

The CAP Mid Term Review and the WTO Doha Round Analyses for the Netherlands, EU and accession countries

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This report analyses the potential impact of the EU CAP reforms that follow the Mid Term Review and the Harbinson Proposal for negotiation modalities in the WTO Doha Round on the Netherlands, EU14 and the accession countries. In welfare terms, the MTR has a relatively small impact on the Netherlands, the other member countries of the EU as well as the accession countries, while agricultural income decreases add up to around 2, 3 and 5 percent respectively. Under the Harbinson Proposal the Netherlands and the other EU member countries face losses of their agricultural incomes of 8 and 10 percent respectively, mainly due to reduced outputs in the cereals, oilseeds, and cattle sectors. The agricultural income in the accession countries is also decreasing. As a conclusion, the MTR does not make the European Agriculture compatible for the WTO Doha Round. The border protection measures, which are hardly affected in the MTR, still play a mayor role. Assumptions about the effects of decoupling and the difference between applied and bound tariff rates influence model results.

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Preface

The Doha Ministerial Conference in 2001 launched a new WTO Round of multilateral trade negotiations. The Ministerial declaration promises negotiations about improving market access, reducing export subsidies and reducing domestic support to agriculture. In accordance with the Declaration, the Chairman of the WTO Committee on Agriculture presented a proposal for the modalities of the negotiations in March 2003. In June 2003 the EU commission came up with the Luxembourg Agreement, a further policy reform following the Mid Term Review (MTR) of the Common Agricultural Policy (CAP). According to the EU Commission this reform will strengthen the EU's negotiating hand in the ongoing WTO trade talks.

The Ministry of Agriculture, Nature Management and Food Quality has requested LEI to assess the potential impacts of both the MTR and the Harbinson Proposal on the Netherlands and other countries of the EU, including the EU accession countries. The relevant policy question for the ministry is whether the reforms following the Luxembourg Agreement are sufficient to make agriculture in the EU compatible for the WTO Doha Round. In other words, to what extent does the MTR prepare the agricultural sector for the WTO negotiations?

Markus Lips carried out the research, with guidance and support by Frank van Tongeren and Siemen van Berkum. The research was supervised by a steering committee with the following staff members of the Ministry of Agriculture, Nature Management and Food Quality: G. Meester (chair), R. Huige, H. Massink, J. Schotanus, G.J. Deelen and B. Vrolijk. LEI would like to sincerely thank the steering committee members for their generous contribution.



Prof. Dr. L.C. Zachariasse
Director General LEI B.V.

Summary

In this study we analyse the Mid Term Review (MTR) and the Harbinson Proposal of the ongoing WTO Doha Round.

The MTR has a small impact on the Netherlands: The agricultural income decreases by 2 percent with major impacts on cereals, oil seeds and cattle. Under the Harbinson Proposal the production of cattle is strongly reduced, while the sugar beet production no longer reaches its quota quantity. The agricultural income decreases by 8 percent.

The analysis shows different results for the MTR and the Harbinson Proposal. A sharp reduction of the border protection (export subsidies and tariffs) as it is included in the Harbinson Proposal but not in the MTR has a significant impact on European agriculture. Most problems are expected in the cereals, sugar beets, cattle, and raw milk sectors. All of them are heavily protected by border measures. The MTR makes European agriculture not yet compatible with the WTO negotiations proposal by Harbinson. The reasons are the border measures, which are hardly affected by the MTR.

For the EU14 (the EU without the Netherlands) the MTR has a modest impact on agriculture. The Harbinson Proposal leads to reductions of the production of cereal, cattle and sugar beet. The latter does not reach its quota quantity. Agricultural income decreases by 10 percent while economic welfare in the EU14 is improved by almost \$ 4 billion.

The accession countries (CEEC) expand their agricultural production slightly under the MTR. The Harbinson Proposal has limited effects on production but the CEEC loses a part of the sugar beet and raw milk quota rents, Accordingly, agricultural income in accession countries decreases by 13 percent.

As an additional issue we analyse separately the WTO accession of Russia. As Russia is a large and nearby situated economy, the country's membership of the WTO might be of significant importance to trade flows with EU countries. However, due to the relatively small tariff adjustments for agricultural products, the Russian accession to the WTO has very little impact on agricultural trade flows between Russia and the EU. Russia can improve its welfare through the WTO accession, as the CEEC can benefit from Russia's WTO membership.

1. Introduction

At the Doha Ministerial Conference in 2001 it was decided to start a new WTO Round of multilateral trade negotiations. The Ministerial declaration promises negotiations about improving market access, reducing export subsidies and reducing domestic support to agriculture. In accordance with the Declaration Stuart Harbinson, the Chairman of the WTO Committee on Agriculture presented a proposal for the modalities of the negotiations in March 2003. In June 2003 the EU commission came up with the Luxembourg Agreement, a further policy reform following the Mid Term Review (MTR) of the Common Agricultural Policy (CAP). According to the EU commission this reform will strengthen the EU's negotiating hand in the ongoing WTO trade talks.

While the MTR mainly deals with domestic support the Harbinson Proposal includes elimination of export subsidies, reduction of domestic support and changes of border protection.

In this report we assess the potential impacts of both the MTR and the Harbinson Proposal on the Netherlands, the rest of the EU as well as on the EU accession countries. We are interested in the question whether the MTR is successful to make agriculture in the EU compatible for the WTO Doha Round. In other words, to what extent does the MTR prepare agriculture for the WTO negotiations? In the centre of our interest are the changes of agricultural outputs, prices, trade, welfare and agricultural income.

Since further proposals like the EU/US joint paper¹ and the Derbez-Paper² (WTO 2003a) lack concrete guidelines of changes in policy measures, these are not included in the present study. The Department of International Affairs of the Dutch Ministry of Agriculture, Nature and Food Quality commissioned this report.³ It is related to two previous studies by Francois et al. (2002) and by van Tongeren and van Meijl (2003).

The organisation of the report is as follows. Chapter 2 includes a description of the analysed policy changes, the MTR and the Harbinson Proposal. In chapter 3 the implementation of the policy changes in the model used for this study is discussed. Chapter 4 includes the data used in this analysis and definition of scenarios. The simulation results are in Chapter 5. In the MTR more subsidies are decoupled. The assumptions on how to model the decoupling play a key role in the analysis. We therefore carry out a sensitivity analysis about the decoupling in chapter 6. As an additional issue we analyse separately the WTO accession of Russia in chapter 7. As Russia is a large and nearby situated economy, the country's membership of the WTO might be of significant importance to trade flows with EU countries.

¹ The paper deals with the 'three pillars' of domestic support, market access and export competition. For each of them the paper provides an outline of how to carry the negotiations forward.

² As main difference to the Harbinson Proposal a so-called blended formula is suggested. For all tariff lines one of the following possibilities should be applied: a) Tariff cut similar to the Uruguay Round, b) Tariff reduction using the Swiss Formula or c) complete elimination of the tariff.

³ Programma 411 (Project 20099 Ondersteuning WTO ronde)

2. Policy Changes

2.1 Mid Term Review (MTR)

The EU Agricultural Ministers reached an agreement for the reform of the Common Agricultural Policy on the 26 June 2003 in Luxembourg (EU 2003). This reform package is called Mid Term Review (MTR).

In the MTR the Single Farm Payment replaces almost all direct payments. The Single Farm Payment will not be linked to what a farmer produces any more and is therefore completely decoupled. As a precondition to receive the Single Farm Payment, the beneficiaries of direct payments are obliged to keep their land in good agricultural and environmental condition. Some standards about environment, food safety and animal and plant health must be met ('Cross-Compliance').

Although decoupling is the general principle, member states have the possibility to maintain a proportion of coupled policies. For cereals and oil seeds the ceiling is 25 percent, while the member countries can choose between three options in the beef production (EU 2003, p.9/10; Tables 1 and 2).

