ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume LVIII 17 Number 3, 2010

APPLICATION OF A SYSTEM OF INDICES TO AN ANALYSIS OF AGRICULTURAL HOLDINGS ECONOMY IN THE LFA REGIONS

M. Novotná, J. Svoboda

Received: February 4, 2010

Abstract

NOVOTNÁ, M., SVOBODA, J.: *Application of a system of indices to an analysis of agricultural holdings economy in the LFA regions.* Acta univ. agric. et silvic. Mendel. Brun., 2010, LVIII, No. 3, pp. 165–174

The economic situation of Czech agriculture is discussed in depth with its key questions related to insufficient level of subsidies (lower than subsidies paid to other member states of the EU) and to a decrease of prices of agricultural commodities. The paper deals with the situation of agricultural holdings in 2003–2007 examined with a system of financial analysis indices. A sample of 150 farms created within the project MSM 6007665806 was used to set indices of the financial analysis. Agricultural holdings were classified according to the share of the area of agricultural land in the LFA. The introduction to the analysis mentions the return on assets (ROA) which is a synthesis indicator of assessing the efficiency of a firm. In the paper, the following system of financial analysis indicators was used: the Altman Z-score index; the IN 95 index, the IN 99 index, IN 01 index; the Kralicek Quick Test, the Bonity index and the Du Pont pyramid system of indices for an analysis of the profitability. The aim of the paper was to assess the profit/loss of farms in relation to different farming conditions related to the share of land in the LFA and to subsidy policy. The analysis revealed that the subsidy system is set to compensate difficult conditions of farms in less favoured areas (i.e. farms with greater percentage of agricultural land in the LFA).

agriculture, subsidies, financial analysis, system of indices, bankruptcy and bonity indices, agricultural holdings, less favoured areas

During the economic crisis, Czech farmers are more impacted by the fact that after the Czech Republic entered the EU the volume of subsidies paid to Czech farmers is significantly lower in comparison with original EU states. In 2004, Czech farmers started with the 25% of direct payments of old member states. Nowadays, they are allowed to 60% and another 30% may be paid by the state. The full level of payments to Czech farmers should be reached in 2013.

However, there are more than 5 miliard of CZK missing in the projected national budget for 2010 to top-up of direct payments (www.agris.cz).

Beside the crisis, Czech farmers face the decrease of prices of agricultural commodities such as crop and milk. In addition, strong and large states of the EU, such as Germany and France significantly nationalize their agricultural policy and give the maximum financial support to their own farmers.

The subsidy policy has a unique position due to specific situation of the agrarian sector and its functions (such as the production of food and recently also the non-production function related mainly to maintaining the landscape).

In 2008, the share of agriculture in the GDP reached to 1.85%, i.e. there was a year-to-year increase of 0.06%. The share of food industry increased by 0.22% and reached 2.91%. However, total agricultural production decreased by 2.5% according to data of the Czech Statistical Office (ČSÚ). Plant production decreased by 8.41%, however animal production increased by 4.5%. Although the profit in this sector significantly decreases (by 29%), this result was the second best since the Czech Republic

entered the EU. The profit amounted to 9.7 milliard CZK (http://www.czso.cz).

Sector A – agriculture, forestry according to the CZ-NACE classification of economic activities – is a number of entities operating under different conditions, not only climatic, that influence all agricultural entities in the same way, also related to the share of agricultural land in less favoured areas (LFA).

The financial support of agriculture in less favoured areas was introduced in 1975 in the EU states and its aim was to support maintaining the agriculture in areas with structural and natural handicaps in order to ensure a minimum population level and the continued conservation of the countryside (Council Directive 75/268 on mountain and hill farming and farming in certain less favoured areas). According to the NR 1257/1999 the aim of the LFA support is:

1. to ensure continued agricultural land use and thereby contribute to the maintenance of a viable rural community;
2. to maintain countryside;
3. to maintain and promote sustainable farming systems which in particular take account of environmental protection requirements (Štolbová, 2006).

There are many indicators used to designate the area as less favoured (including altitude, slope, system of estimated pedologic–ecological units (BPEJ), density of population, share of workers in agriculture). A municipality, i.e. NUTS-5 according to statistical nomenclature, is set as the basic territorial unit that could belong to the LFA. There are three categories of the LFA set according to the above mentioned parameters: mountain, intermediate, specific.

The Czech Republic, with approximately 50% of the agricultural area in the LFA, is slightly under the European average (Štolbová, 2006).

The efficiency of any company, including a farm, is usually analyzed by financial ratios in each sector. It is hardly possible for a company to be successful in all ratios. A combination of better and worse is the most usual. This brings a methodological problem of a synthesis of a number of indices (Mařík, 1998).

