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Abstract

This paper analyses the economic effects of different magnitudes of tariff cuts, different tariff cutting formulas, the implications of tariff capping as well as different numbers and width of tariff bands in the market access pillar of the Doha Round agricultural negotiations. The simulations are conducted with an extended version of the GTAP model and an extended version of the GTAP data base (6.0) including bound and applied rates.

The results reveal that the EU-27 experiences a negative change of its trade balance in the highly protected beef and sugar sectors. The relative increase of EU beef and sugar imports is mainly evoked by the magnitude of tariff cuts and, to a lesser extent, by the kind of formula used to implement the tariff cuts. In contrast, the EU trade balance for milk and cereals is hardly influenced by different options to cut tariffs. Here, the negative change of the trade balance is mainly driven by the elimination of export subsidies. The results also indicate a relative increase of EU exports for other meat, if tariff cuts are high enough to open third countries' markets to the EU.

JEL: F13, Q17

Key words:

Doha Round, agricultural trade liberalization, Common Agricultural Policy, developing countries, tariff reductions

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1. Introduction

Agricultural market access is a highly controversial issue in the current WTO policy debate. According to the latest proposals of the EU, the USA, the G-20 and the G-33, the positions on market access differ strongly and thus the success of the upcoming Hong Kong negotiations is evidently put at risk.[2] The most contentious issues concerning market access are: What magnitude of tariff cuts should be made? What kind of tiered formula should be implemented? Should tariffs be capped? How should the number and width of tariff bands be handled? Should there be flexibility within the tariff bands? How many products should be defined as sensitive? What degree of Special and Differential Treatment (SDT) should be required? How should Tariff Rate Quotas (TRQs) be handled? The answers to these questions will determine the magnitude of the market access which will be granted by WTO member countries and is still a moving target in the WTO negotiations.

This paper addresses some of the questions raised above. Based on the analysis we show how much the trade balance of the EU-27 changes if different tariff cutting options to open market access are applied. We ask whether industrialized countries (ICs), developing countries (DCs), least developed countries (LDCs) or non-WTO member countries (ROW) take advantage of the enlarged EU market access. Furthermore, the most sensitive variables for market access for different product groups will be identified. Section 2 of the paper begins by discussing the variables relevant for market access. Section 3 introduces the extended Global Trade Analysis Project (GTAP) model which is used as the methodological instrument for the calculations. Empirical results are discussed in Section 4. Section 5 concludes the paper.

2. Variables to Enlarge Market Access

The Doha Work Programme commits the WTO members to enlarge market access on the basis of a tiered tariff formula that grants higher cuts for higher tariffs (WTO, 2004). Member countries have already decided on a complex concept to convert non ad valorem tariffs, e.g. specific and mixed tariffs, to ad valorem equivalents (AVEs). Beyond that, not much has been decided yet, so the list of open questions concerning the tariff cuts to open market access is rather long.

2 Compare http://www.ictsd.org/ministerial/hongkong/documents_resources.htm#ictsd

The magnitude of these tariff cuts is one of the most contentious issues in the negotiations. Jean et al. (2005) found that only large tariff cuts would have a major impact on market access. They identified the difference between bound and applied tariff rates as the main reason for this result.

Although the use of a tiered formula is already decided, some leeway exists to implement this formula. It can be imposed as a linear formula with linear cuts between the bands, comparable with the Harbinson proposal (WTO, 2003). This approach gives rise to the problem of discontinuity which results in a change of the ordering of tariffs. From the political-economy perspective, such discontinuities would create political resistance from firms which are just above the transition points (Anderson and Martin, 2005a, p.16). Also, the many developing countries which fixed their bound tariffs at a uniform level can be strongly affected by the problem of discontinuities. A possibility for avoiding this problem is the implementation of a progressive tiered formula as proposed by Canada in May 2005.[3] Instead of applying a single cut to the entire tariff line, different cuts are applied to different portions of the same tariff. Because of smaller cuts in the lower portions of the tariff, in absolute terms this formula cuts high tariffs by less than a linear tiered formula.

Another open question in the WTO negotiations is the degree of flexibility within each formula. Formulas which only target an average reduction have high flexibility. These formulas allow governments to shift the burden of the tariff reduction from one sector to another (Bureau and Salvatici, 2004, p.5). Abreu (1996) shows with manufactures that the average tariff cutting rule used in the Uruguay Round (1986-94) has lead to small cuts in sectors with high tariffs. He identifies the same sectors as the most important ones for least developed countries. High flexibility could be reduced by increasing the number of tariff bands in combination with a smaller width of these tariff bands. Also, more tariff bands could reduce the problem of discontinuity.

