AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

DISCUSSION PAPER

Institute of Agricultural Development in Central and Eastern Europe

QUANTITATIVE ANALYSIS OF THE IMPACTS OF CROATIA'S AGRICULTURAL TRADE POLICY ON THE AGRI-FOOD SECTOR

PETER WEINGARTEN, KLAUS FROHBERG
ETTI WINTER, CATRIN SCHREIBER

DISCUSSION PAPER NO. 56
2003

Theodor-Lieser-Straße 2, 06120 Halle (Saale), Germany
Phone: +49-345-2928-0
Fax: +49-345-2928-199
E-mail: iamo@iamo.de
Internet: http://www.iamo.de

Dr. PETER WEINGARTEN is currently the acting Head of Department for External Environment for Agriculture and Policy Analysis at the Institute of Agricultural Development in Central and Eastern Europe (IAMO). Prof. KLAUS FROHBERG is Director of the Center for Development Research (ZEF), Bonn University, Germany, and Head of Department for Economic and Technological Change. Until October 2002, he was the Executive Director of IAMO. ETTI WINTER and CATRIN SCHREIBER are research scholars at the aforementioned department at IAMO.

Address:	Institute of Agricultural Development in Central and Eastern Europe (IAMO) Theodor-Lieser-Straße 2 06120 Halle (Saale) Germany
Phone:	+49-345-2928 130
Fax:	+49-345-2928 199
E-mail:	weingarten@iamo.de, klaus.frohberg@uni-bonn.de, winter@wiesbaden.netsurf.de, schreiber@iamo.de
Internet:	http://www.iamo.de

This Discussion Paper is based on a study carried out on behalf of the *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ) with the financial support of the German *Ministry for Economic Co-operation and Development* (BMZ).

We would like to thank
Ms. Anita Sever-Koren and Ms. Ruzica Gelo from the Croatian Ministry of Agriculture and Forestry, Dr. Kresimir Jurlin from the Croatian Institute for International Relations,
Ms. Bozica Markovic, Ms. Visnja Knjaz and Mr. Vanja Kaludjer from the Croatian Chamber of Economy,
Mr. Toni Luksic from the Croatian Ministry of Economic Integration,
Dr. Detlev Boettcher, Dr. Andreas Schwarz and Mr. Toni Jukic from the GTZ
for their support.

Discussion Papers are interim reports on work of the Institute of Agricultural Development in Central and Eastern Europe (IAMO) and have received only limited reviews. Views or opinions expressed in them do not necessarily represent those of IAMO. Comments are welcome and should be addressed directly to the author(s).

The series *Discussion Papers* is edited by:

Prof. Dr. Alfons Balmann (IAMO)
PD Dr. Heinrich Hockmann (IAMO)
Prof. Dr. Dr. h.c. Peter Tillack (IAMO)
Dr. Peter Weingarten (IAMO)

ISSN 1438-2172

ABSTRACT

Croatia recently signed several trade liberalisation agreements. The cornerstones of its trade policy are WTO membership, the Stabilisation and Association Agreement with the EU and Croatia's application of membership as well as bilateral free trade agreements within the Stability Pact for South Eastern Europe. The objective of this paper is to quantify the impact of Croatia's agricultural trade policy on the agri-food sector. For the analysis, a partial equilibrium model based on 1999/2000 data is used. Trade between Croatia and Bosnia and Herzegovina, Hungary, Slovenia, the EU-15 and the rest of the world is modelled for 12 product groups. Three liberalisation scenarios are analysed for the years 2002 and 2005. The scenarios differ with regard to the tariff changes. In general, the model results indicate that reciprocal trade liberalisation is welfare improving for Croatia. The increase in consumer welfare is larger than the decline in farmers' profits and the loss of governmental tariff revenues. In conclusion, the continuation of trade liberalisation is to be recommended. However, trade policy alone will not solve the existing problems of the agri-food sector, and transitional compensation measures could be considered to avoid unacceptable hardship. The benefits of trade liberalisation are primarily to be seen in an improved access to international markets, which probably enables Croatian food processors to realise economies of scale. In addition, internationally binding commitments such as trade agreements are likely to foster the internal and international political credibility and reduce political risks.

JEL: Q11, Q17, Q18
Keywords: Croatia, trade liberalisation, agri-food sector, partial equilibrium analysis

ZUSAMMENFASSUNG

QUANTITATIVE ANALYSE DER AUSWIRKUNGEN VON KROATIENS AGRARHANDELSPOLITIK AUF DEN AGRAR- UND ERNÄHRUNGSSEKTOR

In den letzten Jahren hat Kroatien mehrere Handelsabkommen unterzeichnet. Die Hauptelemente der kroatischen Handelspolitik sind die Mitgliedschaft in der WTO, das Stabilisierungs- und Assoziierungsabkommen mit der EU und der Antrag auf EU-Mitgliedschaft sowie die bilateralen Freihandelsabkommen innerhalb des Stabilitätspaktes für Südosteuropa. Ziel des vorliegenden Beitrages ist es, die Auswirkungen dieser Agrarhandelspolitik auf den kroatischen Agrar- und Ernährungssektor zu quantifizieren. Für die Analyse wird ein partielles Gleichgewichtsmodell verwendet, das auf Daten der Jahre 1999/2000 basiert. Für 12 Produktgruppen wird Kroatiens Handel mit Bosnien und Herzegowina, Ungarn, Slowenien, der EU-15 und dem Rest der Welt modelliert. Für die Jahre 2002 und 2005 werden drei Liberalisierungsszenarien untersucht, die sich bezüglich der Zolländerungen unterscheiden. Insgesamt zeigen die Modellergebnisse, das eine wechselseitige Handelsliberalisierung wohlfahrtssteigernde Effekte für Kroatien hat. Der Anstieg der Konsumentenwohlfahrt übersteigt den Einkommensrückgang der Landwirte und den Verlust an staatlichen Zolleinnahmen. Daher ist eine Fortsetzung der Handelsliberalisierung empfehlenswert. Allerdings kann die Handelspolitik alleine die existierenden Probleme im Agrar- und Ernährungssektor Kroatiens nicht lösen. Um unerwünschte Härten zu vermeiden, könnten für eine Übergangsphase Kompensationsmaßnahmen in Betracht gezogen werden. Der Nutzen einer Handelsliberalisierung ist vor allem in einem verbesserten Zugang zu internationalen Märkten zu sehen. Dies ermöglicht es kroatischen Verarbeitern wahrscheinlich, Skaleneffekte zu realisieren. Außerdem erhöhen international bindende

Verpflichtungen wie Handelsabkommen die interne und internationale politische Glaubwürdigkeit und tragen damit dazu bei, politische Risiken zu reduzieren.

JEL: Q11, Q17, Q18
Schlüsselwörter: Kroatien, Handelsliberalisierung, Agrar- und Ernährungssektor, partielle Gleichgewichtsanalyse

CONTENTS

Abstract **3**

Zusammenfassung **3**

List of Figures 6

List of Tables 7

List of Tables in the Annex 7

List of Abbreviations 9

Executive summary **11**

1 Introduction **13**

1.1 Project background 14

1.2 Overview of the paper 14

1.3 Recent political and economic developments in Croatia 14

2 Croatia's trade policies and trade agreements **16**

2.1 WTO 17

2.2 EU Stabilisation and Association Agreement 18

2.3 Memorandum of Understanding between the Countries of the Stability Pact 19

2.4 CEFTA countries 19

2.5 EFTA Countries 20

2.6 Other Free Trade Agreements 20

2.7 Agreed tariff reductions until 2005 20

3 Croatia's agricultural sector **22**

3.1 Agricultural trade flows and competitiveness 24

3.2 Current agricultural policy and reform challenges 27

4 Theoretical considerations on the economic effects of international integration **28**

4.1 International trade theory 29

4.2 Trade liberalisation, economic integration and the world trading system 29

4.2.1 Benefits of institutional integration 30

4.2.2 Special effects of EU enlargement 31

5 Quantitative trade policy analysis with a partial equilibrium model **31**

5.1 Structure of the trade model applied 31

5.2 Data and elasticities 36

5.3 Trade policy scenarios analysed 38

5.4 Results of the quantitative trade policy analysis 40

5.4.1 BASE scenario (tariffs as in 1999/2000) for 2002 and 2005 41

5.4.2 Liberalisation scenarios for 2002 and 2005 41

5.5 Critical assessment of the model applied 48

6 Conclusions and policy recommendations **49**

References **51**

Annexes **54**

Annex 1: Overview on data sources 54
Annex 2: Aggregation of production, consumption and trade data 55
Annex 3: Conversion coefficients 57
Annex 4: Aggregated import tariffs 59
Annex 5: Calculation of the real exchange rate (kuna/€) 60
Annex 6: Results of the trade policy analysis 60

LIST OF FIGURES

Figure 1: Annual change in real GDP (in %) in Croatia 1993-2002 15
Figure 2: GDP per capita in South-Eastern European countries (in US-$) 16
Figure 3: Aggregated Croatian import tariffs for agri-food imports from trading partners for 1999/2000 and the simulation years 2002 and 2005 21
Figure 4: Aggregated import tariffs of trading partners for agri-food imports from Croatia for 1999/2000 and the simulation years 2002 and 2005 21
Figure 5: Production value of Croatian agricultural products (average 1999/2000) 22
Figure 6: Food expenditure including tobacco of Croatian consumers (average 1999/2000) 24
Figure 7: Croatian trade with selected trading partners (average 1999/2000) 25
Figure 8: Total value of agri-food exports from and imports to Croatia for 1999/2000 (in million €) 25
Figure 9: Structure of the trade model applied – quantities 33
Figure 10: Structure of the trade model applied – prices 34
Figure 11: Inconsistencies in the quantity balances of the base year 1999/2000 (in %) 37
Figure 12: Value of Croatia's agri-food exports by countries in 2005 (in million €) 43
Figure 13: Value of Croatia's agri-food imports in 2005 (in million €) 44
Figure 14: Value of Croatia's net agri-food exports by countries in 2005 45
Figure 15: Value of Croatia's net agri-food exports by products in 2005 46
Figure 16: Net agri-food export quantities of Croatia by products in 2005 46

LIST OF TABLES

Table 1: Croatia's trade agreements (as of March 2003) 17

Table 2: Production of selected food items in Croatia 23

Table 3: Croatia's trade balance with agri-food products (in 1000 US-$) 26

Table 4: Croatian trade in agri-food products in 2000 and 2001 27

Table 5: Exogenous and endogenous parameters of the model applied 35

Table 6: Description of scenarios for 2002 and 2005 39

Table 7: Assumed growth rates of technical progress in the period 1999/2000 to 2002 and 2005 (in % p.a.) 40

Table 8: Incentive factor and domestic subsidies by product group (in 1000 €, real) 40

Table 9: Welfare changes for Croatia in 2002 and 2005 relative to the BASE scenario 48

LIST OF TABLES IN THE ANNEX

Table A 1: Overview on the data sources 54

Table A 2: Raw products included in the aggregation to the supplied commodities depicted in the model 55

Table A 3: Products included in the aggregation to the traded products (volumes, prices, tariffs) depicted in the model 56

Table A 4: Products included in the aggregation to the food commodities (including tobacco) depicted in the model 56

Table A 5: Conversion factors used to convert processed commodities into their raw product equivalent 57

Table A 6: Aggregated import tariffs 59

Table A 7: Supply quantities (QS) and incentive prices (PS) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former 60

Table A 8: Supply quantities (QS) and incentive prices (PS) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former 61

Table A 9: Demand quantities (QD) and consumer prices (PD) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former 62

Table A 10: Demand quantities (QD) and consumer prices (PD) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former 62

Table A 11: Export quantities (QSX) and export prices (PSX) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former 63

Table A 12: Export quantities (QSX) and export prices (PSX) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former 63

Table A 13: Import quantities (QDM) and import prices (PDM, including import tariffs) of Croatia: in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former 64

Table A 14: Import quantities (QDM) and import prices (PDM, including import tariffs) of Croatia: in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former 64

Table A 15: Croatian export quantities (QSXX, in 1000 tons) for 2002 compared to the BASE scenario 65

Table A 16: Croatian export quantities (QSXX, in 1000 tons) for 2005 compared to the BASE scenario 66

Table A 17: Croatian import quantities (QDMM, in 1000 tons) for 2002 compared to the BASE scenario 67

Table A 18: Croatian import quantities (QDMM, in 1000 tons) for 2005 compared to the BASE scenario 68

Table A 19: Croatian export prices (PSXX, in €) for 2002 compared to the BASE scenario 69

Table A 20: Croatian export prices (PSXX, in €) for 2005 compared to the BASE scenario 70

Table A 21: Croatian import prices (PDMM, in €) for 2002 compared to the BASE scenario 71

Table A 22: Croatian import prices (PDMM, in €) for 2005 compared to the BASE scenario 72

Table A 23: Croatian net export quantities (in 1000 tons) for 2002 compared to the BASE scenario 73

Table A 24: Croatian net export quantities (in 1000 tons) for 2005 compared to the BASE scenario 74

Table A 25: Subsidies and tariff revenues for Croatia and their absolute changes compared to the BASE scenario (in 1000 €) 75

LIST OF ABBREVIATIONS

AMS	aggregate measure of support
BIH	Bosnia and Herzegovina
BMZ	German Ministry of Economic Co-operation and Development
CARDS	Community Assistance for Reconstruction, Development and Stabilisation
CBS	Croatian Bureau of Statistics
CEEC	Central and Eastern European Countries
CEFTA	Central European Free Trade Agreement
CES	constant elasticity of substitution
CET	constant elasticity of transformation
CoE	Chamber of the Economy
EBRD	European Bank of Reconstruction and Development
EFTA	European Free Trade Association
EU	European Union
FAO	Food and Agriculture Organisation
FTA	free trade agreement
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IAMO	Institute of Agricultural Development in Central and Eastern Europe
IMF	International Monetary Fund
MAF	Ministry of Agriculture and Forestry of the Republic of Croatia
MCP	mixed complementarity problem
MFN	most favoured nation
NATO	North Atlantic Treaty Organisation
PSE	producer support equivalent
RAO	rest of agricultural output
ROW	rest of the world
RVI	rest of variable inputs
SAA	Stabilisation and Association Agreement
SEE	South-Eastern Europe
US-$	US-Dollar
WTO	World Trade Organisation

EXECUTIVE SUMMARY

During the last years, Croatia replaced the import substituting protectionist trade regime and introduced liberalising reforms. The key elements of Croatia's current wave of trade liberalisation are the WTO agreement, the Stabilisation and Association Agreement with the EU and a number of bilateral free trade agreements (FTAs) with other South-Eastern European countries under CEFTA and the Stability Pact for South-Eastern Europe. The FTAs which are currently in application cover about 80 % of the total Croatian imports and exports of agri-food products. The coverage and the scope of trade liberalisation of agri-food products under all these agreements is very different because of the sensitivity of the sector in most of the countries.

Trade between Croatia and Bosnia and Herzegovina will be completely liberalised. According to the specifications of the FTA Croatia cuts all import tariffs for agri-food products from 56 % on average in 1999/2000 to zero in 2002 while Bosnia and Herzegovina does the same in 2005. The liberalisation provisions with the EU grant unlimited duty-free access of Croatian exports to the EU market (except for wine, certain fish and fishery products and baby-beef products), and a moderate reduction of agri-food import duties to Croatia for products originating in the EU. Since the FTAs with Hungary and Slovenia are less liberal, the accession of these two countries to the EU in 2004 requiring the implementation of EU's trade regime leads to a reduction of Hungary's and Slovenia's tariffs applied on imports from Croatia.

The study this paper is based on was commissioned by the Croatian Ministry of European Integration, organisationally supported by the *Deutsche Gesellschaft für Technische Zusammenarbeit* GTZ and financially supported by the German *Ministry for Economic Co-operation and Development* BMZ. It analyses the impact of trade liberalisation on the agri-food sector in Croatia. The study was carried out in close co-operation with Croatian experts from the Ministry of Agriculture and Forestry, the Ministry of European Integration, the Chamber of Economy and the Institute of International Relations. Trade partners and products included in the study are selected according to their importance for Croatia's agricultural production and trade. For the quantitative analysis, it was decided to focus on bilateral trade flows between Croatia and the EU-15, Bosnia and Herzegovina, Slovenia, Hungary and the "rest of the world" respectively.

A partial equilibrium model is used for the comparative-static policy analysis. Its basic elements are a system of 13 output supply (representing total agricultural production) and three input demand functions and a system of 13 food demand functions. The latter cover the total expenditures on food and tobacco spent by Croatia's population. Bilateral trade is modelled for 12 product groups. The model is calibrated based on 1999/2000 data. For the two simulation years 2002 and 2005 the results of three liberalisation scenarios which differ with regard to the applied import tariffs are compared with a BASE scenario. For the latter it is assumed that the same import tariffs as in the base year 1999/2000 prevail.

In the "FTAs scenario" the tariffs are mutually changed as agreed upon in the respective FTAs. In the "FTAs+EU scenario" which is only analysed for 2005, it is additionally assumed, that Hungary and Slovenia are members of the EU. Therefore, they implement the EU trade regime and Croatia levies imports originating from these countries with the same tariffs as those originating in the current EU. The "FTAs+EU+WTO scenario" anticipates a further trade liberalisation. In this scenario, tariffs applied by the "rest of the world" on imports from Croatia and vice versa are cut by 50 %.

The model results indicate that in general trade liberalisation analysed is welfare improving for Croatia. The most important findings are:

- Although farmers' net revenues decline on average, those farmers specialised in tobacco benefit from trade liberalisation due to a considerable increase of the farm gate price. This holds to a less extent also for poultry and egg producers. Worse off are particularly farmers for whom sugar production is an important source of income.
- Regarding employment in agriculture the implementation of the agreements likely leads to small changes which affect farms differently depending on their production structure. For example the labour intensive production of vegetables, fruits and wine slightly decreases, whereas tobacco output considerably grows.
- Consumers face lower retail prices, most pronounced for products aggregated in the model as oilseeds and sugar.
- Food processing is also impacted on due to the liberalisation of agri-food trade. Trade liberalisation increases both exports of Croatia to other countries as well as Croatia's imports. Croatian exporters realise considerable higher prices, and import prices (including import tariffs) significantly decrease. In general, the net effect of growing exports and imports seems to be modest. However, several branches of the food processing industry and in certain regions due to Croatia's long border have to adjust to the changing trade patterns.
- These more static results obtained for two specific years perhaps do not provide due account of the dynamic effects. To those certainly belongs the increased competition on Croatia's markets because foreign companies can more easily supply their food products to the Croatian consumers.
- The impacts of Croatia's bilateral and multilateral trade agreements will very likely neither extremely aggravate nor improve the existing problems of the agri-food sector.
- The increase in consumer welfare (between +4.8 % and +5.8 % in 2005, depending on the scenario) likely overcompensates the decline in farmers' total profits (between -0.7 % and -1.4 %) and the loss of tariff revenues (-95 million € to -106 million €).

Based on the quantitative simulation results and qualitative considerations from trade theory, the following conclusion are drawn:

- The Croatian government should continue to pursue the policy of trade liberalisation through bilateral and multilateral trade agreements. However, although their effects are likely welfare improving, trade policy alone will not solve the existing problems in the agri-food sector as there are e.g. an underdeveloped commercial credit market, a lack of market responsiveness of the trade and distribution system, a lack of competitiveness in upstream and downstream sectors.
- Nevertheless, trade liberalisation can contribute to ameliorate the situation. It is likely that the better access of Croatian food processors to international markets enables them to realise economies of scale which could not be gained by producing only for the small domestic market.
- Besides the reduction of tariffs, also the lowering of non tariff trade barriers and other factors impacting on transaction costs in Croatia's agricultural trade should be an important objective of trade policy. Croatia should continue to harmonise its food safety standards and their enforcement with those of the EU.

– Bi- and multilateral trade agreements are a kind of common institutions and contractual international relations. They foster internal and international political credibility and reduce political risks. Reliable long term planning becomes possible, the effect of which may be a more efficient production of domestic firms and enhanced attraction of domestic and foreign investments. Such trade agreements are an important part of an institution building which stimulates sustainable economic growth.

– In order to avoid any unacceptable hardship due to liberalisation the government should monitor the development of income of agricultural households and pay compensation if necessary. However, such governmental outlays should be made available only for a transitional period and in a way that does not distort production. This can be done by basing it on some past indicators. A return towards a more protectionist trade regime should be avoided and would not solve the problems of the agricultural sector anyway.

– In order to improve the possibilities of analysing different agricultural policy options efforts should be made to improve the reliability of the statistical data base. This holds particularly with respect to labour input in agriculture. Data on labour input vary much across different sources. Reliable information of this kind is of utmost importance for analysing the income situation of agricultural households and, therefore, also necessary for the development of policies targeting poor farmer households. However, the weakness of labour statistics is not only a problem with Croatia but also with many other countries in Europe. Improvements of the statistical data base would also be helpful with regard to the quantities supplied and demanded as well as the corresponding prices. Quantity balances should be consistent, and the total food expenditures should be in line with the spending on the single food items.

1 INTRODUCTION[1]

Agriculture is still an important sector of Croatia's economy. Its estimated share in total gross domestic product (GDP) was 7.1 % in 2001 (EBRD 2003, p. 53).[2] According to MIKULECKY and JURISIC (2001) about 13 % of the economically active population are employed in this sector.[3] As common for a small economy also in Croatia trade plays an important role. In 2001, the estimated share of trade in GDP is was 66 %.[4] In the same year, exports reached 4.66 billion US-$ and imports 9.04 billion US-$, resulting in a foreign trade deficit of 4.38 billion US-$ (IXPOS 2002). Especially agricultural products make up a large share of Croatia's trade; 8.6 % on the import side and 8.2 % on the export side in 2000 (FAOSTAT 2002). In 1999 and 2000, this is equivalent to imports of 422 million € and exports of 224 million € on average.[5] Thus, the agri-food sector is a net importing sector.

Recently, Croatia has significantly improved its international trade relations by implementing a number of trade liberalisation agreements signed with other countries. The former import substituting protectionist trade regime was abolished, and liberalising reforms were introduced. Given this change in agricultural trade policy it is of interest to have an assessment of its impact on agriculture, the food industry and the consumer. Hence, the objective of this

---

[1] This Discussion Paper is based on WEINGARTEN et al. (2002). The authors are grateful to Jana Fritzsch and Peter Voigt for their valuable comments on an earlier draft of this paper.

[2] Share of agriculture in GDP includes hunting, forestry and fishing (EBRD 2003).

[3] According to OECD (2002, p. 89) this share decreased from 16.0 % in 1991 to 8.6 % in 1999, the most recent year for which data are available.

[4] Own calculation based on EBRD (2002).

[5] All figures are an average of 1999/2000 bilateral trade data. We would like to thank our Croatian partners for the provision of the data base for 1999 and 2000 and – for the tariff data – for 2002 and 2005.

study is to analyse the various effects these agreements have. To keep the scope of the study manageable only a selected set of all bilateral agricultural trade agreements are taken into consideration. This covers those signed with Bosnia and Herzegovina, Slovenia, and Hungary as well as the Stabilisation and Association Agreement with the EU[6]. Due to their importance, also the commitments made in trade policy by Croatia's accession to the World Trade Organisation (WTO) are investigated.

1.1 Project background

The study this Discussion Paper is based on was commissioned by the Croatian Ministry of European Integration, and organisationally supported by the *Deutsche Gesellschaft für Technische Zusammenarbeit* GTZ and financially supported by the German *Ministry for Economic Co-operation and Development* BMZ. The Ministry of European Integration responds to a request of the Croatian Parliament to analyse the impact of trade liberalisation on agriculture and fishery. The project was carried out in co-operation between the GTZ and IAMO on the German side and Croatian experts from the Ministry of Agriculture and Forestry (MAF), the Ministry of European Integration, the Chamber of Economy and the Institute of International Relations.

The objective of this study is to assess the impact of various trade agreements on Croatia's agri-food sector. Trade partners and products included in this study are selected according to their importance for Croatia's agricultural production and trade. For the quantitative analysis, it was decided to focus on bilateral trade flows between Croatia and the EU-15, Bosnia and Herzegovina, Slovenia, Hungary and the "rest of the world" (ROW) respectively.

Research questions address the impact of the various trade agreements on production structure, input use, consumption patterns and trade flows for selected products. Policy options to overcome structural bottlenecks and alleviate the impacts of trade liberalisation will be discussed.

1.2 Overview of the paper

In the remainder of section 1, the recent political and economic development in Croatia is briefly described. Croatia's trade policy including various trade agreements is dealt with in section 2. The agreements are introduced in detail before section 3 provides information on the agri-food sector in Croatia, particularly on the agri-food trade. The analysis of the impact of Croatia's trade agreements starts in section 4 with some qualitative theoretical considerations of trade liberalisation according to international trade theory. In section 5, the impacts of trade liberalisation on producers and consumers of agri-food products as well as on the federal budget are quantitatively analysed using a partial equilibrium model. Section 5 starts with a brief description of the structure of the model and the trade policy scenarios analysed. Then, the results of the simulation analysis are presented and interpreted. Finally, policy recommendations are drawn in section 6.

1.3 Recent political and economic developments in Croatia

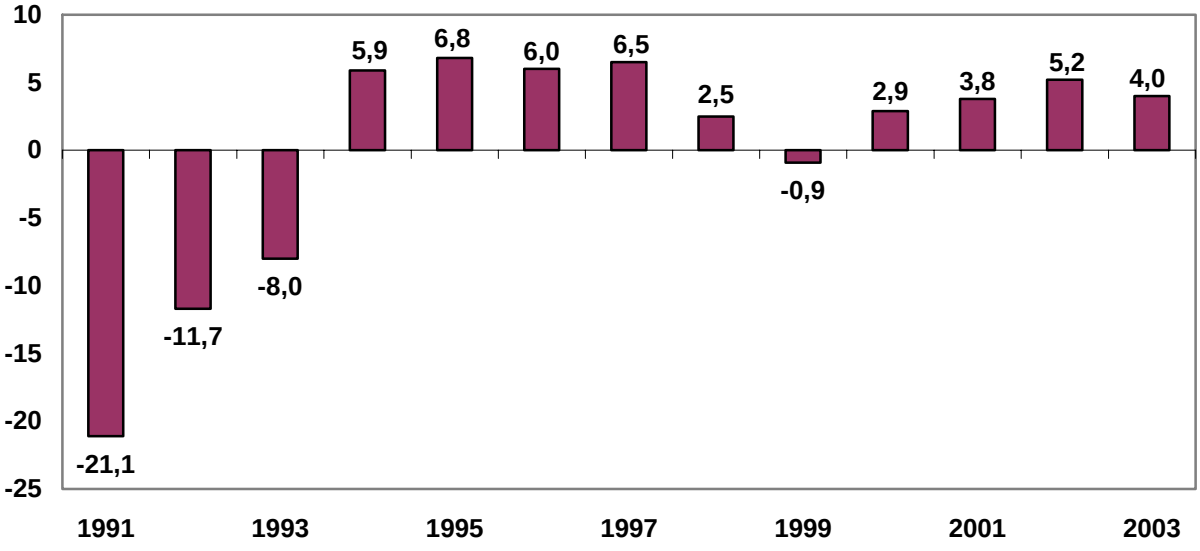
Croatia is a relatively small country in the northern Balkans with 5.59 million ha of land area and a population of 4.4 million. Historically, it was part of the Federal Socialist Republic of Yugoslavia. After the break-up of the Soviet Union, Croatia was one of the former Yugoslav regions that declared independence in 1991. It tried to establish relationships with western states, but it was pulled into the Yugoslavian war. Almost one third of the territory was

[6] To be more precise: the "Interim Agreement on Trade Related Questions".

occupied by Serbian forces, resulting in major migration and displacement of population. The occupation caused a collapse of the economy and major losses of productive capacity. In 1995, the Dayton Peace Agreement was concluded and initiated a period of political stability. Although the government was committed to privatisation and other structural reforms, the authoritarian regime further prevented international acceptance. In 1999, the political landscape changed drastically, and Croatia has been making promising progress towards economic and political integration. Croatia has significantly improved international relations, and market and trade liberalisation are progressing. The country became a member of the Partnership for Peace initiative of the NATO and of the WTO in 2000, it participates in the Stability Pact for South-Eastern Europe, and it has concluded a Stabilisation and Association Agreement with the EU in 2001. In December 2002, the government adopted the National Programme for the Integration of Croatia into the EU. Croatia intends to be ready for joining the EU by the end of 2006 (COMMISSION OF THE EUROPEAN COMMUNITIES 2003). On February, 21, 2003 Croatia applied for membership.