Table 2.1 Summary of Mid Term Review Reforms

Product	Measure
Cereals	Max. 25% of Land Subsidies may remain coupled
Oil Seeds	Max. 25% of Land Subsidies may remain coupled
Raw Milk	Decrease of the support price of 20% through the reduction of Intervention Prices for Butter (-25%) and Skimmed Milk Powder (-15%)
Beef	Compensation Payments based on historic entitlements for Raw Milk Quota (35.5 Euro/ t) 3 Options for Decoupling (Table 2)

The newly introduced direct payments for raw milk compensate the drop of support prices. It forms a part of the Single Farm Payment. At the same time the intervention prices for butter and skimmed milk powder decrease with 25% and 15% respectively.

Table 2.2 *Decoupling in the Beef Production*

Option	Coupled	Decoupled
Option 1	40% Slaughter Premium 100% Suckler Cow Premium	60% Slaughter Premium 100% Special Premium
Option 2	100% Slaughter Premium	100% Special Premium 100% Suckler Cow Premium
Option 3	75% Special Premium	100% Slaughter Premium 25% Special Premium 100% Suckler Cow Premium

Through the instrument of 'modulation' member countries can reduce the Single Farm Payment for bigger farms up to 5 percent in order to finance additional rural development measures. The resulting amount can be distributed by modulation measures, respecting that at least 80 percent have to be spent in the same country. In other words, up to 20 percent can be spent in other member countries. The MTR includes some further instruments like investment support to meet the required standards.

In this report we are not considering environmental and animal welfare issues.¹

2.2 Harbinson Proposal

In November 2001 the new multilateral round of negotiations of the WTO was launched in Doha (WTO Doha Round). As an intermediate step the ministers agreed to come up with a framework of modalities for future agriculture negotiations until end of March 2003. Due to widely divergent positions of the member countries the deadline was missed. Stuart Harbinson, the Chairman of the WTO Committee on Agriculture presented in February 2003 a possible path to a solution. A revised version of his suggestion was released in March 2003 and is widely called 'Harbinson Proposal' (WTO, 2003b). For an assessment of the global trade effects of the Harbinson Proposal see Frandsen et al. (2003). The proposal includes three main elements: market access, export subsidies and domestic subsidies. This structure is in line with the final agreement reached on agriculture in the GATT Uruguay Round. In fact, all agricultural proposals tabled under the Doha Round build on the existing framework of the Uruguay Round Agricultural Agreement. The proposals differ in the exact modalities under which reductions of protection measures are to be negotiated.

Market Access

Tariffs are reduced depending on their initial size. The imposed reductions are smaller for developing countries than for developed countries. The basic assumption is that the bound rates (maximum tariffs in the Uruguay Round) are reduced. While the EU and the US have almost no difference between their bound and applied rates, the situation in most develop-

¹ Backhus and Dijkhuizen (2003) present the current issues for the pig production.

ing countries is different¹. With a significant binding overhang developing countries only need to implement very slight reductions in their current tariffs (applied rates). The issue is discussed in Francois et al. (2002), Francois and Martin (2002) as well as in Podbury and Roberts (2003).

Developing countries can define a limited number of 'special products' in view of food security. For the special products a modest tariff reduction is applied.

Export subsidies

The export subsidies of all agricultural products are to be eliminated using different time schedules for developed (5 years) and developing countries (10 years).

Domestic Support

The Amber Box respectively the AMS (Aggregate Measurement of Support) is reduced by 60 percent. In addition, the Blue Box, which is not included in the AMS, has to be reduced by 50 percent.

Further Issues

Harbinson suggested enlarging the tariff-rate quotas as well as to modify their administration.² Furthermore, he proposed stricter disciplines for State Trading Export Enterprises, such as import agencies or export marketing boards.

¹ As an unwelcome side effect the difference between bound and applied tariffs the importing country can increase (applied) tariffs at short notice. This is a source of uncertainty in international trade.

² The appendix 3 includes an illustration of a tariff-rate quota enlargement.

3. Implementation

The calculations are made with a modified version of the general equilibrium model of the Global Trade Analysis Project (Hertel 1997). A short description of the model can be found in the Appendix 1. As modifications we introduce quotas for sugar beets and raw milk for the EU and the accession countries. We insert several new variables into the model in order to get results for the agricultural income. Furthermore, we split trade flows in intra and extra-EU trade.

This rest of this chapter deals with the implementation of policy changes specified in the previous chapter.

3.1 Mid Term Review

We have to model the decoupled Single Farm Payment in the framework of the GTAP model. Therefore, several assumptions are necessary in order to catch the main elements of the MTR. As a basic principle, we convert all payments in a uniform payment per area for each sector. This so-called homogenous land subsidy is not coupled to a specific production (Frandsen et al., 2002). The subsidy is applied for all agricultural sectors except horticulture (vegetables, also potatoes and fruit). Due to several constraints in both the MTR as well as the reality we apply a more detailed depiction of the policy:

- According to the proposal of the EU commission the newly introduced compensation payments for raw milk (35.5 Euro per ton of quota) is considered as a part of the Single Farm Payment. To transform the whole payment to the homogenous land subsidy is questionable since the raw milk production in the EU takes place in highly specialized farms, which produce no other goods than milk. In the Netherlands 93 percent of the milk is produced in such farms (de Bont and van der Knijff, 2002).¹ Following dairy experts, we assume that the shares for the other EU member countries and the CEEC are 67 percent and 25 percent respectively. This means that the main part of the receiving farms cannot use the compensation payment for the production of other agricultural goods. Consequently, a substantial part is still coupled to the raw milk production and is modeled as output subsidy.
- In the Netherlands the GTAP sector 'Other Crops' (chapter 4.1) consists mainly of flower production, which is excluded from agricultural subsidies.² Consequently, we exclude it from the Single Farm Payments like horticulture. For the EU14 and the CEEC the sector 'Other Crops' is still considered as part of agriculture.
- For the cereal and oil seeds sectors the ceiling for coupled subsidies is 25 percent (Table 1). Most farmers face limited possibilities of substitution. The sugar beet

¹ We assume that the share of cows, which are held on specialized dairy farms, represents the share of milk, which is produced on specialized dairy farms.

² In the GTAP database, the sector 'Other Crops' includes also other products like protein crops.

quota impedes a change towards sugar beets, while the production of potatoes is not attractive due to its exclusion from the Single Farm Payment. Accordingly, we assume the coupled subsidies to be 30 percent instead of 25 percent.

- For the cattle sector the option with the highest share of coupled measurement (Option 1 in Table 2) is applied.
- Finally, we assume that 15 percent of the Single Farm Payment is assigned to capital, while the rest belongs to land.

These assumptions are very crucial for the analysis. A different treatment of the decoupling affects directly results and is discussed in chapter 6. The reduction of the dairy intervention price is implemented as a 10 percent reduction in both import tariffs and export subsidies. The effect of the modulation is modest on a very aggregated level. Therefore, we can neglect it in our analysis.

3.2 Harbinson Proposal

For developed countries a 3-stage tariff reduction is applied that depends on the existing tariff level:¹

Tariff	≥	90%		Tariff Reduction of 60%
15%	<	Tariff	< 90%	Tariff Reduction of 50%
Tariff	<	15%		Tariff Reduction of 40%

The tariffs of developing countries are reduced via a 4-stage procedure:

Tariff	≥	120%		Tariff Reduction of 40%
60%	<	Tariff	< 120%	Tariff Reduction of 35%
20%	<	Tariff	< 60%	Tariff Reduction of 30%
Tariff	<	20%		Tariff Reduction of 25%

We take account of the difference between applied and bound tariff rate. According to the 'water' in the tariff, the tariff reductions are adjusted. We use information from Francois and Martin (2002) as well as Walkenhorst and Dihel (2003). In practice it means that the tariffs of the EU, North America and Australia are reduced more (in percentage) than the tariffs of other regions.