Another controversial issue in the negotiations is the number of sensitive products**.** This issue has been analyzed by Jean et al. (2005). They found that even allowing two percent of the 6-digit tariff lines in developed countries to be classified as sensitive would dramatically reduce the effectiveness of tariff reductions. Whether or not to impose a maximum tariff or a tariff cap is another undecided issue. Here, Jales et al. (2005) shows that a low level cap does not improve trade, because most of the high tariffs are little other than import bans. Concerning tariff rate quotas, de Gorter and Kliauga (2005) found that a reduction of the out-of-quota tariffs increases

trade much more than an expansion of tariff rate quotas. Jales et al. (2005) pointed out that expansion of TRQs is only a second best option for liberalization because they are not transparent and not an efficient way to increase market access.

Most of the studies mentioned above do not take intersectoral and interregional effects of tariff cutting options into account. Also, comparisons of different options for market access are not well documented in the literature. In particular, different numbers and width of tariff bands or different tiered formulas have not been analyzed in a comparable manner. In the following sections we try to partly close this gap in literature.

3. Empirical Model

The analyses in this paper are based on the comparative static standard multi regional general equilibrium GTAP model. This model provides an elaborate representation of the economy including the linkages between farming, agribusiness, industrial and service sectors of the economy. The use of the non-homothetic constant difference of elasticity (CDE) functional form to handle private household preferences, the explicit treatment of international trade and transport margins and a global banking sector which links global savings and consumption are innovative features in GTAP. Trade is represented by bilateral matrices based on the Armington assumption. Further features of the standard model are perfect competition in all markets as well as profit and utility maximizing behavior of producers and consumers. All policy interventions are represented by price wedges. The framework of the standard GTAP model is well documented in the GTAP book (Hertel, 1997) and available on the Internet (www.gtap.agecon.purdue.edu).

3.1 Extensions of the Model

Agricultural policy instruments are represented via price wedges in the Standard GTAP model. Therefore, the Standard GTAP model is complemented with an explicit modeling of the instruments related to the Mid Term Review (MTR) of the EU's Common Agricultural Policy (CAP). Following the approach of Frandsen et al. (2002), we introduce an additional land subsidy rate into the model that is equalized across all sectors entitled to direct payments. Additionally, the EU budget is included in the GTAP model using a Social Accounting Matrix which covers the expenditures and revenues of the European Agricultural Guidance and Guarantee Fund

3 Compare http://www.tradeobservatory.org/library.cfm?refid=72991.

(EAGGF) as well as the net transfer between EU member countries. Here, we followed the approach of Brockmeier et al. (2005).

Besides changes in the political environment of an economy, macroeconomic developments such as technical progress influence its growth. In order to take these changes into account, corresponding trends are incorporated into this analysis. For this purpose an approach by van Tongeren and Huang (2004) is used which allows the inclusion of exogenous projections of global and regional GDP and factor endowments into the extended GTAP model. In the simulations, technical progress is generated endogenously by the model to produce the projected growth pattern.

3.2 Extension of the Data Base

The most recent GTAP database (Version 6.04) includes applied tariffs which are based on the Market Access Map (MAcMap). The source files of MAcMap come from TRAINS, the WTO and the AMAD databases.[4] The applied rates of the newest GTAP database take preferences, AVEs and TRQs into account. Information on preferences is taken from the TRAINS database and is augmented with data from national sources. AVEs are calculated on the basis of the median unit value of world wide exporters using an average flow of the years 2000 to 2003. Finally, TRQs are taking into account utilizing the fill rate from the AMAD database. If the fill rate is less than 90%, the in-quota tariff is used. The out-of-quota rate is employed if the fill rate is higher than 100%. If the fill rate is higher than 90%, but smaller than 100%, a simple average of the in-quota and out-of-quota rate is applied (BOUËT et al., 2004).