The conclusion of general financial health of a firm has to be seen as multi–criteria decision–making, i.e. each index is a criterion. However, it may be difficult to choose the most important criteria and the level of their importance. Many researchers tried to deal with this situation and to set the most important indices for assessing the efficiency and likelihood of bankruptcy of firms and to construct the aggregate characteristics of firm's financial situation. Scientific literature mentions an early warning system and predicative models of financial level (Dluhošová, 2006). A selected system of indices is used to predict and diagnose a financial situation of a firm with the aim to find one synthesis index that would concentrate all strengths and weaknesses of the financial health to indicate explicitly an ability or disability of a firm to prevent a bankruptcy (Kolář, 2006).

There are a number of theoretical models based on mathematic and statistic appliance (the discriminant analysis or regression models are the most common) that try to assess the efficiency of firm with an optimum combination of indices. These aggregate features are called value and bankruptcy indices and they should enable quick orientation for investors and creditors to classify firm according to their quality (efficiency and credibility). The different bankruptcy and value models do not exclude or deny each other and it is not possible to say that some are more correct although they may reveal different results within the same firm. These models of financial health have become important recently as they are a condition of receiving subsidies of the EU funds or the Operational programme Agriculture and others.

Value and bankruptcy indices are only of basic orientation character for a deeper analysis an instrument that would be able to capture the context. To define links between indicators and to create a purpose hierarchy of indicators, i.e. to create a pyramid system is a prerequisite.

MATERIALS AND METHODS

A sample of 150 farms created within the project MSM 6007665806 was used to set indices of the financial analysis. The analysis was performed in 2003–2007. Agricultural holdings were classified according to the share of the area of agricultural land in the LFA within the following criteria: Group I – less than 25% of agricultural land in the LFA; group II – 25% (incl.) to 75%; group III. – 75% and more. The database consisted of enterprise's financial statements (balance sheet; profit and loss statement) and a questionnaire. The average values of each group of agricultural holdings calculated as a weighted average were used to determine the resulting values from the database. The introduction to the analysis mentions the return on assets (ROA) which is a synthesis indicator of assessing the efficiency of a firm. In the paper, the following system of financial analysis indicators was used: the Altman Z-score index; the IN 95 index, the IN 99 index, IN 01 index; the Kralicek Quick Test, the Bonity index and the Du Pont pyramid system of indices for an analysis of the profitability.

RESULTS AND DISCUSSION

Profitability indicators are monitored most frequently. The return on assets (ROA) is the most complex as it is the basic standard of profitability. This is due to the fact that it compares the generated effect to total assets the company controls. In practice, it is hard to distinguish what the effect was purely involving equity or debt capital. If the earnings before interest and taxes (EBIT) will appear in the nume-

rator this indicator is called the *earning power indicator* and it is abstracted from changes in taxes and in setting of capital structure in time. This complex indicator is usually used as a top of a pyramid system and it is further analysed. Table I presents the development of the ROA in each group of farms classified with and without subsidies. It is obvious that all groups were the most successful in 2007 with the value of approximately 6.5%. After the Czech Republic entered the EU the value ranged between 4.8% and 5.47%. All groups would be unprofitable without subsidies with the greatest negative return on assets in group III.

Profitability indicators (return on assets – ROA; return on equity) are a part of a system (of value and bankruptcy indicators) assessing the efficiency of an enterprise and its value through an aggregate characteristics. The purpose of these indicators is to assess the situation of an enterprise related to its profitability as well as other activities. They should be used for quick orientation of investors and creditors and to classify firms according to their quality (efficiency and credibility).

THE Z-SCORE OF PROFESSOR ALTMAN

The origins of this model can be found in the 60 of the last century. Professor Altman applied the direct statistic method – discriminant analysis (DMA) to designate weights for the each ratio, which were consequently included in its model as individual variables. Discriminant function, which results from the index Z, has been compiled for both companies with publicly sold shares and for other businesses. Accordingly, a different criterion for assessing the financial situation is used.

The criterion of success is an increase of the index (the higher the Z-score is the firm is considered more financially healthy). Companies with an index greater than 2.99 (or 2.7 for non-listed companies) may be labelled as a financially stable, while firms with index of less than 1.81 (1.2; respectively) are at the real threat of bankruptcy. Enterprises in the interval 1.81 (1.2; respectively) and 2.99 (2.7; respectively) are in a grey area and without a statistically significant prognosis. Table II showed that the index value of 2.99 and 2.7 respectively was not reached by an average farm in any year. These farms are therefore in a grey zone. Farms without subsidies in groups II were close to bankruptcy with the exception of 2007.

It is necessary to add that the market value of farms was not available so that the book value had to be used. The alteration appeared within the coefficient with the lowest weights in the system causing relatively small error (Doucha, 1996).

