Agro-food exports variety from the Central and Eastern European countries

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Abstract: This paper analyses the agro-food exports variety from twelve Central and Eastern European countries (CEECs) to the European Union (EU) during the years 1995–2007. The panel regression models explain the agro-food exports by its previous year, income in the importing EU countries, and measure of agro-food export product variety, while the real exchange rate appreciation of the CEEC currencies has negatively influenced agro-food exports. The EU enlargement with the reduction in agricultural protection and the borderless single market has induced agro-food export increases in primary agricultural produce and intermediate food-processed products, but less in higher value-added food-processed differentiated products. The impact of increased number of CEECs agro-food product varieties on agro-food export to the EU is positive.

Key words: export variety, agro-food products, Central and Eastern European countries, European Union

The paper investigates the issue of the European integration process and the catching up of the Central and Eastern European countries' (CEECs') agro-food export to the European Union (EU-15)[1]. Jeníček and Krepl (2009) underlined the possible role of foreign trade and its effects. In this present paper, our focus is given to the role of a possible increase in the CEEC number of the agro-food exported products to the EU-15 markets as a possible determinant and driving force for the CEEC agro-food catching up with the more competitive EU-15 markets.

Anderson (1992) argued at the early stage of transition from the central planning to the market economy that the transition Eastern European countries and the post-Soviet Republics might become major agricultural exporters. From this perspective, Tangermann (1994) provides western looks towards the East. They shed light on two important development and trade factors. First, the restructuring of the economy in the transition countries implies the improving product quality by upgrading the production technologies. Second, the production specialisation changes the quantity of exports in response to liberalisation. As trade barriers are removed, the composition of exports changes to reflect the comparative advantages. Depending on the relative factor endowments, this leads to specialisation in certain industries (e.g. Schumacher and Siliverstovs 2006). Even if a country specialises in the low-skilled labour or resource-intensive industries, it could still experience restructuring (e.g. Guha 2006). This can be done by gradually improving the production technology and thus the quality of the products in that industry. In addition, the regional trade agreements and economic integration more likely contribute to the trade creation with growth effects (Badinger 2005; Vicard 2009). Now, almost two decades later the research question is what has really happened with the agro-food export from the CEECs to the EU-15 (e.g. Bašek and Kraus 2009; Svatoš and Smutka 2009) and what is the relation between an increase in the number of the agro-food product varieties and a potential increase in the level of agro-food exports?

In general, an increase in trade could be a result of three factors: intensive margin, where the same set of good is exported in larger volumes; extensive margin, where larger quantities of a larger set of goods are exported; and higher quality goods (Hummels and Klenow 2002). Our focus is on the potential role of the agro-food export varieties on the level of agro-food exports, which is in line with the extensive margin factors and higher quality goods. Following the pioneering work by Krugman (1979) on potential gains from trade through the impact of new varieties and increased variety on aggregate welfare, Feenstra (1992), Klenow and Rodriguez-Clare (1997), Bils and Klenow

[1]The analysed EU-15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

(2001), and Yi (2003) have made further contributions on the role of varieties and differentiated trade.

This paper attempts to answer the question on the extent to which an increase in the number of agro-food exported products from the CEECs have increased their agro-food exports to the EU-15 countries. We analyze agro-food exports from the CEECs to the EU-15 markets and then use the agro-food export product variety to model the determinants of agro-food exports for the CEECs to the EU-15 countries.

The next section provides a material and methods with the literature review, describes the methodology and data used. This is followed by the presentation and discussion of the empirical results to explain the agro-food export variety from the CEECs to the EU-15 markets. The final section concludes.

MATERIAL AND METHODS

The importance of international trade in differentiated products has been highlighted by the theory and the evidence on the intra-industry trade (IIT), which explains the occurrence of trade within the same industry. Gains from the IIT reflect economies of scale with lower costs and wider consumer choices. The product differentiation is likely to lead to the monopolistic competition in producing the differentiated good that is exported in a greater extent than imported, and demands by the consumers for the product variety, where the international trade increases welfare by increasing the consumers' utility. Romer (1994) demonstrates in a simple calibration that the trade liberalization increases the number of the traded varieties as a source of welfare gains. Spies and Marques (2009) applying the augmented gravity equation find that the free trade agreements between the EU and the CEECs during the 1990s substantially increased intra-group trade for the Czech and Slovak Republics and Slovenia at the expense of the rest of the world trade. Bojnec and Fertő (2010) applying the panel regression analysis confirmed that the CEEC agro-food quality differentiation on the EU-15 markets during the pre-accession is explained by comparative advantages from the relative factor endowment.

