DISCUSSION PAPER

Institute of Agricultural Development in Central and Eastern Europe

AGRICULTURAL AND FOOD TRADE IN CENTRAL AND EASTERN EUROPE: THE CASE OF SLOVENIAN INTRA-INDUSTRY TRADE

ŠTEFAN BOJNEC, MONIKA HARTMANN

DISCUSSION PAPER NO. 65
2004

Dr. Štefan Bojnec is an Associate Professor of Economics at the University of Primorska, Turistica – College of Tourism, and Faculty of Management.

Dr. Monika Hartmann is Professor for Market Research of the Agricultural and Food Sector at the Agricultural Faculty of the University of Bonn, Germany.

Mailing address:	University of Primorska, College of Tourism Obala 29 6320 Portorož, Slovenia
E-mail:	stefan.bojnec@turistica.si
Mailing address:	University of Bonn, Department of Agricultural and Food Market Research Nussallee 19 53115 Bonn, Germany
Phone:	+49-228 73 3538
Fax:	+49-228 73 3374
E-mail:	hartmann@agp.uni-bonn.de

ABSTRACT

One of the striking features in Central and Eastern European (CEE) countries is the deterioration of their agricultural and food trade balance during transition to a market economy as imports increased faster than exports or exports even declined. This paper investigates the Slovenian agricultural and food trade in more detail focusing on changes in the geographical distribution of trade and the nature of trade specialization on the basis of the Grubel-Lloyd Intra-Industry Trade index and Marginal Intra-Industry Trade Indices. The results indicate that Slovenian agricultural and food trade largely remains of the inter-industry type with specialisation of exports towards the former Yugoslav markets and imports from the European Union. The proportion of intra-industry trade was especially low for bulk commodities with little or no processing. A major explanations for these findings is that despite the "free" trade agreements Slovenia signed with the EU and countries of Central and Eastern Europe the level of protection in the agricultural and food sector has remained rather high. Due to EU membership Slovenia faces now direct competition in a market of 25 countries. This intensifies the restructuring process in the Slovenian agricultural and food sector. Due to the present low level of IIT this likely induces rather high adjustment costs since restructuring and reallocation of factors will have to occur between and not within industries.

ZUSAMMENFASSUNG

DER HANDEL MIT AGRAR- UND ERNÄHRUNGSGÜTERN DER MITTEL- UND OSTEUROPÄISCHEN LÄNDER – SLOVENIENS INTRA-INDUSTRIELLER HANDEL

Eine der bemerkenswertesten Entwicklungen im Transformationsprozess der mittel- und osteuropäischen Länder ist die Verschlechterung ihrer Agrarhandelsbilanz als Folge rasanter steigender Importe als Exporte oder aufgrund sinkender Exporte bei stagnierenden oder steigenden Importen. Gegenstand der vorliegenden Studie ist eine detaillierte Analyse von Veränderungen in der geographischen Verteilung des Handels als auch in der Art der Handelsspezialisierung in Hinblick auf den slowenischen Agrar- und Ernährungshandel. Die Analyse der Art der Handelsspezialisierung erfolgt auf Basis des Grubel-Lloyd Intra-Industriellen Handelsindex sowie Marginaler Intra-Industrieller Handelsindizes. Die Ergebnisse zeigen, dass Sloweniens Handel mit Agrar- und Ernährungsgütern nach wie vor primär inter-industrieller Natur ist. Dabei erweist sich die EU als wichtigstes Herkunftsland für die Importe Sloweniens, wogegen die Exporte des Landes vorrangig auf den Märkten des früheren Jugoslawiens abgesetzt werden. Intra-industrielle Handelsströme sind vor allem unbedeutend für landwirtschaftliche Produkte mit geringer oder keiner Verarbeitung. Eine wesentliche Erklärung für diese Resultate ist, dass trotz des Abschlusses verschiedener "Freihandelsabkommen" mit der EU und Ländern Mittel- und Osteuropas das Protektionsniveau für Agrar- und Ernährungsgüter nach wie vor sehr hoch ist. Als Mitglied der Europäischen Union sieht sich Slowenien nun unmittelbar dem Wettbewerb in einem Markt von 25 Ländern ausgesetzt. Dies wird den Restrukturierungsprozess im slowenischen Agrar- und Ernährungssektor verstärken. Auf Grund der geringen Bedeutung intra-industrieller Handelsströme wird dies zur Restrukurierung und zur Reallokation von Faktoren zwischen und nicht innerhalb von Branchen führen und damit relativ hohe Anpassungskosten induzieren.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

B&H   – Bosnia and Herzegovina
CEFTA   – Central European Free Trade Agreement
CEE   – Central and Eastern European
CEECs   – Central and Eastern European countries
EU   – European Union
FAO   – Food and Agricultural Organization of the United Nations
FYR   – Former Yugoslav Republic
GDP   – Gross Domestic Product
GLIIT   – Grubel-Lloyd intra-industry trade index
IIT   – Intra-industry trade
OECD   – Organization for Economic Cooperation and Development
SITC   – Standard International Trade Classification
USD   – United States Dollar
WTO   –World Trade Organization

1 INTRODUCTION

The collapse of the centrally planned economic and social systems in Central and Eastern Europe and the build up of market economies and democratic social orders has induced rapid and substantial changes in the agricultural and food trade environment. A reintegration of the Central and Eastern European Countries (CEEC) into the international market has taken place due to the membership of most CEECs in the World Trade Organization (WTO) as well as the signing of a large number of new trade agreements among the CEECs but also between countries of this region and Western countries. As a result of these developments trade patterns of the CEECs are predicted to shift.

This article presents some stylized facts on the development of agricultural and food trade in CEE countries since the beginning of the 90ies. However the main part of the study is devoted to an in-depth analysis of the adjustment in the geographical distribution of trade flows and the change in the nature of trade specialisation for one transition country, Slovenia. Trade theory suggests that economic development and economic integration, does not only foster trade in general but induces especially a rise in the share of intra-industry trade (IIT) (e.g. GREENAWAY AND MILNER, 1983; GREENAWAY AND TORSTENSSON, 1997; BRÜLHART AND HINE, 1999). Intra-Industry trade, the simultaneous export and import of products that are very close substitutes for each other in terms of factor inputs and consumption – is associated with imperfectly competitive product markets where scale economies in production and preference diversity are prevalent. Insights in the kind and the change of trade patterns are valuable since they provide information on potential welfare and adjustment implications following liberalisation and can be helpful in agribusiness planning. As inter-industry trade, intra-industry trade will induce gains from exchange and specialisation, however, due to different reasons. In IIT the gains from exchange are due to the greater product variety and thus depend heavily on preference diversity. The gains from specialisation are primarily derived from greater exploitation of scale economies and thus can primarily be reaped in industries where increasing returns are of high relevance. With respect to adjustment implication it is assumed that c.p. the higher the share of IIT in bilateral regional trade flows the lower the pressure for adjustment in the course of further liberalisation, as it is easier to alter product lines than it is to undertake restructuring and reallocation between industries. In terms of agribusiness strategies the prevalence of inter-industry trade for a product group indicates the relevance of cost efficiency, while the dominance of intra-industry trade reveals the importance of specialisation, product differentiation and brand specific marketing (GREENAWAY AND MILNER, 1987, p. 47; MCCORRISTON AND SHELDON, 1991, p. 174; QASMI AND FAUSTI, 2001, p. 255).

The country – Slovenia - and commodity - agricultural and food trade - focus is of interest for several reasons. First, Slovenia is worth to be looked at in more detail, because of its disintegration from the traditional former Yugoslav markets since 1991. It seems interesting to investigate whether traditional trade relations are nevertheless persistence e.g. due to common language, business networks and infrastructure as is argued in the literature (e.g. EICHENGREEN AND IRVIN, 1996; FRANKEL et al., 1997; DJANKOV AND FREUND, 2002). WYZAN (1999) already analyzed changes in overall Slovenian trade flows, and found a reorientation in trade with focus on the EU. We will concentrate in this paper on agricultural and food. Second, Slovenia has not only signed association agreements with the EU in 1998 but become a member of the Central European Free Trade Agreement (CEFTA) in 1996. The original objective of CEFTA member countries was to create a border-less single market including agriculture and food products. Due to higher prices for agricultural products in Slovenia compared to other CEFTA countries farmers in Slovenia feared that the removal of import tariffs induces a considerable increase in imports from CEFTA countries resulting in substantial welfare losses for Slovenian farmers. Thus, it is not surprising that Slovenian farmers and their organizations strongly

opposed Slovenian membership in CEFTA. However, after considerable broadening and deepening agricultural concessions in the CEFTA in the period up to 1998 thereafter liberalization slowed downed and was partly even reversed. Thus, it seems worthwhile to investigate e.g. whether these developments are reflected in the analysis. Third, the level of agricultural protection in Slovenia remains high. While there has been some shift in the structure of protection from market price supports to direct payments, the former have remained crucial in providing protection to agriculture, suggesting that the proclaimed integration into regional and world market was less profound than originally envisaged. The comparatively high level of protection close or even above the EU level (OECD, 2001) reveals that the agricultural and food sector is and likely will remain of special policy concern in the course of Slovenians integration efforts. Finally, Slovenia belongs to those CEECs that first entered the EU in May 2004. Thus, analysing the structure of Slovenian agricultural and food trade, with focus on the relevance of IIT can finally provide some information on e.g. expected structural adjustment pressure due to EU-accession.

The remainder of the paper is structured as follows. The next section provides a brief overview of studies on IIT focusing on transition countries. A description of trade development in CEECs in general and on the regional structure of Slovenian agricultural and food trade is given in section 4. In section 3 the methodology and data used are presented while the empirical results with respect to various average and marginal IIT indices are discussed in section 5. In the final section of the paper (section 6) conclusions and policy implications are drawn.

