

Development of Visegrad Countries' Agricultural Trade in Relation to Agricultural Production Development

M. Svatoš, L. Smutka, B. A. M. Elshibani, S. A. A. Mousbah

Faculty of Economics and Management, Czech University of Life Sciences in Prague, Czech Republic

Anotace

Článek se věnuje problematice vztahů mezi agrární produkcí a obchodem zemí Visegradské skupiny. Cílem článku je analyzovat agrární produkci ve vztahu k agrárnímu obchodu a identifikovat nejvýznamnější změny v oblasti vývoje agrární produkce, agrárního obchodu a jeho konkurenceschopnosti v případě jednotlivých zemí Visegradské skupiny. Během let 1993 – 2010 země Visegradské skupiny výrazně změnily charakter vlastní agrární produkce a obchodu. Objem agrární produkce byl zredukován zejména v případě Slovenska, České republiky a Maďarska. Redukce agrární a potravinářské produkce zapříčinily výrazný nárůst hodnoty importů zejména v Čechách a na Slovensku. Stagnace v oblasti agrární a potravinářské produkce rovněž negativně ovlivnila i maďarský obchod. Pouze Polsko bylo schopné během sledovaného období výrazně zlepšit situaci v oblasti produkce a obchodu. Agrární obchod České republiky, Slovenska a Maďarska nedisponuje komparativními výhodami jak ve vztahu k zemím EU, tak ani ve vztahu ke třetím zemím. Pouze polský agrární obchod disponuje komparativními výhodami ve vztahu k oběma trhům.

Klíčová slova

Visegradská skupina, zemědělství, produkce, obchod, vývoj, trend, konkurenceschopnost.

Abstract

The paper is devoted to the analysis of Visegrad countries' agricultural production and trade relationship. The objective is to analyze changes in agricultural production in relation to individual countries' agricultural foreign trade performance and to identify the most important changes in area of Visegrad members' agrarian production and trade performance and competitiveness. During the period 1993 – 2010, Visegrad countries' agricultural production and trade were significantly affected. The volume of agricultural production was reduced especially in Slovakia, the Czech Republic and Hungary. The reduction of agricultural and foodstuff production volume in the Czech Republic and Slovakia resulted in the significant growth of imports. Hungarian trade was also negatively affected by its agricultural sector and foodstuff industry stagnation. Only Poland was able during the analyzed time period significantly improve its production and trade performance. Agricultural trade of the Czech Republic, Slovakia and Hungary does not have comparative advantages in relation to the EU and third countries market. Only Poland does have comparative advantages in the field of agricultural trade, both in relation to the EU market, as well as in relation to the global market.

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Key words

Visegrad groups, agriculture, production, trade, development, trend, competitiveness.

Introduction

The global production and trade in agricultural products have been constantly growing. There are several reasons explaining the general growth of global agricultural production and trade. Among the most important factors boosting both trade and

production we can include in particular the growth of human population, the growth of individual incomes, the growth of bio fuels production, liberalisation of global trade, intensification of global production, changes in consumption patterns, the growth of animal products consumption etc. (Jeníček, 2010a; Jeníček, 2010b; Potter, Tilzey, 2007; Kuna,

2010; Horská et al., 2011; Beneš, 2004; Hromadko et al., 2009 and 2010). It is very interesting to see that global food and agricultural production has been growing in all regions around the world with only one exception. The only region, where the global agricultural production stagnates, is Europe – especially the European Union (FAOstat, 2012). In the period 1993 – 2010, the global food production increased its volume by more than 20%, and the volume of crops and animal production also increased by more than 20%. The global production is growing much faster in developing countries in comparison with developed countries (FAO, 2011). While the global animal and crops production in developing countries recorded during the monitored time period increased by about 20%, the developed regions recorded the growth of production volume of only about 4% (FAOstat, 2012). A very specific situation can be seen especially in the case of EU members. The European Union – one of the most important global food producers and traders – is the only region, where the volume of food production stagnates. In general we can see that the volume of livestock production has been the same for the last two decades, and in the case of crops production we can even see a decrease of production volume. The reason for this development is peculiar to the European market. While the majority of countries around the world have been boosting agricultural production to satisfy the growing demand, the policy of the EU countries is the opposite. The aim of the current EU Common agricultural policy is the reduction of production volume, instead of intensifying agricultural production (Svatoš, 2008). The current goal of the agricultural policy is the reinforcement of the non-production function of agriculture (Vošta, 2012). This quite specific attitude towards agriculture has a direct impact on individual EU members' agricultural production and trade (Antimiani, 2012).

However, the paper does not have an ambition to analyse the EU agricultural production and trade development. The paper is focused on agricultural production and trade performance in selected EU members. The analyzed group of countries is Visegrad group (Czech Republic, Hungary, Poland and Slovakia). The reason why those countries are analyzed is the following. During the last twenty years Visegrad members significantly changed their economy structure. The agricultural sector was one of the most affected parts of their economy. Agricultural production and trade were affected

twice. First time they were affected in 90ties during the transformation from central planned economy to market economy. Another moment was represented by individual countries' EU accession in 2004.

