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# **The Agrarian Trade Transformation in the Visegrad Countries**

**Assoc. Prof. Artan Qineti<sup>1)</sup>, Dr. Lubos Smutka<sup>2)</sup>**

1) Department of Economics, Faculty of Econ. and Management, Slovak University of Agriculture, Nitra, Slovak Republic, artan.qineti@fem.uniag.sk

2) Department of Economics, Faculty of Econ. and Management, Czech University of Agriculture, Prague, Czech Republic, LubosSmutka@seznam.cz



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## Abstract

This paper identifies and analyzes the changes that have occurred in terms of territorial and commodity structure of agrarian trade (exports) of countries of the Visegrad Group (or V4 - i.e. Czech Republic, Poland, Hungary and Slovakia) in the period 1993-2008. 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 trade (exports) to the changing economic environment. The paper concludes that in recent years, both the value and volume of V4 export and import operations increased significantly. In the case of exports, individual countries have managed increasing its volumes of exported sophisticated products. The share of current EU members on the value of V4 agricultural trade is increasing at the expense of trade with "third countries". EU accession and its common market forced all analyzed V4 countries to restructure the export commodity structure and most of them (excluding Hungary) have been able to export in the EU market sophisticated products with higher unit prices. It is expected that with the intensification of V4 integration within the EU single market, prices of agrarian exports will rise further. V4 countries are going through a gradual process of specialization of exports of a limited number of aggregate commodity groups. Various specific factors might cause an overall restructuring of the agrarian sector and foreign trade activities in the V4 countries.

**Keywords:** Agrarian Trade, Visegrad Countries, European Union.

## I. Introduction

Countries of the Visegrad Group (Czech Republic, Slovakia, Poland and Hungary) – also referred to as the V4 countries - in recent years have undergone a dramatic development, which have influenced very significantly the structure of the economy, including the agricultural sector and trade with agricultural products. Immediately after the collapse of the so-called 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 transition from a centrally planned economy to a market economy. Particularly, livestock production and the number of workers employed in the agricultural sector have been remarkably reduced, (VÚZE, 2006; Pokrivcak, J., Ciaian, P. (2004); Ciaian, P., Swinnen, J.F.M. (2006); Ciaian, P., Pokrivcak, J. (2007); Bojnec, S. and Ferto, I. (2006); EU-Commission (1999)). As a result, it came to a decrease in the level of self-sufficiency of V4 countries. The share of the agricultural exports in total exports in the case of the V4 countries fell below 10%. In 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 is the case in Poland and Hungary, (Eurostat, 2010). During the first years of transition (in the early 90s of the 20th century) while the share of agrarian exports in OECD countries and in the former EU15 countries has been increasing, in 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 decreased gradually (Pokrivčák, J., 2008). Here, a gradual economic transformation took place, leading to the correction of trade relationship deformations caused during the period before 1990 (Drábik, D., 2008). In the early nineties of the 20th century, the share of EU countries on the V4 agrarian trade was abnormally low, but

over time (thanks to structural changes, and functioning market mechanisms) it has been increasing up to its current level - typical for an EU member country (Bussiere, Fidrmuc and Schnatz, 2005). The EU15 share in total agrarian trade of V4 countries increased mainly due to liberalization process, occurring not simply as a consequence of the GATT / WTO negotiation rounds, but mainly due to the partnership established between V4 and EU15 countries in the process of integration of the former Eastern European countries into the European structures (Pohl, K. Tucek, J., Kraus, J., 2007). In this regard, it should be stressed that the process of liberalization, which affected trade between the V4 countries and the EU15 in the period prior to their EU accession, it was asymmetric in character (Voloshin, J., 2010, Mountain, 2008). It should be emphasized however that the V4 countries at this period had also invested considerable resources to support their own agrarian sector and agrarian trade, but their ability to support the agrarian sector was significantly lagging behind EU countries (Tucek, J., Voloshin, J. 2006). The process of liberalization affected not only V4 trade with the EU15 countries; they also initiated during this period the emergence of the Central European Free Trade Area (CEFTA). However, the pace of liberalization of agrarian trade within CEFTA (Czech Republic, Poland, Slovakia, Hungary and later Bulgaria, Romania and Slovenia) had not been as dynamic, as it was in the case of V4 trade with EU15 (Voloshin, 2010). In May 2004 the V4 countries became EU members. EU accession meant for individual countries very significant changes in agro-trade. Czech Republic, Slovakia, Hungary and Poland became part of the EU single market and all the obstacles limiting until then the movement of goods between them and EU countries ceased to exist (Svatos, 2008). Individual countries had to accept common EU tariffs and also agreements signed and accepted by the EU in the period before V4 accession (Warm, M., et. al. 2005). As a result of their positions with non-EU trade partners from the aspect of the territorial structure of the V4 agrarian trade has been weakening. On the other hand, this development strengthened the positions of older EU Member States as the most important partners of Czech Republic Slovakia, Poland and Hungary.

