The economic results of farms in the Czech Republic

Ekonomické výsledky zemědělských podniků v České republice

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Abstract

Czech agrarian sector has undergone significant changes during last ten years. Since the Czech Republic has entered the European Union in 2004, agrarian sector has had to adapt to conditions of the Common Agricultural Policy (CAP). This policy is taken as a crucial within the EU policies as it includes orientation of food production as well as a broader sense of sustainable development and employment. The paper assesses profit/loss and its efficiency of a sample of farms in the Czech Republic (about 830 farms) in 2004 – 2010. This analysis employed methods of financial analysis – both traditional ratios and systems of bankruptcy and value models). Time series is long enough to monitor results after establishing the UE and the CAP principles in the Czech Republic. The paper shows that although since 2004, revenue per employee has been increasing, the value added per worker has been static without any major changes. However, farms on average were profitable with the exception of 2009. It was verified by bankruptcy and value models that an average farm is in a relatively good financial situation (without any problems or debt and sufficiently liquid).

Keywords: farms, profit/loss, financial analysis, Czech Republic

Abstract

Český agrární sektor prošel v posledních 10 letech významnými změnami. Od vstupu České republiky do Evropské Unie v roce 2004 se musel přizpůsobit podmínkám společné zemědělské politiky (CAP). Tato politika je považována za klíčovou v rámci politik EU, neboť její orientace kromě samotné produkce potravin zahrnuje v širším měřítku i otázky udržitelného rozvoje a zaměstnanosti. Příspěvek hodnotí ekonomické výsledky u vybraného vzorku zemědělských podniků v ČR (cca 830 pozorování) v letech 2004 až 2010. Zhodnocení proběhlo prostřednictvím metod finanční analýzy - jak tradičních poměrových ukazatelů, tak i soustav (bankrotních a bonitních modelů). Časová řada je dostatečně dlouhá ke sledování vývoje výsledků po etablaci českých farmářů na principy EU a CAP. Paper dokládá, že ačkoliv se od

roku 2004 výnosy na pracovníka v letech zvyšují, přidaná hodnota na pracovníka nedoznává výrazné změny. Nicméně zemědělské podniky jsou v průměru vyjma roku 2009 rentabilní a prostřednictvím bonitních a bankrotních modelů bylo ověřeno, že průměrný zemědělský podnik je poměrně v dobré finanční kondici (nemá problémy ani se zadlužeností a je dostatečně likvidní).

Klíčová slova: zemědělské podniky, zisk/ztráta, finanční analýza, Česká republika

