

# Economic development in Slovak agriculture

## *Ekonomický vývoj v slovenskom poľnohospodárstve*

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**Abstract:** The article discusses economic development of Slovak agriculture in the period after the accession of Slovakia to the EU and after adopting the CAP. It evaluates agriculture as a whole and its contribution to the national economy, as well as the economic performance of the individual legal forms of business and production sectors. The results achieved by agriculture in 2004–2007 suggest that the income within the sector (except of 2005) has improved also due to the inflow of the EU subsidies. On the other hand, despite the growing aid the production output is shrinking, wages stagnate and the employment is falling. This suggests that the CAP should be changed after 2013, especially as regards the ways of subsidy payments. Economics of the individual products are largely affected by input prices, realisation prices, as well as by the volume of direct subsidies, namely in the plant production – the subsidies for crops grown on arable land, and in animal production – the subsidies per 1 Big Cattle Unit.

**Key words:** agricultural economics, profit/loss, product sectors, subsidy, profitability

**Abstrakt:** Príspevok je zameraný na ekonomický vývoj v slovenskom poľnohospodárstve po vstupe Slovenska do EÚ a prijatí SPP. Hodnotí poľnohospodárstvo ako celok a jeho účasť v národnej ekonomike, ekonomickú efektívnosť jednotlivých právnych foriem podnikania a výrobných odvetví. Výsledky dosiahnuté v poľnohospodárstve v rokoch 2004–2007 ukazujú, že odvetvie je charakteristické zlepšujúcou sa dôchodkovosťou (okrem roku 2005), čomu pomáha prílev európskych podpôr. Paradoxom je, že aj pri narastajúcej podpore klesá výroba, stagnuje úroveň miezd a znižuje sa zamestnanosť. Výrobnú ekonomiku významne ovplyvňujú ceny vstupov, realizačné ceny, ale aj úroveň priamych podpôr, a to v rastlinnej výrobe podpora plodín na ornej pôde a v živočíšnej výrobe podpora na veľké dobytkie jednotky.

**Klíčové slová:** ekonomika poľnohospodárstva, výsledok hospodárenia, výrobné odvetvia, podpora, rentabilita

### List of abbreviations:

AaRD = Agriculture and Rural Development, AC = Agricultural cooperatives, C = Companies, EAGGF = European Agricultural Fund for Rural Development, LFA = Less Favored Area, MoA SR = Ministry of Agriculture of the Slovak Republic, PF = Physical persons, RDP = Rural Development Programme, RDP = Rural Development Programme, RIAFE = Research Institute of Agriculture and Food Economics, SAPARD = Special Assistance Programme for Agriculture and Rural Development, SAPS = Single Area Payment Scheme, SDP = Sectoral operation Programme, SOP = Sectoral operation Programme, SSO SR = Statistical Office of the Slovak Republic

Compared to the pre-accession period, the years 2004–2007 (after accession of the Slovak Republic to the EU and the adoption of the CAP) saw a growing income within the sector of agriculture, i.e. higher profits, as well as the increased proportion of profitable enterprises. The improved performance was possible also due to subsidies and the increased production efficiency, whereas the enterprises reduced the volume of loss-making production and reduced labour costs.

During this period, the sector of agriculture experienced growth in subsidies and in profit, reduction of production at constant prices (growth at current prices), stagnation, or a slight decline in value added, a slight increase/stagnation of wages, growing labour productivity on income (decline in value added productivity) and falling number of employees. Contributing factors to this development include a high share of subsidies decoupled from production

(LFA) which may slow down the restructuring process in Czech agriculture, as pointed out by Doucha (2006a). The enterprises which performed at the below average level were given a second chance, thus delaying the solution of the problem. The situation in Slovakia is somewhat different in that in addition to the highly prosperous companies, most enterprises recorded average results and some 5% of enterprises generated high losses. Agricultural policies in the OECD countries are analysed by Blaas et al. (2007) who pointed out the fact that there are different ideas (both conservative and liberal) also within the Union, as regards the future of the CAP. Grznár and Szabo (2005) have been dealing with the issues of economics in agriculture. As regards the competitiveness and capital availability in the Slovak agriculture after the accession to the EU, they claim that the capital availability of Slovak agriculture after the EU accession was insufficient and stagnated. Structural changes in farming were not substantial enough to result in a pressure for change in the structure of fixed capital. The results of farming companies suggest that it is the combination of key components, rather than the volume of fixed capital, which determines their effective use and leads to higher labour productivity and better economic results.

The selected problems of capital endowment of Czech agriculture were analysed by Rosochatecka et al. (2008) who described the sources of funding and factors affecting the property and capital structure of holdings. Other authors, Sojkova et al. (2008), Štřeleček et al. (2007) also deal with the economics of agricultural enterprises.