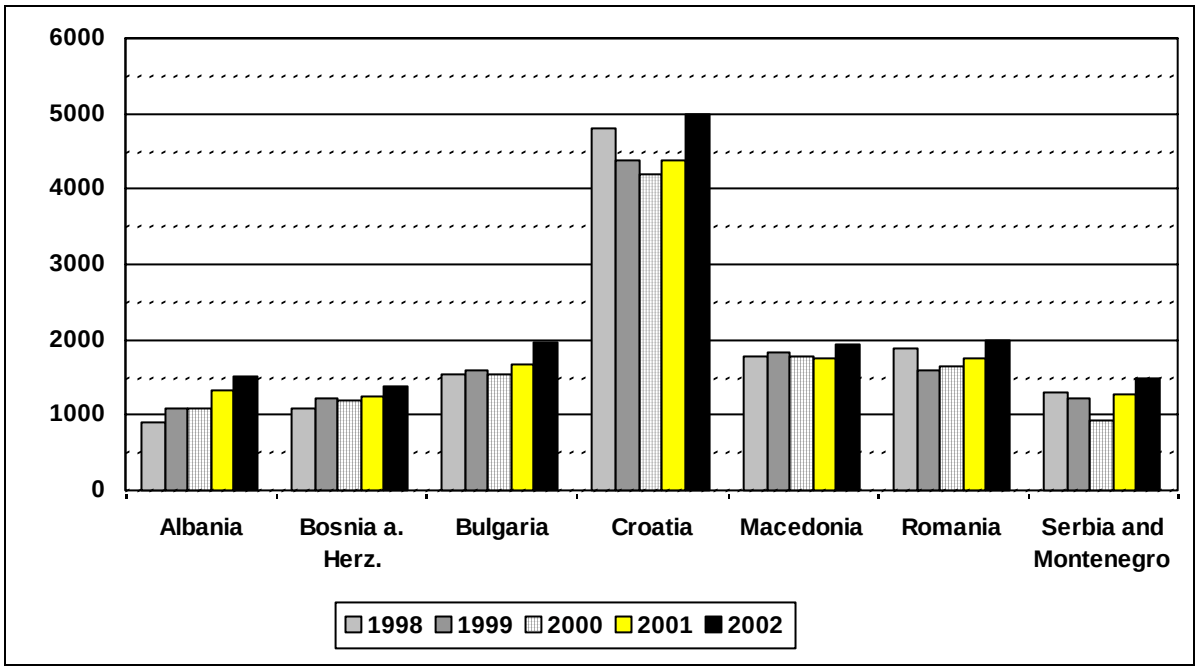
In terms of economic development, successful currency stabilisation in 1993 was followed by a period of significant GDP growth, i.e. 6.3 % on average between 1994 and 1997. As a consequence of a banking crisis and widening external current account deficits, growth slowed down in 1998. The introduction of successful fiscal and macroeconomic reforms as well as measures to control inflation in 1999 were accompanied by a slow-down of economic activity, so that growth was negative in 1999 but picked up significantly in 2000 (see Figure 1). GDP per capita was 4385 US-$ in 2001 (estimation for 2002: 4992 US-$), compared with 1261 US-$ to 1753 US-$ in the other South-Eastern European countries (see Figure 2). According to the WORLD BANK (2003), as of July 2003, Croatia may be classified as an upper middle income country and the other South-Eastern European countries as lower middle income countries.

Figure 1: Annual change in real GDP (in %) in Croatia 1991-2003



Remark: Preliminary for 2002, projections for 2003.
Source: EBRD (2003, p. 18).

Figure 2: GDP per capita in South-Eastern European countries (in US-$)



Remark: Estimations for 2002.
Source: EBRD (2003).

Future prospects for Croatia look promising. Liberalisation is progressing rapidly, and structural reforms are under way. The IMF has approved a new stand-by arrangement with the Government of Croatia in March 2001 (CROATIAN GOVERNMENT BULLETIN 2001), and the World Bank has approved a major structural adjustment loan in December 2001 to support the government's structural and institutional reform program (THE WORLD BANK GROUP 2002). This program covers five areas: the improvement of co-ordination and management of economic policy making, enhancing fiscal discipline, strengthening market institutions, labour market reform and revision of the social protection system. Key reform challenges remain in the areas of government finances, social welfare, privatisation and enterprise restructuring.[7]

2 CROATIA'S TRADE POLICIES AND TRADE AGREEMENTS

Recently, a new wave of trade liberalisation can be observed. Croatia replaced the import substituting protectionist trade regime and introduced liberalising reforms.[8] The key elements of Croatia's current wave of trade liberalisation are the WTO agreement, the Stabilisation and Association Agreement with the EU and a number of bilateral free trade agreements with other South-Eastern European countries under CEFTA and the Stability Pact for South-Eastern Europe (see Table 1).

[7] For an overview on recent economic developments in the Western Balkan countries cf. DIRECTORATE GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS (2003).

[8] "According to the IMF system, Croatia presently falls under the most liberal category." (COMMISSION OF THE EUROPEAN COMMUNITIES 2003, p. 16).

Table 1: Croatia's trade agreements (as of March 2003)

Level	Country/Body	Status/Type of Agreement	Date
Multilateral	WTO	Membership	member since 11/2000
	EU-15	Stabilisation and Association Agreement Application for EU membership	Signed 10/2001 Signed 02/2003
	Stability Pact	Participant, Memorandum of Understanding on Trade Liberalisation	Signed 06/2001
	CEFTA[1)]	Membership	Signed 12/2002 member since 03/03
	EFTA[2)]	Co-operation, FTA	Signed 01/2002
Bilateral	Poland	FTA	Signed 06/2002
	Czech Republic	FTA	Signed 01/2002
	Slovakia	FTA	Signed 01/2002
	Hungary	FTA	Signed 02/2001
	Bulgaria	FTA	Applied 01/2002
	Bosnia and Herzegovina	FTA	Applied 01/2001
	Macedonia	FTA	Applied 05/1997
	Slovenia	FTA	Signed 06/2002
	Romania	FTA	Applied 03/2003
	Lithuania	FTA	Signed 10/2002
	Albania	FTA	Signed 09/2002 Applied 04/2003
	Serbia and Montenegro	FTA	Signed 03/2003 Applied 07/2003

Remarks: [1)] CEFTA: Central European Free Trade Agreement (members: Poland, Czech Republic, Slovakia, Hungary, Slovenia, Romania, Bulgaria).
[2)] EFTA: European Free Trade Association (members: Iceland, Liechtenstein, Norway and Switzerland).

Sources: <http://www.cefta.org>, MINISTRY OF FOREIGN AFFAIRS (CROATIA), STABILITY PACT FOR SOUTH AND EASTERN EUROPE, COMMISSION OF THE EUROPEAN COMMUNITIES (2003).

Besides multilateral agreements, Croatia continues to pursue the policy of trade liberalisation through bilateral FTAs. The FTAs which are currently in application cover about 80 % of the total Croatian imports and exports of agri-food products. The coverage and the scope of trade liberalisation of agri-food products under all these agreements is different because of the sensitivity of the sector in most of the countries.[9] Still, the FTAs are important because they provide a more favourable access to all of these markets for the main Croatian export products.

As a result of recent liberalisation policies, Croatia is in a good position for establishing trade relations with Eastern and Western European neighbours. Despite the loss of traditional export markets in former Yugoslavia right after Croatian independence, recent efforts to establish

[9] Information provided by the MAF, February 2002.

trade agreements show that the improvement of Croatia's international trade relations is under way.

2.1 WTO

Croatia was admitted as a member to the WTO in 2000 after a 7 year period of negotiations. During this process, Croatia has adapted the respective legislation to WTO rules, liberalised service markets and reduced import duties on agricultural and industrial products. A transitional period was agreed until 2005 for industrial products and until 2007 for agricultural products. The key elements of the WTO commitments for the agricultural sector are the limit of domestic support, access to domestic markets as well as the commitment also in future not to apply export subsidies. Croatia committed itself to reduce the aggregate measure of support (AMS) from 161 million € in 2000 to 134 million € in 2004. Upon admission, the average customs duties on agricultural products were cut from 33.7 % to 25 % (on industrial products from 9.7 % to 6.5 %). After a grace period of 7 years the average customs duty on agricultural products will be 16.4 %, or 15.5 % if fish and fish products are included (REPUBLIC OF CROATIA, MINISTRY OF FOREIGN AFFAIRS 2002).

In the process of WTO accession, the legal framework has been completely harmonised with WTO rules. The new Trade Act and the Customs Tariff Act were implemented in January 2001, and a number of specific trade laws and regulations were amended. One of the main objectives of the Croatian Government is "increased growth based on the export of goods and services, as well as increased competitiveness of Croatia and Croatian products" (GOVERNMENT OF THE REPUBLIC OF CROATIA 2001).

2.2 EU Stabilisation and Association Agreement

Since 1997, the EU applies a "Regional Approach to the Balkan Countries" to support the implementation of the Dayton Peace Agreement. The principal means to implement this policy is the Stabilisation and Association Agreement (SAA) which also specifies trade concessions. The SAA is underpinned by the CARDS Programme[10], which is the main channel of the EU's financial and technical assistance. The SAA with Croatia was signed in October 2001, and the Interim Agreement on Trade Related Questions was implemented in January 2002. These provisions grant unlimited duty-free access of Croatian exports to the EU market (except for wine, certain fish and fishery products and baby-beef products), and a moderate liberalisation of agri-food imports to Croatia for products originating in the EU. According to the SAA further trade liberalisation shall be negotiated before July 1, 2006. It is planned to establish a free trade area with the EU after a transition period of 6 years (cf. EUROPEAN COMMISSION, DIRECTORATE GENERAL EXTERNAL RELATIONS without year).

On February, 21, 2003 Croatia applied for membership in the European Union. The European Commission will draw up a formal opinion which probably will take up a year. If it is favourable it will represent the starting point for formal accession negotiations (AGRA EUROPE 2003). Croatia intends to join the European Union in 2007 together with Bulgaria and Romania. In its Stabilisation and Association (SAP) Report 2003 on Croatia the European Commission assesses Croatia's integration efforts as follows:

"It [Croatia] has adopted an ambitious programme for the integration of Croatia into the European Union which includes a plan for the harmonisation of legislation with the acquis. Croatia has indeed started to work intensively in order to align its legislation to the acquis and to address most of the priorities identified in the 2002 SAP Report." (COMMISSION OF THE EUROPEAN COMMUNITIES 2003, p. 4).

[10] CARDS means "Community Assistance for Reconstruction, Development and Stabilisation".

2.3 Memorandum of Understanding between the Countries of the Stability Pact

The Stability Pact for South-Eastern Europe was adopted in 1999 as a long-term conflict prevention strategy of the international community. More than 40 partner countries and organisations have committed themselves to "strengthening countries in South Eastern Europe in their efforts to foster peace, democracy, respect for human rights and economic prosperity, in order to achieve stability in the whole region" (SPECIAL CO-ORDINATOR FOR THE STABILITY PACT FOR SOUTH-EASTERN EUROPE 1999). One of the main features of the Stability Pact is the free trade initiative of the South-Eastern European member countries. The main objective of this initiative is to foster economic development through liberalisation of trade regimes.

Within this framework, the Working Group on Trade Liberalisation and Facilitation negotiated a "Memorandum of Understanding on Trade Liberalisation and Facilitation" that was signed in 2001 by Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania and Serbia and Montenegro. Later, Moldova also signed the Memorandum of Understanding. The aim is the establishment of a free trade area between the signatory countries on the basis of bilateral FTAs. The countries agreed upon a list of principles for the negotiation and, if necessary, revision of existing FTAs. In February 2003, the negotiations of the 21 agreements (not taking into account Moldova, which is associated to the process with an extended timeline) were completed and all should be in force by mid 2003.

The FTA concluded between Croatia and Bosnia and Herzegovina provides for a high level of trade liberalisation with the abolition of all customs duties for products originating in Bosnia and Herzegovina as of January 1, 2001, and a gradual elimination of customs duties for products originating in Croatia during a transitional period ending on January 1, 2004. The FTA with Macedonia was among the first ones that Croatia has concluded. Liberalisation of trade of agri-food products under these early FTAs[11] is limited with regards to the scope and quantity of traded products. Higher levels of trade liberalisation have already been negotiated and are likely to come into force during the first half of 2002.[12] (For the agreement with Bulgaria see CEFTA countries).

2.4 CEFTA countries

The Central European Free Trade Agreement (CEFTA) was established to promote political stability and regional co-operation among transition countries. Member states are Poland, Czech Republic, Slovakia, Hungary, Slovenia, Bulgaria and Romania. The free trade area forms a common market of 90 million people. The objectives are "to harmonise the development of economic relations among signatories through expansion of trade, to speed up the development of the commercial activities of the signatories, to raise standards of living, and to ensure better employment opportunities, increased productivity and financial stability", and also to "ensure fair trade between members and, through the removal of trade barriers, to contribute to the balanced development and expansion of world trade" (CEFTA without year).

In July 2001, Croatia submitted an application for membership. After Croatia joined the WTO, and after initialising the SAA with the EU, basic requirements were met for its admission to the CEFTA. After concluding bilateral FTAs with all member countries Croatia became a full member on March, 1, 2003. From that date the CEFTA agreement replaced the bilateral FTAs with CEFTA countries.

Agreements with four of these countries (Hungary, Czech Republic, Slovakia and Bulgaria) followed the CEFTA model of liberalisation of agri-food products. This model covers a large

[11] See also the FTA with Slovenia.
[12] Information provided by the MAF, February 2002.

range of products which are divided into three lists (lists A, B and C) according to their level of sensitivity. List A includes mainly non-sensitive products for which a mutual abolition of customs duties is agreed. List B includes products for which reduced customs duties are applied. List C includes sensitive products for which reduced customs duties apply only for limited quantities. Unlike Croatian FTAs with other CEFTA countries, the FTA with Poland was not designed according to the CEFTA model. Trade liberalisation only applied to a smaller number of products within mutually agreed quotas.

2.5 EFTA Countries

EFTA is the "European Free Trade Association". The member countries are Iceland, Liechtenstein, Norway and Switzerland. EFTA supports the European efforts to stabilise the Balkan region, and in this context declarations of co-operation were signed with Albania, Macedonia, Croatia and the FR Yugoslavia. The FTA with Croatia[13] was signed in July 2001 and became effective in January 2002. The agreement establishes free trade in industrial products, processed agricultural goods, fish and other marine products. All tariffs on industrial products will thus be eliminated as of 1 January 2007.

Special arrangements apply for processed agricultural products. The liberalisation of trade between Croatia and EFTA countries covers only a small range of less sensitive agri-food products and is not likely to boost a mutual trade. However, full liberalisation was agreed for the fisheries sector, with a transitional period for sensitive fishery products to be imported into Croatia. The EFTA States and Croatia also started negotiating bilateral agreements on trade in basic and processed agricultural products.

2.6 Other Free Trade Agreements

Croatian exporters have expressed a large interest for a trade agreement with Serbia and Montenegro. This is understandable given the fact that in the period 1999-2001 both the mutual trade and Croatian exports of agri-food products to Serbia and Montenegro have risen fivefold. Further FTAs are under negotiation with Turkey, Estonia, and Latvia.[14]

2.7 Agreed tariff reductions until 2005

The most important trade policy instruments applied in Croatia's new trade regime are import tariffs and import quotas. The relevant trade policy instruments, i.e. the effects of the analysed trade agreements, are expressed as ad valorem import tariffs or quota-tariff equivalents. In our study, these are used to calculate the import and export unit values under the new trade regimes.

As a result of the FTAs, the tariff rates applied to agri-food imports into Croatia and exports from Croatia to its trading partners will be significantly reduced within a short period of time (see Table A 6 in the Annex and section 5.2 for the calculation of the aggregated tariffs). For imports of agri-food products into Croatia, aggregated import tariffs range from 20.1 % for imports from the rest of the world to 55.5 % for imports from Bosnia and Herzegovina (see Figure 3). While imports from Bosnia and Herzegovina will be liberalised completely, the import tariffs applied to products from all other trading partners will be between 11.5 and 15.2 % in 2005.[15]

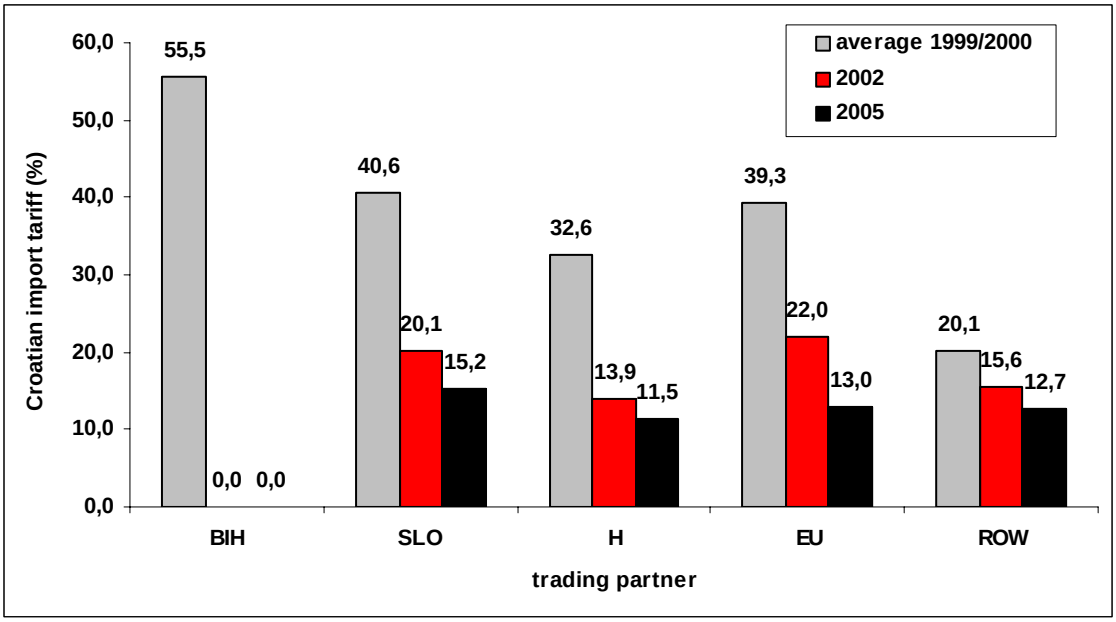
---

[13] Further information is provided by THE SECRETARIAT OF THE EUROPEAN FREE TRADE ASSOCIATION (without year) on its webpages http://secretariat.efta.int/library/legal/fta/croatia/.

[14] Information provided by the MAF, February 2002.

[15] The aggregation of the import tariffs in 2002 and 2005 is based on the trade values of 1999/2000.

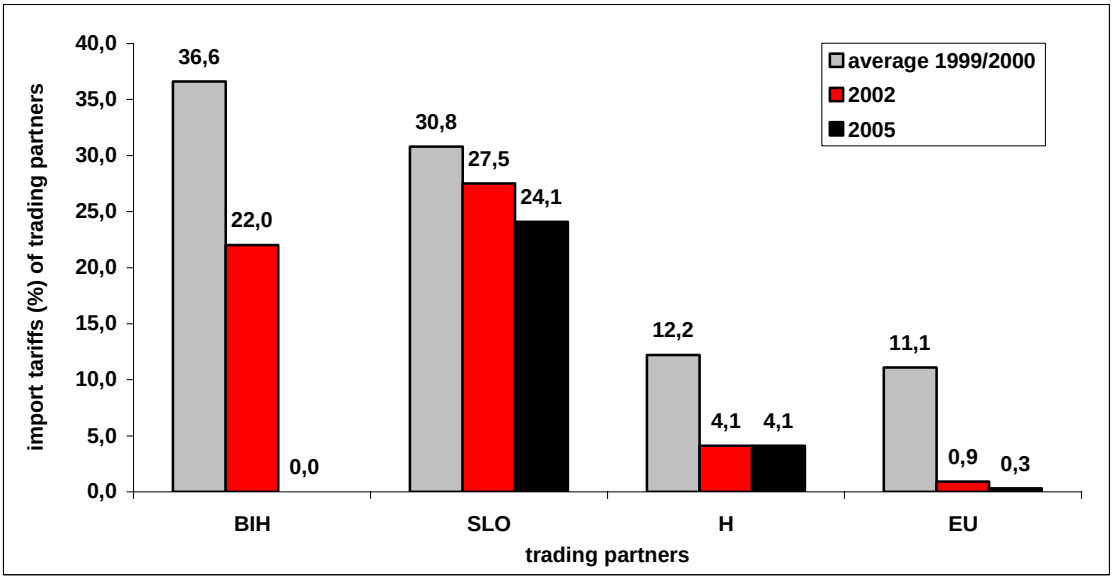
Figure 3: Aggregated Croatian import tariffs for agri-food imports from trading partners for 1999/2000 and the simulation years 2002 and 2005



Source: Own figure based on information provided by MAF.

For Croatian exports to its trading partners, the respective import tariff rates of Croatia's trading partners apply (see Figure). Compared to the respective Croatian import tariffs, these aggregated tariff rates were generally lower in 1999/2000, ranging from 11.1 % in the EU to 36.3 % in Bosnia and Herzegovina. Until 2005, tariffs for Croatian exports to Bosnia and Herzegovina and the EU (with the exception of wine) will be abolished, and tariffs for exports to Hungary will be lowered to 4.1 % on average. Slovenian tariffs remain at 24.1 % on average.

Figure 4: Aggregated import tariffs of trading partners for agri-food imports from Croatia for 1999/2000 and the simulation years 2002 and 2005



Source: Own figure based on information provided by MAF.

Annex 4 lists the aggregated import tariffs of Croatia and its trading partners by product groups for 1999/2000 and the simulation years 2002 and 2005. In the simulation years nearly all tariffs will be lower than in the base year. Only a few will be kept constant, and only for

tobacco and wine some import tariffs even will increase. Croatia rises its tariffs on tobacco imports originating from Hungary, Slovenia and the "rest of the world". However, in terms of import quantities, the former two countries are negligible, whereas the "rest of the world" accounts for around 80 % of Croatia's total tobacco imports in the base year.

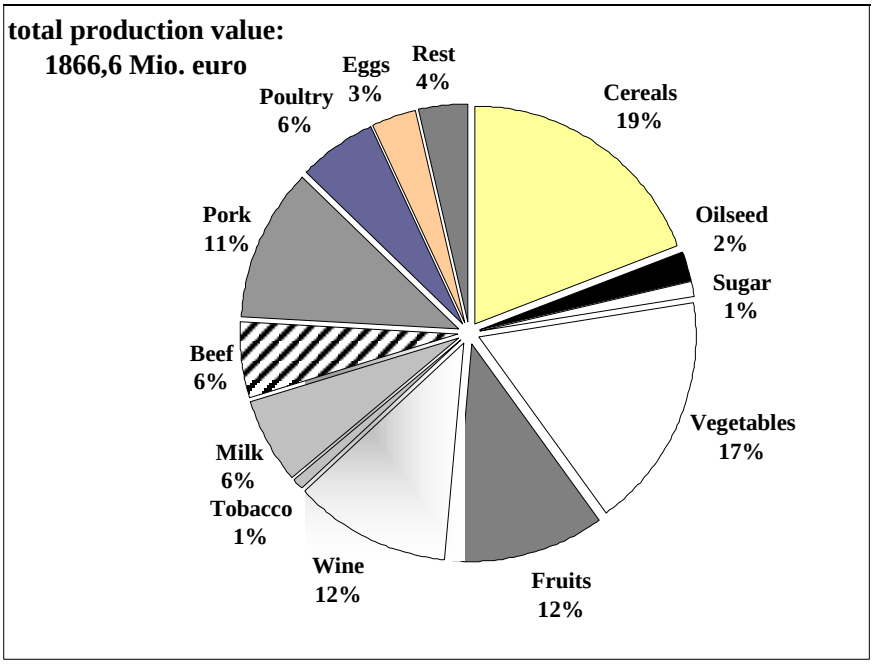
3 CROATIA'S AGRICULTURAL SECTOR

The share of agriculture (including hunting, forestry and fishing) in Croatia's GDP was 7.1 % in 2001 (EBRD 2003, p. 53). This figure is low compared to other South-Eastern European countries[16], but high in comparison with EU average (1.5 % in 1999). The agricultural sector employs about 13 % of Croatia's economically active population (MIKULECKY and JURISIC 2001), but it can be assumed that a higher percentage of the population is engaged in agricultural production on a subsistence level or as part-time activity.

Croatia is characterised by a large variety of natural production conditions. The country has a good agricultural production potential. 56.3 % of Croatia's land area is agricultural land (3.2 million ha). Almost half of the agricultural land is used as permanent pasture, 46 % as arable land and only 4 % of the area is used for permanent crops. Croatia has a dual farm structure. 80 % of the agricultural land is used by small-scale family farms with an average size of 3.5 ha[17], and 20 % by large state-owned Agrokombinats that produce a major share of the crops on the market (MIKULECKY and JURISIC 2001).

Typical agricultural products of Croatia are cereals, vegetables, fruits, livestock and wine. The total production value of the base year used for the modelling exercise (average of 1999/2000) was 1867 million €. With 19 % of the total production value, cereals constitute the largest share, followed by vegetables (17 %),wine and fruits (both 12 %) and pork (11 %) (see Figure 4). Altogether, animal products account for 32 %.

Figure 5: Production value of Croatian agricultural products (average 1999/2000)



Source: Own figure based on information provided by CoE and MAF.

[16] The corresponding figures for Albania is 49.0 % (2001), Bulgaria 12.1 % (2001), Macedonia 9.2 % (1999), Romania 11.4 % (2000) and Serbia and Montenegro 25.1 % (1999) (EBRD 2003).

[17] According to the COMMISSION OF THE EUROPEAN COMMUNITIES (2003) the averages size of the small family farms is 5 ha.

Table 2 summarises the production of selected food items in Croatia in 1999, 2000 and 2001.

