

## Structure and Convergence of Agro-Food Trade of Central and Eastern European Countries with the European Union during Pre-Accession

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### Abstract

*We analyse agro-food trade structures of Central and Eastern European countries (CEECs) with the European Union (EU-15) market to identify the specialisation patterns during the pre-accession using different trade indices. The analyses assess whether these patterns in the CEECs agro-food trade structures indicate convergence of the agro-food trade specialisation. We find that CEECs agro-food export has converged towards greater structural similarity with the EU-15 market, but less in high and very high quality differentiated agro-food products. This implies some of the CEECs pre-accession integration difficulties with higher valued agro-food products on the EU-15 market during adjustments and structural changes of CEECs' agro-food export patterns towards more competitive the EU-15 market.*

**Keywords:** trade structure, specialisation pattern, Central and Eastern Europe

**JEL Classification:** F14, F15, Q17

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### Introduction

The integration of the agro-food sectors of the post-communist Central and Eastern European countries (CEECs) into the Common Agricultural Policy (CAP) of the European Union (EU) has been one of the most challenging issues

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in policy discussion and political debate since the collapse of the Berlin wall in 1989. Majority of studies have raised questions about the prospects and implications of an enlargement of the EU-15 market with CEECs in relation to a certain country (e.g. Bartošová et al., 2007 for Slovakia; Bojnc and Fertő, 2007 for Hungary and Slovenia), but less about structural change and structural convergence in a comparative way for the CEECs. Thus, this study focuses on the CEECs' agro-food structural change and structural convergence during the pre-accession. We analyse the path of agro-food trade restructuring of the CEECs by investigating the evolution and comparison of export structures to the EU-15 market and similarity with the export structure of the EU-15 market.

Crespo and Fontoura (2007) addressed the structural change and structural convergence for the CEECs' manufacturing industry trade. They found a significant increase in the manufacturing industry trade integration of the CEECs into trade links with the EU-15 market since 1989. The majority of the manufacturing industry exports from the CEECs are directed to the EU-15 market, implying a high degree of CEECs trade integration and trade market concentration with the EU-15 market. The pre-accession harmonization of policies, standards and trade adjustment measures has strengthened deepening and widening of integration.

The integration of the CEECs agro-food trade into the more competitive EU-15 market has likely induced greater specialization on the basis of international competitiveness and long-run comparative advantages in the CEECs' exports in order to boost scale economies and productivity gains. However, this has not been investigated so far. Therefore, the paper contributes to the analyses of the structural change and structural convergence for the CEECs' trade in agro-food products with the EU-15 market during the pre-accession. The evolution of the CEECs' agro-food trade pattern might lead to greater convergence with the pattern of the EU-15 market, which arises from advantages associated with increased similarity with smaller industry reallocations, and also accelerates convergence of factor prices (Deardorff, 1994). We analyse the path of agro-food restructuring of the CEECs by investigating the evolution and comparison of export structures to the EU-15 market and similarity with the export structure of the EU-15 market.

The article first explains the methodology, data used, and notation. Then it analyses the CEEC agro-food export and import structures with the EU-15 market by the degree of product processing and agro-food product differentiation groups. The focus in the empirical section is on the analyses of the degree of structural transformation of CEEC agro-food exports to the EU-15 market, the nature of this change with alternative typologies, the degree of structural similarity and convergence of CEECs' agro-food export structure towards the pattern of the EU-15 market, and agro-food quality differentiation and quality ranges. The final section concludes and derives policy implications.

## 1. Methodology, Data and Notation

We express by  $X$  the CEEC agro-food exports to the EU-15 market. Indices  $i$  ( $i = 1, \dots, I$ ),  $j$  ( $j = 1, \dots, J$ ) and  $t$  express, respectively, the country of origin of the trade flow, the product group, and the period. The analysis covers the ten CEECs for the evolution of exports to/imports from the EU-15 market as a reference term, which means that we consider a total of 25 countries or  $I = 25$ . The EU-15 market is considered as a single market. The agro-food trade is defined by the EU-Commission (1999) and the source of detailed disaggregated trade data is the Organisation for Economic Cooperation and Development (OECD). The sample consists of 255 product groups at four-digit level in the Standard International Trade Classification system, which means that the number of the analysed product groups  $J = 255$ .