There are several studies that investigate the role of product variety in exports. Funke and Ruhwedel (2001) investigate empirically whether the increasing export variety has contributed to the export growth of 10 East Asian countries. Their econometric results suggest that producing highly differentiated export goods gives a competitive advantage which allows for selling more products. In a companion paper, Funke and Ruhwedel (2002) investigate the link between exports and export variety for 15 OECD countries. They have empirically ascertained the hypothesis that improvements in the variety of exports are an explanation of the OECD trade flows. Hummels and Klenow (2005) decompose the growth of the world trade into the two parts belonging to the extensive margin and the intensive margin. They find that the extensive margin accounts for two-third of the greater exports of larger economies, and one-third of their imports. Broda and Weinstein (2006) measure the impact of the product variety on welfare for the importer. For the United States (US), they find that the upward bias in the conventional import price index (due to ignoring product variety) is approximately 1.2% per year, implying that the welfare gains from the cumulative variety growth in imports are 2.6% of GDP in 2001. Feenstra and Kee (2007) study the effects of the US tariff reductions on the export variety in trade with China and Mexico. Their empirical results indicate that the tariff liberalisation is important in the expanding export variety. Kandogan (2006) investigates the role of the product variety to explain the export growth of transition countries. He finds that opening up to new trade partners, at first, increases the number of sectors in which the trade occurs. However, only those in certain industries succeeded, which led to specialization in certain product categories (Svatoš et al. 2010). The results also reveal an increase in the variety of product categories in which the CEECs have specialized. Feeenstra and Kee (2004, 2007) also highlight that while the static gains from trade have been widely studied and documented to be relatively small, the dynamic gains due to the expansion of export variety may well be more important. In sum, empirical studies confirm the importance of product variety in the export growth (Feenstra 2006).

Our focus is on the association between the agro-food exports and the variable of product variety. A number of measures of the product variety from the literature are available and discussed. They range from simple ones, such as the number of product categories exported, to more sophisticate ones (Feenstra 1994; Funke and Ruhwedel 2001; Hummels and Klenow 2005). For our purpose we employ the ΔPV_{si} index, which is the measure of product variety proposed by Funke and Ruhwedel (2001), which is defined as:

$$\Delta PV_{si} = \ln \left(\frac{\dfrac{\sum_{f \in F_i} x_{fi}}{\sum_{f \in F} x_{fi}}}{\dfrac{\sum_{f \in F_s} x_{fs}}{\sum_{f \in F} x_{fs}}} \right) \quad (1)$$

where x is the level of the agro-food exports, i depicts the CEEC and s the EU-15 market, f denotes an agro-food product, and F denotes a sum of agro-food products. We analyse the agro-food exports of each CEEC-12 to the EU-15 market. The negative values for the product variety index indicate lower product variety in the CEEC i compared to the EU-15 market s.

We start with our baseline equation for the level of agro-food export, which includes the traditional trade explanatory variables on a scale variable representing the foreign demand and the price competitiveness indicator measured by the effect of the real effective exchange rate appreciation or depreciation on one hand, and export product variety variable as the additional non-price export supply-side effects on the other (Funke and Ruhwedel 2002). We specify the baseline equation for the level of agro-food export as:

$$X_{it} = \mathrm{f}\,(X_{it-1}, \mathrm{REER}_{it-1}, \mathrm{GDP}^{\mathrm{EU}}{}_{t}, \Delta PV_{it}) \qquad (2)$$

where X_{it} represents the level of agro-food exports of the CEEC i in period t to the EU-15 countries as export destinations in Euro. Among the baseline explanatory variables X_{it-1} represents the level of agro-food exports of the CEEC i in the previous period $t - 1$ to the EU-15 countries as export destinations. The lagged value of exports reflects the long-term export adjustment as a result of free trade agreements and entry into the enlarged EU. The source of the agro-food trade data is the Eurostat Comext trade dataset. The agro-food products are defined by the EU-Commission (1997).