Table 2: Production of selected food items in Croatia (in t)

Product	1999	2000	2001
Wheat flour	296 544	276 424	278 916
Bread	124 954	123 599	124 338
Pasta	5 994	6 508	6 972
Fruit juices	11 428	26 188	29 715
Processed vegetables	16 758	16 149	16 537
Condiments	23 396	16 500	16 448
Fresh meat	86 591	91 363	99 517
Sausages	31 867	35 240	40 342
Canned meat	17 216	13 435	11 897
Soup concentrates	4 393	5 041	5 176
Tinned fish	10 359	10 533	11 372
Milk powder	1 431	2 292	1 732
Baby food	3 960	4 131	4 268
Butter	1 723	2 171	2 626
Cheese	18 229	21 153	22 674
Sugar	113 966	56 729	130 693
Confectionery and cocoa products	19 553	20 190	22 056
Biscuits and related products	22 550	21 840	25 277
Edible oil	37 964	35 228	39 630
Margarine	16 124	15 747	16 414
Yeast (Dry)	11 168	10 690	12 053
Coffee substitutes	824	761	728
Beer (000 hl)	3 662 853	3 847 452	3 799 271
Wine (000 hl)	426 036	472 162	500 533
Soft Drinks (000 hl)	2 498 900	1 470 956	1 657 338
Animal feed	471 608	483 550	524 270

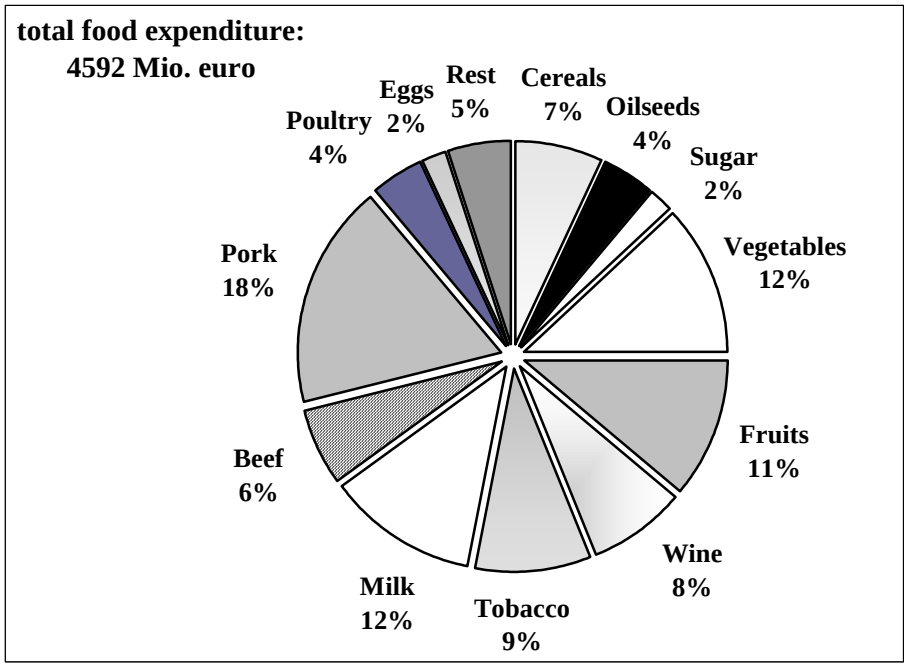
Sources: STATE STATISTICAL OFFICE, cit. in AGRA EUROPE (2002b).

In the base year 1999/2000, Croatian consumers spend a total amount of 4592 million € on agricultural and processed food products, if tobacco is included (see Figure). This results in per capita food expenditure of 1030 €/year.[18] The largest share is contributed to pork products (18 %), followed by vegetables and milk (both 12 %) and fruits (11 %).[19]

[18] An equivalent of foreign tourist nights that contribute to consumption is included in the population figure.

[19] See section 5.2 for the adjustments of the retail prices in order to balance total food expenditures and the spending for the single products.

Figure 6: Food expenditure including tobacco of Croatian consumers (average 1999/2000)



Source: Own figure based on information provided by CoE and MAF.

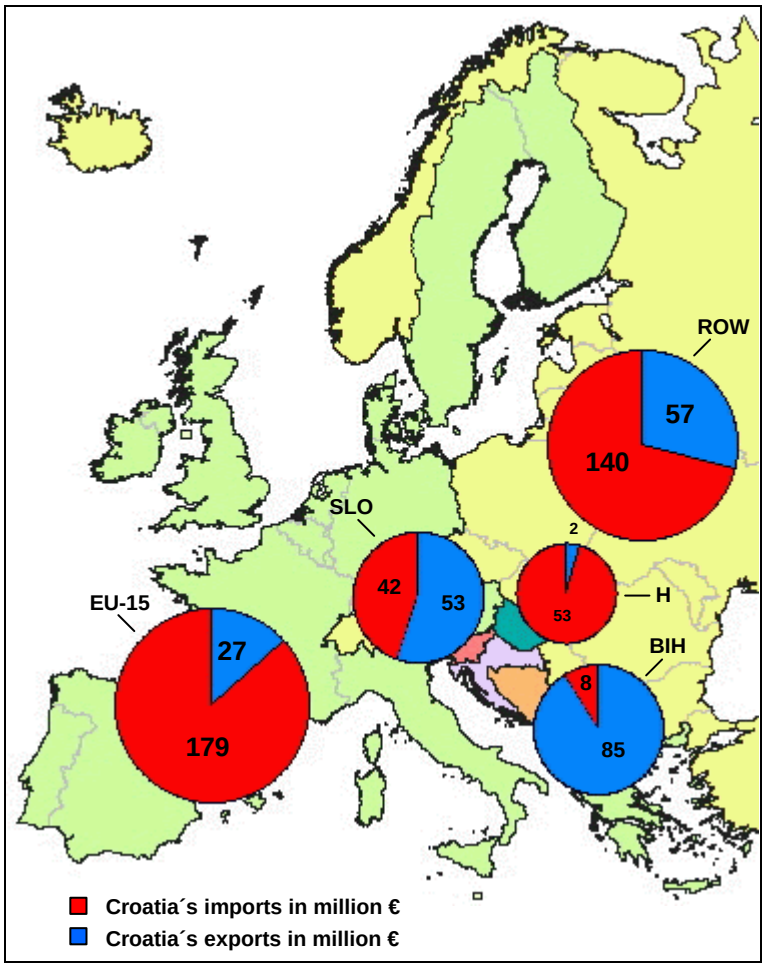
3.1 Agricultural trade flows and competitiveness

Agricultural products are important for Croatia's trade. The share of traded agricultural products in total trade amounted to 8.6 % on the import side and 9.3 % on the export side in 1999 (FAOSTAT 2002). The total value[20] of agricultural imports amounted to 422 million €, which is opposed to 224 million € of export value. Thus, the agri-food sector is a net importing sector. The largest share of agricultural imports (see Figure) into Croatia comes from the EU (42.4 %), most importantly from Italy, Germany and Austria. Other important sources of imports are Hungary (12.6 %) and Slovenia (10 %). The most important destination of Croatian agri-food exports is Bosnia and Herzegovina (38 %), followed by Slovenia (23.7 %) and the EU (12.1 %). The model explicitly covers 66.8 % of Croatia's agricultural imports and 74.5 % of exports on a bilateral level. The approximately one third or one fourth of trade which is conducted with all other countries is aggregated and represented in the model as if it were conducted with a single country, called the "rest of the world" (ROW).

Based on the product differentiation of the trade model applied for the policy analysis (see section 5), the largest share of total export value is made up by tobacco (65.3 million €) and cereals (54.4 million €) (see Figure). The most important imports are fruits (82.1 million €), cereals (62 million €), vegetables (49.8 million €) and oilseeds (48.3 million €).

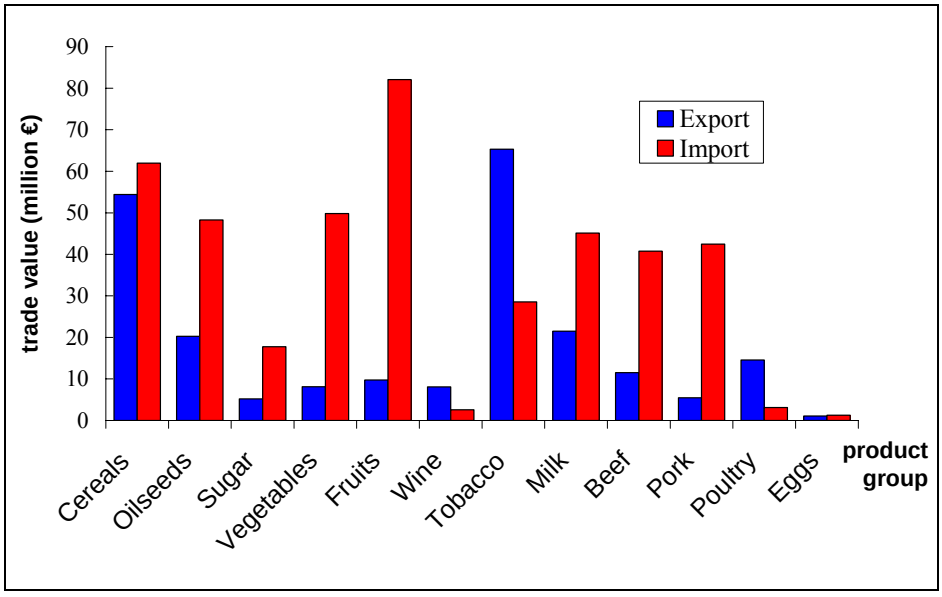
[20] If not expressed otherwise, all figures are an average of 1999/2000 bilateral trade data, which was provided by the MAF and the CoE.

Figure 7: Croatian trade with selected trading partners (average 1999/2000)



Source: Own figure based on information provided by CoE and MAF.

Figure 8: Total value of agri-food exports from and imports to Croatia for 1999/2000 (in million €)



Source: Own figure based on information provided by CoE and MAF.

A more recent overview on Croatia's agri-food trade is provided in Table 3. According to this source, in 2001, Croatia imported agri-food products worth 845 million US-$ compared with 687 million US-$ in 2000. Also the value of the agri-food exports increased, but to a less extent: from 405 million US-$ in 2000 to 470 million US-$ in 2001. As a result, Croatia's trade deficit with these products rose from 280 million US-$ to 375 million US-$.

Table 3: Croatia's trade balance with agri-food products (in 1000 US-$)

	Imports	Exports	Balance
2001	845 140	469 699	-378 442
2000	686 767	405 937	-280 830
1999	696 270	418 373	-277 897

Sources: STATE STATISTICAL OFFICE, cit. in AGRA EUROPE (2002a).

Table 4 shows a more detailed break-down of Croatia's imports and exports. The import and export values of most of the items listed changed considerably from 2000 to 2001, mainly increased in a two-digit percentage range. However, values of a few products also significantly decreased.

The FTAs which are currently in application cover about 80 % of the total Croatian imports and exports of agri-food products. The coverage and the scope of trade liberalisation of agri-food products under all these agreements is different, but is generally limited because of the sensitivity of the sector in most of the countries.[21] Still, the FTAs are important because they provide a more favourable access to all of these markets for the main Croatian exporting products, namely meat products, cigarettes, wine and spirits, confectionery products, fish and fishery products. According to the assessment of competitiveness by KOESTER et al. (2001), "the limited ability of Croatian agricultural products to compete on domestic and international markets stems largely from the failure of government to improve the operation of factor and commodity markets".

[21] Information provided by the MAF, February 2002.

Table 4: Croatian trade in agri-food products in 2000 and 2001

Product	Imports (1000 US-$)			Exports (1000 US-$)		
	2000	2001	change 2001 to 2000 (in %)	2000	2001	change 2001 to 2000 (in %)
Live animals	46 128	32 749	-29.0	1 338	1 977	47.8
Meat and meat products	43 999	51 249	16.5	6 002	5 722	-4.7
Fish and seafood	25 391	46 477	83.0	30 448	46 777	53.6
Milk, dairy products, eggs, honey	49 651	58 610	18.0	19 472	20 920	7.4
Other animal products	10 887	10 838	-0.4	7 244	7 345	1.4
Trees, bulbs, flowers	13 073	15 589	19.2	300	186	-37.9
Vegetables, edible roots and tubers	28 411	35 531	25.1	2 880	2 871	-0.3
Fruits and citrus	52 946	66 841	26.2	3 845	5 959	55.0
Coffee, tea, spices	42 708	31 436	-26.4	5 180	4 266	-17.7
Cereals	8 826	38 805	339.7	37 845	35 082	-7.3
Milling products, malt, starch	12 726	13 221	3.9	1 784	1 878	5.3
Oilseeds	19 730	33 175	68.1	9 452	9 392	-0.6
Rubber and resins	1 878	1 668	-11.2	153	64	-58.2
Textile plants	283	243	-14.0	82	94	14.4
Fats and oils (plant and animal)	16 577	19 866	19.8	10 137	12 962	27.9
Processed meat and fish products	23 154	24 965	7.8	32 651	33 421	2.4
Sugar and sugar-based products	18 988	42 558	124.1	5 014	29 053	479.4
Cocoa and cocoa-based products	21 774	28 824	32.4	17 447	19 732	13.1
Cereals and starch-based products	36 558	47 282	29.3	22 337	24 376	9.1
Fruit and vegetable products	41 279	45 074	9.2	10 055	10 460	4.0
Miscellaneous food products	58 894	65 899	11.9	62 088	60 418	-2.7
Beverages, spirits; vinegar	37 388	50 206	34.3	34 718	34 271	-1.3
Livestock feed	43 918	60 466	37.7	8 846	13 807	56.1
Tobacco and tobacco substitutes	31 601	23 567	-25.4	76 617	88 663	15.7
Total	**686 767**	**845 140**	**23.1**	**405 937**	**469 699**	**15.7**

Sources: STATE STATISTICAL OFFICE, cit. in AGRA EUROPE (2002a).

3.2 Current agricultural policy and reform challenges

Despite favourable natural production conditions, the production level of most farms and industries has remained below potential. A number of structural problems lead to high prices of agricultural and food products and low competitiveness of Croatian products on export markets (KOESTER et al. 2001). Major reform challenges in the agricultural sector are:

- high production costs and the critical financial situation of many enterprises,
- an underdeveloped commercial credit market,
- the lack of market responsiveness of the trade and distribution system,
- the lack of competitiveness in upstream and downstream sectors,
- a non-functioning land market.

In response to the structural problems, a New Law on Agriculture was passed in 2001. The Law sets the policy objectives emphasising competitiveness, living standards and the maintenance of rural areas. More specifically, the objectives include:

- improvement of food security in terms of quantity and quality,
- provision of consumer access to a suitable and constant supply of food in accordance with consumer demands, especially regarding prices, food quality and food safety,
- increase of competitiveness through efficient production and marketing,
- stability of farm incomes and fair living and working standards,
- preservation and advancement of village regions and rural values, natural resource protection and sustainable agriculture.

Also, in 2001 the Law on Agricultural Land was passed. Its basic goal is to achieve larger agricultural holdings. The law offers solutions related to the privatisation of the 1.1 million hectares state-owned agricultural land, the development of the land market and the consolidation of farmland. Unsettled property rights issues still hamper the privatisation process. In addition, a Food Law is in preparation. It will define food safety and food quality criteria for production and trade of foodstuffs.[22]

As part of the reform package, a Law on State Subsidies for Farming, Fisheries and Forestry was adopted in July 2002 and entered into force on January, 1, 2003. This law revised the incentive payment system and replaced the formerly little transparent subsidy system. Different payment schemes are established: i) the income support scheme for non-commercial farms run by elderly people, ii) the production stimulation scheme for commercial farmers, iii) the farm capital investment scheme and iv) a rural development scheme (COMMISSION OF THE EUROPEAN COMMUNITIES 2003; cf. MIKULECKY and JURISIC 2001). By January, 31, 2003, the deadline for registration, more than 100,000 farmers had applied for registration, which is obligatory for commercial farmers participating in the payment schemes (COMMISSION OF THE EUROPEAN COMMUNITIES 2003).

4 THEORETICAL CONSIDERATIONS ON THE ECONOMIC EFFECTS OF INTERNATIONAL INTEGRATION

Applied numerical equilibrium models can be used as instruments of quantitative trade policy analysis. The IAMO model used for this study is based on neo-classical theory. It is a partial equilibrium model for the agricultural sector. In contrast to so-called general equilibrium models, a partial equilibrium model cannot show effects of production or consumption changes on other industries of the economy. Partial equilibrium analysis focuses on one particular industry's product and factor markets. The depiction of markets reflects production, processing, consumption and trade activities. The model is designed for comparative-static analysis, meaning that the impact of alternative domestic and trade policy scenarios on production, consumption and welfare can be analysed for different points in time. To understand the results obtained from the IAMO model, a brief introduction to the relevant theoretical background for the trade policy analysis is given in the following section. The focus is on international trade theory, different aspects of trade liberalisation and the effects of economic integration as well as on the approach of welfare economics.

[22] Information provided by the MAF, April 2002.

4.1 International trade theory

Trade theories differ in explaining the determinants of international trade and specialisation (GANDOLFO 1998). In classical trade theory, it is assumed that trade is caused by differences in comparative costs of production that result from technological differences between countries. A country has a comparative advantage for a good if the opportunity costs of production are lower than in other countries. The rate of the specific terms of trade between the countries express how many units of the exported good are exchanged per one unit of the imported good. The terms of trade are defined as the price index of a country's exports divided by the price index of a country's imports. For trade to take place, the terms of trade must be between the two comparative costs, otherwise the good could be obtained at a lower cost internally. Gains from trade can be captured if the country specialises in the production of a good for which it has a comparative advantage and imports goods for which other countries have lower opportunity costs.

According to HECKSCHER-OHLIN theory (factor proportion theorem), which is considered neo-classical in terms of its methodology and assumptions, trade is caused by differences in factor endowments between countries. The product that uses the most abundant factor of the respective country most intensively is exported. In neo-classical trade theory, the reason for trade is the comparative advantage of a country that is explained by differences in the production function (technology) or relative factor endowments. The determinants of trade are found simultaneously in the differences between factor endowments and technologies.

The outcome of (neo-)classical trade theory can be contradicted when scale economies or imperfect markets play a role. Therefore, new trade theories drop the assumptions of perfect competition and product homogeneity and analyse trade in the context of imperfect competition and product differentiation. Thus, new trade theory focuses on the effects of internal and external economies of scale, market imperfections and consumer preferences. These effects are changes in the magnitude of classical trade effects and the additional effects of enhanced competition which are only to some extent covered by the neoclassical partial equilibrium model applied.

4.2 Trade liberalisation, economic integration and the world trading system

Narrowly defined, trade liberalisation is the removal of trade barriers. Economic integration between two or several countries is a more complex process. It can be broadly defined as "a preferential or discriminatory reduction of barriers to economic transactions and the establishment of institutions between countries" (FOCK 2000, p. 82f). The liberalisation and integration process is induced by both market and policy factors. In general, the degree of institutional (policy-driven) integration should increase with the number of economic transactions. Policy makers need to take choices concerning the optimal degree and the set-up of integration in terms of the reduction of tariff and non-tariff barriers to trade. It requires the commitment of policy makers to institutional harmonisation. Harmonisation costs on political level must be justified by reduced contractual costs for economic agents.

Different steps of liberalisation and integration processes can be classified, ranging from autarky over bilateral or regional agreements to full integration into the world trading system. Bilateral agreements include preferential tariff agreements and free trade agreements. Regional integration agreements are primarily customs unions and free trade areas. The world trading system is embodied in the WTO agreements.

A *preferential tariff agreement* lowers the tariffs in a discriminatory manner. These types of agreements are often asymmetric in the sense that one country lowers its tariffs more than the other, as is often the case between developed and developing countries. *Free trade*

agreements aim at the full elimination of tariffs and other trade barriers, often with specific transition periods. Since third countries are not meant to be affected by such FTAs, an important feature is the application of "rules of origin" that prevent arbitrage trade. A *customs union*, similar to the above mentioned free trade areas, does not apply any internal barriers to trade. In addition, all countries of the customs union apply a common external tariff. The arrangements for a *common market* include the free exchange of goods, services and factors, as well as advancing harmonisation of standards, regulations and other institutions. An *economic union* is the highest level of integration. It implies that a wide range of economic policies are determined jointly, some even at a supranational level.

In addition to that, trade liberalisation within the multilateral trading system under the WTO plays an important role. One of the most important principles of the WTO is the so-called "most-favoured-nation rule" or "MFN clause". It establishes the requirement that WTO members "shall extend unconditionally to all other contracting parties (members) any advantage, favour, privilege or immunity affecting customs duties, charges, rules and procedures that they give to products originating in or destined for any other country" (WTO 1995). Yet, in the WTO rules the principle of non-discrimination coexists with the provisions for regional integration agreements that, in a sense contradict the aforementioned principle. The WTO rules and procedures ensure that bilateral, regional and multilateral approaches to trade liberalisation and economic integration[23] do not have a contradictory effect. This fact is based on the assumption that genuine regional integration areas do not threaten world-wide trade liberalisation. On the contrary, certain issues are addressed faster and more efficiently by regional agreements. An OECD study (1995) comes to the conclusion that "regional integration agreements have proved to be compatible with multilateralism and had a positive overall impact on international trade and the multilateral trading system. They have not stood in the way of further multilateral liberalisation which has, in fact, significantly increased." For many countries, smaller regional integration areas have led the way to more competitiveness and greater acceptance of international rules.

4.2.1 Benefits of institutional integration

The typical effects of economic integration that can be explained by neo-classical theory are the changes in terms of trade that result from the trade creation and trade diversion effects. There are additional arguments in favour of institutional integration and the formation of economic areas that have been brought forward in more recent theoretical approaches (FOCK 2000). These aspects cannot be explained by neo-classical analysis and the modelling exercise of this study. Yet, their effects on the Croatian economy might be significant.

'New trade theory' puts more emphasis on the dynamic effects of integration. Here, the pro-competitive effects are due to the realisation of economies of scale and increased competition. For a small economy like Croatia, relatively large effects can be expected in this respect.

'New regionalism' takes into consideration the advantages from common institutional settings as arguments in favour of economic areas. Common institutions and contractual international relations foster internal and international political credibility and reduces political risks. Reliable long term planning becomes possible, the effect of which may be more efficient production in domestic firms and enhanced attraction of domestic and foreign investments. Another factor taken into account in the approach of 'new regionalism' is that regional economic integration is often more effective in the reduction of non-tariff barriers to trade than multilateral trade liberalisation.

---

[23] This is mainly through Article I and Article XXIV of GATT, which was supplemented by the Uruguay Round Understanding on Article XXIV.

4.2.2 Special effects of EU enlargement

The EU is a regional integration area which has reached a very deep and formalised level of integration, both on economic and policy level. EU enlargement is a special case of integration into a common market that is characterised by asymmetric preconditions and effects. BREUSS (2001) analysed the macro-economic effects of EU enlargement on the current member states and the acceding countries, namely the CEE candidate countries. The starting point is the politically motivated integration of a number of "poor" transition countries into an already existing bloc of economically more advanced industrialised countries. The author comes to the conclusion that the integration effects of the acceding countries will be essentially positive, but the transmission of these positive effects to the current member states will be very small. For the CEEC, the additional average growth of real GDP will be more than ten times as high as for EU countries, i.e. 12 % cumulated from 2001-2010 for the CEEC. Within the EU, only those countries with intensive trade relationships will also experience positive effects. All in all, EU enlargement is a win-win situation for all countries involved.

The standard effects of economic integration are trade diversion and trade creation. The trade diversion effect (most often welfare reducing) reflects a shift of trade flows away from external towards internal trade. The trade creation effect (most often welfare enhancing) is due to an increase in trade caused by a reduction of relatively inefficient production (FOCK 2000).

Besides these theoretical standard effects, BREUSS (2001) identified a number of special features of EU enlargement. *Trade creation effects* result from the elimination of tariffs and costs associated with border controls. Effects are extremely positive for the acceding countries, and only slightly positive for some EU countries. *Common market effects* are caused by efficiency increases that are due to the exploitation of economies of scale and increased price competition, and they occur equally in all countries. The *effects of factor movements* result from foreign direct investments in the acceding countries and labour migration into the EU. Capital flows result in investment gains for the acceding countries and interest rate losses in the countries of origin. Labour migration leads to an immigration surplus in the EU countries and migration losses in the acceding countries. The *costs of EU enlargement* are mainly borne by the EU countries with only minor effects on their balance of payments, while the effects for the acceding countries are positive.

5 QUANTITATIVE TRADE POLICY ANALYSIS WITH A PARTIAL EQUILIBRIUM MODEL

In the following the model used to analyse the impacts of Croatia's agricultural trade policy on its agri-food sector is briefly described. The model is based on two similar which have been developed at IAMO during the last years. These are the **C**entral and **E**astern **E**uropean **C**ountries **A**gricultural **Si**mulation **M**odel CEEC-ASIM (cf. WAHL et al. 2000; WEBER 2001) and the **E**conomic **P**olicy for **A**griculture of the **CIS** EPACIS model (cf. WEINGARTEN and ROMASHKIN 2001; EITELJÖRGE et al. 2000; FOCK et al. 2000). For a more detailed description of the structure and economic theory the model is based on see WAHL et al. (2000). The model used in this study relies on a more advanced solution procedure and is solved as a so-called "Mixed Complementarity Problem" (MCP). The MCP accommodates market and game-theoretic equilibrium models, which are not easily analysed in an optimisation context (RUTHERFORD 1995). It adds a combinatorical twist to the classic square system of non-linear equations and enables a broader range of situations to be modelled (FERRIS and MUNSON 2000).

5.1 Structure of the trade model applied

The comparative-static analysis was carried out with a partial equilibrium model of the Croatian agri-food sector. Its basic elements are a system of output supply and input demand

functions derived from producers' profit maximisation and a system of food demand functions derived from consumers' utility maximisation. The supply side is based on the flexible "Symmetric Generalized McFadden" profit function (SGMF) proposed by DIEWERT and WALES (1987), and consumer demand is derived from the "Normalized Quadratic-Quadratic Expenditure System" (NQQES) developed by RYAN and WALES (1996, 1999). It is assumed that domestic and foreign commodities are not homogenous. To consider the imperfect product substitutability, the ARMINGTON (1969) approach is used to model aggregate exports and imports as well as to incorporate bilateral export and import flows from and to those countries explicitly included in the model. These are the EU-15, Slovenia (SLO), Hungary (H) and Bosnia and Herzegovina (BIH). In the base year, 67 % of Croatia's agricultural imports and 75 % of its exports are carried out with these countries. The approximately one third of trade which is conducted with all other countries is aggregated and represented in the model as if it were conducted with a single country, called the "rest of the world" (ROW).

The model used may be viewed as "calibrated" microeconomic model (DAWKINS et al. 2001). The main focus of such models is a numerical implementation of theoretical structures to get insights about the effects of policy changes. As a consequence, simulation results depend heavily upon the choice of the model's functional forms and on the set of parameters which may be entirely provided by the modeler or parts of it endogenously determined. Since there is a lack of time series data, it is not possible to estimate the necessary parameters of the systems of functions on the supply and demand side by econometric methods. To overcome this problem the parameters of these functions are calibrated in a way that allows to reproduce the base year quantities at base year prices, taking into account all of the theoretical conditions following from the underlying micro-economic theory and using expert knowledge on plausible ranges for supply and demand elasticities. Accordingly, the elasticities in the export supply and import demand functions depend on plausible assumptions on the country specific quantity response to changes in world market prices.

The following 13 agricultural commodities are included in the model (see Figure): cereals, oilseeds, sugar, vegetables, fruits, wine, tobacco, milk, beef, pork, poultry meat, eggs and a residual aggregate. On the supply side "rest of agricultural output" (RAO) represents the value of all other agricultural production. It is the difference between gross agricultural output and the aggregated production value of the agricultural outputs included explicitly. On the demand side "rest of spending" (ROSP) represents the expenditure on food consumption (including tobacco) which is not spent on any of the products included explicitly. Furthermore, three inputs are included in the model: feed cereals, fertiliser and the "rest of variable inputs" (RVI). They represent the input demand of the profit-maximising system. "Rest of variable inputs" is the difference between total intermediate inputs and the feed and fertiliser inputs included in the model. For trading, feed stuffs and their non-feed equivalents are aggregated.[24] No trade flows are modelled for fertiliser and "rest of variable inputs".