All export subsidies are completely eliminated, while 60 and 50 percent reduces the AMS and the Blue Box respectively. The MTR fulfills the requirements of reducing domestic support as it is pointed out in the Harbinson Proposal. Therefore, we apply the MTR for the EU member countries instead of reducing the AMS and the Blue Box by 60 and 50 percent respectively. In other words, in our analysis the Harbinson scenario consists of the

¹ Example: If the starting tariff is 95%, then the new tariff would be $(1-0.6) * 0.95 = 38\%$.

MTR plus reductions of export subsidies and tariffs according to the Harbinson Proposal for EU countries. For all non-EU countries we apply the original Harbinson Proposal.

Since the 'special products' are not nominated yet, we cannot take them into consideration. Tariff-rate quotas are applied on a single tariff line level, while GTAP sectors contain several tariff lines.¹ Accordingly, we cannot introduce them in a sensible manner. The Harbinson Proposal concerns agricultural goods: for all non-agricultural products we assume a tariff cut of 50 percent.

¹ The appendix 3 includes the tariff-rate quota enlargement of a single product (bananas).

4. Data and Scenarios

4.1 Data Aggregation

The version 5.3 of the GTAP database is employed, which refers to the year 1997 (Dimaranan and McDougall, 2002). We aggregate the GTAP database to 13 regions (Table 3) and 18 sectors (Table 4). The Netherlands is split out of the EU15. All remaining member countries build the region EU14. The region CEEC comprises all ten countries, which will join the EU in 2004. Turkey has a preferential trade agreement with the EU and Russia has applied for joining the WTO.

Table 4.1 *Regions*

Name	Region
Netherlands	
EU14	Rest of EU15
CEEC	Accession Countries
Turkey	
Russia	
NAM	North America
SAM	South America
AUSNZ	Australia and New Zealand
HiASIA	High Income Asia
China	China and Hong Kong
oASIA	Other Asian Countries
SSA	Sub-Saharan Africa
ROW	Rest of the World

Looking at the sectors the aggregation provides a detailed coverage of agricultural products. Eight sectors depict the agricultural raw production, while the food processing is illustrated with five sectors. Another five sectors cover the rest of the economy (Table 4). More details about the aggregation can be found in the appendix 2.

The study uses a fairly global division for the sectors and a quantitative approach to agricultural policy in both the EU and third countries. Naturally, each sector in each country has its own specific characteristics, which cannot be examined individually in such a global analysis. The figures presented should then primarily be seen as an indication of the scale and direction of the anticipated effects.

Table 4.2 Sectors

Name	Sector
Cereals	Wheat, Paddy Rice, other Cereals
Horticulture	Vegetables (also Potato) and Fruit
Oil Seeds	Oil Seeds
Sugar Beet	Sugar Beet, Sugar Cane
Other Crops	Other Crops (Flowers, Fiber Plants)
Cattle	Cattle, Sheep, Goats and Horses
Other Animal	Pork and Poultry, Eggs
Raw Milk	Raw Milk
Red Meat	Meat of Cattle, Sheep, Goats and Horses
White Meat	Meat of Pigs and Poultry
Dairy	Dairy Products
Sugar	Sugar Processing
Other Food	Other Processed Food
Extract	Extraction Industries
Metal	Metal and Electro Technical Industries
Other Industries	Textile and Chemical Industries
Trade	Trade and Transport Services
Other Services	Energy Supply, Financial Services, Education

4.2 Additional Coefficients

Since we introduce quotas in the sugar beet and raw milk sectors, an assumption about the quota rent is necessary. It is measured as share of the producer price in the base year (1997, Table 5). We use a study by EuroCARE (2003, Appendix I, p. 21/22) for the sugar beet quota rent, while the estimations of the raw milk quota are based on Kleinhanss et al. (2001).

Table 4.3 Quota Rents in Percent of Producer Price 1997

	Netherlands	EU14	CEEC
Sugar Beet	30%	34%	0%
Raw Milk	23%	22%	0%

4.3 Data Preparation and Simulation

We have to consider all important policy changes since 1997, the base year of the database. Therefore, we carry out two preliminary simulations (Steps A and B) in order to get an adjusted database 'Base 3', which represents the starting point for the model simulation (Figure 1).

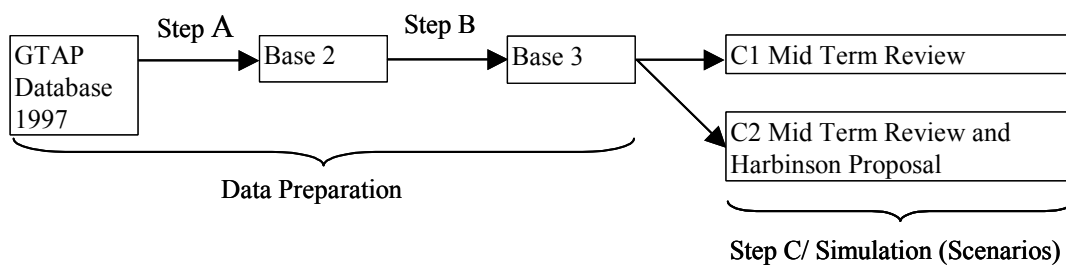


Figure 4.1 Overview

Step A includes four adjustments: First, the Agenda 2000 has to be implemented for the EU member countries (van Meijl and van Tongeren, 2002).¹ Second, due to the WTO accession China adjusted its import tariffs in order to respect the Most Favorite Nation clause. Third, since the implementation of the Uruguay Round commitments had not been concluded by 1997, we have to take it into consideration. Finally, the Agreement on Textile and Clothing (ATC) will phase out all quota restrictions in textile trade.

Step B covers the EU Eastwards Enlargement, which consists of complete trade liberalization between the 15 EU member countries and the region CEEC. Furthermore, the tariffs of the CEEC for imports from third countries are adjusted in order to adopt the EU tariffs. It is important to notice that we introduce quotas for sugar beets and raw milk. Therefore, we recognize the production level in the database as quota quantity. Given the free access to the EU15 demand for both goods is increasing. Accordingly, positive quota rents result in the CEEC region.

In addition to the Enlargement, step B covers also the preferential agreement between Turkey and the EU, which includes the liberalization of trade for non-agricultural products.

Scenarios C1 and C2 are the policy simulation, which is the emphasis in this study. Scenario C1 comprehends the Mid Term Review, while we simulate the Harbinson Proposal in scenario C2.

The region CEEC will adjust stepwise to the payments of the EU agricultural policy. We apply 70 percent of the payments in the EU15 member countries, which will correspond to the situation of the year 2010.

¹ The land payments for cereals and oilseeds changed by +16% and -33% respectively. For the cattle production two new measures were introduced: The special premium is treated as a factor subsidy for land while the slaughter premium is implemented as an output subsidy.

5. Results

All results refer to the adjusted database (Base 3, Figure 1). While the first section deals with output and price changes the focus in section two is on welfare and income.

5.1 Output and Prices

Table 6 presents output changes for all scenarios and the three regions Netherlands, EU14 and CEEC. Price changes are reported in Table 7. The changes of Dutch export and imports are presented in Tables 8 and 9 respectively. Tables 10 and 11 report the export and import changes of the EU14.

In the following we describe the changes of the Netherlands, the EU14 and the CEEC separately.

The Netherlands

Under the Mid Term Review (MTR) all Dutch agricultural sectors maintain or reduce their outputs (Table 6). According to the production developments the demand for land is reduced. Given a constant land area in the model land rents are sinking (Table 7). As a result of the redistribution of payments in the MTR cereals and oil seeds as well as cattle lose subsidies, which increases their production costs. Since we assume that sectors make no profits¹ production costs are equal to producer prices (Table 7). Extra-EU imports for these products increase slightly while the domestic production is decreasing (Table 6). It is important to keep in mind that the sectors cereals and oil seeds play a minor role in Dutch agriculture.

The sector 'Other Crops' shows an output reduction in The Netherlands. At the same time 'Other Crops' increases its output in the EU. Due to the dominant position of flowers in this sector we assume that no subsidies are paid in the Netherlands to this group of products (section 3.1). The price decrease, which follows the rising supply in the Union, is therefore smaller in the Netherlands than the overall decline in the EU (Table 7). Accordingly, the intra EU exports decrease and the intra EU imports increase in the Netherlands (Tables 8 and 9).