REER_{it-1} represents the real effective exchange rate index of the CEEC i in period $t - 1$. The *REER* defined as the nominal effective exchange rate index adjusted for relative movements in the national price or cost indicators of the home CEEC country and the selected countries. The weights are derived from trade in the manufactured goods. An increase in the index reflects an appreciation. The real effective exchange rate indices (1995 = 100) were taken from the Bank of International Settlements database.

$\mathrm{GDP}^{\mathrm{EU}}{}_{t}$ represents the gross domestic product (GDP) volume in euro of the EU-15 countries in period t. The $\mathrm{GDP}^{\mathrm{EU}}{}_{t}$ of the importing country explains the association between the CEEC-12 agro-food exports and the size of the importing country increases. The source of data for the $\mathrm{GDP}^{\mathrm{EU}}{}_{t}$ is the Eurostat database.

The ΔPV_{it} index is calculated using the disaggregated trade data at the five-digit Standard International Trade Classification (SITC-5) level consisting of 557 items for 12 CEECs for the years 1995 to 2007, i.e., after the transformational recession in the CEECs. The measure of product – variety at the SITC-5 level captures different agro-food products and their varieties at this level. Due to this we use the term product variety for the increase in the number of the exported agro-food products.

The association between the X_{it} and the X_{it-1} is expected to be positive. According to the economic theory and the previous studies (Funke and Ruhwedel 2002), increased $\mathrm{GDP}^{\mathrm{EU}}$ volume encourages foreign demand and therefore is expected to have a positive effect on the CEEC's agro-food exports. The association between the X_{it} and the REER is expected to be negative, as the CEEC currency appreciation with the increase in the REER in the previous year is expected to reduce the demand for the CEEC's agro-food exports. Consistently with the previous theoretical explanations, we expect positive associations between the increases in the agro-food product exported varieties and the increase in the level of the agro-food exports. Export opportunities also generate some new varieties produced. Therefore, the increase in product variety is expected to increase agro-food exports and hence the regression coefficient for ΔPV_{it} is expected to be positive.

When we log-linearize the equation (2) we get the following baseline dynamic panel data model to be estimated:

$$\ln X_{it} = \beta_0 + \beta_1 \ln X_{it-1} + \beta_2 \ln \mathrm{REER}_{it-1} + \beta_3 \ln \mathrm{GDP}^{\mathrm{EU}}{}_{t}, + \beta_4 \Delta PV_{it} + \varepsilon_{it} \qquad (3)$$

where i = 1, ..., 12 refers to the number of the CEECs, t = 1,..., 13 refers to the number of years in the time period 1995–2007. Equation (3) is the basic specification of our empirical estimates with the focus on the linkages between the level of the CEEC agro-food exports and the number of agro-food product varieties.

In addition to the baseline model specification, we extend the model specification to include the explanatory variables that are related to the CEEC adjustment and entry to the EU. We specify this with the Nominal Rate of Assistance (NRA) to measure the agricultural supports differential between the domestic and border prices based on the World Bank data:

$$\ln X_{it} = \beta_0 + \beta_1 \ln X_{it-1} + \beta_2 \ln \mathrm{REER}_{it-1} + \beta_3 \ln \mathrm{GDP}^{\mathrm{EU}}{}_{t}, + \beta_4 \Delta PV_{it} + \beta_5 \mathrm{NRA} + \varepsilon_{it} \qquad (4)$$

To estimate (3) and (4), we use the system Generalized Method of Moments (GMM) estimator suggested by Blundell and Bond (1998). This is an efficient exten-

sion of the Arellano and Bond (1991) first-difference GMM estimator, which can be subject to a large downward bias and a very low precision as a result of weak instruments in situations, where the series are highly persistent and/or the relative variance of the fixed effects increases even for large i when t is small. The system GMM estimator combines the first-difference and the level specification to deal with the problem of weak instruments highlighted in the empirical work by Roodman (2006). Blundell and Bond (1998) show that in the autoregressive distributed-lag models, first differences of the series can be uncorrelated with the firm-specific effects provided that the series have stationary means. Thus, we experimented with the lagged differences of the variables as instruments for the level equation. As the linear GMM estimators, the Arellano-Bond and Blundell-Bond estimators have one- and two-step variants. But though the two-step is asymptotically more efficient, the reported two-step standard errors tend to be severely downward biased (Arellano and Bond 1991; Blundell and Bond 1998). To compensate, we employ a finite-sample correction to the two-step covariance matrix derived by Windmeijer (2005).