## **II. Concepts and Methodology**

The objective of this paper is to identify the changes that have occurred in terms of territorial and commodity structure of agrarian trade (exports) of countries of the Visegrad Group (or V4 - i.e. Czech Republic, Poland, Hungary and Slovakia) in the period 1993-2008. Based on our analysis, the V4 countries real agro-trade development and status is defined, in the context of the EU single market. The main idea this paper is to show fundamental changes in the agrarian trade, which have occurred in recent years, and then identify how the Visegrad countries agrarian trade gradually have 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 trade (exports) to the changing economic environment. It is important to also 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 years 1993 and 2008. The last two years 2009 and 2010 were not included in our analysis due to the unavailability of data. United Nations UN COMTRADE database has been selected as the main data source and which has facilitated tracking the development of commodity trade (including agricultural and food items) according to the International Classification (SITC). The analyzed data obtained from the above-mentioned databases are processed in terms of its own exchange value (at current prices in U.S. dollars 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.

**Table 1 - List of commodity aggregation structure of agricultural and food trade**

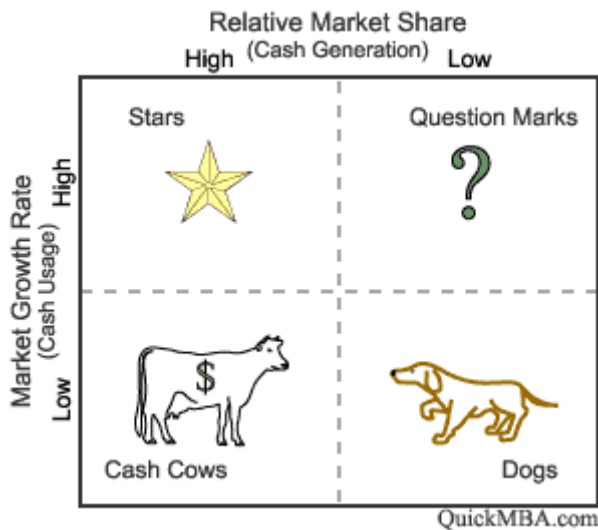
	Products		Products
001	Live animals	<b>056</b>	Vegetables, roots and tubers, prepared, conserves.
011	Beef, fresh, chilled or frozen	<b>057</b>	Fruit and nuts (not oil), fresh, dried
012	Other meat (not beef) and edible offal	<b>058</b>	Canned fruit and fruit products (not juices)
016	Meat, edible offal, salted, etc., meat products	<b>059</b>	Fruit juices (including grape must), unfermented vegetable
017	Meat and offal prepared or conserves	<b>061</b>	Sugar, molasses and honey
022	Milk, cream and milk products (not butter and cheese)	<b>062</b>	Confectionery
023	Butter and other fats and oils derived from milk	<b>071</b>	Coffee and coffee substitutes
024	Cheese and curd	<b>072</b>	Cocoa
025	Eggs and egg yolks fresh, dried, etc., egg albumen	<b>073</b>	Chocolate and food preparations containing cocoa,
034	Fish, fresh (live, killed), chilled or frozen	<b>074</b>	Tea and Holly (mate)
035	Fish, dried, salted or in brine, smoked fish	<b>075</b>	Spice
036	Crustaceans, mollusks, aquatic invertebrates, fresh, etc., etc..	<b>081</b>	Feeding stuff for animals (excluding unmilled cereals)
037	Fish, crustaceans, mollusks, etc.. prepared or preserved	<b>091</b>	Margarine and cooking and fats
041	Wheat (incl. spelled) and ground sorghum	<b>098</b>	Products, edible products (sauces, ketchup, vinegar, etc.).
042	Rice	<b>111</b>	Non-alcoholic beverages .
043	Barley unmilled	<b>112</b>	Alcoholic Beverages
044	Maize (not sweet), unmilled	<b>121</b>	Unprocessed tobacco, tobacco waste
045	Ground cereals (not wheat, barley, rice, corn)	<b>122</b>	Processed tobacco, including tobacco and substitutes
046	Wheat Flour, Maslin flour	<b>411</b>	Animal oils and fats
047	Other ground cereals (not wheat flour and Maslin)	<b>421</b>	Fats, oils, non-drying plant "soft" raw.
048	Products made from cereals, flour, starch in the fruit-vegetable	<b>422</b>	Fats, oils, non-drying plants. raw (not "soft")
054	Vegetables, fresh, chilled, frozen etc., roots, tubers	<b>431</b>	Fats, oils, processed animal and vegetable waxes

