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THE ANALYSIS OF INDIVIDUAL VISEGRAD GROUP MEMBERS' AGRARIAN EXPORT SENSITIVITY IN RELATION TO SELECTED MACROECONOMIC AGGREGATIONS

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Abstract

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This paper analyzes the development of agricultural trade of the countries of the Visegrad Group with emphasis on development of the value of agricultural exports of the individual countries. The subject matter of the analysis is the sensitivity of the commodity structure of agricultural exports of individual countries and the identification of aggregations that are the least and the most sensitive to changes to the external and internal economic environment. From the conducted research, agricultural trade in the V4 countries was found to have developed very dynamically from 1993 to 2008, while the commodity structure of exports has constantly narrowed as the degree of specialization of the individual countries has increased (this applies especially to the Czech Republic, Slovakia and Hungary). From the results of analysis of sensitivity to changes of selected variables relating to the development of the value of agricultural exports of the individual V4 countries, it appears that the aggregations that react most sensitively to changes are those that are the subject of re-exports, followed by the aggregations that are characterized by a high degree of added value. In general it can be said that products of agricultural primary production exhibit less sensitivity in comparison with grocery industry products. This is confirmed by the general trend arising from the very nature of consumer behaviour.

agricultural trade, exports, analysis, sensitivity, change, commodity structure, value

In recent years, the countries of the Visegrad Group (Czech Republic, Slovakia, Poland and Hungary) have undergone very stormy economic, cultural, political and societal developments (Qineti, A., Rajcaniova, M., Matejkova, E., 2009; Pokrivčák, J., Drábik, D., 2008). The individual countries are linked by a common history and similarity of economic and political developments (Střeleček, F., Lososová, J., Zdeněk., R., 2009). The individual countries emerged after World War I and then underwent similar developments in particular in the period after World War II. After 1990 the individual countries replaced their centrally planned economic systems with market economies (Bielik, P., 2010; Horská, E., 2011). The process of transition from one economic system to another was very painful for the individual countries, and was economically, socially and politically exhausting (Bański, J., 2005). The changes affected all sectors of the national economies, including agriculture. From the second half of the 1990s, all of the analyzed countries were linked by an effort to become members of the European Union. The Czech Republic, Slovakia, Poland and Hungary jointly underwent the whole procedure for accession to the EU, during which in the course of negotiations on joining the EU, they tried (as much as possible) to cooperate and support each other.

Their entry into the EU in 2004 meant a drastic change for their individual economies (Burianová, J., 2010). The individual countries became members of a community encompassing in its present form

27 member states with over 500 million inhabitants. The individual member states are also linked by very firm economic and political ties, and their cooperation is strengthened by the existence of the common market of the EU countries, where the idea of the free movement of goods, services, capital and persons is realized, which has greatly influenced and still greatly influences the economic developments of the individual analyzed countries (Jeníček, V., 2009).

Membership in the EU also has an impact on trade in relation to third countries, since the EU realizes outwardly a common policy for EU member states and protection of its internal market (Bašek, V., Kraus, J., 2009).

All of the aforementioned changes together with other changes that have occurred in recent years in the cases of the individual countries, whether at an economic, political, legislative, juridical, cultural, societal or other level, have greatly contributed towards the restructuring of the individual economies of Visegrad Group countries. Each sector of the national economy has had to adapt to changing conditions both on each analyzed country's own market and on the market of the EU countries and the world market (Bojnec, Š., Fertő, I., 2011). Restructuring had a powerful impact in particular on the agricultural sector, the dimensions of which in the case of all of the analyzed countries over the course of twenty years have shrunk, and the importance of agriculture in the context of the national economies (or with respect to generation of GDP) has declined steeply. This process has strongly influenced not only the structure and volume of agricultural and food production in the individual countries of Central Europe, but also the form of their foreign trade of agricultural products and food (hereinafter AFT – agricultural foreign trade). Nonetheless, it should be emphasized that among the individual countries there are big differences with respect to access to the agricultural sector and development not only of the commodity structure, but also of the territorial structure of agricultural trade.

MATERIALS AND METHODS

This paper analyzes the development of value of agricultural exports of Visegrad Group countries. The main idea is to analyze in particular the sensitivity of agricultural exports of individual countries to changes to both the internal and external environment influencing development of the value and structure of agricultural exports of individual Visegrad Group countries.

Analysis through calculation of the value of elasticity reveals the sensitivity of agricultural exports of individual countries to changes that have the potential to influence export performance of individual countries. The analysis then permits a comparison of the differences in sensitivity of agricultural exports to changes of selected factors in the cases of the individual V4 countries, whereby it may be determined how sensitive the exports of a selected country are in comparison with the other analyzed countries.

The goal of the conducted analysis is to quantify the sensitivity of agricultural exports to changes of selected macroeconomic variables and then to identify existing differences between the individual countries of the Visegrad Group.

The actual calculation of the value of elasticity is then based on analysis of mutual relations existing between the value of agricultural exports of individual countries (endogenous variable) on the one hand, and selected factors relating to the development of economic output of the individual countries. Taken into account in this case are the following variables (exogenous variables):

- GDP – world (in USD)
- GDP – EU15 countries (in USD)
- GDP – EU12 countries (new EU members – countries joining in 2004 and 2007) (in USD)
- GDP – individual countries (i.e. Czech Republic, Slovakia, Hungary and Poland) (in USD)
- Agricultural exports – world (in USD)
- Agricultural exports – EU (internal market) (in USD)
- GDP – agricultural sector in individual countries (i.e. Czech Republic, Slovakia, Hungary and Poland) (in USD)
- GDP – agricultural sector – world (in USD)
- GDP – agricultural sector – EU15 countries (in USD)
- GDP – agricultural sector – EU12 countries (in USD).

Relations among individual variables are determined through calculation of correlation, and in relation to the endogenous variable versus the exogenous variable, the index of determinacy is calculated. In this regard, it should be said that the index of correlation is at a very high level in the case of the relation of agricultural trade of the selected country on the one hand and of the selected exogenous parameter on the other hand in the case of most of the analyzed exogenous variables.

The actual analysis of elasticity has been calculated on the basis of the construction of a series of single-factor regressive functions based on the mutual relationship between the value of agricultural exports of the selected country (in the position endogenous variable) and a selected variable relating to the development of the national, European and world economy (exogenous variable). In this regard, the shape of the linear function was chosen as follows:

$$y = bx + c,$$

where:
y .... is the endogenous variable,
x .... is the exogenous variable,
c ..... is the constant.

The quality of the individual equations was tested as follows. The values of the basic tests (t-test, p-value, D-W test, …) gave satisfactory results in the case of the relationship of most of the selected exogenous variables and of the individual endogenous variables characterizing the development of agricultural exports of Poland, Hungary, the Czech Republic and Slovakia in 1993–2008.

Once the resultant form of the value of linear regression is calculated, next is calculated the actual elasticity for the purpose of obtaining information about the average value of sensitivity of agricultural exports to changes in the development of value of selected economic indicators.

The calculation of elasticity is then based on the following relationship:

$$E = (\partial y/\partial x_i) / (x_i/y).$$

From the equation, it is apparent the elasticity is a ratio of the percentage change of the explained variable to the percentage change of the explaining variable "i".

With respect to the uniformity of the data source, the central source chosen for data was the database of UN COMTRADE. That database provides compact time series concerning trade transactions of individual countries from 1961 to 2008. The analysis draws on the categorization of the commodity structure of agricultural and food trade according to SITC categories from 2002. According to that categorization, trade with agricultural and food products is divided into 44 basic aggregations.

RESULTS AND DISCUSSION

From 1993 to 2008 the agricultural trade of individual Central European countries increased in value very sharply (see Tables No. II and III). The agricultural exports of the V4 during the given period rose from USD 4.6 billion to more than USD 31 billion. The value of imports during that same period also increased very sharply from USD 4.3 billion to nearly USD 30 billion. The value of agricultural trade grew most dynamically during the monitored years in Poland, while the least dynamic growth of the value of agricultural trade was in Hungary.