The Altman index is suited to American firms in late sixties; however the economic situation in the Czech Republic significantly differs from the situation in the USA. This is obvious also from the fact that a number of Czech firms (that are really profitable) appeared in the grey zone of uncertain results. Considering this it is more convenient to not to focus on the absolute result value of the Altman index but to focus on its development in time. (Kislingerová, Hnilica; 2005).

I: *ROA in 2003–2007 (%)*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	–0.19	4.83	3.26	2.24	6.73
Group II.	0.65	5.75	3.46	2.69	6.49
Group III.	–0.87	4.90	3.66	3.46	6.77
Without subsidies					
Group I.	–5.43	–2.91	–4.53	–8.01	–5.27
Group II.	–5.52	–5.02	–9.51	–11.73	–3.89
Group III.	–7.05	–6.79	–9.09	–10.14	–5.82

Source: Own calculation

II: *The Z-score in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	1.93	2.18	2.14	2.24	2.34
Group II.	1.80	2.02	1.91	1.85	2.13
Group III.	1.88	2.08	2.11	2.00	2.40
Without subsidies					
Group I.	1.81	2.00	1.97	2.02	2.09
Group II.	1.66	1.78	1.63	1.52	1.91
Group III.	1.74	1.81	1.83	1.69	2.13

Source: Own calculation

THE IN95 INDEX

The IN index is an original Czech concept of Inka and Ivan Neumaier. They tried to find a method that would allow assessing the financial risk of Czech enterprises (Neumaierová, Neumaier; 2002).

Similarly to the Altman Index, this index contains standard ratio related to activity, profitability, debts and liquidity. Each indicator has its weigh as a weighed average of the sector in the classification of economic activities. As a result, this model of financial health considers specific features of each sector and describes their specialities. The weights are set in relation to the enterprise's classification according to Czech classification of economic activities (Czech version of the European standard – NACE CZ).

The value of IN95 greater than 2 predicts a satisfactory financial situation. If the value is less than or equal to 1, an enterprise is threatened by serious financial problems. In the interval between 1 and 2, the firm is in a grey zone (Table III). The value greater than 2 was reached only by farms with subsidies mostly in 2007 and 2004. Farms in each group excluding subsidies reached a value of less than 1 with a negative value most frequently in group III.

THE INDEX IN99

The 99 Model is a result of a discrimination analysis that made a revision of the IN95 indicators weights subjected to the economy of the Czech Republic in relation to their significance to reach an economic profit (EVA). This index is designed in order to accept an owner's point of view.

The IN99 with a value of more than 2.07 predicts a profit of a firm. The IN99 below 0.684 means a loss. The grey zone is pretty wide and the situation of a firm is not clear. However, it is always a sign of certain problems (Neumaierová, Neumaier; 2002).

As regards the relationship of both IN indices, it is obvious that if the company is not able to meet its obligations, this is unbearable for the owner because it is threatening the existence of the firm. From the owner's point of view, the fulfilment of criteria is a necessary but not sufficient obligation. The fact that a firm is in compliance with its obligations, does not necessarily mean that they constitute a value for the owner i.e. that it achieves the return on equity exceeding the rate of alternative cost of capital. There might be the opposite case: the firm creates value for owners, but its method of financing is so aggressive (for example due to too rapid growth) and it is unable to fulfil its obligations (Neumaierová, Neumaier; 2002). IN99 calculations of the average farm in any group, including respectively excluding subsidies (Table IV) suggest that farms in any year did not generate value for their owners.

IN 01

This index is an integration of the above mentioned IN indices created by a discrimination analysis from a sample of Czech enterprises.

The IN01 of more than 1.77 means that the enterprise generates a value; the IN01 of less than 0.75

III: *The IN95 Index in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	1.21	2.33	2.04	1.86	2.69
Group II.	1.25	2.37	1.96	1.68	2.94
Group III.	1.08	2.52	2.37	2.21	2.83
Without subsidies					
Group I.	0.24	0.67	0.29	–0.31	0.39
Group II.	0.08	0.14	–0.88	–1.05	0.29
Group III.	–0.22	–0.35	–1.00	–1.02	0.29

Source: Own calculation.

IV: *IN 99 in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	0.34	0.57	0.49	0.44	0.69
Group II.	0.36	0.63	0.51	0.46	0.65
Group III.	0.33	0.56	0.50	0.50	0.67
Without subsidies					
Group I.	0.12	0.25	0.16	0.01	0.19
Group II.	0.10	0.19	–0.03	–0.14	0.22
Group III.	0.07	0.07	–0.03	–0.08	0.14

Source: Own calculation

predicts a bankruptcy. The grey zone lies between 0.75 and 1.77 (Neumaierová, Neumaier; 2002). Farms (Table V) with subsidies reached the grey zone since 2004. Excluding subsidies, farms in all groups would probably face a bankruptcy (According to the Neumaiers, there is the 86% probability of bankruptcy is if IN01 < 0.75).