The economic efficiency and market of main agricultural commodities have been discussed by Doucha (2006b) who calculated the cost profitability as the ratio of price and unit costs; and the total profitability is defined as the ratio of price including direct subsidised and unit costs, without the subsidization of feeds in AP. He states that the average Czech producers were able to achieve profitability for most commodities only after the inclusion of direct subsidies in the calculation. Some types of subsidies, e.g. the current LFA payments or payments for arable land with the production of feeds may result in a high total profitability in the breeding of ruminants (milk and slaughter animals).

## METHODOLOGY

The analysis mostly relied on the data from the Statistical Office of the SR, the Information Sheets of the MA SR which include the profit and loss account

data and balance sheets of the individual enterprises. We have also used the database of the RIAFE selected sample of agricultural enterprises, including capital expenses of the product sectors in 2004–2007. We have focused on the legal forms of business, including legal persons and private farmers. The solution applied the basic mathematical and statistical methods, the index-based method and the knowledge-based analytical method. Economic efficiency in agriculture was investigated through the main economic indicators. Profit/loss represented the basic synthetic indicator which was for the general description of the results of the enterprise operations. This was the resulting effect of production and realisation of outputs. The development of agriculture economics was assessed, using the fixed base indices which expressed the ratio of the indicator values in the current and base period. Of key importance was the knowledge of the factors which determine the generation of profit/loss and help to discover the potential weaknesses in the management of the process which affect the profit potential in enterprises. In addition to efficiency indicators, we also compared inputs and outputs, using ratio indicators which eliminated the impact of some factors, such as the enterprise size, which may have a substantial impact on the amount of profit/loss. Economic efficiency in agriculture was defined as the efficiency in the utilisation of production resources and workforce. This also covers the utilisation of land, property, the capacity of buildings and facilities.

We have investigated economic efficiency in the individual production sectors (wheat, barley, grain maize, potatoes, oil rape, sugar beet, dairy cows – milk, beef cattle for fattening, fattening of pigs) under various natural conditions, using the set of the following indicators:

- costs per 1 hectare and per 1 tonne, including the key cost items,
- production intensity – per hectare crop yield,
- prices (achieved in the selected sample),
- profit/loss per 1 hectare and per 1 tonne expressed as the difference between price and costs,
- cost profitability, as the ratio of profit and unit costs (without subsidies),
- cost profitability including subsidies.

Two options were investigated – profitability of the production sectors, i.e. cost profitability with and without subsidies, i.e. the complementary national direct payments in crop production, namely the payments for crops grown on arable land and the payments including the state support for the individual crops and keepers.

## RESULTS

Slovak agriculture in 2004–2007 was described by the decline in number of workers and the continuing income disparity in comparison with the national economy (Table 1), decline in agricultural production (crop and animal production), the growth in the volume of tangible/intangible assets and investments, the continuing interannual and regional differences in economic performance, the accession of Slovakia into the EU and the adjustment to the CAP requirements, as well as by financing of the projects from the EU funds (SAPARD and, later on, by the EAGGF through the SOP and RDP).

The development of agriculture was affected by a more efficient generation of gross value added. Over the past two years, its contribution to the gross value added in the national economy has grown and achieved 5.4% in 2007.

The development of income in agriculture after 2003 (Table 2) experienced large differences which were caused by a number of factors. Except 2005, the sector of agriculture reached profit during most of the periods after the accession to the EU. The income generation in agriculture improved in the first year of Slovak membership in the EU (2004) and the sector posted profit. The contributing factors included favourable weather conditions, good crop yield, and

substantial cost savings in enterprises. The most important factor was the amount of subsidies (direct payments) which increased compared to the pre-accession period. The share of profitable enterprises increased yearly by 32% and has now achieved the level of more than 50%.

There are large differences in most indicators between the performance results converted to one hectare of agricultural land in the productive and less favoured areas. The highest economic performance in agriculture was registered in Western Slovakia with a higher proportion of productive areas, and a lower performance was recorded in the Central and Eastern Slovakia with a higher share of less favoured areas. Some 68% of enterprises operate in less favoured areas and they farm at, or maintain in good condition, more than 50% of agricultural land.

Compared to the average results in the sector of agriculture, the results achieved by agricultural holdings which farm in the less favoured areas were lower by 20–35%, and in some indicators they achieved only 30 to 50% of the values in productive areas.