**Source: Czech Statistical Office - Eurostat, 2010**

For the purposes of interpretation of selected results of our analysis (especially the analysis of the aggregate share on the final value of agricultural trade, and further the analysis of the growth rate of individual aggregate values in the years 1993-2008) we have used a modified version of the BCG Matrix (**Boston Consulting Group Matrix**, Kotler, 2008 ). This allows splitting the agricultural commodity trade structure of individual countries in several segments characterized by diverse development trends. Such classification of the commodity structure makes easier the identification of those commodities that represent the promising part of the commodity structure of each country, as well as those commodities that appear to be non-perspective. The graphical demonstration of the results from our analysis of the V4 countries commodity structure allows for their comparison with the results in the EU and world level. In this regard, it should be noted that the concept of BCG matrix is used more at the corporate level, but there is no rationale preventing the application the concept arising from the BCG matrix at the national economy level. Alternative applications the of BCG matrix concept can be found in a number of authors (Sirkin, H., L. Hemerling, J., W., Bhattacharya, A., K., Butman, J., 2008). In this respect, it is useful to note that similar analysis, but at the corporate level, GE matrix concepts are used (for example Jakubíková, D., 2008, or by Kotler, P., 2007). However, the results estimated from this matrix are difficult to interpret, since this matrix is divided by product / aggregates in nine segments, unlike the BCG matrix, where in our case, the commodity structure is divided into only 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 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 on 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 on 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 on

the value of agricultural trade, but on the other hand, 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 on the final value of the agricultural exports also below average (low)). Our 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 external and internal economic environment.

**Figure 1: Boston Consulting Group (BCG) - Growth-Share Matrix**



Estimated elasticities in our 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 relations existing between the value of the agricultural exports of individual countries (endogenous variable) on one hand, and selected factors related to the economic output development of individual countries. In this case, the following variables have been taken into account (exogenous variables): world GDP (in USD); EU-15 GDP (in USD); NMS or EU12 GDP (EU New Member

States that entered EU between 2004 and 2007, in USD); individual V4 countries GDP (i.e. Czech Republic, Slovak Republic, Hungary and Poland, in USD); world agrarian exports (in USD); EU agrarian exports (common market, in USD); individual V4 countries agriculture GDP (in USD); world agriculture GDP (in USD); EU15 agriculture GDP (in USD); NMS or EU12 GDP agriculture GDP (in USD); The analysis of elasticity was based on a series simple regression functions analyzing the relationship between the value of the selected countries agricultural exports (as the endogenous variable) and the selected factor related to the development of national, European and world economy (as exogenous variable):

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i, \quad i = 1, \dots, n.$$

where:  $y_i$  – endogenous variable,  $x_i$  – exogenous variable,  $\beta_0, \beta_1$  – regression parameters.