However, comparable bound rates at the 6 digit or at the GTAP database aggregation level are not yet publicly available. Accordingly, the GTAP database used for calculations in this paper is extended by bound tariff data. Tariff data up to the 10 digit level is provided by the Economic Research Service (ERS) of the USDA. This includes agricultural ad valorem and non ad valorem bound tariffs from Chapters 1-24 of the Harmonized System 1996 (HS96). Specific tariffs are converted into AVEs based on average world import unit values (Gibson et al., 2001, p. 6). Tariff data provided at the 8 or 10 digit levels are aggregated to the 6 digit level using the simple

[4] For information on these databases, see the World Bank's World Integrated Trade Solution website http://wits.worldbank.org/witsweb/. Information on AMAD (Agricultural Market Access Database) is available from www.amad.org.

average.[5] However, all 2, 4 or 6 digit tariffs are aggregated to the GTAP level using import trade weights. This is done with the help of source generic world import values from the COMTRADE database for the year 2001 excluding intra-EU trade.

Import weighting is the most commonly used aggregation scheme, also utilized to aggregate the applied rates included in the GTAP database version 6.04. Advantageously, trade weights take the relative importance of trade flows into account. Furthermore, the welfare implications are better addressed with this method. In contrast, the import weighted aggregation scheme leads to an endogeneity bias, as the weight for every individual tariff decreases with an increase of the tariff. Accordingly, prohibitive tariffs impeding market access, and thereby reducing the trade volumes to zero, are not taken into account by import weighting. Trade barriers are therefore underestimated with this method.[6]

3.3 Calculation of Tariff Cuts

WTO negotiations are based on bound rates, while the economic effect of a tariff cut depends on the applied rate. Therefore, our calculations of tariff cuts are based on bound and applied rates. The difference between bound and applied duties is called water in the tariffs.[7] A reduction of the bound rate does not result in a trade effect, if the reduced bound rate remains above the applied rate (Figure 1, Parts 1.1 and 1.2), i.e. the water in the tariff still exists after the tariff cut so that imports are unchanged. However, there will be a trade effect if tariff cuts exceed the water in the tariffs (Figure 1, Part 1.3).[8]

Accordingly, tariff cuts are calculated based on the following equations:

$$T_{br}^{0} \cdot \left(1 - \frac{y_{br}}{100}\right) = T_{br}^{1} \qquad (1)$$

where: T Tariff rate
y Tariff cut in %

5 This procedure was used due to missing data on bilateral trade values at the 8 or 10 digit level.

6 In contrast to this study, Walkenhorst and Dihel (2003) used simple averages for the tariff aggregation to avoid biases from the interdependence of tariff levels and trade flows. The simple non weighted average, however, does not take the relative importance of particular tariffs into account.

7 There is disagreement over the definition of the term "water in the tariffs" in the literature. For example, Martin and Wang (2004) define water in the tariffs as any gap between the applied rate and the actual rate of protection, where the actual rate is lower. Additionally, the term "water in the tariffs" is not equivalent to the term "binding overhang" which defines the difference between the bound and the MFN rate (Francois and Martin, 2003).

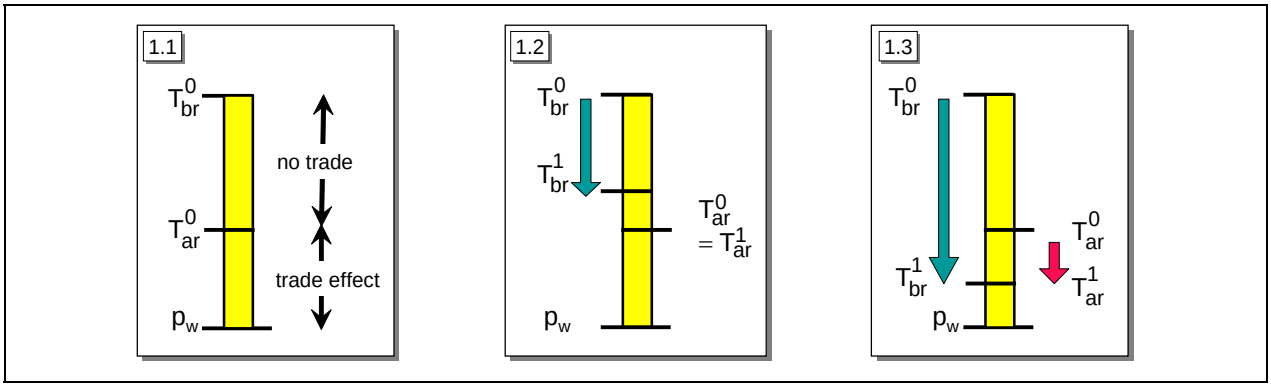
8 Due to unavailable information we do not take effective protection into account. However, it should be stressed that an implemented tariff cut will not result in a trade effect if it leaves the applied rate above the effective protection (Podbury and Roberts, 2003, p. 5).