The subsidisation has largely contributed to the profitability of most enterprises in less favoured areas, as shown by the high share of total subsidies in income – 19.2% in less favoured areas and 8.7% in productive areas. The enterprises in productive areas achieved higher labour productivity and higher

Table 1. Agriculture and its contribution to the key performance indicators of the national economy (%)

Indicator/years	2003	2004	2005	2006	2007
Gross domestic product (constant prices)	4.26	3.90	3.74	4.04	4.83
Intermediate consumption (constant prices)	3.08	3.11	3.11	2.93	3.11
Gross fixed capital formation (current prices)	2.30	2.36	2.24	2.58	2.90
Gross value added (constant prices)	4.77	4.40	4.25	4.51	5.40
Employment	5.43	4.93	4.57	4.36	4.11
Average wage	73.30	74.25	73.32	71.20	72.60

Source: SSO SR data, calculations by the SSO SR and the RIAFE

Table 2. Development of basic economic indicators in agriculture<sup>1</sup>

Indicator	2003	2004	2005	2006	2007
Profit/loss in SKK billion	-2.5	1.0	-0.3	1.3	0.3
Income costs in SKK/100 SKK of yield	104	98	101	98	97
Cost profitability in %	-3.8	1.6	-0.5	1.9	0.4
Share of profitable enterprises in %	51	83	75	80	85

<sup>1</sup>legal persons

Source: CD RIAFE, MoA Information sheets

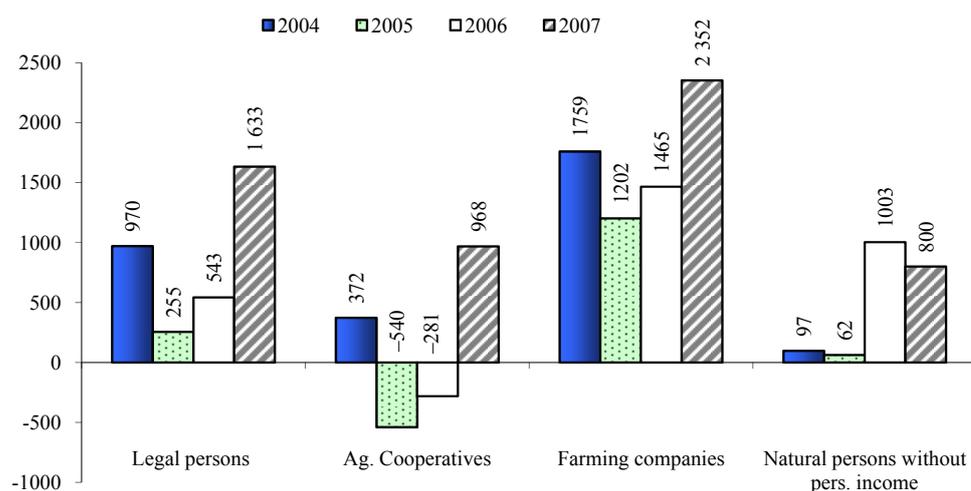


Figure 1. Profit/loss per 1 ha a.l. according to the legal form of business

Source: CD RIAFE, MoA Information sheets

employment per 100 ha of agricultural land. The share of profitable enterprises substantially increased after the accession to the EU, although a steeper increase was registered in regions with a higher share of less favoured areas.

Legal forms of business operation also contribute to the performance differences. All forms of businesses (AC, C, PF) recorded an interannual growth in profit since 2004 (Figure 1) and the share of profitable enterprises also grew (except of AC in 2005 and 2006, when the sector of cooperatives as a whole generated loss). The growth in profit was bolstered by subsidies and production efficiency, while the enterprises reduced labour costs and loss-making production. The differences between results achieved by the individual legal forms of businesses have been caused by the natural conditions, as well as by the performance of the company management. Farming companies continued to achieve better economic results.

Higher efficiency in performance of farming companies is also shown in lower costs of income, and lower labour costs, due to the lower employment per 100 ha of a.l.

Agricultural cooperatives recorded a lower usability of assets resulting in the higher proportion of the redundant assets. In addition, cooperatives also had to cover a substantially higher share of wage/personal costs in the total costs than farming companies. On the positive side, agricultural cooperatives recorded a higher share of value added in production which was caused by the reduction of costs in the consumption of production (Table 3).