2   BRIEF LITERATURE REVIEW

During the last decade a number of empirical studies investigated the change in the level and structure of trade in transition economies (e.g., SMITH, 1994; BRENTON AND GROS, 1997). One of the key questions in these analyses were the changes in trade patterns after the collapse of the communist system, the role of free trade agreements in fostering trade reorientation, and the relevance of trade creation versus trade diversion (e.g. MAUREL AND CHEIKBOSSIAN, 1998; WYZAN, 1999; FIDRMUC AND FIDRMUC, 2000; DJANKOV AND FREUND, 2002). Unlike market type economies where IIT specialization was found to prevail (BALASSA, 1966; GRUBEL AND LLOYD, 1975; DRABEK AND GREENAWAY, 1984), trade between centrally planned economies was generally characterized by inter-industry specialization (PELZMAN, 1977; 1978). The significant growth in IIT flows of CEE countries in trade with the EU is reported as a reflection of the reorientation of trade from Eastern to Western markets (BRENTON AND GROS, 1997). ATURUPANE et al. (1999) analyzed different types of IIT and found that vertical IIT dominates horizontal IIT in trade between the CEE countries and the EU. VAN BERKUM (1999, 2002) investigated the sensitivity of IIT in agro-food products on foreign direct investments (FDIs) drawing attention on changing patterns and implications for East-West trade flows. BOJNEC (2001) analyzed patterns of IIT in main agricultural and food products for ten CEE countries that signed the Association Agreements with the EU in the first round. His results reveal that trade liberalization and the dismantling of trade barriers resulted in an increase of IIT in agricultural and food trade in CEECs, however to a different extent depending on the product and country considered. This paper adds to the existing literature by an in-depth analysis of the adjustment in the geographical structure and in the level of market integration of Slovenians agricultural and food trade using both IIT index and marginal IIT indicators at a rather disaggregated level. First, however, an overview on the development of agricultural and food trade in the CEECs in general and on the regional structure of Slovenian agricultural and food trade more specifically will be provided.

3 DEVELOPMENT OF TRADE IN CEE COUNTRIES

3.1 Stylized facts with respect to agricultural and food trade in CEE countries

The CEE countries have experienced similarities, but also differences in the development of agricultural and food trade patterns. One striking similarity across all CEE countries, but Romania,[1] is the deterioration in their agricultural and food trade balance, however due to different reasons (Table 1).

Bulgaria and Hungary are the only CEE countries with an agricultural and food trade surplus in 2002, however the level of surplus dropped over the period 1992 to 2002 due to a decline in exports and an increase in imports. These two countries are relatively abounded with natural land resources and internationally competitive particularly in crop production (e.g. EITELJÖRGE AND HARTMANN, 1999). In the group of the CEECs Hungary has been especially successful in attracting FDIs in the food-processing sector, which developed production for domestic and export markets in the region and thus is a further explanation for the considerable surplus in agricultural and food trade of this country.

Two groups of countries experienced a shift from net exporter to net importer of agricultural and food products. In the Czech Republic, Estonia, Latvia and Lithuania this occurred due to a much faster increase in imports than in exports. These countries are characterized by relative liberal import regimes. Before transition to a market economy, product differentiation in the food markets of the CEECs was rather limited. Although more varieties are generated in the meantime, due to a lack of competitiveness or consumer preferences for products not produced domestically imports have tremendously increased. Trade development in these countries is in accordance with theoretical expectations of growth in both exports and imports following liberalization and economic growth. It is also expected that trade flows of similar products will become more balanced and thus the share of IIT type trade will increase.

Also the FYR of Macedonia and Serbia and Montenegro are countries that had to bear a shift from being a net exporter to becoming a net importer. However, in these countries exports declined, while imports increased considerably. Especially, due to political instabilities in the Balkan region, traditional exports of agricultural and food products of these countries, such as fruit and vegetables from the FYR of Macedonia dropped significantly. In addition, this group of countries experienced for several products a considerable decline in domestic production and exports, which was substituted by imports. Due to delays in privatization and restructuring in the course of the transformation, the processing sector lacks international competitiveness. Considering that most trade in agricultural and food products is in processed products the processing sector is a main bottleneck for agri-food trade. As a result, the region turned out as a net importer of food.

The final group of countries, e.g. Albania, Bosnia and Herzegovina (B&H), Poland, Slovakia, Croatia, and Slovenia experienced an increase in their trade deficit with agricultural and food products. Especially, Albania and B&H are characterized by a low level of exports while imports amount to more than ten times of the export value in 2002, thus resulting in a rather high trade deficit. While in B&H the export value remained almost constant between 1992 and 2002, imports rose by 425 %. This development can be explained by the war and its consequences but also by the slow progress in privatization and restructuring of the former socially owned agrocombinats and food processing enterprises. In addition, the entry of new firms into

---

[1] Romanias deficit in agricultural and food trade slightly declined over the period 1992 to 2002, due to a more pronounced increase in exports than imports. Nevertheless, the trade deficits is in 2002 with 727 million US dollars still relatively large.

the market proceeded rather hesitantly. B&H exports potentials are limited and constrained additionally by institutional and competitiveness problems.

Poland and Slovakia on the other hand increased exports considerably, but with an even faster rise in imports trade deficit slightly grew. As discussed above this development pattern is more consistent with theoretical expectation following trade liberalization and economic growth. Croatia and Slovenia experienced an increase in trade deficit in agricultural and food products because exports declined and imports increased. While the Croatian export potential had been damaged by the war, this is less so for Slovenia. The evidence suggests a lack of export competitiveness. The situation of Slovenia will be analyzed in more detail in the following section.

Table 1:   CEE countries agricultural and food trade, 1992 and 2002 (million USD)

	1992		2002		Balance	
	Exports	**Imports**	**Exports**	**Imports**	**1992**	**2002**
Albania	15.8	270.1	25.5	297.4	-254.3	-271.9
Bosnia and Herzegovina	40.9	138.9	42.6	731.1	-98.0	-688.5
Bulgaria	902.6	350.9	672.8	546.9	551.7	125.9
Croatia	537.8	575.5	499.6	942.0	-37.7	-442.4
Czech Re-public*	1,146.4	1,117.5	1,375.6	2,220.8	28.9	-845.2
Estonia	56.3	49.4	397.0	695.5	6.9	-298.5
Hungary	2,643.5	675.8	2,634.8	1,285.8	1,967.7	1,349.0
Latvia	57.7	54.1	265.4	853.4	3.6	-588.0
Lithuania	199.8	145.4	542.9	626.8	54.4	-83.9
Macedonia, FYR	293.4	194.9	143.6	318.6	98.5	-175.0
Poland	1,846.5	1,952.0	3,014.5	3,470.4	-105.5	-455.9
Romania	289.9	1,105.0	462.0	1,188.7	-815.1	-726.7
Serbia and Montenegro	494.9	400.4	408.0	523.0	94.5	-115.0
Slovakia*	348.2	554.6	528.9	969.7	-206.4	-440.8
Slovenia	448.7	611.1	401.8	732.8	-162.4	-331.0

Note: * 1993 data.

Source: Compiled on the basis of data from FAO (2004).

3.2 Analysis of Slovenian regional structure of total trade

Patterns in trade geography are influenced by factors such as geographical proximity, historical and cultural linkages between countries but also by political and economic factors (e.g. KRUGMAN, 1991; GREENAWAY AND TORSTENSSON, 1998). With the economic decline in the former Yugoslav economy during the 1980s, Slovenia started to diversify its trade. The former Yugoslav markets lost in this process in importance while some other, particularly Western markets gained in relevance (e.g. WYZAN, 1999). Reorientation of Slovenian exports were more substantial for non-food manufacturing goods than for agricultural and food products. Agricultural and food imports from outside the former Yugoslav markets were hindered by a

high level of special import levies. Due to these protectionist measures and the geographical proximity, inter-republican agricultural and food trade remained dominant. The reorientation of Slovenians non-agricultural and food trade was in contrast eased because former Yugoslavia concluded several trade and cooperation agreements with Western countries during the 1970s and the 1980s. Besides trade itself, these agreements were important for e.g. scientific and technical cooperation and fostered joint ventures with Western enterprises. With the rising instabilities in the economic and political system and the final independence from former Yugoslavia the orientation towards the Western market gained further in importance.

Thus, already in 1992, most of Slovenian trade was oriented to the EU with 61 percent of total exports and 60 percent of total imports (Table 2). Up to 1999, these shares increased further to 66 percent and 69 percent, respectively. However, most recently between 2000 and 2001, these shares declined to 62 percent for exports and to 68 percent for imports.

Over the period 1992 to 1999, the relevance of the traditional former Yugoslav markets as destination for and origin of Slovenian trade dropped considerably from 23 percent to 15 percent and from 20 percent to 6 percent, respectively.[2] However, between 2000 and 2001 an increase in exports to the former Yugoslav markets took place due to the political and economic stabilization of the Balkan region.

Only minor changes could be observed with respect to the shares of other OECD countries, other CEE countries and the rest of the world in total Slovenian imports and exports over the period 1992 to 2001. However, it is interesting to note that while the import and export shares of all other CEE countries remained stable or even showed a minor declining tendency over the period 1997 to 2001 the importance of the CEFTA countries as trade partners for Slovenia slightly increased. This is an indication that the membership of Slovenia in CEFTA has induced trade creation in this trading zone at least with respect to total trade. Slovenian trade geography in 2001 is presented in Figure 1 which clearly reveals the crucial importance of Slovenian trade with the EU-15.

---

[2]   The decline in trade between Slovenia and the other parts of former Yugoslavia was already recorded at the end of the 1980s and thus before the collapse of former Yugoslavia (see also WYZAN, 1999). During that time first barriers hindering inter-republican trade were introduced additionally inducing an economic slowdown. With the collapse of the former Yugoslavia in 1991 inter-republican exchange of goods and services was further hampered by the implementation of a wide range of trade barriers and due to deep economic and political instabilities and war consequences in the region. The increased stability of the Balkan region since the end of the 1990's is reflected in a rise in interregional trade flows.

Table 2:   Slovenian trade and trade in agricultural and food products by region, 1992-2001

