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Agricultural performance in the V4 countries and its position in the European Union

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Abstract: The paper is devoted to an analysis of the development of agrarian farms in Visegrad Group (V4) countries, primarily in terms of results and the most important production inputs of production factors and their efficiency in the period from 2004 to 2013 based on the EU Farm Accountancy Data Network (FADN). The results of the analysis show that if farms in the V4 countries want to achieve the same performance as developed countries, they must invest more in purchasing intensification factors and adjust the structure of assets production specification. It will be necessary to stop the reduction in the numbers of livestock and to strive for growth in gross farm income, mainly through the processing of agricultural raw materials.

Keywords: agricultural production, effectiveness, factors of production, intermediate consumption, assets, support, work unit

After several years of transformation in processes of agricultural and food production, the Visegrad Group (V4) countries joined the European Union (EU) together in 2004. These processes of transformation affected all areas of the material and production base in the agri-food sector from ownership relations to the concentration of production, the emergence of various large companies, the arrival of foreign investors, the emergence of new organisational structures, a refocusing of the production specification of farms through to a relatively drastic decline in the number of workers in the agricultural sector.

Joining the EU brought about a major change of the business environment in the sector, in particular, access to the EU's large agri-food market and the creation of a challenging, competitive environment. The demands on these newly entered countries have increased in terms of the management of agricultural enterprises, the need for strategic management and the need to explore not only domestic demand but also foreign markets. The emphasis is on effective management and the development of new support tools, but the unequal subsidies for the new and old countries of the EU remain in place.

Agricultural and food production in the V4 countries previously had much in common, and, with the exception of Poland, large concentrated enterprises without too much specialisation were prevalent. Many of these enterprises were broken up and the previously homogeneous agricultural production sector became more fragmented consisting of both large cooperative enterprises but also commercial companies and numerous self-employed farmers.

The paper is devoted to an analysis of the development of agrarian enterprises in the V4 countries in terms of production results and the most important production input factors of farms and their efficiency in the period from 2004 to 2013 based on EU agricultural accountancy data (Farm Accountancy Data Network – FADN).

The V4 countries, except for Poland, are among the smaller countries in the EU. In 2013, their agri-

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Table 1. Development of agricultural output of the Visegrad Group (V4) countries in the basic prices in million €

Country	2011	2012	2013	2014	2015
Poland (million €)	22 747	23 198	23 671	23 044	22 654
Hungary (million €)	7 753	7 498	7 804	7 927	7 816
Czech Republic (million €)	4 834	4 860	4 936	4 966	7 816
Slovakia (million €)	2 259	2 397	2 407	2 392	2 161
EU-27, 28 (million €)	404 084	414 323	425 585	418 545	410 132

Source: Eurostat database, October 2016

culture used 23 100 thousand ha of agricultural land representing only 13.4% of the land resources used by the EU. In 2015, V4 production accounted for only l9.9% of the EU-28 production. The development of agriculture in the V4 countries quantified using the indicator of production output is compared with development in the EU-28 in recent years in Table 1.

The agricultural performance of the V4 countries in terms of output indicators, which includes producer prices excluding taxes and including subsidies in the individual countries has not changed much in the individual countries in recent years with the exception of the Czech Republic in 2015, where the output grew year-to-year by 57%. Output in the Slovak agricultural sector has been stagnating or falling.

The agricultural aim of the V4 countries after accession was to as soon as possible at least reach the performance of average farms in the EU, as the results of the best performing countries such as Belgium, Holland and Germany seemed to be unachievable. The extent to which this goal was achieved is illustrated in Table 2.

In it we show the data taken from FADN about selected indicators calculated per 1 ha of used land between the year of entry into the EU and 2013. During this period, the agricultural production of an average farm in the EU-27 increased by 10.2% but in Poland by 81.3%. In the Czech Republic it increased by 38.3% but in Slovakia only by 26.9%. In 2013, agricultural production in Slovakia reached only 52.2% of the EU-28 average.

The V4 countries also considerably lag behind the EU average in farm gross income. Slovakia and the Czech Republic, on the other hand, significantly reduced the deployment of workers per 100 ha of agricultural area leading to growth in productivity. In the amount of subsidies per unit of land Slovakia still lags behind the EU average, but Hungary and the Czech Republic already exceed it. All the V4 countries, however, still lag behind the average of the original EU countries, which in the case of the EU-15 was €371 per ha in 2013.