The rate of profit in farming companies was mirrored in the profitability indicators of the total and own capital. On the other hand, the share of current (non-investment) subsidies in income was lower in the group of farming companies than in agricultural cooperatives. However, the investment subsidies per

Table 3. Basic economic indicators in cooperatives and farming companies (SKK/ha a.l., %)

Indicator	Agricultural cooperatives				Farming companies			
	2004	2005	2006	2007	2004	2005	2006	2007
Profit/loss	335	-493	-281	968	1 602	1 107	1 465	2 352
Cost of income	99.03	101.39	100.7	97.7	96.54	97.84	97.11	90.06
Value added	7 915	7 033	6 070	7 463	5 976	5 911	5 211	7 173
Labour productivity on value added (SKK thousand/employee)	209	193	176	207	207	205	195	255
Number of employees per 100 ha of a.l.	3.8	3.6	3.5	3.5	2.9	2.9	2.7	2.6
Total debt to equity ratio (%)	25.7	27.4	26.2	27.3	52.7	53.9	51.2	54.6
Current subsidies without inv.	5 158	5 509	6 552	8 326	5 028	5 718	6 584	7 841

Source: Questionnaires of the MoA SR, the RIAFE

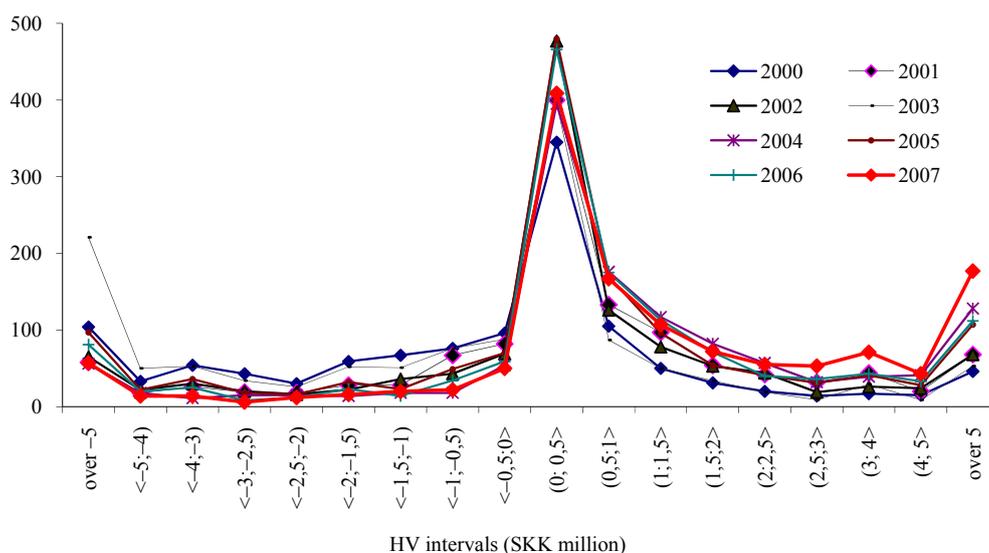


Figure 2. Number of profitable and loss-making enterprises in agricultural production, by the performance interval  
Source: CD RIAFE, MoA Information sheets

1 hectare of a.l. were 2.6 times higher in farming companies.

Higher profitability of farming companies was also affected by the diversification of their operations, with focus on trade. This allowed the companies to reach higher revenues on sales of goods and a faster stock turnover. The capital structure continues to experience differences. While own capital represents 70% of the total in agricultural cooperatives, farming companies operate with 60% of foreign capital. The reason behind worse results in agriculture is the continuing high loss recorded by 7% of agricultural holdings, the results of

which have a negative impact on the overall results of legal forms of business, as well as in agriculture as a whole. These holdings recorded a loss of more than SKK 5 million per holding and thus represent some 76% of the total loss; and they farm about 10% of the total area of agricultural land.

On the other hand, there are highly prosperous enterprises with the profit of SKK 10 million and more, which farm 5% of the land and contribute by almost 40% to the total profit. Most enterprises recorded profit of less than SKK 1 million per enterprise. This is also shown in Figure 2 (Gauss curve) where the

Table 4. Average results of enterprises by the area of agricultural land, in 2005–2007

Size bracket (land in ha)	Share in %, of enterprises in			Profit/loss	
	number	area	income	SKK/ha of a.l.	1 000 SKK per enterprise
Without land	3.6	–	5.3	–	–1 384
Up to 100	6.4	0.3	4.7	37	–8
101–500	19.1	4.5	14.2	1 081	311
501–1 000	23.4	14.3	18.2	30	15
1 001–1 500	17.7	17.4	16.4	283	351
1 501–2 000	11.1	15.5	12.6	66	104
2 001–2 500	6.5	11.8	7.5	277	662
2 501–3 000	3.6	7.4	5.3	381	1 030
3 001–3 500	3	7.7	4.2	14	75
3 501–4 000	1.7	5.2	3.2	629	2 403
4 001 and more	3.8	16	8.5	956	4 865
Total	100	100	100	310	287

Source: Questionnaires of MoA SR, RIAFE

detailed structure of enterprises is shown by their profit/loss. The results in the most recent year of 2007 show an increased proportion of enterprises that reached profit above SKK 5 million.

