

# VISEGRAD COUNTRIES' AGRICULTURAL FOREIGN TRADE DEVELOPMENT (TRANSFORMATION PROCESS)\*

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Changes in the territorial and commodity structure of agrarian export trade of countries of the Visegrad Group in the period 1993–2008 were identified and analyzed. The paper concludes that in recent years, both the value and volume of Visegrad countries' export and import operations have increased significantly. In the case of exports, individual countries have managed to increase the volumes of its exported finalized products. The share of the current EU members in the value of the Visegrad Group agricultural trade is increasing at the expense of trade with "third countries". EU accession and its common market forced all analyzed Visegrad Group countries to modify their export commodity structure, and most of them (apart from Hungary) have been able to export finalized products with higher unit prices to the EU market. It is expected that with the intensification of the Visegrad Group's integration within the EU single market, prices of agrarian exports will rise further on. The members of the Visegrad Group of countries are going through a gradual process of specialization of exports in a limited number of aggregate commodity groups. Various specific factors might cause an overall restructuring of the agrarian sector and foreign trade activities in these countries.

agrarian trade; Visegrad countries; European Union; structure; development

## INTRODUCTION

The countries of the Visegrad Group (Czech Republic, Slovakia, Poland, and Hungary) – also referred to as the V4 countries – have undergone a dramatic development in recent years, which has very significantly influenced the structure of their economy, including the agricultural sector and trade with agricultural products. Immediately after the collapse of the "Eastern bloc", COMECON and the USSR, all V4 countries faced a significant economic downturn that coincided with the collapse of the former socialist system and its market linkages. The agrarian sector suffered very significant losses in the process of the transition from a centrally planned economy to a market economy. In particular, livestock production and the number of workers employed in the agricultural sector has been reduced noticeably, (European Commission, 1999; Pokrivčák, Ciaian, 2004; Bojnec, Ferto, 2006; Ciaian, Swinnen, 2006; Tuček, Vološin, 2006; Ciaian, Pokrivčák, 2007). This has resulted in a decrease in the level of V4

countries self-sufficiency. The share of agricultural exports in total exports in the case of the V4 countries fell below 10%. In the Czech Republic and Slovakia the reduction has been much more significant, since the position of the agrarian sector is not as significant in these two countries as in the case in Poland and Hungary (European Commission, 2010). During the first years of transition (in the last decade of the 20<sup>th</sup> century), while the share of agrarian exports in OECD countries and in the former EU15 countries was increasing, in the countries of Central and Eastern Europe, and especially in regions throughout the Commonwealth of Independent States (CIS), the total value of agricultural trade stagnated or even gradually decreased (Pokrivčák, Drábik, 2008). Here, a gradual economic transformation took place, leading to the correction of trade relationship deformations caused during the period before 1990 (Drábik, Bártová, 2008). In the early years of the last decade of the 20<sup>th</sup> century, the share of the EU member states in agrarian trade with the V4 countries was abnormally low, but over time (thanks to structural changes, and function-