Within the context of all of the analyzed countries, the value of agricultural exports during the monitored period rose on average by ca. 13.6% annually, and the corresponding value of agricultural imports represented ca. 13.64% annually. The results show that within the context of all of the analyzed countries, agricultural exports and imports are increasing in value at approximately the same rate, while there exists a certain slight preponderance on the import side, which has

I: *List of aggregations representing the commodity structure of agricultural and food trade*

SITC code	Aggregation	SITC code	Aggregation
001	LIVE ANIMALS	056	VEGTABLES, PRPD, PRSVD, NES
011	BOVINE MEAT	057	FRUIT, NUTS EXCL. OIL NUTS
012	OTHER MEAT, MEAT OFFAL	058	FRUIT, PRESERVED, PREPARED
016	MEAT, ED. OFFL, DRY, SLT, SMK	059	FRUIT, VEGETABLE JUICES
017	MEAT, OFFL. PRPD, PRSVD, NES	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, OTH. COCOA PREP
034	FISH, FRESH, CHILLED, FROZN	074	TEA AND MATE
035	FISH, DRIED, SALTED, SMOKED	075	SPICES
036	CRUSTACEANS, MOLLUSCS ETC	081	ANIMAL FEED STUFF
037	FISH ETC. PREPD, PRSVD. NES	091	MARGARINE AND SHORTENING
041	WHEAT, MESLIN, UNMILLED	098	EDIBLE PROD. PREPRTNS,NES
042	RICE	111	NON-ALCOHOL. BEVERAGE, NES
043	BARLEY, UNMILLED	112	ALCOHOLIC BEVERAGES
044	MAIZE UNMILLED	121	TOBACCO, UNMANUFACTURED
045	OTHER CEREALS, UNMILLED	122	TOBACCO, MANUFACTURED
046	MEAL, FLOUR OF WHEAT, MSLN	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, NES

Source: Czech Statistical Office, 2010

increased in value during the past years slightly faster in comparison with exports. In this regard it should be emphasized that the average growth rate of the value of agricultural exports of the individual countries of the V4 very greatly exceeds the average growth rate of value of agricultural trade around the world and especially in EU countries.

During the monitored period, agricultural trade of the individual V4 countries, and especially exports, reacted very sensitively to stimuli affecting them, both from the internal and especially from the external economic environment. Since there is a large number of variables affecting agricultural trade, the following variables were selected for the analysis below (for details see the methodology): GDP in the world, GDP in EU15 countries, GDP in EU12 countries, GDP of individual countries, agricultural exports in the world, agricultural exports in the countries, agricultural GDP in the context of the individual monitored countries and regions.

From the results of analysis of the mutual relations between the selected variables, one finds a very close dependence among the majority of the variables in question. This mutual relationship is strengthened by the fact that the American dollar, which is used for this analysis, has weakened significantly in recent years, thereby increasing the dollar values of most of the monitored variables at the regional and global level. If attention is devoted to the resultant values of sensitivity of agricultural trade or individual analyzed countries to changes in the development of selected factors influencing both the domestic and the global environment, one may assert the following (see the table No. IV).

II: *Growth rate of the value of agricultural exports realized in the context of world trade (growth rate calculated using a chain index)*

	Inter-annual growth rate 1993–2008	Inter-annual growth rate 1993–1998	Inter-annual growth rate 1999–2003	Inter-annual growth rate 2004–2008
World	1.08	1.07	1.03	1.15
EU27	1.08	1.06	1.04	1.13
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 + our own calculations

III: *Development of values of the flows of goods of agricultural trade in the Czech Republic, Hungary, Poland and Slovakia in 1993–2008*

in mil. USD	Import					in mil. USD	Export				
	Czech Republic	Hungary	Poland	Slovakia	V4		Czech Republic	Hungary	Poland	Slovakia	V4
1993	981	689	2 079	563	4 312	**1993**	1 029	1 692	1 544	337	4 602
1995	1 678	836	2 735	707	5 956	**1995**	1 253	2 568	2 287	506	6 614
1997	1 760	975	3 427	804	6 966	**1997**	1 157	2 590	3 166	412	7 325
1999	1 630	878	3 033	716	6 257	**1999**	1 014	2 065	2 394	371	5 844
2001	1 685	1 010	3 071	835	6 601	**2001**	1 172	2 287	2 727	419	6 605
2003	2 433	1 526	3 566	1 034	8 559	**2003**	1 624	2 864	4 173	657	9 318
2005	3 989	2 667	6 125	2 046	14 827	**2005**	2 989	3 626	8 358	1 407	16 380
2007	5 992	3 787	10 074	3 129	22 982	**2007**	4 369	5 719	12 951	2 145	25 184
2008	7 100	4 705	13 603	3 971	29 379	**2008**	5 527	7 115	16 133	2 365	31 140

Source: UN Comtrade, 2010 + our own calculations

IV: *Elasticity of agricultural trade of the selected countries depending on the percentage of change of value of selected variables in 1993–2008*

Agrarian export - Elasticity (%)	World trade	EU trade	World GDP	Individual V4 members GDP	GDP of EU15	GDP of EU12	World agrarian GDP	Agrarian GDP of individual V4 members	EU15 - Agrarian GDP	EU12 - Agrarian 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 + our own work

Without a doubt, Poland is the country that reacts most sensitively to changes to the external and internal environment influencing the development of agricultural exports of the selected countries. Poland's agricultural trade is growing very dynamically. After Poland comes Slovakia, then the Czech Republic and Hungary. An interesting finding in this regard is the fact that Hungary, which represents a natural player on the market for agricultural and food products, exhibits the lowest level of elasticity in dependence on changes to the environment, whether external or internal. In general it can be asserted that the elasticity of the agricultural exports of the individual countries to changes of the external environment is high, and in view of the trend towards growth of added value in all of the monitored variables, the trend of development is positive. On average, it can be said that the elasticity of Polish agricultural exports to changes caused by changes of value (usually growth) of selected variables is very high. Generally, corresponding to a one-percent change to any of the aforementioned exogenous variables is on average a change to the actual value of Polish agricultural exports by ca. 2.56%. In the case of Slovakia one also finds high elasticity of the value of agricultural exports to the external environment (ca. 2.48%). In the case of the Czech Republic, the sensitivity to external and internal changes is not as great. The average value of flexibility in respect to the percentage of change of the value of selected variables in 1993–2008 varied at the level of 2.12%. The least elastic development of the value of agricultural exports can be seen in the case of Hungary. Its agricultural sector is now dragging along with a tendency towards stagnation. The crisis in which Hungarian agriculture has found itself has greatly impacted its export competitiveness, and Hungary, formerly the leader for agricultural exports of the Visegrad, is stagnant, and in 1993–2008 it did not take full advantage of the potential possibilities that became available to it as a result of the total liberalization of the European agricultural and food market.

If we analyze the sensitivity of agricultural exports of the individual countries to changes to selected variables of the external and internal environment, one may assert that the changes having the greatest impact on all of the countries are not those of the global market, but rather those of the countries of the EU (especially changes to GDP of EU15 countries, and specifically changes to the agriculture GDP of the EU15 countries), to which the individual countries belong and which constitute the main export market for their agricultural and food products. Tables No. V, VI, VII and VIII below give a brief overview of the development of the value of elasticity of individual aggregations representing the commodity structure of Polish, Czech, Slovak and Hungarian exports.