PFs also experienced differences in performance. In the breakdown of farmers by the size of agricultural land, the highest earnings were achieved by the enterprises which farmed the areas of less than 50 hectares and above 500 ha of a.l. The situation had changed after the deduction of personal income – the enterprises with lower areas then recorded a loss and the amount of profit increased with the size of the farmed area. The earnings of natural persons were mostly affected by their focus on crop production. The income from crop production was 6.5 higher than the income from animal production.

As regards the structure of enterprises in agricultural production, we need to emphasize that even despite the decline in the number of agricultural cooperatives and the increase in the number of farming companies, cooperatives continue to hold most (44%) of the land and also present the highest average area per enterprise – 1 357 ha of a.l. Farming companies were the most frequent and expanding form of ownership. Farming companies farmed 37% of land, at the average of 646 ha of a. l. per enterprise.

The number of farms owned by natural persons experienced an ongoing growth (22%), with the growing average areas. In total, the farms of natural persons farmed 15% of the area of agricultural land and the average farm size equals to 41 ha.

The ownership structure continued to experience a mixed development, with a faster decline of the number of owners in the group of farming companies

than in the group of agricultural cooperatives. In average, one cooperative was co-owned by some 188 owners, against 17 owners per one farming company. However, 90% of farming companies are owned by the maximum of 5 owners.

Given the future subsidy policy, the key issue at present is the size structure of farms. Most farms owned by legal persons farm the area of 501–1 000 ha of a.l. (Table 4).

The best performance per hectare of a.l. was achieved by farms with 101–500 ha, although the farms with the areas above 4 000 ha reached the highest profit per enterprise.

Before discussing product economics, I should also mention the development of agricultural production (Figure 3) which grew in current prices in 2007 and recorded a 4.6% decline when expressed in constant prices of 2006. The structure of production has changed, with the increase in crop and the decrease in animal production. The year 2007 was the first year since 1991 which experienced a higher volume of crop production than that of animal production.

### Economics of product sectors

The product economics is largely affected by input prices, realisation prices, as well as by the volume of direct subsidies, namely in crop production – Figure 3. Development of gross production in agriculture, in SKK billion (in constant prices of 2000) subsidies for crops grown on arable land, and in animal production – the subsidies per 1 Big Cattle Unit.

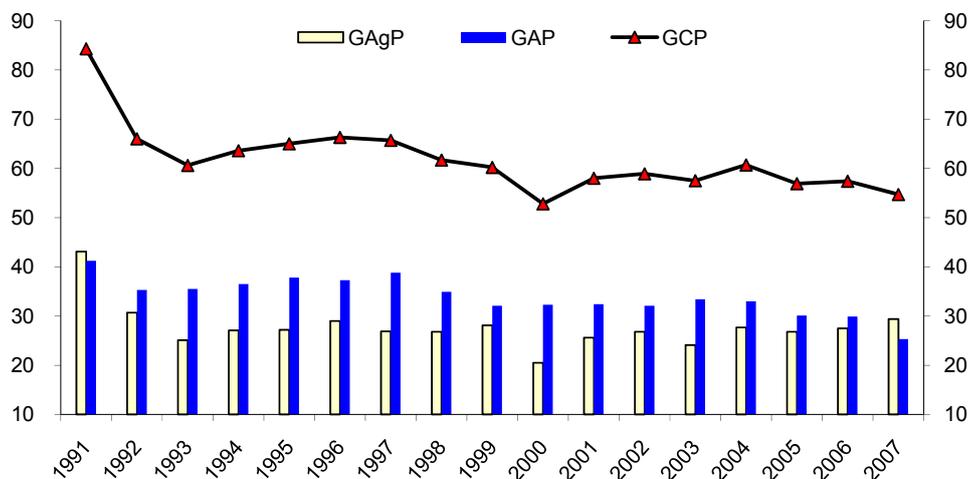


Figure 3. Development of gross output in agriculture, in SKK billion (in constant prices of 2000)

GAgP = Gross Agricultural Product, GAP = Gross Animal Product, GCP = Gross Crop Product

Source: Statistical Office of the Slovak Republic

A number of factors have a varied impact on the efficiency of product sectors, due to the varied natural conditions, production intensity and the varied level of performance in enterprises. These include the rate between costs and yields. The costs in the product sectors are mostly determined by the consumption and prices of inputs into agriculture and different natural conditions.

Due to the varied natural conditions, i.e. land and climate conditions; the overall costs of most agricultural products tend to drop down with the decreasing intensity of production in less favourable conditions. The higher decline in production intensity compared to the decline in costs contributes to a more expensive production of most products in less favoured areas.