In the raw milk production we have to consider two effects. First, the reduction of the intervention price for butter and skimmed milk powder decrease the raw milk price. Accordingly, the dairy industry faces a significantly lower price.² Second, since we assume that the compensation payment is partly coupled to the raw milk production (chapter 3.1) the raw milk producer price is somewhat supported. As a result of the two effects a raw milk producer price decrease of 2.6 percent results (Table 7).

¹ In general equilibrium modeling, it is normally assumed that output or rather producer price is equal to production costs, including remuneration for capital and labor inputs. Accordingly there is no pure profit.

² It enables a reduction of the production cost of the dairy industry of 6.5 percent (Table 7).

Table 5.1 Output Changes in Percent

	Netherlands		EU14		CEEC	
	C1 MTR	C2 Harb	C1 MTR	C2 Harb	C1 MTR	C2 Harb
Cereals	-16.7	-29.6	-0.8	-8.1	2.0	-0.8
Horticulture	-0.4	-4.4	1.2	-0.7	-3.3	-3.4
Oil Seeds	-8.0	-5.4	-3.1	-1.4	3.3	5.1
Sugar Beet	0.0	-7.0	0.0	-7.7	0.0	0.0
Other Crops	-2.6	-1.2	4.5	4.6	1.0	1.7
Cattle	-4.2	-18.1	-1.1	-5.4	2.1	0.1
Other Animal	-1.1	-1.7	1.4	1.4	0.5	0.9
Raw Milk	0.0	0.0	0.0	0.0	0.0	0.0
Red Meat	-3.6	-20.9	-0.4	-5.9	0.8	-3.5
White Meat	-0.6	-2.8	0.5	-0.1	0.4	0.3
Dairy	0.1	0.7	-0.5	-0.3	-2.3	-2.5
Sugar	0.1	-7.8	-0.0	-11.3	-0.1	-0.4
Other Food	0.6	-1.7	0.2	-1.4	0.2	-0.1
Extract	0.0	0.2	-0.0	0.2	-0.0	0.4
Metal	0.3	0.3	-0.1	0.5	-0.2	-0.4
Other Industries	0.1	-0.4	-0.0	0.0	-0.1	-0.2
Trade	0.1	0.8	0.0	0.3	0.0	0.6
Other Services	0.0	0.0	0.0	0.0	-0.0	0.0

The tariff cuts in the Harbinson Proposal reduces the price of imported cereals. At the same time the price of domestic production increases due to the reallocation of subsidies. A significant decrease of domestic output results (Table 6). The tariff reduction leads also to large decrease of the cattle and red meat output. The sectors white meat and other animal are hardly affected. The sector raw milk is still producing its quota quantity, while the quota rent is reduced.

Lower tariffs as well as the elimination of export subsidies have a major impact on sugar beet production. A large decrease for exported sugar results (Table 8). The quota quantity is no longer reached (Table 6), the quota rent disappears. A producer price reduction of 34 percent takes place (Table 7).

One would expect that a tariff reduction as it is included in the Harbinson Proposal would lead to at least a small increase of exported quantities. The decrease of Dutch extra-EU exports of cereals, red meat and sugar shows the opposite. Since we consider the differences between applied and bound tariff rates, the EU reduces its import tariffs to a larger extent than most of its trading partners. The trade liberalization we look at is therefore highly unbalanced. At the same time intra-EU exports decreases because trade from EU countries to other member countries face stronger competition from non-EU exporters. The results for Dutch imports illustrate this (Table 9). The extra-EU imports increase and replace the intra-EU imports. The total effect is modest except for red meat where imports increase by 7 percent (Table 8). As a consequence, the domestic output of cattle decreases by 18 percent (Table 6).

Table 5.2 (Producer) Price Changes in Percent

	Netherlands		EU14		CEEC	
	C1 MTR	C2 Harb	C1 MTR	C2 Harb	C1 MTR	C2 Harb
Land	-7.6	-15.4	-17.5	-29.1	26.0	20.7
Unskilled Labor	-0.1	-0.4	0.1	-0.4	0.2	-0.4
Skilled Labor	-0.0	-0.3	0.1	-0.4	0.2	-0.3
Capital	0.1	0.9	0.0	1.2	0.0	2.3
Cereals	7.2	4.3	1.2	-1.0	-2.1	-4.1
Horticulture	-0.3	-1.2	-0.9	-2.2	3.2	1.5
Oil Seeds	3.2	2.3	3.3	1.5	-1.6	-3.4
Sugar Beet	0.8	-33.8	0.4	-37.5	1.2	-40.7
Other Crops	-0.8	-1.6	-4.2	-5.1	-1.9	-3.4
Cattle	-1.9	-3.6	-1.2	-2.8	-1.7	-3.9
Other Animal	-0.9	-2.2	-2.4	-3.8	-1.7	-3.9
Raw Milk	-2.6	-6.7	-12.3	-18.2	-10.3	-13.7
Red Meat	2.0	0.4	1.1	-0.2	-0.1	-1.9
White Meat	-0.5	-1.5	-1.0	-2.0	-0.8	-2.6
Dairy	-6.5	-9.0	-5.5	-7.7	-4.6	-6.9
Sugar	0.3	-16.4	0.1	-10.2	0.3	-17.1
Other Food	-0.4	-2.0	-0.2	-1.3	-0.2	-2.3
Extract	0.0	-0.2	0.0	-0.2	0.0	-0.4
Metal	-0.0	-0.7	0.0	-0.5	0.1	-0.6
Other Industries	-0.0	-0.7	0.0	-0.6	0.1	-0.6
Trade	-0.1	-0.6	0.0	-0.5	-0.0	-0.7
Other Services	-0.0	-0.5	0.0	-0.5	0.1	-0.5

Table 5.3 *Percentage Changes of Dutch Exported Quantities*¹

	C1 MTR			C2 Harbinson		
	Intra-EU	Extra-EU	Total	Intra-EU	Extra-EU	Total
Cereals	-22.1	-23.1	-22.4	-30.2	-55.8	-39.1
Horticulture	-0.6	0.5	-0.4	-6.6	4.7	-4.4
Oil Seeds	-8.3	-11.6	-8.4	-6.1	4.0	-5.7
Sugar Beet						
Other Crops	-4.1	1.2	-3.1	-4.0	10.6	-1.3
Cattle						
Other Animal						
Raw Milk						
Red Meat	-4.9	-6.5	-5.2	-26.0	-38.0	-27.8
White Meat	-1.2	1.1	-0.9	-3.8	-2.6	-3.7
Dairy	3.4	-7.5	-0.1	5.9	-9.5	0.8
Sugar	-0.9	-1.1	-1.0	1.3	-53.8	-33.8
Other Food	1.2	1.5	1.2	-4.3	6.8	-1.5
Extract	0.0	-0.0	0.0	0.2	3.1	0.3
Metal	0.3	0.2	0.3	-0.7	5.5	0.7
Other Industries	0.2	0.1	0.2	-1.3	3.8	-0.1
Trade	0.1	0.2	0.1	3.7	2.2	3.3
Other Services	0.3	0.2	0.2	0.5	2.0	1.4

¹ For the interpretation of the changes of exports and imports (Tables 8 to 11) it is important to notice that certain goods like sugar beets, cattle, other animal and raw milk are almost not traded. Therefore, a minor quantity change can lead to a large percentage change. For that reason these products are left out in the reporting tables.