We expect that the CEEC adjustment and the entry to the EU has reduced the border effect and thus encouraged the CEEC agro-food export to the EU-15 markets (e.g. Olper and Raimondi 2008). The transition process to market economies with liberalisation, institutional and policy reforms in the CEEC economies have likely affected the agro-food sector, which is likely to positively affect the CEECs agro-food export performances on the EU-15 markets. During the analysed period, there were decreasing tariffs under the association agreements and the borderless single market with the entry into the EU with the technology transfers packages and an upgrade of technical and sanitary characteristics of the CEECs goods with a vertical quality differentiation.

The CEECs might differ also due to the country-specific successes or failures in the transition process, institutional and policy changes, adjustments and the entry of the CEECs into the World Trade Organization (WTO) and the EU. For example, Croatia (not an EU member) and Russia (not a WTO or EU member) are included in the sample face tariffs and non-tariffs barriers for its exports to the EU. Due to these specific, the CEEC-12 conditions and the CEEC-12 agro-food sector adjustments with the expected increasing vertical integration of food chains over time, we also experiment with the country and year dummy variables to capture the cross-country differences and the possible changes and shifts over the analyzed period.

EMPIRICAL RESULTS

Development of the CEEC-12 agro-food export

To analyse the importance of product variety in exports we use the data set for the CEEC-12 agro-food exports to the EU-15. The CEEC-12 are the new EU-8 member states from the CEEC of the 2004 enlargement (Estonia, Hungary, the Czech Republic, Latvia, Lithuania, Poland, Slovakia, and Slovenia) and the new EU-2 member states of the 2007 enlargement (Bulgaria and Romania). In addition to these

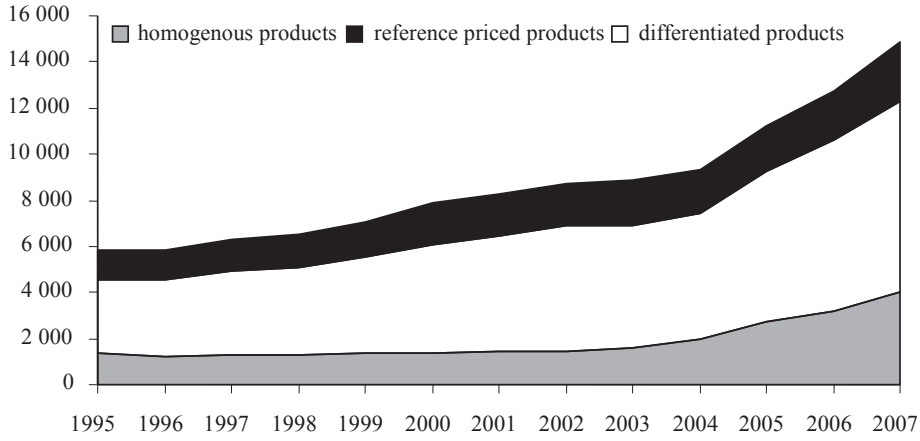

Figure 1. Agro-food exports of the CEEC-12 to the EU-15 by main product groups (in 1995 Euro prices, in millions)

Note: The nominal Euro values are deflated by annual average harmonized indices of consumer prices (HICP 1995 = 100) for Euro area

Source: Own calculations based on Eurostat Comext trade dataset, and Eurostat and European Central Bank for HICP

new EU-10 member states from the CEEC, we also include Russia, which in addition to the Baltic States (Estonia, Latvia, and Lithuania) is from the former Soviet Union territory, and Croatia, which in addition to Slovenia is from the former Yugoslavian territory. Therefore, Russia and Croatia are taken as the proxies for performance of other states from their territories that are still outside the EU membership.

