Productivity of factors in the enlarged EU

Produktivita výrobných faktorov v rozšírenej Únii

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Abstract: The paper is examining the productivity of production factors in the EU-15 and some of the New Member States. International comparison shows that Slovakia is considerably lagging behind the EU-15 countries in the productivity of land and productivity of labour, but it is rather competitive in productivity of the fixed and variable capital. In order to get comparable data, the author adjusted figures on production of agricultural activities published in the Economic Accounts of Agriculture, and excluded the influence of different price – and support levels in the EU-15 and New Member Countries.

Key words: production factor, agriculture, comparison, European Union, Economic Accounts for Agriculture

Abstrakt: Príspevok skúma produktivitu výrobných činiteľov v krajinách EU-15 a vo vybraných nových členských krajinách. Medzinárodné porovnanie ukazuje, že Slovensko významne zaostáva za krajinami EU-15 v produktivite pôdy a práce, ale je pomerne konkurencieschopné, pokiaľ ide o produktivitu fixného a variabilného kapitálu. Kvôli získaniu porovnateľných údajov autor pracuje s upravenými hodnotami poľnohospodárskej produkcie, vykazovanými v ekonomických účtoch poľnohospodárstva. Úprava spočívala vo vylúčení vplyvu výrobných dotácií a trhovej intervencie na ocenenie produkcie.

Kľúčové slová: výrobný faktor, poľnohospodárstvo, komparácia, Európska únia, Poľnohospodársky ekonomický účet

INTRODUCTION

In the future, the extent of agricultural use of land in the new EU member states will be mainly determined by the following two factors: by the Common Agricultural Policy (CAP) supporting instruments and by the ability of agricultural producers to meet the challenges from the part of the possible competitors.

The current reform of the CAP indicates that in a long term, the support of production will decrease, and the CAP will be aimed at motivating the land holders, land owners and land leasers to secure the landscape stewardship, in other words, the maintenance of land by agricultural or other activities that preserve the landscape quality.

As far as Europe as a whole is concerned, despite the mentioned direction of public policies, the competition between countries, regions and individual producers for another incomes will continue. These incomes will supplement their incomes from public funds with incomes from sale of agricultural commodities produced in commercially oriented agricultural and food-processing facilities.

It is very unlikely that the CAP reform will succeed in eliminating the profit motivation in individuals' behaviour or the need for increasing the subsistence sources of households. One can hardly expect that the "hobby farms" of middle class and men of means will take up the landscape management only.

Most probably also in the future the farmers' decision whether to continue agricultural activity or not will be determined by the volume of income attained. Income generation will go on depending on the efficiency of utilisation of resources.

OBJECTIVE

This paper focuses on examining the position of agricultural sector in Slovakia from the viewpoint of the productivity of used production factors in international comparison. This is based on the past data on relevant indicators related to the EU-15 countries and to some new member states (Slovakia's neighbouring countries). The information gained this way may assist in elaborating strategy options, which the Slovak agriculture might follow in the future in order to strengthen its sustainability and competitiveness.

MATERIAL AND METHOD

The paper uses standard indicators of economic statistics and of the Economic Accounts for Agriculture (EAA): value of production at current prices, value of production at basic prices, output of agricultural industry (activities of agricultural sector), intermediate consumption, gross value added, fixed capital consumption,

net value added. Also other indicators have been used, such as the amount of labour input expressed by the Annual Work Unit (AWU), utilized agricultural area (UAA), and subsidies on production.

As a source of information, the database New Cronos (EUROSTAT), the publication "Agriculture in the European Union, Statistical and Economic Information" (Directorate General for Agriculture, 2003), and the database of calculations of agricultural support levels PSE/CSE (OECD 2003) were used.

First of all, we had to solve the problem of comparability of the economic performance indicators, effectiveness and productivity between the EU-15 countries and the new member states. The use of different policies in these countries significantly influences the nominal value of indicators, in particular the above-mentioned indicators of performance, and this fact distorts any assessment in international comparison.

Based on a nominal comparison, in 1999, Slovakia reached only one tenth of the productivity of labour and land of the EU average measured by net value added and one fourth when measured by the value of agricultural production. The gap between Slovakia and the EU-15 countries in gross agricultural production per hectare and the unit value added consequently, has already been pointed out by other authors (Grznar, Szabo 2004). The same can be stated about labor productivity. Slovakia belongs together with the Czech Republic, Estonia and Hungary to a cluster of countries with a agrarian quota comparable with the EU15, but with a considerably lower labour productivity (Sojková, Stehlíková 2004]. One cannot avoid the assumption that such high differences may result from some sort of distortion caused by the character of the data used. Mainly the significantly deviating values of production (caused by price and subsidy disparities) may rise doubts about the correctness of assessments of the productivity and efficiency of production factors based upon those data.

In order to get the comparability of indicators, we conducted some corrections of the indicator data, which enabled us to tentatively exclude the impact of the disparate price and subsidy levels on the indicator showing the value of agricultural output.