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total exports (million USD)	6,681.2	6,082.9	6,827.9	8,315.8	8,309.8	8,368.9	9,050.6	8,545.9	8,732.2	9,252.4
% by region										
- EU-15	60.8	63.2	65.6	67.0	64.6	63.6	65.5	66.1	63.9	62.2
- Other OECD	5.3	6.4	6.1	5.4	5.1	5.2	5.3	5.8	6.1	5.2
- Former Yugoslavia	22.6	15.9	15.2	14.6	16.7	16.6	15.4	15.2	15.6	16.9
- Other CEE countries	7.3	10.3	9.6	9.8	10.6	11.4	10.4	9.8	11.2	12.5
Of which CEFTA						6.2	6.7	7.2	7.9	8.0
- Rest of the world	4.0	4.2	3.5	3.2	3.1	3.2	3.4	3.1	3.2	3.2
Agricultural and food exports (million USD)	427.6	284.4	324.0	315.2	336.8	311.6	331.7	320.9	315.5	331.0
% by region										
- EU-15	31.9	34.8	30.0	26.8	23.3	24.5	28.4	28.6	21.1	16.9
- Other OECD	2.9	5.5	5.1	5.4	5.4	5.5	8.1	8.1	8.3	5.7
- Former Yugoslavia	54.2	47.5	53.3	57.6	62.1	60.2	55.1	56.1	61.0	67.9
- Other CEE countries	7.9	9.8	9.2	9.4	8.6	9.2	7.1	5.6	5.1	5.3
Of which CEFTA						3.0	3.2	3.5	2.7	2.7
- Rest of the world	3.1	2.4	2.4	0.8	0.6	0.6	1.3	1.6	4.5	4.1
% of total exports	6.4	4.7	4.7	3.8	4.1	3.7	3.7	3.8	3.6	3.6
Total imports (million USD)	6,141.0	6,501.0	7,303.9	9,491.7	9,421.4	9,366.5	10,110.9	10,082.6	10,115.8	10,147.6
% by region										
- EU-15	59.6	65.6	69.2	68.8	67.5	67.4	69.4	68.9	67.8	67.7
- Other OECD	6.7	7.7	8.0	8.3	8.9	8.8	9.3	9.5	8.8	8.1
- Former Yugoslavia	19.8	10.7	8.0	7.1	7.5	6.3	5.9	5.7	5.9	5.3
- Other CEE countries	9.4	9.0	9.2	10.2	9.4	10.8	9.9	10.4	11.7	12.7
Of which CEFTA						6.3	7.7	8.4	9.1	9.5
- Rest of the world	4.5	6.9	5.6	5.6	6.7	6.7	5.5	5.5	5.8	6.2
Agricultural and food imports (million USD)	528.7	523.5	603.2	700.7	700.0	660.0	636.7	602.4	577.3	595.1
% by region										
- EU-15	28.8	44.3	53.4	50.5	48.5	49.8	54.6	51.9	51.5	52.3
- Other OECD	2.8	6.3	5.8	6.7	7.4	6.1	5.0	6.5	5.4	4.7
- Former Yugoslavia	42.5	23.1	14.2	14.0	13.8	11.6	12.2	11.0	10.2	10.1
- Other CEE countries	15.1	11.0	11.8	15.3	14.4	16.4	14.1	17.5	18.5	19.1
Of which CEFTA						16.3	13.9	17.4	18.3	18.8
- Rest of the world	10.8	15.3	14.8	13.5	15.9	16.1	14.1	13.1	13.7	13.7
% of total imports	8.6	8.1	8.3	7.4	7.4	7.0	6.3	6.0	5.7	5.9
Balance in total trade (million USD)	540.2	-418.1	-476.1	-1,175.9	-1,111.6	-997.6	-1,060.3	-1,536.7	-1,383.7	-895.2
By region										
- EU-15	406.4	-418.8	-572.0	-957.0	-993.5	-992.6	-1,088.9	-1,295.4	-1,275.8	-1,107.7
- Other OECD	-57.7	-114.9	-168.8	-339.5	-410.4	-388.6	-465.8	-457.1	-364.4	-349.4
- Former Yugoslavia	289.4	268.5	456.0	537.8	675.7	792.6	804.5	723.5	769.3	1,023.6
- Other CEE countries	-93.3	39.4	-14.7	-151.1	-8.1	-51.1	-53.0	-214.0	-204.8	-129.3
Of which CEFTA						-203.2	-170.0	-228.9	-227.9	-225.6
- Rest of the world	-4.7	-192.3	-176.6	-266.2	-375.2	-357.9	-257.2	-293.7	-308.0	-332.3
Balance in agriculture and food trade (million USD)	-101.1	-239.1	-279.2	-385.5	-363.2	-348.4	-305.1	-281.5	-258.0	-264.1
By region										
- EU-15	-15.9	-133.0	-225.1	-269.8	-260.9	-252.4	-253.6	-220.6	-230.5	-255.2
- Other OECD	-2.2	-17.4	-18.5	-29.8	-33.8	-23.1	-4.7	-12.8	-5.2	-9.0
- Former Yugoslavia	7.0	14.3	86.9	83.7	112.4	110.8	105.5	113.6	133.5	164.5
- Other CEE countries	-46.1	-29.6	-41.3	-77.6	-71.3	-79.6	-66.5	-87.4	-90.9	-96.1
Of which CEFTA						-98.6	-78.5	-93.6	-97.0	-102.9
- Rest of the world	-43.9	-73.4	-81.2	-92.1	-109.6	-104.1	-85.6	-74.1	-64.7	-68.0

Note: Trade in agricultural and food products consists of the SITC positions from 00111 bovine animals to 22390 flour meal from oilseeds, excluding the SITC position 21 hides, skins, and furskins.

Source: Own calculations on the basis of data from the STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA by individual years 1992-2001.

3.3 Analysis of Slovenian regional structure of agricultural and food trade

Already during the former Yugoslav times, Slovenia was a net importer of agricultural and food products. During this period Slovenia imported primarily agricultural raw products, particularly cereals, from Croatia and Serbia, and exported processed food products to the former Yugoslav markets. After Slovenian independence considerable changes in trade flows occurred. The former Yugoslav markets lost their relevance as a source of raw materials, while the EU and the CEFTA countries (e.g. Hungary) gained in importance. At the same time Slovenia experienced a marked drop of agricultural and food exports from USD428 million in 1992 to USD331 million in 2001 and an increase of imports from USD529 million in 1992 to

USD595 million in 2001 leading to a deterioration of the agricultural and food trade balance (Table 2).[3] While agricultural and food exports are decreasing, Slovenian total export of goods in current USD showed a rising tendency leading to a decline of the share of agriculture and food in total exports from 6.4 percent in 1992 to 3.6 percent in 2001. On the other hand, total imports rose much faster than agro-food imports. Thus, while agricultural and food products accounted for a share in total imports of 8.6 percent in 1992, this share dropped to 5.9 percent in 2001. This indicates faster growth of non-food trade, but also a lack and further deterioration of Slovenian international competitiveness in agricultural and food products.

Figure 1:   **Slovenian trade geography, 2001 (Million USD)**
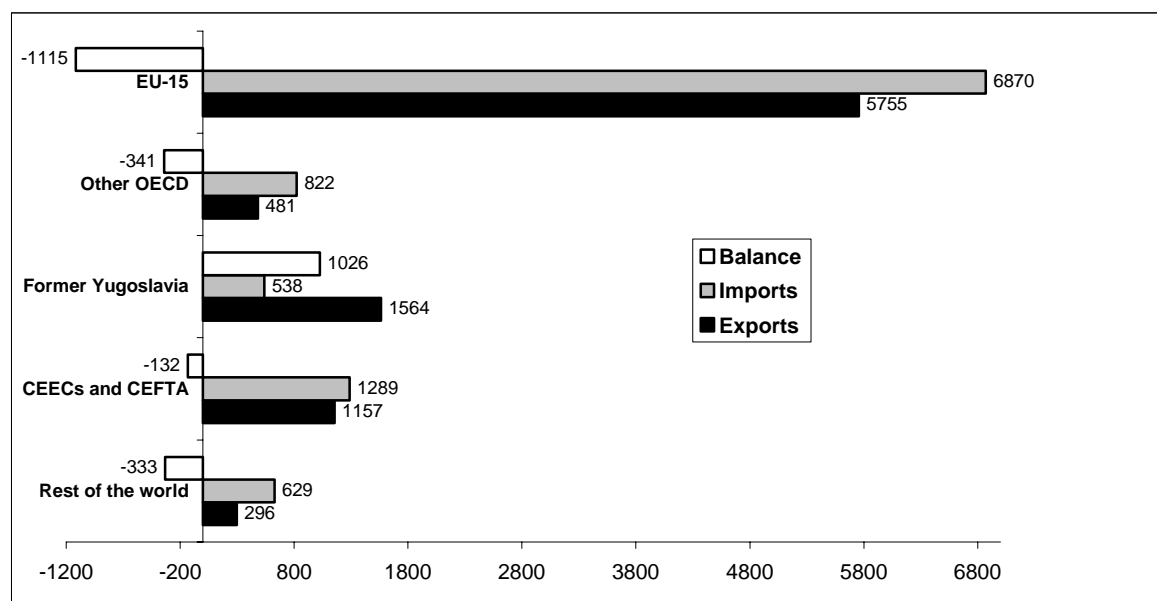
Source: Own calculations on the basis of data from the STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA.

While trade flows in industrial goods between Slovenia and the EU are relative symmetric, this is much less so for agricultural and food trade. About two-thirds of total Slovenian export is directed to the EU, while with respect to agricultural and food products this share amounts to only 17 percent in 2001 (see Figure 2). The relevance of the EU as a destination for Slovenian agro-food commodities fluctuated over the period 1992 to 2001, reaching its peak with 35 percent in 1993 and falling to a low of 23 percent in 1996 and 17 percent in 2001 (see Table 2). Despite of trade disintegration, more than half of Slovenian agricultural and food exports is directed to the former Yugoslav republics. This share ranged between 48 percent in 1993, 62 percent in 1996 and 68 percent in 2001. This clearly indicates the maintained historical trade linkages that continue also after the border and trade barriers had been introduced. With the stipulation of bilateral free-trade agreements between Slovenia and the former Yugoslav states particularly since the second half of the 1990s, Slovenian agricultural and food exports to these markets gained special preferences making them again more attractive vis-à-vis other competitors from the region. However, with the entry into the EU this preferential trade status of Slovenia is abolished. Slovenia has the same status with respect to the former Yugoslav markets as other EU members. This is likely to reduce Slovenian export competitiveness in the former

---

[3]   Agricultural and food products in which Slovenia is a major net exporter are milk and dairy products, poultry and processed poultry products, hops, and partly fruit juices, wine and some other processed products. Domestic production is close to a market balance for beef, pork, potatoes, apples, some other fruit and vegetables during season. A substantial percentage of other agricultural and food products, particularly cereals, rice, sugar, as well as some vegetables and fruit are imported (see also OECD, 2001).

Yugoslav markets in general, and particularly in agricultural and food products, where trade preferences had been among the most important. The share of total agricultural and food products going to other OECD countries more than doubled over the period 1992 to 2001, albeit from a low level while other CEE countries lost in relevance as a destination for Slovenian agro-food exports. This, however, does not hold for the CEFTA countries (Table 3). Between 1997 and 1999 their share in Slovenian agricultural and food exports showed a slight increase, but declined after then. This might be a reflection of the new protectionist developments among CEFTA countries by the end of the 90ies as already mentioned above. Thus, while in 1999, the CEFTA-6 countries (Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia) accounted for 3.5 percent of Slovenian agricultural and food exports, this share reached only 2.7 percent in 2001. In this group Romania (0.8 percent) and the Czech Republic (0.6 percent) are the single most important target for Slovenian agricultural and food products. With EU membership Slovenian trade is ruled by EU trade policies. Thus, preferential agreements of Slovenia with Non-EU members in the framework of CEFTA, e.g. Romania do no longer exist.

Figure 2:   Slovenian agricultural and food trade geography, 2001 (Million USD)

Source: Own calculations on the basis of data from the STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA.