The quality and robustness of estimations has been tested by calculating the p-values, t-test, Durbin-Watson test, as well as the index determination. Based on the linear regression results, elasticities have been estimated based as the following:

$$E = \frac{\partial y}{\partial x} * \frac{x}{y} \quad \text{where } x \text{ represents average values, } y \text{ theoretical ones.}$$

### III Data and Empirical Results

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 agricultural trade turnover in the analyzed countries on average increased annually by approximately 13.6%. In this regard, it is important to emphasize the fact that the final value of agricultural trade turnover share of the agrarian

exports and imports is at approximately equal proportions. In the period 1993 - 2008 the import value share on final agro-trade turnover value in analyzed countries represented approximately 49%, while value of the agricultural exports represented approximately 51%. It should be also emphasized that the mutual proportion of the agrarian export and import remained almost unchanged. During the analyzed period, the share of the agricultural imports fluctuated between about 47-52%, while the share of the agricultural exports then oscillated between 48-53%. Based on the analysis of the individual countries agricultural trade value it can be concluded that long-term annual growth rate of the agricultural exports and imports value for all countries analyzed have been very balanced. The value of the agricultural exports in the period increased on average by 13.6% annually, while the value of the 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 then in 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 registered 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.

**Table 2 – Agrarian Trade Turnover and Balance for Czech Republic, Hungary, Poland and Slovakia (1993 – 2008)**

Mil. USD	Trade Turnover					Mil. USD	Trade Balance				
	Czech R.	Hungary	Poland	Slovakia	V4		Czech R.	Hungary	Poland	Slovakia	V4
<b>1993</b>	2010	2381	3623	900	8914	<b>1993</b>	48	1003	-535	-226	290
<b>1994</b>	2249	2934	4200	936	10319	<b>1994</b>	-321	1090	-226	-190	353
<b>1995</b>	2931	3404	5022	1213	12570	<b>1995</b>	-425	1732	-448	-201	658
<b>1996</b>	3052	3262	6226	1133	13673	<b>1996</b>	-764	1596	-982	-381	-531
<b>1997</b>	2917	3565	6593	1216	14291	<b>1997</b>	-603	1615	-261	-392	359
<b>1998</b>	3048	3564	6503	1255	14370	<b>1998</b>	-550	1458	-577	-411	-80
<b>1999</b>	2644	2943	5427	1087	12101	<b>1999</b>	-616	1187	-639	-345	-413
<b>2000</b>	2666	2872	5415	1076	12029	<b>2000</b>	-456	1040	-409	-342	-167
<b>2001</b>	2857	3297	5798	1254	13206	<b>2001</b>	-513	1277	-344	-416	4
<b>2002</b>	3420	3526	6290	1379	14615	<b>2002</b>	-612	1180	-238	-399	-69
<b>2003</b>	4057	4390	7739	1691	17877	<b>2003</b>	-809	1338	607	-377	759
<b>2004</b>	5451	5698	11061	2447	24657	<b>2004</b>	-1089	1116	1167	-491	703
<b>2005</b>	6978	6293	14483	3453	31207	<b>2005</b>	-1000	959	2233	-639	1553
<b>2006</b>	7904	6988	17392	3931	36215	<b>2006</b>	-1406	1048	2842	-547	1937
<b>2007</b>	10361	9506	23025	5274	48166	<b>2007</b>	-1623	1932	2877	-984	2202
<b>2008</b>	12627	11820	29736	6336	60519	<b>2008</b>	-1573	2410	2530	-1606	1761

**Source: UN Comtrade, 2010, own calculations**

The data above (table 2) indicate that the agricultural trade of Central European countries responded positively to the accession of Czech Republic, Slovakia, Hungary and Poland into the EU. The trade value and volume has gradually increased to its present value, where countries in total export agro-food products at a value around 30 billion U.S. dollars. A positive feature is the fact that the opening of the each V4 country's market toward imports from other EU countries has not led to the fulfillment of 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: CR approximately 7.1 billion USD, Hungary about 4,7 billion dollars, Poland about \$13,6 billion and Slovakia approximately \$4 billion), agricultural trade deficit has not increased considerably. The increase in the value of imports for each V4 country analyzed, more or less has been compensated 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, it can be seen that after joining the EU, the agro-food trade balance reached to a more positive status in comparison with 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 long 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.