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ing market mechanisms) it has increased to its current level typical of an EU member state (Bussiere et al., 2005). The EU15 share in total agrarian trade of the V4 countries increased mainly due to a process of liberalization, occurring not simply as a consequence of the GATT/WTO negotiation rounds, but mainly because of the partnership established between the V4 and EU15 countries in the process of integration of the former Eastern European countries into the European structures (Pohlová et al., 2007). In this regard, it should be stressed that the process of liberalization, which had affected trade between the V4 countries and the EU15 in the period prior to their EU accession, was asymmetric in character (Vološin et al., 2011). It should be emphasized however that in this period the V4 countries had also invested considerable resources to support their own agrarian sector and agrarian trade, though their ability to support the agrarian sector was significantly lagging behind that of the EU countries (Tucek, Vološin, 2006). The process of liberalization affected not only the V4 trade with the EU15 countries, but also during this period it initiated the emergence of the Central European Free Trade Area (CEFTA). The pace of liberalization of agrarian trade within CEFTA (Czech Republic, Poland, Slovakia, Hungary and later Bulgaria, Romania, and Slovenia) was not as dynamic as it was in the case of the V4 trade with the EU15 (Vološin et al., 2011). In May 2004 the V4 countries became EU members. EU accession brought about very significant changes in agri-trade for the individual countries. The Czech Republic, Slovakia, Hungary, and Poland became part of the EU single market, and all the obstacles limiting the movement of goods between them and the EU countries up to that time, ceased to exist (Svatoš, 2008). The individual countries had to accept common EU tariffs and also agreements signed and accepted by the EU in the period before the V4 accession. As a result of their positions with non-EU trade partners, from the aspect of the territorial structure of the Visegrad Group, agrarian trade has been weakening. This development did, however, strengthen the positions of the older EU Member States as the most important partners of the Czech Republic, Slovakia, Poland, and Hungary.

## MATERIAL AND METHODS

The objective of this paper is to identify changes in the territorial and commodity structure of agrarian export trade of the countries of the Visegrad Group (or V4 – i.e. the Czech Republic, Poland, Hungary, and Slovakia) in the period 1993–2008. Based on this analysis, the V4 countries' real agri-trade development and status is defined in the context of the EU single market. The main idea of this paper is to show the fundamental changes in agrarian trade, which have occurred in recent years, and then identify how

the Visegrad countries' agrarian trade has gradually adapted to the EU single market conditions. In terms of methodological approaches, the analysis is divided into several parts dealing with the development of the agrarian trade of the Visegrad Group in terms of commodity and territorial structure, as well as from the perspective of the sensitivity of agrarian export trade to the changing economic environment. It is also important to mention that from the analytical point of view, the analysis (data permitting) is prepared to deal with the agrarian trade development and other related variables for the time period between 1993 and 2008. The United Nations UN COMTRADE database has been selected as the main data source, and has enabled the development of commodity trade (including agricultural and food items) to be tracked according to the International Classification (SITC). The SITC nomenclature divides trade in agricultural and foodstuff products into 44 basic commodity groups (Table 1, for details see the UN COMTRADE methodology on <http://unstats.un.org/unsd/trade/methodology%20imts.htm>) – the share of finalized products (with the higher level of added value) is estimated according to the share of the individual SITC items' share in total agrarian export value (for details see Smutka et al., 2011).

The analyzed data obtained from these databases are processed in terms of their own exchange value (at current prices in USD). Export prices and value are usually expressed in F.O.B. prices, while imports value and prices are generally expressed in C.I.F.

For the purpose of interpretation of selected results of this analysis (especially the analysis of the aggregate share in the final value of agricultural trade, and further the analysis of the growth rate of individual aggregate values in the years 1993–2008), a modified version of the BCG Matrix has been used (Boston Consulting Group Matrix) (Kotler, 2007). This allows the agricultural commodity trade structure of the individual countries to be split into several segments characterized by diverse development trends. Such a classification of the commodity structure makes the identification of the commodities representing the promising part of the commodity structure of each country as well as those appearing non-perspective, easier. In this regard, it should be noted that the concept of the BCG Matrix is used more at the corporate level, but there is no rationale preventing the application of the concept arising from the BCG Matrix at the national economy level. Alternative applications of the BCG Matrix concept can be found in the works of a number of authors (Sirkin et al., 2008). In this respect, it is useful to note that a similar analysis, though at the corporate level, can be achieved using the GE Matrix concept (e.g. Kotler, 2007; Jakubíková, 2008). The results estimated from this Matrix are, however, difficult to interpret, since this Matrix is divided by product/aggregates into nine segments, unlike the BCG Matrix,

Table 1. A list of aggregations representing the commodity structure of trade in agricultural products and food