The correction of nominal data on output of agricultural industry (in terms of the Economic Accounts of Agriculture) has been carried out in the following two steps:

1. We tried to „clean" the value of the indicator "output of agricultural industry" from the influence produced by valuation of the indicator at basic prices (which include subsidies on production and production taxes). The numerical value of this influence has been derived from the difference between the published (Agriculture 2003) value of production at producer prices and of the same at basic prices. The value of the indicator "output of the agricultural industry" has bee reduced by this difference in all the examined countries. There is a risk of certain distortion by this operation indeed, because this sum has been set up as a balance of "subsidies on production" and "production taxes". While subsidies inflate the value of basic price, taxes decrease it. While "production taxes" are framework present very distinctively within the CAP, as we suppose, these had been lower or did not exist at all in the new member states. This indicates that the effect of subsidies in the EU-15 countries is likely to be underestimated when compared with the same in the new member states.

2. We eliminated the effect of higher prices on the value of the output of agricultural sector. The price effect is generated by the EU intervention policies, which push the prices of domestic producers above the level of world prices. If we want to eliminate this influence on prices, we have to quantify the impact of intervention policies. For this, we have chosen the indicator "market price support" (MPS) which shows the total of the difference between the value of production at current producer prices and the value of production at the reference (world) prices. The share of this difference in the value of production may be used as a coefficient for adjustment of the output of agricultural industry to a single price basis (world prices).

FINDINGS AND DISCUSSION

We compared the production factors' productivity using indicators of the Economic Account for Agriculture adjusted to a single level of prices and subsidies. This calculation helped us to reach a comparable value of the "output of the agricultural industry" in all the countries compared.

Table 1 shows the authentic values of indicators of agricultural production at producer and basic prices as well as the value of output of agricultural industry at basic prices, and at the same time their adjusted values for 2001 (the latest comprehensive data available from the above-mentioned source).

For calculations of production factors' productivity measured by output of agricultural industry per factor unit, the adjusted values according to Table 1 were used. We compared the values of the EU15 countries with values of some new member states – the Czech Republic, Hungary, Poland, and Slovakia.

The results of measurements of the productivity of land, labour, fixed and variable capital are illustrated by Table 2.

The productivity of fixed capital in Slovakia is supposed to be higher than in other countries with comparable production conditions because Slovakia should draw advantages from better utilization of machines, appliances and facilities that are given by the scale of production, larger than in other countries.

The productivity of land is directly proportional to its natural fertility, variable inputs into land and labour input. In many countries, the inputs of variable capital substitute the deficit of natural fertility, and for this reason their productivity is very low.

The productivity of land in Slovakia is the lowest among the compared countries. It is related to the very

low variable input into land when compared not only with the EU15 countries but also with the neighbouring new member states.[1]

The productivity of labour is comparable to Greece and Portugal. Within Europe, the highest values of labour productivity is reached by the Netherlands and Denmark, which show the highest level of capital inputs.

The productivity of fixed capital in Slovakia is higher than in other European countries, except Greece, Hungary, and Poland, which have a relatively high availability of labour but low availability of fixed capital.

On the other hand, *the productivity of intermediate consumption* is comparable with the EU-15 countries, and, for example, it is higher than in Austria and Germany. The highest values of productivity of the intermediate consumption is shown in the Mediterranean countries. It is related to their natural conditions of production and a higher labour input. On the contrary, the Nordic countries, as well as Austria, reach lower values of production despite high capital investments. This fact can be explained by the adverse, even extreme natural conditions of production in these countries, where high inputs of intermediate product substitute the low natural land fertility. Although the inputs and also production in the Netherlands are very high, this country reaches approximately the same productivity level of intermediate consumption as Slovakia.

The high inputs of fixed and variable capital (facilitated by the EU support policy) in many member countries are depressing the net value added generated by the sector. This would become negative if support is eliminated in countries such as Germany, Finland, Austria, Sweden, and the United Kingdom. The example of countries such as the Mediterranean countries, France, and the Netherlands points out a relatively high efficiency of capital investments linked with high labour inputs.

It looks that the countries with higher variable and labour inputs are more successful in the income generation than countries with the highest values of fixed capital consumption.

The higher creation of net value added in these countries enables also a higher level of fixed capital formation.

Comparison of net fixed capital formation in the individual countries is illustrated in Table 3.

Table 1. Output of agriculture in the EU-15 and in the new member states adjusted by deduction of subsidies on production and of market price support

Country	Value of production at current prices (mil. €)	Value of production at basic prices (mil. €)	Difference (subsidies on production)	Output of agricultural industry in mil. €		
				EAA	Adjusted by deduction of production subsidies	Adjusted by deduction of subsidies on production and MPS
Belgium	7 034	7 317	283	7 359	7 076	5 384.836
Denmark	8 378	9 093	715	9 098	8 383	6 379.463
Germany	40 637	44 369	3 732	44 490	40 758	3 1016.840
Greece	8 856	11 185	2 329	11 655	9 326	7 097.086
Spain	31 273	34 708	3 435	35 585	32 150	24 466.150
France	56 835	63 550	6 715	65 072	58 357	44 409.68
Ireland	5 193	5 879	686	5 879	5 193	3 951.873
Italy	39 858	42 630	2 772	43 388	40 616	30 908.780
Luxembourg	230	257	27	263	236	179.596
Netherlands	20 301	20 650	349	20 744	20 395	15 520.600
Austria	4 897	5 357	460	5 751	5 291	4 026.451
Portugal	5 544	5 944	400	5 944	5 544	4 218.984
Finland	3 243	3 842	599	3976	3 377	2 569.897
Sweden	3 899	4 401	502	4 563	4 061	3 090.421
United Kingdom	20 105	23 229	3 124	24 119	20 995	15 977.200
Czech Republic	3 219	3 234	15	3 232	3 217	2 731.233
Hungary	5 369	5 471	102	5 660	5 558	4 857.692
Poland	14 640	14 745	105	14 965	14 860	13 091.66
Slovakia	1 371	1 407	36	1 522	1 486	1 480.056