### **The 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. relatively new EU members - has not yet managed to fully adapt to the conditions of EU single market (in this respect, it is appropriate to say that the EU market itself, still has 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. This represents a very significant shift from the situation that each V4 country faced in the early nineties of the 20th century.

**Table 3 - Growth rate of agrarian exports values realized in the world trade (growth rate calculated through the chain index)**

	Growth rate 1993-2008	Growth rate 1993-1998	Growth rate 1999-2003	Growth rate 2004-2008
World	1,08	1,07	1,03	1,15
EU27	1,08	1,06	1,04	1,13
Czech Rep.	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**

In the future it is expected that the V4 agricultural trade will adapt better to the EU market conditions. It can be identified a wide range of commodity groups that will certainly strengthen their importance in the national and in particular, within the European agricultural market structures. On the other hand, a segment of commodity group aggregation is being crystallized, which position is phasing out both from domestic, as well as regional and global markets. Also, ongoing liberalization at both the EU27 and at the WTO level will have a huge impact on these developments. Changes in the structure of the agricultural commodity exports are already apparent. Currently, across countries of the Visegrad Group, it can be observed a significantly different export commodity structure in comparison to the early nineties of the 20th century. The export structure in the analyzed countries is constantly changing and adapting to market conditions of the EU. Currently, 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 and graphs show the dynamics of changing export structure in V4 countries. In the case of Czech Republic (table 4, figure 2), among export pillars could be ranked commodities like milk, skim milk and 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 the above mentioned products is influenced by the fact that are produced and traded by multinational companies).

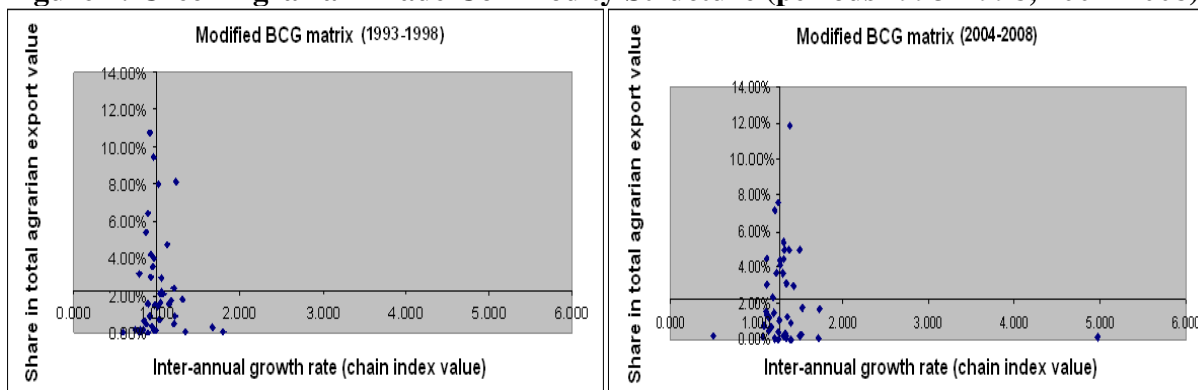


**Table 4: BCG Matrix Evaluation: The Analysis of Czech Agricultural Exports Development and Structure (period 1993-2008)**

	1993-1998	1999-2003	2004-2008			The share on exports value	Growth rate of exports value
The share of individual commodity on total agrarian exports	26,22%	38,54%	46,37%	Yellow	Star	above average	above average
	50,04%	44,14%	36,78%	Cyan	Cash cow	above average	below average
	17,11%	5,59%	7,40%	Green	Problem children	below average	above average
	6,62%	11,73%	9,46%	Red	Dog	below average	below average
The number of aggregations in the various segments of BCG matrix	5	9	9	Yellow	Star		
	9	8	8	Cyan	Cash cow		
	14	11	14	Green	Problem children		
	16	16	13	Red	Dog		