Table 5.4 Percentage Changes of Dutch Imported Quantities¹⁴

	C1 MTR			C2 Harbinson		
	Intra-EU	Extra-EU	Total	Intra-EU	Extra-EU	Total
Cereals	0.0	5.1	0.5	-8.9	50.6	-2.9
Horticulture	1.7	-1.4	0.6	-5.3	6.2	-1.2
Oil Seeds	-8.9	1.6	0.7	-0.1	-1.7	-1.6
Sugar Beet						
Other Crops	14.5	-3.2	0.5	13.3	-4.6	-0.9
Cattle						
Other Animal						
Raw Milk						
Red Meat	-0.7	4.0	1.1	-31.8	67.3	6.5
White Meat	1.3	-2.8	0.4	-6.5	26.3	0.9
Dairy	-1.9	23.3	-1.2	-4.3	47.1	-2.9
Sugar	0.2	1.0	0.5	-26.5	22.4	-4.2
Other Food	0.2	-0.4	0.0	-12.6	33.8	1.3
Extract	0.1	0.1	0.1	0.3	-0.5	-0.3
Metal	-0.0	0.2	0.0	-3.0	5.6	0.4
Other Industries	-0.0	0.1	0.0	-2.5	4.7	0.2
Trade	-0.1	-0.0	-0.0	1.1	-1.2	-0.4
Other Services	-0.1	0.0	-0.0	0.7	-1.4	-0.5

EU14

The MTR has a small impact on outputs (Table 6). Land rents are clearly sinking (Table 7). The raw milk producer price decreases by more than 12 percent, which stands in contrast to the result for the Netherlands. There are two reasons for the difference:

- The specialization of raw milk production is different (see chapter 3.1). For the Netherlands 93 percent of the quota premium are treated as output subsidy, while the corresponding number in the EU14 is 67 percent. In the model an output subsidy decreases the consumer price (in this case the price for raw milk for processing).
- In the GTAP database the raw milk cost shares in the dairy industries are different (50 percent for the Netherlands, 28 percent for EU14). Accordingly, the raw milk price decrease has to be larger in the EU14 in order to attain a reduction of the dairy price. The differences of the raw milk cost share reinforces also the first effect.

Under the Harbinson Proposal the production of cereals and cattle is reduced (Table 6). The reason is the decrease of extra-EU exports (Table 8). Like the Netherlands the EU14 reaches no longer the sugar beet quota quantity. Accordingly, the producer price decreases about 37 percent (Table 7).

CEEC

The accession countries (CEEC) increase slightly their production of cereals, oil seeds and cattle in the MTR scenario (Table 6). An increasing production and additional subsidies in-

crease the demand for land. Consequently, the land rent is increasing by 26 percent (Table 7).

Under the Harbinson Proposal the sugar beet price decreases dramatically. For the interpretation we have to keep in mind, that through the accession process quota quantities for sugar beets and raw milk were introduced in the CEEC. Due to the open access for these products to the EU15 countries the demand increases and leads finally to positive quota rents. In the Harbinson Proposal the CEEC still produces the sugar beets quota quantity (Table 6) while the quota rent is partly reduced.

Table 5.5 Percentage Changes of EU14 Exported Quantities¹⁴

	C1 MTR			C2 Harbinson		
	Intra-EU	Extra-EU	Total	Intra-EU	Extra-EU	Total
Cereals	-1.5	-4.3	-2.3	-12.3	-27.1	-17.0
Horticulture	2.0	2.9	2.1	-2.6	12.7	-1.1
Oil Seeds	-8.7	-11.9	-9.1	-2.5	3.1	-1.8
Sugar Beet						
Other Crops	11.7	16.5	13.2	12.1	24.4	15.8
Cattle						
Other Animal						
Raw Milk						
Red Meat	-1.2	-3.0	-1.6	-24.3	-29.3	-25.5
White Meat	0.8	3.1	1.4	-2.2	2.5	-0.9
Dairy	-1.4	-11.7	-4.2	-1.2	-12.2	-4.3
Sugar	-0.1	-0.4	-0.2	-24.1	-62.4	-45.2
Other Food	0.2	0.5	0.3	-8.1	6.0	-3.1
Extract	-0.0	-0.1	-0.1	0.3	2.7	0.9
Metal	-0.1	-0.2	-0.1	-1.7	6.7	1.5
Other Industries	-0.0	-0.1	-0.0	-1.8	4.9	0.8
Trade	-0.0	-0.1	-0.1	3.0	2.2	2.7
Other Services	-0.0	-0.1	-0.1	0.6	2.0	1.4

Table 5.6 *Percentage Changes of Imported Quantities to the EU1414*

	C1 MTR			C2 Harbinson		
	Intra-EU	Extra-EU	Total	Intra-EU	Extra-EU	Total
Cereals	-0.9	4.1	0.3	-12.9	40.1	-0.3
Horticulture	0.6	-1.8	-0.2	-4.0	8.7	0.5
Oil Seeds	-6.4	5.4	2.5	-1.0	-0.6	-0.7
Sugar Beet						
Other Crops	2.3	-6.4	-3.5	2.7	-7.9	-4.4
Cattle						
Other Animal						
Raw Milk						
Red Meat	-1.5	3.5	0.1	-23.9	83.2	10.8
White Meat	0.2	-3.3	-0.0	-1.8	36.1	0.9
Dairy	-1.0	22.4	0.4	0.0	6.6	0.5
Sugar	-0.3	0.7	0.1	-19.8	40.0	6.5
Other Food	0.4	-0.5	0.2	-6.9	33.8	4.4
Extract	-0.0	0.0	0.0	0.4	-0.2	-0.1
Metal	-0.0	0.1	0.0	-1.6	5.5	0.7
Other Industries	-0.0	0.1	0.0	-1.7	5.4	0.8
Trade	0.0	0.1	0.0	1.1	-1.4	-0.5
Other Services	-0.0	0.1	0.0	0.6	-1.4	-0.6

5.2 Welfare and Income

Table 12 includes the welfare change measured with the equivalent variation for all regions. The results of both scenarios for the Netherlands are modest and can be neglected. The EU14 increases its welfare by \$ 2 billion in the MTR. This amount is equal to 0.03 percent of the EU14 Gross Domestic Product (GDP). The Harbinson Proposal brings twice as much. The accession countries (CEEC) face a small welfare loss from the Harbinson Proposal.

High income Asia (HiASIA) can take advantage of the Harbinson Proposal with an equivalent variation of almost \$ 11 billion. The Harbinson Proposal is beneficial for all regions which include developing countries like China, oAsia, Sub-Saharan Africa (SSA) and the Rest of the World (ROW). The negative welfare result for North America (NAM) is noteworthy. A welfare gain, which originates from an improved allocation is overcompensated by a negative terms-of-trade effect. Later indicates that import prices rise faster than export prices, which is driven by falling land rents as agricultural support is lowered. For the EU we also observe a negative terms-of-trade effect, but here it is outweighed by allocative efficiency gains in the wake of reduced agricultural support.

For the whole world a welfare improvement of 0.1 percent of world GDP results from the Harbinson Proposal.

Table 5.7 *Equivalent Variation*

	In \$ Million		In Percent of GDP	
	C1 MTR	C2 Harb	C1 MTR	C2 Harb
Netherlands	-38	-24	-0.01	-0.01
EU14	2093	3900	0.03	0.05
CEEC	36	-146	0.01	-0.05
Turkey	-3	245	-0.00	0.12
Russia	-22	-731	-0.00	-0.16
NAM	-68	-1144	-0.00	-0.01
SAM	-207	2190	-0.01	0.11
AUSNZ	25	901	0.01	0.20
HiASIA	-46	10929	-0.00	0.22
China	-6	2941	-0.00	0.29
OASIA	-52	2906	-0.00	0.26
SSA	-124	424	-0.06	0.21
ROW	-345	4322	-0.02	0.25
World	1242	26713	0.00	0.09

Table 13 presents the income changes of all agricultural sectors. Income is defined as the factor costs of labor and capital (i.e. value added at market prices). In addition, the quota rent in the sectors sugar beet and raw milk belongs to the income. It is important to notice that the results cannot directly be compared with those of the earlier Harbinson Study (van Tongeren and van Meijl, 2003) since the aggregation is different.¹ Furthermore, some assumptions about policy modeling (inclusion of the MTR) as well as the use of a more recent database have an impact on the results.