subscript br/ar	Bound / applied rate
superscript 0/1	Initial / final situation

If T_{br}^{1} is higher than or equal to T_{ar}^{0}, no tariff cuts will be implemented. If T_{br}^{1} is smaller than T_{ar}^{0}, the tariff cut to achieve $T_{br}^{1} = T_{ar}^{1}$ will be implemented according to equation (2):

$$T_{br}^{1} = T_{ar}^{1} = T_{ar}^{0} \cdot \left(1 + \left(\frac{T_{br}^{1} - T_{ar}^{0}}{T_{ar}^{0}}\right)\right) \tag{2}$$

Figure 1: Bound Rates, Applied Rates and Water in the Tariffs[1)]



T = Tariffs, br = Bound rates, ar = Applied rates, p_w = World market price

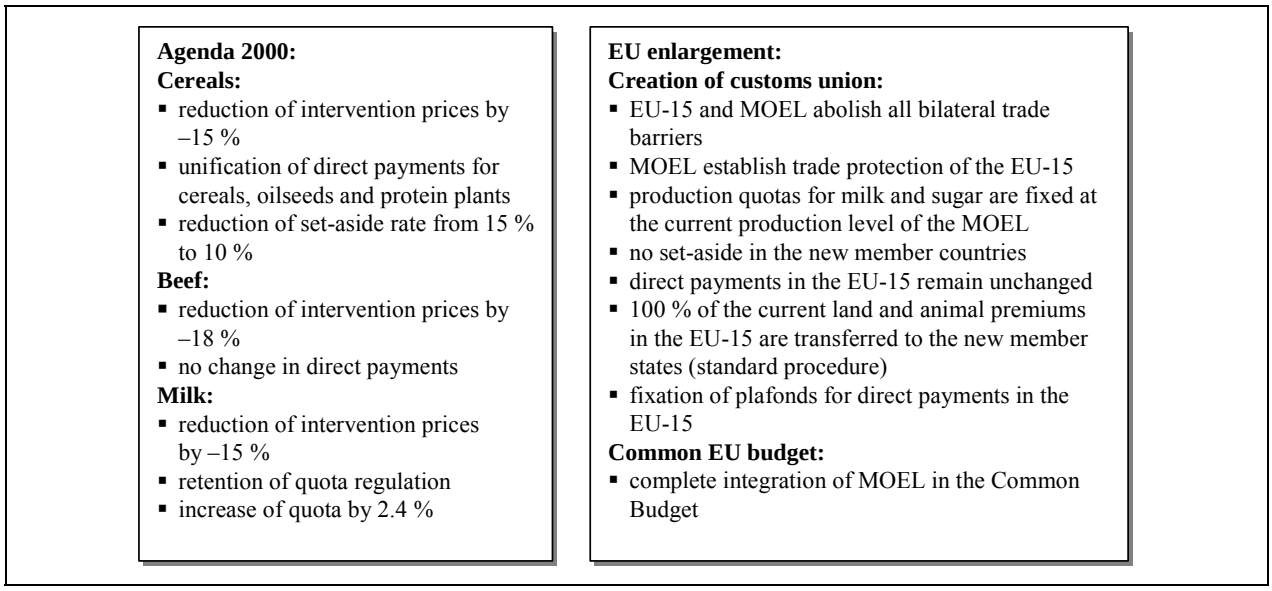
Water in the tariffs will lead to country-specific reduction commitments. Due to the ceiling binding option in the Uruguay Round, developing countries were allowed to implement the tariff binding without reference to former protection levels. As a result, the bound tariffs in developing countries are much higher than in developed countries (Anderson and Martin, 2005a, pp. 14). Therefore, developing countries might experience an implicit preferential treatment that might be added to the already granted special and differential treatment.

3.4 Experiments

The base run of the simulations represents a projection of population, GDP and factor endowment up to the year 2014. Additionally, the Agenda 2000 agricultural policy reform in the EU (2004) and the EU enlargement (2010) are implemented (compare Figure 2). The EBA agreement is introduced without transition periods through a 100% elimination of tariffs for LDCs in 2010. With the implementation of the MTR (2014), the existing domestic support measures are converted into a region-specific fully decoupled land area payment, while budgetary outlays for total domestic support are held constant. The base run only takes into account policy interven-

tions in the EU-15 and in the candidate countries. Developments in other regions, like the Farm Bill of the USA, are not considered. Parallel to the base run, a scenario is implemented as well. It takes the same projections and policy shocks (Agenda 2000, EU enlargement, EBA agreement and MTR) into account, but for the time period 2010 to 2014, it additionally includes simulations related to the WTO round.