SITC code	Aggregation	SITC code	Aggregation
001	live animals	056	vegetables, prepared or preserved, non elsewhere specified
011	bovine meat	057	fruit, nuts excl. oil nuts
012	other meat, meat offal	058	fruit, preserved, prepared
016	meat, edible offal, dry, salt, smoked	059	fruit, vegetable juices
017	meat, offal, prepared, preserved, non elsewhere specified	061	sugars, molasses, honey
022	milk and cream	062	sugar confectionery
023	butter, other fat of milk	071	coffee, coffee substitute
024	cheese and curd	072	cocoa
025	eggs, birds, yolks, albumin	073	chocolate, other cocoa including preparations
034	fish, fresh, chilled, frozen	074	tea and mate
035	fish, dried, salted, smoked	075	spices
036	crustaceans, molluscs, etc.	081	animal feed stuff
037	fish, etc. prepared, preserved, non elsewhere specified	091	margarine and shortening
041	wheat, meslin, unmilled	098	edible products and preparations, non elsewhere specified
042	rice	111	non-alcohol beverages, non elsewhere specified
043	barley, unmilled	112	alcoholic beverages
044	maize unmilled	121	tobacco, unmanufactured
045	other cereals, unmilled	122	tobacco, manufactured
046	meal, flour of wheat, meslin	411	animal oils and fats
047	other cereal meal, flours	421	fixed veg. fat, oils, soft
048	cereal preparations	422	fixed veg. fat, oils, other
054	vegetables	431	animal, veg. fats, oils, non elsewhere specified

source: Czech Statistical Office, 2010

where in the case of the Czech Republic the commodity structure is divided into just four segments. The mere commodity structure of world agricultural trade is analyzed in three time period intervals: 1993–1998, 1999–2003, and 2004–2008. A modified version of the BCG Matrix terminology and interpretation has been applied, where commodities placed in its upper right corner are called a star (represented by a high share of the final value of agricultural trade and rapid growth rate of its export value); those placed in the upper left corner are called cash cows (with a higher than average share of the total aggregate value of the agricultural exports, but low growth rate of their exports value); commodities placed in the lower right corner are called problem children (or sometimes question marks, which are characterized by a low share of the value of agricultural trade, whilst the annual export growth levels are very high); in the last quadrant, the last commodity groups left are the dogs (those are the aggregations with an export growth rate below average and a share of the final value of the agricultural exports also below average (low)). This analysis of the commodity and territorial structure development of V4 agricultural trade deals also with the sensitivity of the agricultural trade of the analyzed countries,

related to changes in selected variables of the external and internal economic environment.

Estimated elasticities in the analysis help to reveal the sensitivity of the agricultural exports of different countries, related to changes which have the potential to affect their export performance. The elasticity coefficient estimations are based on an analysis of the relationships existing between the values of the agricultural exports of individual countries (endogenous variable) on the one hand, and selected factors related to the economic output development of individual countries on the other. In this case, the following variables (exogenous) have been taken into account (all in USD): world GDP, EU-15 GDP, NMS or EU12 GDP (EU new member states that entered EU between 2004 and 2007), individual V4 countries' GDP (i.e. Czech Republic, Slovak Republic, Hungary, and Poland), world agrarian exports, EU agrarian exports (common market), individual V4 countries' agriculture GDP, world agriculture GDP, EU15 agriculture GDP, NMS or EU12 agriculture GDP. The analysis of elasticity was based on a series of simple regression functions analyzing the relationship between the value of the selected countries' agricultural exports (as the endogenous variable) and the selected factor related

Table 2. Agrarian trade turnover and balance for the Czech Republic, Hungary, Poland, and Slovakia (V4) (1993–2008)