If we then summarize the findings above relating to the characteristic of sensitivity of the commodity structure of the agricultural exports of Visegrad Group countries, we come to the following conclusions, which directly concern the actual status of the commodity structure of the agricultural exports of the individual analyzed countries. From the calculated data, it is seen that the commodity structure of the agricultural exports of the Visegrad Group countries is very flexible. In the case of Polish agricultural exports, the number of aggregations with a higher than average value of elasticity is 23 (if one were to use the average value of flexibility of agricultural exports of Visegrad Group countries as a whole, the number of aggregations with above-average elasticity would in fact rise to 33). It is also worth mentioning that of the 44 aggregations of Polish agricultural exports, 41 are characterized by an elasticity figure higher than 1 (showing themselves to be flexible). Regarding Slovak agricultural exports, it can be said that 37 aggregations of the commodity structure of Slovak agricultural exports have proven themselves to be flexible. In the case of 21 aggregations, the figure for flexibility is above average in comparison with the average for Slovak agricultural exports as a whole, and approximately 27 aggregations (i.e. 6 more aggregations) have above-average flexibility within the context of the average for the Visegrad Group countries. Czech agricultural exports have above-average elasticity in the case of 23 aggregations, and if we use the average flexibility of agricultural trade of Visegrad Group countries, the number of aggregations evaluated as above average falls to 21. It should also be said that the majority of the aggregations, i.e. 38 of 44, show themselves to be flexible with an elasticity figure greater than 1. In comparison with the other countries in question, Hungarian agricultural exports have the lowest flexibility figure in relation to changes to the external and internal environment. Exhibiting flexibility (having an elasticity figure greater than 1) are "only" 27 aggregations of the commodity structure of Hungarian exports. Maintaining above-average flexibility in the context of the average for Hungarian agricultural trade are approximately 18 aggregations, and in the case of the average for countries of the Visegrad Group as a whole, the number of above-average aggregations falls to approximately 10. From this point of view, it would appear that Hungarian trade is the most stable in comparison with all of the other Visegrad Group countries, but in this case the low level of elasticity means that Hungary's agricultural exports have had the slowest growth of value in comparison with all of the other analyzed countries, where the export values of agricultural exports during the years of general growth (1993–2008) increased greatly.

Elasticity of the commodity structure of agricultural trade of the Visegrad Group countries (identical trends and differences)

An interesting determination relating to the elasticity of the commodity structure of

agricultural exports of the Czech Republic, Slovakia, Hungary and Poland is the fact that within the context of the first half of the scale of commodity structure of agricultural exports, (i.e. in the case of 22 aggregations) there are matches among the individual countries in the case of only 5 aggregations, and if we compare matching of lists of items with an above-average rate of growth of value of agricultural exports in the case of the individual countries, we find that the lists match only in the case of 9 aggregations, indicative of the fact that although the individual countries have a very similar commodity structure of agricultural exports, the stimuli of the external and internal environment influence development of the value of agricultural exports of the individual countries manifest themselves with respect to the development of the actual value of individual aggregations in the cases of the individual V4 countries in very different ways.

Hungary

In the case of Hungary, it can be observed that the pillars of Hungarian agricultural exports that accounted for more than two thirds of the value of total agricultural exports in 1993–2008 have very low elasticity in relation to changes to the external and internal environment. Aggregations with above-average elasticity values, both with respect to the average for Hungarian agricultural trade and to agricultural trade in the Visegrad Group countries, accounted in 1993–2008 for approximately 38% and 30% respectively of the value of total exports. On the basis of the facts stated, one may understand the stagnation of Hungarian agricultural trade, where it can be seen that the aggregations constituting the pillar of value are developing over time only slowly, while there is generally dynamic growth only in aggregates with a low share of the resultant value of realized trades.

Poland

In the case of Poland, it is apparent that among the items with a high degree of flexibility are both aggregations with a high share of realized exchange and aggregations with a very low share. Nonetheless, it should be said that aggregations with above-average value of elasticity in the context of Polish agricultural exports or in the context of exports of Visegrad Group countries account for approximately 40% and 70% respectively of the resultant value of Polish agricultural exports. It follows from this that the majority of aggregations of Polish agricultural exports react very sensitively to changes to the external and internal environment. These reactions, especially in 2004–2008, have had a very powerful effect. Agricultural exports have reacted very sensitively to change to the environment, especially in relation to the EU27 market and also in relation to markets of the new EU member states, and have been able to benefit from these changes.

Czech Republic

With Czech agricultural trade, one sees that the commodity structure of agricultural exports rests on more than 20 aggregations characterized by an above-average level of elasticity, both with respect to the Czech structure of agricultural exports and with respect to the export structure of the Visegrad Group countries. Through the influence of the accession negotiations that took place in 1995–2003 and through the influence of developments since the Czech Republic joined the EU, Czech agricultural exports have strongly increased their standing within the context of the economy and within the context of agricultural trade as a whole. More than ¾ of the aggregations are characterized by a high level of sensitivity to changes to the external environment, as was shown especially in 2004–2008 by the sharp increase of the traded value of Czech agricultural and food exports. It is important to mention that as with Poland, the high level of elasticity of exports (positive in this case) manifests itself both in the case of aggregations with a small share of traded value, and particularly in the set of aggregations that represent a large share. It is also interesting that in 1993–2008, aggregations with an above-average level of elasticity in the context of the national commodity structure of exports accounted for ca. 65% of the resultant value of agricultural exports of the Czech Republic. As far as the aggregations are concerned, the elasticity of which exceeded the average value of elasticity of the market for agricultural exports of countries of the Visegrad Group, their share in the total value of agricultural exports of the Czech Republic in 1993–2008 reached the level of 53%. This is indicative of the fact that Czech agricultural exports are developing very dynamically and react sensitively to changes to the environment, to which they then adapt.

Slovakia

The last of the analyzed countries is Slovakia. In recent years, Slovak exports have reacted more than Czech exports to changes to the internal and external economic environment. The value of exports has grown very dynamically, thanks also to the high degree of elasticity in the case of the individual aggregations of the commodity structure of Slovak agricultural exports. In 1993–2008, more than thirty aggregations of Slovak exports showed an elasticity figure greater than 1. Approximately 27 aggregations have shown an above-average elasticity figure in comparison with the average for Visegrad Group countries, and of those, approximately 21 aggregations have shown above-average flexibility in comparison with the average commodity structure of Slovak agricultural exports. The share of individual aggregations with an above-average value in the total value of Slovak agricultural exports in 1993–2008 varied at around 53% in the case of the national average and at around

V: *Elasticity of individual aggregations of Czech agricultural exports to changes to the external and internal economic environment in 1993–2008*