Figure 2: Agenda 2000 and EU Enlargement



The Doha Work Programme leaves a lot of room for speculation on how market access will be improved through agricultural trade negotiations. Thus, in the following six experiments, some of the variables still under negotiation (as discussed in Section 2) will be varied to see how they affect the outcome of the Doha round. Table 1 therefore shows three different variants for tariff bands, representing widened (1), shrunken (2) and a reduced number of bands (3). Additionally, Table 1 presents variations of tariff cuts classified as low (A) and high (B) as well as tariff cuts adapted to a lower number of tariff bands (C).

In Table 2 we demonstrate how the six experiments are formed using the variations of tariff bands and cuts, different kind of formulas and the option of capping. The experiments are put together in such a way that Experiments 2 to 6 only differ from Experiment 1 in one variable.

Additionally, we implemented a tariff cut for non-agricultural commodities of 50% and 33% in the IC and the DC, respectively. Export subsidies are also eliminated in all experiments, while it is assumed that the EU direct payments qualify for the green box and are therefore kept unchanged. In line with Special and Differential Treatment, DCs only have to reduce their tariffs by half of the IC tariff reductions. LDCs are exempted from tariff reductions.

Table 1: Bands and Tariff Cuts

	Tariff Bands			Tariff Cuts		
	Variant 1	**Variant 2**	**Variant 3**	**Variant A**	**Variant B**	**Variant C**
Developed Countries	> 80 > 60 ≤ 80 > 40 ≤ 60 > 20 ≤ 40 0 ≤ 20	> 50 > 40 ≤ 50 > 30 ≤ 40 > 20 ≤ 30 0 ≤ 20	>80 >50 ≤ 80 >20 ≤ 50 0 ≤ 20	20 % 18 % 16 % 14 % 12 %	80 % 72 % 64 % 56 % 48 %	80 % 69.5 % 58.5 % 48 %
Developing Countries	> 130 > 80 ≤ 130 > 30 ≤ 80 0 ≤ 30	> 70 > 50 ≤ 70 > 30 ≤ 50 0 ≤ 30		10 % 9 % 8 % 7 % 0 %	40 % 36 % 32 % 28 % 0 %	

Table 2: Experiments

		Experiments					
Variable	**Variant**	**1**	**2**	**3**	**4**	**5**	**6**
Tariff bands	**1**	♦	♦	♦		♦	
	2				♦		
	3						♦
Tariff cuts	**A**			♦			
	B	♦	♦		♦	♦	
	C						♦
Kind of tiered formula	**linear**	♦		♦	♦	♦	♦
	progressive		♦				
Capping						♦	

4. Results

This section discusses the results of the six experiments. In analyzing the effects of different options for expanding market access, we mainly focus on the changes of the EU-27 trade balances and whether ICs, DCs, LDCs[9] or the non-WTO member countries (ROW) are able to take advantage of the enlarged EU market access. Due to limited space we further restrict the discussion of the results to the main products of the EU-27. Results are presented in millions of US$ for the year 2001 of the GTAP database. The calculations are based on the software GEMPACK (Version 9.0), RunGTAP and AnalyseGE (Harrison and Pearson, 1996). A fixed trade balance is adopted as the macroeconomic closure in all experiments.

9 ICs, DCs, LDCs and ROW are classified according to the WTO classification. The simulations were conducted on a more disaggregated base. Due to limited space we only report the results of the EU-27 and the four country groups.

In Table 3 we display the change in the regional trade balance by commodity for the Experiments 1 to 6.[10] An examination of Table 3 shows high negative changes of the EU-27 trade balance for beef, while all other groups of countries improve. In Experiment 3, with lower tariff cuts the EU trade balance loss (US$ -6,173 million) mostly stems from the elimination of export subsidies to ICs, DCs and ROW. The resulting gain for third countries is more or less evenly distributed between ICs, DCs, and ROW. However, DCs' exports increase disproportionately if tariff cuts are high (all other experiments). In contrast, the trade gain of the LDCs is low and remains relatively unchanged between the experiments. A comparison of Experiments 1 and 5 and Experiments 1 and 6 for the beef sector reveals that neither the capping nor the number of bands has a significant impact on the beef sector in all countries. Clearly, the highly protected EU beef sector is most sensitive to tariff cuts. Accordingly, this loss of Experiment 1 (US$ -19,807 million) increases and decreases respectively, when equal tariff cuts are enforced on shrunken tariff bands (compare Experiment 1 and 4) or implemented with a different kind of tiered formula (compare Experiment 1 and 2). These changes are mirrored by third countries.