In the Netherlands the MTR leads to income decreases in the sectors cereals, oil seeds and cattle due to reduced outputs. Over all agricultural sectors a decrease of 2 percent results. Under the Harbinson Proposal the sectors cereals, oil seeds and cattle face stronger reduction of their productions and hence larger income losses. In addition, the sugar beet quota rent is lost. The total primary agricultural income decreases by 7.6 percent.

¹ For example the sector 'Dairy' (van Tongeren and van Meijl, 2003) includes the dairy industry as well as the raw milk production. The aggregation of this study distinguishes between 'raw milk' and 'dairy'.

Table 5.8 *Agricultural Income Changes in Percent*

	Netherlands		EU14		CEEC	
	C1 MTR	C2 Harb	C1 MTR	C2 Harb	C1 MTR	C2 Harb
Cereals	-12.4	-24.2	7.9	-1.5	2.7	-1.0
Horticulture	-0.7	-5.1	0.9	-1.7	-1.9	-2.8
Oil Seeds	-7.0	-4.9	-1.9	-1.2	4.0	5.1
Sugar Beet	4.7	-49.6	5.6	-55.3	2.9	-52.5
Other Crops	-2.9	-1.9	3.2	2.6	1.1	1.0
Cattle	-5.2	-17.8	-6.4	-10.7	2.1	-0.8
Other Animal	-2.1	-3.1	-0.1	-0.7	0.5	0.2
Raw Milk	-1.2	-7.1	-16.1	-25.2	-18.0	-22.6
Total						
Agriculture	-2.2	-7.6	-2.8	-10.2	-4.8	-13.3

The MTR reduces the raw milk quota rent for the EU14. In total, the agricultural income is reduced by almost 3 percent. The Harbinson Proposal reduces the quota rent for raw milk further while those of sugar beets is completely eliminated. Together with the income reduction of all sectors except 'Other Crops' the agricultural income is reduced by 10 percent.

For the interpretation of CEEC results we have to keep in mind, that through the accession process quota quantities for sugar beets and raw milk are introduced and quota rents result from the open access to the EU15 market. The quota rent for raw milk is partly reduced in the scenario MTR, which results in a decrease of the agricultural income. Under the Harbinson Proposal the main part of the sugar beet quota rent is lost. The sectoral income of sugar beets is even more decreasing as the producer price (Table 7). Therefore, it is important to take notice that the producer price includes all input costs as well as the quota rent.

6. Sensitivity Analysis

The modelling of the decoupling plays an important role in our analysis. Therefore, we assess the impact of our assumptions on this issue. For the scenario Mid Term Review (MTR) we alter two assumptions, which are mentioned in chapter 3.1:

- First, the whole raw milk quota premium is assigned to the Single Farm Payment and accordingly transferred to the homogenous land payments.
- Second, we treat the sector 'Other Crops' in the Netherlands as an agricultural sector. This assumption is in line with the treatment of the sector 'Other Crops' in the other EU member countries. Accordingly, land payments are also transferred to this sector.

In the Tables 14 to 16 we compare the results for quantity, price and income changes. The version with the adjusted assumptions is called 'Option', while the results from the former section are repeated as version 'MTR'.

Table 6.1 Output Changes in Percent

	Netherlands		EU14	
	MTR	Option	MTR	Option
Cereals	-16.7	-16.3	-0.8	0.8
Horticulture	-0.4	-3.0	1.2	0.1
Oil Seeds	-8.0	-13.9	-3.1	-2.7
Sugar Beet	0.0	0.0	0.0	0.0
Other Crops	-2.6	2.5	4.5	4.0
Cattle	-4.2	-5.3	-1.1	-2.0
Other Animal	-1.1	-1.5	1.4	1.4
Raw Milk	0.0	0.0	0.0	0.0
Red Meat	-3.6	-5.0	-0.4	-0.8
White Meat	-0.6	-0.8	0.5	0.5
Dairy	0.1	0.2	-0.5	-0.4
Sugar	0.1	0.1	-0.0	-0.0
Other Food	0.6	0.5	0.2	0.2
Extract	0.0	0.0	-0.0	-0.0
Metal	0.3	0.1	-0.1	-0.1
Other Industries	0.1	0.1	-0.0	-0.0
Trade	0.1	0.0	0.0	-0.0
Other Services	0.0	-0.0	0.0	-0.0

As a consequence of our first adjusted assumption more subsidies are spent on land. Land becomes cheaper. It is attractive to use more land in order to substitute other factors.

Table 15 shows clearly the rise of land rents. Instead of a decrease of 7.6 percent the land rent increases by 54 percent in the Netherlands. As a consequence, production costs of most agricultural and food-processing sectors increase in the version 'Option'. Accordingly, output reductions are larger (Table 14). An exception is the sector 'Other Crops' in the Netherlands. Receiving no subsidies in the version 'MTR', the sector shows smaller production cost in the version 'Option' and an increase of its output.

Table 6.2 (Producer) Price Changes in Percent

	Netherlands		EU14	
	MTR	Option	MTR	Option
Land	-7.6	53.8	-17.5	5.7
Unskilled Labor	-0.1	-0.0	0.1	0.0
Skilled Labor	-0.0	-0.0	0.1	0.0
Capital	-0.0	-0.0	0.1	0.0
Cereals	7.2	5.7	1.2	-0.8
Horticulture	-0.3	1.2	-0.9	0.3
Oil Seeds	3.2	4.9	3.3	3.0
Sugar Beet	0.8	0.5	0.4	0.3
Other Crops	-0.8	-2.3	-4.2	-4.0
Cattle	-1.9	-0.3	-1.2	1.0
Other Animal	-0.9	-0.9	-2.4	-2.5
Raw Milk	-2.6	-12.0	-12.3	-18.8
Red Meat	2.0	2.9	1.1	1.9
White Meat	-0.5	-0.5	-1.0	-1.0
Dairy	-6.5	-6.7	-5.5	-5.7
Sugar	0.3	0.2	0.1	0.1
Other Food	-0.4	-0.4	-0.2	-0.2
Extract	0.0	-0.0	0.0	-0.0
Metal	-0.0	-0.0	0.0	0.0
Other Industries	-0.0	-0.0	0.0	-0.0
Trade	-0.1	-0.1	0.0	-0.0
Other Services	-0.0	-0.0	0.0	0.0

The results of the two versions for raw milk are quite different. In the version 'MTR' a substantial part of the compensation payment is modeled as output subsidy and supports the producer price. In the version 'Option' the compensation payment is completely decoupled, the raw milk price significant lower. This in turn means a smaller quota rent and a larger decrease of the sectoral and even the agricultural income (Table 16).

Table 6.3 *Income Changes in Percent*

	Netherlands		EU14	
	MTR	Option	MTR	Option
Cereals	-12.4	-8.0	7.9	15.5
Horticulture	-0.7	-2.1	0.9	0.3
Oil Seeds	-7.0	-11.9	-1.9	-1.7
Sugar Beet	4.7	4.5	5.6	5.8
Other Crops	-2.9	2.0	3.2	2.7
Cattle	-5.2	-6.2	-6.4	-8.8
Other Animal	-2.1	-2.3	-0.1	0.0
Raw Milk	-1.2	-17.9	-16.1	-27.5
Total				
Agriculture	-2.2	-5.8	-2.8	-4.9

Although the output of the sector cereals is reduced in the EU14 the version 'Option' shows a strong income increase (Table 16). Due to the high land price and the decrease of land subsidies for cereals land is substituted by labor and capital. While both factors belong to the agricultural income, this is not the case for land.

A comparison of the two assumptions for the Harbinson scenario would lead to similar differences.

7. Russian WTO Accession

7.1 Description of Scenario

In 1993 Russia applied for accession to the WTO. Since 1995 a negotiation process between Russia and WTO member countries is ongoing in order to define the tariff commitments of Russia. The trade flows between the Netherlands, the EU14 as well as the CEEC and Russia are included in Table 17. While the Russian agricultural exports are modest, both the Netherlands as well as the EU14 holds a significant share of the food imports of Russia.