Material and methods

The main objective of this paper is to analyze individual Visegrad members' agricultural production development and to identify the most significant changes in agricultural sector and its volume and structure which appeared during the period 1993 – 2010. Another objective is to analyze changes in agricultural production in relation to individual countries' agricultural foreign trade performance and to identify the most important changes in the area of Visegrad members' agrarian export and import and especially in area of individual countries' agricultural trade competitiveness.

It is important to mention that in analytical terms, the entire text is compiled from the viewpoint of the development of agricultural production and trade within the scope of time including the period of the years 1993 - 2010. Paper is analyzing the basic characteristic related to agricultural production performance: animal and crops production volume, volume of foodstuff production, changes in commodity structure of agricultural production etc. Except for agricultural production development, paper is analyzing also agricultural trade performance both in relation to the EU27 and third countries (export, import and trade balance).

In terms of the uniformity of the data source, the UN COMTRADE database was selected as the central source of data for the analysis of agrarian trade, FAOSTAT database and WDI database were chosen for the analysis of agricultural production volume and value development.

The analysis of trade and production performance development is conducted by way of the utilization of basic statistical characteristics, such as the basic index, chain index and geometric mean. A part of the analysis is also conducted by way of indices, the objective of which is the characterization of the comparative advantages (modified Ballasa index RCA1 – Ballasa, 1965). The Ballasa index provides a simple overview of the comparative advantage distribution (e.g., Proudman and Redding, 2000; Hinloopen and Marrewijk, 2001).

**Revealed comparative advantage index
(RCA1 – global/regional level)**

$$RCA1 = (X_{ij}/X_{nj})/(X_{it}/X_{nt})$$

where:

X represents exports

i represents the analyzed country

j represents the analyzed sector of the economy (sector of industry or commodity)

n represents the group of countries or world

t represents the sum of all sectors of the economy or the sum of all commodities or the sum of all branches

The RCA1 index analyzes the exporting of commodity “j” in the case of country “i” in proportion to the total exports of the given country and the corresponding total exports of the analyzed group of countries or of the whole world (Hinloopen, Marrewijk, 2001 and Utkulu, Seymen, 2004). A comparative advantage is then proven if the RCA1 index value is greater than 1. If, however, the result of the calculated index is less than 1, it may be asserted that the given country has a competitive disadvantage in the case of the given commodity or group of commodities (Qineti, Rajcaniova, Matejkova, 2009).

Results and discussion

Visegrad countries agricultural production

The main subjects of the following analysis are agricultural production and trade in the Czech Republic, Slovakia, Hungary and Poland. Each

country became a member of the EU in 2004, and each can be considered as a developed country. If we analyze the structure of individual Visegrad countries' economy, we can see that agriculture plays a minor role. The share of agriculture in individual countries' economy is steadily decreasing (for details see Table 1).

Agricultural land represents a large proportion of total land in these countries. The share of agricultural land is the highest in Hungary (63%), and the lowest in Slovakia (40%). The share of agricultural land in total land is quite stable in the Czech Republic and in Hungary, however in Poland and Slovakia it has been declining over the last two decades (for details see Tables 2). It can be seen that during the analyzed time period the size of agricultural land decreased in all countries except for the Czech Republic.

Employment in agriculture is very low in the analyzed countries. The share of people working in agricultural sector has been steadily decreasing in each of the analyzed countries. The lowest share of people working in agriculture is in the Czech Republic and Slovakia. The highest share is in Poland (Table 3). All analyzed countries can be characterized by the significant reduction of number of people working in agriculture. The effect of this development was the significant growth of countries' agricultural sector effectiveness.

The value added generated by the agricultural sector has been constantly growing – the only exception is the Czech Republic. The average value of inter annual growth rate of agricultural value

Country Name	1993	1995	1997	1999	2001	2003	2005	2007	2008	2009	2010
Hungary	7.5	8.0	7.1	5.9	5.3	4.3	4.2	4.0	4.3	3.4	3.5
Slovak Republic	6.1	5.9	5.3	4.7	4.7	4.5	3.7	4.1	4.2	3.9	3.9
Czech Republic	5.3	4.5	3.8	3.6	3.5	2.7	2.6	2.4	2.3	1.9	1.7
Poland	8.4	8.0	6.6	5.2	5.1	4.4	4.5	4.3	3.7	3.7	3.5

Source: WDI, 2012

Table 1: Visegrad countries – the share of agriculture in GDP value in %.