The sugar sector's reaction to the implementation of the Doha round is somewhat different. Here, the relative increase of EU sugar imports is accompanied by a loss in the LDCs' and mostly also the ICs' sugar trade balance arising from preference erosion and the high tariff cuts respectively. A comparison of Experiment 1 with Experiments 4, 5 and 6 shows the highly protected sugar sector is invariant to the width of the tariff bands, the capping and the number of tariff bands. The size of changes is only reduced in Experiments 2 and 3 where the progressive formula leads to lower tariff cuts or lower tariff cuts are implemented.

Table 3 also shows negative changes for the EU trade balance of milk products in all experiments (US$ -10,126 to -10,980 million). These are almost unchanged between experiments and are therefore indifferent to variations in tariff cuts and bands, the implemented formula and the capping. Consequently, the relative increase of EU milk imports to exports can mainly be attributed to the elimination of EU export subsidies. Again, all third countries show positive changes of their trade balances for milk which remain more or less unchanged in the DCs and the LDCs (compare Experiment 1 to 6). Nevertheless, the DCs can obviously be identified as the main milk surplus producer, gaining as much as US$ 7,403 million in Experiment 4. The remaining relative increase in exports is distributed to ICs and the ROW. In contrast to the EU, the ICs are re-

10 The change in the trade balance represents the change in the value of fob exports minus the value of cif imports.

sponsive to lower tariff cuts, the more moderate progressive formula and shrunken tariff bands, so that their milk surplus increases from Experiment 1 to Experiments 2, 3 and 4, respectively. In contrast, the reduced number of bands in Experiment 6 apparently leads to higher tariff cuts in ICs which in turn reduces the gain of US$ 1,527 million from Experiment 1 to US$ 1,380 million. The remaining trade gain is always absorbed by the non-participating ROW.

Table 3: Change in Trade Balance (Million US$)

	EU-27	IC	DC	LDC	ROW	EU-27	IC	DC	LDC	ROW
	Experiment 1					Experiment 2				
Difference to Experiment 1						progressive tiered formula				
Cereals	-1029	-1488	2320	-7	86	-1172	-1346	2502	-12	-56
Sugar	-2814	-764	5163	-1843	93	-1881	-590	3717	-1390	68
Beef	-19807	851	16171	133	2020	-14174	1122	10582	127	2026
Other meat	2715	-3386	-317	283	224	837	-1921	293	271	216
Milk	-10582	1527	7344	582	1560	-10736	2338	7082	568	1296
	Experiment 3					Experiment 4				
Difference to Experiment 1	lower tariff cuts					shrunken tariff bands				
Cereals	-1160	242	962	2	13	-1125	-2016	3016	-25	-32
Sugar	-589	92	810	-252	20	-2824	-831	5221	-1837	97
Beef	-6173	1922	2263	117	2023	-20002	666	16508	133	2022
Other meat	-2061	839	845	216	205	2445	-3367	-87	292	222
Milk	-10126	2985	6425	530	867	-10980	1858	7403	590	1552
	Experiment 5					Experiment 6				
Difference to Experiment 1	tariff capping					lower number of tariff bands				
Cereals	-1038	-1562	2403	-2	81	-1025	-1501	2340	-9	74
Sugar	-2819	-776	5181	-1845	93	-2810	-772	5166	-1844	93
Beef	-19845	816	16255	132	2018	-19707	944	16007	133	2017
Other meat	2550	-3605	81	287	221	2700	-3403	-278	283	221
Milk	-10619	1517	7396	585	1554	-10433	1380	7331	581	1572

1) IC = industrialized countries, DC = developing countries, LDC = least developed countries, ROW = non-WTO member countries

Source: Own calculations.

Table 3 also shows the results for cereals and other meat. Obviously, the change of the trade balance for cereals does not differ very much between Experiment 1, 2, 4, 5 and 6 in all countries and regions. The EU loss varies between US$ -1,025 and -1,172 million and is accompanied by an even higher loss in ICs which amounts to US$ -2,016 million (Experiment 04). Most of the additional cereal imports into the EU and ICs come from the DCs whose trade balance rises between US$ 2,320 and 3,016 million. The situation is only changed when tariff cuts are significant lower (compare Experiment 1 and 3). Here, the EU surprisingly suffers one of its highest relative increases of imports while ICs are much better off.