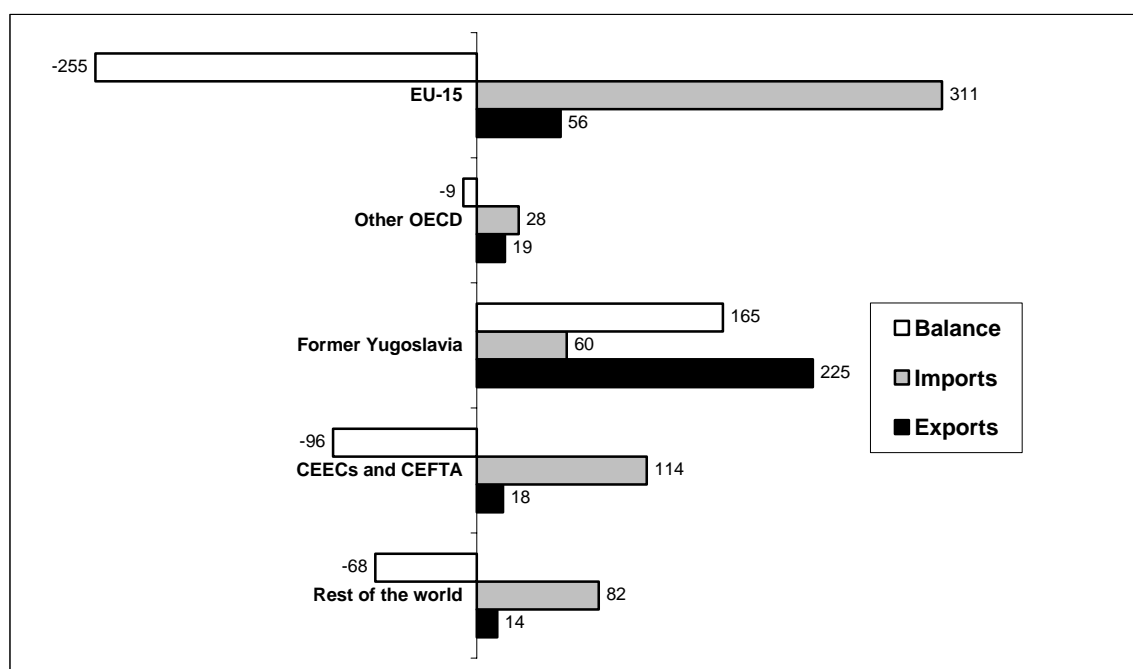While the former Yugoslav republics are still of considerable relevance as a market for Slovenian agro-food products their importance as a source of these imports sharply declined from 43 percent in 1992 to 10 percent in 2001 (see Table 2). Due to instabilities in these markets, there had been a shortage of agricultural and food products previously exported to Slovenia and consequently, Slovenia has substituted those by imports from the EU and to a much lesser extent by imports from CEFTA countries. The share of agricultural and food imports originating from the EU expanded considerably reaching 52 percent in 2001, thus making the EU the main foreign supplier of agricultural and food products to the Slovenian market. Among the CEFTA countries, the neighboring export oriented Hungary is by far the most important source of Slovenian agricultural and food imports. Also the relevance of other OECD countries, CEE countries and the rest of the world as an origin for Slovenia's agricultural imports show an increasing trend.

Table 3: **Slovenian agricultural and food trade with CEFTA Countries, 1997-2001**

	1997	1998	1999	2000	2001
Agricultural and food exports (million USD)	311.6	331.7	320.9	315.5	331.0
% of which CEFTA countries	3.0	3.2	3.5	2.7	2.7
- Bulgaria	0.2	0.1	0.2	0.1	0.0
- Czech Republic	1.2	1.3	1.1	0.9	0.6
- Hungary	0.7	0.3	0.4	0.5	0.4
- Poland	0.2	0.1	0.4	0.2	0.4
- Romania	0.3	0.6	0.8	0.5	0.8
- Slovak Republic	0.5	0.8	0.7	0.5	0.4
Agricultural and food imports (million USD)	660.0	636.7	602.4	577.3	595.1
% of which CEFTA countries	16.3	13.9	17.4	18.3	18.8
- Bulgaria	0.1	0.1	0.2	0.1	0.2
- Czech Republic	1.0	1.1	1.3	1.4	1.5
- Hungary	13.6	10.4	13.3	14.0	14.1
- Poland	0.8	1.1	1.6	1.9	2.0
- Romania	0.6	0.7	0.5	0.4	0.5
- Slovak Republic	0.2	0.5	0.5	0.5	0.5
Balance in agriculture and food trade (million USD)	-348.4	-305.1	-281.5	-258.0	-264.1
of which CEFTA countries	-98.6	-78.5	-93.6	-97.0	-102.9
- Bulgaria	-0.1	-0.5	-0.4	-0.6	-1.0
- Czech Republic	-3.3	-2.5	-4.1	-5.5	-6.6
- Hungary	-87.9	-65.5	-79.2	-79.0	-82.7
- Poland	-4.4	-6.5	-8.1	-10.0	-10.8
- Romania	-3.1	-2.7	-0.8	-0.7	-0.4
- Slovak Republic	0.2	-0.8	-1.0	-1.1	-1.5

Note: Agricultural and food trade consists of the SITC positions from 00111 bovine animals to 22390-flour meal from oilseeds, excluding the SITC position 21 hides, skins, and furskins.

Source: Own calculations on the basis of data from the STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA.

As mentioned above Slovenian agricultural and food trade balance is traditionally negative. With a share of between 18 percent and 59 percent agricultural and food products account for a considerable share of the total trade deficit in the period 1993 to 2001. In 2001 the agro-food trade deficit amounted to USD264 million (see Table 2 and Figure 2). Among the five regions analyzed in this paper, Slovenia was only able to realize an export surplus in agricultural and food products with the former Yugoslav republics.[4] With all other regions a negative trade balance for agricultural and food products was detected over the period 1992-2001. The

---

[4] The Slovenian surplus in trade with the former Yugoslav markets may deteriorate upon Slovenian accession to the EU. The stipulated bilateral free trade agreements between Slovenia and the individual states of the Former Yugoslavia are replaced by the common EU trade policies. The bilateral free-trade agreements of Slovenia with Croatia, FYR of Macedonia and B&H permitted Slovenia preferential access to these Former Yugoslav markets and vice versa. These bilateral free trade agreements are abolished with Slovenian membership in the EU on 1st May 2004. The EU has signed with these countries of the Southern Balkan as well preferential trade agreements that now also rule Slovenian trade with this region. However, concessions differ in some cases considerably to the prior situation; e.g. the preferential quota of the EU to access the Croatian milk market is set at 3,300 tons, while the similar Slovenian preferential quota with Croatia used to be 12,500 tons.

trade deficit is especially pronounced with the EU and with the CEFTA countries. In the latter group the unbalance in trade is particularly great with Hungary. Slovenia seems to lack competitiveness in agricultural and food products relative to the EU-15 and several CEE markets in the region. Agricultural, particularly crop production in Slovenia is constrained by unfavorable natural and structural conditions. Relatively small farms and high production costs constrain international competitiveness of the sector. The food-processing sector was highly protected in the past from foreign competition and primarily oriented towards the domestic markets and the traditional markets in the former Yugoslavia. With EU integration the food-processing sector is challenged by the increased competition. This very likely will provide additional incentives for imports. However, EU membership also eases access for Slovenian firms to the large market of the EU-25 and thus might provide opportunities for Slovenian exports for some products.

4 METHODOLOGY AND DATA

To investigate the level and the development of Slovenians external market integration we use indicators that measure the level of IIT at various points in time and marginal IIT indicators. With trade liberalization and economic growth, trade theory suggests, that intra-industry trade will increase implying external market integration. In case, that the degree of integration is already relatively high (e.g. greater than 50 %), induced structural adjustment costs tend to be lower, and vice versa.

Several indices to measure IIT have been proposed in the literature. The most widely used formula is the GRUBEL AND LLOYD (1975) intra-industry trade (GLIIT) index. It is defined as the share of IIT of product i in total trade of product i between regions l and k:

$$(1) \qquad GLIIT_{l,k,i} = (1 - \frac{\left| X_{l,k,i} - M_{l,k,i} \right|}{X_{l,k,i} + M_{l,k,i}}) * 100 ,$$

where X refers to exports and M to imports. The index takes values between 0 and 100. If a region l does not simultaneously export and import the considered product i from the other region k the GLIIT is equal to 0. In this case trade in product i is exclusively of the inter-industry type. In contrast, a GLIIT of 100 reflects the situations where the value of export and import flows of the considered product i are identical for regions l and k. In this case these regions are very well integrated and trade liberalization tends to result in low structural adjustment costs.

To arrive at meaningful results the calculations for the IIT should be carried out at a disaggregated level. However, results are generally presented at a rather aggregated level. The share of IIT at the aggregate level[5] j is defined as the weighted average of the product indices in (1) for the individual product i, with the weights being based on the share of the specific product i in total trade of the aggregate j:

$$(2) \qquad GLIIT_{l,k,j} = (1 - \frac{\sum_{i} \left| X_{l,k,i} - M_{l,k,i} \right|}{\sum_{i} (X_{l,k,i} + M_{l,k,i})}) * 100 .$$

The GLIIT index as defined in equations (1) for the individual product i and (2) for the weighted aggregate j provides information on the composition of trade flows in each year.

---

[5] Aggregation can occur at different levels. It can encompass all trade of a sector or even a country but it can also be limited to all trade belonging into a product category, e.g. milk products.