Country Name	1993	1995	1997	1999	2001	2003	2004	2005	2007	2010
Czech Republic	42 820	42 800	42 800	42 820	42 780	42 690	42 650	42 600	42 490	42 390
Hungary	61 300	61 790	61 950	61 860	58 650	58 650	58 640	58 630	58 070	57 830
Poland	187 150	186 220	184 570	184 350	177 880	161 690	163 270	159 060	161 770	161 190
Slovak Republic	24 460	24 460	24 450	24 430	22 550	22 360	19 340	19 410	19 300	19 300

Source: WDI, 2012

Table 2: Agricultural land (sq. km).

Country Name	1993	1995	1997	1999	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Czech Republic	7.7	6.6	5.8	5.2	4.8	4.8	4.5	4.3	4	3.8	3.6	3.2	3.1	3.1
Hungary	9.1	8	7.9	7.1	6.2	6.2	5.5	5.3	5	4.9	4.7	4.3	4.6	4.5
Poland	24	22.6	20.5	18.1	19.1	19.3	18.4	18	17.4	15.8	14.7	14	13.3	12.8
Slovak Republic	10.2	9.2	9.2	7.4	6.1	6.2	5.8	5.1	4.7	4.4	4.2	4	3.6	3.2

Source: WDI, 2012

Table 3: Employment in agriculture (% of total employment).

Country Name	1993	1997	2001	2005	2010	Inter annual growth rate - GEOMEAN
Czech Republic	2 601 256 550	1 718 645 956	1 943 983 107	2 496 690 029	2 100 452 125	0.9875
Hungary	2 069 593 467	2 196 051 563	2 541 385 349	3 387 836 924	2 744 022 562	1.016731
Poland	7 994 303 202	7 643 310 115	8 051 872 151	8 833 573 449	8 863 696 021	1.006091
Slovak Republic	1 100 419 889	1 250 230 330	1 307 352 128	1 549 659 112	1 955 039 617	1.034385

Source: WDI, 2012

Table 4: Agriculture, value added (constant 2000 US\$).

Country Name	1993	1995	1997	1999	2001	2003	2005	2007	2008	2010	Inter annual growth rate - GEOMEAN
Czech Republic	4 945	4 078	3 634	4 298	4 662	5 324	6 712	5 262	5 674	6 423	1.015501
Hungary	3 449	3 935	4 482	4 848	5 856	5 595	8 822	6 882	11 029	8 522	1.054644
Poland	1 759	1 767	1 896	2 072	2 182	2 397	2 626	2 616	2 643	2 994	1.031807
Slovak Republic	3 916	4 343	4 942	4 607	5 493	7 209	7 141	9 779	11 279	9 924	1.056222

Source: WDI, 2012

Table 5: Agriculture value added per worker (constant 2000 US\$).

added is positive in the case of Hungary, Poland and Slovakia, and negative in the case of the Czech Republic (for details see the Table 4).

The productivity of agriculture per worker is increasing in each of the Visegrad countries studied. The average growth rate of real agricultural added value in individual Visegrad countries is the following: Slovakia (5.6% a year), Hungary (5.4% a year), Poland (3.1% a year) and the Czech Republic (1.55% a year). (See Table 5).

The volume of food production in individual Visegrad countries decreased during the period 1993 – 2010, the only exception being Poland. Table 6 provides detailed information about the volume of food production in individual Visegrad countries. In the case of the Czech Republic the volume of production decreased by more than 28%. In Hungary the current volume of food production is at the same level as in 1993, but if we take into consideration the peak level of food production in 2001, we can see that the current production volume is lower by 20-21%. Slovakian volume of food production declined

during the analyzed time period by more than 27%, and only one Visegrad country (Poland) was able to keep the level of food production stable during the last twenty years.

If we examine the individual countries food and agricultural production in more detail, we can see that both segments – animal and crops production – of agricultural production were heavily affected during the last nearly twenty years development (for more details – see Tables 7 and 8). The volume of crops production decreased in each of the analyzed countries. It was not only the volume of crops production which declined during the last twenty years in the individual analyzed countries, the volume of animal production also declined. Especially the Czech Republic and Slovakia recorded the significant decline of animal production. The Hungarian volume of production was also reduced, but the level of reduction was not as high as it was in the other two cases. The only exception among the Visegrad countries is Poland (during the last two decades its production volume increased by more than 12%).

From the detailed analysis of above mentioned

Country Name	1993	1997	2001	2003	2005	2007	2008	2009	2010
Czech Republic	126.15	100.22	101.14	88.32	98.30	95.67	101.84	98.20	91.86
Hungary	86.60	94.83	103.84	83.26	95.15	79.30	103.79	94.81	82.83
Poland	99.80	92.64	95.59	96.03	98.17	100.33	102.13	106.25	100.16
Slovak Republic	115.80	113.36	93.89	91.95	102.87	89.29	104.04	93.03	83.99

Source: WDI, 2012

Table 6: Food production index (2004-2006 = 100).

