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Impact of CAP subsidies on profit in agricultural enterprises in Slovakia

In this article we focus on the evaluation of subsidies and profit. To evaluate the importance of subsidies in relation to income, we selected two indicators. The first is a proportional indicator of profit per hectare of agricultural land and the second is the (profit minus subsidy) per hectare of agricultural land. These indicators enable to assess the status of farms in case that they would not receive subsidies. Chosen time horizon from 1993 to 2008 also allows assessment of the progress of the importance of subsidies in terms of ability to make a profit.

Introduction

Baláž, P. (1996) - characterizes subsidies as cash with the nature of transfer payments, i.e. payments by individuals or institutions provided to another individual or institution without some backflow to be expected.

In their study Mayrand, K., Dion, S., Paquin, M., Lebel, IP (2003) address the need to define subsidies. They argue that the term includes extensive subsidies for the agricultural segment of public policy that needs to be defined and classified for the better analysis and understanding. Agriculture is in their opinion, one of the economic sectors in which subsidies are most used. Subsidies have profound effects on production and trade in the agricultural sector.

Slosar, R., Šlosárová, A., Majtán (1996) define grants and subsidies as provided non-repayable funds (usually cash) from the state budget, budgets of cities and municipalities, from state funds. Subsidies are provided either on business development or to cover costs. Their purpose is to cover the imbalance of financial flows. The subsidy shall be construed as a financial assistance, which serves to maintain low prices for goods and services to the population.

Tomanovičová, J. (2008) describes in her article the objectives of the Common Agricultural Policy (CAP), which are in the Treaty of Rome Article no. 39 as follows:

increase agricultural productivity by promoting technical progress and ensuring the rational development of agricultural production and optimum utilization of production factors, especially labour,

ensure a fair standard of living of farmers, particularly by increasing individual earnings of persons engaged in agriculture,

to stabilize markets;

availability of supplies,

ensure that supplies reach consumers at reasonable prices.

Balkhausen, O., Bans, M., Grethe, H. and Nolte, S. (2005) identified main elements of the CAP reforms as follows:

decoupling, the decoupling of direct payments from production,
cross - compliance (cross compliance) - higher standards of environmental protection, food safety and animal welfare,
modulation - 5% of direct payments after reaching the full amount will be transferred to II. Pillar of the CAP, which is rural development (not for the new Member States until 2013),
introduction of new rural development measures to support farmers,
new guidance system for businesses.

Blaas, G. (2006) says that European farmers would not survive without support. The globalization causes a need for the support of European agriculture. The main reason is that agriculture in some parts of the world has great advantages compared with the European one, which allow the production at lower costs. These are the countries which have almost unlimited production resources, especially land. Today, agricultural subsidies are seen not as support of production but as a reward to the farmers for producing public goods.

Material and methods

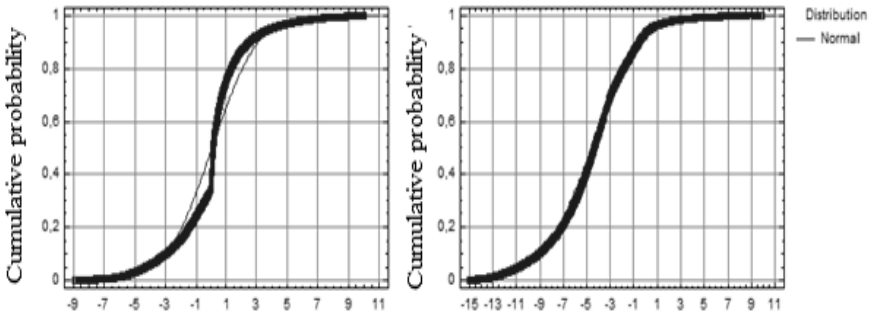
Since the establishment of the Slovak Republic in 1993 to the present day, agriculture has been supported by public funds. Subsidies during this period reached a different level and were focused on different areas of production respectively process. The main objective of this article is to assess the relationship between the amount of subsidies and profit.