KRALICEK QUICK TEST

This test was created in 1990. It offers quick and relatively exact assessment. It uses four basic indicators of the financial analysis (two for financial stability and two for profitability). It is a scoring model. Value of each ratio is attributed to points. The sum or average of points gives a scoring mark which will allow us to assess the financial credibility of an enterprise. (Grunwald, Holečková; 2007).

Working with four indicators only, this quick test is correct. If they used 20, 30 or more indicators, the results would hardly change. More indicators, however, has the advantage that possible errors or the cause of a particularly favourable trends can be identified quickly (Kralicek, 1993).

To obtain a reliable assessment the following measure is recommended. A five-point scale allows assessing each indicator by a mark between 4 (very good) and 0 (threatened by insolvency). The total mark is obtained by summing the four marks dividing the sum by four. Additionally, the average mark should be calculated for financial stability and the profit situation (Kralicek, 1993). The disadvantage of this model can be seen in the evaluation of the company, which has no credit and thus no interest expense. In this case, indicators of profitability can not be compared with any indicator, and therefore it is no possible to use them in the assessment, which may to some extent distort the explanatory power of this model.

Farms in the sample (Table VI) with subsidies included reached good results since 2004 (marks of 3 and more suggested very good farms). Excluding subsidies, farms were poor. Compared to different financial health models, this model seem to be more tolerant; it uses the cash flow before taxation. Other models of financial health do not use the cash flow indicator at all.

BONITY INDEX

The bonity index is based on multi-variation discrimination analysis with a simplified method (Sedláček, 2009).

This index uses 6 ratios measured to its outer acceptable limit. According to this ratio, points are set (possible maximum and minimum, for example 2 and 0). Based on this classification, an average value of points reached by all indices is appointed. Ratios with 0 points are excluded and a score of a financial health is therefore necessary to be revised. The score of 1.5 and more is the A-scale (perfect health); the B-scale ranges between 1.4 and 1.00 (good health. Almost all farms since 2004 reached the C-scale (weaker health; between 0.9 and 0.5) – see table VII. The score of less than 0.5 (all farms excluding subsidies) is the D-scale of poor health.

V: *IN01 in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	0.75	1.21	1.10	1.06	1.40
Group II.	0.72	1.17	1.03	0.91	1.44
Group III.	0.70	1.29	1.26	1.22	1.49
Without subsidies					
Group I.	0.35	0.53	0.39	0.16	0.44
Group II.	0.24	0.25	–0.13	–0.22	0.38
Group III.	0.17	0.13	–0.09	–0.09	0.44

Source: Own calculation

VI: *Kralicek Quick test in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	2.00	3.00	3.00	3.00	3.25
Group II.	2.75	3.00	3.00	3.00	3.00
Group III.	2.25	3.00	3.00	3.00	3.25
Without subsidies					
Group I.	1.25	1.50	1.50	2.00	1.50
Group II.	1.50	1.50	2.00	2.00	1.50
Group III.	1.25	1.25	2.00	2.00	1.50

Source: Own calculation

VII: *Bonity index in 2003–2007*

Farm (% LFA)	2003	2004	2005	2006	2007
Including subsidies					
Group I.	0.17	0.61	0.53	0.41	0.83
Group II.	0.20	0.69	0.56	0.47	0.97
Group III.	0.17	0.71	0.68	0.63	0.93
Without subsidies					
Group I.	0.16	0.17	0.18	0.18	0.19
Group II.	0.14	0.14	0.16	0.17	0.20
Group III.	0.15	0.16	0.17	0.18	0.20

Source: Own calculation

THE DU PONT PYRAMID

The pyramid system allows to assess the reason of the situation and to analyse causes of the development of a firm. Indices have to be link according to causality. The factor of analysis has to be taken into account and no area of the financial health has to be left out.

This paper decomposes the ROE according to the Du Pont system with three main determinants: Return on sales ((ROS=), total assets turnover ratio (tatr =), and financial leverage (FL =). Knowledge of links is mediated by special methods used to quantify the influence of indices as causal factors on a change of the top index in time (Neumaierová, Neumaier; 2002).

The most appropriate special method is the decomposition according to index logarithms – the logarithm method. This method cannot be used in some cases, mainly if there are some counter changes of the top index or in case of a zero change of the top index. In such case a different method such as the method of gradual changes that has become one of the most frequent methods of decomposition in spite of its basic hypothesis (it predicts gradual and isolated changes of each element) has to be used (Seger, Hindls, Hronová; 1998).