Detailed abstract

Od vstupu České republiky do Evropské Unie v roce 2004 se agrární sektor musel přizpůsobit podmínkám společné zemědělské politiky (CAP). Cílem předložené stati je posoudit vývoj výkonnosti průměrného zemědělského podniku v České republice v letech 2004 až 2010 a zhodnotit, zda výkonnost průměrného zemědělského podniku se po vstupu do EU zlepšuje. Pro výpočet ukazatelů finanční analýzy byla využita vlastní datová základna zemědělských podniků (cca 830 pozorování), která je na našem pracovišti shromažďována již několik let. Ukazatele popisující velikost podniku jsou zjišťovány jako průměrné tj. prakticky vyjadřují velikost námi sledovaného průměrného zemědělského podniku. Jako hodnotící metody byly využity metody finanční analýzy. Nejprve standardní ukazatele poměrové finanční analýzy: rentabilita, aktivita, zadluženost a likvidita. Jako samostatná skupina byla hodnocena i produktivita práce. V dalším kroku byly aplikovány soustavy ukazatelů – tzv. bankrotní a bonitní modely. Jednalo se o: Altmanův index finančního zdraví, modely IN (IN95, IN99, IN01, IN05), Kralickův Quick test, Index bonity a Index finančního zdraví používaný v České republice v rámci Operačního programu „Rozvoj venkova a multifunkční zemědělství“ MZe ČR. Z provedené analýzy vyplynulo několik závěrů. Průměrný zemědělský podnik za dobu sledování realizuje zisk (kromě roku 2009) s průměrnou výší 3,2 mil. Kč. Rentabilitu lze považovat z hlediska kladných hodnot všech jejích dílčích ukazatelů za pozitivní, ovšem průměrná hodnota nepřesahuje 4%, což již tak uspokojivé není. Velice kladně lze hodnotit likviditu, která dosahuje obecně uznávaných pozitivních hodnot. Dobrá je i celková zadluženost, která nepřesahuje ve sledovaném období 50%. Výnosy na pracovníka se od roku 2004 v letech zvyšují, přidaná hodnota na pracovníka nedoznává výrazné změny. Nicméně zemědělské podniky jsou v průměru vyjma roku 2009 rentabilní a prostřednictvím bonitních a bankrotních modelů bylo ověřeno, že průměrný zemědělský podnik je poměrně v dobré finanční kondici (nemá problémy ani se zadlužeností a je dostatečně likvidní). Avšak i přes relativně kladné hodnocení bonity či možnosti bankrotu ovšem podniky netvoří ekonomickou přidanou hodnotu (EVA) měřenou českým indikátorem IN99. Z celkové analýzy jednoznačně vyplynula úzká vazba na dotační politiku CAP, což pochopitelně není překvapivé. Dle české účetní legislativy je většina dotací součástí ostatních provozních výnosů, jejichž podíl tvoří cca 16%. Hodnoty výsledku hospodaření a celkové rentability očištěné o dotace jsou však již alarmující. Podniky se rázově ocitají ve ztrátě (průměrná ztráta 9 mil. Kč), což na sebe váže i zápornou rentabilitu a negativní vývoj všech ostatních ukazatelů. Bohužel tedy nelze konstatovat, že by vstup do EU přispěl výrazně ke zlepšení výnosnosti, která by byla způsobena jinak, než dotacemi. Česká republika byla do roku 2013 zemí s postupným slaďováním principů a postupů této politiky, kdy se dostávala na úroveň 100% dotací, které byly vypláceny v původních členských

zemích EU. V dalších letech již bude zemí s plně funkčním systémem CAP. Protože však neustále dochází ke korekci jejich parametrů, ukáže až nově aktualizovaný systém, jakým způsobem se projeví na náš agrární sektor.

Introduction

Business is a process that depends on a lot of internal and external factors partly possible and partly impossible to influence. It is important for the management to be able to channel or use influence of such factors for successful future development. An analysis of economic effects and processes in an enterprise is important for successful management. Economy of farms is specific so that it is important to consider such special aspects in the analysis.

Farms within agrarian sector use a number of subsidies under the Common Agricultural Policy (CAP), which is financially the largest policy of the European Union. The agricultural sector also fulfils other secondary functions that are indispensable in other sectors of the national economy. Since the production of both conventional as well as organic farming, are greatly promoted political and economic instruments, especially in the form of grant aid, it is necessary to constantly keep analyzing cost-effectiveness in relation to the resulting output (Kroupová, Malý, 2010).

The aim of the paper was to monitor changes in the most important financial indicators of a stable sample of farms in relation to changes in subsidy policy as stated after joining the EU. The aim was also to reveal the reaction of farms to such change and to assess the way in which the accession has influenced financial position and efficiency of farms.

Simplified performance measurement framework can be outlined as follows: it involves more than just measurement it also includes the definition and understanding of indicators, data collection and analysis, subsequently setting priorities and taking action to improve. The framework must include a description of outputs and outcomes (Businessballs.com [online], 2013).