Country Name	1993	1997	2001	2003	2005	2007	2008	2009	2010
Czech Republic	133.11	108.34	105.92	99.33	99.66	96.71	98.34	94.90	93.11
Hungary	116.07	106.91	113.57	111.77	97.56	96.77	97.96	96.39	89.61
Poland	92.43	92.65	92.09	98.82	98.79	105.99	100.29	102.22	104.39
Slovak Republic	139.09	123.25	97.34	106.55	100.82	95.56	94.79	86.39	86.63

Source: WDI, 2012

Table 7: Livestock production index (2004-2006 = 100).

Country Name	1993	1997	2001	2003	2005	2007	2008	2009	2010
Czech Republic	105.25	97.37	102.25	77.86	100.12	92.43	102.78	99.65	86.47
Hungary	111.94	115.15	99.8	80.69	102.47	81.84	108.55	94.22	76.88
Poland	131.4	106.31	112.19	95.83	98.26	99.04	106.3	110.06	96.85
Slovak Republic	110.7	91.83	98.24	72.43	95.38	71.28	103.55	89.68	76.32

Source: WDI, 2012

Table 8: Crop production index (2004-2006 = 100).

countries we can see that the crops production is facing a much higher level of fluctuation in comparison with the animal production. During the analyzed time period not all commodities recorded a significant production slowdown. In the case of the Czech Republic the most significant reduction of production can be seen in the case of: fruits, pulses, starchy roots, sugar crops, vegetables, bovine meat, eggs, pig meat, milk, offals and animal fats (especially the whole animal production was heavily affected). On the other hand the significant production growth was recorded for: cereals, oil crops and poultry meat. Hungarian agricultural production volume during the same time period was particularly affected in the case of: fruits, pulses, spices, starchy roots, sugar crops, tree nuts, bovine meat, eggs, pig meat, animal fats and milk. The growth of production was recorded only in the case of cereals, oil crops, vegetables and poultry meat. Slovakian agricultural production recorded a huge decrease in the case of fruits, pulses, starchy roots, sugar crops, tree nuts, vegetables, bovine meat, eggs, pig meat, animal fats, offals and milk. The production growth was recorded only in the case of the following commodity groups: cereals, oil crops and poultry

meat. On the basis of these findings, it can be seen that the reduction affected the same groups of commodities in each of the above mentioned countries, whilst production of cereals, oil crops and poultry meat was boosted in each case. The general growth of cereals production can be explained by the reduction of animal production in individual countries. It can also be explained by the fact that corn is only commodity which is purchased by individual countries' state authorities. The growth of oil crops production volume is influenced by the bio-fuels policy applied in the European Union, and the growth of poultry production is driven by the changes in consumption patterns and also through the growth of demand – because of much lower unit price level of poultry meat in comparison with bovine and pig meat. While Hungary, the Czech Republic and Slovakia recorded a significant production slowdown, the Polish agricultural sector recorded a different development in the monitored time period. Polish agricultural production is characterised by significant oscillations, however if we compare the level of production at the beginning of the nineties, with the level of production in 2010, we can see a significant production growth in the case of many

commodities (cereals, fruits, oil crops, tree nuts, eggs, poultry meat and animal fats). The production of pig meat and milk was only slightly affected. The only commodities which recorded a significant production slowdown were: pulses, starchy roots, sugar crops, vegetables and bovine meat.

While the level of production in individual analyzed countries was reduced significantly (the only exception being Poland), the level of domestic consumption changed only a little during the whole monitored time period (FAOstat, 2012). A significant decrease of production volume in comparison with domestic consumption volume development affected the level of agricultural market self-sufficiency level in individual analyzed

countries (see Table 9).

The changes in agricultural production volume, apparent in the monitored time period, had a direct impact on agricultural trade value and volume development. The following subchapter analyzes the value and volume of individual Visegrad members' agricultural trade development. Trade development is analyzed in relation to the EU market and third countries.

Visegrad countries trade development and trade competitiveness

If we analyze agricultural trade performance of individual Visegrad members we should understand, that agricultural trade must be