In the article we use the following sources of information and material:
professional domestic and foreign literature,
Green reports of the Ministry of Agriculture for the years 2001 to 2009 and other data from the Ministry of Agriculture, in particular Rural Development Program for 2007-2013,
individual data for the years 1993 to 2008 for all existing agricultural enterprises (legal entities) from information sheets of the Ministry's internal.
To achieve the main goal we used the following methods:
analysis of individual balance sheets and profit and loss statements for selected indicators, these data and selected ratios were analyzed using statistical software Statgraphics. For removal of extreme values, we used the exclusion rule (the lowest 5% and the highest 5% were excluded)
graphic data processing - we used various forms of graphical data processing:
box plot – which shows the median, the cross shows the average value, upper and lower quartile The length of the box represents interquartile range (IQR), i.e. central 50% of values file. Right comma is 75 percentile and left comma 25 percentile.
graph of average values with 95% confidence levels.
quantile chart - shows the empirical and normal cumulative distribution.
ratios:
profit per ha = (profit after tax) / (agricultural land).
profit without subsidies per ha= (profit after tax - subsidies) / (agricultural land).

Results

Taking into account the comparison of quantile charts for profit per hectare and profit without subsidies per hectare (chart 1), it can be stated that even with subsidies up to 35% of businesses over the years 1993 to 2008 did not achieve positive earnings – profit and without subsidies up to 95% of enterprises. It is possible to conclude that the subsidies are for long-term viability of farms an important source of funding. Is it possible to discuss what would change if the farms did not receive subsidies, how would be the development of agricultural commodity prices. Such a question is relevant only in the case that subsidies would be cancelled in all countries, within the EU and also worldwide. The current situation shows that for long-term survival of enterprises in agriculture there is a need of government funds.

Chart 1
Quantile chart –
Profit/hectare of agricultural land (Profit-subsidies)/hectare of agricultural land



Source: own calculation

The quantile chart shows the variable profit per hectare significantly breaks in the value 0. The quantile chart also shows that 25% of enterprises had the value of this variable from 0 to 400 SKK (0-13,28EUR) per hectare throughout the reporting preiod. From the above it can be concluded that there is strong motivation to achieve a low profit and probably by using accounting operations, the enterprises try to optimize the income tax. Reason for this conclusion is the comparison of cumulative probability of profit/hectare and (profit-subsidies)/hectare. By excluding the subsidies the chart is harmonic which means that subsidies cause the disharmonic chart on the left. And that is irrational. Therefore the disharmony is caused by the tax dimension of economic result – profit or loss.

Previous quantile chart 1 does not evaluate the development of indicators over time. This view can be found in tables 1 and 2 and also in subsequent charts. The first table contains the descriptive characteristics of the variable profit per hectare of agricultural land.

Average value of the variable profit per hectare of agricultural land ranged from -1369 SKK (-45,5 EUR) in 1993 to 1327 SKK (40,1 EUR) in 2007. It is possible to evaluate that in the studied enterprises the situation regarding profit has improved after joining the EU in 2004, since the average value of this variable is always positive.
The comparison of the average of the whole period, with a median for the whole period shows that the median value is higher which means that after the removal of "extreme" values the situation in the enterprises regarding profit per hectare is better.
Table 1
Profit/hectare of agricultural land in 1993-2008 in thousand SKK

Year	Number of enterprises	Average	Median	Standard deviation	Coefficient of variation	Lower quartile	Upper quartile
1993	876	-1,36916	-0,95711	2,13742	-156,11%	-2,63961	0,113448
1994	926	-0,85106	-0,30771	2,22308	-261,21%	-2,14176	0,407512
1995	967	-0,53347	0,016929	2,02088	-378,82%	-1,64426	0,587116
1996	1043	-0,19691	0,070661	2,1772	-1105,70%	-1,3252	0,776022
1997	1110	0,147952	0,184646	2,29722	1552,68%	-1,01394	1,28442
1998	1116	-0,28249	0,07339	2,18269	-772,67%	-1,58575	0,807036
1999	1088	-0,37452	0,054228	2,24318	-598,95%	-1,63384	0,842324
2000	1080	-0,49021	0,02074	1,67976	-342,66%	-1,39941	0,391394
2001	1094	0,543616	0,233906	1,65396	304,25%	0	1,00265
2002	1099	0,393741	0,218617	1,68378	427,64%	0,01056	0,791667
2003	1173	-0,98165	0,010922	2,7166	-276,74%	-2,37653	0,341876
2004	1132	1,14246	0,685072	2,15638	188,75%	0,141794	1,85399
2005	1226	0,322753	0,283255	2,60512	807,16%	0,016628	1,24434
2006	1216	0,711543	0,468867	2,48736	349,57%	0,073099	1,50288
2007	1179	1,32697	0,825353	2,28857	172,47%	0,189973	2,25444
2008	1097	0,780658	0,488346	2,69527	345,26%	0,033435	1,78015
Spolu	17422	0,060521	0,171171	2,35705	3894,56%	-0,91338	1,00483