Year	Trade turnover (mil. USD)					Trade balance (mil. USD)				
	Czech Republic	Hungary	Poland	Slovakia	V4	Czech Republic	Hungary	Poland	Slovakia	V4
1993	2010	2381	3623	900	8914	48	1003	-535	-226	290
1998	3048	3564	6503	1255	14370	-550	1458	-577	-411	-80
1999	2644	2943	5427	1087	12101	-616	1187	-639	-345	-413
2003	4057	4390	7739	1691	17877	-809	1338	607	-377	759
2004	5451	5698	11061	2447	24657	-1089	1116	1167	-491	703
2008	12627	11820	29736	6336	60519	-1573	2410	2530	-1606	1761

source: UN Comtrade, 2010, own calculations

to the development of national, European, and world economy (as exogenous variable):

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$$

where:

$y_i$  = endogenous variable (individual countries' export value)

$x_i$  = exogenous variable (individual variables related (the relevance of individual variables is confirmed through the calculation of determination index) in individual countries' agrarian export performance)

$\beta_0, \beta_1$  = regression parameters

$\varepsilon_i$  = error term

$i$  = index of a particular observation ( $i = 1, \dots, n$ )

Every calculated regression expresses the relationship between one endogenous and one exogenous variable. The 40 regressions analyzing the relationship between individual Visegrad countries' agrarian export and each above mentioned variable were calculated for the purpose of elasticity calculation. Based on the individual linear regression results, elasticities have been estimated.

## RESULTS AND DISCUSSION

In the period 1993–2008 the value of agro-food trade in Central European countries increased considerably. Its turnover during the same period increased from approximately \$ 9 billion to about \$ 60 billion. The value of the agricultural trade turnover in the analyzed countries increased on average by approximately 13.6% annually. In this regard, it is important to emphasize that the final value of agricultural trade turnover share of the agrarian exports and imports is in approximately equal proportions. In the period 1993–2008 the import value share on final agri-trade turnover value in the analyzed countries represented approximately 49%, while the value of the agricultural exports represented approximately 51%. It should also be emphasized that the mutual proportion of the agrarian export and import remained almost unchanged. During the analyzed period, the share of the agricul-

tural imports fluctuated between about 47 and 52%, while the share of agricultural exports varied between 48 and 53%. Based on the analysis of the individual countries' agricultural trade value it can be concluded that long-term annual growth rate of agricultural exports and imports value for all countries analyzed has been very balanced. The value of agricultural exports in the period increased on average by 13.6% annually, while the value of agricultural imports increased by approximately 13.64% annually. The results show that both the agricultural exports and imports values increased at approximately the same rate, though it can be noticed that there is a slight predominance on the import side, which value in recent years has increased slightly faster in comparison with exports. Such trends in the long term lead to a gradual reduction in the share of positive trade balance in the region's total agro-food turnover. It must be stressed that the agro-food trade of the region as a whole has long been characterized by positive trade balances (negative balances were recorded only in 1996, 1998, 1999, 2000, and 2002). These figures were influenced to a major extent by the fact that Polish and Hungarian agricultural trade has long been characterized by surpluses. To the contrary, Czech and Slovak agricultural trade has long been characterized by deficits.

The data given in Table 2 indicate that the agricultural trade of Central European countries responded positively to the accession of the Czech Republic, Slovakia, Hungary, and Poland into the EU. The trade value and volume has gradually increased to its present value, where countries export agro-food products to a total value of around 30 billion U.S. dollars. A positive feature is the fact that the opening of the each V4 country's market to imports from other EU countries has not led to any of the catastrophic scenarios that predicted an increase in trade deficits. Although after the accession of V4 countries, the value of imports increased very significantly (in 2008, the value of agricultural imports was in the case of individual V4 countries at the following levels (in billion USD): Czech Republic ca. 7.1, Hungary about 4.7, Poland about 13.6, and Slovakia ca. 4), the agricultural trade deficit has not increased considerably. The increase



Table 3. Growth rate of values of agrarian exports in world trade (calculated through the chain index)