Business performance measurement is to quantify the contribution of the enterprise to achieve its goals. The primary goal derives the theory of an enterprise. It is based empirically on economic practice. The concept of the objectives of the enterprise (business) has undergone historical development. In its original version of the theory of an enterprise is considered to be the primary target to maximize profits, in the short term, i.e. without a time dimension and without the influence of risk. The basic indicators used to measure this objective, the overall profit, later known as profitability ratios such as the ROI (Return on Investment) developed by Du Pont Corporation in 1919; the ROE (Return on Equity), the ROA (Return on Assets) etc. Within economic practice, primary objective – profit maximizing – has transformed into the above mentioned ROE ratio as well as into the EPS (Earnings per Share) ration and to an increase of share prices. In the eighties of the 20th century, more structured models of management were created included risk in the decision making and certain dynamics. The newest models consider maximizing a shareholder value as an objective of enterprise´s behaviour. As agreed by most of specialists such objective is the most preciously described by the MVA (market value added) ratio and the EVA (economic value added) ratio (Synek, Kislingerová, 2010).

Although models including risk are supposed to be the most accurate, traditional financial analysis ratios based on financial statements are often preferred.

The aim of financial analysis is to assess financial health of an enterprise, to identify its weaknesses that could possibly cause problems and to identify its strenghtness that could be employed in the future. Financial analysis is used as a tool to assess financial health by a number of subjects that want to evaluate their economy and management (Bláha, Jindřichovská, 1996).

Formulation of conclusions about the overall financial health of an enterprise should be understood as a multi-criteria decision-making role, where each of the indicators is related to one of the criteria. Problem is the objective selection of the most important indicators and determination of their importance. Specialists keep looking for a way out of this situation trying to determine key indicators for performance assessment and the likelihood of bankruptcy of enterprises on the basis of characteristics to construct an aggregate financial situation of an enterprise. The literature discusses the early warning system or financial level prediction models (Dluhošová, 2006).

Financial analysis involves several different methods of ratio analysis. A parallel system of indicators that includes ratios covers all the components of business efficiency. Blocks of indicators measuring certain aspects of the financial situation, taking the financial health of all perceived characteristics as equivalent are created. An enterprise must not only be profitable, but reasonably in debt and of such liquidity to be able to keep its existence for a long time (Kislingerová, et al., 2004).

Fundamental analysis includes financial analysis and technical analysis. Fundamental analysis is based on the knowledge of mutual economic and non-economic phenomena. It includes assessing the results of an enterprise, its health, management, and also its market opportunities and position against competitors. Technical analysis uses mathematical, statistical and algorithmic methods for quantitative business data processing with subsequent economic assessment results (Sedláček, 2001).

Methods and materials

The aim of the paper is to assess efficiency of an average farm in the Czech Republic after the EU accession, i.e. since 2004; to assess whether the performance of the average farm, measured by financial ratios, has improved after joining the EU. Special data base of farms was used for the calculation of the financial analysis, the sample of farms data has been collected at our university for several years. The structure of farms was based on communication with subjects using double-entry (financial) accounting recorded as standard financial statements. Characteristics of selected farms are revealed in Table 1. Ratios describing the size of farms are measured as the average i.e. they practically express our observed average size of the farm.

Table 1: Characteristics of selected farms

Item	2004	2005	2006	2007	2008	2009	2010
Elevation (m.ab.sea.lev)	459	451	460	450	453	457	464

Agricultural area (ha)	1 787	1 794	1 746	1 823	1 803	1 765	1 766
Number of employees	82	81	75	75	68	62	58
Number of farms	142	122	127	115	116	112	98
PLCs	39.44%	40.16%	40.16%	42.61%	37.93%	38.39%	36.73%
Cooperatives	42.96%	43.44%	43.31%	41.74%	45.69%	46.43%	47.96%
LLCs	15.49%	13.93%	14.17%	14.78%	15.52%	14.29%	14.29%
Individuals	2.11%	2.46%	2.36%	0.87%	0.86%	0.89%	1.02%

Source: own calculations

The sample of farms in all years was rather stable concerning the altitude and the area of agricultural land. Although a slight decrease of the number of subjects in the sample, the ratio or different legal form was more or less the same. In the sample, there were the majority of legal persons as the number of natural persons was approximately 1% only. The development of these characteristics revealed an obvious decrease in the average number of employees (typical of the agrarian sector in the Czech Republic in this period).