Czech – agrarian export	World trade	EU trade	World GDP	Czech GDP	EU15 GDP	EU12 GDP	World Agrarian GDP	Czech agrarian GDP	EU15 agrarian GDP	EU12 Agrarian GDP
S3-001	1.933	1.963	2.328	1.188	2.361	1.211	2.712	2.144	4.204	2.061
S3-011	1.565	1.525	1.824	0.973	1.691	1.003	2.252	1.729	2.296	1.647
S3-012	1.965	1.983	2.423	1.234	2.418	1.260	2.704	2.206	3.727	2.068
S3-016	5.526	5.502	6.424	3.349	6.303	3.422	7.900	5.967	11.358	5.744
S3-017	2.908	2.920	3.396	1.759	3.386	1.793	4.134	3.190	6.227	3.059
S3-022	2.269	2.287	2.741	1.393	2.735	1.425	3.190	2.479	4.737	2.387
S3-023	0.518	0.531	0.557	0.293	0.603	0.297	0.774	0.571	1.850	0.599
S3-024	1.311	1.316	1.610	0.819	1.591	0.836	1.793	1.444	2.360	1.351
S3-025	1.119	1.140	1.335	0.690	1.369	0.695	1.563	1.256	2.610	1.197
S3-034	1.102	1.116	1.361	0.690	1.368	0.701	1.488	1.224	2.219	1.148
S3-035	3.411	3.442	4.067	2.082	4.102	2.118	4.807	3.802	7.594	3.631
S3-036	1.465	1.456	1.785	0.914	1.736	0.938	2.085	1.597	2.769	1.529
S3-037	2.583	2.624	3.189	1.605	3.218	1.641	3.600	2.869	5.496	2.733
S3-041	2.489	2.519	3.064	1.542	3.017	1.579	3.438	2.751	4.637	2.542
S3-042	1.694	1.705	1.836	0.974	1.892	0.981	2.452	1.884	4.901	1.811
S3-043	2.948	3.008	3.734	1.843	3.755	1.892	3.992	3.178	5.564	3.012
S3-044	3.965	3.982	4.788	2.464	4.713	2.506	5.494	4.304	7.219	4.074
S3-045	2.656	2.702	3.420	1.669	3.430	1.725	3.628	2.800	4.820	2.743
S3-046	0.289	0.286	0.225	0.149	0.188	0.147	0.570	0.494	1.300	0.409
S3-047	0.240	0.230	0.328	0.144	0.327	0.149	0.377	0.272	0.266	0.301
S3-048	1.882	1.894	2.253	1.161	2.250	1.179	2.621	2.112	3.970	1.977
S3-054	1.163	1.184	1.313	0.686	1.347	0.695	1.716	1.275	3.033	1.255
S3-056	2.188	2.204	2.696	1.364	2.680	1.396	3.009	2.373	4.081	2.260
S3-057	2.434	2.472	3.034	1.511	3.052	1.545	3.336	2.723	4.796	2.546
S3-058	0.969	0.981	1.125	0.576	1.177	0.579	1.328	1.115	2.627	1.057
S3-059	1.264	1.265	1.592	0.788	1.574	0.810	1.699	1.347	2.419	1.301
S3-061	1.875	1.928	2.434	1.187	2.480	1.206	2.499	2.173	3.633	2.025
S3-062	1.970	2.010	2.539	1.271	2.556	1.293	2.622	2.247	3.623	2.057
S3-071	1.826	1.851	2.338	1.170	2.321	1.199	2.418	2.046	2.982	1.866
S3-072	–0.471	–0.434	–0.089	–0.087	–0.088	–0.102	–0.991	–0.301	–2.110	–0.533
S3-073	2.042	2.065	2.452	1.257	2.466	1.277	2.850	2.263	4.400	2.151
S3-074	3.254	3.240	3.756	1.971	3.694	2.017	4.680	3.534	6.866	3.384
S3-075	0.342	0.335	0.326	0.198	0.324	0.198	0.519	0.361	0.869	0.362
S3-081	2.169	2.178	2.610	1.339	2.587	1.365	3.034	2.401	4.350	2.266
S3-091	1.669	1.674	1.937	0.993	1.952	1.012	2.339	1.803	3.960	1.765
S3-098	2.110	2.115	2.536	1.304	2.517	1.328	2.923	2.335	4.228	2.197
S3-111	2.393	2.385	3.008	1.515	2.918	1.557	3.254	2.554	3.776	2.430
S3-112	1.444	1.464	1.746	0.891	1.768	0.906	2.012	1.608	3.157	1.528
S3-121	4.069	4.092	4.966	2.520	4.929	2.567	5.623	4.380	8.063	4.246
S3-122	1.471	1.435	1.668	0.898	1.598	0.912	2.043	1.622	2.504	1.490
S3-411	0.906	0.932	0.995	0.518	1.049	0.519	1.377	0.922	2.588	0.937
S3-421	2.676	2.663	3.171	1.636	3.090	1.674	3.779	2.923	5.039	2.768
S3-422	0.622	0.691	0.534	0.311	0.690	0.293	1.041	0.874	3.659	0.825
S3-431	0.898	0.910	1.013	0.540	1.038	0.544	1.278	1.027	2.171	0.955
Total	1.890	1.904	2.292	1.169	2.285	1.192	2.621	2.093	3.800	1.977

Source: UN Comtrade, 2010 + our own work

VI: *Elasticity of individual aggregations of Slovak agricultural exports to changes to the external and internal economic environment in 1993–2008*

Slovak – agrarian export	World trade	EU trade	World GDP	Slovak GDP	EU15 GDP	EU12 GDP	World Agrarian GDP	Slovak agrarian GDP	EU15 agrarian GDP	EU12 Agrarian GDP
S3-001	2.185	2.219	2.711	1.386	2.738	1.388	3.012	2.275	4.450	2.292
S3-011	2.065	2.147	2.676	1.365	2.774	1.335	2.790	2.220	4.118	2.191
S3-012	3.261	3.309	4.056	2.076	4.070	2.079	4.482	3.350	6.385	3.424
S3-016	3.319	3.349	4.110	2.079	4.098	2.091	4.488	3.310	5.725	3.396
S3-017	3.853	3.874	4.621	2.357	4.600	2.407	5.401	3.771	7.691	4.004
S3-022	3.117	3.139	3.821	1.960	3.792	1.982	4.318	3.166	6.008	3.245
S3-023	2.630	2.637	3.267	1.683	3.235	1.695	3.595	2.794	4.910	2.700
S3-024	2.183	2.203	2.671	1.371	2.661	1.381	3.003	2.219	4.202	2.270
S3-025	3.451	3.475	4.158	2.127	4.152	2.160	4.819	3.438	7.073	3.596
S3-034	1.536	1.575	1.958	1.003	2.000	0.985	2.064	1.668	3.151	1.626
S3-035	0.093	0.056	–0.088	–0.029	–0.008	–0.015	0.184	0.089	1.509	0.180
S3-036	1.190	1.202	1.299	0.693	1.276	0.730	1.723	1.102	2.554	1.229
S3-037	3.154	3.154	3.682	1.910	3.651	1.955	4.431	3.082	6.525	3.308
S3-041	2.653	2.735	3.186	1.599	3.276	1.620	3.654	2.693	6.607	2.865
S3-042	1.020	0.980	0.941	0.490	1.012	0.504	1.507	0.848	3.991	1.128
S3-043	3.173	3.219	3.927	2.006	3.949	2.016	4.374	3.279	6.275	3.258
S3-044	2.511	2.538	3.060	1.563	3.069	1.581	3.458	2.596	5.055	2.602
S3-045	2.431	2.479	3.188	1.627	3.156	1.609	3.149	2.662	3.206	2.455
S3-046	3.834	3.875	4.454	2.278	4.500	2.336	5.474	3.713	9.471	4.115
S3-047	1.783	1.773	1.739	0.883	1.851	0.939	2.772	1.398	6.836	1.994
S3-048	1.880	1.899	2.299	1.187	2.288	1.195	2.581	1.946	3.699	1.958
S3-054	0.756	0.781	0.824	0.422	0.873	0.444	1.147	0.680	2.241	0.831
S3-056	1.387	1.392	1.639	0.837	1.635	0.856	1.946	1.355	2.934	1.462
S3-057	2.891	2.937	3.596	1.837	3.617	1.835	3.952	2.977	5.668	3.029
S3-058	2.644	2.658	3.194	1.640	3.178	1.671	3.704	2.674	5.252	2.730
S3-059	1.546	1.543	1.821	0.937	1.788	0.966	2.240	1.452	3.088	1.636
S3-061	2.881	2.926	3.706	1.883	3.735	1.864	3.858	3.147	5.431	3.009
S3-062	2.339	2.355	2.662	1.375	2.672	1.431	3.415	2.206	5.573	2.487
S3-071	3.784	3.753	4.393	2.256	4.266	2.351	5.415	3.571	7.431	3.912
S3-072	0.256	0.348	0.828	0.474	0.902	0.358	–0.086	1.042	–1.169	0.197
S3-073	2.354	2.388	2.915	1.495	2.934	1.495	3.231	2.453	4.819	2.482
S3-074	2.298	2.266	2.687	1.404	2.532	1.467	3.230	2.200	3.506	2.349
S3-075	1.207	1.240	1.368	0.703	1.412	0.724	1.765	1.087	3.000	1.285
S3-081	1.510	1.489	1.770	0.912	1.730	0.934	2.115	1.463	2.999	1.556
S3-091	–0.557	–0.635	–0.769	–0.403	–0.835	–0.400	–0.796	–0.699	–1.235	–0.641
S3-098	2.176	2.192	2.728	1.388	2.706	1.391	2.971	2.243	3.993	2.237
S3-111	2.460	2.483	3.199	1.638	3.149	1.627	3.274	2.697	3.853	2.528
S3-112	0.367	0.394	0.268	0.142	0.374	0.161	0.643	0.280	2.414	0.483
S3-121	0.093	0.058	0.269	0.155	0.213	0.114	–0.042	0.280	–0.865	0.031
S3-122	–1.197	–1.184	–1.580	–0.798	–1.501	–0.802	–1.596	–1.266	–1.324	–1.212
S3-411	1.517	1.552	1.982	1.028	2.000	1.004	1.999	1.748	2.835	1.607
S3-421	1.382	1.416	1.840	0.959	1.879	0.920	1.759	1.667	2.571	1.451
S3-422	2.863	2.853	3.097	1.633	3.052	1.705	4.263	2.430	7.006	3.095
S3-431	2.340	2.385	2.917	1.504	2.956	1.484	3.190	2.369	4.692	2.481
Total	2.214	2.240	2.719	1.392	2.727	1.401	3.051	2.278	4.478	2.317