Figure 1 shows the agro-food exports of the CEEC-12 to the EU-15 in the real 1995 Euro prices. We use the Rauch's (1999; 2001) commodity classification to gain more insights for the agro-food trade flows. He classifies trade into three commodity groups: homogeneous products that are traded on the organized exchanges, reference priced products not sold on exchanges but whose benchmark price exists, and differentiated products for all other products. Between 1995 and 2007, the CEEC-12 agro-food exports to the EU-15 markets increased from 5.8 billion Euros to more than 18.7 billion Euros in current prices or deflated in 1995 Euro prices, from 5.8 billion Euros to 14.9 billion Euros. At the 1995 Euro prices and during the same analyzed period, the CEEC-12 differentiated products exports increased from 1.3 billion Euros to more than 2.5 billion Euros or by 95.7% between the first and the last analyzed years. The CEEC-12 reference priced products exports increased from 3.2 billion Euros to 8.3 billion Euros or by 163.7%. The most rapid was the CEEC homogeneous products exports increase from 1.4 billion Euros to 4.0 billion Euros, or by 194.1%. Particularly rapid have been the CEEC-12 agro-food exports to the EU-15 markets since the EU enlargement in 2004; these results are consistent with Bojnec and Fertő (2008b). However, our empirical results do not confirm that the CEEC-12 exported agro-food products have become more in the higher value-added differentiated in varieties (Figure 1).

BASELINE DYNAMIC PANEL MODEL

The CEEC-12 agro-food export to the EU-15 is classified as the level of agro-food export and separately for three groups of products using the Rauch's (1999) product classification. Table 1 presents the results of the dynamic panel estimations by using for one period the lagged variable for the level of the agro-food export by the CEEC-12 to the EU-15 markets. The Hansen test with the reported other diagnostic

Table 1. System of GMM estimation results: the level of the CEEC-12 agro-food exports

	Agro-food products: total	Homogeneous products	Reference priced products	Differentiated products
$\ln X_{it-1}$	0.718***	0.706***	0.290***	0.675***
$\ln \mathrm{REER}_{it-1}$	–0.246	–0.835*	0.484	–0.075
$\ln \mathrm{GDP}^{\mathrm{EU}}{}_{t}$	0.495***	0.845**	1.057***	0.489**
ΔPV_{it}	0.547**	0.954**	0.597**	0.130
Constant	–0.811	–3.708	–4.986	–1.364
N	144	144	144	144
Wald chi^2 (9)	3 061.71	2 358.03	1 130.88	14 083.68
	0.0000	0.0000	0.0000	0.0000
AC(1)	–2.48	–1.63	–1.62	–1.80
	0.013	0.103	0.105	0.072
AC(2)	1.09	0.43	0.10	–0.72
	0.275	0.669	0.917	0.470
Hansen	10.57	8.37	9.41	7.55
	0.306	0.497	0.400	0.581

Note: The table gives Blundell and Bond (1998) system GMM estimates in levels. The sample period is 1995 to 2007. Two-step p-values based on the Windmeijer (2005) correction are used for the specified significance level of the regression parameters: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.001$. AC(1) and AC(2) is test of the first-order and second-order autocorrelation. Hansen is the test of over identification restrictions under the null of valid instruments. Wald is the Wald-test of the joint significance of all variables.

Source: own calculations

tests below the estimates does not reject the joint test of the model and instrument validity. The regression results confirm the theoretical expectations.

The lagged level of the agro-food export variable is statistically significant in the three cases for baseline models, implying that the level of the CEEC-12 agro-food export in the previous period does matter for the level of the CEEC-12 agro-food export to the EU-15 markets. This is also in line with the empirical findings by Funke and Ruhwedel (2002) for the merchandise trade in the OECD countries. As expected, the association pertaining to this variable is positive and significant. The coefficient of elasticity is the lowest in the case for the reference priced products, and higher in the case for the differentiated products and the homogeneous products. The highest coefficient of elasticity is found for the level of the CEEC agro-food export in the previous period than for the Rauch's product groups, respectively.

The coefficient of elasticity pertaining to the real effective exchange rate index (REER) for the one period lagged variable has a negative sign and is statistically significant only in the case of homogeneous products. In this single case, the negative association is consistent with the theoretical expectations and suggests that the CEEC-12 currencies exchange rate appreciation reduces the demand in the EU-15 markets for the homogeneous agro-food products, and thus provides negative implications for the homogeneous agro-food products exports in the CEEC-12 to the EU-15 markets.