A comparison of the GLIIT over time indicates how this structure has changed (THOM AND MCDOWELL, 1998). However, in cases where the focus of the analysis is on structural adjustment implications due to trade disintegration and liberalization it seems not sufficient to calculate the degree of IIT at different points in time but to analyze the pattern of change in trade flows in a certain period of time. Most common approach to do this is the calculation of marginal IIT, which is calculated between two different years or two different periods. Several indicators to measure marginal IIT have been proposed in the literature (see GREENAWAY AND TORSTENSSON, 1997). In this article the GRUBEL-LLOYD style indicators of marginal IIT, first introduced by BRÜLHART (1994) will be used. According to BRÜLHART marginal IIT can be calculated as follows:

(3)
$$A_{l,k,i} = (1 - \frac{\left|(X_{l,k,i}^{t} - X_{l,k,i}^{t-n})\right| - \left|M_{l,k,i}^{t} - M_{l,k,i}^{t-n}\right|}{\left|X_{l,k,i}^{t} - X_{l,k,i}^{t-n}\right| + \left|M_{l,k,i}^{t} - M_{l,k,i}^{t-n}\right|}) * 100$$

$$A_{l,k,i} = (1 - \frac{\left|\Delta X_{l,k,i} - \Delta M_{l,k,i}\right|}{\left|\Delta X_{l,k,i}\right| + \left|\Delta M_{l,k,i}\right|}) * 100$$
,

where t refers to a particular year and n standing for the number of years separating the two points in time relevant for the analysis. Just like the GLIIT index in equations (1) and (2), the marginal "A" IIT index can take values between 0 and 100. An "A" value of 0 (100) indicates that marginal trade of region l with region k in the considered product i is completely of the inter-industry (intra-industry) type. Similar like for the GLIIT in equation (2), the aggregation of the marginal "A" IIT index over several products/a sector/the whole economy is conducted using the trade weights. The following formula is used in the aggregation procedure as suggested by BRÜLHART (1994):

(4)
$$A_{l,k,j} = \sum_{i} w_{l,k,i} A_{l,k,i}$$
,

where $w_{l,k,i}$ are the appropriate trade weights:

(5)
$$w_{l,k,i} = \frac{\left|\Delta X_{l,k,i}\right| + \left|\Delta M_{l,k,i}\right|}{\sum_{i} (\left|\Delta X_{l,k,i}\right| + \left|\Delta M_{l,k,i}\right|)}$$
,

By analyzing the structure of trade changes between two different points/periods in time, the marginal "A" IIT index provides information on the relevance of IIT in total trade changes. A high value for "A" indicates that trade-induced factor reallocation and efficiency improvements occur within rather than between sectors, which is an indication for low adjustment costs. [6]

However, the marginal IIT index "A" provides little information on sectoral performance. To capture the distribution of trade-induced gains and losses BRÜLHART (1994) suggested an alternative indicator "B"

(6)
$$B_{l,k,i} = \frac{\Delta X_{l,k,i} - \Delta M_{l,k,i}}{\left|\Delta X_{l,k,i}\right| + \left|\Delta M_{l,k,i}\right|} * 100 ,$$

---

[6] In this paper we do not explicitly analyze structural adjustment costs induced by trade liberalization. Such costs will not only differ depending on the degree of external integration but will also depend e.g. on the sector/product group analysed.

where $|B_{l,k,i}| = 1 - A_{l,k,i}$.

The "B" indicator is bounded by minimum -100 and by maximum 100. If "B" equals 0, marginal trade is entirely of the IIT type while a value for "B" of 100 or -100 reflects that marginal trade is completely of the inter-industry type. However, unlike the "A" measure, this index provides not only information on the relevance of marginal IIT but also on product/sector specific performance of the considered country or region. A greater increase (smaller decrease) in exports than in imports can be considered as good (bad) domestic performance, thus, a "B">0 indicates a positive economic development of the considered product while the opposite holds for "B"<0. One shortcoming of the "B" index is that it cannot be meaningful aggregated across products.[7] One way to overcome this problem and obtain a summary statistic resulting from the calculations of the disaggregated product i level is by summing up separately the number of products i of the aggregate j for which holds "-100≤B<-50", "-50≤B≤50" and "50<B≤100". The second group "-50≤B≤50" refers to those products, where marginal IIT dominates, while the first "-100≤B<-50" and third group "50<B≤100" characterize those products where inter-industry trade change prevails. However, while the first group covers those products that reflect a weak performance, the vise versa holds for the third group. This procedure has been applied in the empirical part of the paper.

The trade data used in the empirical analysis are from the Statistical Office of the Republic of Slovenia. They are classified according to the five-digit Standard International Trade Classification (SITC) scheme. For each product we obtained information on Slovenian export and import flows with respect to the following regional specification: EU-15;[8] other OECD countries;[9] former Yugoslav Republics; CEFTA and other CEE countries, and the rest of the world. The aggregate "CEFTA and other CEE countries" is for the period 1997-2001 further distangled, providing information on Slovenian agro-food import and export flows with each of the CEFTA countries (Hungary, Poland, Czech Republic, Slovakia, Bulgaria, and Romania) and with the other CEE countries. The empirical results with respect to the various IIT indices introduced in this section are presented in section 5.

5 RESULTS ON IIT AND MARGINAL IIT

5.1 Degree of IIT by individual years and trade partners

This section investigates the degree and structure of IIT with respect to Slovenians agricultural and food sector for the years 1992 to 2001. For this reason the GLIIT index as defined in equation 1 has been calculated at the 5-digit SITC level and then aggregated to the 1-digit and 2-digit level according to equation 2. The results are presented in Table A1 in the Appendix and summarized in Table 4 for 2001 for the world as a whole and for Slovenians most important agricultural trading partners, the countries of former Yugoslavia, the EU-15 and the

---

[7] Assume "B" equals -100 for product m and 100 for product n. Assuming that the absolute level of marginal IIT is equal for both products, the weighted average of the two products would result in a "B" value of 0. This indicates a high level of marginal IIT although marginal trade for both products was completely of the inter-industry type.

[8] The EU-15 covers the previous EU-15 members (before the enlargement towards the East on 1st May 2004), including Austria, Sweden and Finland over the whole period 1992-2001.

[9] The group "other OECD countries" slightly changed over time. It covers the countries Australia, Canada, Iceland, Japan, New Zealand, Norway, Switzerland, Turkey and the United States for the years 1992 and 1993. Since 1994 Mexico and since 1997 South Korea is additionally considered in this aggregate. However, both countries are of little relevance in the agricultural and food trade of Slovenia. Thus, the change in the country coverage of this region will very likely be of little relevance for our results.

CEECs.[10] The results reveal a GLIIT value for the commodity aggregate "All agricultural and food products" of 13.4 %, indicating that 86.6 % of total trade in this sector is of the inter-industry type.[11] Especially trade with the region "CEFTA and other CEECs" (3.1 %) is almost exclusively of the inter-industry type while with the countries of former Yugoslavia a share of 22.1 % has been of the IIT type in 2001. This proportion of IIT, although much higher than for the other regions considered in the analysis, is still very low, considering the fact that prior to 1991 Slovenia and those countries belonged to the common Yugoslav market. The GLIIT index for "All agricultural and food products" amounts to 11.5 % for trade with the EU-15.

While the relevance of IIT is in general low, it nevertheless varies among the different sub-sectors and trade partners. Comparatively higher values for the GLIIT index are revealed for "sugar, honey and preparations" (SITC 06), "miscellanies edible products" (SITC 09), "beverages" (SITC 11) and "tobacco products" (SITC 12), and thus primarily for those branches producing high value processed food products with a high level of product variation. In contrast especially the sub-sectors at the first level of processing such as "live animals" (SITC 00), "meat and meat preparations" (SITC 01) and "cereals and cereal preparation" show rather low GLIIT values. This outcome is in accordance with economic theory, since IIT is, ceteris paribus, expected to be higher in sectors with high product differentiation. From these results it can be concluded that adjustment costs following further trade liberalisation tend to be more pronounced in the latter than in the former food branches.

For most sub-sectors the importance of IIT is highest in the exchange with the countries of former Yugoslavia ("cereals and cereal preparations", "vegetables and fruits", "sugar, honey and preparations", "miscellanies edible products"), for some product aggregates it is the exchange with the EU that reveals the highest share of IIT (animal feeds, beverages).

In general the results indicate a fairly low external integration of Slovenian agricultural and food sector suggesting relatively high trade induced adjustment costs following a further liberalisation.

---

[10] Agricultural trade flows with other regions is not analyzed in detail in this and the following sections because it has been of minor relevance. The low and fluctuating level of trade with those regions also leads to very erratic values for the IIT over time and for the MIIT indicators presented in this paper. E.g. in 1994, exports of live animals to the other OECD countries amounted to $7 thousand, while imports reached a value of $15 thousand resulting in an GLIIT of GLIIT 66.1 %. Since for the other years only imports are recorded the GLIIT indices in those years equal zero. Thus, such an analysis is of little value.

[11] The prevalence of the high level of inter-industry trade in Slovenian agricultural and food sector is partly owed to its strong net import position for these products.

Table 4:   **The GLIIT-Index in agricultural and food products in Slovenia at the weighted one- and two-digit SITC levels, 2001**

	World	of which		
		EU-15	Former Yugoslavia	CEE countries
Agricultural and food trade	13.4	11.5	22.1	3.1
SITC 00 – live animals	8.3	31.7	9.5	0.3
SITC 01 – meat and meat preparations	5.7	8.6	5.6	1.0
SITC 02 – dairy and eggs	13.3	16.7	12.9	7.4
SITC 03 – fish and fish products	8.1	3.9	32.7	0.0
SITC 04 – cereals and preparations	10.9	10.6	37.9	1.9
SITC 05 – vegetables and fruits	5.7	5.1	15.3	5.4
SITC 06 – sugar, honey and preparations	32.1	33.5	47.2	5.7
SITC 07 – coffee, tea, cocoa and spices	14.2	5.0	76.0	4.5
SITC 08 – animal feeds	10.4	27.8	6.0	1.6
SITC 09 – miscellanies edible products	27.5	7.0	53.7	3.3
SITC 11 – beverages	15.8	26.7	12.2	14.6
SITC 12 – tobacco products	30.1	9.7	60.8	0.0
SITC 22 – oil seeds	20.9	24.8	70.3	14.9

Note: The weighted average of the SITC from 00111 bovine animals to the SITC 22390 flour meal from oil-seeds, excluding the SITC 21 hides, skins, and furskins. CEE countries include CEFTA and other CEE countries. For the calculation of the GLIIT-Index see equations 1 and 2 and the corresponding expositions in the text.

Source: Own calculations.

5.2 Comparison of GLIIT indices between two points in time

It is conceived that the share of IIT in total trade increases with economic development and economic integration. For this reason the GLIIT index is compared between three points in time. To smooth for annual fluctuation in trade flows two-year averages 1995-1996, 1998-1999, and 2000-2001 are taken, respectively. The results are summarized in Table 5.

The share of IIT in Slovenian agricultural and food trade with the world increased on average over the years 1995/96 to 1998/99 by 3.2 % points while it declined over the period 1998/99 to 2000/01 by 3.5 % points and thus even to a greater extent. The same pattern, albeit to a different extent is revealed for trade with the EU, the countries of former Yugoslavia and the CEECs. These results are surprising given the fact, that Slovenia experienced over the period analysed real GDP growth rates of between 3.5 and 5.0 % p.a. and signed the Free Trade Agreement with the CEFTA countries and the Association and the Double Zero Agreement with the EU. Thus, neither those political decisions nor the economic development resulted in an increase of the level of IIT. These results confirm the presumption that the changes in the trade conditions due to the different free-trade agreements were much smaller than often expected, since Slovenia enjoyed a favourable trading regime already during the 1970s and 1980s with the EU, and agricultural and food trade liberalisation with new CEFTA markets was much smaller with respect to the agricultural and food sector than it was envisaged initially.