To analyse our sample we used the method of gradual changes in each group of farms due to the above mentioned counter effects of analysed indices. Still, the interpretation was difficult in some case. Some changes (indices of these impacts) were impossible to analyse at all. The comparison of 2007 with 2003 including subsidies (the Czech Republic was not a member state of the EU in 2003 which resulted into a different subsidy policy) had to be done absolutely as a result of mathematic relations. A relative comparison was not worth doing as there was a negative index due to a negative ROE in 2003. The interpretation of a relative change (index) is difficult for a decomposition of different types of farms. It is necessary to take into account that this index is calculated as a ratio of two negative numbers. As a result of mathematic relations we need to base our interpretation on reverse value of the index.

Compared to 2003, the ROE increased in 2007 in group I and II including subsidies by almost the same amount of profit from 1 CZK of equity (by 0.10 CZK). Group III had slightly increased return on equity change (by 0.1145 CZK on 1 CZK of equity). The main reason of this situation is the change of subsidy policy after the EU accession; the increase of subsidies resulted in an increase of operational sales and therefore increased profit and assets. There is a positive influence of increased return on assets (ROA) and return on sales (ROS) consequently – the most significant in group III. Other influences of analysed indices were not significant.

Next step of an analysis compared farms excluding subsidies (Table 9). Results revealed different development in different groups. The 2007 was a successful year for farmers. This situation reflected in all indices in the paper. As a result, the comparison of the ROE in farms excluding subsidies was favourable in groups II and III (ROE increased by 45.3% and 25.4%). Causes of this change are analysed by a Du Pont pyramid model. Group II revealed that the ROE was positively influenced by the return on assets, especially by an increase of the return on sales. Group III revealed that the return on equity increased mainly due to the change of a financial leverage indicator (due to a change of the financial leverage the ROE increased by 13.8%; i.e. by 0.0133 CZK of profit from 1 CZK of equity) followed by a return on sales (the ROE increased due to the ROS by 8.83%). There was a different situation in group I with a slight decrease of the return on equity (by 1.86%). The influence of the change was unable to compensate a decrease of the ROE due to the return on assets (ROA). A decrease of the total assets turnover ratio had the most significant negative impact (due to this ratio the ROE decreased by 13.5%).

A RELATION OF THE PROFIT LOSS AND SUBSIDIES

After the Czech Republic had entered the EU a possibility to use financial resources of the EU funds appeared – the European Agricultural Fund for Rural Development (EAFRD) and European Fisheries Fund (EFF) in the programming period of 2007–2013. The above mentioned funds were preceded by the European Agricultural Guidance and Guarantee Fund (EAGGF) and the Financial Instrument for Fisheries Guidance (FIFG). These

VIII: *The Du Pont method; comparison of 2003 and 2007, subsidies included*

Item	Change of ROE	Influence of analytic indices on analysed index (ROE)			
		Influence of the change $ROA = \frac{NP}{A}$	Influence of the change $FL = \frac{A}{E}$	Influence of the change $ROS = \frac{NP}{S}$	Influence of the change $tatr = \frac{S}{A}$
Group I					
Absolute change	0.1004	0.1022	–0.0018	0.0959	0.0063
Group II					
Absolute change	0.1022	0.1039	–0.0017	0.1006	0.0033
Group III					
Absolute change	0.1145	0.1203	–0.0058	0.1282	–0.0079

Source: Own calculation

IX: *The Du Pont method; comparison of 2003 and 2007, subsidies excluded*

Item	Change of ROE	Influence of analytic indices on analysed index (ROE)			
		Influence of the change $ROA = \frac{NP}{A}$	Influence of the change $FL = \frac{A}{E}$	Influence of the change $ROS = \frac{NP}{S}$	Influence of the change $tatr = \frac{S}{A}$
Group I					
Index	0.9814	0.8963	1.0950	1.0361	0.8650
Absolute change	–0.0018	–0.0112	0.0094	0.0034	–0.0146
Group II					
Index	1.4530	1.3655	1.0641	1.4778	0.9240
Absolute change	0.0333	0.0286	0.0047	0.0345	–0.0059
Group III					
Index	1.2540	1.1018	1.1381	1.0883	1.0125
Absolute change	0.0245	0.0112	0.0133	0.0098	0.0014