Source: UN Comtrade, 2010 + our own work

VII: *Elasticity of individual aggregations of Polish agricultural exports to changes to the external and internal economic environment in 1993–2008*

Polish – agrarian export	World trade	EU trade	World GDP	Polish GDP	EU15 GDP	EU12 GDP	World Agrarian GDP	Polish agrarian GDP	EU15 agrarian GDP	EU12 Agrarian GDP
S3-001	0.761	0.792	0.970	0.480	1.020	0.477	1.011	0.627	1.724	0.810
S3-011	3.808	3.825	4.621	2.560	4.567	2.408	5.265	3.445	7.073	3.945
S3-012	2.847	2.876	3.496	1.903	3.495	1.804	3.917	2.545	5.649	2.962
S3-016	4.606	4.572	5.242	3.061	5.158	2.827	6.633	4.449	9.922	4.827
S3-017	1.214	1.192	1.282	0.759	1.310	0.688	1.742	1.242	3.408	1.314
S3-022	2.110	2.124	2.581	1.405	2.572	1.332	2.932	1.912	4.248	2.220
S3-023	2.516	2.573	3.132	1.662	3.212	1.602	3.488	2.291	5.793	2.724
S3-024	3.130	3.151	3.832	2.104	3.805	1.985	4.311	2.826	6.002	3.257
S3-025	4.788	4.803	5.700	3.194	5.652	3.002	6.741	4.397	9.783	4.980
S3-034	1.775	1.775	2.201	1.212	2.166	1.132	2.410	1.601	3.206	1.823
S3-035	3.616	3.653	4.465	2.414	4.456	2.294	4.974	3.224	7.077	3.772
S3-036	0.318	0.320	0.162	0.122	0.257	0.104	0.543	0.396	2.291	0.371
S3-037	2.125	2.137	2.579	1.429	2.558	1.344	2.929	1.929	4.101	2.205
S3-041	2.507	2.547	3.155	1.709	3.149	1.626	3.279	2.070	4.037	2.494
S3-042	2.848	2.862	3.176	1.814	3.231	1.676	4.100	2.852	7.602	3.049
S3-043	3.918	3.942	4.923	2.587	4.939	2.493	5.364	3.308	7.631	4.041
S3-044	3.394	3.471	4.449	2.280	4.434	2.201	4.459	2.800	4.883	3.452
S3-045	3.102	3.179	3.983	2.076	4.039	1.994	4.161	2.702	5.601	3.224
S3-046	1.984	1.998	2.039	1.207	2.110	1.103	2.932	2.146	6.345	2.201
S3-047	2.804	2.783	3.182	1.854	3.127	1.700	4.019	2.734	6.150	2.913
S3-048	3.087	3.106	3.775	2.070	3.759	1.954	4.253	2.789	6.078	3.218
S3-054	2.079	2.107	2.564	1.396	2.579	1.328	2.861	1.855	4.259	2.175
S3-056	1.679	1.682	2.100	1.150	2.067	1.078	2.264	1.503	2.941	1.729
S3-057	1.875	1.904	2.282	1.235	2.316	1.178	2.598	1.700	4.157	1.990
S3-058	1.346	1.353	1.639	0.908	1.628	0.855	1.851	1.197	2.570	1.380
S3-059	1.989	2.010	2.467	1.337	2.458	1.269	2.712	1.767	3.824	2.069
S3-061	1.297	1.302	1.620	0.858	1.625	0.816	1.746	1.130	2.404	1.351
S3-062	1.729	1.733	1.991	1.107	2.029	1.037	2.425	1.643	4.406	1.848
S3-071	1.802	1.771	2.198	1.253	2.102	1.147	2.472	1.666	2.862	1.817
S3-072	2.243	2.272	2.844	1.530	2.840	1.451	2.998	1.962	4.046	2.319
S3-073	2.175	2.173	2.660	1.464	2.634	1.371	2.979	1.994	4.279	2.273
S3-074	2.264	2.278	2.780	1.539	2.765	1.449	3.104	2.043	4.326	2.351
S3-075	2.719	2.737	3.317	1.814	3.311	1.711	3.768	2.478	5.403	2.840
S3-081	2.365	2.377	2.903	1.598	2.874	1.503	3.238	2.138	4.422	2.456
S3-091	2.734	2.701	3.158	1.849	3.061	1.687	3.856	2.617	5.151	2.797
S3-098	2.552	2.563	3.136	1.722	3.103	1.625	3.495	2.268	4.784	2.629
S3-111	2.511	2.564	3.029	1.608	3.072	1.562	3.540	2.187	5.495	2.644
S3-112	2.045	2.073	2.448	1.334	2.467	1.269	2.862	1.874	4.614	2.165
S3-121	2.597	2.580	3.139	1.768	3.071	1.647	3.609	2.372	4.681	2.672
S3-122	4.030	4.030	4.810	2.693	4.734	2.527	5.682	3.702	7.937	4.186
S3-411	2.137	2.141	2.502	1.418	2.476	1.309	2.988	2.044	4.327	2.218
S3-421	4.530	4.539	5.443	3.010	5.383	2.836	6.341	4.105	8.958	4.695
S3-422	2.629	2.589	3.031	1.808	2.934	1.645	3.793	2.549	5.282	2.694
S3-431	0.509	0.509	0.264	0.231	0.345	0.198	0.927	0.699	3.077	0.630
Total	2.316	2.331	2.822	1.548	2.812	1.461	3.196	2.092	4.602	2.413

Source: UN Comtrade, 2010 + our own work

VIII: *Elasticity of individual aggregations of Hungarian agricultural exports to changes to the external and internal economic environment in 1993–2008*