Table 3 shows a similar situation for other meat. Compared to Experiment 1 (US$ 2,715 million) the EU trade balance for other meat decrease to US$ 837 million in Experiment 2, and dramatically deteriorates to US$ -2,061 million in Experiment 3. Apart from Experiment 2 and 3 the EU, however, experiences a relative increase of other meat that is completely absorbed by ICs while the DCs, LDCs and the ROW only play a minor role.

Where does the negative development of the EU trade balance for cereal and other meat in Experiment 3 come from? A more detailed analysis can be conducted based on the decomposition which splits the total change of the trade balance in its single components (compare Harrison et al., 1999). These represent the so-called subtotals that are attributable to changes in individual exogenous variables, e.g., the tariff cuts. Table 4 shows this decomposition for the changes in the EU trade balance of cereals and other meat in Experiments 1 to 6. At first glance it can be seen that the driving force behind the change in EU trade balance for cereals is the elimination of EU export subsidies. This effect is very similar in size throughout all Experiments (US$ -1,063 to -1,080 million). A further negative effect for the EU trade balance of cereals results from the cut in import tariffs between third countries which clearly displaces EU cereal exports. Here, a comparison shows that this effect for the EU cereal trade balance is highest in Experiment 4 (US$ -481 million) where tariff cuts are reinforced through an implementation in shrunken tariff bands and the DCs trade balance for cereals increases considerably (US$ 3,016 million, compare Table 3). Table 4 also reveals the opposite effect in Experiment 3, where lower tariff cuts only result in small displacements of EU cereal exports (US$ -88 million).

Finally, Table 4 presents the effects of EU tariff cuts for third countries' agricultural products as well as the third countries' tariff cuts for EU agricultural products. While the latter is only of smaller size, the former compensates the negative effect of tariff cuts between third countries most of the time.

Table 4: Decomposition of the Change in EU Trade Balance (Million US$)

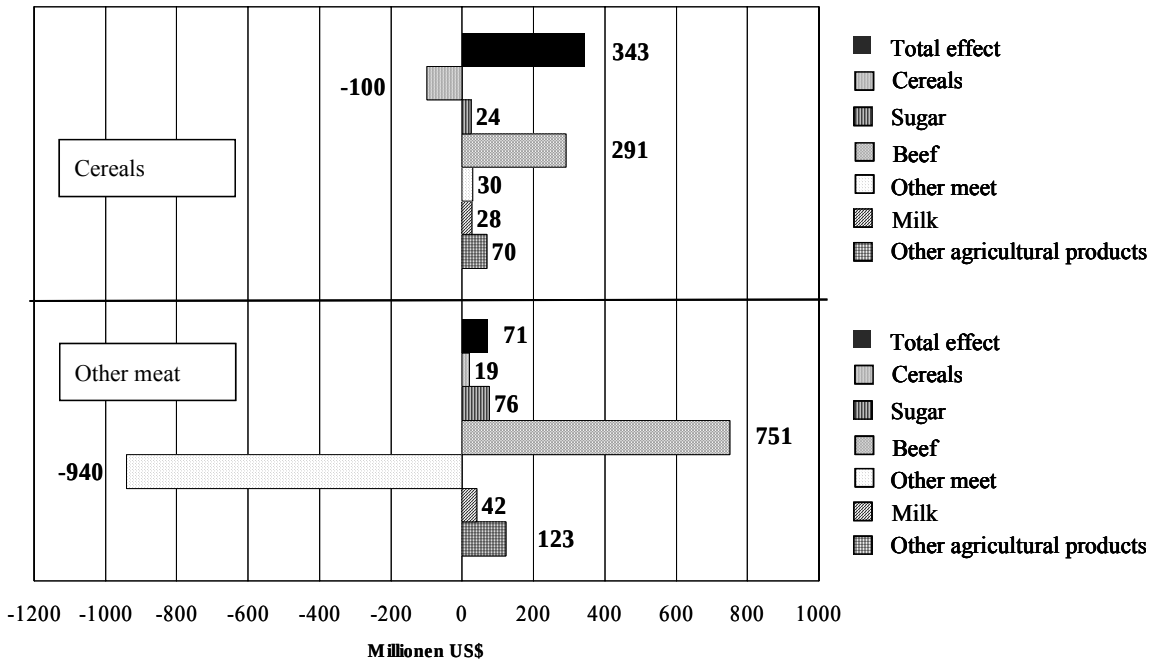
Experiment	Tax cuts of ag. products: from TC to EU	Tax cuts of ag. products: from EU to TC	Tax cuts of ag. products: from TC to TC	Tax cuts of non-ag. products	Elimination of export subsidies: from EU to TC	Elimination of export subsidies: from TC to all regions	Total
	Cereals						
01	343	85	-373	5	-1070	-20	-1029
02	232	42	-352	5	-1080	-19	-1172
03	40	11	-88	3	-1109	-17	-1160
04	318	116	-481	6	-1063	-21	-1125
05	342	51	-346	5	-1071	-20	-1038
06	341	106	-387	5	-1070	-20	-1025
	Other meat						
01	71	10021	-4141	-23	-3225	12	2715
02	-139	7014	-2864	-19	-3168	12	837
03	-17	1244	-351	-7	-2945	15	-2061
04	93	10787	-5180	-26	-3242	12	2445
05	63	9945	-4235	-23	-3212	12	2550
06	4	9849	-3923	-23	-3218	12	2700