The model is based on a simultaneous three-step decision-making process of economic subjects, i.e. producers and consumers. At the first level, producers decide on input quantities demanded, and output quantities produced (QS_i, at the top of the right-hand side of Figure 8)[25], given prevailing producer incentive prices (PS_i). They are assumed to maximise profits by producing multiple outputs using a bundle of variable inputs. Production structure is modelled with the SGMF. On the demand side, consumers decide on the quantities demanded (QD_i, see top of the left-hand side of Figure) at given retail prices (PD_i). They maximise utility – subject to a budget constraint. Consumption structure is modelled with the NQQES.

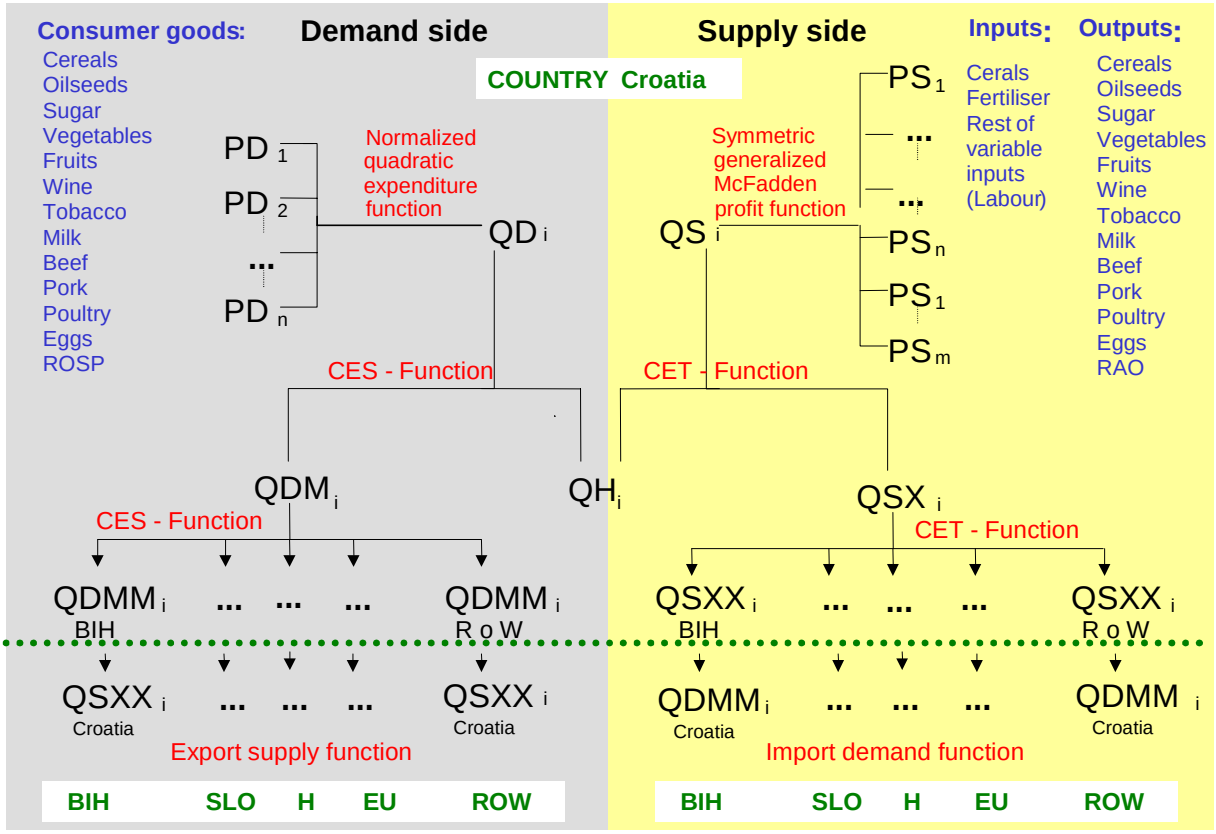
[24] In simulation analyses, the price ratios between feed stuffs and their non-feed equivalents are kept constant.
[25] The subscript $_i$ denotes the product.

At the second level – shown in the centre of the right-hand side of Figure – producers decide what quantities to sell on the domestic market (QH_i) or to export (QSX_i) depending on the ratio between the domestic market price (PH_i) and the aggregate export price (PSX_i). They maximise revenues given a CET aggregator function. Correspondingly, consumers (including feed demand of producers) choose between domestically produced (QH_i) and imported goods (QDM_i)) depending on the ratio between the domestic market price (PH_i) and the aggregate import price (PDM_i). QH and QDM are assumed not to be perfect substitutes and consumers minimise their expenditure for the composite good given a CES aggregator function.

At the third level – shown in the lower part of Figure – total export quantities are distributed to the respective trading partners ($QSXX_{cou,i}$) depending on the ratios between the export prices for the different destinations ($PSXX_{cou,i}$) and the aggregate export price (PSX_i). The quantities to be imported from particular countries ($QDMM_{cou,i}$) are determined depending on the ratios between the import prices of the different origins ($PDMM_{cou,i}$) and the aggregate import price (PDM_i). This is again accomplished by using CET or CES aggregator functions, respectively. There is, however, a restrictive assumption arising from the use of CET and CES functions: the elasticities of transformation or substitution between each pair of trading partners have the same magnitude.

The assumed inhomogeneity of products depicted by the applied CES and CET aggregator functions has implications for the quantity balances. Since the functions are calibrated using the base year data, the quantities of that year balance out, e.g. Croatia's total exports of product *i* equals the sum of the exports of *i* to Croatia's trading partners. However, this does not exactly hold for the simulation year, because the products are not completely homogenous, depending on their destination. Nevertheless, export and import values always balance out.

Figure 9: Structure of the trade model applied – quantities

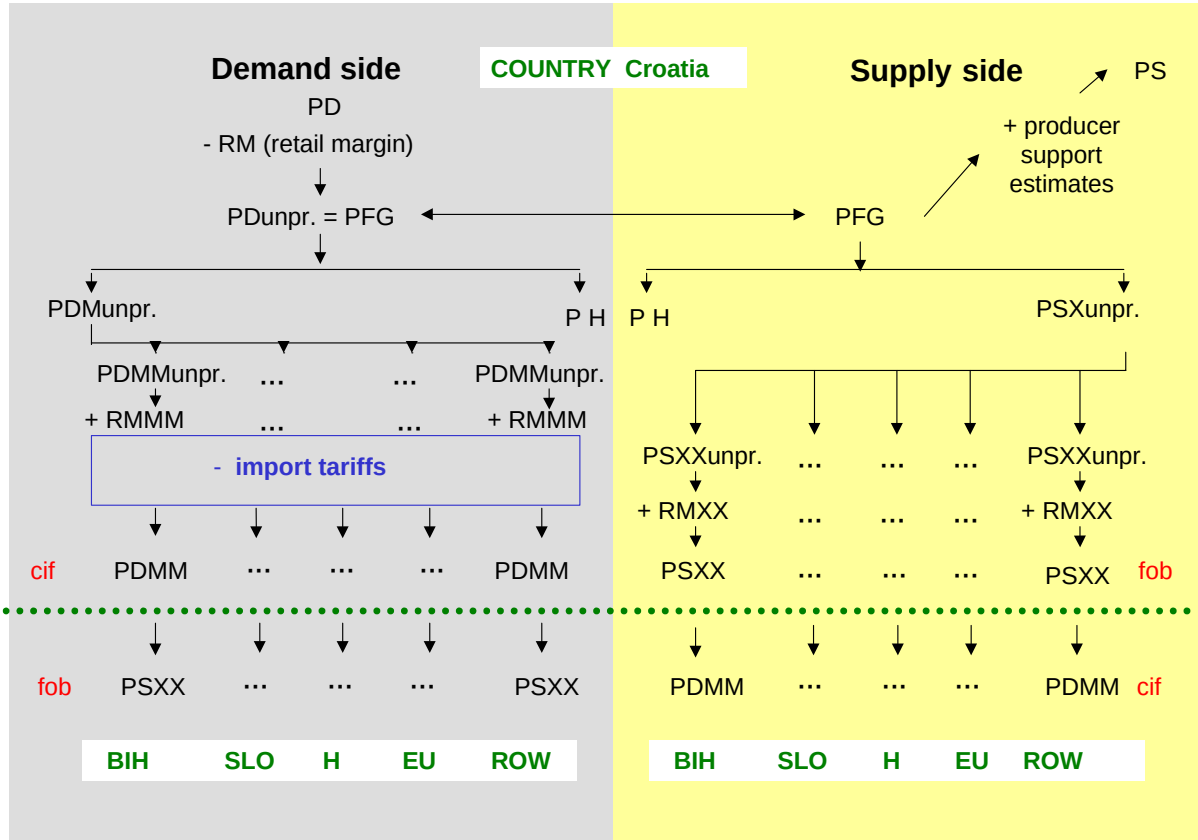


Remark: See Figure.

Source: Own figure.

Figure 9 depicts the price linkages in the model applied. Since Croatia does not apply export tariffs or export subsidies at all, import tariffs are the only trade policy instrument included in the model. The analysis is carried out by looking at various scenarios (see section 5.4). Each differs with regard to the assumption which of the trade agreements are considered. The impact of each of these scenarios is that distortions on imports (tariff rates) are exogenous altered. Impacts of changing other trade barriers are not investigated such as tariff rate quotas and quality standards as well as transaction costs.

Figure 10: Structure of the trade model applied – prices



Remarks: P: prices, Q: quantities, S: supply side, D: demand side, X: export, M: import, PD = consumer price, PFG = farm gate price, PS = incentive price, PDM = aggregated import parity price, PH = price for domestically produced goods sold on the domestic market, PSX = aggregated export parity price, PDMM = bilateral import price including tariffs, PSXX = bilateral export price, RM = retail margin, RMM (RMXX) = retail margin of imports (exports), unpr = unprocessed or at a low processing level. ROSP = rest of spending, RAO = rest of agricultural output. BIH = Bosnia and Herzegovina, SLO = Slovenia, H = Hungary, EU = EU 15, ROW = "rest of the world".

Source: Own figure.

The chain of impact in the model of Croatia may be described as follows. A change in import tariff rates alters the wedge between import and export prices of Croatia and its trading partners. These, in turn, affect domestic prices and, therefore, also decisions on supply and demand. For simplicity, impacts on income and hence domestic food expenditures are neglected due the partial nature of the model. Though these effects were mentioned in sequence, in the model they are going on simultaneously and instantaneously. The latter is a simplification of reality where they occur at different time intervals.

For each scenario, the model determines a set of prices as to adjust decisions of producers and consumers to make bilateral import and export prices between trading partners be equal to the wedge established by the new import and export policies. Corresponding to each of these prices the respective quantity is determined; i.e. composite as well as bilateral export and import

volumes for each of the commodities traded. In addition, output, demand, and domestic sales are also arrived at for them. However, for the "rest of agricultural output" only the output is determined, as well as for the intermediate inputs fertiliser and "rest of variable inputs". The domestic price ratio between cereals for final use and intermediate use is kept constant.

Croatia's trading partners, the EU-15, Slovenia, Hungary and Bosnia and Herzegovina as well as the "rest of world", are depicted in the model only in a considerably simplified way. Rather than determining all the quantities and prices as indicated for Croatia, export supply and import demand functions are specified representing the various decisions within the respective country in an aggregate way.

Based on these results, changes in net revenues of farmers available for remunerating capital, land, labour and managerial skills as well as in welfare of consumers and in the government's budget are calculated. Farmers' net revenue is calculated as revenues from market sales plus government support received minus expenditures on variable inputs. Consumer welfare is expressed as equivalent variation. Finally, changes in the state budget consist of those in tariff revenues minus government support to agricultural producers.

Table 5 summarises which parameters are exogenous and which are endogenous for the calibration of the model and the simulation analysis. In the case of an ex ante analysis the population, the national income (or total food expenditure) and the rate of technical progress have to be assumed for the simulation year. The policy instruments to be analysed have to be specified. While running the model it calculates endogenously the results. The most interesting are the prices and quantities both on the supply and demand side as well as the bilateral trade flows. Based hereon, the welfare indicators mentioned are calculated.

Table 5: Exogenous and endogenous parameters of the model applied

Calibration of the model	
Exogenous parameters	**Endogenous parameters**
– quantities (supply, demand, import, export) – prices (farm gate, retail, import, export) – income, population – tariffs/subsidies (import, export) – starting values for elasticities for supply and demand (own- and cross price elasticities, income elasticities) – elasticities of substitution and of transformation and the resulting parameters – import and export elasticities of the other countries and the resulting constant and slope of functions	– elasticities of supply and demand – parameters of the supply and demand systems based on the "Generalised symmetric McFADDEN profit function" and the "Normalised quadratic expenditure function"
Simulation analysis	
Exogenous parameters	**Endogenous parameters**
– endogenous parameters of calibration – subsidies to agriculture – import tariffs – income – population – parameters of CET and CES functions (Croatia) and of linear export supply and import demand functions (trading partners)	– quantities (supply, demand, imports, exports) – prices (farm gate, retail, imports, exports) – welfare (producers, consumers, state budget)

Source: Own figure.

5.2 Data and elasticities

In order to analyse the impact of different policies, it is necessary to establish a consistent data base for the year the model is calibrated to. Data were prepared by Croatian experts from the Ministry of Agriculture and Forestry, the Chamber of Economy and the Institute for International Relations and consistency checks by IAMO researchers (see Annex 1 for a general overview on the data sources).[26] The last agricultural census was carried out in 1991[27] and more recent reliable statistics on labour input in agriculture are not available, labour could not be included in the model. The model was tuned with the most recent available data on quantities, prices and tariffs. These refer to 1999 and 2000. The average of these two years was chosen as the base year in order to make the base year more representative.

All quantities are expressed as raw equivalents, except for sugar beets, which are converted to sugar equivalents. Conversion factors applied to calculate processed commodities into raw equivalents are based on FAO (without year) (see Annex 1). In order to avoid double counting, each processed product is only back calculated into one raw product. Import and export prices are expressed as unit values. Import tariffs for the products covered by the model are calculated as the weighted average of the tariffs of the raw product and its processed commodities:

$$P^{eq} = \frac{\sum_i p_i * q_i}{\sum_i q_i * conv_i}, \qquad t^{eq} = \frac{\sum_i p_i * q_i * t_i}{\sum_i p_i * q_i}$$

where P^{eq} denotes the calculated average price (unit value) of the product expressed in raw product equivalents, P_i , q_i refers to the price (quantity) of the (processed) good i, $conv_i$ represents the conversion factor to express the quantity of the processed good in raw product equivalents, t^{eq} symbolises the calculated average tariff rate of the product expressed in raw product equivalents and t_i denotes the import tariff of the (processed) product i.

Annex 2 provides an overview on the aggregation of production, consumption and trade data.

The most important domestic agricultural policy instruments that are currently applied in Croatia are producer subsidies that are connected to certain agricultural production activities or outputs. For the purpose of the modelling exercise, all domestic support policy instruments are expressed as producer subsidy equivalents (PSEs). These form an additional price component and are used to calculate the incentive price for domestic producers.

Due to inconsistencies in the data sources available and the necessity of aggregating processed commodities to the products included in the model, there is a lack of consistency in the quantity balances, which hampers the trade policy analysis. For some products total supply (domestic supply *QS* and imports *QDM*) and total demand (domestic demand *QD* and exports *QSX*) considerably diverge (see Figure). The difference is highest for tobacco, where it reaches 28 % of total supply. With the exception of tobacco, inconsistencies are more pronounced for animal products than for crops. To overcome this statistical problem of inconsistent quantity balances in the simulation analysis, these differences are interpreted as stock changes and kept constant over time.

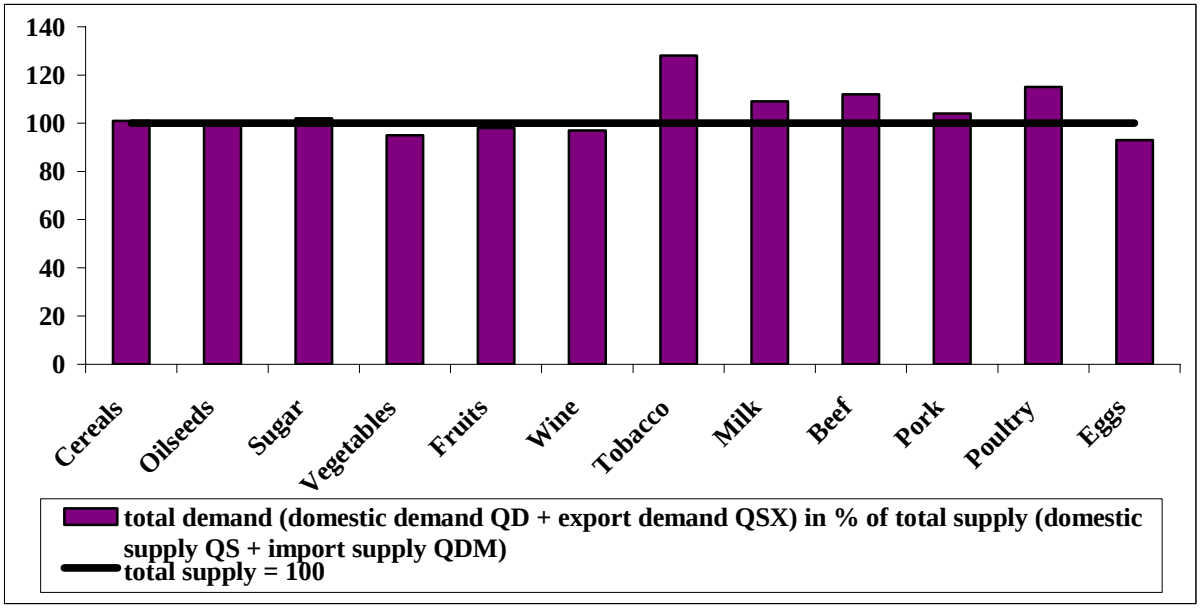
---

[26] We would like to thank Ms. Anita Sever-Koren and Ms. Ruzica Gelo from the Croatian Ministry of Agriculture and Forestry, (MAF), Dr. Kresimir Jurlin from the Croatian Institute for International Relations as well as Ms. Bozica Markovic, Ms. Visnja Knjaz and Mr. Vanja Kaludjer from the Croatian Chamber of Economy for the provision of the data and additional information on Croatia's agricultural (trade) policy.

[27] In mid 2003 a new agricultural census is carried out.

Another inconsistency occurred with regard to the food expenditure (including tobacco). Given the data provided the expenditure calculated on the basis of the quantities demanded and the retail prices exceeded the provided figure of total food expenditure by 25 %, if "rest of spending" equals 0. We assumed that "rest of spending" is 5 % and tobacco is 9 % of the total food expenditure. Thus, in order to get a consistent expenditure balance, the retail prices of all other products had to be reduced by 15 %.

Figure 11: Inconsistencies in the quantity balances of the base year 1999/2000 (in %)



Remark: See Figure.
Source: Own calculation based on data provided by the MAF.

For the creation of a partial equilibrium model such as the one applied, the construction of a theoretically consistent and economically plausible response system for product supply and input demand, imports and exports, and human consumption, is of the utmost importance. As a starting point for the specification of the supply and demand systems, own and cross price elasticities were predetermined, taking into account information from other studies and experts' knowledge. However, estimates in the existing literature often refer to different countries and/or product aggregations and thus do not take into consideration the specifics of agriculture in Croatia. Given the limited transferability of the data in the literature to the present model, it is important to ensure that the model is consistent with economic theory. The parameters of the supply and demand functions used are determined so as to minimise the (weighted) square of deviation from a set (full matrix) of predetermined initial elasticities and those finally applied in the model subject to the constraints required by economic theory (FROHBERG and WINTER 2001).

As in all models based on the ARMINGTON approach, the assumed elasticities of transformation and substitution respectively influence the results of the simulation analyses.[28] In all policy simulation scenarios 2.0 was used as elasticity of transformation between domestically sold products (QH) and exported products (QSX) as well as between exports to different countries ($QSXX_{cou}$). We assumed an elasticity of substitution of -0.5 between domestic (QH) and imported products (QDM) as well as between imports from different countries ($QDMM_{cou}$).

[28] The use of the CES/CET functions for analyzing trade policy regimes was recently criticized for different reasons (see FROHBERG and WINTER 2003). Critics refer to the inherent restriction of substitutability when more than two independent variables are included in the analysis and they illustrate the drawbacks of these functional forms from the viewpoint of economic theory.

Regarding Croatia's trading partners, the elasticities in their export supply and import demand functions depend on plausible assumptions on the country specific quantity response to changes in world market prices. The higher the assumed export supply and import demand elasticities of Croatia's trading partners are, the less Croatia's agriculture influences the other countries' markets, i.e. the more the small country assumption holds. For each product, the export supply (import demand) elasticities at the quantities and prices of the base year are set to equal +1.2 (-1.0) for Hungary, Slovenia as well as Bosnia and Herzegovina. The corresponding figures for the "rest of the world" and the EU are +20 (-10).

5.3 Trade policy scenarios analysed

Four scenarios are analysed for the years 2002 and 2005. In the BASE scenario, it is assumed that the 'status quo' in terms of trade policies is maintained and all tariffs remain as in 1999/2000. Trade agreements implemented later than 1999/2000 are not taken into account. This scenario serves as a reference for comparing the outcomes of the trade liberalisation scenarios. 2002 represents a year when most of the agreements Croatia signed are in its early stage of implementation while in 2005 they will be fully implemented.

As trade liberalisation the following three scenarios are analysed (see Table 6):

- In the 'FTA scenario', the tariffs are mutually changed as agreed upon in the respective FTAs with Bosnia and Herzegovina, Hungary, Slovenia and the EU as well as some other countries included in the aggregate "rest of the world". This leads to an initial reduction in the year 2002 and a further one in 2005. The aggregated import tariffs for 1999/2000, 2002 and 2005 are listed in Annex 4.
- In the 'EU scenario', which is only analysed for the year 2005, the tariffs are also reduced according to the FTAs, with the additional assumption that Slovenia and Hungary are members of the EU. This means that Croatia applies the same tariffs for imports from these countries as from the EU and that Slovenia and Hungary implement the trade regime of the EU.
- In the 'WTO scenario', an additional 50 % reduction of tariffs is assumed for the "rest of the world" for 2002 and 2005 respectively. The same holds for imports of the "rest of the world" from Croatia.

In addition, due consideration is given to the fact that for these countries trading conditions with other nations also change because of altering world market prices. The assumed changes in world market prices are based on FAPRI (2002). Since in the model Croatia's trading partners do not directly exchange goods with other countries this effect is indirectly captured by adjusting those functions which determine export to and import from Croatia. For example, if world market price developments make it easier for Croatia's trading partners to import goods from other countries rather than Croatia itself this is reflected in their import functions depicting their preferences of buying goods in Croatia. In the scenarios these functions are influenced by expected changes in world market prices and for the EU an additional impact of the Agenda 2000 reform of the common agricultural policy is considered.

Table 6: Description of scenarios for 2002 and 2005

Scenario	Tariffs applied in the simulation years	
	2002	**2005**
Base	Status quo 1999/2000	status quo 1999/2000
FTA	as agreed upon in the free trade agreements for 2002	as agreed upon in the free trade agreements for 2005
FTA + EU	not analysed for 2002	as agreed upon in the free trade agreements for 2005 H and SLO as EU members: – Croatian imports from H and SLO are levied in the same way as imports from the EU – H and SLO apply the same tariffs on imports from Croatia as the EU
FTA + EU + WTO	as agreed upon in the free trade agreements for 2002 import tariffs for trade between Croatia and ROW are reduced by 50 %	as agreed upon in the free trade agreements for 2005 H and SLO as EU members: – Croatian imports from H and SLO are levied in the same way as imports from the EU – H and SLO apply the same tariffs on imports from Croatia as the EU import tariffs for trade between Croatia and ROW are reduced by 50 %

Source: Own table.

Some parameters are changed in all scenarios alike including the BASE scenario, i.e. they influence the outcome of all scenarios irrespective of the tariff changes. This is necessary because the model parameters are calibrated to represent the average of the years 1999 and 2000. Since outcomes of the scenarios are analysed for the years 2002 and 2005 the conditions of 1999/2000 have to be 'moved forward' to these other two years. Accordingly, the assumptions on growth rates of technical progress in agriculture between 1999/2000 and the other two years as well as the level of government support are the same for all scenarios.

In this respect the following assumptions have been made:

- annual technical progress (see Table 7) ranging from 0.0 % for fruits, wine and vegetables up to 1.9 % for sugar and eggs;
- no change in population: for all years, a population of 4.46 million (including an equivalent of tourist nights) is assumed;
- 7.3 % nominal annual growth rate of total food expenditure (in kuna);
- 4 % inflation rate in Croatia and 2 % in the EU;
- nominal exchange rate of 7.6 kuna/€ in 1999/2000, 7.4 kuna/€ in 2002 and 8.1 kuna/€ in 2005 leading to real exchange rates of 7.6 kuna/€ in 1999/2000, of 7.049 kuna/€ in 2002 (appreciation compared to 1999/2000) and of 7.279 kuna/€ in 2005 (depreciation compared to 2002, but appreciation in relation to 1999/2000) (see Annex 5 for the calculation of the real exchange rates);
- change in domestic subsidies in nominal terms paid to agriculture from a total of 1.171 billion kuna in 1999/2000 to 1.315 billion kuna in 2002 and 1.105 billion kuna in 2005.[29] For the model analysis the area and headage payments are converted to output based payments.

[29] Information provided by the MAF.

Table 7: Assumed growth rates of technical progress in the period 1999/2000 to 2002 and 2005 (in % p.a.)

Cereals	1.7 %	Milk	2.6 %
Oilseeds	0.5 %	Beef	0.5 %
Sugar	1.9 %	Pork	0.5 %
Vegetables	0.0 %	Poultry	0.5 %
Fruits	0.0 %	Eggs	1.9 %
Wine	0.1 %	Rest of ag. output	0.1 %
Tobacco	2.2 %	Feed	1.1 %

Source: Own assumptions partly based on trend analyses of FAO yields in the period 1992-2000.

The subsidies paid influence the producer incentive price. In Table 8 the payments of domestic subsidies are presented as total government expenditure per product group. How strong a subsidy stimulates production depends on the design of the subsidy scheme. If the subsidy is directly linked to the output (as it is the case with milk), the subsidy stimulates production in the same way as a similar increase in the farm gate price. For area payments, however, this stimulus is less pronounced. Thus, in order to calculate the incentive price we increased the farm gate price by the respective subsidy payments per unit of the commodity produced multiplied by the incentive factor shown in Table 8.

Table 8: Incentive factor and domestic subsidies by product group (in 1000 €, real)

	Incentive factor	**1999/2000**	**2002**	**2005**
Cereals	0.5	42 174	81 081	66 667
Oilseeds	0.5	17 165	26 757	22 222
Sugar	0.5	8 617	10 135	7 407
Vegetables	1.0	383	520	370
Fruits	1.0	3 471	2 189	926
Wine	0.5	1 193	1 405	1 185
Tobacco		0	0	0
Milk	1.0	40 946	44 459	30 864
Beef	0.5	5 238	6 081	3 086
Pork	0.5	2 430	4 054	3 704
Poultry	0.5	915	1 054	0
Eggs		0	0	0
Rest of ag. output		0	0	0
Total		**122 532**	**177 736**	**136 432**

Source: Own calculation based on data provided by the MAF.

5.4 Results of the quantitative trade policy analysis

In this section the most important results of the agricultural trade policy scenarios are discussed. The tables in Annex 6 provide more detailed information. All monetary figures are expressed

in real terms in euro. They will be compared to those of the BASE scenario. Hence, the latter needs to be described first. In order to avoid any ambiguity with regard to the direction of changes, all figures are written with a positive or negative sign. Positive figures always indicate an increase relative to the respective base run, negative figures a decrease.