Several authors have dealt with the analysis and evaluation of the development of agriculture in Slovakia and other EU countries from different perspectives. The focus of attention was mainly development trends in the industry, the continuing disparity of results of agricultural enterprises between the EU countries, segmentation of the countries according to the industry or farm performance and so on. The development and current performance itself of an average V4 farm remains poorly studied.

In their paper, Jašová et al. (2016) addressed the impact of institutional factors such as employment on fixed-term contracts, minimum wage, wage bargaining structure, active employment policy, tax burden on labour and others on the development

Table 2. Selected indicators of an average EU farm and Visegrad Group (V4) countries between 2004 and 2013

Country	Production per ha in €		GFI per ha in €		AWU per 100 ha		Support per ha in €	
	2004	2013	2004	2013	2004	2013	2004	2013
Poland	873	1 583	359	651	14.0	13.4	133	196
Hungary	1 119	1 604	408	615	9.5	9.5	186	333
Czech Republic	1 000	1 383	354	414	4.0	3.0	186	334
Slovakia	949	1 205	298	315	5.4	2.8	122	247
EU-27, 28	2 094	2 308	927	961	6.9	5.6	270	299

AWU – annual work unit; GFI – gross farm income

Source: Eurostat database, September 2016, Report on Agriculture and Food Industry of the Slovak Republic; Ministry of Agriculture and Rural Development, 2015, own provision

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of structural unemployment in the V4 countries. They characterised differences in the influence of these factors on the development of unemployment in the countries of this group. Bielik et al. (2012) identified the comparative advantages of foreign trade with agricultural products of the V4 countries. They observed that the Czech Republic, Slovakia and Hungary have no comparative advantage on the EU agricultural market or on global markets and that the V4 countries play only a marginal role in the overall agricultural market of the EU. In his paper, Svatoš (2008) evaluated the dynamics of the formation of European agriculture, the role of the common agricultural policy and the impacts of agrarian markets on the orientation of the production of individual countries including the V4 countries. He also assessed the risks and potential of GMOs. Střeleček et al. (2009) analysed the distribution of subsidies in the V4 countries between 2004 and 2006 in enterprises with different specialisations and their impacts on performance. They observed that over 50% of farms in the Czech Republic, Slovakia and Poland farmed under less favourable production conditions (LFA). Differences between countries were also observed in labour productivity, which was highest in the Czech Republic. Slovakia received the lowest amount of subsidies.

In their study, Jambor et al. (2016) evaluated the agricultural development of countries that joined the EU between 2004 and 2014. They quantified the performance of individual countries using the method of parallel factor analysis. They noted that after joining the EU, only Poland, Estonia and Lithuania increased their performance. In the other new countries, performance stagnated or declined. As a basis for improvement, they identified the production of agrarian and food products with higher added value and focus on the necessary development strategies. Countries that will focus solely on the production of agrarian raw materials will fall behind. Artan and Smutka (2011) examined the development of foreign trade with agricultural products in the V4 countries. They noted that in all these countries the value of import but also export increased after joining the EU. In his analysis, Dos Santos (2013) classified 23 EU countries into four clusters according to their agriculture performance, with Slovakia and the Czech Republic together forming the third group with a lower performance, the typical characteristics of which include the largest farm area, the highest provision of staff with capital, the lowest cash flow into the farm but also the lowest output per unit of land. Hungary and Poland received a better evaluation in their cluster. Jambor and Hubbart (2013) examined the effects of Hungary's accession to the EU on changes in foreign trade in the area of food. They observed an increase in the comparative disadvantage of Hungarian agriculture after 2009. In his analysis of the efficiency of the exploitation of production resources in Poland and Germany after Poland's accession to the EU in 2004–2012, Kolodziejczak (2014) concluded that agriculture in Germany uses three times more capital than in Poland, while it has a higher cost of labour. Nevertheless, Poland has begun a process of convergence with Germany in the use of production resources, but this will take a longer period of time. Svatoš and Smutka (2012), based on an analysis of the foreign agrarian trade of the V4 countries, observed that 80% of this trade is conducted with other EU countries. The agrarian trade of the Czech Republic, Slovakia and Hungary does not have comparative advantages compared to the EU market or the global market. On the level of bilateral relations with individual EU member countries, however, these countries are able to achieve comparative advantages. Takacs-György (2012) compared the development of Hungarian and Polish agriculture after accession to the EU. They concluded that the Polish farming sector is growing fast and can be an example for Hungary. In their paper, they concentrated in particular on structural changes, soil management strategy and exploitation of intensification factors.