	1993–2008	1993–1998	1999–2003	2004–2008
World	1.08	1.07	1.03	1.15
Czech Republic	1.116	0.997	1.113	1.281
Slovakia	1.13	1.00	1.14	1.29
Hungary	1.10	1.03	1.08	1.20
Poland	1.17	1.08	1.15	1.31

source: UN Comtrade, 2010, own calculations

Table 4. BCG Matrix evaluation: analysis of Czech agricultural exports development and structure (period 1993–2008)

	1993–1998	1999–2003	2004–2008	BCG segment	Share on exports value	Growth rate of exports value
Share of individual commodity groups involved into individual BCG segments on total agrarian exports	26.22%	38.54%	46.37%	star	above average	above average
	50.04%	44.14%	36.78%	cash cow	above average	below average
	17.11%	5.59%	7.40%	problem children	below average	above average
	6.62%	11.73%	9.46%	dog	below average	below average
Number of aggregations in various segments of BCG Matrix	5	9	9	star		
	9	8	8	cash cow		
	14	11	14	problem children		
	16	16	13	dog		

source: UN Comtrade, 2010, own calculations

in the value of imports for each V4 country analyzed has more or less been compensated for by the rise in the value of agricultural exports mostly traded into EU markets. The results of the agricultural trade balance of all Central European countries analyzed in total reveals that, after joining the EU, the agro-food trade balance was more positive when compared to the period before their accession into the EU. It should be stressed though, that this result has been affected mainly by the results of the Polish and Hungarian agro-food trade. The figures above show that the growth rate of the V4 agricultural exports value is well above the world and European average, despite the fact that Hungary is undergoing a profound structural and budgetary crisis, which has had a negative impact on its agricultural sector.

#### Analysis of the agro-food export commodity structure of the V4 countries

From the observed trends it can be concluded that the agro-food territorial and commodity structure of the V4 countries is constantly trying to adapt to the integration process conditions occurring in the EU 27 market. However the commodity structure of the Czech Republic, Slovakia, Hungary, and Poland – i.e. comparatively new EU members – has not yet managed to fully adapt to the conditions of the EU single market (in this respect, it is appropriate to say that the EU market itself has still failed to adapt to changes caused by its enlargement in 2004 and 2007). The V4 agro-food export commodity structure is becoming

even more concentrated, and what is more important, the average agricultural exports growth rate for each commodity aggregate currently exceeds the growth rates in the world and especially in the European market (Table 3). This represents a very significant shift from the situation that each V4 country faced in the early 1990s.

In the future it is expected that the V4 agricultural trade will adapt better to the EU market conditions. A wide range of commodity groups can be identified that will certainly strengthen their importance in the national and in particular, within the European agricultural market structures. Ongoing liberalization at both the EU27 and at the WTO level will also have a huge impact on these developments. Changes in the structure of the agricultural commodity exports are already apparent. Currently, across the countries of the Visegrad Group, a significantly different export commodity structure can be observed when compared to the early 1990s. The export structure in the analyzed countries is constantly changing and adapting to market conditions of the EU. Currently, the V4 countries export pillars include commodity group aggregations, whose position in the agrarian export commodity structure will become even stronger in the future. The following tables and charts illustrate the evolution of the commodity structure of agricultural trade (exports) for each country analyzed. The tables show the dynamics of the changing export structure in the V4 countries. In the case of the Czech Republic (Table 4), the following commodities could be ranked among the export pillars: milk, skimmed milk and

Table 5. BCG Matrix evaluation: analysis of Hungarian agricultural exports development and structure (period 1993–2008)

	1993–1998	1999–2003	2004–2008	BCG segment	Share on exports value	Growth rate of exports value
Share of individual commodity groups involved into individual BCG segments on total agrarian exports	31.80%	22.61%	29.08%	star	above average	above average
	48.45%	54.24%	52.20%	cash cow	above average	below average
	11.48%	10.57%	9.42%	problem children	below average	above average
	8.28%	12.58%	9.30%	dog	below average	below average
Number of aggregations in various segments of BCG Matrix	6	4	5	star		
	7	8	9	cash cow		
	15	15	10	problem children		
	16	17	20	dog		

source: UN Comtrade, 2010, own calculations

Table 6. BCG Matrix evaluation: analysis of Polish agricultural exports development and structure (period 1993–2008)