Table 7.1 Russian Trade in Mill. Dollar

	Russian Exports				Russian Imports			
	Netherlands	EU14	CEEC	Total	Netherlands	EU14	CEEC	Total
Food	32	877	212	3421	1106	5142	1605	16661
Non-Food	3224	28371	10151	90706	1304	27532	4237	62423

Source: GTAP 5.3 Database (Dimaranan and McDougall, 2002)

For our analysis we distinguish between agricultural and industrial goods. For the agricultural goods we assume an initial bound rate of 27 percent. At the end of the accession process a final bound rate of 20 percent will remain, which indicates a tariff reduction of around 25 percent.¹ Since the applied tariffs are lower than the bound rates we assume a reduction of 8 percent for applied tariffs. The Russian tariffs for all industrial goods are reduced towards 8.7 percent.² We assume that there are no tariff changes for Russian exports.³ A similar set of assumptions was employed by de Souza (2003).

7.2 Results

The Russian accession to the WTO has no impact on the production in the EU (Table 18). Considering the small tariff adjustments it is not a surprising fact.

As a consequence of the unilateral tariff cut, the factor demand (land, labor and capital) in Russia decreases. The factor prices decline, which in turn reduces production cost for all sectors. Exports increase slightly (Table 19). The impact on outputs in Russia is modest (Table 18). Since oilseeds is a small sector its output increase is negligible.

¹ European Commission MD 592/02 (133 Committee) from 28 November 2002

² Note de la Délégation Française, 11 December 2002

³ This implies no increase of export opportunities for Russia.

Russia imports more Dutch dairy products. A strong increase shows the import of Metal goods from the CEEC.

Table 7.2 *Output Changes in Percent*

	Netherlands	EU14	CEEC	Russia
Cereals	0.0	0.0	-0.1	-0.1
Horticulture	0.1	0.0	-0.0	-0.0
Oil Seeds	-0.0	-0.0	-0.1	0.4
Sugar Beet	0.0	0.0	0.0	-0.0
Other Crops	-0.0	0.0	-0.1	0.0
Cattle	0.0	0.0	-0.0	-0.1
Other Animal	0.0	0.0	-0.0	-0.1
Raw Milk	0.0	0.0	0.0	-0.0
Red Meat	0.0	0.0	-0.0	-0.4
White Meat	0.0	0.0	-0.0	-0.4
Dairy	-0.0	0.0	-0.0	-0.2
Sugar	-0.0	0.0	0.0	0.0
Other Food	0.0	0.0	-0.0	-0.0
Extract	-0.0	-0.0	-0.2	0.1
Metal	-0.0	-0.0	0.2	-0.4
Other Industries	-0.0	0.0	-0.1	-1.1
Trade	0.0	0.0	-0.0	0.1
Other Services	-0.0	-0.0	0.0	0.2

Table 7.3 *Changes of Russian Exports and Imports in Percent*

	Russian Exports			Russian Imports		
	Netherlands	EU14	CEEC	Netherlands	EU14	CEEC
Cereals	1.9	1.8	1.9	-0.1	-0.1	-0.5
Horticulture	1.9	1.6	1.8	1.3	-0.3	-0.1
Oil Seeds	1.4	1.4	1.6	0.3	0.7	0.1
Sugar Beet	2.1	2.1	1.9	-1.0	-1.3	-0.8
Other Crops	1.8	1.8	1.9	2.0	-0.3	-0.8
Cattle	2.6	2.7	2.8	-2.1	-2.0	-2.2
Other Animal	2.4	2.4	2.6	-0.4	-0.2	0.4
Raw Milk	2.4	2.4	2.2	-1.3	-1.4	-0.9
Red Meat	2.0	2.0	2.2	1.0	0.8	0.2
White Meat	2.0	2.0	2.1	1.1	-0.3	0.7
Dairy	1.9	1.9	1.9	1.4	0.6	0.7
Sugar	1.7	1.4	1.8	2.5	2.4	2.2
Other Food	2.0	2.0	2.3	0.9	0.8	1.1
Extract	1.1	1.1	0.5	-1.0	-1.1	1.9
Metal	3.9	3.8	4.2	3.9	-2.4	25.6
Other Industries	2.3	2.3	2.5	-6.2	1.1	5.2
Trade	1.6	1.6	1.8	-0.7	-0.7	-1.1
Other Services	1.7	1.7	1.9	-0.6	-0.6	-1.0

Russia can improve its welfare through the WTO accession (Table 20). The factor allocation becomes more efficient. The CEEC, Turkey and China show welfare increase as well. The reason is an improvement of the Terms of Trade. The worldwide effect is a welfare gain of half a billion \$.

We conclude that the Russian accession to the WTO has no impact on the Netherlands as well as the EU14. In contrast, the CEEC can benefit from it.

Table 7.4 Welfare Change (Equivalent Variation) in Million \$

Region	Equivalent Variation
Netherlands	13
EU14	-42
CEEC	183
Turkey	155
Russia	219
NAM	-120
SAM	-43
AUSNZ	-12
HiASIA	79
China	123
oASIA	-13
SSA	-22
ROW	42
Total	563

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Appendix 1 The GTAP Model

The GTAP model is a comparative static multi-sector multi-region general equilibrium model. Each country or region is depicted within the same structural model. The regional household to which the income of factors, tariff revenues and taxes are assigned represents the consumer side. The regional household allocates its income to three expenditure categories: private household expenditures, government expenditures and savings. For the consumption of the private household, the nonhomothetic Constant Difference of Elasticities (CDE) function is applied.

A representative producer for each sector of a country or region makes production decisions to maximize a profit function by choosing inputs of labor, capital, and intermediates to produce a single sector output. In the case of crop production, farmers also make decisions on land allocation. Intermediate inputs are produced domestically or imported, while primary factors cannot move across country.

The GTAP model includes two global institutions. All transports between regions are carried out by the international transport sector. The trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Using transport inputs from all regions the international transport sector minimize its costs under the Cobb-Douglas technology. The second global institution is the global bank, which takes the savings from all regions and purchases investment goods in all regions depending on the expected rates of return. The global bank guarantees that global savings are equal to global investments.

The welfare changes are measured by the equivalent variation. Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modeled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Trade policy instruments are represented as import or export taxes/subsidies.

A detailed discussion of the basic algebraic model structure of the GTAP model can be found in Hertel (1997).

Appendix 2 Data Aggregation

Table A 2.1 Aggregation of Regions

Abrev.	GTAP-Region	Abrev.	GTAP-Region	Abrev.	GTAP-Region
NED	Netherlands	NLD	AUSNZ	Australia	AUS
EU14	Austria	AUT		New Zealand	NZL
	Belgium	BEL	HiASIA	Japan	JPN
	Denmark	DNK		Korea	KOR
	Finland	FIN		Taiwan	TWN
	France	FRA		Singapore	SGP
	Germany	DEU	CHINA	China	CHN
	United Kingdom	GBR		Hong Kong	HKG
	Greece	GRC	oASIA	Indonesia	IDN
	Ireland	IRL		Malaysia	MYS
	Italy	ITA		Philippines	PHL
	Luxembourg	LUX		Thailand	THA
	Portugal	PRT		Vietnam	VNM
	Spain	ESP		Bangladesh	BGD
	Sweden	SWE		India	IND
CEEC	Czech Republic	CZE		Sri Lanka	LKA
	Hungary	HUN		Rest of South Asia	XSA
	Malta	MLT	SSA	Malawi	MWI
	Poland	POL		Mozambique	MOZ
	Slovakia	SVK		Tanzania	TZA
	Slovenia	SVN		Zambia	ZMB
	Estonia	EST		Zimbabwe	ZWE
	Latvia	LVA		Other Southern Africa	XSF
	Lithuania	LTU		Uganda	UGA
	Cyprus	CYP		Rest of Sub-Saharan Africa	XSS
Turkey	TUR		Botswana	BWA	
Russia	Russian Federation	RUS	ROW	Switzerland	CHE
NAM	Canada	CAN		Rest of EFTA	XEF
	United States	USA		Albania	ALB
SAM	Mexico	MEX		Bulgaria	BGR
	Central America, Caribbean	XCM		Croatia	HRV
	Colombia	COL		Romania	ROM
	Peru	PER		Rest of Former Soviet Union	XSU
	Venezuela	VEN		Rest of Middle East	XME
	Rest of Andean Pact	XAP		Morocco	MAR
	Argentina	ARG		Rest of North Africa	XNF
	Brazil	BRA		Rest of South Afr. Custom Union	XSC
	Chile	CHL		Rest of World	XRW
	Uruguay	URY			
	Rest of South America	XSM			