In his study, Blaas (2013) compared the performance of the food industry in different EU countries and noted that Slovakia is among the countries with the lowest share of the food industry in industrial employment not only compared to countries regarded as agrarian, but also in comparison to developed countries such as Belgium or the Netherlands. This limits the creation of higher added value for our entire agri-food industry. In our analysis of the performance of EU agriculture in the period from 2004 to 2011 (Szabo and Grznár 2015), we concluded that the performance of Slovak agriculture, in terms of segmentation, ranked in the sixth to last segment and has in comparison with developed countries a low deployment of fixed capital, intermediate levels of product and livestock as well as lower amounts of obtained subsidies compared to the developed countries. Moreover, it does not exploit its competitive advantages offered in particular by company size, economies of scale and labour productivity. An analysis of the agriculture of V4 countries shows that the

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most efficient agriculture is practiced in the Czech Republic and Hungary as a result of the increased deployment of intermediate consumption, better capitalisation and higher subsidies relative to Slovakia. Křístková and Ratinger (2014) assessed the imbalance in the distribution of direct payments in the EU. They noted that large farms in the Czech Republic do not exhibit economies of scale, but their results depend on the amount of subsidies just as in case of smaller farms.

Špička (2013) examined the income of farms in the new EU countries and the old EU-15 countries from 2001 to 2011 both before and after the expansion in 2004. Three groups of countries were identified according to the economic performance of their agricultural sectors, with Slovakia and the Czech Republic included in the second largest segment. In creating the clusters, the size of the enterprise, the number of staff, the number of livestock and pension per worker were all taken into account. Kočišová (2015) examined the technical efficiency of EU agriculture on the basis of FADN data for the years 2007–2011 using the DEA method. Results for the V4 countries showed that Hungary and Slovakia reported technical efficiency for the entire period, Poland only in some years and the Czech Republic was behind Poland in the researched period. In their study of the V4 countries, Chrastinová and Belešová (2016) found that only Hungary and Poland had higher exports than imports of agricultural products in 2014.

In the Czech Republic and Slovakia, the value of imports exceeds exports; in Slovakia, the ratio of imports to exports is 1.48. In their paper, Chrenko and Sojková (2013) focused on the analysis of weights for individual indicators of sustainable development. In terms of methodology, they determined weights using correlation and factor analysis.

In some cases, the V4 countries seek to adopt common positions on current issues relating to the application of the EU Common Agricultural Policy. One example is the meeting of the Agrarian Chamber of the V4 countries in Modra, Slovakia (Sedlák 2016), which discussed the threat of legal action at the European Court as a result of adopted legislation on soil protection and the limits placed on foreign investors with respect to the speculative buying of land, which is much cheaper in the V4 countries than in the old EU countries.

MATERIAL AND METHODS

The analysis is based on the available statistical data on agriculture of the EU countries. For international comparisons, we used the Eurostat database from 2016 and the data for the years 2004–2013 of the EU's Farm Accountancy Data Network (FADN), which describe a series of indicators for an average farm in individual countries, including the V4 countries. We focused mainly on comparing the performance and production factors of farms of the V4 countries on one hand and on the results of the EU-27 farms and Germany on the other hand. The benchmark value also includes the EU-27 or the EU-28 average.

We also used the information provided in annual reports on agriculture and food published by the Ministry of Agriculture and Regional Development of the Slovak Republic, which also features some international reviews. We draw additional information from scientific and expert literary sources.

To assess the state of agriculture, we used the following indicators – agricultural production and gross farm income and net added value to express the performance of farm intermediate consumption, assets, labour, livestock and support to express the level of inputs. In our methodological procedures, we used standard methods of research work, such as analysis and syn-

Table 3. Farms of Visegrad Group (V4) countries and the EU, selected indicators, average of the years 2010–2013

Country	Area (ha)	AWU per 100 ha of agricultural land	Production €/ha of agricultural land	Total assets €/ha
Poland	18.7	9.1	1 547	8 252
Hungary	44.6	3.4	1 390	3 533
Czech Republic	229.0	2.8	1 392	3 911
Slovakia	528.0	2.5	985	1 635
EU-27, 28	32.4	4.9	1 999	8 702

AWU – annual work unit

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per enterprise. Own processing. Available at www.vuepp.sk

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thesis, descriptive statistics, regression and correlation analysis, comparison and graphs. In some cases, statistical functions in MS Excel were used to process data.