Table 5: **GLIIT-Index for Slovenian agricultural and food trade by regional distribution**

	GLIIT (in percent)			Change of GLIIT in percentage-points		
	1995-96	**1998-99**	**2000-01**	**1998/99 to 1995/96**	**2000/01 to 1998/99**	**2000/01 to 1995/96**
Agricultural and food trade of which	14.6	17.8	14.3	3.2	-3.5	-0.3
- EU-15	15.6	16.0	12.6	0.4	-3.4	-3.0
- Other OECD	3.1	34.4	32.7	31.3	-1.7	29.6
- Former Yugoslavia	24.7	25.7	22.8	1.0	-2.9	-1.9
- CEE countries	5.9	10.9	3.4	5.0	-7.5	-2.5
- Rest of the world	1.0	1.4	1.3	0.4	-0.1	0.3

Note: Agricultural and food trade consists of the SITC positions from 00111 bovine animals to 22390-flour meal from oilseeds, excluding the SITC position 21 hides, skins, and furskins.

Source: Own calculations.

5.3 Marginal IIT indicators

To capture the adjustment costs due to the enforcement of the association agreement and Slovenian membership in CEFTA marginal IIT indices have been calculated. Table 6 shows a value for the "A" measure of marginal IIT of 8.7 %, 9.7 % and 9.0 %, respectively, if total agricultural and food trade with the world is considered. This implies that on average less than 10 % of the change in Slovenian agricultural and food trade over the periods 1995/96 to 1998/99, 1998/99 to 2000/01, and 1995/96 to 2000/01, respectively, was of the IIT type. The highest share in marginal IIT is revealed for the EU over the period 1998/99 to 2000/2001. However, even this proportion is with around 14 % rather low. Thus, the results indicate that most of the changes occurring in trade flows were of the inter-industry type and therefore very likely have induced high adjustment costs.

Table 6: **Marginal IIT "A" measure for Slovenian agricultural and food trade by regional distribution**

	"A" Measure (in percent)		
	1998/99 to 1995/96	**2000/01 to 1998/99**	**2000/01 to 1995/96**
Agricultural and food trade of which	8.7	9.7	9.0
- EU-15	12.1	14.3	13.5
- Other OECD	3.2	9.4	4.9
- Former Yugoslavia	11.6	9.4	11.1
- CEE countries	4.0	6.3	2.6
- Rest of the world	1.8	1.5	2.0

Note: Agricultural and food trade consists of the SITC positions from 00111 bovine animals to 22390-flour meal from oilseeds, excluding the SITC position 21 hides, skins, and furskins.

Source: Own calculations.

Table 7 summarizes the results of the calculations of the marginal IIT trade indicator "B" and thus provide evidence with respect to the sectoral performance of Slovenian agricultural and food sector over time. For Sovenia´s agricultural and food trade with the world the number of

products at the 5-digit SITC level for which the "B" measure is smaller than "-50" is greater than the number of products for which this indicator takes values above 50 over the period 1995/96 to 2000/2001 indicating that there have been more agricultural and food products Slovenia has specialized "out of" than "into". However, Table 7 also reveals that this does not hold for the second sub-period 1998/99 to 2000/2001 which might indicate that Sovenian competitiveness in agricultural and food products has improved in recent years.

Table 7:   Marginal IIT "B" indicator for Slovenian agricultural and food trade by regional distribution

| | "B" Measure | | | | | | | | |
| | 1998/99 to 1995/96 | | | 2000/01 to 1998/99 | | | 2000/01 to 1995/96 | | |
	-100≤B<-50	-50≤B≤50	50<B≤100	-100≤B<-50	-50≤B≤50	50<B≤100	-100≤B<-50	-50≤B≤50	50<B≤100
Agricultural and food trade of which	745	110	698	700	93	723	743	106	715
- EU-15	146	28	186	163	28	169	143	33	184
- Other OECD	133	9	147	133	9	131	136	7	146
- Former Yugoslavia	153	42	147	124	33	174	137	42	166
- CEE countries	167	19	97	142	16	113	177	13	95
- Rest of the world	146	12	121	138	10	136	150	8	124

Note: Refers to the number of products at the 5-digit SITC level for which the index "B" takes the respective values (see equation 6 in section 3).

Source: Own calculations.

Looking at the regional dis-aggregation the picture is quite heterogeneous. It is especially trade with the CEECs that reveals a declining competitiveness for the whole period as well as for both sub-periods while for trade with the EU the opposite holds. The results for former Yugoslavia reflect those already presented for the world as a whole.

5.4 The sensitivity of the results to the regional level of trade data dis-aggregation

The degree of aggregation at the product and regional level influences the outcome of the analysis on IIT. It is well known that the higher the level of data aggregation the higher the share of IIT (GRAY, 1979; GANDOLFO, 1987; HELPMAN, 1998). By comparing the values of the GLIIT index over time and/or by calculating marginal IIT-measures the degree of aggregation might in addition lead to different results not only with respect to the magnitude of change but also with respect to the sign of the change. This is demonstrated in Table 3 with respect to the aggregate "All Agricultural and Food Trade".

Table 8: **Analysis of Slovenian agricultural and food trade: Sensitivity of the GLIIT-Index and the marginal IIT "A" and "B" measures to different procedures of regional data dis-aggregation**

	Agricultural and food trade			
	1998/99 to 1995/96		2000/01 to 1995/96	
	Total*	Regional**	Total*	Regional**
GLIIT (change in percentage points)	-0.7	3.2	-1.3	-0,3
Marginal IIT "A" Measure (in percent)	20.1	8.7	18.0	9.0
Marginal IIT "B" Measure (number of the 5-digit SITC products)				
-100≤B<-50	168	745	147	743
-50≤B≤50	60	110	56	106
50<B≤100	143	698	166	715

Note: Agricultural and food trade consists of the SITC positions from 00111 bovine animals to 22390-flour meal from oilseeds, excluding the SITC position 21 hides, skins, and furskins.

* Data at 5-digit SITC level.

** Data at 5-digit SITC level and regionally disaggregated. Regional dis-aggregation by the following groups: EU-15, other OECD countries, former Yugoslavia, CEFTA and other CEE countries, and the rest of the world.

Source: Own calculation.

The column headed by "total" reflects the case where first, for each product at the five-digit SITC level the various IIT indices are calculated for Slovenian trade with the world and second, the respective formulas for product aggregation are applied. The columns headed by "regional" refer to the case where the IIT indices are first calculated for Slovenian bilateral trade with each of the five regions – EU-15, Other OECD, Former Yugoslavia, CEFTA and other CEE, Rest of the world – at the five-digit SITC level and then aggregated region-wise and product-wise.

As expected the level of trade data aggregation influences the values of the GLIIT index and the marginal IIT measures to a considerable extent. For the whole agricultural and food sector the indices are about twice as high, if the calculation is based on aggregated trade data. Even more striking, however, is that the change in the GLIIT index is biased by the calculation procedure. The same holds if one compares the marginal IIT "A" and "B" measures. This indicates the sensitivity of the results with respect to the aggregation chosen. This does not imply that a higher level of aggregation is misleading or flawed per se. The level of data aggregation suitable, very much depends on the problem analysed and is important for the interpretation of the results and thus for the policy recommendations derived.

6 CONCLUSIONS AND POLICY IMPLICATIONS

One of the striking features in the CEE countries during transition to a market economy is the considerable deterioration in their agricultural and food trade balance. Except for Bulgaria and Hungary, CEE countries are substantial net importers of agricultural and food products in

2001. An increasing trade deficit in agricultural and food products is also identified for Slovenia, which exited from former Yugoslavia in 1991. On 1st of May 2004, it became member of the EU. In this paper Slovenian trade flows are analyzed in more detail.

The geographical focus of Slovenian agricultural and food trade has changed to a considerable extent over the last decade and it largely differs between exports and imports. Slovenian exports of those products are still oriented towards the former Yugoslav markets. With these countries Slovenia experiences a trade surplus in agricultural and food products since independence. Milk and dairy products, drinks and processed higher value-added products are Slovenian main export products into this region. However, imports of agricultural and food products no longer originate from the countries of former Yugoslavia but have been substituted and now primarily come from the EU. With the stipulation of the free trade agreement the CEFTA countries have slightly gained in importance as a source for agricultural and food products. This holds particularly with respect to Hungary. However, Slovenia has not been successful in increasing its exports to this region. In fact, trade with the regions EU-15, Other OECD, CEFTA, Rest of the world is characterized by relative high deficits. This provides a first indication that Slovenia lacks competitiveness in the agricultural and food sector especially vis-à-vis the EU and the CEFTA countries (e.g. EITELJÖRGE AND HARTMANN, 1999).

The relevance of IIT in Slovenian agricultural and food trade is very low, but varies among the different sub-sectors and trade partners. The highest share of IIT can be detected for trade with the countries of former Yugoslavia and for higher processed products. However, not only the level of IIT is rather low. Also most of the change in trade over time has been of the inter-industry type while the change in IIT or marginal IIT has been of minor relevance.

The analysis reveals that the extent of Slovenian trade integration in agricultural and food products with the former Yugoslav republics is still among the most important. This holds despite the fact that several constraints were impeding those trade flows in the 1990s, e.g. trade barriers, different currencies, deterioration of infrastructure and interrupted transport connections due to the war. In most recent years these traditional trade links have even strengthened again due to an overall stabilization of the region and the enforcement of bilateral agreements. However, this development is likely to be stopped or even reversed again due to Slovenian membership in the EU since May 2004. As an EU member Slovenia is no longer eligible to rely on the bilateral free trade agreements with the markets of the former Yugoslav countries. This might provide an incentive for Slovenian food processing enterprises to invest directly in this region to maintain their market shares.[12]

The integration efforts of Slovenia with the EU and the CEFTA countries since the mid-1990s has neither led to a strong increase in the level of IIT nor has marginal IIT been of high relevance. Trade with CEFTA countries increased only slightly mainly because liberalization was insufficient to induce a substantial diversion of trade flows. With the EU countries, the rise in trade has not been so significant during the 1990s since Slovenia enjoyed similar trade conditions already before signing this agreement. Thus, the Association Agreement with the EU did not induce substantial changes for the Slovenia's agricultural and food sector. Further adjustments occurred within the framework of the so called "double-zero" agreement between the EU and the association countries of Central and Eastern Europe that came into force in July 2000. With respect to Slovenia this agreement was relatively limited in scope. Finally, the double benefit agreement was signed by the end of 2001 as a preparation for the border-less

---

[12] For example, the Slovenian brewery from Laško bought the Croatian brewery in Split and the Slovenian largest dairy "Ljubljanske mlekarne" invested in the dairy plant in Tuzla in B&H. Some other Slovenian food-processing enterprises have been also active in investments activities in the former Yugoslav republics most recently.

trade in the enlarged EU. The effects of this latter agreement can be expected to be more pronounced since liberalization in the framework of this agreement has been quite substantial. However, the impact of this agreement could not be detected in this paper since our analysis covered only the years up to 2001.

