}\right)\right] + \sum_{\substack{j=1 \\ i \neq j}}^{J} \varepsilon_{i,j,r}\left[\hat{P}_{w_j}\left(1+\frac{\Delta t_{p\,j,r}}{1+t_{p\,j,r}}\right)\right];$$

$$(3) \quad \Delta X_{i,r} = \gamma_{i,r}\Delta S_{i,r};$$

$$(4) \quad \Delta M_{i,r} = D_{i,r}\hat{D}_{i,r} - S_{i,r}\hat{S}_{i,r} + \Delta X_{i,r};$$

where *D, S, X,* and *M* denote demand, supply, exports and imports respectively;
    ^ denotes relative changes and Δ absolute changes;

P_w denotes world price;

t_c denotes the domestic consumption tariff and t_p denotes the domestic production tariff;

ε denotes supply elasticity, η denotes demand elasticity, and γ denotes the initial ratio of exports to production;

i and j are commodities indexes; and

r is a country index.

Equation 3 requires that the change in exports in each market is some proportion of the change in production. This proportion is determined by the ratio of exports to production. For example, if all the initial production is exported, all the change in production is exported. If half the initial production is exported, half of the change in production is exported. This implies that the proportion of exports to production is maintained. Equation 4 clears the market, so that production plus imports equals domestic consumption and exports.[12]

For this application the standard version of ATPSM has been modified to include the following features:

(i)   A land constraint that redistributes unused acreage. The production of wheat, barley, rice, maize and sorghum in each country is raised or lowered by the average change in production multiplied by the ratio of land to other primary factors. This assumes a tonne of each crop in a country uses the some amount of land. Total production of crop may fall or rise depending on the contribution of land compared with capital and labour.

(ii)   Production quotas and quota rents. Production quotas are specified for EU raw sugar and dairy products, US tobacco, Canadian dairy and poultry and Japanese rice and dairy. These quotas are assumed to be binding unless the market price falls below the shadow price. Producers then respond according to the specified supply elasticity. Quota rent contributes to producer surplus.

(iii)   A producer response to changes in quota rents on exports. Here there is no shadow price specified. Producers respond immediately to any change in rent. This implies the supply curve goes through the point at which quantity and price are observed. This permits trade diversion when quota rents change as a result of mfn reductions.

(iv)   An enlarged European Union with 25 members.

(v)   An Armington specification for imports so that the share of imports in consumption is determined by relative domestic and import prices. The change in exports is determined by changes in consumption, production and imports.

(vi)   Revision of domestic support data to include amber box payments for the major users. The difficulty here is the extent to which amber box payments are conflated with border measures, implying that if tariffs are removed, the additional effect of reducing support is minimal. (See de Gorter, Ingco and Ignacio (2004b) for a comprehensive discussion.)

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[12] This paragraph is taken from the ATPSM Handbook, available from UNCTAD's website at www.unctad.org/tab.