RESULTS AND DISCUSSION

Ranking of the V4 countries within the EU

Based on the FADN data for the period from 2010 to 2013, we first examined the state of agriculture in the V4 countries. The basis for comparison was the average of selected performance indicators and resources of farms over the assessed period. The data in Tables 3 to 4 express the farm average for respective countries and represent the whole agrarian business sector.

The greatest differences between the individual countries are in the area of a farm expressed as the area of utilised agricultural land. Farms in Slovakia and the Czech Republic have the largest area allowing concentrated production and offering potential economies of scale. The smallest area is in Poland, where collectivisation in agriculture never materialised.

On the other hand, if we express the performance of farm production per 1 ha area of the enterprise as an average over four years, the best figure is achieved by Poland with a value of €1 547, followed by the Czech Republic, Hungary and ultimately Slovakia, which reached only €985, which is 63.6% of the Polish production. Production in Poland in turn, however, reaches only 77.4% of the EU-28 level.

Large differences between countries are also evident in the area of labour resources. The greatest proportion of workers permanently employed on farms are found in Poland, namely 9.1 per 100 ha of land, while the lowest relative number is in Slovakia with only 2.5 workers. While Poland far exceeds the average of the EU-28, the other V4 countries are significantly below this level. Another productive resource that we focused on is the asset value per unit of land. Poland is leading in this indicator and almost reaches the EU-28 average. The smallest assets are on Slovak farms, which reach only 18.7% of the EU average, while the Czech Republic and Hungary also do not reach the average level.

Analysis of labour productivity expressed as output per worker in the V4 countries reveals two distinct levels. In the Czech Republic and Hungary this amounted to €48 000 per employee, while the SR had slightly less and Poland reached only around €17 000. All four countries are below the EU-28 average. Interestingly, similar results were observed also in relation to the total production of the deployed intermediate product, which reflects the efficiency of consumption of purchased inputs. This result is not very flattering for Slovakia, because it confirms the low efficiency of the intermediate product and the lack of utilisation of economies of scale, observation which are also confirmed by Figure 1.

Livestock density only reaches the level of the EU average in Poland, which has become a major exporter of animal products; on the other end of the spectrum, Hungary, the Czech Republic and Slovakia have witnessed a continuous decline in livestock numbers in recent years and density in these countries is only about one half of the EU-28 average. The V4 countries still lag behind the EU-28 average in the amount of subsidies per unit of land.

Table 5 presents the gross income and net value added in the V4 countries as well as the EU-28 average in 2010–2013 per ha of agricultural land. Poland ranks highest for these indicators, but it lags behind the EU-28 in gross value added by 20% and in net value added by 16%. The Czech Republic and Hungary are relatively balanced and the SR is the least successful.

Table 4. Agriculture of Visegrad Group (V4) countries and the EU, selected indicators, average of the years 2010–2013

Country	Production per AWU (€)	Production € per intermediate consumption (€)	Livestock units per 100 ha	Total subsidies per ha
Poland	17 218	1.051	70.9	310
Hungary	40 413	1.502	36.7	331
Czech Republic	48 193	1.314	44.6	368
Slovakia	36 761	1.192	26.7	290
EU-27, 28	54 001	1.564	72.1	410

AWU – annual work unit

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per entreprise, own processing. Available at www.vuepp.sk

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Table 5. Agriculture of Visegrad Group (V4) countries and the EU, selected indicators, average of the years 2010–2013

Country	GFI (€/ha)	NVA (€/ha)	NVA in €/AWU	Outputs/Inputs (€)*
Poland	886	691	7 458	1.15
Hungary	698	623	18 131	1.20
Czech Republic	691	533	18 541	0.89
Slovakia	425	253	8 136	0.78
EU-27, 28	1 108	824	21 601	1.11

* year 2013; AWU – annual work unit; GFI – gross farm income; NVA – net value added

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per enterprise, own processing. Available at www.vuepp.sk

Table 6. Development of total production in € per 1 ha of agricultural land in Visegrad Group (V4) countries and Germany