Production intensity has a decisive effect on the level of costs. The overall costs tend to increase under the same conditions if the intensity is increasing. The growth in overall costs is effective if the unit costs tend to decline, i.e. if the growth in production intensity is higher than the growth in overall costs. The different level of performance in enterprises has a substantial impact on the economic results in the individual lines of production, and on the total economic result in the enterprise.

The economic income of product sectors is mostly affected by the following factors: the level of earnings/realisation prices, production intensity, and subsidisation. The subsidies level (for crops grown on arable land and the state aid) had a positive effect on the economics, mostly on crop products, and helped to reduce the loss created by animal products.

As regards the production and economic conditions in 2004–2007, the individual crops areas were reduced,

with the exception of the oil seed crops (increase in crop areas) and grain maize (only a slight increase in crop areas). The crop areas of feeding crops have also increased. Per hectare yields of main agricultural commodities dropped down over the period. The production of crop commodities dropped down, except of the oil seed crops.

The situation was similar in the case of animal commodities. The number of animals continued to drop down regarding beef cattle, pigs and poultry. The numbers of sheep recorded a slight increase (the numbers of ewes declined against the previous year). The production of animal commodities (except of poultry for slaughter and eggs) dropped down, even though the yield parameters slightly increased year-on-year.

As regards the main inputs into agriculture, the interannual consumption of industrial fertilizers decreased by 3.9% against the increase in prices. The consumption of chemicals also recorded an increase (8.4%). The consumption of domestic certified seeds experienced a decline year-on-year. The consumption of compound feeds grew by 4.9% year-on-year due to the decline in the prices of feeds. The most significant increase in prices of inputs against the previous year occurred in the case of fuel, mainly diesel fuel (29.1%), water and sewage charges (11.5%), animals for keeping and for fattening (7.6%), seeds and planting material (3.8%) – except of oil seeds, fertilizers (3.3%), and services in agriculture (1.8%). The prices of chemicals only experienced a slight increase (0.5%) and the prices of animal feeds dropped down year-on-year (3%).

After a decline in 2005, the prices of crop commodities grew yearly by 1.2% in 2004–2006, mostly



Figure 4. Wheat production economics  
Source: CD RIAFE, Own costs agricultural commodities

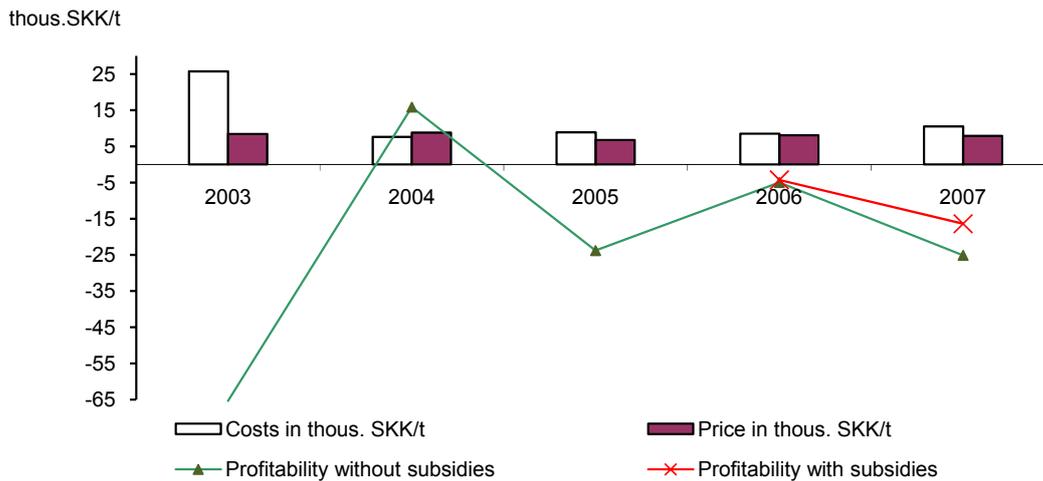


Figure 5. Rape production economics  
Source: CD RIAFE, Own costs agricultural commodities

the prices of oilseed rape and potatoes. The price of sugar beet dropped down. The prices of animal commodities dropped down by 0.7% against the previous year, mostly due to the low prices of chicken for slaughter. The prices of sheep (rams, lambs) increased, as did the prices of beef cattle for slaughter, and the prices of eggs. The prices of pigs for slaughter stagnated. The price of milk experienced a slight decline (0.2%).

The efficiency of agricultural commodities could be increased by the growth in the intensity of production and cost savings (which would reduce unit costs), through the increase in the prices of agricultural commodities, and the increase of subsidies allocated to farmers. The analysis of situation in the most

recent period has shown that without subsidies, the production of the key crops (except sugar beet) and animal products would result in a loss. The subsidization helped to reduce the amount of loss in the case of crop products and created profit for some commodities. Despite subsidisation, the animal products continued to generate a loss.