5.4.1 BASE scenario (tariffs as in 1999/2000) for 2002 and 2005

The outcomes of the BASE scenario are to be seen as an attempt to reflect Croatia's general trends in production, consumption and trade given trade policies of 1999/2000. Thus, changes in 2002 and 2005 to 1999/2000 are caused by income growth, technical progress and variation in domestic policies. According to the assumptions made with regard to these parameters, a general upward trend can be observed in domestic supply and demand quantities of all products except fruits and "rest of agricultural production" on the supply side. For all of the products the relative increase in demand exceeds that of supply resulting for most products in growing farm gate prices and retail prices. For the latter, tobacco is one of the exceptions. The positive trend in domestic supply quantities is more pronounced for eggs, poultry, milk and sugar. Incentive prices and retail prices most considerably rise for wine, poultry, eggs and pork. Consumption increases particularly for beef, sugar, milk and tobacco. In 2002, except for beef export prices fall below their 1999/2000 level, while for most of the products imports become cheaper.

5.4.2 Liberalisation scenarios for 2002 and 2005

In general, it can be observed that production, consumption and trade patterns in 2002 and 2005 develop similar within the same scenario. Changes compared to the BASE scenario are somewhat more pronounced in 2005 than in 2002 due to the further reduction of import tariffs. Therefore, the following description of model results focuses on the simulation year 2005. Another general pattern is that with few exceptions, the effects of lowering tariffs are additive in the sense that price and quantity changes increase from the FTAs scenario over the FTAs+EU scenario to the FTAs+EU+WTO scenario.

Domestic supply: incentive prices and quantities

For most products producer incentive prices decrease in all liberalisation scenarios compared to the BASE scenario (see Table A 7 and Table A 8 in Annex 6). In 2002, the decline ranges from -2.7 % for sugar to -0.5 % for pork in the FTA scenario, whereas prices increase between +0.1 % for poultry to +0.8 % for tobacco. In the FTAs+EU+WTO scenario, price changes range from -2.5 % for fruits to +11.9 for tobacco. In 2005, price effects are generally larger than in 2002 due to the larger tariff reductions. In the FTA scenario price changes are between -5.1 % for sugar and +4.5 % for tobacco. The corresponding figures in the FTAs+EU+WTO scenario are -4.3 % (sugar) and +15.1 % (tobacco). Tobacco is a special case: it is the only product with higher import tariffs in the FTA scenario than in 1999/2000. Croatia increases its tariff for imports from Hungary, Slovenia and the "rest of the world". Whereas the former two countries are negligible in terms of import quantities, the latter is the most important source of tobacco imports.

For most products and scenarios, the corresponding relative changes in domestic supply are smaller than those of the incentive prices. According to the simulation results for 2002, the adjustments range between -1.6 % (sugar) and +1.0 (eggs) in the FTA scenario and between -1.6 % (sugar) and +5.8 % (tobacco) in the FTAs+EU+WTO scenario compared to the BASE scenario. In 2005, the changes are more pronounced.

These output changes imply three aspects. Firstly, the initial and medium-term (4 years) responses of farmers to the new incentive prices are relatively small because capital and

labour can hardly be adjusted within this time frame. Hence, output changes should be interpreted mainly as re-allocating these two production factors and land. Secondly, since production and input use respond only little, the decline in incentive prices leads to an almost proportional adjustment in revenue from market sales and in expenditures for variable inputs. The difference of these two values, net revenue, is available for remunerating production factors. Hence, this will decline as well. Thirdly, in the longer time horizon technical progress will dominate the development of agriculture; i.e. any output decline over the next, say 5, years due to the introduction of more liberal trade policies will be compensated by using new technologies which are expected to be available for agriculture in the future.

Domestic demand: retail prices and quantities

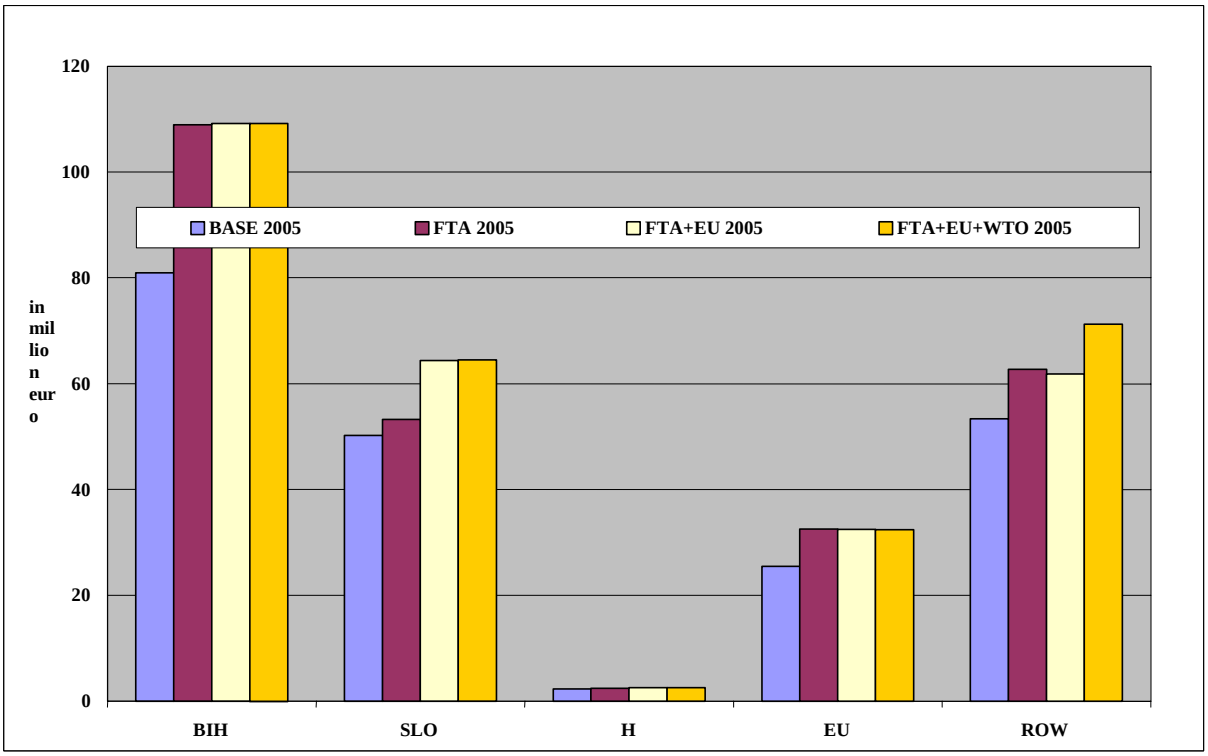
Consumer prices show a common increasing trend in the BASE scenarios over the period considered; i.e. until 2005 (see Table A 9 and Table A 10). All prices except for cereals and tobacco rise, though to a different extent. Liberalising agri-food trade as analysed in this study leads to lower retail prices. In all liberalisation scenarios, the prices are lower than in the respective BASE scenario, with the exception of tobacco and eggs. Without considering these two products, consumer prices in the FTAs scenario for 2005 decrease between -1.9 % (wine) and -13.1 % (sugar). The respective changes in demand quantities due to liberalisation and compared to the BASE scenario are lower in magnitude, and the effects are all positive. In the FTAs scenario for 2005, consumption levels are higher in the range of +1.3 % for tobacco and +6.1 % for milk and beef. In general, the three trade liberalisation scenarios differ only marginally with regard to their impact on consumer prices and level of demand. This also is partly due to the (simplifying) assumption made that income does not change because of liberalising agricultural trade. In addition, the preference structure of consumers is assumed to remain unchanged.

Trade: export and import values and quantities[30]

In 1999/2000, the most important countries for Croatia's exports were Bosnia and Herzegovina (38 % of its total export value), the "rest of the world" (25 %) and Slovenia (24 %). Exports to the EU only account for 12 %. As a result of the liberalisation scenarios, the value of Croatia's agri-food exports increases markedly (see Figure). Trade liberalisation leads to strongest impacts on Croatia's exports to Bosnia and Herzegovina which besides the EU makes the most drastic change in the import tariffs levied on exports from Croatia. Trade between Croatia and Bosnia and Herzegovina is completely liberalised in terms of import tariffs in 2005. While the EU reduces its import tariffs for all products depicted in the model with the exception of wine to zero, Croatia cuts its tariffs for imports from the EU drastically although not completely.

[30] In this section, the term "EU" always refers to the current EU-15 regardless whether Hungary and Slovenia have joined the EU in the respective scenario.
See Table A 11 to Table A 14 for Croatia's aggregate trade quantities, Table A 15 to Table A 22 for its bilateral trade data and Table A 23 as well as Table A 24 for its net trade data.

Figure 12: Value of Croatia's agri-food exports by countries in 2005 (in million €)

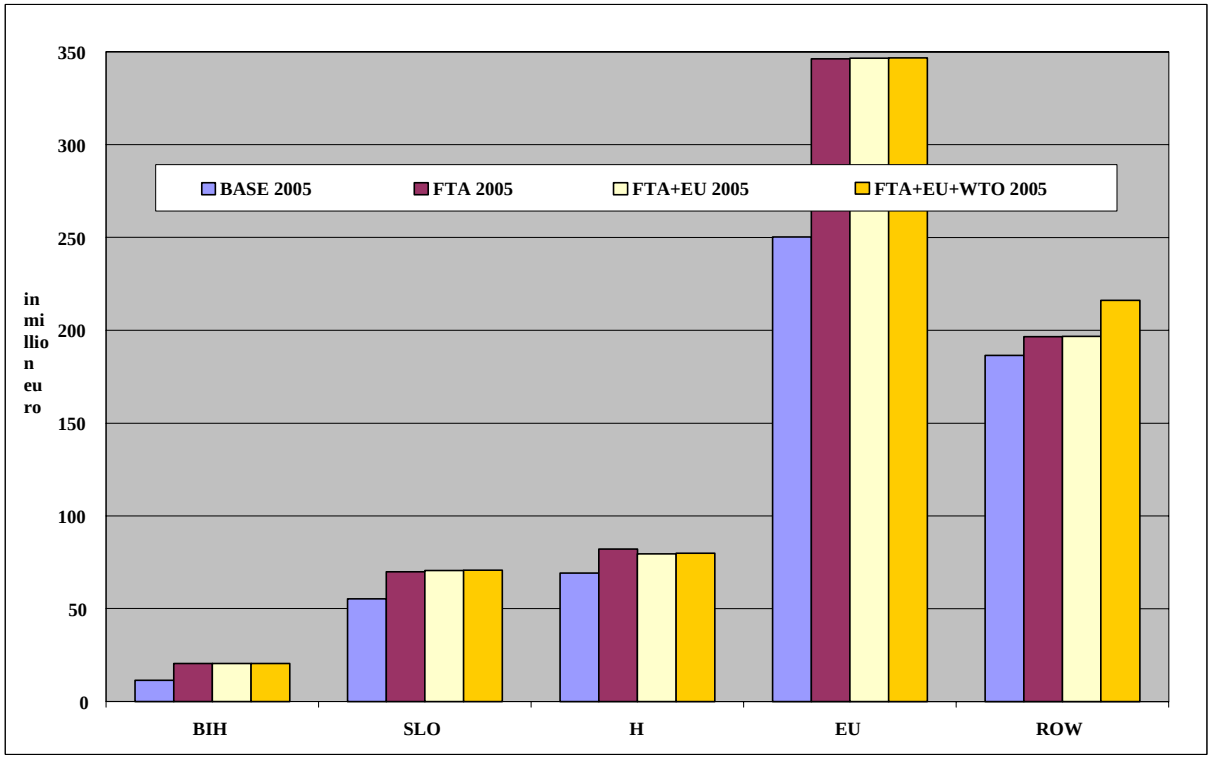


Source: Own calculation.

Assuming the same tariffs as in 1999/2000, exports from Croatia to Bosnia and Herzegovina equal 81 million € in the BASE scenario 2005. Without import tariffs, they increase by more than one third up to almost 110 million € in the liberalisation scenarios in 2005. The exports to all other countries also grow, but to less extent. For exports to Slovenia, the differences between the BASE scenario (50 million €) and the FTAs scenario (53 million €) are not very large, but the effects of EU enlargement have an additional impact (+11 million €) on the value of Croatian exports. For exports to the "rest of the world", the positive influence of the FTAs+EU+WTO scenario is stronger than in the other liberalisation scenarios. The total export value goes up from 212 million € in the BASE scenario in 2005 to 280 million € in the FTAs+EU+WTO scenario; an increase of about 31 %.

Due to the reduction of import tariffs by Croatia, also the imports increase (see Figure). In absolute numbers, the import value increases most shipments from the EU. In the liberalisation scenarios, in 2005, Croatia's imports from there are worth around 346 million € compared to 250 million € in the BASE scenario in that year. Relatively, the growth is most pronounced for imports from Bosnia and Herzegovina with an increase of almost 80 % in 2005. The total value of Croatia's agri-food imports in 2005 goes up from 573 million € in the BASE scenario by +28 % to 734 million € in the most liberal scenario. The EU contributes to this total import value 47 %, the "rest of the world" 29 %, Hungary 11 %, Slovenia 10 % and Bosnia and Herzegovina 3 % (FTAs+EU+WTO scenario). In 1999/2000 these shares have been similar.

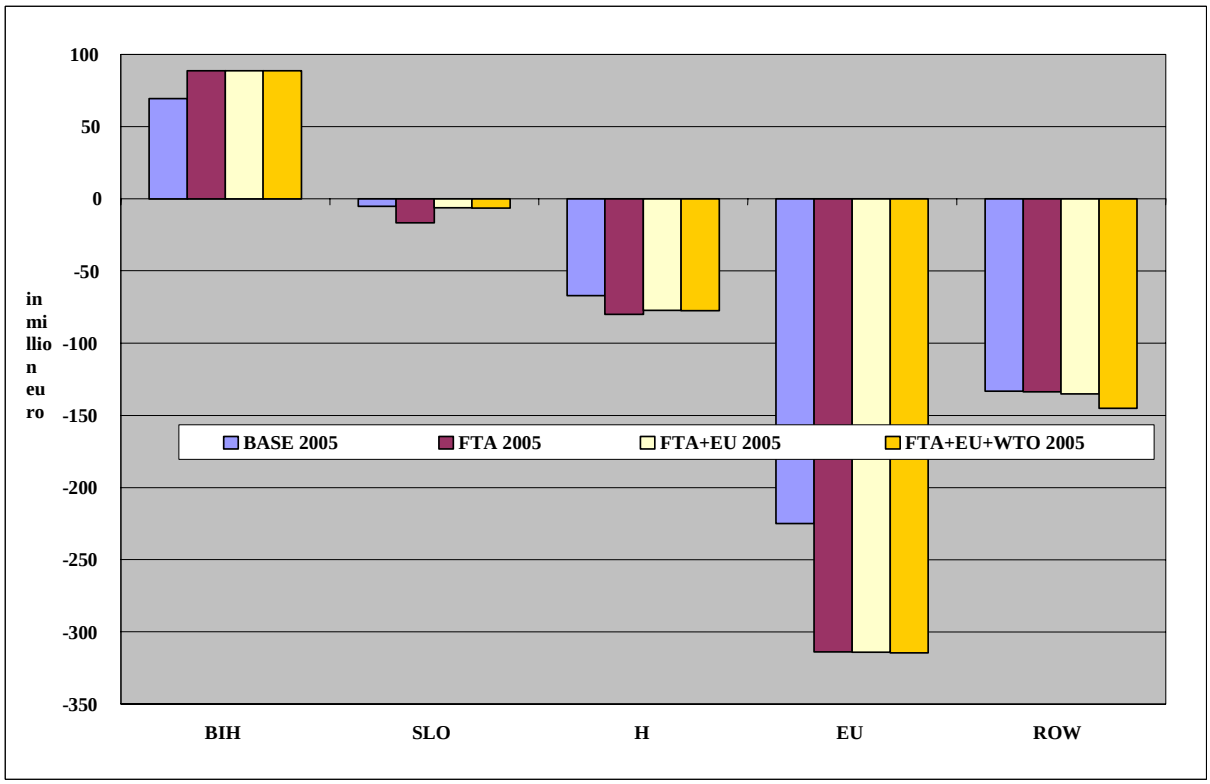
Figure 13: Value of Croatia's agri-food imports in 2005 (in million €)



Source: Own calculation.

Since value of both exports and imports increases, Croatia's net trade balance does not alter so much (see Figure and Table A 23 as well as Table A 24). On the basis of bilateral trade, the EU and the "rest of the world" are the most important origins of imports, while Bosnia and Herzegovina, the "rest of the world" and Slovenia are the most important destinations of exports. In the simulation year 2005, all liberalisation scenarios strengthen Croatia's position as a net agri-food exporter (with respect to Bosnia and Herzegovina) or a net agri-food importer (with regard to all other countries). The effect of all three liberalisation scenarios is about the same for the most important origins of imports. Net imports from the EU increase strongly in all liberalisation scenarios for 2005 (314 million €) compared to the BASE scenario (225 million €), while the effects are smaller for the "rest of the world". Minor differences between the scenarios can be observed for trade with Slovenia and Hungary. For both countries, the FTAs scenario leads to a larger increase in net imports compared to the BASE scenario than the two scenarios in which both countries are a member of the EU.

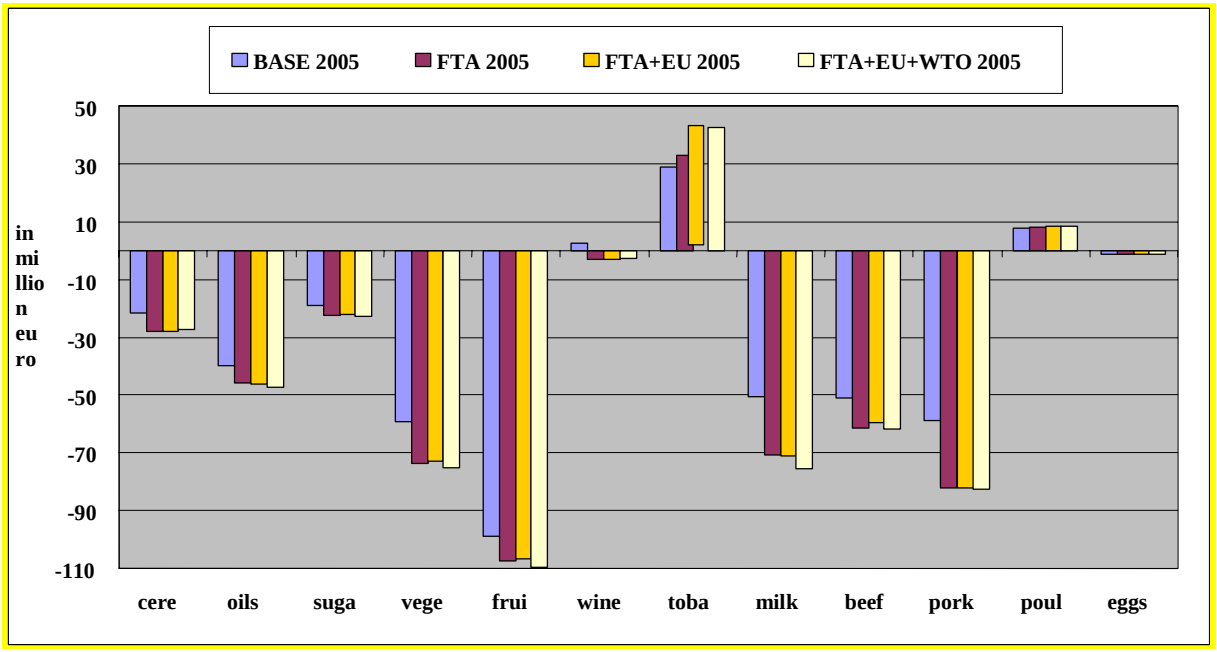
Figure 14: Value of Croatia's net agri-food exports by countries in 2005



Source: Own calculation.

Figure illustrates that Croatia remains a net exporter in value terms of tobacco and poultry in all scenarios. Whereas it is a net exporter of wine in the BASE scenario in 2005, it becomes a net importer in the liberalisation scenarios. Of all other products, Croatia imports more than it exports, and the trade policies analysed strengthen this development. The trade deficit is highest for fruits (around -107 million €), pork (-82 million €), vegetables and milk (both around -73 million €).

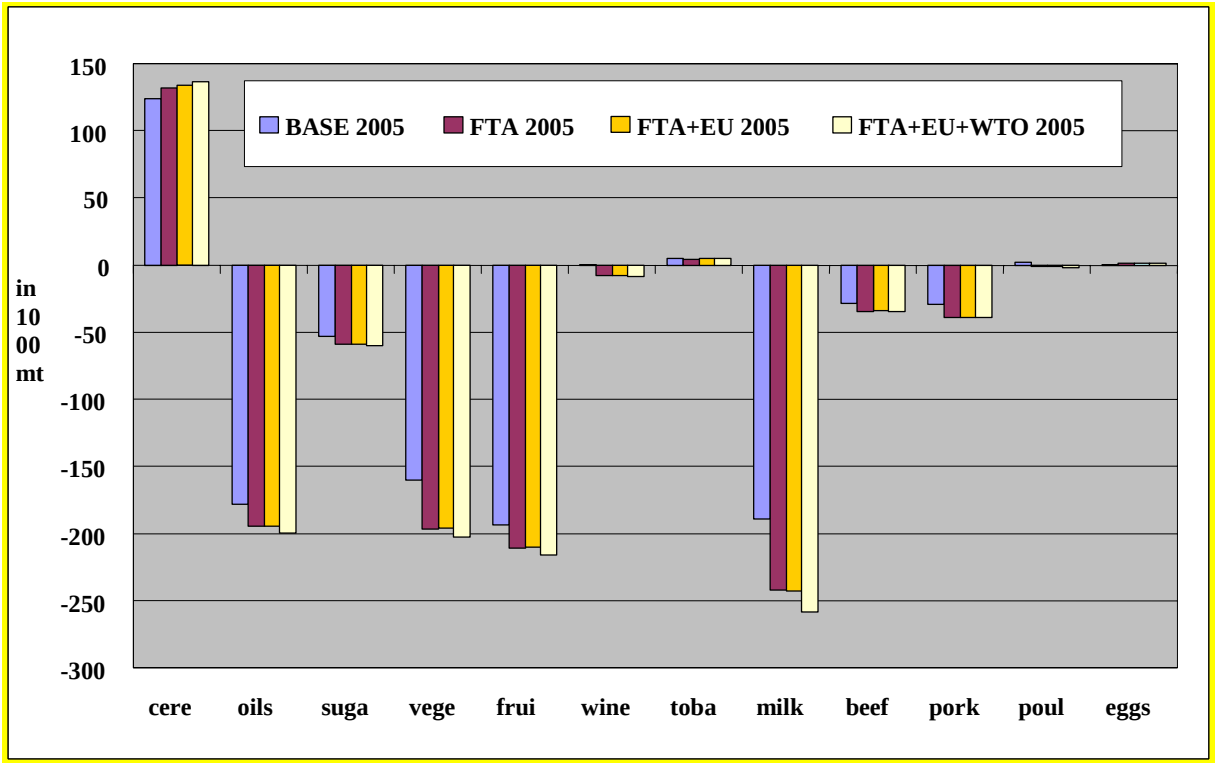
Figure 15: Value of Croatia's net agri-food exports by products in 2005



Source: Own calculation.

Looking at the net agri-food exports in terms of quantity, the general picture is the same (see Figure). The most obvious exception is cereals. Croatia exports more than 130,000 t cereal products expressed in raw equivalent more than it imports. Since the import unit values are considerable higher than the export unit values, it realises a trade deficit for cereals of 28 million €. Probably, imported cereal products have a higher level of processing or quality than exported products.

Figure 16: Net agri-food export quantities of Croatia by products in 2005



Source: Own calculation.

Looking at exports by commodity, Croatia sold abroad in 1999/2000 large quantities of cereals, oilseeds, milk, fruits and tobacco. In terms of export value for 1999/2000, tobacco (30 %) and cereals (24 %) are most important, followed by milk (10 %) and oilseeds (9 %). Compared to 1999/2000, export quantities remain rather stable in the BASE scenarios (see Table A 11 and Table A 12). For all products, the effects of liberalisation in 2005 compared to the BASE scenario are positive which implies an increase. The relative changes of export quantities range from +2.4 % for tobacco to +24.5 % for poultry in the FTAs scenario and from +5.3 % for oilseeds to +27.6 % for poultry in the FTAs+EU+WTO scenario.

Croatian export prices of most of the products decline in the BASE scenarios for 2002 and remain stable or increase slightly again in 2005. The price effects of the liberalisation scenarios are significant, and the changes compared to the respective BASE scenario are positive in all liberalisation scenarios. In 2002, the prices differ from the BASE scenario between +0.6 % for tobacco and +13.3 % for poultry in the FTAs scenario, and +3.8 % for oilseeds and +18.7 % for poultry respectively in the FTAs+EU+WTO scenario. In 2005, the effects of liberalisation on export prices are even more pronounced. The differences with the BASE scenario for 2005 range from +4.6 % for oilseeds and +24.3 % for pork in the FTAs scenario to +5.7 % to +28.3 % for the same products in the FTAs+EU+WTO scenario.

In 2005, the highest share in total import value (excluding tariffs) are reached by fruits (16 %), milk (14 %), cereals (13 %) and pork (12 %) as well as vegetable (11 %). In all scenarios, import prices (including tariffs) go down significantly. The relative decrease is strongest for wine (-40 %), poultry (-32 %), sugar (-20 %), cereals (-16 %) and milk and oilseeds (both -15 %). Only the import price of eggs is more or less stable (-1 %; all changes refer to the FTAs+EU+WTO scenario in 2005).This decrease in import prices corresponds with an increase in the quantities imported. Wine (+169 %) and poultry imports (+121 %) more than double in 2005, followed by milk and pork (both +33 %). However, wine and poultry together only contribute to less than 3.5 % to the total import value. For all other than the four mentioned products, the increase of imports in terms of quantity is in the range of +8 % to +30 % in 2005.

Welfare effects

Producers, consumers and the federal budget are influenced by trade liberalisation. The welfare effects are expressed as changes relative to the BASE scenario of the respective simulation year. In all liberalisation scenarios, net revenues of agricultural producers decrease as a result of liberalisation while consumers are better off. Producers' income decreases by -1.4 % in the FTAs scenario and by -0.7 % in the FTAs+EU+WTO scenario compared to the BASE scenario for 2005, consumers' welfare rises by +4.8 % and +5.8 % (see Table 9). The impact on the federal budget is a result of changes in subsidies paid to farmers and tariff revenues. The variations in domestic subsidies per output unit were introduced into the model as an exogenous variable. Accordingly, total subsidy payments will be increased from 123 million € in 1999/2000 to 178 million € in 2002 and decline again in 2005 to 134 million €. In the model, the subsidies are paid per unit of output and thus, their total amount varies across the scenarios according to the quantities produced. However, as output changes are minor due to liberalisation so are those in total payments of agricultural subsidies.

The state budget is considerably more influenced by the reductions in revenues from import tariffs. In the BASE scenarios, tariff revenues from imports of agri-food products increase from 137 million € in 1999/2000 to 188 million € in 2002 and 191 million € in 2005 (see Table A 25). Tariff revenues are much lower in the liberalisation scenarios than in the BASE scenarios in both years. Compared to 191 million € in the base scenario for 2005, tariff revenues decline by -55 % to 86 million € in the FTAs+EU+WTO scenario. As a result, the net

effects on the federal budget of liberalisation are strongly negative, e.g. the sum of agricultural subsidies and tariff revenues for agri-food imports decrease from a surplus of 57 million € in the BASE scenario in 2005 to a deficit of 40 million € in the FTAs scenario and of 49 million € in the FTAs+EU+WTO scenario. The deficit is even higher in the 2002 liberalisation scenarios since agriculture is stronger subsidised by the state than in 2005.