The period analysed in the empirical analysis by using detailed disaggregated trade data from OECD is for the pre-accession years between 1995 and 2003 or  $t = 0$  refers to 1995, and  $t = 1$  to 2003. The world is designated as  $p$ . Nominal trade flows are expressed in US dollar and are deflated for the US dollar inflation to 1995 as the base year of the analysis. The source of US dollar inflation is OECD. Therefore, the trade data used in the empirical analysis is in constant 1995 US dollar prices.

Similarly to Crespo and Fontoura (2007), we consider two matrices with the generic element  $X_{ji}(t)$  representing the agro-food exports from CEEC  $i$  to the EU-15 market, in product group  $j$ , in period  $t$ , whereas  $X_i(t)$  represents total agro-food exports from CEEC  $i$  to the EU-15 market, in period  $t$ . Similarly,  $X_{jp}(t)$  and  $X_p(t)$  represent, in period  $t$ , the world exports to the EU-15 market in product group  $j$  and the world total exports to the EU-15 market, respectively.

The share of product group  $j$  in total agro-food exports of CEEC  $i$  to the EU-15 market is designated as  $V_{ji}(t)$  and thus, the  $J$  values of  $V_{ji}(t)$  depict the export structure of CEEC  $i$  to the EU-15 market. CEECs agro-food export and import structures are classified by using two different classifications. First, following Chen *et al.* (2000), we classify agro-food trade into four product groups by the degree of product processing: bulk raw commodities, processed intermediates, consumer-ready food, and horticulture. Second, we employ Rauch's (1999) 'conservative aggregation' and 'liberal aggregation' of three commodity categories to gain possible insights into the differentiation of results by non-homogeneous agro-food product categories: homogeneous products that are traded on organised exchanges, reference priced products not sold on exchanges but whose benchmark price exists, and differentiated products for all other products.

The analysis of the structural change is conducted by the degree of transformation of the CEECs' agro-food export structure to the EU-15 market by employing the Lawrence index ( $T_i$ ):

$$T_i = \beta \sum_{j=1}^J |V_{ji}(1) - V_{ji}(0)|$$

where

$$V_{ji}(t) = X_{ji}(t)/X_i(t)$$

and

$$X_i(t) = \sum_{j=1}^J X_{ji}(t)$$

It is assumed that  $\beta = 1/2$ .  $T_i$  compares the agro-food export structure of CEEC  $i$  to the EU-15 market at two different moments at  $t = 0$  and  $t = 1$ .  $T_i$  ranges between 0 and 1, an increase implying structural transformation. Moreover, we analyse a taxonomy based on EU-15 market demand dynamism for the CEECs' agro-food export structures by the three dynamic demand growth groups by the EU-15 markets: (i) demand growth rate less than 5 per cent, (ii) demand growth rate between 5 per cent and less than 10 per cent, and (iii) demand growth rate equal to or greater than 10 per cent.

The structural similarity and structural convergence of the CEEC export structures is analyzed by the Krugman structural similarity index  $E_{ip}(t)$ :

$$E_{ip}(t) = \beta \sum_{j=1}^j |V_{ji}(t) - V_{jp}(t)|$$

where

$$V_{jp}(t) = X_{jp}(t)/X_p(t)$$

$E_{ip}(t)$  ranges between 0 and 1, increasing from structural similarity (0) to structural dissimilarity (1). It is assumed that  $\beta = 1/2$ .