Self sufficiency	item	1993	2009	item	1993	2009
Czech Republic	Bovine Meat	101.30%	77.15%	Cereals	152.38%	150.54%
Czech Republic	Pigmeat	101.95%	64.33%	Fruits	66.92%	31.40%
Czech Republic	Poultry Meat	106.78%	76.82%	Oilcrops	95.82%	141.03%
Czech Republic	Animal Fats	109.67%	78.34%	Pulses	286.87%	101.02%
Czech Republic	Eggs	109.24%	80.55%	Starchy Roots	115.93%	85.07%
Czech Republic	Milk	126.25%	119.53%	Sugarcrops	100.96%	93.99%
Czech Republic	Offals	98.26%	57.28%	Vegetables	74.85%	28.48%
Hungary	Bovine Meat	134.99%	65.31%	Cereals	100.78%	175.80%
Hungary	Pigmeat	111.55%	103.32%	Fruits	133.95%	102.90%
Hungary	Poultry Meat	131.57%	129.59%	Oilcrops	115.42%	200.78%
Hungary	Animal Fats	112.17%	88.93%	Pulses	185.81%	105.53%
Hungary	Eggs	102.79%	97.24%	Starchy Roots	102.48%	77.26%
Hungary	Milk – Exc. Butter	102.88%	94.90%	Sugarcrops	100.43%	98.82%
Hungary	Offals	98.04%	138.60%	Vegetables	124.15%	119.62%
Poland	Bovine Meat	96.20%	207.30%	Cereals	98.85%	107.01%
Poland	Pigmeat	98.31%	85.97%	Fruits	115.24%	136.07%
Poland	Poultry Meat	80.92%	145.16%	Oilcrops	93.82%	102.91%
Poland	Animal Fats	100.11%	115.05%	Pulses	121.17%	92.66%
Poland	Eggs	86.44%	125.90%	Starchy Roots	102.36%	105.69%
Poland	Milk – Exc. Butter	96.08%	110.34%	Sugarcrops	132.40%	102.56%
Poland	Offals	116.48%	122.20%	Vegetables	100.00%	99.99%
Poland	Bovine Meat	94.42%	126.38%	Cereals	105.82%	108.03%
Slovakia	Pigmeat	102.25%	65.22%	Fruits	94.40%	128.80%
Slovakia	Poultry Meat	96.84%	44.81%	Oilcrops	79.61%	33.57%
Slovakia	Animal Fats	93.88%	78.22%	Pulses	103.19%	157.42%
Slovakia	Eggs	103.82%	62.68%	Starchy Roots	136.44%	57.50%
Slovakia	Milk – Exc. Butter	99.32%	86.73%	Sugarcrops	107.94%	262.58%
Slovakia	Offals	113.19%	111.50%	Vegetables	97.27%	100.06%
Slovakia	Bovine Meat	99.44%	87.87%	Cereals	111.45%	54.77%

Source: FAO, 2012

Table 9: Visegrad countries – level of animal and crops production self sufficiency development in 1993 - 2009.

analyzed in two different dimensions. The first dimension is represented by the period of economy transformation (1993 – 1999) and second dimension is represented by the period 2000 – 2010 (This period can be characterized as period of preparation for the EU accession and the EU membership.). The period 1993 – 1999 can be characterized by low inter-annual growth rate of export values (the only exception is Poland) and significant growth rate of import value. Except for Poland, all Visegrad members recorded a significant worsening of their trade balance (see Table 10).

On the other hand the time period 2000 – 2010 can be characterized by the significant inter-annual growth rate of both export and import value in the case of all analyzed countries (The inter annual growth rate of export was usually higher in comparison with the inter annual growth rate of imports. The result was the stabilization of agrarian trade balance). The reason of significant agricultural trade value

growth was the agricultural market liberalization process between EU and individual Visegrad members (for details see Tables 11 and 12).

Because of limited space, this paper analyses agricultural trade development in period 2000 – 2010. It is important to state that the actual territorial structure of agricultural trade of the Visegrad countries is distinctly oriented toward the EU27 countries. In relation to the position of agricultural trade of the Visegrad members within the overall merchandise trade, it may be stated that likewise as in the case of the global and European market, agricultural trade represents only a supplement to merchandise trade. In the case of goods exports and imports, agricultural products have approximately a 7% or 6.2 % share in the total value (data for the year 2010). In this regard, it is important to state that the value of both agricultural exports as well as imports of the Visegrad countries is dynamically increasing. Just in the years 2000 – 2010, the value

In mld. USD	Czech R.	Hungary	Poland	Slovakia	Czech R.	Hungary	Poland	Slovakia
	Export Agriculture:				Import Agriculture			
1993	1.03	1.69	1.54	0.4	0.98	0.69	2.08	0.43
1994	0.96	2.01	1.99	0.37	1.28	0.92	2.21	0.56
1995	1.25	2.57	2.29	0.51	1.68	0.84	2.73	0.71
1996	1.14	2.43	2.62	0.38	1.91	0.83	3.6	0.76
1997	1.16	2.59	3.17	0.41	1.76	0.98	3.43	0.8
1998	1.25	2.51	2.96	0.42	1.8	1.05	3.54	0.83
1999	1.01	2.06	2.39	0.37	1.63	0.88	3.03	0.72
2000	1.11	1.96	2.43	0.37	1.56	0.92	2.86	0.71
Inter annual growth rate – average value	1.01	1.02	1.07	0.99	1.07	1.04	1.05	1.07

Source: Comtrade, own processing, 2012

Table 10: Agrarian export and import value development in period 1993 – 2000.