As expected, the increase in the GDP volume of the EU-15 countries is positively and significantly associated with the level of the CEEC-12 agro-food export to the EU-15 markets. These results are consistent with the Linder's (1961) demand growth hypotheses that higher incomes in the EU-15 importing countries are associated with an increase in demand for product varieties by consumers in these countries, which is important for the level of the agro-food export from the CEEC-12 to the EU-15 markets. However, unlike to our expectation that the higher the GDP the higher the export of the differentiated products, we find that the coefficient of elasticity is the lowest for the differentiated products (and agro-food as a whole) and higher for the homogeneous and reference priced products. This implies the supply-side competition difficulties of the CEEC-12 in higher value-added differentiated products to the EU-15 markets.

The export product variety has a positive impact on the CEEC-12 agro-food exports to the EU-15 markets. The product variety (ΔPV) variable has the positive sign, which is – except for the regression for the differentiated products – also statistically significant. The coefficient of elasticity is the lowest, but statistically significant for the reference priced products and the highest and statistically significant for the homogeneous products. These results suggest that the CEEC-12 agro-food export opportunity on the EU-15 markets is also in the differentiated products, where the CEEC-12 have increased exports, but less dynamically than in the cases of the referenced and homogeneous agro-food products. This unexpected and striking finding – which is inconsistent with the theoretical expectations – seems to be associated with the CEEC agro-food supply-side competition shortcomings in the differentiated product exports to the EU-15 markets.

Model with protection variable and two step GMM system

We are also interested in the role of the agricultural sector protection in explaining the level of the CEEC-12 agro-food exports to the EU-15 markets. The NRA variable is introduced as an additional control explanatory variable to investigate the stability and consistency of the findings explained in the previous section for the baseline model. Namely, during the analysed years, most of the CEEC-12 were completing the transitional reforms and restructurings, and adjusting for the EU membership and for the competition on the enlarged EU markets. We expect that the level of the CEEC agro-food exports to the EU-15 markets is negatively associated by the NRA variable in the CEEC-12.

The two steps GMM system estimation procedure is applied to estimate the extended baseline model, the specification of which is extended in such a way that the baseline model is additionally specified for the NRA variable. Table 2 presents the regression results that, in comparison with Table 1, are based on the additional regression specifications for the NRA variable. Similarly to the baseline models, the Hansen test together with the other diagnostic tests does not reject the joint test of the model and instrument validity. The regression coefficient for the NRA variable, except for the homogeneous products, has a significant negative sign. The lower the CEEC-12 nominal rate of assistance, which captures the CEEC-12 trade and price distortions, the greater is the level of the CEEC-12 agro-food exports to the EU-15 markets, implying that the CEEC-12 agro-food sector's trade and price liberalization have improved its efficient ability in the exports to the EU-15 markets. This seems to be related to the increasing competition pressures in the CEEC-12, which are more specialized towards

Table 2. System of GMM estimation results with agricultural protection: the level of the CEEC-12 agro-food exports

	Agro-food products: total	Homogenous products	Reference priced products	Differentiated products
lnX_{it-1}	0.678***	0.572***	–0.148	0.904***
$\ln REER_{it-1}$	0.070	–1.341**	0.841	–0.241
$\ln GDP^{EU}_{t}$	0.367**	1.016***	2.020	0.450
ΔPV_{it}	0.486***	1.431***	–0.105	–0.241
NRA	–0.199***	–0.159	–0.484***	–0.365***
Constant	0.647	–1.387	–13.506	0.000
N	132	132	132	132
Wald chi^2 (11)	2 794.89	563.90	1 915.06	1 358.86
	0.0000	0.0000	0.0000	0.0000
AC(1)	–2.15	–1.23	0.67	–2.29
	0.032	0.220	0.504	0.022
AC(2)	1.00	–1.84	–0.55	–1.14
	0.315	0.066	0.586	0.253
Hansen	8.34	6.91	3.73	8.01
	0.401	0.546	0.881	0.433

Note: The table gives Blundell and Bond (1998) system GMM estimates in levels. The sample period is 1995 to 2007. Two-step p-values based on the Windmeijer (2005) correction are used for the specified significance level of the regression parameters: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.001$. AC(1) and AC(2) is test of the first-order and second-order autocorrelation. Hansen is the test of over identification restrictions under the null of valid instruments. Wald is the Wald-test of the joint significance of all variables.

Source: own calculations

the agro-food products with the comparative trade advantages. The literature on the East-West trade highlights that similar matched two-way trade flows or the IIT are basically vertically differentiated (Fertő 2005; Majkovič et al. 2007; Bojnec and Fertő 2008a; Fertő and Soós 2008), but the results based on the revealed comparative advantage indices also show some deterioration in the trade competitiveness of the CEEC on the EU-15 markets (Bojnec and Fertő 2008b; Fertő 2008).