Source: Own calculations.

At first sight, it is difficult to understand why the cut of EU import tariffs has a positive effect on the EU trade balance for cereals, viz. US$ 343 million in Experiment 1. For this reason, Figure 3 presents a further decomposition of this effect for Experiment 1. Figure 3 discloses that the cut of EU import tariffs for cereals undoubtedly has a negative effect on the EU trade balance for cereals (US$ -100 million). However, the tariff cuts for all the other EU agricultural products, particularly for beef (US$ 291 million), has a positive effect on the EU trade balance for cereals. In sum, these positive effects outweigh the negative effect of the cut of the relatively low EU tariff for cereals.

Table 4 also presents a decomposition of the results for the EU trade balance for other meat. Here, the effect of the elimination of EU export subsidies plays a major role and goes along with a negative effect of tariff cuts between third countries. The latter is particularly high in those experiments which implement high tariff cuts. It amounts to US$ -5,180 million in Experiment 4 where high cuts are implemented using shrunken bands.

Figure 3: Effects of the EU Import Tariff Cuts for Agricultural Product on the Trade Balance of Selected Products (Million US$)



Source: Own calculations.

It is interesting to note that high tariff cuts also considerably increase the possibility for the EU to export other meat to third countries, mainly to ICs (compare also Table 3). In Experiment 4 this results in a positive effect of the EU trade balance for other meat of US$ 10,787 million. However, comparing Experiment 1 with Experiments 4, 5 and 6, it can be stated that the width and the number of the tariff bands, as well as capping, is not of significant importance for the EU trade balance of other meat nor for third countries.

5. Conclusion

The negotiations on agricultural market access are a central issue in the Doha Round. This paper analyses the economic effects of different magnitudes of tariff cuts, different tariff cutting formulas, the implications of tariff capping as well as different numbers and width of tariff bands. The simulations are conducted with an extended version of the GTAP model. Furthermore, an extended version of the GTAP data base (6.0) including bound and applied rates is used.

The results reveal that the EU-27 experiences a negative change of its trade balance in the highly protected beef and sugar sectors. The relative increase of EU beef and sugar imports is mainly

evoked by the magnitude of tariff cuts and, to a lesser extent, by the kind of formula used to implement the tariff cuts. In contrast, the EU trade balance for milk and cereals is hardly influenced by different options to cut tariffs. Here, the negative change of the trade balance is mainly driven by the elimination of export subsidies. The results also indicate a relative increase of EU exports for other meat, if tariff cuts are high enough to open third countries' markets to the EU.

Who will reap the advantage from an improved EU market access induced by the WTO negotiations? From the non-participating LDCs and ROW points of view it does not make much of a difference whether tariff cuts are high or implemented with different formulas, numbers and width of tariff bands. They only realize a minor trade gain. Additionally, the LDCs suffer from preference erosion in the sugar sector which increases with higher tariff cuts. In contrast, DCs are able to disproportionately increase their beef, sugar and cereal exports to the EU, if higher tariff cuts are implemented. A different tariff cutting formula, varying numbers and width of tariff bands and capping, however, does not lead to a significantly higher access of DCs to the EU market.

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