Export	bil. USD	2000	2002	2004	2005	2006	2007	2008	2009	2010	Inter annual growth rate – average value
CR	Agriculture	1.11	1.4	2.18	2.99	3.25	4.37	5.53	4.84	4.94	1.161
	Total trade	29.05	44.26	65.77	78.21	95.14	120.9	146.09	112.88	132.14	1.164
SR	Agriculture	0.37	0.49	0.98	1.41	1.69	2.15	2.37	2.39	2.49	1.21
	Total trade	11.88	14.48	27.86	31.85	41.69	58.04	70.19	55.55	64	1.183
Hungary	Agriculture	1.96	2.35	3.41	3.63	4.02	5.72	7.12	5.89	6.5	1.127
	Total trade	28.09	34.34	55.47	62.27	74.06	94.59	108.21	82.57	94.69	1.129
Poland	Agriculture	2.43	3.03	6.11	8.36	10.12	12.95	16.13	14.96	16.79	1.213
	Total trade	30.96	40.25	73.78	89.38	109.58	138.78	171.86	136.64	157.06	1.176

Source: Comtrade, own processing, 2012

Table 11: Development of value and structure of foreign trade (export) of Visegrad group countries in the years 2000 – 2010.

Import	bil. USD	2000	2002	2004	2005	2006	2007	2008	2009	2010	Inter annual growth rate – average value
CR	Agriculture	1.56	2.02	3.27	3.99	4.65	5.99	7.1	6.55	6.65	1.156
	Total trade	32.24	48.23	66.71	76.53	93.43	116.82	141.83	104.85	125.69	1.146
SR	Agriculture	0.71	0.89	1.47	2.05	2.24	3.13	3.97	3.76	3.97	1.188
	Total trade	12.77	16.63	29.46	34.23	44.76	59.21	72.61	55.16	64.38	1.176
Hungary	Agriculture	0.92	1.17	2.29	2.67	2.97	3.79	4.7	4	4.12	1.162
	Total trade	32.08	37.61	60.25	65.92	76.98	94.66	108.78	77.27	87.36	1.105
Poland	Agriculture	2.86	3.21	4.95	6.13	7.27	10.07	13.6	11.58	13.08	1.164
	Total trade	48.13	54.27	88.15	101.54	125.65	164.17	210.48	149.57	174.13	1.137

Source: Comtrade, own processing, 2012

Table 12: Development of value and structure of foreign trade (import) of Visegrad group countries in the years 2000 – 2010.

Export	RCA1	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CR	EU27	Agriculture	0.41	0.37	0.35	0.35	0.38	0.44	0.43	0.45	0.44	0.42
SR	EU27	Agriculture	0.36	0.37	0.37	0.33	0.42	0.53	0.52	0.47	0.41	0.44
Hungary	EU27	Agriculture	0.68	0.72	0.62	0.63	0.63	0.63	0.61	0.79	0.79	0.77
Poland	EU27	Agriculture	0.75	0.72	0.69	0.72	0.88	1.06	1.12	1.12	1.08	1.06
CR	Others	Agriculture	1.04	0.79	0.5	0.7	0.57	0.65	0.46	0.38	0.31	0.3
SR	Others	Agriculture	0.69	0.65	0.61	0.46	0.42	0.53	0.44	0.23	0.21	0.17
Hungary	Others	Agriculture	2.2	2.08	2.08	1.83	1.62	1.26	1.28	0.72	0.8	0.69
Poland	Others	Agriculture	2.49	2.24	2.1	2.26	1.87	1.74	1.68	1.44	1.29	1.46

Source: Comtrade, own processing, 2012

Table 13: Competitiveness of commodity structure of goods trade of Visegrad countries in relation to the EU market and to the global market.

of agricultural export of the Visegrad countries increased from USD 6 billion to more than USD 30 billion, and in the case of agricultural import, there was an increase in the traded value from USD 6 billion to 28 billion. In terms of their own development of agricultural trade, the Visegrad countries as a group achieve a positive balance of agricultural trade. Nevertheless, it is appropriate to state that currently, such positive balance is fully to the debit of the agricultural trade of Poland and Hungary, while the agricultural trade of the Czech Republic and Slovakia regularly finishes in negative values.

A specific characteristic of merchandise trade of the Visegrad countries is the competitiveness of individual trade transactions, both in relation to the market of the EU27 countries, as well as in relation to the market of third countries. In this regard, it is appropriate to emphasize that currently, in terms of the development of the value of effected trade flows, the important thing is primarily the ability to retain comparative advantages in relation to the EU27 market, which represents

the main outlet for exports originating from Visegrad countries. The following Table 13 provides information on the development of values of the RCA1 trade competitiveness index. As regards agricultural trade, there we can state that agricultural trade of the Visegrad countries is currently uncompetitive, both in relation to the EU market, as well as in relation to the market of third countries. Nevertheless, in the case of Poland, the situation is the opposite. Only Polish agricultural trade is capable of achieving comparative advantages, and, importantly – it is also capable of amplifying them.