Hungarian – agrarian export	World trade	EU trade	World GDP	Hungarian GDP	EU15 GDP	EU12 GDP	World Agrarian GDP	Hungarian agrarian GDP	EU15 agrarian GDP	EU12 Agrarian GDP
S3-001	0.931	0.924	1.109	0.600	1.080	0.578	1.299	0.931	1.865	0.977
S3-011	0.868	0.892	0.978	0.555	1.028	0.510	1.284	0.973	2.574	0.944
S3-012	0.597	0.600	0.709	0.394	0.715	0.369	0.827	0.606	1.411	0.640
S3-016	1.966	1.966	2.233	1.219	2.285	1.166	2.818	1.972	5.165	2.116
S3-017	0.417	0.415	0.412	0.209	0.447	0.220	0.621	0.378	1.532	0.478
S3-022	2.593	2.582	3.143	1.713	3.061	1.652	3.600	2.504	4.578	2.664
S3-023	0.113	0.197	0.145	0.141	0.296	0.078	0.133	0.223	1.044	0.179
S3-024	0.466	0.463	0.643	0.378	0.615	0.325	0.588	0.515	0.476	0.475
S3-025	0.790	0.805	0.918	0.537	0.953	0.492	1.084	0.828	1.877	0.834
S3-034	–0.633	–0.621	–0.956	–0.571	–0.881	–0.474	–0.781	–0.695	0.135	–0.607
S3-036	–0.445	–0.465	–0.325	–0.135	–0.379	–0.196	–0.830	–0.442	–2.166	–0.552
S3-037	1.238	1.438	1.944	1.441	2.280	0.889	1.364	2.045	3.405	1.363
S3-041	2.164	2.184	2.519	1.362	2.512	1.328	3.014	2.121	4.834	2.305
S3-042	4.944	4.872	5.382	2.850	5.116	2.990	7.321	4.889	9.759	5.125
S3-043	3.335	3.334	3.944	2.147	3.888	2.083	4.692	3.252	6.747	3.479
S3-044	2.740	2.735	3.304	1.817	3.265	1.738	3.827	2.642	5.413	2.836
S3-045	0.598	0.615	0.598	0.305	0.676	0.323	0.852	0.530	2.309	0.677
S3-046	0.803	0.790	0.698	0.276	0.702	0.394	1.226	0.606	3.246	0.921
S3-047	1.248	1.247	1.573	0.882	1.542	0.813	1.663	1.265	2.278	1.287
S3-048	1.806	1.809	2.179	1.205	2.157	1.138	2.477	1.799	3.511	1.881
S3-054	0.781	0.793	0.949	0.534	0.960	0.492	1.076	0.810	1.765	0.825
S3-056	0.937	0.945	1.156	0.652	1.154	0.595	1.263	0.958	1.848	0.973
S3-057	0.659	0.668	0.715	0.415	0.750	0.394	0.982	0.728	1.943	0.725
S3-058	1.075	1.092	1.272	0.714	1.297	0.668	1.532	1.113	2.530	1.146
S3-059	–0.119	–0.100	–0.281	–0.170	–0.203	–0.142	–0.073	–0.067	1.157	–0.048
S3-061	2.573	2.609	3.170	1.774	3.188	1.631	3.497	2.599	5.085	2.683
S3-062	1.334	1.351	1.509	0.903	1.536	0.820	1.876	1.556	3.113	1.447
S3-071	2.783	2.807	3.444	1.919	3.429	1.774	3.828	2.810	5.445	2.890
S3-072	0.506	0.622	0.654	0.535	0.940	0.275	0.747	1.207	4.253	0.740
S3-073	1.192	1.211	1.438	0.803	1.463	0.739	1.637	1.215	2.710	1.259
S3-074	1.845	1.876	2.241	1.263	2.280	1.150	2.543	1.912	4.171	1.937
S3-075	–0.014	–0.002	–0.095	–0.057	–0.044	–0.041	0.017	–0.011	0.790	0.026
S3-081	2.302	2.333	2.922	1.677	2.913	1.498	3.100	2.442	4.164	2.386
S3-091	1.565	1.620	2.111	1.265	2.152	1.054	2.019	1.790	2.766	1.610
S3-098	1.320	1.316	1.487	0.780	1.470	0.796	1.896	1.236	2.904	1.385
S3-111	1.704	1.674	1.901	0.995	1.893	1.017	2.425	1.536	4.089	1.798
S3-112	–0.041	–0.003	–0.228	–0.144	–0.118	–0.103	0.068	–0.003	1.676	0.067
S3-121	1.116	1.167	1.534	0.988	1.614	0.770	1.443	1.500	2.539	1.243
S3-122	0.267	0.186	0.104	–0.124	0.020	0.076	0.562	–0.080	1.265	0.290
S3-411	0.522	0.540	0.527	0.307	0.584	0.290	0.844	0.619	2.008	0.602
S3-421	1.482	1.476	1.644	0.887	1.661	0.883	2.115	1.383	3.355	1.552
S3-422	4.287	4.313	5.057	2.827	5.038	2.684	6.040	4.376	9.128	4.478
S3-431	1.521	1.534	1.999	1.125	1.990	1.011	1.987	1.525	2.614	1.551
Total	1.299	1.308	1.541	0.850	1.546	0.807	1.812	1.296	2.876	1.371

Source: UN Comtrade, 2010 + our own work

70% in the case of the average value of elasticity of agricultural exports of Visegrad Group countries as a whole. Again, as was the case in particular with Polish agricultural exports, it is clear from these results that Slovak agricultural trade is dynamically adapting itself to the conditions on the market of the EU27 countries, which are its key partners. Slovakia is successfully standing up to the competition and increasing not only the volume, but especially the value of its trade. A positive phenomenon accompanying developments of Slovak agricultural exports is its great, mostly positive elasticity with respect to changes influencing the conditions both on Slovakia's own market and in particular within the framework of the markets of EU27 countries.

CONCLUSION

During the past two decades (specifically in 1990–2008), agricultural trade of Visegrad Group countries has undergone a whole series of changes influencing its resultant appearance and character. In the cases of all of the analyzed countries of the Visegrad Group, in recent years there has been a very sharp increase to the value of exports and imports. Over the years there has also been a sharp increase to the volume of realized transactions (growth of traded goods expressed physically). The growth rate of trade value exceeds both for imports and exports the growth rate of the physical volume of traded production. The commodity structure of agricultural trade in the case of the V4 countries is relatively settled in a limited number of aggregations (an exception in this regard is Poland, which has a very diverse export structure in comparison, for example, with the Czech Republic or Slovakia), which constitute the basis of the value of overall agricultural exports. In the case of the individual V4 countries, the pillars of the present value of agricultural exports are represented by the following aggregations (see Table No. IX) – the shares of the relevant aggregations in the resultant value of agricultural exports of individual countries vary within the range of 60–70% (see the table below).

The exports of the individual V4 countries react very flexibly to changes both in the external and the internal environment. Especially in the cases of the Czech Republic, Slovakia and Poland, a high degree of reactions can be seen to changes of selected macroeconomic aggregations. On the other hand, with Hungary one sees that in spite of its long tradition in the agricultural sector, it is currently feeling its way ahead uncertainly. In comparison with the other V4 countries, it is unable to make effective headway on the market of the EU27 countries, and it is gradually losing the position it had built up through decades of work. From the results of analysis of sensitivity of the development of value of exports to changes to the development of selected economic characteristics, the following findings arise concerning the sensitivity of the value of exports in the cases of individual aggregations to changes of selected indicators (Tables No. X and XI).