The quality differentiation and quality ranges ( $\varphi_{ji}$ ) are analyzed for each product group  $j$  by the ratio between the unit value of the agro-food exports of CEEC  $i$  to the EU-15 market ( $UV(X_{ji}(t))$ ) and the unit value of world agro-food exports to the same EU-15 market ( $UV(X_{jp}(t))$ ):

$$\varphi_{ji}(t) = UV(X_{ji}(t)) / (UV(X_{jp}(t)))$$

where

$UV$  – the exports' unit value.

Five quality ranges are distinguished: very high ( $\varphi_{ji} > 1.30$ ), high ( $\varphi_{ji} \in [1.15, 1.30]$ ), medium ( $\varphi_{ji} \in [1/1.15, 1.15]$ ), low ( $\varphi_{ji} \in [1/1.30, 1/1.15]$ ), and very low ( $\varphi_{ji} < 1/1.30$ ).

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## 2. Empirical Results

### 2.1. CEEC Export and Import Structures

We classify the CEEC agro-food product group export structures as a percentage of total agro-food exports to the EU-15 market and the CEEC agro-food product group import structures as a percentage of total agro-food imports from the EU-15 market.

First, we employ the Chen *et al.* (2000) agro-food product classification by the degree of product processing. We define as improvements of CEEC export competitiveness and export specialization when the share of higher value added consumer-ready food increased. Table 1 compares the structure of agro-food exports from the CEECs to the EU-15 markets and the structure of agro-food imports from the EU-15 markets to the CEECs at the start and at the end of the analyzed years 1995 and 2003.

By the agro-food export structures, we can identify three groups of the CEECs. The first group composes those CEECs with the prevailing lowest value added bulk raw commodities in their agro-food exports to the EU-15 markets. Among them are the three Baltic States (Latvia, Estonia, and Lithuania), and Slovakia. For the initial analysed year, this holds also for the Czech Republic, but with some declines later by the increase of the share in higher value added consumer-ready food. This implies improvements in export competitiveness for the Czech Republic that has been arising from food industry and food chain restructuring. The second group composes the CEECs with the prevailing high proportion of higher value added consumer-ready food in their agro-food export structures to the EU-15 market, which can be considered more export competitive. This reflects positive results arising from technological and product innovation activities in food processing and international agro-food marketing. This group of more agro-food export competitive the CEECs consists of Poland and Hungary, and to a lesser extent also Bulgaria. Poland's share of these products in the structure of agro-food export structures to the EU-15 market further increased. The third group of the CEECs consists of those countries with mixed agro-food export structures and less clear patterns in agro-food export specialisation to the EU-15 markets by degree of product processing. Among them are Romania, which tends to specialise towards lower value added bulk-raw commodities, and Slovenia, which tends to specialise towards bulk raw commodities and consumer-ready food. It is interesting to note that none of the CEECs has been identified as experiencing prevalence and patterns of export specialisation towards processed intermediates and horticulture. The CEECs' agro-food export structures to the EU-15 markets indicate the CEECs' export abilities and

competitiveness patterns that are results of natural factor endowments for production of bulk-raw commodities, and restructuring, investments, and quality improvements in food processing and marketing for consumer-ready food.

Table 1  
**CEECs' Agro-Food Export and Import Structures with EU-15 Market by Product Groups (%)**

	CEECs' exports to EU-15								CEECs' imports from EU-15							
	1995				2003				1995				2003			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Bulgaria	26	10	53	11	35	6	49	10	3	20	67	10	4	28	58	10
Czech Republic	53	17	24	6	43	15	39	3	7	24	50	19	7	26	49	17
Estonia	79	5	14	1	76	2	21	1	5	20	68	7	5	20	66	9
Hungary	23	16	53	7	26	16	50	8	9	24	54	13	10	24	49	18
Latvia	87	8	4	0	93	2	5	0	3	17	70	10	3	24	60	13
Lithuania	62	12	20	6	50	22	26	2	2	26	63	10	8	31	49	13
Poland	22	18	54	6	13	13	66	9	6	32	46	16	7	31	40	22
Romania	22	30	33	15	45	25	22	9	5	20	71	5	21	22	47	11
Slovakia	57	24	13	6	58	17	22	3	7	28	42	23	7	32	42	19
Slovenia	44	15	36	5	42	13	42	3	11	16	58	14	14	15	52	19

Note: 1 bulk raw commodities; 2 processed intermediates; 3 consumer-ready food; 4 horticulture.