Source: Own calculation

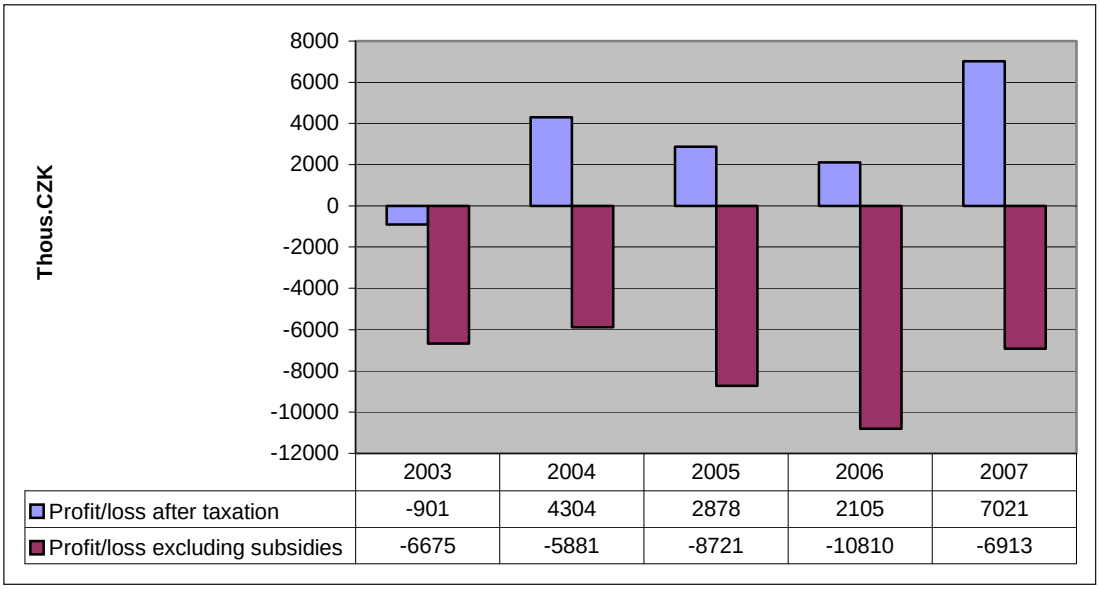
were a part of structural funds that realized the European policy of economic and social cohesion in 2004–2006 (www.mze.cz).

Figure 1 presents the relation of subsidies as a part of farm's revenues and the profit/loss in the sample of farms used in this paper.

Figure 1 revealed the profit of farms since 2004. 2004 and 2007 were the most successful years. This situation was caused by good climatic conditions and higher prices. Currently, there are many difficulties connected with prices as current prices of agricultural commodities as these prices are at the level of price before 1989 that will significantly influence the profit/loss in 2009.

Regarded subsidies, it is possible to say that they are a significant part of income on farms. Their share in total revenues amounted to 15–20%. In 2003 (i.e. before the Czech Republic entered the EU), an average amount of subsidies was approximately 5.5 million CZK. Accession to the EU was connected with new resources (such as the Structural funds) and an increase of subsidies – in average there was more than two-fold increase with current amount of approximately 14 million CZK (Svoboda, 2008).

In spite of a significant amount of European resources, Czech farmers are not satisfied with the share they get. Farmers of new member states protest against the common agricultural policy, especially against the system of direct payments.



	2003	2004	2005	2006	2007
Profit/loss after taxation	-901	4304	2878	2105	7021
Profit/loss excluding subsidies	-6675	-5881	-8721	-10810	-6913

Source: Own calculation

1: *Influence of subsidies on the profit loss (thousand CZK)*

SUMMARY

The main aim of the paper was to assess the profit/loss of farms in relation to different farming conditions related to the share of land in the LFA and to subsidy policy. The analysis revealed the following conclusions:

1. The return on assets (ROA) of all farms did not exceed the level of 7% during the period of investigation; however regarded to the sector it could be considered as sufficient. Regarding this return, 2007 was the most successful years mainly due to good climatic conditions and prices that did not decrease in such extent as in previous years. The analysis explicitly revealed that including subsidies there are no significantly different results. However, the situation differs excluding subsidies – the worse return on assets (ROA) was reached in groups II and III (i.e. farms with the greatest share of the LFA) of even more than –10% in the 2006. Similar conclusion are supposed to be revealed also within bankruptcy and bonity indices as the ROA indicator is a part of all used models.
2. The Altman Z-score showed a positive development in time, although all farms were in the grey zone all the time. Groups II and III excluding subsidies would be threatened by bankruptcy (with the exception of 2007). Regarding specific features of agriculture, the IN95 model revealed that the value of more than 2 was reached by farms including subsidies only mostly in 2007 and 2004. Excluding subsidies, the value of less than 1 was in farms of all groups excluding subsidies; with the most frequent negative value in group III. The IN01 index revealed similar results. The IN99 of an average farm in any group including/excluding subsidies indicated that farms did not create any value for owners in any year. The Kralicek Quick test seem to be a little tolerant as there were significant differences among groups – with the average mark of 3 (2 excluding subsidies) and the indicator was stable in time. The bonity index was found in the C category – weaker health – within almost all groups of farms since 2001. All types of farms regardless the group and excluding subsidies are in the D category of poor health.
3. The Du Pont pyramid analysis decomposing the return on equity (i.e. the rates of return to owners) showed the worse results within group I excluding subsidies. This conclusion is in contrast to results of bankruptcy and value indices. The explanation of this fact can be seen in the following context: we have chosen significant years (2003 and 2007) that represented the situation before the EU accession and after the change of common agricultural policy (CAP). Farms in group III (with the greater share in the LFA) including subsidies revealed the greatest importance of the subsidy policy more significantly supporting these farms improving their total profit. Due to this, the ROE increased under the influence of the ROA and ROS consequently by approximately 12 percentage points.