IX: *The most important aggregations of agricultural exports in 2004–2008*

Czech Republic			Hungary			Poland			Slovakia		
Commodity group	**Export in mil. USD**	**Share in total export**	**Commodity group**	**Export in mil. USD**	**Share in total export**	**Commodity group**	**Export in mil. USD**	**Share in total export**	**Commodity group**	**Export in mil. USD**	**Share in total export**
S3-022	2 171.2	12.2%	S3-012	3 583.6	15.2%	S3-012	5 582.4	10.6%	S3-061	833.8	10.0%
S3-048	1 358.9	7.6%	S3-044	3 049.5	12.9%	S3-022	3 587.7	6.8%	S3-022	796.5	9.5%
S3-112	1 244.9	7.0%	S3-081	2 057.2	8.7%	S3-054	3 437.7	6.5%	S3-048	778.6	9.3%
S3-098	975.8	5.5%	S3-041	1 781.2	7.6%	S3-048	3 319.7	6.3%	S3-073	703.4	8.4%
S3-122	954.0	5.4%	S3-056	1 675.8	7.1%	S3-122	2 512.0	4.8%	S3-001	481.0	5.7%
S3-001	875.2	4.9%	S3-061	1 066.2	4.5%	S3-058	2 481.5	4.7%	S3-024	469.6	5.6%
S3-041	825.7	4.6%	S3-001	1 034.0	4.4%	S3-059	2 374.0	4.5%	S3-057	436.3	5.2%
S3-081	804.0	4.5%	S3-054	984.1	4.2%	S3-011	2 311.5	4.4%	S3-098	393.4	4.7%
S3-061	785.4	4.4%	S3-017	777.9	3.3%	S3-098	2 294.5	4.4%	S3-012	372.4	4.4%
S3-073	738.7	4.2%	S3-421	757.1	3.2%	S3-073	2 218.1	4.2%	S3-044	363.9	4.3%
TOP 10 Total	10 733.9	60.4%	TOP 10 Total	16 766.6	71.1%	TOP 10 Total	30 119.0	57.4%	TOP 10 Total	5 628.9	67.2%
Export Total	17 781.6	xx	Export Total	23 580.3	xx	Export Total	52 494.2	xx	Export Total	8 375.6	xx

Source: UN Comtrade, 2010

X: *Analysis of the sensitivity of agricultural exports of Visegrad Group countries to changes to the external and internal environment in 1993–2008*

Sensitivity of individual aggregations of agricultural exports to the percentage change of selected variables (v%) (the average sensitivity of agricultural exports of V4 countries to changes to the internal and external environment varies at the level of ca. 2.16%)

Czech Republic					Hungary				
Commodity group	Elasticity	Export in mil. USD	Share in export	Cumulative share in export	Commodity group	Elasticity	Export in mil. USD	Share in export	Cumulative share in export
S3-016	6.149	37.5	0.12%	0.12%	S3-042	5.325	4.7	0.01%	0.01%
S3-121	4.545	54.6	0.18%	0.30%	S3-422	4.823	35.1	0.07%	0.08%
S3-044	4.351	206.5	0.67%	0.97%	S3-043	3.69	429.9	0.88%	0.96%
S3-035	3.906	11.0	0.04%	1.01%	S3-071	3.113	694.1	1.42%	2.38%
S3-074	3.639	62.0	0.20%	1.21%	S3-044	3.032	4 612.3	9.43%	11.81%
S3-043	3.293	333.9	1.08%	2.29%	S3-061	2.881	1 534.6	3.14%	14.95%
S3-017	3.277	468.2	1.52%	3.81%	S3-022	2.809	1 161.0	2.37%	17.33%
S3-045	2.959	91.9	0.30%	4.11%	S3-081	2.574	3 106.9	6.36%	23.68%
S3-037	2.956	84.2	0.27%	4.39%	S3-041	2.434	3 114.4	6.37%	30.05%
S3-421	2.942	531.4	1.73%	6.11%	S3-016	2.291	99.2	0.20%	30.26%
S3-041	2.758	1 282.1	4.17%	10.28%	S3-074	2.122	126.4	0.26%	30.52%
S3-057	2.745	710.1	2.31%	12.58%	S3-048	1.996	1 016.3	2.08%	32.59%
S3-111	2.579	1 037.2	3.37%	15.95%	S3-111	1.903	794.5	1.63%	34.22%
S3-022	2.564	3 434.0	11.16%	27.11%	S3-091	1.795	132.2	0.27%	34.49%
S3-081	2.43	1 331.8	4.33%	31.44%	S3-037	1.741	12.0	0.02%	34.51%
S3-056	2.425	293.3	0.95%	32.39%	S3-431	1.686	31.8	0.07%	34.58%
S3-098	2.359	1 648.4	5.36%	37.75%	S3-421	1.644	1 536.6	3.14%	37.72%
S3-073	2.322	1 243.5	4.04%	41.79%	S3-062	1.544	292.7	0.60%	38.32%
S3-062	2.219	1 161.1	3.77%	45.56%	S3-098	1.459	1 041.3	2.13%	40.45%
S3-001	2.21	1 444.3	4.69%	50.25%	S3-121	1.392	116.4	0.24%	40.69%
S3-012	2.199	1 042.4	3.39%	53.64%	S3-047	1.38	108.6	0.22%	40.91%
S3-061	2.144	1 129.4	3.67%	57.31%	S3-073	1.367	770.9	1.58%	42.49%
S3-048	2.13	2 417.4	7.85%	65.16%	S3-058	1.244	1 181.5	2.42%	44.90%
S3-042	2.013	92.7	0.30%	65.47%	S3-011	1.061	429.0	0.88%	45.78%
S3-071	2.002	889.8	2.89%	68.36%	S3-056	1.048	3 781.5	7.74%	53.52%
S3-091	1.91	433.6	1.41%	69.77%	S3-072	1.048	5.4	0.01%	53.53%
S3-112	1.652	2 377.8	7.73%	77.49%	S3-001	1.029	2 392.1	4.89%	58.42%
S3-011	1.651	129.4	0.42%	77.91%	S3-046	0.966	411.5	0.84%	59.26%
S3-036	1.627	4.9	0.02%	77.93%	S3-025	0.912	256.6	0.52%	59.79%
S3-122	1.564	2 092.5	6.80%	84.73%	S3-054	0.898	2 332.5	4.77%	64.56%
S3-024	1.443	810.5	2.63%	87.36%	S3-057	0.798	1 117.5	2.29%	66.84%
S3-059	1.406	270.8	0.88%	88.24%	S3-045	0.748	190.3	0.39%	67.23%
S3-054	1.367	1 175.7	3.82%	92.06%	S3-012	0.687	9 170.1	18.76%	85.99%
S3-025	1.297	193.0	0.63%	92.69%	S3-411	0.684	161.1	0.33%	86.32%
S3-034	1.242	568.7	1.85%	94.53%	S3-034	–0.608	75.2	0.15%	86.47%
S3-058	1.153	436.2	1.42%	95.95%	S3-036	–0.594	4.9	0.01%	86.48%
S3-411	1.074	28.6	0.09%	96.05%	S3-017	0.513	2 159.9	4.42%	90.90%
S3-431	1.037	294.1	0.96%	97.00%	S3-024	0.494	617.0	1.26%	92.16%
S3-422	0.954	26.5	0.09%	97.09%	S3-122	0.257	346.9	0.71%	92.87%
S3-023	0.659	622.4	2.02%	99.11%	S3-023	0.255	57.8	0.12%	92.99%
S3-046	0.406	89.2	0.29%	99.40%	S3-112	0.117	1 837.1	3.76%	96.75%
S3-075	0.383	113.1	0.37%	99.77%	S3-075	0.057	232.8	0.48%	97.23%
S3-047	0.263	66.9	0.22%	99.98%	S3-059	–0.005	1 356.1	2.77%	100.00%
S3-072	–0.521	5.0	0.02%	100.00%	S3-035	N/A	0.1	0.00%	100.00%
Total	2.122	30 777.3	100.00%		Total	1.471	48 888.5	100.00%	
Share[1]	65.16%	20 056			Share	38.32%	18 734.6		
Share[2]	53.64%	16 509			Share	30.26%	14 792.1		

Source: UN Comtrade, 2010 + our own work

1 Share of items with an above-average value of elasticity in the context of the national average of the given country in the total value of agricultural exports of the given country in 1993–2008

2 Share of items with an above-average value of elasticity in the context of the countries of the Visegrad Group in the total value of agricultural exports of the given country in 1993–2008

XI: *Analysis of the sensitivity of agricultural exports of Visegrad Group countries to changes to the external and internal environment in 1993–2008 (continuation of Table No. X)*

Sensitivity of individual aggregations of agricultural exports to the percentage change of selected variables (v%) (the average sensitivity of agricultural exports of V4 countries to changes to the internal and external environment varies at the level of ca. 2.16%)