Source: Authors' own calculations based on OECD dataset.

By the agro-food import structures, the CEECs' agro-food imports from the EU-15 markets are concentrated on consumer-ready food. The CEECs' prevalence on imports of consumer-ready foods from the EU-15 is determined by the growth of CEECs consumers' incomes and consumers' preferences towards varieties and different qualities, where import costs are also reduced by newly developed marketing channels and international chains of supermarkets.

Second, we employ Rauch's (1999) conservative classification by commodity categories for organised exchange in homogeneous products, for reference priced products, and for differentiated products, respectively. Table 2 presents the results of the CEECs' agro-food export and import structures by the three categories of products with the EU-15 markets. By Rauch's commodity classification, the most important examples in each of the three categories of products are: first, for organised exchange in homogeneous products such as for some cereals, live animals, wood, and similar. Second, reference priced products such as milk, meats, eggs, fruit, vegetables, and similar. Third, differentiated products such as flours, preserved fruit and vegetables, sugar, honey, sugar confectionary, margarine, and similar.

We can distinguish two groups of the CEECs by the agro-food export structures to the EU-15 markets. First, the CEEC group with prevailing export specialisation on the reference priced products. To this group of countries belongs

the Czech Republic, the Baltic States (Estonia, Latvia, and Lithuania), and Poland. Additionally in 2003, in this direction towards the reference priced products one may note a strengthening of agro-food export specialisation to the EU-15 markets for Bulgaria, Romania, and to a lesser extent for Slovakia. The second group of the CEECs consists of those countries with less strengthened agro-food export specialisation patterns. Among them are Hungary, which tends to specialise towards reference priced products and Slovenia with an important role of differentiated products.

Table 2

**CEECs' Agro-Food Export and Import Structures with EU-15 Market by Rauch's Conservative Classification of Product Groups (%)**

	CEECs' exports to EU-15						CEECs' imports from EU-15					
	1995			2003			1995			2003		
	1	2	3	1	2	3	1	2	3	1	2	3
Bulgaria	36	44	20	20	56	24	41	43	16	32	44	23
Czech Republic	10	75	15	9	70	21	24	54	23	24	52	24
Estonia	23	68	9	15	76	9	45	38	17	41	42	17
Hungary	29	48	23	25	49	26	25	53	22	22	55	22
Latvia	28	66	6	15	76	9	41	45	14	36	44	21
Lithuania	10	68	23	7	54	39	31	48	20	27	50	24
Poland	18	55	27	15	54	30	24	58	19	24	59	17
Romania	34	28	38	25	40	35	36	42	22	31	48	20
Slovakia	23	47	30	18	52	30	23	54	24	20	54	26
Slovenia	20	31	48	16	39	45	28	45	27	26	56	18

*Note:* 1 homogeneous product; 2 reference priced products; 3 differentiated products.

*Source:* Authors' own calculations based on OECD dataset.

On the other hand, when the CEECs' agro-food imports from the EU-15 markets are considered, we can identify two types of import specialisation patterns. First, the prevailing import specialisation pattern towards the reference priced products for the Czech Republic, Hungary, Poland, Slovakia, and also for Lithuania, and Slovenia. Second, more mixed import specialisation patterns by some CEECs. For Estonia, this initially involved homogeneous products as the most significant single import product category. For the other CEECs, the reference priced products do not have the relative majority, but they do represent the single most important import product category. The importance of the homogeneous products in the CEECs' imports from the EU-15 market varies, which imply differences in the levels and patterns in development across CEECs, but in general CEECs have converged towards greater similarity with the EU-15 markets.