It is obvious that the efficiency of farms differs in different years, mainly related to the development of conditions for farming (climatic changes, changes of price etc.) more than to the share of agricultural area in the LFA and a subsequent classification to a relevant group. The above mentioned revealed that the subsidy system is adjusted to eliminate unfavourable conditions of farms in the LFA

(i.e. with more percentage of agricultural area in the LFA). Excluding subsidies, there were differences in the efficiency of farms in individual groups.

SOUHRN

Aplikace soustav ukazatelů na rozbor hospodaření zemědělských podniků v regionech LFA

Ekonomická situace českého zemědělství je v současnosti velice diskutovaná, zejména problematika nedostatečné úrovně dotací ve srovnání s původními členskými státy EU, a otázka poklesu cen zemědělských komodit. Příspěvek se zaměřuje na hodnocení situace v zemědělství prostřednictvím soustav ukazatelů finanční analýzy v letech 2003–2007. Byly využity bankrotní a bonitní indikátory (Altmanův index důvěryhodnosti; Indexy důvěryhodnosti IN 95, IN 99, IN 01; Kralickův Quick test; Index bonity) a pro rozklad rentability Du Pont jednovrcholová soustava ukazatelů. Tyto modely byly aplikovány u výběrového vzorku zemědělských podniků (cca 150 ročně); tříděných dle jejich podílu zemědělské půdy spadají do méně příznivých oblastí, čímž byly dány intervaly, do kterých spadal relativně stejný počet podniků: I. skupina – do 25 %; II. skupina – od 25 % (včetně) do 75 % a III. skupina – nad 75 % (včetně). Datovou základnu tvořily podnikové výkazy (rozvaha a výkaz zisku a ztráty) a dotazník. Ke stanovení výsledných hodnot z datové základny byly použity průměrné hodnoty ukazatelů za danou skupinu zemědělských podniků vypočítané jako prostý průměr.

Z provedené analýzy lze vyvodit tyto závěry:

1. Rentabilita aktiv (ROA) u všech podniků nepřesáhla ve všech letech sledování 7 %, což obecně nelze považovat za výrazně pozitivní výsledek, ovšem vzhledem k danému odvětví bychom jej mohli považovat za dostačující. Rok 2007 byl z hlediska rentability nejúspěšnějším, zejména vlivem dobrých klimatických podmínek a cen, které v tomto roce nezaznamenaly takové propady jako v následujících letech. Analýza však jednoznačně prokázala, že mezi jednotlivými skupinami podniků, se zahrnutím všech dotací, se nevyskytují výrazně rozdílné výsledky. Bez započtení dotací je však situace odlišná – podniky ve II. a III. skupině (tedy s nejvyšším podílem LFA) dosahují nejhorší rentabilitu aktiv (ROA), která dokonce v roce 2006 přesáhla – 10 %. Obdobné závěry lze očekávat i u dále využitých bankrotní a bonitních modelů, neboť ukazatel ROA je součástí všech užitých modelů.
2. U Altmanovo Z–scóre je zřejmý jeho pozitivní vývoj v čase, přestože se ve všech letech nachází v šedé zóně. II. a III. skupině bez dotací (kromě roku 2007) by hrozil bankrot. Se zohledněním specifik pro zemědělství bylo u modelu IN95 zjištěno, že nad hodnotou 2 se zemědělské podniky nacházely pouze s dotacemi a opět nejvíce v roce 2007 a 2004. Pod hodnotu 1 byly shodně podniky ve všech skupinách bez započtení dotací, přičemž zápornou hodnotu měly podniky nejčastěji ve III. skupině. Obdobně se choval i IN 01. Výpočty IN99 u průměrného zemědělského podniku v jakékoliv skupině a to včetně, resp. bez zahrnutí dotace naznačují, že zemědělské podniky v žádném sledovaném roce netvoří hodnotu pro své vlastníky. Kralickův Quick test se jeví jako mírné shovívavý, neboť nebyly zjištěny tak zjevné rozdíly mezi jednotlivými skupinami podniků – průměrná známka 3 (2 bez dotací), stabilita ukazatele v čase. Index bonity se nacházel v kategorii C – slabší zdraví, kam lze zařadit téměř všechny skupiny zemědělských podniků od roku 2004. Všechny typy podniků bez ohledu na skupinu a bez započtení dotace ve všech letech patří do pásma D – křehké zdraví.
3. Z pyramidové analýzy Du Pont, kde předmětem rozkladu je rentabilita vlastního kapitálu (tj. míra zhodnocení pro vlastníky), vyplývají pro I. skupinu podniků bez započtení dotace nejhorší výsledky. Tento dílčí závěr je poněkud v protikladu k výsledkům bankrotních a bonitních modelů. Vysvětlení této skutečnost však musíme chápat v širších souvislostech: zvolené roky pro pyramidální rozklad (2003 a 2007) byly záměrně, neboť charakterizují situace před vstupem do EU a po změně společné zemědělské politiky (CAP). U podniků III. skupiny (největší podíl LFA) se započtením dotací se nejzřetelněji odrazila významnost dotační politiky, která vyšším podílem subvencuje tyto podniky a tím zlepšuje jejich celkové ekonomické výsledky. Ty se projevily zvýšením ROE vlivem ROA a následně i ROS o cca 12 procentních bodů.