The situation varied among the individual commodities. Subsidisation largely contributed to the profitability of wheat. In 2007, the profitability increased by 8.8 pts to 30.2% due to subsidisation. In addition, the wheat production economics was also affected by the higher price, which surpassed the costs (Figure 4). Even despite its subsidisation, oilseed rape has continued to produce loss (except in

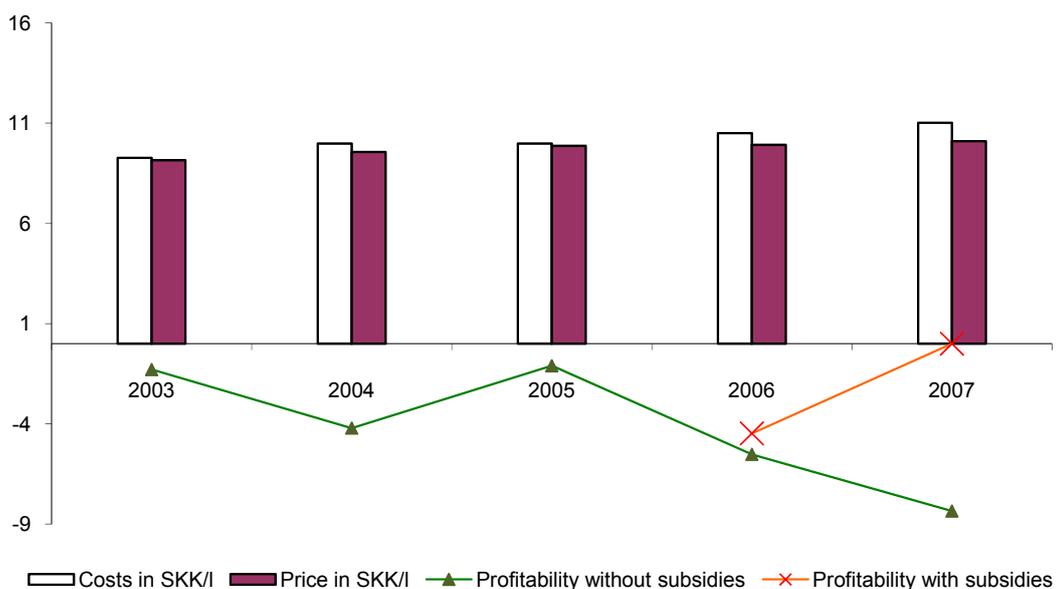


Figure 6. Milk production economics (dairy cows)  
Source: CD RIAFE, Own costs agricultural commodities

2004). The subsidies only helped to slightly reduce the loss in 2007 by 8.7 pts to 16.4%. High costs were the reason behind high losses for this commodity (Figure 5). Sugar beet was the most profitable crop over the entire period. The subsidisation largely contributed to growth of its profitability in 2007 to 22.8%.

Without subsidies, the production of milk would have been non-profitable in every year during the monitored period (Figure 6). Despite subsidies, this commodity did not generate any profit in 2007. The fattening of livestock (Figure 7) did not produce any profit over the years, despite subsidisation. The subsidies helped to reduce the loss in 2007, although the profitability remained at the level of -11.7%.

Fattening of pigs would have produced a loss without subsidies. Due to the low purchase prices in 2007, the loss generated by this commodity substantially

increased. This commodity was not subsidised, what resulted in the elimination of pig herds.

The review of product sectors (Figure 8) shows that the commodities in crop production were profitable (except oilseed rape and potatoes) and subsidisation helped to improve their profitability. On the other hand, commodities in animal production generated loss even after the inclusion of the proportionate part of subsidies.

If the most recent subsidization (such as the SAPS and LFA) was included in the product economics, this would have a positive impact on the product economics. There were objections regarding the methodology of including subsidies in the calculations; therefore we did not consider these subsidies in product economics. These subsidies were treated as the subsidy targeted at preservation of rural areas and the income earned by agricultural enterprises.