Source: own calculation

Evaluation of variability by the standard deviation and coefficient of variation is relatively complicated. Both descriptive statistics are high and we can conclude that the variability of profit per hectare in enterprises is high. The positive trend can be observed on the development of the coefficient of variation, positive in each period.
The development of the upper and lower quartiles can be summarized as that since 2004 more than 75% of businesses have achieved a positive ratio of profit per hectare. In the period 1993-2003 the similar situation was observed only in two periods.
Another table (number 2) contains the descriptive characteristics of the development of the ratio profit minus the subsidy per hectare of farmland. Compared with the first indicator the average during the whole period did not reach value higher than 0. From this fact, it is possible to conclude that the management of farms without subsidies is not

possible and the importance of subsidies is even increasing. The most negative value was reached in 2008, when profit without subsidies per hectare of farmland reached SKK -7150 (237,3 EUR). Negative value was confirmed also by the median. During the entire reported period the median had negative value.

Table 2
(Profit-subsidies)/hectare of agricultural land in 1993-2008 in thousand SKK

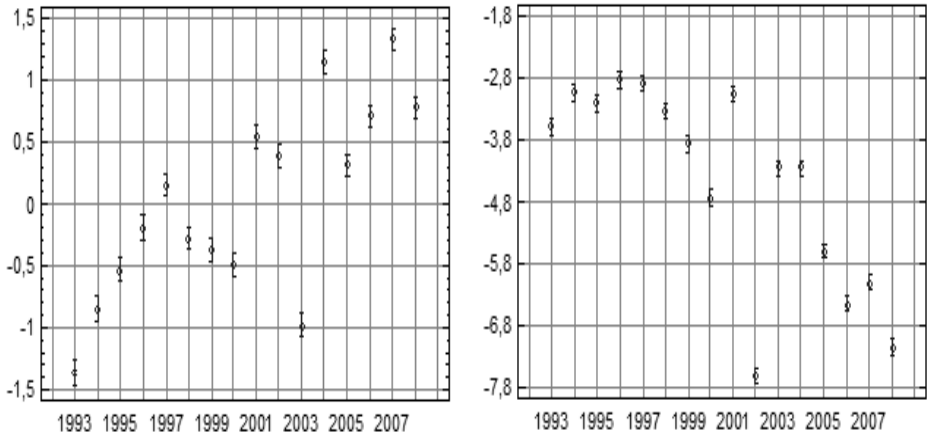
Year	Number of enterprises	Average	Median	Standard deviation	Coefficient of variation	Lower quartile	Upper quartile
1993	877	-3,58019	-3,61995	2,43233	-67,94%	-5,21607	-1,53003
1994	926	-3,04961	-3,01239	2,59228	-85,00%	-4,84878	-1,03194
1995	968	-3,19412	-3,1764	2,44459	-76,53%	-4,90165	-1,31199
1996	1050	-2,83722	-2,93153	2,69161	-94,87%	-4,73173	-0,86609
1997	1114	-2,88975	-2,96509	2,71259	-93,87%	-4,54826	-1,08426
1998	1116	-3,33487	-3,3009	2,266	-67,95%	-4,85091	-1,67789
1999	1021	-3,85858	-3,7639	2,84319	-73,69%	-5,43916	-1,96486
2000	1080	-4,75215	-4,62683	1,93772	-40,78%	-5,83982	-3,56876
2001	1099	-3,06126	-3,26141	2,19241	-71,62%	-4,4527	-1,82625
2002	1128	-7,60962	-7,55629	3,53955	-46,51%	-10,2558	-5,45812
2003	1191	-4,24534	-3,9593	3,0612	-72,11%	-6,00317	-2,54652
2004	1150	-4,24222	-4,73278	3,01458	-71,06%	-5,95725	-3,05335
2005	1240	-5,60554	-5,4736	3,44416	-61,44%	-7,58685	-3,84984
2006	1214	-6,45195	-6,35115	3,3857	-52,48%	-8,73769	-4,39723
2007	1196	-6,10352	-6,22459	4,12193	-67,53%	-9,06557	-4,00881
2008	1082	-7,1496	-7,5202	4,2752	-59,80%	-10,2663	-4,66773
Spolu	17422	-4,56965	-4,39255	3,40933	-74,61%	-6,52823	-2,42331