Table 9: Welfare changes for Croatia in 2002 and 2005 relative to the BASE scenario

	Liberalisation scenarios (change compared to BASE of 2002 and 2005)					
	FTAs		**FTA + EU**		**FTA + EU + WTO**	
	2002	2005	2002	2005	2002	2005
Change in producers' profit	-1.4 %	-1.4 %	n.a.	-1.2 %	-0.6 %	-0.7 %
Change in consumers' welfare	3.2 %	4.8 %		4.7 %	4.5 %	5.8 %
Change in the federal budget (in million €)	-63054	-96434		-94787	-75391	-105691

Remark: Producers' profit is available for the remuneration of capital, land, labour and managerial tasks.
Source: Own calculation.

5.5 Critical assessment of the model applied

Like all models, the one applied in this study can only abstract from reality, which is far more complex. However, focusing on those relations which are most important for the purpose of using the model, it should contribute to a better understanding of the relevant issues. To those who use the model results it is usually rather difficult to distinguish the models based on their algebraic functional form. There are often maintained hypotheses hidden in these functions which cannot easily be detected, especially by those not familiar with modelling. Namely the CES and CET functions used for describing trade relations restrict substitution possibilities among the independent variables rather strongly. They maintain the hypothesis that substitutability among any pair of distinct variables is alike. Using the CES/CET for differentiating trade by countries of origin and destination respectively, the homothetic structure of these functional forms causes that import and export shares are invariant to the total amount of imports and exports. Another critical aspect recently discussed in the literature (McDANIEL and BALISTRERI 2002; HILLBERRY et al. 2001) refers to the degree of substitutability. It is illustrated that too small values for the elasticities of substitution limit a model's response to changes in trade policies. This supports the widely-held belief in policymaking circles that empirical analyses based among others on the CES function understate the effects of changes in trade policies on the economy. This may also explain the relatively moderate effects calculated in this study. Moreover, the authors demonstrate that not only the quantitative effects of trade liberalisation but also the qualitative effects i.e. losses or benefits, are sensitive to the choice of the CES substitution parameter. Especially the ARMINGTON approach used for implementing the assumption that imported goods are differentiated by country of origin was recently criticised on theoretical grounds (PANAGARIYA 2000; PANAGARIYA and DUTTAGUPTA without year). It is claimed that there is an inherent contradiction between the postulate of imperfect substitutability implying some monopoly power and the small-country assumption, both of which are often made simultaneously in models designed for empirical trade analysis. In this respect modellers are criticised to generate benefits for small countries from preferential trade liberalisation (ROBINSON and THIERFELDER 1999) by recourse to a wrong model specification and wrong parameter values. These results do not match with those derived by theoretical economists (BHAGWATI et al. 1998). Hence, when interpreting the model results one always has to bear in mind the assumptions which are explicitly or implicitly made in the

model, as well as the validity and reliability of the database.[31] Advances in both theory and methodology suggest using improved functional forms in models for policy analysis. This suggestion has been already considered for the supply and demand system of the model used for this study. In a further improved version of the IAMO simulation model, flexible functions are also employed in order to represent the bilateral trade relations (FROHBERG and WINTER 2003). An important characteristic of these alternative trade functions is their second order flexibility, this means that own- and cross price elasticities of bilateral trade can be depicted without imposing further constraints.[32] Since there are no data available to econometrically estimate the elasticities, the initial elasticities employed in the model can only be subjective judgements by experts. However, the calibration procedure employed to ensure theoretical consistency of the model parameters invalidates the reproach often raised against "calibrated" models to use so called "coffee table" elasticities (DAWKINS et al. 2001).

Possibilities to further improve such a model-based trade policy analysis are particularly to increase the consistency of the original database and to model the export supply and import demand functions of Croatia's trading partner in more detail, for example by depicting their agri-food sector in the same way as it is done for Croatia. However, this goes far beyond the scope of this study. Plausibility of quantitative simulation models may be increased generally, by additional improvements in the methods applied to obtain reliable model parameters, this might be for example a combination between calibration and econometric estimation. Experiments with more advanced functional forms to represent reality in connection with a detailed structural and parametric sensitivity analysis are promising and should be further investigated. Finally, the critical assessment of the empirical simulation model applied clarifies the necessity of a dialogue between the customers and the designers of an empirical model for policy analysis.

6 CONCLUSIONS AND POLICY RECOMMENDATIONS

- The model results indicate that in general trade liberalisation analysed is welfare improving for Croatia. The increase in consumer welfare likely overcompensates the decline in farmers' total profits and the loss of tariff revenues. To avoid any hardship due to liberalisation the government should monitor the development of income of agricultural households and pay compensation if necessary. However, such governmental outlays should be made available only for a transitional period and in a way that does not distort production. This can be done by basing it on some past indicators. A return towards a more protectionist trade regime should be avoided and would not solve the problems of the agricultural sector anyway.
- To quantitatively analyse the impacts of Croatia's agricultural trade policy on its agri-food sector was the objective of this study. The results do not reveal dramatic changes in production and consumption patterns. Although farmers' net revenues decline on average, those specialised in tobacco benefit from trade liberalisation due to a considerable increase of the farm gate price. This holds to a less extent also for poultry and egg producers. Worse off are particularly farmers for whom sugar production is an important source of income.

---

[31] For the limits of economic analyses based on models see BRANDES (1985).

[32] It should be mentioned that the Cobb-Douglas function is flexible only with regard to the first-order derivatives, i.e. it is incapable of attaining arbitrary second-order (substitution) effects. This holds also for the CES/CET in the case of three goods and more. In the two-good case, this function is also second-order flexible.

- Regarding employment in agriculture the implementation of the agreements likely leads to small changes which affect farms differently depending on their production structure. For example the labour intensive production of vegetables, fruits and wine slightly decreases, whereas tobacco output considerably grows.
- Consumers face lower retail prices, most pronounced for products aggregated in the model as oilseeds and sugar.
- Food processing is also impacted on due to the liberalisation of agri-food trade. Trade liberalisation increases both exports of Croatia to other countries as well as Croatia's imports. Croatian exporters realise considerable higher prices, and import prices (including import tariffs) significantly decrease. In general, the net effect of growing exports and imports seems to be modest. However, several branches of the food processing industry and in certain regions due to Croatia's long border have to adjust to the changing trade patterns.
- The impacts of Croatia's bilateral and multilateral trade agreements will very likely neither extremely aggravate nor improve the existing problems of the agri-food sector. Therefore, the government should foster the competitiveness of this sector by further pursuing the recommendations laid down in the report *Competitiveness in Agriculture and EU accession: A Strategy for Croatian agriculture* by KÖSTER et al. (2001). The Croatian government should pursue its efforts to make the system of direct payments more transparent and reliable.
- According to the analysis a reduction of annual tariff revenues in the order of 95 million € to 106 million € in 2005 compared to the BASE scenario (all tariffs as in 1999/2000) is to be expected. This should be taken into account in the financial planning of the state budget.
- Besides the reduction of tariffs, also the lowering of non tariff trade barriers and other factors impacting on transaction costs in Croatia's agricultural trade should be an important objective of trade policy. Croatia should continue to harmonise its food safety standards and their enforcement with those of the EU.
- There are other effects of trade liberalisation which could not be quantified with the model applied. It is likely that the better access of Croatian food processors to international markets enables them to realise economies of scale which could not be realised by producing only for the small domestic market. In addition, trade liberalisation increases competition on the domestic market and thereby reduces market distortion.
- Bi- and multilateral trade agreements are a kind of common institutions and contractual international relations. They foster internal and international political credibility and reduce political risks. Reliable long term planning becomes possible, the effect of which may be a more efficient production of domestic firms and enhanced attraction of domestic and foreign investments. Therefore, the Croatian government should continue to pursue the policy of trade liberalisation through bilateral free trade agreements, particularly in the South-Eastern European region.
- In order to improve the possibilities of analysing different agricultural policy options efforts should be made to improve the reliability of the statistical database. This holds particularly with respect to labour input in agriculture. Data on labour input vary much across different sources. Reliable information of this kind is of utmost importance for analysing the income situation of agricultural households and therefore also necessary for the development of policies targeting poor farmer households. However, the weakness of labour statistics is not only a problem with Croatia but also with many other countries in Europe.

– Improvements of the statistical database would also be helpful with regard to the quantities supplied and demanded as well as the corresponding prices. Quantity balances should be consistent, and the total food expenditures should correspond with the spending on the single food items.

REFERENCES

AGRA EUROPE (2002a): Agri-food deficit widens in 2001, *East Europe*, April 2002, pp. 20-21.

AGRA EUROPE (2002b): Food production up 10 % in 2001, *East Europe*, April 2002, p. 21.

AGRA EUROPE (2003): Commission to give verdict on Croatian EU accession, *East Europe*, May 2003, p. 2.

ARMINGTON, P. (1969): A Theory of Demand for Products Distinguished by Place of Production, *International Monetary Fund Staff Papers, Vol. XVI*, pp. 159-176.

BHAGWATI, J., GREENAWAY, D., PANAGARIYA, A. (1998): Trading Preferentially: Theory and Policy, *Economic Journal 108(449)*, pp. 1128-1148.

BRANDES, W. (1985): Über die Grenzen der Schreibtisch-Ökonomie, Tübingen.

BREUSS, F. (2001): Markoökonomische Auswirkungen der EU-Erweiterung auf alte und neue Mitgliedsländer, <http://www.preparity.wsr.ac.at/public/veroeffentlichungen/at/tp12-1-breuss.pdf>.

CEFTA (without year): Central European Free Trade Agreement – Aims, Objectives and Extent, <http://www.cefta.org/>, 09.04.2002.

COMMISSION OF THE EUROPEAN COMMUNITIES (2003): Croatia : Stabilisation and Association Report 2003, *Commission staff working paper, SEC(2003)341,* Brussels.

CROATIAN GOVERNMENT BULLETIN (2001): <http://www.vlada.hr/bulletin/2001/march/econ-mirror.html>, 09.04.2002.

DIRECTORATE GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS (2003): The Western Balkans in transition, *European Economy Occasional Papers no. 1*, Brussels, <http://europa.eu.int/comm/economy_finance/publications/occasional_papers/2003/ocp1en.pdf>, 23.08.2003.

DAWKINS, C., SHRINIVASAN, T., WHALLEY, J. (2001): Calibration, in: HECKMAN, J., LEAMER, E. (eds.): Handbook of Econometrics, Volume 5, Elsevier Science.

DIEWERT, W. E., WALES, T. J. (1987): A Generalized McFadden Cost Function, *Econometrica 55*, pp. 43-68.

EBRD (EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT) (2002): Transition report update, London.

EBRD (EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT) (2003): Transition report update, London.

EITELJÖRGE, U., WAHL, O., WEBER, G. (2000): Support to Improving Agricultural and Food Trade among the NIS – Agricultural Policy Simulation with the Partial Equilibrium Model (EPACIS) –, report prepared for Action 3 of the TACIS-Project "Support to Improving Agricultural and Food Trade among the NIS", Moscow, unpublished.

EUROPEAN COMMISSION, DIRECTORATE GENERAL EXTERNAL RELATIONS (without year): The EU's relations with Croatia, <http://europa.eu.int/comm/external_relations/see/croatia/>, April 2002.

FAO (without year): Technical Conversion Factors for Agricultural Commodities, <http://www.fao.org/WAICENT/FAOINFO/ECONOMIC/ESS/tcf.pdf>, 18.12.2001.

FAOSTAT (2002): Online agricultural data base of the FAO, <http://apps.fao.org/page/collections?subset=agriculture>, April 2002.

FAPRI (2002): World Agricultural Outlook Briefing Book, <http://www.fapri.org/brfbk02/brfbk02.html>, 27.03.2002.

FERRIS, M. C., MUNSON, T. S. (2000): GAMS/PATH User Guide, Version b 4.3.

FOCK, A. (2000): Integrating Estonia into the EU: Quantitative Analysis of the Agricultural and Food Sector, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 5*, Kiel.

FOCK, A., WEINGARTEN, P, WAHL, O., PROKOPVIEV, M. (2000): Russia's Bilateral Agricultural Trade: First Results of a Partial Equilibrium Analysis, in: WEHRHEIM, P., FROHBERG, K., SEROVA, E, V. BRAUN, J. (eds.): Russia's Agro-food Sector: Towards Truly Functioning Markets, Dordrecht, pp. 271-297.

FROHBERG, K., WINTER, E. (2001): Functional Forms in Complete Demand Systems – Do they Matter for Policy Analysis?, in: BROSIG, S., HARTMANN, M. (eds.): Analysis of Food Consumption in Central and Eastern Europe: Relevance and Empirical Methods, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 13*, Kiel, pp. 120-141.

FROHBERG, K. WINTER, E. (2003): Impacts of Croatia's bi- and multilateral trade agreements: Experiments with different trade model specifications, paper presented at the 43. annual conference of the Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaus (GEWISOLA), Stuttgart-Hohenheim, 29.09.-01.10.2003.

GANDOLFO, G. (1998): International Trade Theory and Policy, Berlin, Heidelberg.

GOVERNMENT OF THE REPUBLIC OF CROATIA (2001): Developmental Priorities of the Republic of Croatia 2002-2004, Growth of Employment and Standard, Strategic Planning Office.

IXPOS (2002): Länderinformationen Kroatien, <http://www.ixpos.de/frameset.htm?content=http://www.ixpos.de/laender_und_branchen/laender_und_regionen/LIKroatien.html>, 02.08.2002.

HILLBERRY, R., ANDERSON, M., BALISTRERI, E., FOX, A.(2001): The Determinants Of Armington Taste Parameters In CGE Models, Or Why You Love Canadian Vegetable Oil, *Working Paper No. 2001-07-C*, US. International Trade Commission.

KÖSTER, U., CHRISTENSEN, G., HAYNES, J. (2001): Competitiveness in Agriculture and EU accession: A Strategy for Croatian agriculture Strategy for Croatian agriculture, Report prepared for the Croatian Ministry of Agriculture and Forestry.

MCDANIEL, C. A., BALISTRERI, E. J. (2002): A Discussion on Armington Trade Substitution Elasticities, *Office of Economics Working Paper No. 2002-0I-A*, US. International Trade Commission.

MINISTRY OF FOREIGN AFFAIRS (CROATIA): <http://www.mvp.hr/eng/1-2-bilateralni.htm>, August 2003.

MIKULECKY, J., JURISIC, Z. (2001): Main characteristics of Croatian agricultural policy, Zagreb, paper contributed to the international conference "Agricultural Policy Forum for the Stability Pact Countries" held in Leipzig/Germany, 04.-05.12.2002.

OECD (2002): Agricultural Policies in Transition Economies, Paris.

PANAGARIYA, A.(2000): Preferential Trade Liberalization: The Traditional Theory and New Developments, *Journal of Economic Literature, Vol. 38 (June)*, pp. 287-331.

PANAGARIYA, A., DUTTAGUPTA, R. (without year): The "Gains" from Preferential Trade Liberalization in the CGE Models: Where do they Come From?, <www.bsos.umd.edu/econ/panagariya/apecon/Technical%20Papers/cge-critique.pdf>.

REPUBLIC OF CROATIA, MINISTRY OF FOREIGN AFFAIRS (2002): <http://www.mvp.hr/mvprh-www-eng/>, March 2002.

ROBINSON, S., THIERFELDER, K. (1999): Trade Liberalization and Regional Integration: The Search for Large Numbers, International Food Policy Research Institute, Trade and Macroeconomics Division, *Working Paper No. 34*.

RUTHERFORD, T. F. (1995): Extension of GAMS for complementarity problems arising in applied economic analysis, *Journal of Economic Dynamics and Control 19*, pp. 1299-1324.

RYAN, D. L., WALES, T., (1996): A Simple Method for Imposing Local Curvature in Some Flexible Consumer Demand Systems, *University of British Columbia Discussion Paper No. 96-25*.

RYAN, D. L., WALES, T. J. (1999): Flexible And Semiflexible Consumer Demands With Quadratic Engel Curves, *The Review of Economics and Statistics, 81(2)*, pp. 277-287.

SPECIAL CO-ORDINATOR FOR THE STABILITY PACT FOR SOUTH-EASTERN EUROPE (1999): Constituent Documents, Cologne Document, <http://www.stabilitypact.org/stabilitypactcgi/catalog/cat_descr.cgi?prod_id=409>, 04.09.2002.

STABILITY PACT FOR SOUTH AND EASTERN EUROPE: <http://www.stabilitypact.org/stabilitypactcgi/catalog/view_file.cgi?prod_id=6726&prop_type=en>, August 2003.

THE SECRETARIAT OF THE EUROPEAN FREE TRADE ASSOCIATION (without year): Free Trade Agreement between the EFTA States and Croatia, <http://secretariat.efta.int/library/legal/fta/croatia/>, 09.04.2002.

THE WORLD BANK GROUP (2002): Press Releases, News Release NO. 2002/131/ECA, <http://lnweb18.worldbank.org/news/pressrelease.nsf/673fa6c5a2d50a67852565e200692a79/79da24c7390c27ca85256b18007d70c5?OpenDocument>, 09.04.2002.

WAHL, O., WEBER, G., FROHBERG, K. (2000): Documentation of the Central and Eastern European Countries Agricultural Simulation Model (CEEC-ASIM Version 1.0), *IAMO Discussion Paper Nr. 27*, Halle (Saale).

WEBER, G. (2001): Agricultural Policy Analysis in Transition Countries with CEEC-ASIM: who will loose, who will gain by EU-accession?, in: HECKELEI, T., WITZKE, H. P., HENRICHSMEYER, W. (eds.): Agricultural Sector Modelling and Policy Information Systems, Kiel, pp. 220-228.

WEINGARTEN, P., FROHBERG, K., WINTER, E., SCHREIBER, C. (2002): Quantitative Analysis of the Impacts of Croatia's Agricultural Trade Policy on the Agri-food Sector, report prepared on behalf of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) for the Croatian Ministry of Agriculture and Forestry, Halle (Saale), unpublished. [Croatian translation available: WEINGARTEN, P., FROHBERG, K., WINTER, E., SCHREIBER, C.(2002): Kvantitativna analiza učinaka hrvatske politike poljoprivredne trgovine na agrarno-prehrambeni sektor: Eschborn i Halle Njemačka].

WEINGARTEN, P., ROMASHKIN, R. (2001): The "Economic Policy for Agriculture of the CIS" (EPACIS) Model: Implementation and results of agricultural trade policy experiments, presentation at the TACIS-SIAFT conference "Intra-CIS Trade Barriers and WTO Accession: SIAFT Advice and Recommendations", Moscow, 05.06.2001.

WORLD BANK (2003): World Bank list of economies (July 2003), <http://www.worldbank.org/data/databytopic/CLASS.XLS>, 23.08.2003.

WTO (1995): Guide to GATT Law and Practice, Vol. 2, Geneva.

ANNEXES

Annex 1: Overview on data sources

Table A 1: Overview on the data sources

Type of data	Variables	Sources
General	population, GDP, food expenditure	Croatian Bureau of Statistics
	exchange rates	Croatian National Bank
Growth rates	GDP, income, private consumption	"Croatia in the 21st Century – Macroeconomics", Office for Strategy of Development of the Republic of Croatia
	technical progress	IAMO assumptions
Production	output quantities, production levels, farm gate prices	Croatian Bureau of Statistics
	intermediate inputs	Croatian Bureau of Statistics, "Production and Consumption Balances of Agricultural Products in Croatia", Ministry of Agriculture
Consumption	consumption quantities	Croatian Bureau of Statistics
	retail prices	Croatian Bureau of Statistics, data from the retail chain (compiled by MAF)
Trade	import/export quantities, prices	Croatian Bureau of Statistics
Policy	domestic policy, trade policy	Ministry of Agriculture
	tariffs	Croatian customs tariff - WTO commitment, Stabilisation and Association Agreement, Free Trade Agreements
Elasticities	own and cross price elasticities of supply and demand	IAMO assumptions

Source: Own table.

Annex 2: Aggregation of production, consumption and trade data

The following tables serve as an overview of primary products included in the selected data depicted in the model on the production, consumption and trade side. For the aggregation of product groups the respective conversion factors (see Annex 3) are applied.

Table A 2: Raw products included in the aggregation to the supplied commodities depicted in the model

Variable	Included raw products
Cereals	wheat, barley, maize, rye, oats, millet, buckwheat
Oilseeds	soybeans, olives, sunflower seeds, rape seeds
Sugar	refined sugar
Vegetables	potatoes, carrots, beans, onions, garlic, leek, lenses, cabbage and kale, tomatoes, paprika, cucumbers, pumpkin
Fruits	apples, pears, peaches, apricots, grapes, plums, cherries and sour cherries, oranges, mandarins, lemons, figs, quinces, walnuts, almonds, strawberries, raspberries
Tobacco	dry tobacco leaf
Wine	wine
Milk	cow's milk
Beef	beef – carcass weight
Pork	pork – carcass weight
Poultry Meat	poultry total – carcass weight
Eggs	hen's eggs

Source: Own table.

Table A 3: Products included in the aggregation to the traded products (volumes, prices, tariffs) depicted in the model

Variable	Included products (tariff headings or chapters)
Cereals	10, 11, 19, 2302
Oilseeds	1201-1207, 1507-1517, 2304-2306, 210310
Sugar	121291, 17
Vegetables	07, 2001-2005, 210320
Fruits	08, 2006-2009
Tobacco	24
Wine	2204, 2205
Milk	04
Beef	010290, 0201, 0202, 1601, 160250, 0206, 021020
Pork	010391, 010392, 0203, 021011-021019, 020641, 020649, 020630, 1601, 160241-160249
Poultry Meat	010592, 010593, 010599, 0207, 160231-160239
Eggs	0407, 0408

Source: Own table.

Table A 4: Products included in the aggregation to the food commodities (including tobacco) depicted in the model

Variable	Included products
Cereals	rice, flour, bakery products, pastry and biscuits, pasta, other
Oilseeds	vegetable oils, margarine
Sugar	refined sugar, confectionery
Vegetables	fresh, frozen, dried, preserved and processed, potatoes
Fruits	fresh fruit, dried fruits and seeds, preserved and processed fruit
Tobacco	dried tobacco leaf (processing industry data)
Wine	wine
Milk	fresh milk, condensed and powdered milk, cheese, other dairy products
Beef	fresh beef and veal
Pork	fresh pork
Poultry Meat	fresh poultry meat
Eggs	poultry eggs and egg powder

Source: Own table.

Annex 3: Conversion coefficients

The following conversion coefficients were used to convert processed commodities into their raw product equivalent.

Table A 5: Conversion factors used to convert processed commodities into their raw product equivalent

Product	Coefficient
Cereals	
- cereals	1
- flour	1.22 to 1.27
- grouts, meal and pellets	1.22 to 1.47
- rolled or flaked grains	1.32 to 1.89
- germ of cereals	50
- malt	1.37
- starch	0.93 to 1.10
- wheat gluten	5.26
- baby food and other preparations of flour, starch	0.93 to 1.18
- pasta	1.27
- prepared foods obtained by the swelling or roasting of cereals or cereal products	1.18
- bread, pastry, bread, biscuits	0.87
- bran, sharps of cereals	5.56 to 9.09
Oilseeds	
- oilseeds	1
- soybean oil	5.56
- olive oil	5.0 to 5.26
- sunflower seed oil	2.44
- rape seed oil	2.78
- other vegetable oils	2.17 to 5.26
- oil-cake of oilseeds	1.27 to 2.13
- soy sauce	0.29
Sugar	
- sugar beet	0.12
- sugar and sugar products	1
Vegetables	
- fresh and chilled vegetables	1
- frozen vegetables	1.14 to 2.86
- dried vegetables	3.85 to 5.0
- preserved vegetables	3.7 to 7.69
- tomato juice	1.25
- ketchup	2.5
Fruits	
- fresh, chilled, frozen fruits	1
- dried fruits	2.86 to 8.3
- jams, marmalades	2
- preserved fruits	0.77
- fruit juices	1.3 to 2.5
Wine	1
Tobacco	1

Product	Coefficient
Milk	
- yoghurt and other fermented products	1.25
- whey and other products consisting of natural milk constituents	1.37
- butter	21.3
- cheese	6.67
Beef	
- live cattle	0.52
- beef and veal, fresh, chilled, frozen	1
- beef and veal, salted, dried, smoked	2.17
- meat preparations of beef	1.67
- sausages and similar products	1.25
Pork	
- live pigs	0.76
- pig meat, fresh, chilled, frozen	1
- meat preparations of pig meat	1.14
- sausages and similar products	1.18
Poultry	
- live poultry	0.78
- poultry meat, fresh, chilled, frozen	1
- products made of poultry meat	1.09
Eggs	
- eggs	1
- dried eggs	5

Source: Based on FAO (without year).

Annex 4: Aggregated import tariffs

Table A 6 provides the aggregated import tariffs on a bilateral level for Croatia and its trading partners by product groups and for all products included. To calculate the average aggregated import tariff of a product, the tariffs of its sub-products are weighted with their share of the sub-product in the import value of the respective product. The tariffs were calculated by the Croatian Chamber of Economy using import values of 1999/2000. "Total" is the weighed average of the tariff rates of all included products of the respective country, weighed by the respective import value of 1999/2000.