In conclusion the analysis reveals that since the beginning of the 90ies substantial changes occurred in the geographical distribution and to some extent also in the level of Slovenian agricultural and food trade. However, intra-industry trade has remained of very little relevance up to 2001, the final year of our analysis. This holds especially for bulk commodities with little or no processing. There are two explanations for these findings. First and foremost, the level of protection in the agricultural and food sector has remained rather high over the period analyzed and thus has hampered trade in general and intra-industry in particular, since especially so called sensitive products were exempted from liberalization. Second, Slovenian producers have not been successful in reaping economies of scale especially in the production but also in the processing of agricultural products due to the fragmented structure in the primary sector as well as in the food industry and the rather slow privatization and restructuring process in the latter.

Due to EU membership Slovenia faces now direct competition in a market of 25 countries. This fosters the restructuring process in the Slovenian agricultural and food sector. Due to the present low level of IIT this likely induces rather high adjustment costs since restructuring and reallocation will have to occur between and not within industries. The relative greater relevance of IIT for food products involving a greater degree of processing indicate that adjustment costs tend to be lower for those products. Especially, producers of those products need to realize product differentiation and brand marketing strategies to maintain and gain domestic and foreign market shares. It can be expected that in ten years from now, the relevance of intra-industry trade in Slovenian agricultural and food trade with the other EU countries will more than double. The relevance of IIT in trade with other countries very much will depend on the outcome of the WTO and thus on the extent of multilateral liberalization.

REFERENCES

ATURUPANE, C., DJANKOV, S., HOEKMAN, B. (1999): Horizontal and Vertical Intra-Industry Trade Between Eastern Europe and the European Union, *Weltwirtschaftliches Archiv, 135, No. 1*, pp. 62-81.

BALASSA, B. (1966): Tariff Reductions and Trade in Manufactures among the Industrial Countries, *American Economic Review, 56, No. 3*, pp. 466-473.

BOJNEC, Š. (1996): Integration of Central Europe in the Common Agricultural Policy of the European Union, *The World Economy, 19, No. 4*, pp. 447-463.

BOJNEC, Š. (2001): Patterns of Intra-Industry Trade in Agricultural and Food Products During Transition, *Eastern European Economics, 39, No. 1*, pp. 61-89.

BRENTON, P., GROS, D. (1997): Trade Reorientation and Recovery in Transition Economies, *Oxford Review of Economic Policy, 13, No. 2*, pp. 65-76.

BRÜLHART, M. (1994): Marginal Intra-Industry Trade: Measurement and the Relevance for the Pattern of Industrial Adjustment, *Weltwirtschaftliches Archiv, 130, No. 3*, pp. 600-613.

BRÜLHART, M., HINE. R. C. (1999): Marginal Intra-Industry Trade and Trade-Induced Adjustment: A Survey, in: BRÜLHART, M., HINE, R. C. (eds.): Intra-Industry Trade and Adjustment, The European Experience, London, pp. 36-69.

DJANKOV, S., FREUND, C. (2002): Trade Flows in the Former Soviet Union, 1987 to 1996, *Journal of Comparative Economics, 30, No. 1*, pp. 76-90.

DRABEK, Z., GREENAWAY, D. (1984): Economic Integration and Intra-Industry Trade: The EEC and the CMEA Compared, *Kyklos, 37, No. 3,* pp. 444-469.

EICHENGREEN, B., IRWIN, D. (1996): The Role of History in Bilateral Trade Flows, National Bureau of Economic Research, *Working paper 5565,* MA: NBER, Cambridge.

EITELJÖRGE, U., HARTMANN, M. (1999): Central and Eastern European Food Chain Competitiveness, in: THE INTERNATIONAL FOOD AND AGRIBUSINESS MANAGEMENT ASSOCIATION (ISMEA) (ed.): The European Agro-Food System and the Challenge of Global Competition, Rome, pp. 187-224.

FAO (2004): FAOSTAT Database (March 15, 2004): <http://faostat.fao.org>, Food and Agricultural Organization of the United Nations, Rome.

FIDRMUC, J., FIDRMUC, J. (2000): Disintegration and Trade, CENTER FOR ECONOMIC AND POLICY RESEARCH (ed.): *Discussion Paper 2641,* CEPR, London.

FRANKEL, J., STEIN, E., WEI, S. (1997): Regional Trading Blocs in the World Economic System, Institute for International Economics, Washington, DC.

FROHBERG, K., HARTMANN, M. (1997): Comparing Measures of Competitiveness, *IAMO Discussion Paper No. 2,* Halle (Saale).

GANDOLFO, G. (1987): International Economics I – The Pure Theory of International Trade, Springer, Berlin.

GRAY, P. H. (1979): Intra-Industry Trade: The Effect of Different Levels of Data Aggregation, in: GIERSCH, H. (ed.): On the Economics of Intra Industry Trade, J. C. B. Mohr, Tübingen.

GREENAWAY, D., MILNER, C. (1987): Intra-Industry Trade: Current Perspectives and Unresolved Issues, *Weltwirtschaftliches Archiv, Vol. 12, No. 1*, pp. 39-57.

GREENAWAY, D., MILNER, C. (1983): On the Measurement of Intra-Industry Trade, *Economic Journal 93, No 372*, pp. 900-908.

GREENAWAY, D., TORSTENSSON, J. (1997): Back to the Future: Taking Stock on Intra-Industry Trade, *Weltwirtschaftliches Archiv, 133, No. 2*, pp. 249-69.

GREENAWAY, D., TORSTENSSON, J. (1998): Economic Geography, Comparative Advantage and Trade within Industries: Evidence from the OECD, CENTER FOR ECONOMIC AND POLICY RESEARCH (ed.): *Discussion Paper 1857,* CEPR, London.

GRUBEL, H. G., LLOYD, P. J. (1975): Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products, MacMillan, London.

JACKSON, M. (1997): Intra Balkan Trade and Economic Cooperation: Past Lessons for the Future, LICOS – CENTRE FOR TRANSITION ECONOMICS LICOS (ed.): *Discussion Paper 62,* Leuven.

KRUGMAN, P. (1991): Geography and Trade, Mass.: MIT Press, Cambridge.

HELPMAN, E. (1998): The Structure of Foreign Trade, *NBER Working Paper, 6752*, Mass, Cambridge.

MAUREL, M., CHEIKBOSSIAN, G. (1998): The New Geography of Eastern European Trade, *Kyklos 51, No. 1*, pp. 45-71.

McCORRISTON, S., SHELDON, I. M. (1991): Intra-Industry Trade and Specialisation in Processed Agricultural Products: The Case of the US and the EC, *Review of Agricultural Economics, Vol. 13, No. 2*, pp. 173-184.

OECD (2001): Agricultural Policies, Markets and Trade: Monitoring and Outlook, Organisation for Economic Cooperation and Development, Paris.

PELZMAN, J. (1977): Trade Creation and Trade Diversion in the Council of Mutual Economic Assistance, 1954-1970, *American Economic Review, 67, No. 4*, pp. 713-722.

PELZMAN, J. (1978): Soviet-COMECON Trade: The Question of Intra-Industry Specialization, *Weltwirtschaftliches Archiv, 114, No. 2*, pp. 297-304.

QASMI, B. A., FAUSTI, S. W. (2001): NAFTA Intra-industry Trade in Agricultural and Food Products, *Agribusiness, Vol. 17, No. 2,* pp. 255-271.

SMITH, A. (1994): International Trade and Payments in the Former Soviet/CMEA Area: Reorientation of Reintegration?, Royal Institute of International Affairs, London.

THOM, R., MCDOWELL, M. (1988): Trade Liberalisation and Adjustment: How Important is Intra-Industry Trade?, Department of Economics University College Dublin, Centre for Economic Research (ed.): *Working Paper 98/6.*

VAN BERKUM, S. (1999): Patterns of Intra-Industry Trade and Foreign Direct Investment in Agrofood Products: Implications for East-West Integration, *MOCT-MOST, 9, No. 3*, pp. 255-271.

VAN BERKUM, S. (2002): Trade and Foreign Direct Investment Patterns: The Case of Dutch Agribusiness, PhD Thesis, Ponsen en Looijen, Wageningen.

WYZAN, M. L. (1999): Macedonian and Slovenian Trade: Contrasting Patterns and Focus on the European Union, *Post-Soviet Geography and Economics, 40, No. 5*, pp. 309-334.