Source: own calculation

Negative development of the indicator supports the value of the upper and lower quartile. It can be stated that in any of the years more than 75% of companies did not achieve positive profit without subsidies per hectare. The quartile chart even shows that only less than 10% of companies achieved the positive value of the indicator.

Average values for both variables for each year are presented in the following Figure 2.

Figure2
Average value:
Profit/hectare of agricultural land (Profit-subsidies)/hectare of agricultural land

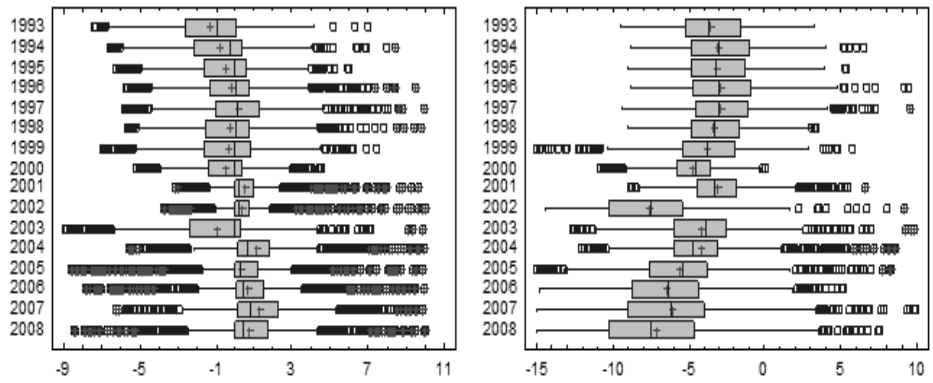


Source: own calculation

From Figure 2 it is clear that the variable profit per hectare of agricultural land has three trends. Increase in the variable but predominantly negative average value is the first trend. Stagnation in 1998-2000 with a slight negative trend and a negative average income is the second trend. The third is connected with period 2001-2008, when the average of the variable profit per hectare of agricultural land is positive (with the exception of 2003, which was affected by bad harvests due to drought) with relatively high volatility.
The second indicator - profit without subsidies per hectare of agricultural land - can reveal a significant decrease in mean values after 2004. Entering EU in 2004 brought the increase in subsidies per hectare, but also a significant reduction in profit without subsidy per hectare of agricultural land. Ability to make profit without subsidies after joining the EU is decreasing. One of the reasons is decoupling the CAP subsidies from the production.

Boxed plot 3 compares four descriptive characteristics through a graphical display for both variables:
• profit per hectare of agricultural land.
• profit without subsidy per hectare of agricultural land.
Box plot

Figure 3
Profit/hectare of agricultural land (Profit-subsidies)/hectare of agricultural land



Source: own calculation

Box plots are visualizing the conclusions of previous assessments of descriptive characteristics. While in the first indicator there is a clear improvement over the period, the second indicator records decrease from the 2004.

Conclusion
The analysis can be summarized into the following conclusions:
• there is strong motivation to achieve a low positive result and probably using the accounting operations enterprises try to influence the profit with the goal of tax optimization.
• since 2004, more than 75% of businesses achieve a positive ratio of profit or loss per hectare.
• profit without subsidies is decreasing, which results in increasing importance of government funds flowing through the CAP.
• in each year more than 75% of companies did not achieve positive profit without subsidies per hectare.
• entering the EU brought an increase in subsidies per hectare, but also a significant reduction in profit or loss without subsidy per hectare.

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Summary

The article evaluates the changes in Slovak agriculture after entering EU. We focus on the ability to make profit by using two ratios. From the analysis we can summarize, that agricultural enterprises generate higher profit after 2004. But they are more and more dependent on the help in form of CAP subsidies. Decoupling the subsidies from production brought in Slovakia a new form of agriculture – agriculture with fewer earnings, less production. Without subsidies a majority of enterprises is not able to survive in the long run.

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