Except for the regression for the level of the CEEC-12 agro-food exports and for the homogeneous products, respectively, the NRA variable has made the GDP^{EU} variable insignificant. In the reference priced model, except for the NRA variable, other variables have become insignificant. In the regression for the differentiated products in addition to the NRA variable only the one-year lagged agro-food export variable has remained statistically significant. In the regression for the homogeneous products, the NRA variable is insignificant, whereas the baseline variables from Table 1 have remained statistically significant. The coefficients of elasticity for the variables of $REER_{t-1}$, GDP^{EU} and ΔPV have increased and have an absolute value greater than one, implying elastic responses. For the level of the CEEC-12 agro-food export, the NRA variable is significant, whereas the $REER_{t-1}$ variable remains insignificant. The X_{t-1}, GDP^{EU} and ΔPV variables are statistically significant, but the size of value for their coefficient of elasticity is lower than in the baseline regression presented in Table 1.

CONCLUSION

This paper contributes to the theory and empirics of the main trends and drivers of the agro-food exports from the CEECs to the EU-15 markets between 1995 and 2007. This period covers both the transition period of the CEECs economies and the CEEC-10 access to the EU. The focus is on the extent to which an increase in the agro-food product varieties explains the increase in the level of the CEEC-12 agro-food exports to the EU-15 markets.

Rather mixed results on the analysed CEECs agro-food export determinants are found as the coefficient

are generally, but not always statistically significant. The impact of increased in the number of the agro-food product exported on the level of agro-food export is economically positive and, except for the differentiated products, statistically significant. The sustainability of the CEEC-12 agro-food export depends on the export specialization of the product as confirmed by the economically positive and statistically significant association with the agro-food export level in the previous period. The income growth in the importing country is one of the main drivers for the level of the CEEC-12 agro-food export to the EU-15 markets, which is consistent with the Linder's (1961) hypothesis that consumer demand for quality depends on their income. The real exchange rate appreciation of the CEEC currencies has negatively influenced their agro-food export, which is statistically significant for the homogeneous products.

Among the experiences and lessons learnt, we have found that the EU enlargement has contributed to the CEEC agro-food trade creation on the EU-15 markets, but in contrast to the initial expectations, the CEEC are still not significant agro-food exporters to the EU-15 markets. One of the most striking findings is that, in contrast to the theoretical expectations on the fastest growth of agro-food exports in differentiated products, the CEEC-12 agro-food export growth to the EU-15 markets is the fastest for the least sophisticated homogeneous products. The reference priced products specified as not sold on exchanges, but whose benchmark price exists, are the most important in the CEEC agro-food export structure to the EU-15 markets. These results imply restructuring progresses for trade creation effects that have been achieved in the CEEC-12 agro-food exports to the EU-15 markets, but the patterns for differentiated products clearly confirm competitive difficulties in the CEEC agro-food sectors and international marketing. The nominal rate of assistance variable, which captures the price and trade liberalisations, is inversely associated with agro-food exports. The decline in the CEEC-12 nominal rate of assistance is a factor that encourages the CEEC-12 agro-food exports to the EU-15.

For most of the CEEC agro-food export developments, after the two decades of the transition and the EU enlargement, their trade structures and patterns are typical for the trade between the unequal trading partners. The CEEC-12 agro-food exports take a relatively small share of the EU-15 agro-food imports, and the CEEC-12 agro-food export increases are less in more sophisticated differentiated products. Both the increases in the export product variety on the greater number of the exported agro-food products and the increases on the higher quality of the exported agro-food products are the issues that should be addressed. These findings are consistent with the previous research on the CEEC agro-food trade despecialization and loss of the revealed comparative advantages on the EU-15 markets (Fertő 2008; Bojnec and Fertő 2008b), and confirm the CEEC difficulties in agro-food price and quality catching up with the EU-15 markets (Bojnec and Fertő 2007, 2009). Among the issues for the future research, there are to include in the regression model the additional explanatory variables to control for the heterogeneous CEEC characteristics as the agro-food exporting countries in the terms of technology used, factor endowments, and the structure of the agro-food sector and the economies.

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