Year	Poland (€/ha)	Hungary (€/ha)	Czech Republic (€/ha)	Slovakia (€/ha)	Germany (€/ha)
2004	1 157	964	1 100	690	2 145
2005	1 132	945	1 057	684	2 067
2006	1 247	907	1 118	582	2 235
2007	1 454	1 152	1 273	880	2 597
2008	1 504	1 284	1 303	916	2 431
2009	1 191	940	1 103	776	2 178
2010	1 427	1 237	1 176	747	2 459
2011	1 577	1 350	1 452	1 115	2 740
2012	1 652	1 519	1 487	1 053	3 031
2013	1 635	1 455	1 480	1 025	3 079
Average growth	55.7	64.0	46.1	46.8	103.1

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per enterprise, own processing. Available at www.vuepp.sk

The table illustrates productivity as expressed by net value added per worker; Poland has the lowest value followed by Slovakia. The remaining two countries are doing better, but lag behind the EU average by 14%. The FADN data show the indicator of total agricultural production in relation to total inputs. The table also shows the level of this indicator in assessed countries in 2013. Visually, this ratio is expressed by Figure 2.

The most efficient farms in the assessed period were in Hungary and Poland, which exceeded the average of the EU; in the Czech Republic and Slovakia the outputs were higher than inputs.

Development trends in EU countries

If the goal of agricultural holdings in the V4 countries is to approach the performance and efficiency levels of the developed countries of the original EU, they should change their basic management parameters in the necessary direction. These include in particular the basic output indicator of the total output value and the most important inputs including specifically the deployment of labour, purchased inputs (intermediate consumption), assets as well as the levels of subsidies.

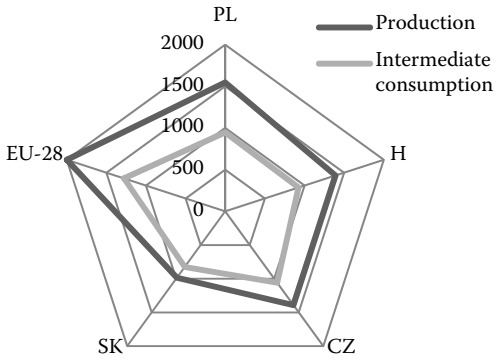

Figure 1. Production and intermediate product in € per 1 ha in Visegrad Group (V4) countries and the EU 28 average 2010–2013

CZ – Czech Republic; EU – European Union; H – Hungary; PL – Poland; SK – Slovakia

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2011–2014, average per enterprise, own processing

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Table 7. Development of intermediate production in € per 1 ha of agricultural land in Visegrad Group (V4) countries and Germany

Year	Poland (€/ha)	Hungary (€/ha)	Czech Republic (€/ha)	Slovakia (€/ha)	Germany (€/ha)
2004	684	672	785	515	1 389
2005	660	697	792	523	1 351
2006	735	639	865	511	1 481
2007	832	789	933	605	1 685
2008	977	871	1 041	786	1 707
2009	799	739	937	857	1 541
2010	858	866	945	700	1 705
2011	964	893	1 028	890	1 897
2012	1 026	930	1 341	889	2 033
2013	1 048	1 011	1 115	835	2 027
Average growth	41.7	36.6	45.8	46.6	75.7

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per enterprise, own processing. Available at www.vuepp.sk

Table 6 shows the evolution of average farm production in the V4 countries and in Germany per ha of agricultural land in the period from 2004 to 2013 and the average increase in industrial production in the period calculated with Excel SLOPE function using linear regression. The average increase in production is largest in Hungary, but still lags behind the growth of German farms, which is the benchmark value here. The other countries have a much lower increase. V4 countries still have a long way to go to approach the performance of German farms.

Table 7 shows the development of intermediate consumption in the V4 countries and we analysed its relationship to the value of production.

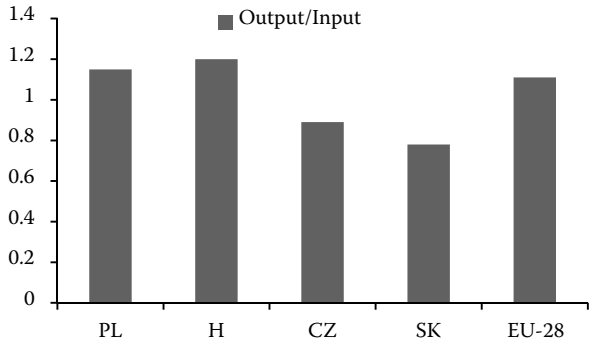

Figure 2. Farm outputs to farm inputs in Visegrad Group (V4) and EU-28, 2013, coefficient

CZ – Czech Republic; EU – European Union; H – Hungary; PL – Poland; SK – Slovakia

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2013, average per enterprise, own processing

The annual growth of intermediate consumption per hectare in the reporting period in Hungary, Poland and Germany is slower than that of productions, while in the Czech Republic and Slovakia these parameters were relatively balanced. However, Germany exhibits a significantly higher rate. In Figure 3 we compare the production increases with the increments in intermediate consumption and thus illustrate the effectiveness of the increase in intermediate consumption.