Poland					Slovakia				
Commodity group	Elasticity	Export in mil. USD	Share in export	Cumulative share in export	Commodity group	Elasticity	Export in mil. USD	Share in export	Cumulative share in export
S3-025	5.304	568.2	0.69%	0.69%	S3-046	4.405	117.3	0.90%	0.90%
S3-016	5.13	245.9	0.30%	0.99%	S3-017	4.258	189.9	1.45%	2.35%
S3-421	4.984	822.5	1.00%	2.00%	S3-071	4.113	251.4	1.92%	4.27%
S3-122	4.433	3 006.7	3.67%	5.67%	S3-025	3.845	114.1	0.87%	5.14%
S3-043	4.315	94.5	0.12%	5.79%	S3-012	3.649	447.1	3.42%	8.56%
S3-011	4.152	2 735.1	3.34%	9.13%	S3-016	3.596	16.8	0.13%	8.69%
S3-035	3.994	1 759.4	2.15%	11.27%	S3-043	3.548	192.5	1.47%	10.16%
S3-044	3.582	118.2	0.14%	11.42%	S3-037	3.485	12.3	0.09%	10.25%
S3-024	3.44	2 844.0	3.47%	14.89%	S3-022	3.455	1 051.5	8.04%	18.29%
S3-048	3.409	4 403.2	5.38%	20.27%	S3-061	3.244	1 029.7	7.87%	26.16%
S3-045	3.406	201.3	0.25%	20.51%	S3-057	3.234	561.7	4.29%	30.45%
S3-042	3.321	38.0	0.05%	20.56%	S3-422	3.2	1.8	0.01%	30.47%
S3-012	3.149	7 730.1	9.44%	30.00%	S3-041	3.089	420.3	3.21%	33.68%
S3-047	3.127	27.2	0.03%	30.03%	S3-058	2.935	150.2	1.15%	34.83%
S3-075	3.01	131.3	0.16%	30.19%	S3-023	2.914	68.2	0.52%	35.35%
S3-091	2.961	513.4	0.63%	30.82%	S3-044	2.803	548.0	4.19%	39.54%
S3-023	2.899	653.1	0.80%	31.62%	S3-111	2.691	421.6	3.22%	42.76%
S3-422	2.895	12.1	0.01%	31.63%	S3-073	2.657	1 038.1	7.93%	50.69%
S3-111	2.821	1 226.3	1.50%	33.13%	S3-062	2.651	200.0	1.53%	52.22%
S3-121	2.814	264.9	0.32%	33.45%	S3-431	2.632	120.1	0.92%	53.14%
S3-098	2.788	3 472.2	4.24%	37.70%	S3-045	2.596	28.6	0.22%	53.36%
S3-041	2.657	582.1	0.71%	38.41%	S3-001	2.465	729.6	5.58%	58.93%
S3-081	2.587	2 063.2	2.52%	40.93%	S3-024	2.416	748.6	5.72%	64.66%
S3-074	2.49	384.0	0.47%	41.39%	S3-098	2.403	611.2	4.67%	69.33%
S3-072	2.45	268.4	0.33%	41.72%	S3-074	2.394	17.8	0.14%	69.46%
S3-046	2.407	61.7	0.08%	41.80%	S3-011	2.368	96.2	0.73%	70.20%
S3-073	2.4	3 562.9	4.35%	46.15%	S3-047	2.197	5.4	0.04%	70.24%
S3-411	2.356	329.8	0.40%	46.55%	S3-048	2.093	1 373.2	10.50%	80.74%
S3-022	2.344	5 740.3	7.01%	53.56%	S3-034	1.756	48.0	0.37%	81.10%
S3-037	2.334	2 041.4	2.49%	56.05%	S3-411	1.727	83.8	0.64%	81.74%
S3-054	2.32	5 618.2	6.86%	62.92%	S3-059	1.702	46.4	0.35%	82.10%
S3-112	2.315	1 401.1	1.71%	64.63%	S3-081	1.648	467.2	3.57%	85.67%
S3-059	2.19	3 955.0	4.83%	69.46%	S3-421	1.584	218.2	1.67%	87.34%
S3-057	2.123	2 938.5	3.59%	73.04%	S3-056	1.544	134.7	1.03%	88.37%
S3-062	1.995	1 615.8	1.97%	75.02%	S3-075	1.379	18.1	0.14%	88.50%
S3-034	1.93	2 055.2	2.51%	77.53%	S3-036	1.3	0.3	0.00%	88.51%
S3-071	1.909	1 627.4	1.99%	79.51%	S3-122	–1.246	294.6	2.25%	90.76%
S3-056	1.819	2 642.8	3.23%	82.74%	S3-042	1.242	20.7	0.16%	90.92%
S3-058	1.473	5 053.6	6.17%	88.91%	S3-054	0.9	575.7	4.40%	95.32%
S3-017	1.415	2 956.0	3.61%	92.52%	S3-091	–0.697	118.9	0.91%	96.23%
S3-061	1.415	2 613.3	3.19%	95.71%	S3-112	0.553	384.0	2.93%	99.16%
S3-001	0.867	3 296.7	4.03%	99.74%	S3-072	0.315	56.9	0.43%	99.60%
S3-431	0.739	147.5	0.18%	99.92%	S3-035	0.197	1.4	0.01%	99.61%
S3-036	0.488	65.2	0.08%	100.00%	S3-121	0.031	51.5	0.39%	100.00%
Total	2.559	81 887.5	100.00%		Total	2.482	13 083.7	100.00%	
Share[3]	40.93%	33 512.8			Share	53.36%	6 981.2		
Share[4]	69.46%	56 875.6			Share	70.24%	9 190.1		

Source: UN Comtrade, 2010 + our own work

3 Share of items with an above-average value of elasticity in the context of the national average of the given country in the total value of agricultural exports of the given country in 1993–2008

4 Share of items with an above-average value of elasticity in the context of the countries of the Visegrad Group in the total value of agricultural exports of the given country in 1993–2008

SUMMARY

During the past two decades (specifically in 1990–2008), agricultural trade of Visegrad Group countries has undergone a whole series of changes influencing its resultant appearance and character. In the cases of all of the analyzed countries of the Visegrad Group, in recent years there has been a very sharp increase to the value of exports and imports. The exports of the individual V4 countries react very flexibly to changes both in the external and the internal environment. The subject matter of the analysis is the sensitivity of the commodity structure of agricultural exports of individual countries and the identification of aggregations that are the least and the most sensitive to changes to the external and internal economic environment.

The actual calculation of the value of elasticity is then based on analysis of mutual relations existing between the values of agricultural exports of individual countries (endogenous variable) on the one hand, and selected factors relating to the development of economic output of the individual countries. Taken into account in this case are the following variables (exogenous variables): GDP – world, GDP – EU15, GDP – EU12, GDP – Czech Republic, Slovakia, Hungary and Poland, Agricultural exports – world, Agricultural exports – EU (internal market),GDP – agricultural sector in Czech Republic, Slovakia, Hungary and Poland, GDP – agricultural sector – world, GDP – agricultural sector – EU15 and GDP – agricultural sector – EU12. From the conducted research, agricultural trade in the V4 countries was found to have developed very dynamically from 1993 to 2008, while the commodity structure of exports has constantly narrowed as the degree of specialization of the individual countries has increased (this applies especially to the Czech Republic, Slovakia and Hungary). From the results of analysis of sensitivity to changes of selected variables relating to the development of the value of agricultural exports of the individual V4 countries, it appears that the aggregations that react most sensitively to changes are those that are the subject of re-exports, followed by the aggregations that are characterized by a high degree of added value. In general it can be said that products of agricultural primary production exhibit less sensitivity in comparison with grocery industry products. This is confirmed by the general trend arising from the very nature of consumer behaviour.

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