Table A 6: Aggregated import tariffs

	Croatian import tariffs by country of origin			Tariffs applied by the trading partners on imports from Croatia		
	1999/ 2000	**2002**	**2005**	**1999/ 2000**	**2002**	**2005**
EU						
Cereals	32.1	14.6	6.2	51.4	0.0	0.0
Oilseeds	21.9	7.4	3.7	0.2	0.0	0.0
Sugar	53.5	32.2	13.9	44.9	0.0	0.0
Vegetables	44.5	30.7	18.5	0.0	0.0	0.0
Fruits	26.5	14.7	10.0	4.1	0.0	0.0
Wine	178.8	17.9	10.5	0.0	6.0	2.2
Tobacco	20.5	10.2	7.6	7.4	0.0	0.0
Milk	46.4	25.3	15.1	50.2	0.0	0.0
Beef	52.1	32.0	20.0	1.8	0.0	0.0
Pork	53.5	35.0	23.8	66.9	0.0	0.0
Poultry	105.8	26.2	17.3	0.0	0.0	0.0
Eggs	15.0	11.2	7.9	46.0	0.0	0.0
TOTAL	**39.3**	**22.0**	**13.0**	**11.1**	**0.9**	**0.3**
Hungary						
Cereals	27.2	11.2	4.6	27.0	8.8	8.8
Oilseeds	70.0	14.6	9.8	0.0	0.0	0.0
Sugar	16.3	13.3	13.1	51.2	12.0	12.0
Vegetables	19.6	9.6	9.1	51.0	0.8	0.8
Fruits	19.3	7.8	7.4	24.6	2.5	2.5
Wine	356.4	328.1	246.1	62.9	62.9	62.9
Tobacco	20.0	41.0	36.0	51.2	51.2	51.2
Milk	28.4	15.6	15.5		37.0	37.0
Beef	19.6	7.2	7.0		25.0	25.0
Pork	47.8	26.2	21.9	51.7	24.9	24.9
Poultry	43.9	7.8	7.8		28.0	28.0
Eggs	8.2	6.6	4.6	25.2	25.2	25.2
TOTAL	**32.6**	**13.9**	**11.5**	**12.2**	**4.1**	**4.1**
Slovenia						
Cereals	33.8	21.0	11.5	21.5	14.9	4.1
Oilseeds	49.7	9.0	4.1	16.6	8.7	5.1
Sugar	20.8	12.5	5.2	18.4	17.7	1.8
Vegetables	31.0	30.1	22.0	13.7	12.5	9.0
Fruits	17.1	9.1	2.8	13.8	8.2	4.4
Wine	27.5	3.2	0.6	57.4	57.2	57.1
Tobacco	25.0	45.5	38.0	40.1	39.9	39.9
Milk	63.7	24.4	20.0	33.7	22.4	20.7
Beef	35.2	20.6	14.6	31.3	26.6	15.6
Pork	42.4	26.6	25.2	31.1	18.5	16.4
Poultry	50.2	33.1	17.6	9.3	7.3	6.1
Eggs	28.5	26.6	18.8	23.7	23.7	23.7
TOTAL	**40.6**	**20.1**	**15.2**	**30.8**	**27.5**	**24.1**
Bosnia and Herzegovina						
Cereals	38.0	0.0	0.0	32.7	19.6	0.0
Oilseeds	36.7	0.0	0.0	10.6	6.4	0.0
Sugar	41.6	0.0	0.0	27.1	16.2	0.0
Vegetables	32.1	0.0	0.0	29.0	17.4	0.0
Fruits	29.4	0.0	0.0	45.5	27.3	0.0
Wine	212.9	0.0	0.0	38.1	22.9	0.0
Tobacco	20.0	0.0	0.0	46.3	27.8	0.0
Milk	55.0	0.0	0.0	29.0	17.4	0.0
Beef	63.2	0.0	0.0	67.2	40.3	0.0
Pork	70.3	0.0	0.0	64.0	38.4	0.0
Poultry	87.0	0.0	0.0	70.0	42.0	0.0
Eggs	-	0.0	0.0	18.4	11.0	0.0
TOTAL	**55.5**	**0.0**	**0.0**	**36.6**	**22.0**	**0.0**
"Rest of the world"						
Cereals	27.9	15.5	12.9	no data available. For the trade policy analysis, it was assumed that the "rest of the world" levies imports from Croatia with the same tariffs as Croatia imports from the "rest of the world".		
Oilseeds	15.1	9.3	2.1			
Sugar	38.4	25.2	22.3			
Vegetables	28.2	20.3	17.5			
Fruits	12.9	10.9	10.6			
Wine	117.1	97.2	73.9			
Tobacco	20.1	24.9	22.4			
Milk	42.1	33.3	30.0			
Beef	14.0	6.4	5.7			
Pork	47.3	43.7	36.1			
Poultry	102.6	33.6	21.0			
Eggs	0.2	0.1	0.1			
TOTAL	**20.1**	**15.6**	**12.7**			

Source: CROATIAN CHAMBER OF ECONOMY.

Annex 5: Calculation of the real exchange rate (kuna/€)

The real exchange rate is calculated as $exchange_{real} = exchange_{nominal} * \frac{(1+\inf_{partner})^{dt}}{(1+\inf_{croatia})^{dt}}$.

The index is calculated as $(\frac{kuna_t}{euro_t}) / (\frac{kuna_{99/00}}{euro_{99/00}})$.

A number less than one means an appreciation of the kuna in real terms.

Year	Nominal exchange rate (kuna/€)	Inflation rate (p.a.) Croatia	Inflation rate (p.a.) trade partners	Real exchange rate (kuna/€)	Index of real exchange rate
1999/2000	7.6			7.6	1
2002	7.4	4 %	2 %	7.049	0.928
2005	8.1	4 %	2 %	7.279	0.958

Source: Own calculation based on data provided by the Institute for International Relations.

Annex 6: Results of the trade policy analysis

Table A 7: Supply quantities (QS) and incentive prices (PS) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2002		Liberalisation scenarios for 2002 (% change compared to BASE)					
					FTAs		FTA + EU		FTA + EU + WTO	
	QS (1000 mt)	PS (€/mt)	QS (1000 mt)	PS (€/mt)	QS	PS	QS	PS	QS	PS
Cereals	2825	133	2945	137	0.6	0.5	This scenario is not applied in 2002 since SLO and H have not joined the EU.		0.8	1.4
Oilseeds	210	251	215	264	-0.6	-1.2			-0.6	-0.6
Sugar	85	280	90	294	-1.6	-2.7			-1.6	-1.8
Vegetables	1036	314	1037	341	-0.6	-1.9			-0.9	-1.8
Fruits	241	911	237	964	-0.5	-2.2			-0.8	-2.5
Wine	244	887	246	1043	-0.1	-1.2			-0.2	-0.9
Tobacco	9	1593	9	1503	0.7	0.8			5.8	11.9
Milk	595	268	633	292	-0.1	-0.9			-0.1	-0.4
Beef	33	3293	34	3609	-0.4	-1.4			-0.3	-0.8
Pork	130	1644	136	1886	0.2	-0.5			0.3	0.1
Poultry	77	1407	82	1656	0.6	0.1			1.2	1.4
Eggs	47	1292	52	1521	1.0	0.5			1.5	1.8
RAO	69	1000	67	1000	-0.0	0.0			-0.4	0.0
Feed	-2078	92	-2192	90	-0.2	0.6			-0.3	1.6
Fertiliser	-137	140	-131	140	0.8	0.0			1.4	0.0
RVI	-614	1000	-623	1000	-0.0	0.0			0.1	0.0

Remarks: a) RAO = rest of agricultural output.
b) RVI = rest of variable inputs.
c) All input quantities are expressed with a negative sign.
d) Item 'feed' contains grains used for feeding.

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 8: Supply quantities (QS) and incentive prices (PS) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2005		Liberalisation scenarios for 2005 (% change compared to BASE)					
					FTAs		FTA + EU		FTA + EU + WTO	
	QS (1000 t)	PS (€/mt)	QS (1000 mt)	PS (€/mt)	QS	PS	QS	PS	QS	PS
Cereals	2825	133	3062	133	0.9	1.0	0.8	1.1	1.0	1.7
Oilseeds	210	251	216	251	-0.6	-1.1	-0.6	-0.8	-0.7	-0.6
Sugar	85	280	93	271	-2.9	-5.1	-2.9	-5.0	-2.8	-4.3
Vegetables	1036	314	1049	353	-1.0	-2.7	-1.1	-2.6	-1.3	-2.6
Fruits	241	911	239	999	-0.8	-3.0	-0.8	-2.8	-1.1	-3.2
Wine	244	887	248	1098	-0.2	-1.1	-0.2	-1.0	-0.2	-0.8
Tobacco	9	1593	10	1513	2.6	4.5	6.3	12.3	7.4	15.1
Milk	595	268	649	272	0.0	-0.7	-0.0	-0.6	-0.0	-0.3
Beef	33	3293	34	3722	-0.2	-1.1	-0.1	-0.8	-0.0	-0.3
Pork	130	1644	140	1960	0.2	-0.5	0.2	-0.4	0.3	0.1
Poultry	77	1407	85	1721	1.3	0.9	1.2	1.0	1.8	2.1
Eggs	47	1292	54	1546	1.7	1.4	1.6	1.5	2.1	2.5
RAO	69	1000	68	1000	-0.2	0.0	-0.3	0.0	-0.5	0.0
Feed	-2078	92	-2271	90	-0.2	1.1	-0.2	1.2	-0.3	1.8
Fertiliser	-137	140	-124	140	1.0	0.0	1.2	0.0	1.3	0.0
RVI	-614	1000	-623	1000	0.0	0.0	0.0	0.0	0.1	0.0

Remarks: a) RAO = rest of agricultural output.
b) RVI = rest of variable inputs.
c) All input quantities are expressed with a negative sign.
d) Item 'feed' contains grains used for feeding.

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 9: Demand quantities (QD) and consumer prices (PD) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2002		Liberalisation scenarios for 2002 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QD (1000 mt)	PD (€/mt)	QD (1000 mt)	PD (€/mt)	QD	PD	QD	PD	QD	PD
Cereals	639	497	688	491	2.8	-5.4	This sceniario is not applied in 2002 since SLO and H have not joined the EU.		3.1	-5.5
Oilseeds	281	645	315	642	3.9	-8.3			6.0	-10.1
Sugar	124	714	142	725	2.7	-7.2			3.9	-7.5
Vegetables	749	750	780	800	1.5	-3.0			1.8	-3.3
Fruits	372	1372	410	1419	2.6	-3.4			3.7	-4.2
Wine	234	1666	238	1960	2.8	-1.9			3.0	-1.7
Tobacco	8	50424	9	47609	0.1	2.5			3.6	-5.5
Milk	770	724	881	790	4.3	-3.7			5.8	-3.9
Beef	52	5477	64	5687	4.4	-3.3			5.9	-3.1
Pork	157	5034	170	5658	3.6	-2.5			3.8	-2.0
Poultry	85	2321	92	2739	3.0	-2.1			4.0	-1.2
Eggs	43	1807	48	2130	1.1	0.5			1.6	1.7
ROSP	230	1000	325	734	5.1	-3.4			10.2	-12.8

Remark: ROSP = rest of spending.

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 10: Demand quantities (QD) and consumer prices (PD) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2005		Liberalisation scenarios for 2005 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QD (1000 mt)	PD (€/mt)	QD (1000 mt)	PD (€/mt)	QD	PD	QD	PD	QD	PD
Cereals	639	497	707	495	4.4	-7.9	4.4	-7.9	4.8	-8.0
Oilseeds	281	645	321	655	6.0	-12.4	6.2	-12.8	7.4	-13.0
Sugar	124	714	148	716	5.2	-13.1	5.0	-13.0	6.4	-13.1
Vegetables	749	750	791	832	3.2	-4.9	3.0	-4.7	3.3	-5.0
Fruits	372	1372	415	1479	3.5	-4.7	3.4	-4.6	4.5	-5.3
Wine	234	1666	241	2066	3.0	-1.9	3.0	-1.9	3.2	-1.8
Tobacco	8	50424	9	49114	1.3	0.8	1.2	1.0	4.4	-6.5
Milk	770	724	903	827	6.1	-4.7	6.2	-4.8	7.6	-5.1
Beef	52	5477	66	5933	6.1	-4.0	5.5	-3.5	6.9	-3.4
Pork	157	5034	175	5901	5.5	-3.5	5.4	-3.5	5.7	-3.1
Poultry	85	2321	95	2858	3.9	-2.1	3.8	-2.0	4.7	-1.3
Eggs	43	1807	50	2165	1.7	1.4	1.6	1.4	2.1	2.4
ROSP	230	1000	343	727	8.3	-7.2	8.0	-7.0	12.4	-15.2

Remark: ROSP = rest of spending.

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by

the Croatian Chamber of Economy.

Table A 11: Export quantities (QSX) and export prices (PSX) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2002		Liberalisation scenarios for 2002 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QSX (1000 mt)	PSX (€/mt)	QSX (1000 mt)	PSX (€/mt)	QSX	PSX	QSX	PSX	QSX	PSX
Cereals	302	180	286	166	12.1	9.9	This scenario is not applied in 2002 since SLO and H have not joined the EU.		15.8	13.4
Oilseeds	88	230	86	211	2.7	1.9			3.6	3.8
Sugar	4	1223	4	1163	8.1	6.2			11.6	10.8
Vegetables	8	1044	7	1011	4.0	3.0			5.9	5.6
Fruits	14	713	12	692	5.8	4.0			7.5	5.7
Wine	7	1119	6	1081	2.1	1.0			8.5	7.7
Tobacco	11	6005	11	5608	0.3	0.6			6.0	14.0
Milk	48	448	45	444	6.8	5.7			8.9	8.5
Beef	5	2387	5	2510	5.5	4.4			6.1	5.5
Pork	2	2511	2	2447	8.8	8.0			12.9	12.7
Poultry	6	2332	5	2278	13.9	13.3			18.3	18.7
Eggs	1	899	1	886	2.5	1.9			6.3	6.4

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 12: Export quantities (QSX) and export prices (PSX) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2005		Liberalisation scenarios for 2005 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QSX (1000 mt)	PSX (€/mt)	QSX (1000 mt)	PSX (€/mt)	QSX	PSX	QSX	PSX	QSX	PSX
Cereals	302	180	303	168	17.4	14.3	17.7	14.8	19.7	16.6
Oilseeds	88	230	86	217	5.0	4.6	5.5	5.4	5.3	5.7
Sugar	4	1223	4	1183	14.7	11.2	14.8	11.4	16.3	13.8
Vegetab.	8	1044	7	1038	7.9	6.8	8.2	7.4	9.4	9.0
Fruits	14	713	12	714	10.7	8.4	11.2	9.0	11.9	9.6
Wine	7	1119	6	1102	10.1	9.1	11.2	10.2	16.4	15.7
Tobacco	11	6005	11	5642	2.4	5.1	6.0	14.0	7.7	17.8
Milk	48	448	45	456	13.4	12.5	14.8	14.0	15.3	14.9
Beef	5	2387	5	2601	11.0	9.9	11.1	10.3	11.2	10.9
Pork	2	2511	2	2530	22.0	21.2	22.3	21.6	25.5	25.3
Poultry	6	2332	6	2349	24.5	24.3	24.9	24.8	27.6	28.3
Eggs	1	899	1	886	5.3	4.9	9.1	8.9	8.9	9.2

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 13: Import quantities (QDM) and import prices (PDM, including import tariffs) of Croatia in 1999/2000 as well as in 2002 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2002		Liberalisation scenarios for 2002 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QDM (1000 mt)	PDM (€/mt)	QDM (1000 mt)	PDM (€/mt)	QDM	PDM	QDM	PDM	QDM	PDM
Cereals	163	500	190	473	17.6	-10.5	This scenario is not applied in 2002 since SLO and H have not joined the EU.		19.5	-10.9
Oilseeds	226	266	255	264	6.2	-9.2			9.2	-11.3
Sugar	40	617	54	583	10.2	-10.8			13.7	-12.1
Vegetables	133	513	168	496	10.8	-7.4			14.1	-9.0
Fruits	162	609	202	579	6.2	-5.7			9.0	-7.4
Wine	4	1314	6	1330	129.5	-34.9			147.7	-37.2
Tobacco	5	6286	7	5894	-0.4	2.6			6.8	-6.2
Milk	157	420	227	407	18.3	-9.7			24.5	-11.6
Beef	18	2865	29	2480	11.1	-7.3			14.4	-8.1
Pork	23	2796	30	2860	20.0	-9.3			21.1	-9.2
Poultry	2	2403	4	2429	83.7	-26.6			101.3	-28.9
Eggs	0	6790	0	6676	3.3	-0.6			5.8	-0.3

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 14: Import quantities (QDM) and import prices (PDM, including import tariffs) of Croatia in 1999/2000 as well as in 2005 for the BASE scenario and the liberalisation scenarios compared to the former

	Average of 1999/2000		BASE scenario for 2005		Liberalisation scenarios for 2005 (% change compared to BASE)					
					FTAs		FTAs + EU		FTAs + EU + WTO	
	QDM (1000 mt)	PDM (€/mt)	QDM (1000 mt)	PDM (€/mt)	QDM	PDM	QDM	PDM	QDM	PDM
Cereals	163	500	187	487	28.1	-15.4	28.5	-15.5	30.1	-15.8
Oilseeds	226	266	260	268	9.6	-13.8	9.9	-14.1	11.5	-14.5
Sugar	40	617	57	572	19.1	-19.1	18.6	-18.8	22.4	-19.7
Vegetables	133	513	166	522	22.1	-13.0	21.6	-12.8	24.6	-14.0
Fruits	162	609	205	602	8.6	-7.9	8.4	-7.7	11.1	-9.3
Wine	4	1314	5	1420	152.0	-37.8	151.8	-37.8	169.0	-39.7
Tobacco	5	6286	7	6096	1.9	0.6	2.4	0.7	8.3	-7.3
Milk	157	420	233	427	26.3	-12.8	26.9	-13.1	32.7	-14.8
Beef	18	2865	30	2559	15.3	-9.2	13.9	-8.3	16.9	-9.0
Pork	23	2796	31	3001	31.7	-13.6	31.6	-13.6	32.7	-13.5
Poultry	2	2403	4	2531	107.3	-30.6	107.3	-30.6	120.9	-32.0
Eggs	0	6790	0	6924	6.9	-1.1	7.0	-1.1	9.1	-0.8

Remark: *) Including import tariffs.

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 15: Croatian export quantities (QSXX, in 1000 tons) for 2002 compared to the BASE scenario

	average 1999/2000					BASE scenario 2002					Liberalisation scenarios for 2002 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs +EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	121.3	48.3	0.3	29.3	103.4	116.5	46.4	0.3	29.1	93.8	6.4	3.9	9.0	47.5	11.7	This scenario is not applied in 2002 since SLO and H have not joined the EU.					6.4	11.1	13.3	47.7	19.1
Oil-seeds	24.1	28.0	7.6	15.4	13.2	23.7	27.4	7.4	14.5	12.2	2.4	3.9	0.4	0.8	5.5						1.9	7.6	-0.1	-0.0	8.8
Sugar	2.7	0.8	0.0	0.4	0.4	2.6	0.7	0.0	0.4	0.4	5.6	1.2	16.4	41.8	11.3						5.0	9.1	21.5	40.4	21.3
Vege-tables	2.9	1.3	0.2	2.0	1.3	2.6	1.2	0.2	1.7	1.1	5.6	1.1	22.5	0.9	7.0						5.2	7.1	22.5	0.2	15.2
Fruits	3.2	4.2	0.5	3.7	2.1	2.9	3.9	0.4	3.2	1.8	8.2	3.6	11.5	5.4	3.3						8.1	7.9	12.8	5.4	8.1
Wine	1.4	0.2	0.2	4.1	1.4	1.3	0.1	0.1	3.2	1.1	7.2	0.7	0.6	-4.3	10.4						7.0	22.7	24.6	-4.6	42.2
Tobac-co	1.8	3.1	0.0	1.3	4.7	1.8	3.0	0.0	1.2	4.6	6.7	-0.1	-0.1	6.4	-3.8						3.2	13.3	17.1	-0.2	-0.7
Milk	32.5	5.7	0.0	6.7	3.1	30.3	5.3	0.0	8.0	2.7	5.6	5.3	-16	45.8	7.1						5.3	15.8	0.2	44.9	20.1
Beef	1.6	0.2	0.0	1.4	1.6	1.4	0.2	0.0	1.6	1.3	10.1	2.5	-11.3	2.7	7.7						9.8	15.0	0.3	2.2	10.1
Pork	1.2	0.2	0.0	0.1	0.8	1.1	0.1	0.0	0.1	0.6	9.6	5.9	10.9	59.6	3.0						9.3	14.8	22.7	58.9	19.2
Poultry	2.6	0.9	0.0	1.4	1.3	2.4	0.8	0.0	1.2	1.1	10.1	1.3	-13.0	0.5	46.5						9.7	4.7	-0.2	-0.3	63.7
Eggs	0.8	0.3	0.0	0.0	0.1	0.7	0.3	0.0	0.0	0.1	3.7	0.3	0.3	41.5	0.6						3.4	11.3	12.0	40.6	-0.0

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 16: Croatian export quantities (QSXX, in 1000 tons) for 2005 compared to the BASE scenario

	average 1999/2000					BASE scenario 2005					Liberalisation scenarios for 2005 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	121.3	48.3	0.3	29.3	103.4	125.2	49.9	0.3	31.0	107.1	15.2	8.9	8.9	47.9	14.7	15.1	10.8	12.9	47.6	14.5	15.1	10.8	13.0	47.7	20.7
Oilseeds	24.1	28.0	7.6	15.4	13.2	24.5	28.5	7.7	15.2	13.4	5.3	5.4	0.2	0.5	11.9	5.1	7.7	0.1	0.2	11.6	4.9	7.5	-0.2	-0.2	12.1
Sugar	2.7	0.8	0.0	0.4	0.4	2.9	0.8	0.0	0.4	0.5	13.5	9.1	16.4	43.1	15.0	13.4	9.9	21.8	42.9	14.8	13.0	9.5	21.4	41.9	24.2
Vege-tables	2.9	1.3	0.2	2.0	1.3	2.8	1.3	0.2	2.0	1.2	14.3	2.8	22.3	1.0	9.4	14.2	7.3	22.6	0.7	9.1	14.0	7.1	22.4	0.4	16.7
Fruits	3.2	4.2	0.5	3.7	2.1	3.1	4.1	0.5	3.6	2.0	21.4	5.8	11.8	5.9	4.0	21.3	8.1	13.0	5.7	3.9	21.4	8.1	13.0	5.8	8.7
Wine	1.4	0.2	0.2	4.1	1.4	1.4	0.2	0.2	4.0	1.4	18.8	0.6	0.5	-1.1	23.6	18.8	24.9	26.9	-1.2	23.6	18.6	24.8	26.7	-1.5	52.8
Tobacco	1.8	3.1	0.0	1.3	4.7	2.1	3.5	0.0	1.5	5.6	17.0	-1.2	-1.3	4.2	-4.0	14.8	12.8	16.4	-0.2	-8.1	14.0	12.0	15.6	-1.6	-1.2
Milk	32.5	5.7	0.0	6.7	3.1	34.1	6.0	0.0	7.8	3.3	14.0	5.9	-16.0	45.4	9.3	14.0	15.8	0.4	45.3	9.2	13.7	15.6	0.2	44.8	21.6
Beef	1.6	0.2	0.0	1.4	1.6	1.5	0.2	0.0	1.5	1.5	28.2	7.4	-11.4	2.6	8.1	28.0	15.1	0.4	2.3	7.9	27.8	14.9	0.1	1.9	10.2
Pork	1.2	0.2	0.0	0.1	0.8	1.2	0.2	0.0	0.1	0.8	26.8	6.8	10.8	59.4	8.2	26.8	14.9	22.7	59.3	8.1	26.6	14.7	22.5	58.8	22.6
Poultry	2.6	0.9	0.0	1.4	1.3	2.6	0.9	0.0	1.3	1.3	28.8	1.7	-13.1	0.2	59.3	28.7	4.9	0.0	0.1	59.2	28.4	4.6	-0.3	-0.4	71.4
Eggs	0.8	0.3	0.0	0.0	0.1	0.8	0.3	0.0	0.0	0.2	8.9	0.2	0.2	40.9	0.4	8.8	11.1	11.7	40.7	0.3	8.6	10.8	11.5	40.1	-0.1

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 17: Croatian import quantities (QDMM, in 1000 tons) for 2002 compared to the BASE scenario

	average 1999/2000					BASE scenario 2002					Liberalisation scenarios for 2002 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	3.4	8.3	60.6	72.4	18.0	3.3	8.8	58.8	89.7	20.0	24.4	5.4	8.3	21.8	13.8	This scenario is not applied in 2002 since SLO and H have not joined the EU.					24.7	5.6	8.5	22.5	29.4
Oilseeds	3.3	7.3	26.7	41.6	147.0	3.4	7.6	27.9	49.0	167.4	20.1	20.5	27.5	11.2	-2.7						19.3	19.7	26.7	9.5	3.6
Sugar	0.2	7.8	13.8	15.9	2.8	0.2	8.3	14.7	23.3	3.7	23.1	0.4	-2.9	15.5	6.2						23.2	0.5	-2.9	15.7	28.0
Vege-tables	0.7	3.6	15.4	79.5	33.4	0.8	4.0	17.3	102.1	44.3	20.4	-1.4	4.7	14.1	6.9						20.2	-1.6	4.5	13.6	24.1
Fruits	2.7	9.8	2.6	79.8	66.7	3.0	10.9	2.9	100.9	85.1	18.4	3.2	5.5	13.0	-1.9						17.9	2.8	5.1	12.0	6.3
Wine	0.4	1.1	0.1	1.6	0.8	0.5	1.3	0.1	2.2	1.2	124.0	15.6	3.8	283.5	15.4						124.3	15.7	3.9	284.5	84.5
Tobacco	0.1	0.0	0.0	0.9	4.5	0.1	0.0	0.0	1.1	5.3	16.4	-9.2	-9.8	22.2	-2.9						11.8	-12.8	-13.4	11.0	6.3
Milk	3.3	32.6	34.2	51.4	35.8	3.9	38.7	40.7	92.4	54.2	35.7	20.6	6.6	25.5	8.2						36.2	21.0	7.0	26.4	36.8
Beef	0.5	1.4	4.1	3.6	8.1	0.6	1.5	4.4	15.9	10.1	41.0	7.0	6.7	14.7	8.6						41.6	7.5	7.2	15.5	15.8
Pork	0.9	2.8	5.3	13.8	0.2	1.0	3.2	5.9	20.4	0.3	46.8	8.5	11.9	23.5	3.3						47.4	9.0	12.4	24.8	39.3
Poultry	0.0	0.4	0.0	1.5	0.4	0.1	0.5	0.1	2.3	0.7	56.8	8.9	23.1	121.9	96.8						58.3	9.9	24.2	126.5	146.5
Eggs	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.8	1.9	1.9	7.9	1.9						1.9	3.0	3.0	10.6	4.6

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 18: Croatian import quantities (QDMM, in 1000 tons) for 2005 compared to the BASE scenario

	average 1999/2000					BASE scenario 2005					Liberalisation scenarios for 2005 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	3.4	8.3	60.6	72.4	18.0	3.2	8.3	56.4	74.8	17.6	23.1	10.9	12.1	35.9	15.8	23.1	15.0	10.9	36.0	15.9	23.3	15.2	11.1	36.5	29.1
Oil-seeds	3.3	7.3	26.7	41.6	147.0	3.5	7.8	28.5	41.0	156.6	16.8	21.2	28.0	11.3	3.3	16.6	21.3	33.1	10.8	2.7	16.8	21.6	33.4	11.3	5.1
Sugar	0.2	7.8	13.8	15.9	2.8	0.2	10.2	18.2	16.9	3.1	17.4	1.0	-6.7	34.9	-0.2	17.5	-4.5	-7.1	35.1	-0.0	17.9	-4.2	-6.7	36.1	18.9
Vege-tables	0.7	3.6	15.4	79.5	33.4	0.8	3.9	17.0	84.6	36.9	19.1	2.3	3.9	32.2	8.7	19.3	4.7	-2.1	32.5	8.9	19.0	4.4	-2.3	31.9	23.9
Fruits	2.7	9.8	2.6	79.8	66.7	3.0	11.0	2.9	87.7	74.7	17.3	6.8	4.9	19.1	-3.3	17.4	1.7	3.2	19.3	-3.1	17.0	1.3	2.8	18.2	4.7
Wine	0.4	1.1	0.1	1.6	0.8	0.5	1.2	0.1	1.5	0.9	123.9	17.8	21.2	332.1	42.2	123.9	10.0	171.6	332.2	42.3	124.1	10.1	171.8	332.9	108.5
Tobac-co	0.1	0.0	0.0	0.9	4.5	0.1	0.0	0.0	1.0	4.8	15.8	-6.0	-7.9	25.8	-0.7	16.0	13.3	9.9	26.4	-0.2	11.5	8.9	5.6	14.9	7.6
Milk	3.3	32.6	34.2	51.4	35.8	3.9	37.9	39.8	66.3	41.6	35.5	23.7	6.5	43.1	12.6	35.4	27.2	6.7	42.8	12.4	35.7	27.5	6.9	43.5	38.9
Beef	0.5	1.4	4.1	3.6	8.1	0.6	1.6	4.7	8.4	9.4	40.4	10.8	6.6	28.1	9.2	40.8	7.5	-1.8	28.6	10.0	41.3	7.8	-1.5	29.4	16.3
Pork	0.9	2.8	5.3	13.8	0.2	1.0	3.3	6.1	15.4	0.2	46.2	9.2	14.5	42.8	13.0	46.2	10.1	13.2	42.9	13.0	46.8	10.5	13.6	44.1	44.9
Poultry	0.0	0.4	0.0	1.5	0.4	0.1	0.5	0.1	1.7	0.5	56.6	19.4	23.2	153.2	126.6	56.6	19.6	16.0	153.3	126.7	57.9	20.6	16.9	157.7	162.7
Eggs	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	1.7	7.7	4.2	15.8	4.1	1.7	15.5	1.8	15.9	4.1	2.6	16.5	2.8	18.3	6.4