APPENDIX

Table A1: **The GLIIT-Index for agricultural and food products in Slovenia at the weighted one- and two-digit SITC levels, 1992-2001**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Agricultural and food trade	22.6	16.4	15.6	15.0	13.4	12.7	15.9	17.2	15.3	13.4
- EU-15	18.0	17.2	17.4	16.2	14.1	13.0	15.0	16.5	13.7	11.5
- Other OECD	5.7	2.0	3.7	4.1	2.0	16.6	37.3	31.2	35.8	28.9
- Former Yugoslavia	33.4	25.7	23.6	25.7	22.6	22.3	24.1	27.2	23.5	22.1
- CEFTA and other CEE	7.9	7.6	8.1	4.5	6.1	1.5	2.3	2.6	3.8	3.1
- Rest of the world	1.7	2.3	1.1	0.8	1.0	0.8	0.8	1.3	1.4	1.3
SITC 00 – live animals	23.6	11.0	4.1	3.1	5.2	3.7	5.4	4.4	4.2	8.3
- EU-15	13.4	13.9	9.1	6.9	13.4	8.6	21.0	23.5	19.4	31.7
- Other OECD	0	0	66.1	0	0	36.6	11.2	1.8	4.3	5.2
- Former Yugoslavia	41.5	36.3	25.8	24.8	9.3	1.4	10.3	5.2	5.8	9.5
- CEFTA and other CEE	0.1	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.3
- Rest of the world	0	55.3	88.6	0	3.4	68.9	27.9	95.0	57.6	1.0
SITC 01 – meat and meat preparations	20.3	11.7	18.2	15.9	7.7	4.5	5.7	7.5	5.0	5.7
- EU-15	14.3	8.5	29.3	31.2	15.7	6.6	6.9	11.0	6.4	8.6
- Other OECD	2.1	1.3	0.6	2.6	0	0.0	0	3.9	0.0	7.4
- Former Yugoslavia	32.6	17.9	9.5	10.9	6.9	5.0	6.4	8.1	5.9	5.6
- CEFTA and other CEE	8.2	10.3	7.2	1.4	1.7	1.9	1.3	0.8	0.9	1.0
- Rest of the world	0.0	0.8	5.2	0	5.0	0.0	0	0.3	0.0	0.0
SITC 02 – dairy and eggs	29.5	15.5	6.4	6.1	10.9	13.9	13.4	16.3	12.5	13.3
- EU-15	30.4	10.7	6.5	6.5	15.6	17.6	18.8	27.0	11.4	16.7
- Other OECD	16.7	0	0.9	17.4	9.3	41.3	25.0	24.4	33.7	3.8
- Former Yugoslavia	30.8	21.4	6.6	5.5	8.1	10.0	9.8	11.4	12.3	12.9
- CEFTA and other CEE	2.5	4.1	12.2	4.7	2.2	5.4	1.6	0.0	0.9	7.4
- Rest of the world	0	0	3.5	0	26.8	5.5	0	7.6	0.0	0.4
SITC 03 –fish and fish products	13.6	15.4	10.0	10.0	12.9	11.4	5.8	7.0	8.7	8.1
- EU-15	7.8	20.1	11.4	11.7	15.4	10.5	4.9	4.0	3.3	3.9
- Other OECD	0.2	0.5	1.2	0.6	2.0	12.2	0.2	8.2	1.0	0.4
- Former Yugoslavia	25.5	17.4	12.3	17.2	21.2	28.1	18.8	25.5	32.8	32.7
- CEFTA and other CEE	9.1	14.4	18.0	4.7	2.9	0.0	0.0	0.0	21.6	0.0
- Rest of the world	0	1.5	3.1	1.6	2.6	1.8	0.8	1.0	2.3	1.3
SITC 04 – cereals and preparations	11.6	8.6	9.1	8.7	8.0	7.3	9.9	9.8	12.0	10.9
- EU-15	6.4	7.8	5.0	4.9	3.9	4.1	8.8	6.8	11.2	10.6
- Other OECD	0.8	1.3	2.3	3.2	2.9	5.7	3.8	4.7	6.5	7.0
- Former Yugoslavia	18.8	17.0	25.9	23.7	22.5	29.9	25.3	32.2	35.5	37.9
- CEFTA and other CEE	0.8	2.7	3.9	1.8	1.8	0.4	2.1	1.3	2.2	1.9
- Rest of the world	0	0	2.5	0.1	0.1	0.2	3.1	18.4	1.0	2.5
SITC 05 – vegetables and fruits	17.4	13.8	13.0	12.3	9.7	8.2	11.1	11.3	9.4	5.7
- EU-15	12.0	14.6	11.3	11.8	9.4	9.0	11.9	12.9	9.8	5.1
- Other OECD	11.4	1.2	1.3	1.3	0.6	0.7	2.2	4.2	10.9	1.3
- Former Yugoslavia	29.9	22.0	28.1	30.1	26.3	22.6	25.9	24.7	20.0	15.3
- CEFTA and other CEE	5.8	8.7	13.0	6.5	6.6	1.1	3.1	3.2	3.8	5.4
- Rest of the world	0.7	0.1	1.3	0.4	0.7	0.3	0.3	0.2	0.4	0.1
SITC 06 – sugar, honey and preparations	41.6	34.6	29.8	26.3	24.4	22.3	30.8	29.5	30.7	32.1
- EU-15	28.6	41.0	33.3	29.0	28.1	27.7	31.3	35.5	36.8	33.5
- Other OECD	10.6	7.2	21.7	5.7	2.8	2.0	38.9	3.8	6.1	54.5
- Former Yugoslavia	53.2	48.3	40.3	46.5	45.2	49.4	56.7	62.0	50.6	47.2
- CEFTA and other CEE	57.1	7.8	23.2	22.4	18.6	0.6	1.8	10.8	6.6	5.7
- Rest of the world	3.3	3.4	2.8	7.0	42.7	5.1	16.9	27.0	32.0	35.1
SITC 07 – coffee, tea, cocoa and spices	22.5	16.5	13.0	8.9	12.6	13.7	11.3	10.7	12.9	14.2
- EU-15	24.3	15.1	14.5	6.8	9.4	12.4	10.0	5.5	5.3	5.0
- Other OECD	13.0	10.6	5.0	7.0	9.9	11.4	7.1	5.5	10.8	12.2
- Former Yugoslavia	36.1	39.6	38.5	32.2	45.5	59.2	47.0	64.0	69.9	76.0
- CEFTA and other CEE	12.5	24.4	22.7	29.2	69.3	2.8	4.3	2.4	4.7	4.5
- Rest of the world	0.1	0.3	0.6	0.5	0.4	0.2	0.8	0.1	0.9	1.1
SITC 08 – animal feeds	18.8	17.6	14.7	13.3	13.6	14.2	17.7	20.0	17.4	10.4
- EU-15	26.3	31.7	33.9	28.7	39.3	41.9	45.7	44.8	49.4	27.8
- Other OECD	6.0	21.7	11.1	2.9	1.7	5.6	5.7	7.8	13.6	17.1
- Former Yugoslavia	32.6	36.3	16.2	26.4	13.7	5.7	4.2	7.5	5.5	6.0
- CEFTA and other CEE	7.1	2.3	6.9	0.5	1.6	0.6	0.4	1.5	0.3	1.6
- Rest of the world	0.1	0.1	0	0	0.1	0.2	0.0	0.2	0.5	0.5
SITC 09 – miscellanies edible products	40.1	30.6	32.8	32.6	31.0	24.2	25.9	26.6	26.4	27.5
- EU-15	5.5	5.1	3.3	2.2	1.9	2.5	4.6	3.4	2.4	7.0
- Other OECD	8.5	1.6	7.7	20.6	3.4	10.8	29.8	30.4	43.6	39.5
- Former Yugoslavia	56.8	51.2	56.3	63.3	61.8	52.4	48.7	52.0	56.8	53.7
- CEFTA and other CEE	1.4	4.3	4.1	6.6	19.8	3.8	8.5	9.9	9.4	3.3
- Rest of the world	9.9	37.5	22.5	1.3	14.9	1.2	12.4	28.6	47.7	57.5
SITC 11 – beverages	26.2	20.1	18.3	19.8	17.6	16.0	22.9	20.9	17.7	15.8
- EU-15	31.2	39.7	28.9	28.1	30.2	33.1	38.9	32.4	30.3	26.7
- Other OECD	2.2	0.7	1.9	1.8	2.5	6.2	12.4	11.5	12.2	12.3
- Former Yugoslavia	27.5	11.2	13.3	16.1	13.2	10.4	17.4	15.7	12.7	12.2
- CEFTA and other CEE	17.8	20.6	26.9	23.2	12.7	3.7	3.4	13.1	21.9	14.6
- Rest of the world	73.3	14.7	24.4	14.8	27.8	44.4	47.3	55.1	35.2	25.7
SITC 12 – tobacco products	29.2	25.7	11.5	19.4	15.6	29.8	40.7	46.4	34.9	30.1
- EU-15	49.0	48.1	31.8	49.7	42.5	25.6	19.7	32.8	23.1	9.7
- Other OECD	0	0.1	2.6	2.5	0.2	48.4	78.3	65.3	67.0	61.1
- Former Yugoslavia	39.6	41.4	16.3	26.4	15.5	32.6	45.5	62.7	43.9	60.8
- CEFTA and other CEE	0	0.0	0	0	32.9	0.7	0.0	0.0	0.0	0.0
- Rest of the world	8.3	22.5	0.3	1.4	1.6	0.0	0	0	0.1	0.0
SITC 22 – oil seeds	21.4	13.8	7.7	13.4	10.4	12.3	8.4	7.6	13.9	20.9
- EU-15	33.5	15.5	6.9	17.1	15.8	15.5	11.0	6.3	20.1	24.8
- Other OECD	0	0	0	0	6.8	0	0	7.1	0.0	0.0
- Former Yugoslavia	26.6	42.8	25.4	59.3	7.3	6.7	6.6	31.1	34.2	70.3
- CEFTA and other CEE	0.2	2.9	0.6	0.1	0.3	0.0	0.5	7.9	5.2	14.9
- Rest of the world	0	0	0	0	0.1	4.5	0	0	0.0	0.0

Note: The weighted average of the SITC from 00111 bovine animals to the SITC 22390 flour meal from oil-seeds, excluding the SITC 21 hides, skins, and furskins. A value of the GLIIT index close to 100 indicates the intra-industry trade (IIT) variety, and a value of the GLIIT close to zero indicates the inter-industry trade type. The GLIIT zero denotes one-way trade.

Source: Own calculations.

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 Wirtschafts-
geschichte und Entwicklungsökonomie für den russischen Getreidemarkt im Trans-
formationsprozeß

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 Transfor-
         mationsbeginn

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. 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 сельскохозяйст-
венных 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 verti-
cal 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 сельско-
хозяйственных предприятий

No. 50 ЛИССИТСА, А., БАБИЧЕВА, Т. (2003):
Анализ Оболочки Данных (DEA) – Современная методика определения эффек-
тивности 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 STANGE, H., LISSITSA, A. (2003):
Russischer 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 per-
spective

No. 54　BORKOWSKI, A. (2003):
Machtverteilung im Ministerrat nach dem Vertrag von Nizza und den Konventsvor-
schlägen 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

No. 57　БОКУШЕВА, Р., ХАЙДЕЛЬБАХ, О. (2004):
Актуальные аспекты страхования в сельском хозяйстве

No. 58　DERLITZKI, R., SCHULZE, E. (2004):
Georg Max Ludwig Derlitzki (1889-1958)

No. 59　VŐNEKI, E. (2004):
Zur Bewertung des Ungarischen SAPARD-Programms unter besonderer Berücksich-
tigung der Investitionen im Milchsektor

No. 60　ЧИМПОЕШ, Д., ШУЛЬЦЕ, Э. (2004):
Основные экономические проблемы сельского хозяйства Молдовы

No. 61　BAUM, S, WEINGARTEN, P. (2004):
Interregionale Disparitäten und Entwicklung ländlicher Räume als regionalpolitische
Herausforderung für die neuen EU-Mitgliedstaaten

No. 62　PETRICK, M. (2004):
Can econometric analysis make (agricultural) economics a hard science? Critical re-
marks and implications for economic methodology

No. 63　SAUER, J. (2004):
Rural Water Suppliers and Efficiency – Empirical Evidence from East and West
Germany

No. 64　PETRICK, M., BALMANN, A. (2004):
Beiträge des 2. Doktorandenworkshops zur Agrarentwicklung in Mittel- und Ost-
europa 2004

No. 65　BOJNEC, S., HARTMANN, M. (2004):
Agricultural and Food Trade in Central and Eastern Europe: The Case of Slovenian
Intra-Industry Trade

Die Discussion Papers sind erhältlich beim Institut für Agrarentwicklung in Mittel- und Ost-
europa (IAMO) oder im Internet unter http://www.iamo.de.

The Discussion Papers can be ordered from the Institute of Agricultural Development in Cen-
tral and Eastern Europe (IAMO). Use our download facility at http://www.iamo.de.