	1993–1998	1999–2003	2004–2008	BCG segment	Share on exports value	Growth rate of exports value
Share of individual commodity groups involved into individual BCG segments on total agrarian exports	35.03%	42.43%	33.58%	star	above average	above average
	49.08%	43.92%	52.45%	cash cow	above average	below average
	10.19%	11.24%	9.13%	problem children	below average	above average
	5.70%	2.41%	4.83%	dog	below average	below average
Number of aggregations in various segments of BCG Matrix	9	9	8	star		
	8	9	12	cash cow		
	18	13	18	problem children		
	9	13	6	dog		

source: UN Comtrade, 2010, own calculations

Table 7. BCG Matrix evaluation: analysis of Slovak agricultural exports development and structure (period 1993–2008)

	1993–1998	1999–2003	2004–2008	BCG segment	Share on exports value	Growth rate of exports value
Share of individual commodity groups involved into individual BCG segments on total agrarian exports	40.44%	49.30%	47.10%	star	above average	above average
	41.75%	34.13%	32.91%	cash cow	above average	below average
	8.48%	7.57%	12.62%	problem children	below average	above average
	9.33%	9.00%	7.37%	dog	below average	below average
Number of aggregations in various segments of BCG Matrix	8	8	7	star		
	7	8	7	cash cow		
	12	14	16	problem children		
	17	14	14	dog		

source: UN Comtrade, 2010, own calculations

dairy products, flour and cereals, alcoholic beverages, food products, tobacco products, live animals, candies and confectionery, animal feed, wheat, chocolate, and cocoa-containing products. In many cases the strong export position of these products is influenced by the fact that they are produced and traded by multinational companies. On the other hand the following product groups' perspectives are very low and they can be classified as dogs: bovine meat, meat edible offals, eggs, crustaceans and molluscs, selected unmilled cereals, flour of wheat, preserved and prepared vegetables and

fruit, fruit and vegetable juices, spices, animal oils and fats, selected vegetable fats and oils.

Hungary's agricultural exports (Table 5) are currently based on the following product groups: maize, meat, wheat, animal feed, vegetables, live animals, sugar, vegetable fats and oils, milk and dairy products, meat ingredients as well as cereal and flour products. On the other hand, the following product groups' perspectives are very low and they can be classified as dogs: bovine meat, butter and other fat of milk, cheese and curd, eggs, fish and fish products, crustaceans and

Table 8. Correlation index characterizing the relationship between individual Visegrad countries agrarian trade export performance and individual selected variables (1993–2008)

Correlation index	World trade	EU trade	World GDP	Visegrad Group GDP	GDP EU15	GDP EU12	Agric. world GDP	Agric. GDP, resp. V4	EU15 agric. GDP	EU12 agric. GDP
Hungarian agrarian export	0.975	0.964	0.912	0.868	0.908	0.943	0.985	0.900	0.530	0.967
Czech agrarian export	0.972	0.964	0.950	0.968	0.935	0.971	0.971	0.924	0.436	0.947
Slovak agrarian export	0.952	0.953	0.956	0.949	0.951	0.958	0.939	0.898	0.432	0.929
Polish agrarian export	0.983	0.972	0.970	0.968	0.953	0.982	0.972	0.901	0.431	0.951

source: UN Comtrade, 2010, own calculations

Table 9. Agrarian trade elasticities of selected countries (1993–2008)