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 19: Croatian export prices (PSXX, in €) for 2002 compared to the BASE scenario

	average 1999/2000					BASE scenario 2002					Liberalisation scenarios for 2002 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	171	213	1229	161	177	154	191	1123	157	155	4.2	1.8	6.8	44.5	9.5	This scenario is not applied in 2002 since SLO and H have not joined the EU.					4.2	8.7	10.9	44.5	16.5
Oilseeds	380	191	188	177	125	345	172	169	156	107	1.6	3.2	-0.4	0.1	4.7						2.1	7.8	0.1	0.2	9.0
Sugar	961	1735	1022	820	2333	864	1563	920	779	2154	3.7	-0.6	14.3	39.2	9.3						4.3	8.3	20.7	39.4	20.4
Vegetables	946	670	350	1415	1190	891	631	330	1307	1104	4.6	0.1	21.3	-0.1	6.0						5.0	6.8	22.2	-0.0	14.9
Fruits	873	484	671	815	765	831	460	639	754	710	6.3	1.9	9.6	3.6	1.5						6.3	6.1	10.9	3.6	6.3
Wine	1662	1651	1667	1021	896	1569	1558	157	926	831	6.0	-0.4	-0.5	-5.3	9.2						6.2	21.8	23.7	-5.3	41.2
Tobacco	8414	8464	2248	515	4981	7410	7454	1980	457	4617	7.0	0.2	0.1	6.7	-3.5						11.0	21.9	25.9	7.4	6.8
Milk	513	550	448	48	448	467	501	408	63	416	4.5	4.2	-16.8	44.2	5.9						4.9	15.3	-0.2	44.3	19.7
Beef	2136	1985	1837	3337	1837	2026	1873	1720	4008	1603	8.9	1.4	-12.3	1.6	6.5						9.2	14.4	-0.2	1.6	9.5
Pork	3070	1422	4107	1268	1970	2851	1303	3820	1157	1763	8.8	5.2	10.2	58.5	2.3						9.1	14.6	22.5	58.6	19.0
Poultry	1992	2826	2213	2769	2213	1886	2676	2093	2545	2043	9.6	0.8	-13.4	-0.0	45.7						10.0	5.0	0.1	0.1	64.2
Eggs	757	1350	1930	2285	699	689	1230	1758	2104	648	3.2	-0.3	-0.3	40.7	-0.0						3.5	11.5	12.1	40.8	0.1

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 20: Croatian export prices (PSXX, in €) for 2005 compared to the BASE scenario

	average 1999/2000					BASE scenario 2005					Liberalisation scenarios for 2005 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	171	213	1229	161	177	155	193	1130	161	162	12.1	6.0	6.1	43.9	11.6	12.2	8.1	10.2	44.0	11.6	12.2	8.0	10.1	43.9	17.6
Oil-seeds	380	191	188	177	125	356	178	176	146	118	4.8	5.0	-0.2	0.1	11.4	5.0	7.6	-0.1	0.1	11.5	5.2	7.9	0.2	0.2	12.5
Sugar	961	1735	1022	820	2333	872	1562	923	803	2272	9.9	5.7	12.8	38.6	11.4	10.0	6.7	18.2	38.7	11.4	10.5	7.1	18.7	38.8	21.5
Vege-tables	946	670	350	1415	1190	913	646	338	1339	1140	13.1	1.7	21.0	-0.1	8.2	13.3	6.5	21.6	-0.1	8.3	13.5	6.7	21.9	-0.0	16.2
Fruits	873	483	671	815	765	852	472	655	774	733	18.8	3.6	9.4	3.6	1.8	18.9	5.9	10.7	3.6	1.8	18.9	5.9	10.7	3.6	6.5
Wine	1662	1651	167	1021	896	1608	1597	161	920	858	17.7	-0.3	-0.4	-2.0	22.5	17.7	23.9	25.8	-2.0	22.5	17.9	24.1	26.0	-2.0	51.9
Tobac-co	8414	8464	2248	515	4981	6864	6904	1834	438	4762	20.1	1.4	1.3	6.9	-1.5	23.5	21.3	25.2	7.4	-1.1	24.7	22.4	26.4	7.6	8.1
Milk	513	550	448	48	448	466	500	407	64	428	13.1	5.0	-16.7	44.2	8.4	13.1	15.0	-0.3	44.2	8.4	13.4	15.2	-0.2	44.3	21.2
Beef	2136	1985	1837	3337	1837	2100	1949	1800	4084	1734	27.0	6.4	-12.2	1.6	7.1	27.1	14.3	-0.3	1.6	7.1	27.5	14.6	-0.1	1.7	9.9
Pork	3070	1422	4107	1268	1970	2888	1333	3866	1162	1869	26.0	6.1	10.1	58.4	7.5	26.0	14.2	22.0	58.4	7.5	26.3	14.5	22.2	58.5	22.4
Poultry	1992	2826	2213	2769	2213	1951	2770	2176	2587	2148	28.5	1.5	-13.2	0.0	59.0	28.6	4.8	-0.0	0.0	59.0	29.1	5.1	0.2	0.1	72.3
Eggs	757	1350	1930	2285	699	674	1202	1718	2148	669	8.5	-0.2	-0.2	40.4	0.0	8.6	10.8	11.5	40.4	0.1	8.9	11.1	11.8	40.5	0.1

Sources: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 21: Croatian import prices (PDMM, including import tariffs, in €) for 2002 compared to the BASE scenario

	average 1999/2000					BASE scenario 2002					Liberalisation scenarios for 2002 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	242	1204	165	731	425	248	1196	171	671	412	-13.0	-5.5	-6.7	-12.1	-9.0	This scenario is not applied in 2002 since SLO and H have not joined the EU.					-12.8	-5.3	-6.5	-12.0	-14.4
Oil-seeds	296	298	370	331	227	304	307	380	320	223	-14.6	-14.8	-17.2	-11.3	-5.2						-15.1	-15.3	-17.6	-11.4	-8.9
Sugar	598	290	277	934	1370	625	307	293	844	1308	-15.6	-6.6	-5.0	-12.9	-9.1						-15.6	-6.5	-4.9	-12.9	-17.2
Vege-tables	642	797	557	528	426	658	816	570	506	401	-11.2	-1.8	-4.7	-8.7	-5.8						-11.3	-2.0	-4.9	-8.8	-12.7
Fruits	501	782	921	605	580	506	790	931	572	546	-10.7	-4.3	-5.4	-8.6	-1.9						-11.0	-4.6	-5.7	-8.7	-6.2
Wine	984	1239	786	1525	1258	1064	1340	850	1507	1199	-34.1	-8.2	-3.1	-49.6	-8.1						-34.0	-8.1	-3.0	-49.6	-27.2
Tobac-co	3406	10661	4044	3695	6872	3363	10524	3992	3485	6437	-5.1	7.4	7.8	-7.4	3.9						-8.3	3.8	4.2	-8.0	-6.0
Milk	916	501	333	438	357	981	537	357	381	338	-15.7	-10.6	-4.9	-12.3	-5.6						-15.5	-10.3	-4.6	-12.3	-15.7
Beef	4290	2868	2869	2669	2858	4555	3062	3054	1405	2821	-17.7	-5.5	-5.4	-8.7	-6.2						-17.4	-5.2	-5.0	-8.5	-8.6
Pork	4246	3904	2413	2641	1866	4668	4285	2682	2560	1904	-18.0	-4.7	-6.1	-10.6	-2.3						-17.7	-4.3	-5.7	-10.5	-15.3
Poultry	2435	3185	2244	1598	4584	2720	3544	2501	1575	4429	-20.5	-4.6	-10.3	-33.2	-29.1						-19.9	-3.8	-9.5	-33.0	-35.8
Eggs	11676	2377	3996	4842	11696	13012	2648	4452	4665	11216	0.7	0.1	0.1	-2.7	0.1						1.6	1.1	1.0	-2.5	0.3

Source: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 22: Croatian import prices (PDMM, including import tariffs, in €) for 2005 compared to the BASE scenario

	average 1999/2000					BASE scenario 2005					Liberalisation scenarios for 2005 (% change compared to BASE)														
											FTAs					FTAs + EU					FTAs + EU + WTO				
	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW	BIH	SLO	H	EU	ROW
Cereals	242	1204	165	731	425	241	1171	166	699	418	-13.7	-9.1	-9.6	-17.9	-11.0	-13.7	-10.7	-9.0	-17.9	-11.0	-13.5	-10.5	-8.9	-17.8	-15.5
Oil-seeds	296	298	370	331	227	304	307	380	354	233	-16.5	-18.0	-20.2	-14.4	-11.2	-16.6	-18.3	-22.0	-14.5	-11.2	-16.5	-18.1	-21.8	-14.4	-12.0
Sugar	598	290	277	934	1370	537	246	234	882	1283	-18.5	-12.1	-8.6	-24.0	-11.6	-18.5	-9.5	-8.3	-23.9	-11.6	-18.2	-9.3	-8.0	-23.9	-18.5
Vege-tables	642	797	557	528	426	533	911	962	734	686	-12.0	-5.0	-5.7	-16.4	-7.8	-11.9	-5.9	-2.7	-16.4	-7.8	-12.0	-6.1	-2.9	-16.4	-13.8
Fruits	501	782	921	605	580	663	751	586	492	395	-11.3	-7.1	-6.2	-12.0	-2.3	-11.3	-4.7	-5.3	-12.0	-2.3	-11.6	-5.0	-5.6	-12.0	-6.5
Wine	984	1239	786	1525	1258	1006	1267	804	1650	1287	-34.0	-9.1	-10.3	-52.5	-17.2	-34.0	-5.9	-40.1	-52.5	-17.2	-34.0	-5.8	-40.0	-52.5	-31.6
Tobac-co	3406	10661	4044	3695	6872	3473	10868	4122	3807	7006	-5.6	4.8	5.8	-9.4	1.9	-5.4	-4.3	-2.8	-9.4	2.0	-8.6	-7.5	-6.1	-10.0	-6.9
Milk	916	501	333	438	357	1004	550	366	456	392	-15.8	-11.9	-5.0	-18.1	-7.6	-15.9	-13.2	-5.2	-18.1	-7.7	-15.7	-13.1	-5.0	-18.0	-16.7
Beef	4290	2868	2869	2669	2858	4738	3172	3171	2082	3157	-17.7	-7.4	-5.6	-13.9	-6.7	-17.5	-5.6	-1.2	-13.7	-6.7	-17.3	-5.3	-0.9	-13.5	-8.8
Pork	4246	3904	2413	2641	1866	4689	4309	2672	2982	2072	-18.0	-5.1	-7.4	-17.1	-6.7	-18.0	-5.5	-6.8	-17.1	-6.7	-17.8	-5.2	-6.5	-17.0	-17.2
Poultry	2435	3185	2244	1598	4584	2662	3513	2462	1869	5060	-20.1	-8.5	-10.0	-37.2	-33.6	-20.1	-8.6	-7.2	-37.2	-33.6	-19.5	-7.9	-6.5	-37.0	-37.6
Eggs	11676	2377	3996	4842	11696	12930	2632	4424	5400	12952	1.4	-1.4	0.2	-5.0	0.3	1.5	-4.8	1.4	-5.0	0.3	2.2	-4.0	2.2	-4.8	0.4

Source: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 23: Croatian net export quantities (in 1000 tons) for 2002 compared to the BASE scenario

	average 1999/2000						BASE scenario 2002						Liberalisation scenarios for 2002 (% change compared to BASE)															
													FTAs						FTAs + EU						FTAs + EU + WTO					
	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW
Cereals	140	118	40	-60	-43	85	96	113	38	-59	-61	74	1	6	4	8	10	11	This scenario is not applied in 2002 since SLO and H have not joined the EU.						9	6	12	8	10	16
Oil-seeds	-138	21	21	-19	-26	-134	-169	20	20	-21	-34	-155	8	-1	-2	37	16	-3							12	-1	3	36	13	3
Sugar	-36	3	-7	-14	-16	-2	-50	2	-8	-15	-23	-3	10	4	0	-3	15	6							14	4	-0	-3	15	29
Vege-tables	-125	2	-2	-15	-77	-32	-161	2	-3	-17	-100	-43	11	-1	-3	4	14	7							14	-1	-5	4	14	24
Fruits	-148	1	-6	-2	-76	-65	-190	-0	-7	-2	-98	-83	6	3299	3	4	13	-2							9	3167	-0	4	12	6
Wine	3	1	-1	0	3	1	0	1	-1	0	1	-0	-1524	-76	17	-51	-659	65							-1659	-76	15	362	-662	511
Tobac-co	5	2	3	0	0	0	4	2	3	0	0	-1	1	6	-0	1	-134	3							5	3	13	20	-100	51
Milk	-109	29	-27	-34	-45	-33	-183	26	-33	-41	-84	-51	21	1	23	7	24	8							28	1	22	7	25	38
Beef	-13	1	-1	-4	-2	-6	-24	1	-1	-4	-14	-9	12	-10	8	7	16	9							16	-11	6	7	17	17
Pork	-21	0	-3	-5	-14	1	-28	0	-3	-6	-20	0	21	-343	9	12	23	3							22	-352	9	12	25	5
Poultry	4	3	0	-0	-0	1	2	2	0	-0	-1	0	-121	9	-12	32	242	-30							-142	8	-4	30	252	-62
Eggs	1	1	0	-0	-0	0	1	1	0	-0	-0	0	2	4	0	2	7	-7							7	3	12	0	10	-27

Source: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 24: Croatian net export quantities (in 1000 tons) for 2005 compared to the BASE scenario

	average 1999/2000						BASE scenario 2005						Liberalisation scenarios for 2005 (% change compared to BASE)																	
													FTAs						FTAs + EU						FTAs + EU + WTO					
	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW	Total	BIH	SLO	H	EU	ROW
Cereals	140	118	40	-60	-43	85	96	113	38	-59	-61	74	0	15	8	12	29	14	0	15	10	11	30	14	3	15	10	11	30	19
Oil-seeds	-138	21	21	-19	-26	-134	-169	20	20	-21	-34	-155	12	3	-1	38	16	3	12	3	2	45	15	2	15	3	2	45	16	5
Sugar	-36	3	-7	-14	-16	-2	-50	2	-8	-15	-23	-3	19	13	0	-7	35	-2	19	13	-6	-7	35	-2	23	13	-5	-7	36	18
Vege-tables	-125	2	-2	-15	-77	-32	-161	2	-3	-17	-100	-43	23	12	2	4	33	9	22	12	3	-2	33	9	25	12	3	-3	32	24
Fruits	-148	1	-6	-2	-76	-65	-190	-0	-7	-2	-98	-83	8	-263	7	4	19	-4	8	-249	-2	1	20	-3	11	-283	-2	1	19	5
Wine	3	1	-1	0	3	1	0	1	-1	0	1	-0	-1865	-59	20	-583	-698	159	-1848	-59	8	-4050	-698	160	-2001	-60	8	4061	-700	458
Tobac-co	5	2	3	0	0	0	4	2	3	0	0	-1	3	17	-1	-1	-159	36	11	15	13	17	-201	87	7	14	12	17	-127	105
Milk	-109	29	-27	-34	-45	-33	-183	26	-33	-41	-84	-51	29	11	26	7	43	13	30	11	29	7	43	13	37	10	29	7	43	40
Beef	-13	1	-1	-4	-2	-6	-24	1	-1	-4	-14	-9	16	20	11	7	31	9	14	19	6	-2	32	10	18	18	7	-1	32	17
Pork	-21	0	-3	-5	-14	1	-28	0	-3	-6	-20	0	32	-254	9	14	43	4	32	-255	10	13	43	4	33	-266	10	14	44	4
Poultry	4	3	0	-0	-0	1	2	2	0	-0	-1	0	-143	28	-33	32	320	-65	-142	28	-24	20	321	-65	-161	28	-27	21	330	-97
Eggs	1	1	0	-0	-0	0	1	1	0	-0	-0	0	5	9	-1	5	15	-16	10	9	11	-1	15	-17	9	9	10	0	18	-29

Source: Own calculation. Base year data provided by the Croatian Ministry of Agriculture and Forestry and by the Croatian Chamber of Economy.

Table A 25: Subsidies and tariff revenues for Croatia and their absolute changes compared to the BASE scenario (in 1000 €)

	average 1999/2000	BASE scenario		Liberalisation scenarios					
		2002	2005	FTAs		FTA + EU		FTA + EU + WTO	
				2002	2005	2002	2005	2002	2005
				total amount					
Subsidies	122830	178296	134323	178381	134545	n.a.	134518	178532	134615
Tariff revenues	136930	188007	191044	125038	94832		96452	112852	85646
Budget = - subsidies + tariff revenues	14100	9711	56721	-53343	-39713		-38066	-65680	-48970
				absolute change compared to BASE of 2002 and 2005 resp.					
Subsidies	122830	178296	134323	+85	+222	n.a.	+195	+236	+292
Tariff revenues	136930	188007	191044	-62969	-96212		-94592	-75155	-105398
Budget = - subsidies + tariff revenues	14100	9711	56721	-63054	-96434		-94787	-75391	-105691

Source: Own calculation.

DISCUSSION PAPERS
DES INSTITUTS FÜR AGRARENTWICKLUNG IN MITTEL- UND OSTEUROPA (IAMO)

DISCUSSION PAPERS
OF THE INSTITUTE OF AGRICULTURAL DEVELOPMENT IN CENTRAL AND EASTERN EUROPE (IAMO)

No. 1 FROHBERG, K., HARTMANN, M. (1997):
Promoting CEA Agricultural Exports through Association Agreements with the EU – Why is it not working?

No. 2 FROHBERG, K., HARTMANN, M. (1997):
Comparing Measures of Competitiveness: Examples for Agriculture in the Central European Associates

No. 3 POGANIETZ, W. R., GLAUCH, L. (1997):
Migration durch EU-Integration? Folgen für den ländlichen Raum

No. 4 WEINGARTEN, P. (1997):
Agri-Environmental Policy in Germany – Soil and Water Conversation –

No. 5 KOPSIDIS, M. (1997):
Marktintegration und landwirtschaftliche Entwicklung: Lehren aus der Wirtschaftsgeschichte und Entwicklungsökonomie für den russischen Getreidemarkt im Transformationsprozeß

No. 6 PIENIADZ, A. (1997):
Der Transformationsprozeß in der polnischen Ernährungsindustrie von 1989 bis 1995

No. 7 POGANIETZ, W. R. (1997):
Vermindern Transferzahlungen den Konflikt zwischen Gewinnern und Verlierern in einer sich transformierenden Volkswirtschaft?

No. 8 EPSTEIN, D. B., SIEMER, J. (1998):
Difficulties in the Privatization and Reorganization of the Agricultural Enterprises in Russia

No. 9 GIRGZDIENE, V., HARTMANN, M., KUODYS, A., RUDOLPH, D., VAIKUTIS, V., WANDEL, J. (1998):
Restructuring the Lithuanian Food Industry: Problems and Perspectives

No. 10 JASJKO, D., HARTMANN, M., KOPSIDIS, M., MIGLAVS, A., WANDEL, J. (1998):
Restructuring the Latvian Food Industry: Problems and Perspectives

No. 11 SCHULZE, E., NETZBAND, C. (1998):
Ergebnisse eines Vergleichs von Rechtsformen landwirtschaftlicher Unternehmen in Mittel- und Osteuropa

No. 12 BERGSCHMIDT, A., HARTMANN, M. (1998):
Agricultural Trade Policies and Trade Relations in Transition Economies

No. 13 ELSNER, K., HARTMANN, M. (1998):
Convergence of Food Consumption Patterns between Eastern and Western Europe

No. 14 FOCK, A., VON LEDEBUR, O. (1998):
Struktur und Potentiale des Agraraußenhandels Mittel- und Osteuropas

No. 15 ADLER, J. (1998):
Analyse der ökonomischen Situation von Milchproduktionsunternehmen im Oblast Burgas, Bulgarien

No. 16 PIENIADZ, A., RUDOLPH, D. W., WANDEL, J. (1998):
Analyse der Wettbewerbsprozesse in der polnischen Fleischindustrie seit Transformationsbeginn

No. 17 SHVYTOV, I. (1998):
Agriculturally Induced Environmental Problems in Russia

No. 18 SCHULZE, E., TILLACK, P., DOLUD, O., BUKIN, S. (1999):
Eigentumsverhältnisse landwirtschaftlicher Betriebe und Unternehmen in Rußland und in der Ukraine – Befragungsergebnisse aus den Regionen Nowosibirsk und Shitomir

No. 19 PANAYOTOVA, M., ADLER, J. (1999):
Development and Future Perspectives for Bulgarian Raw Milk Production towards EU Quality Standards

No. 20 WILDERMUTH, A. (1999):
What Kind of Crop Insurance for Russia?

No. 21 GIRGZDIENE, V., HARTMANN, M., KUODYS, A., VAIKUTIS, V., WANDEL, J. (1999):
Industrial Organisation of the Food Industry in Lithuania: Results of an Expert Survey in the Dairy and Sugar Branch

No. 22 JASJKO, D., HARTMANN, M., MIGLAVS, A., WANDEL, J. (1999):
Industrial Organisation of the Food Industry in Latvia: Results of an Expert Survey in the Dairy and Milling Branches

No. 23 ELSNER, K. (1999):
Analysing Russian Food Expenditure Using Micro-Data

No. 24 PETRICK, M., DITGES, C. M. (2000):
Risk in Agriculture as Impediment to Rural Lending – The Case of North-western Kazakhstan

No. 25 POGANIETZ, W. R. (2000):
Russian Agri-Food Sector: 16 Months After the Breakdown of the Monetary System

No. 26 WEBER, G., WAHL, O., MEINLSCHMIDT, E. (2000):
Auswirkungen einer EU-Osterweiterung im Bereich der Agrarpolitik auf den EU-Haushalt
(steht nicht mehr zur Verfügung – aktualisierte Version DP 42)

No. 27 WAHL, O., WEBER, G., FROHBERG, K. (2000):
Documentation of the Central and Eastern European Countries Agricultural Simulation Model (CEEC-ASIM Version 1.0)

No. 28 PETRICK, M. (2000):
Land Reform in Moldova: How Viable are Emerging Peasant Farms? An assessment referring to a recent World Bank study

No. 29 WEINGARTEN, P. (2000):
Buchbesprechung: BECKMANN, V. (2000): Transaktionskosten und institutionelle Wahl in der Landwirtschaft : Zwischen Markt, Hierarchie und Kooperation

No. 30 BROSIG, S. (2000):
A Model of Household Type Specific Food Demand Behaviour in Hungary

No. 31 UVAROVSKY, V., VOIGT, P. (2000):
Russia's Agriculture: Eight Years in Transition – Convergence or Divergence of Regional Efficiency

No. 32 SCHULZE, E., TILLACK, P., GERASIN, S. (2001):
Eigentumsverhältnisse, Rentabilität und Schulden landwirtschaftlicher Großbetriebe im Gebiet Wolgograd

No. 33 KIELYTE, J. (2001):
Strukturwandel im baltischen Lebensmittelhandel

No. 34 Шульце, Э., Тиллак, П., Герасин, С. (2001):
Отношения собственности, рентабельность и долги крупных сельскохозяйственных предприятий в Волгоградской области

No. 35 HARTMANN, M., FROHBERG, K. (2001):
Konsequenzen der Integration im Agrar- und Ernährungssektor zwischen Beitrittsländern und der EU-15

No. 36 PETRICK, M. (2001):
Documentation of the Poland farm survey 2000

No. 37 PETRICK, M., SPYCHALSKI, G., ŚWITŁYK, M., TYRAN, E. (2001):
Poland's Agriculture: Serious Competitor or Europe's Poorhouse? Survey results on farm performance in selected Polish voivodships and a comparison with German farms

No. 38 HOCKMANN, H., KASHTANOVA, E., KOWSCHIK, S. (2002):
Lage und Entwicklungsprobleme der weißrussischen Fleischwirtschaft

No. 39 SCHULZE, E., TILLACK, P., PATLASSOV, O. (2002):
Einflussfaktoren auf Gewinn und Rentabilität landwirtschaftlicher Großbetriebe im Gebiet Omsk, Russland

No. 40 ШУЛЬЦЕ, Э., ТИЛЛАК, П., ПАТЛАССОВ, О. (2002):
Факторы, влияющие на прибыль и рентабельность крупных сельскохозяйственных предприятий в Омской области в России

No. 41 BAVOROVÁ, M. (2002):
Entwicklung des tschechischen Zuckersektors seit 1989

No. 42 FROHBERG, K., WEBER, G. (2002):
Auswirkungen der EU-Osterweiterung im Agrarbereich

No. 43 PETRICK, M. (2002):
Farm investment, credit rationing, and public credit policy in Poland
– A microeconometric analysis –

No. 44 KEDAITIENE, A., HOCKMANN, H. (2002):
Milk and milk processing industry in Lithuania: An analysis of horizontal and vertical integration

No. 45 PETRICK, M. (2003):
Empirical measurement of credit rationing in agriculture: a methodological survey

No. 46 PETRICK, M., LATRUFFE, L. (2003):
Credit access and borrowing costs in Poland's agricultural credit market: a hedonic pricing approach

No. 47 PETRICK, M., BALMANN, A., LISSITSA, A. (2003):
Beiträge des Doktorandenworkshops zur Agrarentwicklung in Mittel- und Osteuropa 2003

No. 48 SCHULZE, E., TILLACK, P., MOSASHWILI, N. (2003):
Zur wirtschaftlichen Situation georgischer Landwirtschaftsbetriebe

No. 49 ЛИССИТСА, А., БАБИЧЕВА, Т. (2003):
Теоретические основы анализа продуктивности и эффективности сельскохозяйственных предприятий

No. 50 ЛИССИТСА, А., БАБИЧЕВА, Т. (2003):
Анализ Оболочки Данных (DEA) – современная методика определения эффективности производства

No. 51 ЛИССИТСА, А., ОДЕНИНГ, М., БАБИЧЕВА, Т. (2003):
10 лет экономических преобразований в сельском хозяйстве Украины – Анализ эффективности и продуктивности предприятий

No. 52 LISSITSA, A., STANGE, H. (2003):
Agrarsektor im Aufschwung? Eine Analyse der technischen und Skalen-Effizienz der Agrarunternehmen

No. 53 VALENTINOV, V. (2003):
Social capital, transition in agriculture, and economic organisation: a theoretical perspective

No. 54 BORKOWSKI, A. (2003):
Machtverteilung im Ministerrat nach dem Vertrag von Nizza und den Konventsvorschlägen in einer erweiterten Europäischen Union

No. 55 KISS, P., WEINGARTEN, P. (2003):
Cost of compliance with the acquis communautaire in the Hungarian dairy sector

No. 56 WEINGARTEN, P., FROHBERG, K., WINTER, E., SCHREIBER, C. (2003):
Quantitative Analysis of the Impacts of Croatia's Agricultural Trade Policy on the Agri-food Sector

Die Discussion Papers sind erhältlich beim Institut für Agrarentwicklung in Mittel- und Osteuropa (IAMO).

The Discussion Papers can be ordered from the Institute of Agricultural Development in Central and Eastern Europe (IAMO).