Source: UN Comtrade, 2010, own calculations

**Figure 2: Czech Agrarian Trade Commodity Structure (periods 1993–1998, 2004–2008)**



Source: UN Comtrade, 2010, own calculations

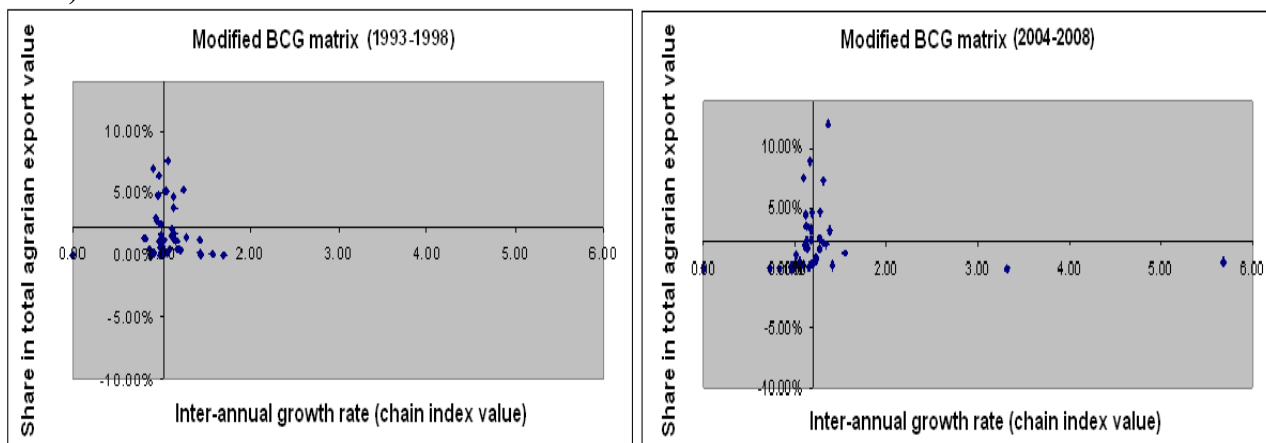
Hungary's agricultural exports (table 5, figure 3) are currently based on the following product groups: maize, meat, wheat, animal feed, vegetables, live animals, sugar, vegetable fats and oils, milk and dairy products, meat ingredients as well as cereal and flour products.

**Table 5 - BCG Matrix Evaluation: The Analysis of Hungarian Agricultural Exports Development and Structure (period 1993-2008)**

	1993-1998	1999-2003	2004-2008			The share on exports value	Growth rate of exports value
The share of individual commodity on total agrarian exports	31,80%	22,61%	29,08%	Yellow	Star	above average	above average
	48,45%	54,24%	52,20%	Cyan	Cash cow	above average	below average
	11,48%	10,57%	9,42%	Green	Problem children	below average	above average
	8,28%	12,58%	9,30%	Red	Dog	below average	below average
The number of aggregations in the various segments of BCG matrix	6	4	5	Yellow	Star		
	7	8	9	Cyan	Cash cow		
	15	15	10	Green	Problem children		
	16	17	20	Red	Dog		

Source: UN Comtrade, 2010, own calculations

**Figure 3: Hungarian Agrarian Trade Commodity Structure (periods 1993–1998, 2004–2008)**



Source: UN Comtrade, 2010, own calculations

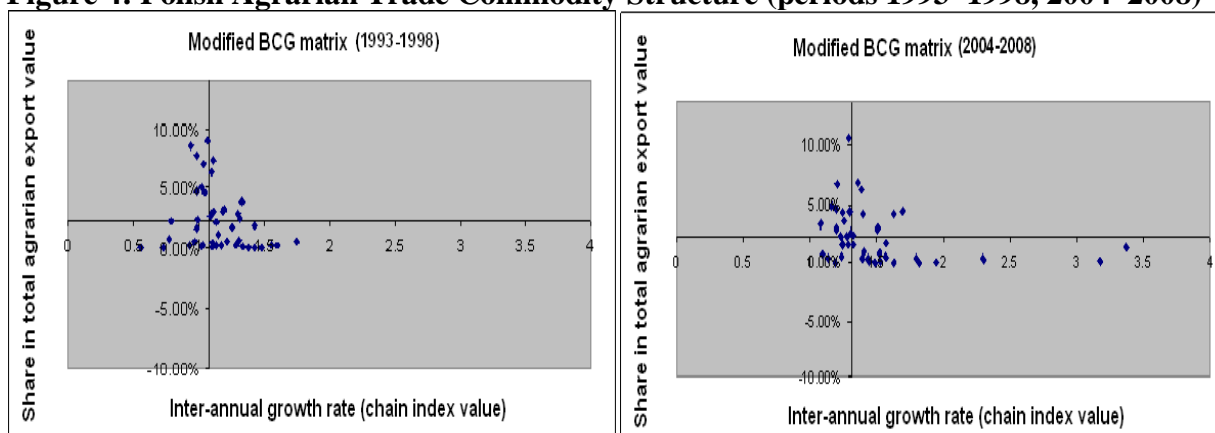
Among pillars of Polish agro-food exports (table 6, figure 4) we could mention the following product groups: meat, milk and dairy products, fresh vegetables, cereal products and flour, canned fruits and fruit products, fruit and vegetable juices, tobacco products, chocolate and cocoa including products and food ingredients.