Production and growth in production are ensured by the interaction of a number of factors. In our analysis, we further verified the partial relationship between production and selected factors in farms in V4 countries and Germany for the period 2004–2013. Excel LINEST function was used to describe the linear relationship between the factor and the result. The

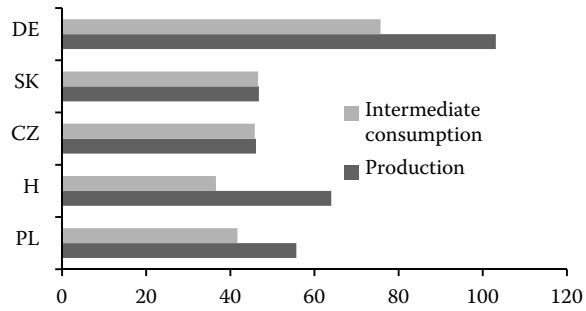

Figure 3. Average annual growth of output and intermediate consumption in the years from 2004 to 2013

CZ – Czech Republic; DE – Germany; H – Hungary; PL – Poland; SK – Slovakia

Source: Tables 6 and 7 in this work

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Table 8. Correlation of total production (*y*) and selected production factors (*xi*), coefficient *bxi* and correlation coefficient

Factor	Poland	Hungary	Czech Republic	Slovakia	Germany
AWU (€/ha)*	14 726/–0.16	34 023/0.23	N/–0.38	28 224/–0.30	N/–0.88
Inter. cons. (€/ha)*	1.619/0.97	1.459/0.96	1.309/0.91	1.189/0.83	1.494/0.98
Total assets (€/ha)*	0.209/0.75	0.397/0.94	0.365/0.81	0.355/–0.36	0.259/0.96
Subsidies (€/ha)*	5.36/0.83	4.426/0.87	4.055/0.65	3.324/0.76	6.119/0.75
Area (€/ha)*	1 413/0.84	1 182/0.52	1 249/–0.43	846/0.39	2 422/0.79

*the second entry in each table field expresses the correlation coefficient between the relationship of production and the corresponding factor; AWU – annual work unit; Inter. cons. – intermediate consumption; N – nondemonstrable

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per farm, own processing. Available at www.vuepp.sk

bxi coefficient reflects the contribution of unit factor to the total growth in production.

Table 8 presents results describing the linear statistical relationship between the value of total production on the farm of the relevant country and selected production factors. The second entry in each table field expresses the correlation coefficient between the relationship of production and the corresponding factor. With regards to the workers, the highest value of production per worker is generated by Hungary, followed by Slovakia. In Czech Republic and Germany this relationship is inconclusive. The lowest value is exhibited by Poland. The correlation coefficient is mostly negative, whereas the increasing production is accompanied by stagnant or declining numbers of workers.

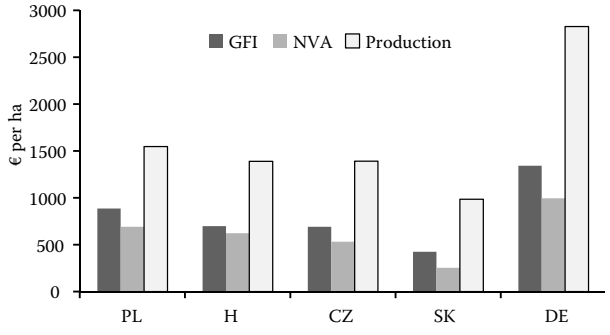

Figure 4. Gross farm income, net value added and production in € per ha on farms in Visegrad Group (V4) countries and Germany, average of years 2010–2013

CZ – Czech Republic; DE – Germany; H – Hungary; PL – Poland; SK – Slovakia; GFI – gross farm income; NVA – net value added