Source: EUROSTAT and author's own calculations

[1] As it came to light within the preparation for implementation of land parcels identification system (LPIS), it is likely to be related to the used statistics of agricultural land that shows figures, which are not comparable with assessment of the utilized agricultural area (UAA) in the compared states.

Table 2. Comparison of factor productivity

	Output/ha UAA (€)	Output/work unit (€/AWU)	Output/ fixed capital consumption (mil. €)	Output/ intermediate consumption (mil. €)
Belgium	3 874	74 686	8.883	1.1980
Denmark	2 368	86 914	6.344	1.2872
Germany	1 820	51 335	4.317	1.2471
Greece	1 985	12 655	11.965	2.4583
Spain	956	26 305	8.310	2.0510
France	1 594	44 557	5.482	1.3512
Ireland	886	22 518	6.480	1.2932
Italy	2 013	25 481	3.916	2.1738
Luxembourg	1 403	42 761	3.261	1.3606
Netherlands	8 029	73 107	6.008	1.3734
Austria	1 193	23 825	2.992	1.3018
Portugal	1 099	8 030	6.451	1.4263
Finland	1 160	24 290	3.421	0.9564
Sweden	1 012	44 086	4.830	1.0129
United Kingdom	1 011	48 168	5.046	1.1411
Czech Republic	638	17 910	8.285	1.2598
Hungary	830	7 512	10.274	1.4031
Poland	718	5 186	9.669	1.4660
Slovakia	606	14 845	8.454	1.3717

Source: EUROSTAT and author's own calculations

Table 3. Net fixed capital formation in EUR/ha (AWU)

	Net fixed capital formation (mil. €)	Net fixed capital formation /ha (€)	Net fixed capital formation /AWU (€)
Belgium	–67.8	–48.78	–940.36
Denmark	312.1	115.85	4 252.04
Germany	–1 220	–71.60	–2 019.20
Greece	504.1	141.01	898.89
Spain	–71.1	–2.78	–76.44
France	5	0.18	5.02
Ireland	.	.	.
Italy	1 724.1	112.28	1 421.35
Luxembourg	0.7	5.47	166.67
Netherlands	663	342.99	3 122.94
Austria	–16.9	–5.01	–100.00
Portugal	–18.3	–4.77	–34.83
Finland	194.2	87.64	1 835.54
Sweden	153.2	50.16	2 185.45
United Kingdom	–1 048	–66.33	–3 159.48
Czech Republic	–23.2	–5.42	–152.13
Hungary	316.2	54.02	488.94
Poland	–572.6	–31.38	–226.84
Slovakia	–45.5	–18.62	–456.37

Source: EUROSTAT and author's own calculations

The countries with intensive agriculture usually provide for an extended reproduction of fixed capital, e.g. the Netherlands and Denmark where the net fixed capital formation reached the value of 116 €/hectare in 2001. A surprisingly high fixed capital net formation is reached by Greece (141 €/hectare), Italy (112 €/hectare), Finland, and Sweden. As far as Greece and Italy are concerned, this fact can be interpreted as a trend towards enhancing the relatively low fixed capital endowment, but the net capital formation in the countries with high level of endowment is impressively high as well (the Netherlands, Sweden, Finland, Denmark).

However, very interesting conclusions can be drawn also from the comparison of the values of fixed capital net formation in the new member states. The highest negative value of fixed capital net formation is shown by Poland, and it is followed by Slovakia. It is remarkable that the only country among new member states that extends its agricultural fixed capital endowment is Hungary (similar to Slovenia, which is not included in the table).

CONCLUSION

Following Slovakia's accession to the European Union, the choice of the right development strategy for agricultural sector has become an issue of the utmost importance not only for farmers but also for public administration that is responsible for the setting-up necessary institutional framework of the sector.

Based on the findings of the analysis, it seems that from the viewpoint of income generation (as an indicator of competitiveness and sustainability of the sector), the most important are high investments into variable inputs linked with relatively high labour inputs. Once the Common Agricultural Policy is implemented in the new member states, this way is open also for Slovakian farmers due to the higher compensation of costs both by prices and budgetary transfers.[2]

From this angle of view, an intensive use of variable inputs and higher labour input seem to be more efficient than augmenting capital investments.

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[2] However, the transition period for implementation of direct payments in the new member states significantly weakens the income effect of the Common Agricultural Policy in those countries.