**Table 6 - BCG Matrix Evaluation: The Analysis of Polish Agricultural Exports Development and Structure (period 1993-2008)**

	1993-1998	1999-2003	2004-2008			The share on exports value	Growth rate of exports value
The share of individual commodity on total agrarian exports	35,03%	42,43%	33,58%	Yellow	Star	above average	above average
	49,08%	43,92%	52,45%	Cyan	Cash cow	above average	below average
	10,19%	11,24%	9,13%	Green	Problem children	below average	above average
	5,70%	2,41%	4,83%	Red	Dog	below average	below average
The number of aggregations in the various segments of BCG matrix	9	9	8	Yellow	Star		
	8	9	12	Cyan	Cash cow		
	18	13	18	Green	Problem children		
	9	13	6	Red	Dog		

Source: UN Comtrade, 2010, own calculations

**Figure 4: Polish Agrarian Trade Commodity Structure (periods 1993–1998, 2004–2008)**



Source: UN Comtrade, 2010, own calculations

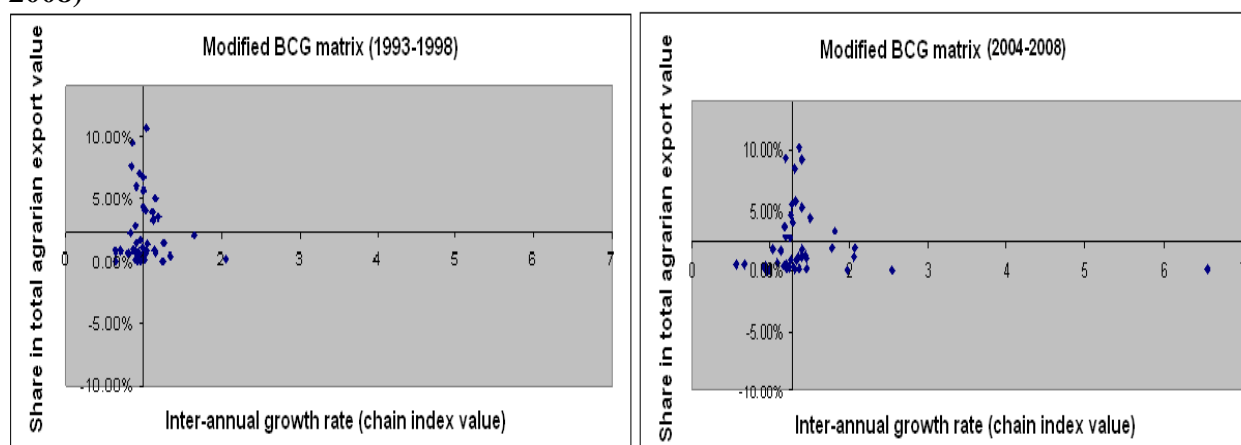
**Table 7 - BCG Matrix Evaluation: The Analysis of Slovak Agricultural Exports Development and Structure (period 1993-2008)**