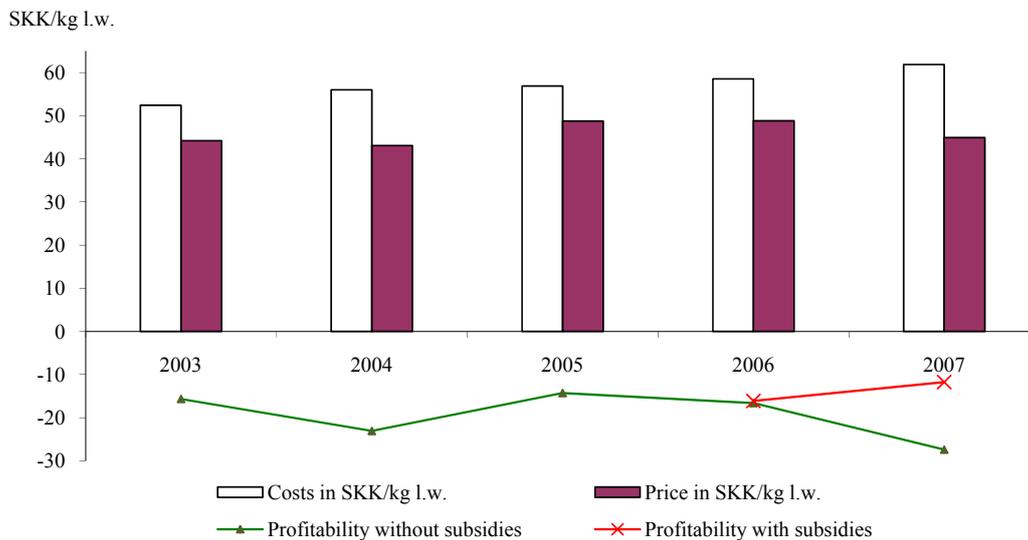


Figure 7. Production economics of bovine animals

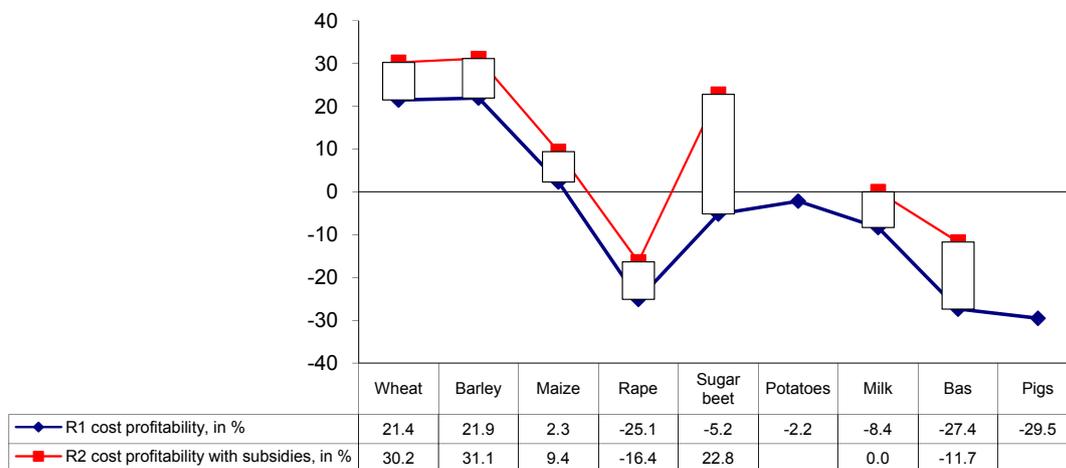


Figure 8. Profitability of main agricultural products

## CONCLUSION

The results achieved by Slovak agriculture in 2004–2007 (i.e. after the integration into the EU) suggest that the income within the sector has improved also due to the inflow of the EU subsidies. The trend of economic efficiency is also affected by the changes in the structure of legal forms of business. Farming companies tend to reach better operation results than agricultural cooperatives. The current trend shows an increasingly dominant position of farming companies which was also caused by their faster structural changes. We expect the differences in economic performance between the legal forms of business operation to remain, even despite the gradual mitigation in differences. The diverse ownership structure in agricultural cooperatives will also contribute to this process. Despite the decline in the number of agricultural cooperatives and the increasing number of farming companies and natural persons, agricultural cooperatives continue to hold the highest share (44%) in the area of agricultural land. The differences in the ownership structure continued and the number of owners dropped down at a faster rate in farming companies when compared to agricultural cooperatives. Efficiency was also differentiated in the product sectors, namely for crop and animal commodities. Subsidies are of key importance in product economics, and most production enterprises would generate losses without subsidies. Direct payments represented the main bulk of subsidies in Slovak agriculture. Even though subsidisation covered the whole country, the bulk of subsidies were aimed at more productive areas, i.e. to the enterprises that farmed in more favourable natural conditions. Rural development subsidies were allocated through the RDP and SOP AaRD. On the other hand, despite the growing support, production output is shrinking, wages stagnate and the employment is falling. With regard to the above, the anticipated CAP reform for

the following budgeting period should revise the methods of subsidy payments which may reduce the concentration of agricultural land among enterprises, and contribute to the disaggregation of subsidies.

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