The data of this paper were collected from financial statements (balance sheets and profit/loss statements) and a questionnaire with additional details on farm characteristics assessed by financial analysis methods. At first, standard ratios of financial analysis were employed – classified by different groups: profitability, activity, debt and liquidity. Labour productivity was assessed individually. The next step applied index systems – the following bankruptcy and value models:

1. The Altman Index of financial health from 1983 applied in closed companies and companies that are not traded on the capital market. (Altman, 1968)
2. The IN models (IN95, IN99, IN01, IN05) applied in Czech firms. This is a group of models that assess a risk of bankruptcy as well as whether an enterprise creates any profit – i.e. a value for its owners (Neumaierová, Neumaier, 2002).
3. Value model: the Kralicek Quick test (Kralicek, 1991) and the Value Index (Grünwald, Holečková, 2007)).
4. The Financial Health Index applied within the Operational Programme “Rural Development and And Multi-Functional Agriculture” by the Ministry of Agriculture in the Czech Republic to assess farms applying for a subsidy (www.mze.cz).

These indicators were calculated for each farm individually. Subsequently, the average value was calculated. As it was the assessment of financial performance, with rather stable sample of farms and the structure according to legal forms of farming and agricultural land in the LFA was almost unchanged, a simple average was used. A similar method of calculation was also used by Střeleček et al (2009). Even the official results of the EU are calculated for an average enterprise, although the weighing procedure could be quite complicated.

Values for the indicators that can be considered synthetic - ROA, labour productivity and the IN 95 (taking into account the sector specifics) were calculated for different sized farms. The classifications were based on:

- The legal form (as defined by the Act No. 513/1991 Coll., the Commercial Code and by Act No. 90/2012 Coll., on commercial companies and

cooperatives from 1 January 2014) – classified into public limited companies, cooperatives, natural persons (individuals) and limited liability companies;

- The share of land in less favoured areas (LFA) as used by the FADN network - www.vsbox.cz/fadn) – classified into mountain, other, outside and ambivalent areas.

Results and discussion

Indicators are an efficient tool for evaluating company performance. These can be characterized as absolute, ratio or system of indicators. Accounting provides various input data in the form of the absolute values of variables. In order to analyse interactions and relations between indicators different absolute values are expressed as the relative proportions, thus creating ratios. Analysis of financial statements using ratios is widely used and has universal applicability. The use of parallel pointer system is used as a very frequent procedure for analysing the financial situation of a company Financial indicators are clustered into groups according to what part of management in a company do they evaluate (indicators of profitability, activity, liquidity, leverage, or productivity). Table 2 lists the different categories of income and profitability indicators and closely related indicators evaluating one of the most important aspects of business success.

Table 2: Profitability Ratios

Item	2004	2005	2006	2007	2008	2009	2010	growth
Profit/loss (thousand CZK):								
-operating	5 088	3 655	2 881	8 128	5 696	-148	4 229	0.9696
-financial	-830	-873	-775	-1 019	-1 118	-1 015	-965	1.0237
-extraordin.	239	432	308	247	279	87	285	1.0335
- total brutto	4 496	3 214	2 414	7 356	4 856	-1 077	3 549	0.9613
- total netto	4 152	2 904	2 030	6 910	4 351	-1 001	3 091	0.9520
ROA I	5.01%	2.51%	1.73%	5.84%	2.76%	-1.06%	2.44%	0.8871
ROA II	6.03%	3.45%	2.83%	7.02%	4.04%	-0.08%	3.68%	0.9207
ROE	14.05%	-5.11%	3.79%	13.67%	4.28%	-2.50%	2.22%	0.7353
ROS	6.10%	3.04%	2.44%	7.65%	3.60%	-1.75%	3.89%	0.9280
ROC (CZK)	0.069	0.035	0.029	0.087	0.043	-0.010	0.045	0.9312
1-ROS (CZK)	0.935	0.966	0.971	0.919	0.9597	1.018	0.955	1.0035