	1993-1998	1999-2003	2004-2008			The share on exports value	Growth rate of exports value
The share of individual commodity on total agrarian exports	40,44%	49,30%	47,10%	Yellow	Star	above average	above average
	41,75%	34,13%	32,91%	Cyan	Cash cow	above average	below average
	8,48%	7,57%	12,62%	Green	Problem children	below average	above average
	9,33%	9,00%	7,37%	Red	Dog	below average	below average
The number of aggregations in the various segments of BCG matrix	8	8	7	Yellow	Star		
	7	8	7	Cyan	Cash cow		
	12	14	16	Green	Problem children		
	17	14	14	Red	Dog		

Source: UN Comtrade, 2010, own calculations

In the case of Slovakia (table 7, figure 5), the following product groups has 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. The commodity structure of the Slovak agricultural exports belongs among the most dynamically changing structures between all members of the Visegrad Group.

**Figure 5: Slovak Agrarian Trade Commodity Structure (periods 1993–1998, 2004–2008)**



Source: UN Comtrade, 2010, own calculations

### The Sensitivity Analysis of V4 Agro-food Trade to Changes in External and Internal Environment

It is important to emphasize the fact that the agro-food trade of the V4 countries reacts very sensitively to changes in internal and (especially) in external economic environment. Undoubtedly, Poland responds most sensitively to changes in external and internal environment affecting the development of the agricultural exports of selected countries, the agricultural trade is growing very dynamically there. It is followed by Slovakia, the Czech Republic and Hungary. An interesting finding in this regard is the fact 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 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. On average we can say that 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 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, we can notice also high values of agro-food export elasticity to changes in the external environment (approx. 2.48%). In the case of Czech Republic, the sensitivity to changes in 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 years 1993 - 2008 fluctuated around 2.12%. The lowest elasticity of the agrarian export can be monitored in case of Hungary.

**Table 8 – Agrarian Trade Elasticities of Selected Countries (1993 – 2008)**

Agrarian exports Elasticity (%)	World Trade	EU Trade	World GDP	Hungarian 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

### Changes in the Territorial Structure of Agro-food Trade in V4 Countries

An important factor that influences the nature of agro-food trade in V4 countries is the fact that the EU is continuously expanding. For V4 countries there are important trading partners in both the EU15, as well as in 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 27 current EU members on the final value of the agricultural exports and imports is shown in the following tables 9 and 10. They show that the third countries share (i.e. non-EU members) on the agrarian trade territorial structure of the Czech Republic, Slovakia, Poland and Hungary have been steadily declining. Among crucial factors influencing such trend could be mentioned 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 not to forget a range of other factors). The share of third countries (non-EU members) on the final value of exports and imports in recent years has been significantly reduced. If we look at the changes that occurred in the trade with non-EU countries, it can be noticed a lower growth dynamics compared to the past, while in the case of Czech Republic and Slovakia both the volume and value of trade transactions tend to stagnate.

**Table 9-10: Exports (left-hand side) – Agro-Trade; Imports – Agro-Trade (right-hand side); (share of selected trade flows on final value).**

1996	Czech R	Hungary	Poland	Slovakia	1996	Czech R	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	Czech R	Hungary	Poland	Slovakia	2008	Czech R	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%

**Source: UN Comtrade, 2010, own calculations**

#### IV Conclusions

The structure of the 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 increased significantly. V4 trade is gradually specializing in production of a limited range of agrarian commodities and trading with only a limited number of partners. In the case of V4 countries the reduction of non-EU countries share on the final value of agrarian trade flows is apparent. Even within the EU market, which currently includes 27 member countries, the V4 export territorial structure is largely focused on a few key partners whose share on the final value of exports is very significant. The proportion of current EU members on 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 analyzed V4 countries to restructure the export commodity structure, so that most of them (with the exception of Hungary) have been able to export in the EU market sophisticated products with a higher degree of processing and thus with higher unit prices. 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 be significantly affected also by the EU Common Agricultural Policy. V4 agrarian trade territorial structure began very quickly adapting to EU market conditions and has tended to follow the path of the developments that have occurred in the past in the case of EU15. Generally, in 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 internal (domestic policies of V4 countries, domestic interest groups influence, domestic market situation, etc.) and from the external economic environment (EU policies, the liberalization of the European and world market in the framework of WTO, etc.).

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