## 2.2. Structural Change

The degree of transformation of the CEECs' agro-food export structure to the EU-15 market is evaluated employing the  $T_i$  index. Table 3 compares the results of the  $T_i$  indices for the CEECs' manufacturing industry exports, which is taken from Crespo and Fontoura (2007), and our results for agro-food exports.

Table 3  
Lawrence ( $T_i$ ) Indices for CEEC Exports, 1995 – 2003

	Manufacturing industry	Agro-food
Bulgaria	0.536	0.35
Czech Republic	0.472	0.30
Estonia	0.606	0.31
Hungary	0.523	0.26
Latvia	0.702	0.34
Lithuania	0.637	0.51
Poland	0.492	0.32
Romania	0.548	0.50
Slovakia	0.622	0.34
Slovenia	0.429	0.28
CEEC average	0.548	0.40
EU-15 average	0.352	0.33

Source: Crespo and Fontoura (2007) for manufacturing industry trade and authors' own calculations based on OECD dataset for agro-food trade.

The results confirmed that the CEECs experienced a more profound structural change in their manufacturing industry export pattern than in their agro-food export pattern to the EU-15 markets. During the analysed pre-accession period 1995 – 2003, the CEECs' agro-food sectors with the highest export structural changes to the EU-15 markets are found for Lithuania and Romania, but this finding holds much less for Central European countries that had earlier started the process of transition to a market economy and adjustment towards the EU-15 market. The highest degrees of the structural change pertaining to the agro-food export structure to the EU-15 markets are found for Lithuania and Romania, while Hungary and Slovenia changed the least.

To explain the structural transformation, we make use of a procedure by EU-Commission (2003), which consists of breaking down commodities by the pre-defined dynamism of EU-15 market demand growth criteria and evaluating the share of each category in the total agro-food exports of each CEEC (Peneder, 2001).

Table 4 presents the results of  $T_i$  for the CEECs agro-food export structures by the three dynamic EU-15 market demand growth groups. Except for Bulgaria and Romania, the results show a tendency towards an increasing CEEC agro-food export specialisation with the most profound structural changes in the most dynamic agro-food growth sectors, in terms of EU-15 market demands. There are important differences among CEECs. In the initial analysed year 1995, the

CEECs experienced more than a half of agro-food exports to the EU-15 markets in the least dynamic demand growth group. Except for Romania, the importance of this group tended to decline between the years 1995 and 2003. However, in 2003, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia still experienced more than 50 per cent of agro-food exports to the EU-15 markets in the least dynamic demand growth group. The results for the middle dynamic demand growth group are mixed. For Bulgaria, the Czech Republic, Poland, Slovakia, and Slovenia, the importance of this group shows a trend towards structural changes with an increasing specialisation, but only for Poland this group is the most significant in their agro-food export structures to the EU-15 market in 2003. As the most remarkable findings, there is none of the CEECs that experienced the prevalence in agro-food exports in the most dynamic EU-15 market demand growth group. This is a considerable difference in comparison with the findings by Crespo and Fontoura (2007) for CEECs' manufacturing industry exports to the EU-15 markets, where CEECs are found to be much more efficient than we have found for agro-food exports to the EU-15 market during the pre-accession period 1995 – 2003. In 2003, the agro-food export share to the EU-15 markets in the most dynamic demand group of products is the highest for Hungary and Lithuania, which made profound structural changes in agro-food exports to the EU-15 market.