Agrarian exports elasticity (%)	World trade	EU trade	World GDP	Visegrad Group GDP	GDP EU15	GDP EU12	Agric. world GDP	Agric. GDP, resp. V4	EU15 agric. GDP	EU12 agric. GDP
Czech Rep.	1.89	1.90	2.29	1.17	2.29	1.19	2.62	2.09	3.80	1.98
Slovakia	2.21	2.24	2.72	1.39	2.73	1.40	3.05	2.28	4.48	2.32
Hungary	1.30	1.31	1.54	0.85	1.55	0.81	1.81	1.30	2.88	1.37
Poland	2.32	2.33	2.82	1.55	2.81	1.46	3.20	2.09	4.60	2.41

source: UN Comtrade, 2010, own calculations

molluscs, rice, cereals (except for barley, maize, and wheat), cocoa, chocolate and cocoa products, spices, tobacco manufactured and unmanufactured, animal oils and fats, fixed vegetable fats and oils.

From the pillars of Polish agro-food exports (Table 6), the following product groups may be mentioned: meat, milk and dairy products, fresh vegetables, cereal products and flour, canned fruits and fruit products, fruit and vegetable juices, tobacco products, chocolate and cocoa-containing products, and food ingredients. On the other hand, the following product groups' perspectives are very low and they can be classified as dogs: crustaceans and molluscs, wheat, rice, barley, and animal and vegetable fats and oils.

In the case of Slovakia (Table 7), the following product groups have been gradually profiled among its agrarian exports pillars: milk and dairy products, cereal products and flour, chocolate and cocoa-containing products, cheese and cottage cheese, live animals, sweets, fruit, meat, food products, corn, and soft drinks. On the other hand, the following product groups' perspectives are very low and they can be classified as dogs: meat and edible offals, fish (fresh, chilled, frozen), selected cereals (except for wheat and barley), fruits and nuts (especially bananas and citrus etc.), preserved and prepared fruit, spices, unmanufactured tobacco, animal oils and fats, and fixed vegetable fat and oils. It should be highlighted, that the commodity structure of Slovak agricultural exports is among the

most dynamically changing structures of all members of the Visegrad Group.

#### Sensitivity analysis of V4 agro-food trade to changes in external and internal environment

It is important to emphasize that the agro-food trade of the V4 countries reacts very sensitively to changes in the internal and (especially) the external economic environment (their agrarian export performance and individual variables related to individual countries' agrarian trade performance are closely correlated – Table 8). Undoubtedly, Poland responds most sensitively to changes in the external and internal environment, affecting the development of the agricultural exports of selected countries, where the agricultural trade is growing very dynamically. Poland is followed by Slovakia, the Czech Republic, and Hungary. An interesting finding in this regard is that Hungary, which is a natural player in the market with agricultural and food products, shows the lowest degree of elasticity in response to changes in both the external and internal environment. Overall, the elasticity of the agricultural exports of each country to changes in the external environment is high and shows a positive trend for all variables (Table 9). It may be said that, on average the elasticity of the Polish agro-food exports to the changes caused by the changes in the value (usually an increase) of selected variables is

Table 10. Agri-trade exports (left) and imports (right) (share of selected trade flows in final value, in %)

1996 export	Czech Rep.	Hungary	Poland	Slovakia	1996 import	Czech Rep.	Hungary	Poland	Slovakia
EU15 1995	35.68	44.98	45.80	17.07	EU15	52.92	41.26	44.94	35.74
EU27 2007	72.37	61.99	52.15	70.29	EU27	68.95	46.16	51.84	78.52
External trade	27.63	38.01	47.85	29.71	external trade	31.05	53.84	48.16	21.48
2008 export	Czech Rep.	Hungary	Poland	Slovakia	2008 import	Czech Rep.	Hungary	Poland	Slovakia
EU15 1995	42.44	49.77	59.22	27.21	EU15 1995	55.89	60.72	55.62	28.82
EU27 2007	91.09	81.58	80.57	95.28	EU27 2007	84.17	91.10	66.70	75.78
External trade	8.91	18.42	19.43	4.72	external trade	15.83	8.90	33.30	24.22
External partners of the EU*	2.99	11.04	5.04	3.26	external partners of EU*	4.81	5.43	8.64	4.06
Others under the MNF**	5.92	7.38	14.39	1.46	others under the MNF**	11.02	3.47	24.66	20.16