Source: Standard results of Farm Accountancy Data Network (FADN) for the years 2010–2013, average per farm, own processing

Intermediate consumption is best utilised on farms in Poland and Hungary, even better than in Germany; however, a lower volume of purchased production goods is needed. Slovak farms exhibit the least effect of intermediate product on production. The correlation coefficients are relatively high in all countries and confirm the strong relationship between intermediate consumption and production output. The most efficient use of assets occurs in Hungary and the Czech Republic followed by Slovakia. The negative correlation between production and assets in Slovakia reflects the very unstable development in the volume of assets in each of the years in the country. The low level in Germany is surprising. Supporting steps generate the highest value of production in Germany, followed by Poland and Hungary. Correlation coefficients are relatively high in all countries under review. This is similar for land, where the leading country of the V4 is Poland, but in Germany the land generates a disproportionately higher value of production. The correlation coefficients are highest in Poland and Germany, where farm land area grew in the assessed 14-year period. In other countries, the land area of farms in the sample stagnated.

Finally, Figure 4 illustrates the differences in the values of the three resulting indicators monitored by the FADN, namely in the value of agricultural production, gross farm income and net value added. These indicators were calculated for an average farm in the V4 countries and Germany, for an average year in the period 2010–2013.

The highest value for all three indicators is exhibited by Germany. The gross value added is more than 47% of the total agricultural production. All the monitored indicators are substantially lower in the V4 countries. In all indicators, Poland is leading and Slovakia ranks last.

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CONCLUSION

Agriculture in the V4 countries undoubtedly pursues common objectives in terms of efficiency and performance, namely to get closer to the level of the original EU countries and to prevail in competition with other countries on the common market. Analysis of the development of agricultural farms in V4 countries based on the EU's FADN suggests that achieving these goals is not easy and mostly fails.

An analysis of the Eurostat database shows that in the period from 2010 to 2013, EU agricultural production increased by 10.2%, but in Poland the increase was 81.3%. In the Czech Republic, production increased by 38.3% and in Slovakia by only 26.9%. In 2013, production in Slovakia came to only 52.2% of the average of the EU-28. Thus, while there was a shift in the value of production in each country, the directions and magnitudes of the changes varied.

According to the FADN EU, the V4 countries significantly lag behind the EU averages in the development of agricultural production. However, Slovakia and the Czech Republic have substantially outperformed the EU level in optimising workers at 100 ha p.p., which is a prerequisite for growth in labour productivity. In the amount of subsidies per unit of land, Slovakia still lags behind the EU average, but Hungary and the Czech Republic already exceeded this average. All the V4 countries, however, still lag behind the average of the original EU countries, which in the case of the EU-15 was €371 per ha in 2013.

In terms of labour productivity, expressed as the total production per worker, the V4 countries can be divided into two groups. The Czech Republic and Hungary achieve over €48 000 per worker, while in Slovakia it is slightly less and in Poland only around €17 000. Nevertheless, all four countries are below the average of the EU-28. It is interesting that a similar result is achieved even when the proportion of the total production to the applied intermediate product is considered, which reflects the efficiency of the consumption of purchased inputs. This result is not very flattering for Slovakia, as it confirms the low efficiency of the intermediate product and the non-use of savings of scale.

Density of livestock at the level of the EU average is achieved only in Poland, which has become a major exporter of animal products; Hungary and the Czech Republic come to about half of the level of the EU-28, and, at the end comes the Slovak Republic with a continuous decline in recent years.

In the analysis we have evaluated the linear statistical relationship between the value of total production on the farm of the relevant country and selected production factors. With regards to workers, the highest value of production per worker in the V4 countries is generated by Hungary and Czech Republic, while Poland has the lowest.

Intermediate consumption is best valorised on Polish and Hungarian farms, even better than on German ones; however, a lower application of the purchased production goods is needed. Slovak farms exhibit the lowest effect of intermediate product on the generation of output. Assets are most effectively used in Hungary. Subsidies generate the highest value of production in Poland and Hungary; however, they do not reach the level of Germany. The picture for land is similar: Poland leads but in Germany the land generates a disproportionately higher production value.

The results of the analysis showed that the farms in V4 countries need to orientate their production more according to the market signals, invest more in the purchase of intensification factors and adjust the structure of their assets to the production focus. It will be necessary to stop the decline in livestock numbers particularly in Slovakia and to strive towards growth in gross value added, mainly through the processing of agricultural raw materials.

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