Table 4

**Lawrence ( $T_i$ ) Indices for CEEC Agro-Food Exports to EU-15 Market by Demand Dynamism Groups (%)**

	1995			2003		
	Growth rate			Growth rate		
	<5%	5% to <10%	≥10%	<5%	5% to <10%	≥10%
Bulgaria	51	19	29	46	31	23
Czech Republic	60	36	4	45	45	10
Estonia	72	23	4	62	21	17
Hungary	50	36	14	40	35	25
Latvia	77	22	1	74	12	14
Lithuania	70	28	2	56	19	25
Poland	54	43	3	36	53	11
Romania	50	33	17	65	22	12
Slovakia	77	17	6	60	25	14
Slovenia	66	23	11	57	27	16

Source: Authors' own calculations based on OECD dataset.

### 2.3. Structural Similarity and Convergence of the Agro-Food Export Structures

We evaluate the degree of similarity for the CEEC agro-food export structure to the EU-15 market by using world agro-food exports to the EU-15 market, which is a proxy by EU-15 total agro-food imports, as a reference point. To

evaluate the structural similarity and convergence of the CEECs' agro-food export structures we use Krugman's structural similarity or specialisation index ( $E_{ip}$ ). The evolution of the  $E_{ip}$  index between the two years (1995 and 2003) provides an indication of the degree of structural convergence/divergence. A decrease of the  $E_{ip}$  index over the periods or a negative sign for the difference between the indices in 1995 and 2003 implies a process of structural convergence, and vice versa an increase of the  $E_{ip}$  index over the periods or a positive sign for the difference, which implies a process of structural divergence.

Table 5 shows different levels of the  $E_{ip}$  by the CEECs. The results confirmed the  $E_{ip}$  index level variations by CEECs for the analysed years between the lowest level and structural convergence for more advanced Poland, and the highest level for Latvia. Moreover, three different patterns by the CEECs are identified in development of the  $E_{ip}$  index with the structure of world agro-food exports to the EU-15 markets between the two years analysed. First, the prevailing patterns of a convergence of the CEECs' agro-food export structure towards that of the world agro-food exports to the EU-15 markets, which is confirmed by the decline in the  $E_{ip}$  index that holds for Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, and Romania. Second, Slovakia and Slovenia show a process of structural divergence of agro-food export structure vis-à-vis the world agro-food exports to the EU-15 markets. Third, for Estonia and Latvia the  $E_{ip}$  index remains at the same level, implying an absence of changes in the similarity of export structures. Therefore, for most of the CEECs we find their agro-food export convergence towards greater structural similarity with the EU-15 markets.

Table 5  
Structural Similarity with EU-15 Total Agro-Food Imports

	1995	2003
Bulgaria	0.75	0.67
Czech Republic	0.72	0.71
Estonia	0.81	0.81
Hungary	0.69	0.65
Latvia	0.85	0.85
Lithuania	0.76	0.73
Poland	0.65	0.60
Romania	0.74	0.69
Slovakia	0.71	0.72
Slovenia	0.72	0.75

Source: Authors' own calculations based on OECD dataset.

#### 2.4. Quality Differentiation and Quality Ranges

The analysis of the CEEC agro-food export and import structures with the EU-15 market confirms differentiation of CEEC agro-food products by the degree of product processing and by homogeneous vs. reference priced and differentiated

products. The product quality differentiation and classification of quality ranges are based on intra-industry trade (IIT) literature, which disentangles between horizontal and vertical IIT on the basis of its unit value (e.g. Fertő, 2005). More specifically, in our analysis, quality differentiation and quality ranges are evaluated on the basis of the CEEC unit value of agro-food exports to the EU-15 market vis-à-vis the unit value of world agro-food exports to the EU-15 market of that product.

Table 6  
Quality Ranges (% of total agro-food exports)

	1995					2003				
	Very low	Low	Medium	High	Very high	Very low	Low	Medium	High	Very high
Bulgaria	21	9	44	2	24	29	5	40	6	20
Czech Republic	38	3	32	3	24	59	2	14	3	23
Estonia	29	20	44	2	6	21	6	13	43	18
Hungary	33	9	47	3	7	16	8	39	10	28
Latvia	69	22	4	4	2	26	10	59	1	5
Lithuania	61	10	15	1	13	20	38	7	2	32
Poland	44	16	22	3	14	19	16	29	24	12
Romania	40	11	37	3	9	22	1	59	4	14
Slovakia	40	22	29	3	6	40	9	37	2	12
Slovenia	43	11	14	8	23	20	9	47	9	15

Source: Authors' own calculations based on OECD dataset.