\*all trade partners outside the EU which signed any kind of trade agreement with the EU (free trade agreement, association agreement, customs union, economic partnership agreement, stabilization and association agreement, etc.); \*\*all trade partners working under the MNF or not having any trade agreement with the EU; source: UN Comtrade, 2010, own calculations

very high. A change by 1% in selected (exogenous) variables leads the Polish agrarian exports to change by about 2.56%. In the case of Slovakia, high values of agro-food export elasticity to changes in the external environment can also be noticed (ca. 2.48%). In the case of the Czech Republic, the sensitivity to changes in the external and internal economic environment is not as high. The average value of elasticity in relation to the percentage change in value of selected variables in the period 1993–2008 fluctuated around 2.12%. The lowest elasticity of the agrarian export can be monitored in the case of Hungary.

#### Changes in the territorial structure of agro-food trade in V4 countries

An important factor that influences the nature of agro-food trade in the V4 countries is that the EU is continuously expanding. For the V4 countries there are important trading partners in both the EU15, as well as in the new member states that joined the EU in 2004 and 2007. It is exactly the share of the new EU member states on the agrarian trade of the Czech Republic, Slovakia, Poland, and Hungary that is permanently and dynamically increasing. The increase in the share of the 27 current EU members in the final value of the agricultural exports and imports is shown in Table 10. The values indicate that the third countries' share (i.e. non-EU members) in the agrarian trade territorial structure of the Czech Republic, Slovakia, Poland, and Hungary has been steadily declining. Among the crucial factors influencing this trend could be mentioned the EU Common Trade Policy, EU Common Agricultural Policy, as well as the considerable influence of the efforts of domestic producers to succeed in the EU market, where prices are generally higher than in the world market (of course a range of other factors should

not be forgotten). The share of third countries (non-EU members) in the final value of exports and imports in recent years has been significantly reduced. If the changes that occurred in trade with non-EU countries is considered, a lower growth dynamics compared to the past can be observed, while in the case of the Czech Republic and Slovakia both the volume and value of trade transactions tend to stagnate.

#### CONCLUSIONS

The structure of agricultural exports in the case of all countries analyzed is dynamically changing. In recent years, both the value and volume of export and import operations have increased significantly. V4 trade is gradually specializing in the production of a limited range of agrarian commodities and is focused on only a limited number of partners. In the case of the V4 countries, the reduction of non-EU countries' share in the final value of agrarian trade flows is apparent. Even within the EU market, which currently includes 27 members, the V4 export territorial structure is largely focused on a few key partners whose share in the final value of exports is very significant. The proportion of current EU members in the value of V4 agricultural trade will continue to increase at the expense of trade with «third countries». Specialization and concentration of foreign trade of agricultural activities is particularly beneficial in terms of transaction costs. EU accession and the opportunity to trade their products in the common market forced all the analyzed V4 countries to restructure their export commodity structure, so that most of them (with the exception of Hungary) have been able to export sophisticated products with a higher degree of processing and thus with higher unit prices into the EU market. In the future it is expected



that with the intensification of V4 integration within the EU single market, prices of agrarian exports will rise. Export prices will also be significantly affected by the EU Common Agricultural Policy. V4 agrarian trade territorial structure began to adapt very quickly to EU market conditions and has tended to follow the path of the developments that occurred in the past in the case of the EU15. Generally, in the case of the agricultural trade commodity and territorial structure of the Czech Republic, Slovakia, Poland, and Hungary it can be concluded that their development is still far from complete, and in this respect, it is expected that both exports and imports in the coming years will undergo very significant changes that might affect their form and structure due to both the internal (domestic policies of the V4 countries, influence of domestic interest groups, domestic market situation, etc.) and the external economic environment (EU policies, liberalization of the European and world market in the framework of WTO, etc.).

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