On the base of above mentioned data we can see that during the last two decades agricultural trade completely changed its character. Agricultural trade becomes more concentrated both from territorial and commodity point of view. The size of agricultural production in individual countries was significantly reduced and they become more dependent on agrarian imports and their agrarian exports lost their shares in total merchandise trade performance. The only country which did not lost

Period	Reporter	Commodity Description	Import	Export	Balance	Period	Import	Export	Balance
1994	Czech Rep.	LIVE ANIMALS; ANIMAL PRODUCTS	145	306	160	2010	1 774	1 320	-455
1994	Czech Rep.	VEGETABLE PRODUCTS	499	238	-261	2010	1 963	1 288	-675
1994	Czech Rep.	ANIMAL OR VEGETABLE FATS , etc.	60	51	-9	2010	283	242	-42
1994	Czech Rep.	PREPARED FOODSTUFFS, etc.	666	451	-216	2010	3 356	2 766	-590
1994	Hungary	LIVE ANIMALS; ANIMAL PRODUCTS	188	759	570	2010	1 188	1 887	700
1994	Hungary	VEGETABLE PRODUCTS	307	585	279	2010	958	2 795	1 837
1994	Hungary	ANIMAL OR VEGETABLE FATS , etc.	27	89	63	2010	308	303	-5
1994	Hungary	PREPARED FOODSTUFFS, etc.	503	809	306	2010	2 470	2 773	303
1994	Poland	LIVE ANIMALS; ANIMAL PRODUCTS	524	609	85	2010	3 864	5 854	1 989
1994	Poland	VEGETABLE PRODUCTS	762	553	-209	2010	3 717	3 088	-629
1994	Poland	ANIMAL OR VEGETABLE FATS , etc.	176	19	-157	2010	655	425	-230
1994	Poland	PREPARED FOODSTUFFS, etc.	940	894	-46	2010	5 900	8 132	2 232
1994	Slovakia	LIVE ANIMALS; ANIMAL PRODUCTS	74	87	13	2010	988	698	-290
1994	Slovakia	VEGETABLE PRODUCTS	194	136	-58	2010	1 037	888	-149
1994	Slovakia	ANIMAL OR VEGETABLE FATS , etc.	31	8	-24	2010	222	103	-119
1994	Slovakia	PREPARED FOODSTUFFS, etc.	316	168	-149	2010	1 933	1 177	-756

Source: Comtrade, own processing, 2012

Table 14: Changes in Visegrad members' agrarian trade value and commodity structure – comparison of years 1994 and 2010.

its production capacity and which was able to significantly improve its trade performance and competitiveness is Poland. The following Table 14 provides us brief information about the changes in individual Visegrad members' agrarian foreign trade which appeared in period 1994 – 2010 (the year 1993 was excluded because of specific trade development in the Czech Republic and Slovakia after the breakup of Czechoslovakia).

Conclusion

During the period 1993 – 2010, Visegrad countries' agricultural production and trade were significantly affected. The volume of agricultural production was reduced in Slovakia, the Czech Republic and Hungary. The only country which agricultural production performance was almost not affected is Poland. Czech, Slovakian and Hungarian agricultural production reduced its size both in relation to animal and crops production. On the other hand – during the same time period – Poland was able to increase the volume of animal production and the volume of crops production almost did not change. In relation to foodstuff production it can be said, that the Czech Republic and Slovakia significantly reduced their production performance, Hungary was able to keep plus minus the same level of production for the whole analyzed time period and the same can be said about Poland. In relation to agrarian trade activities, individual Visegrad countries recorded the significant

changes. The reduction of agricultural and foodstuff production volume in the Czech Republic and Slovakia resulted in the significant growth of imports, which is closely related with the growth of their negative agrarian trade balance. Hungarian trade was also negatively affected by its agricultural sector and foodstuff industry stagnation. Hungary was able to keep the positive trade balance, but it lost its position as a significant regional exporter of meat and meat products and prepared foodstuffs. Only Poland was able during the analyzed time period significantly improve its production performance both in relation to agricultural sector and foodstuff industry. Poland was able to increase its export performance – especially in relation to processed foodstuff products and it becomes a regional trade tiger. Polish inter annual growth of exports value exceeded the value of imports and country recorded the significant positive balance in trade in live animals, animal products and prepared foodstuffs.

If we focus on the actual objective of the article, which was to identify the comparative advantages of agricultural trade of the Visegrad countries in relation to the global market, as well as in relation to the EU27 countries, the following may be stated. Agricultural trade of the Czech Republic, Slovakia and Hungary as a whole does not have comparative advantages either on the global market or on the internal market of the EU countries. However, Poland as the only representative of the Visegrad

countries does have comparative advantages in the field of agricultural trade, both in relation to the internal market of the EU countries, as well as in relation to the global market (to the market of third countries). If we focus on the territory of the EU27 countries, which represents the main trade partner of all of the analyzed countries, both in terms of exports, as well as in terms of imports, it may be stated that although the Czech Republic, Slovakia and Hungary do not have comparative advantages in the area of agricultural trade in regard to the EU as a whole, they are capable of achieving

comparative advantages at the level of bilateral relations with individual EU member countries. In terms of bilateral business competition, Poland and Hungary are of course in the best position. On the other hand, the Czech Republic and Slovakia are in the worst positions.