Table 6 presents the share of the each quality category in the CEEC agro-food exports to the EU-15 markets. In the initial analysed year 1995, Latvia and Lithuania were the countries with the highest share of agro-food exports to the EU-15 market in the very low quality category. This category is also the single most important agro-food export quality category for the Czech Republic, Poland, Romania, Slovakia, and Slovenia. On the other hand, the medium quality category is the single most important agro-food export quality category for Bulgaria, Estonia, and Hungary.

Unlike for manufacturing industry trade, where Crespo and Fontoura (2007) found a positive evolution towards a reduction of the very low quality category and an increase in the very high quality category for manufacturing industry exports, our empirical results for agro-food exports show mixed results and the strong heterogeneity among the CEECs. Between 1995 and 2003, first, the Czech Republic experienced an increase in the very low quality category and a decline in the very high quality category. In the final analysed year 2003, for Slovakia the very low quality category remained the single most important agro-food export quality category. Second, Lithuania switched from the very low quality category to the low and very high quality category as a positive development. Third, an evolution towards the medium quality category is strengthened for

Latvia, Romania, Slovenia, and to a lesser extent for Poland. This medium quality category remained the most important single category for Bulgaria and Hungary, but it is also the most significant single quality category for Poland. Fourth, Estonia switched from the medium to the high quality category, which is also important for Poland. Finally, the proportion of products of the very high quality category in the structure of CEEC agro-food exports increased in six out of ten countries (Estonia, Hungary, Latvia, Lithuania, Romania, and Slovakia). These empirical results confirm catching-up process in the agro-food relative export quality level to the EU-15 markets.

### **Conclusions and Policy Implications**

This paper provides an application of the standard trade indices for measuring the structural change and similarity of the CEECs agro-food trade of the CEECs with the EU-15 market in the period before joining the EU. The analyses have revealed the CEEC agro-food structural change, specialisation, and structural convergence towards the EU-15 markets, and the CEECs' efforts to develop comparative advantage in agro-food productions vary by CEECs and by agro-food product groups. Most of the CEECs' agro-food exports during the pre-accession are still more similar to each other than to the EU-15. The CEECs' crucial agro-food trade feature is their similar concentrated competitive structure as a result of a similar structure of the agro-food economy. The CEECs' agro-food problem during the pre-accession is in the quality competition, which has been improved a slightly as clearly confirmed by our empirical results. This is also a significant difference in our findings for the CEEC-10 agro-food structural change and structural convergence, and the results for CEEC-10 manufacturing industry trade by Crespo and Fontoura (2007). The CEECs' agro-food structural convergence during the pre-accession was less considerable than holds for manufacturing industry trade.

In intra agro-food structural transformation, the average quality differentiation in agro-food products during the pre-accession remained. The lower average agro-food export quality level in the CEECs vis-à-vis the EU-15 markets and a less considerable catching-up process in quality upgrading in some of CEECs' agro-food exports are one of the significant reasons that CEECs' high and very high quality products have had difficulties to compete on the EU-15 markets during the pre-accession period.

The empirical results have confirmed the progress in structural changes and structural convergence in the CEEC agro-food export to the EU-15 market during the pre-accession, but the results vary by the individual CEECs. The CEECs

pre-accession agro-food trade adjustment process has not been completed. With the accession to the EU, the integration and trade creation effects are encouraging agro-food restructuring and reallocation in the CEECs as well as in the EU-15, structural changes and are bringing additional competition on the enlarged EU market, which is becoming more externally open to competition between regions and globally.

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