Table A 2.2 Aggregation of Sectors

Abrev.	Gtap-Sector	Abrev.	Gtap-Sector
Cereals	Paddy rice	PDR	Other Industries
	TEX		Textiles
	Wheat	WHT	Wearing apparel
	Cereal grains nec	GRO	Leather products
Horticulture	Vegetables, fruit, nuts	V_F	Wood products
Oil Seeds	Oil Seeds	OSD	Paper products, publishing
Sugar Beet	Sugar cane, sugar beet	C_B	Petroleum, coal products
Other Crops	Plant-based fibers	PFB	Chemical, rubber, plastic prods
	Crops nec	OCR	Mineral products nec
Cattle	Cattle, sheep, goats, horses	CTL	Manufactures nec
Other Animal	Animal products nec	OAP	Trade
	Wool, silk-worm cocoons	WOL	Transport nec
Raw Milk	Raw milk	RMK	Sea transport
Red Meat	Meat of cattle, and sheep	CMT	Air transport
White Meat	Meat products nec	OMT	Electricity
			Other Services
Dairy	Dairy products	MIL	Gas manufacture, distribution
Sugar	Sugar	SGR	Water
Other Food	Vegetable oils and fats	VOL	Construction
	Processed rice	PCR	Communication
	Food products nec	OFD	Financial services nec
	Beverages and tobacco	B_T	Insurance
Extract	Forestry	FOR	Business services nec
	Fishing	FSH	Recreation and other services
	Coal	COL	PubAdmin/Defence/Health/Educat
	Oil	OIL	Dwellings
	Gas	GAS	
	Minerals nec	OMN	
Metal	Ferrous metals	I_S	
	Metals nec	NFM	
	Metal products	FMP	
	Motor vehicles and parts	MVH	
	Transport equipment nec	OTN	
	Electronic equipment	ELE	
	Machinery and equipment	OME	

Appendix 3 Tariff Rate Quotas – A Case Study

To present the mechanism of a tariff-rate quota (TRQ) as an import regime we show the import of fresh bananas to the EU (tariff number 08030019, Figure 2).¹

In 1995 the imported quantity was 3.7 Mill. tons and exceeded clearly the quota quantity of 2.2 Mill. tons. Accordingly, the intersection of the demand (D) and supply function (S) is in the area of the over-quota tariff. While the import price (P_{World}) was 53 Eurocent per kg, the in-quota and over-quota tariffs were 7.5 and 68 cents per kg respectively.

Since the quota quantity was exceeded the over-quota tariff determined the domestic consumer price (PD). Normally, it is assumed that bananas, which were imported at the in-quota tariff, are sold at the price PD. As a consequence, a quota rent exists. The question to whom the quota rent belongs depends on the administration of the TRQs.

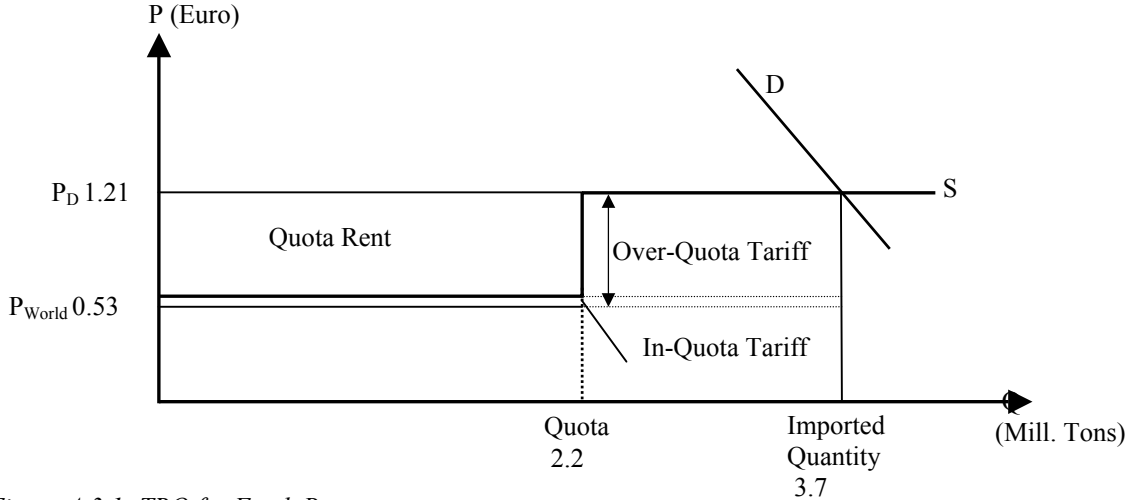


Figure A 3.1 TRQ for Fresh Bananas

What happens if the quota quantity is doubled? Without altering tariffs and world market price we expand the quota quantity in Figure 3. The intersection of demand and supply is now at the in-quota tariff. Although the imported quantity increases, the expanded quota quantity is not reached. Accordingly, the domestic consumer price (PD) decreases towards the in-quota tariff. As a consequence, the quota rent disappears.

¹ We use data from the Agricultural Market Access Database (AMAD, <http://www.amad.org>).

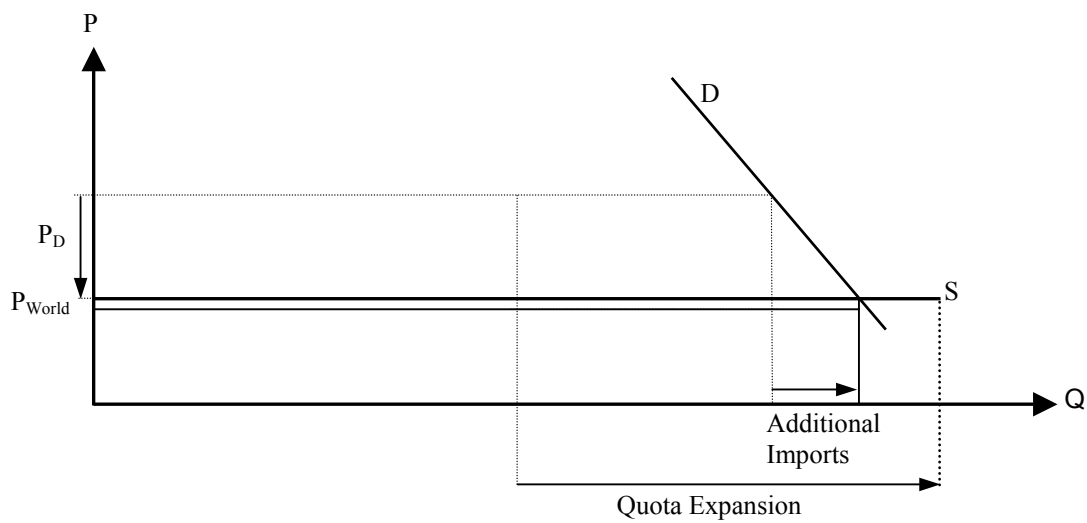


Figure A 3.2 TRQ for Bananas after Quota Expansion

For a TRQ, which exceeds its quota quantity three aspects may have an important influence if an expansion of the quota quantity takes place. First, the size of the expansion itself is crucial. Second, the difference between in- and over-quota tariff has to be considered. Finally, the elasticity of demand is of interest.