Je zřejmé, že výkonnost podniků je odlišná v letech zejména v souvislosti s vývojem podmínek podnikání v zemědělství (klimatické vlivy, vliv změny cen, a další) než v závislosti na podílu zemědělské půdy v LFA a tedy v závislosti na tom, v jaké skupině se nacházejí. Z uvedeného vyplývá, že dotační systém je nastaven tak, že eliminuje ztížené podmínky podniků hospodařících v méně příznivých oblastech (tj. s vyšším procentním podílem zemědělské půdy v LFA). Bez započtení dotací zjevně podniky v jednotlivých skupinách dosahují rozdílné výkonnosti.

zemědělství, dotace, finanční analýza, soustavy ukazatelů, bankrotní a bonitní modely, zemědělské podniky, méně příznivé oblasti

REFERENCES

DOUCHA, R. 1996: *Finanční analýza podniku. Praktické aplikace.* 1. vyd. Praha: VOX Ekonomické poradenství, 224 s. ISBN: 80-902111-2-7.

DLUHOŠOVÁ, D., 2006: *Finanční řízení a rozhodování podniku*. 1. vyd. Praha: Ekopress, 191 s. ISBN 80-86119-58-0.

GRUNWALD, R., HOLEČKOVÁ, J., 2007: *Finanční analýza a plánování podniku*. 1. vyd. Praha: Ekopress, 318 s. ISBN 978-80-86929-26-2.

KISLINGEROVÁ, E., HNILICA, J. 2005: *Finanční analýza – krok za krokem*. 1. vyd. Praha: C. H. Beck, 137 s. ISBN: 80-7179-321-3.

KOLÁŘ, P., MRKVIČKA, J., 2006: *Finanční analýza*. 2. vyd. Praha: ASPI, a. s., 228 s. ISBN 80-7357-219-2.

KRALICEK, P., 1993: *Základy finančního hospodaření*. 1. vyd. Praha: Linde, 110 s. ISBN 80-85647-11-7.

MAŘÍK, M., 1998: *Určování hodnoty firem*. 1. vyd. Praha: Ekopress, 206 s. ISBN 80-86119-09-2.

NEUMAIEROVÁ, I., NEUMAIER, I., 2002: *Výkonnost a tržní hodnota firmy*. 1. vyd. Praha: Grada Publishing, 215 s. ISBN 80-247-0125-1.

Ministerstvo zemědělství ČR: *Podpora z EU a národní dotace* [online]. 2009 [cit. 2009-08-03]. Dostupné z www: <http://www.mze.cz/index.aspx?ch=74&typ=1&val=44662&ids=0>.

SEDLÁČEK, J., 2007: *Finanční analýza podniku*. 1. vyd. Brno: Computer Press, 154 s. ISBN 978-80-251-1830-6.

SEGER, J., HINDLS, R., 1998: *Statistika v hospodářství*. 1. vyd. Praha: ETC Publishing, 636 s. ISBN 80-86006-56-5.

SVOBODA, J., 2008: Regionální disparity dotační politiky agrárního sektoru, *Auspicia,* roč. V, č. 2, s. 24–26. ISSN 1214 – 4967.

ŠTOLBOVÁ, M. 2006: Méně příznivé oblasti pro zemědělství v ČR a EU. Výzkumná studie, Praha: VÚZE, 62 s., ISBN 80-86671-35-6.

Zákon č. 252/1997 Sb., o zemědělství

Zemědělci: Na přímé platby v roce 2010 chybí pět mld. Kč [online]. 2009 [cit. 2009-11-03]. Dostupné z www: <http://www.agris.cz/podnikani/detail.php?id=164580&iSub=598&PHPSESSID=-01304d5a0e3bdda63abc75d78953488e>.

Address

Ing. Martina Novotná, Ph.D., Katedra ekonomiky, Ing. Jaroslav Svoboda, Ph.D., Katedra účetnictví a financí, Jihočeská univerzita v Českých Budějovicích, Studentská 13, 370 05 České Budějovice, Česká republika, e-mail: novotna@ef.jcu.cz, svoboda@ef.jcu.cz