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Corresponding author:

Doc. Ing. Luboš Smutka, Ph.D.

Department of Economics, Faculty of Economics and Management,

Czech University of Life Sciences in Prague, Kamýcká 129, 165 21 Prague 6, Czech Republic

Phone: +420 224 38 2076, E-mail: smutka@pef.czu.cz

References

- [1] Antimiani A., Carbone A., Costantini V., Henke R. Agri-food exports in the enlarged European Union. *Agric. Econ. – Czech.* 2012, No. 8, Vol. 58, pp. 354-366. ISSN: 0139-570X.
- [2] Balassa, B. Trade liberalization and 'revealed' comparative advantages. *The Manchester School of Economic and Social Studies.* 1965, Vol.32, No.2, pp. 99/123. ISSN: 10490078.
- [3] Beneš, V. *Zahraniční obchod - příručka pro obchodní praxi.* Grada Publishing, 2004. ISBN: 80-247-0558-3.
- [4] FAO. FAOSTAT - production and trade database [on-line]. 2012. [cit. 06.12.2012]. Available at: <<http://faostat.fao.org/default.aspx>>.
- [5] FAO. *State of food and agriculture 2010-11: Women in agriculture - Closing the gender gap for development.* Rome. 2011. ISBN: 9789251067680.
- [6] Hinloopen, J., Marrewijk, C. On the empirical distribution of the Balassa index. *Review of World Economics.* 2001, No. 1, Vol. 137, pp. 1-35. ISSN: 1610-2886.
- [7] Horská, E., Uergeova, J., Prokejnova, R. Consumers' food choice and quality perception: Comparative analysis of selected Central European countries. *European Union. Agric. Econ. – Czech.* 2011, No. 10, Vol. 57, pp. 493-499. ISSN: 0139-570X.
- [8] Hromadko, J., Hromadko, J., Miler, P. et al. Bioethanol production. *Listy cukrovarnické a reparské.* 2010, No. 7-8, Vol. 126, pp. 267-271. ISSN: 1210-3306.
- [9] Hromadko, J., Hromadko, J., Miler, P. et al. Life cycle assessment of fossil fuels and bioethanol. *Listy cukrovarnické a reparské.* 2009, No. 11, Vol. 125, pp. 320-323. ISSN: 1210-3306.
- [10] Jeníček, V. Population problem in the future – challenges, questions. *Agric. Econ. – Czech.* 2010, No. 4, Vol. 56, pp. 97–107. ISSN: 0139-570X.
- [11] Jeníček, V. World population - development, transition. *Agric. Econ. – Czech.* 2010, No. 1, Vol. 56, pp. 1-15. ISSN: 0139-570X.
- [12] Kuna, Z. *Demografický a potravinový problém světa.* Praha: Wolters Kluwer ČR, a.s., 2010, pp. 340. ISBN 978-80-7357-588-5.

- [13] Potter, C., Tilzey, M. Agricultural multifunctionality, environmental sustainability and the WTO: Resistance or accommodation to the neoliberal project for agriculture? *Geoforum*. 2007, No. 6, Vol. 38, pp. 1290–1303. ISSN: 0016-7185.
- [14] Proudman, J., Redding, S. Evolving Patterns of International Trade. *Review of International Economics*. 2000, No. 3, Vol. 8, pp. 373-396. ISSN: 1467-9396.
- [15] Qineti, A., Rajcaniova, M., Matejkova, E. The competitiveness and comparative advantage of the Slovak and the EU agri-food trade with Russia and Ukraine. *Agric. Econ. – Czech*. 2009, No. 8, Vol. 55, pp. 375-383. ISSN 0139-570X.
- [16] Svatoš, M. Selected trends forming European agriculture. *Agric. Econ. – Czech*. 2008, No. 3, Vol. 54, pp. 93 - 101. ISSN: 0139-570X.
- [17] UN COMTRADE. Trade database, [on-line]. cit. 03/12/2012. Available: <http://comtrade.un.org/db/default.aspx>.
- [18] Utkulu, U., Seymen, D. Revealed Comparative Advantage and Competitiveness: Evidence for Turkey vis-à-vis the EU/15. European Study Group 6th Conference, ETSG 2004.
- [19] Vošta, M. Agriculture under the conditions of globalisation focussed on the expansion of the EU. *Agric. Econ. – Czech*. 2012, No. 4, Vol. 58, pp. 165-171. ISSN 0139-570X.
- [20] WORLD BANK. WDI database [on-line]. cit. 01/12/2012. Available: <http://data.worldbank.org/data-catalog/world-development-indicators>.