Source: own calculations

The profit/loss is a summary and traditional indicator evaluating the effectiveness (profitability). The structure of the profit is given in Table 1. In the agricultural sector is its amount significantly affected by natural and climatic conditions affecting both crop and livestock production. Operating income, which is generated from the core business enterprises, should be ranging is positive terms - thus achieving a profit could fulfil a sense of their activities. Profit was achieved (with the exception of 2009) in all the monitored years. Unfortunately, it cannot be said that the amount was clearly a growing trend. This is as already mentioned, partly due to climatic and

natural conditions, and then due to the development of agricultural commodity prices - and not only Czech prices, but also worldwide. An important component that affects the result is value added. However, the amount is decreasing (average rate of decline of 3.5%). On the contrary, increasing the yield component that de facto has been generating a profit for several years is the amount of operating subsidies paid under the CAP.

Long-term loss (at about 1 million CZK) of profit from financial activities has not had so surprising trend (similarly in other sectors). It is due to paid interest expenses on loans. This is related to finance, especially investment activities as a result of under-funding of agricultural enterprises. Profit from extraordinary activities (at about 300 thousand CZK) consisted primarily of compensation costs as a result of extraordinary events – e.g. a compensation from insurance companies. Total gross profit or loss (the average height of about four miles CZK) was basically copying the operating profit, while its net value is about 500 thousand. CZK lower due to taxes on income. (Lososová, Svoboda, 2013).

Traditional ratios of profitability copy the profit/loss trend. Less correct calculation of asset profitability is to use a return on net assets (ROA I). This ratio expresses an ability of management to use total assets of a company in favour of its owners. The developments of its values revealed 2004 and 2007 as the best years and 2009 as the worst one. The ROA II calculated as the EBIT (earnings before interest and taxes) and assets ratio is usually in positive terms. A loss may occur only in case if a loss is greater than taxes and cost interests. In spite of this fact, a loss occurred in 2009 only, the other years revealed a profit with the biggest value in 2007 (7.02%) and 2004 (6.03%). An average growth rate was influenced by limit values that had caused an average annual decrease by about 10%.

Great attention is given to the measurement of the shareholders' equity of indicators: return on equity (ROE). On the basis of this indicator, owners can determine if their invested capital provides sufficient yield to the corresponding risk. Return on equity should be higher than the alternative yield as risky investments. Return on equity is affected both by the amount of profit after tax as well as by developing its own capital. Especially the latter, the indicator is in the evaluation of problems in some cases. If its value is too low (the ROE then becomes extremely high values) or when companies are at a loss and at the same time have negative equity, ie., The resulting ROE takes positive values, so the result indicates good management of the company, which is logical nonsense. In order to alleviate these deficiencies have been eliminated for the calculation of ROE results of companies with negative equity. The resulting values of the ROE are again obvious fact mentioned above, the highest values can be observed in 2004, followed by 2007. The average growth rate in the interval indicated a relatively strong decline - and an average annual ROE declined by almost 30%.

The apparent contradiction in the development of indicators ROA calculated from net income (positive) and ROE (negative value) in 2005 is due to the fact that the mean value of indicators for the farms used a simple arithmetic mean (when calculating a simple average to the final value affect firms with lower levels of equity).

The Return of Sales (ROS), Return on Costs (ROC) and 1-ROS assess practically the same part of management, the difference is in a scale only.

Costs of production are developed according to expectations in line with profitability ratios, ie the best values, the average farm in 2007 (for 1 CZK revenues needed

0.9192 CZK costs). Worst value is reached in the crisis year of 2009 which is even higher than one (1 CZK revenues was achieved with 1.0181 CZK costs).

Significant factor that could affect the performance of agricultural enterprises are also investments such as Ming (2002) says. Ming, S (2002) in his paper studies the role of support to agriculture in the context of budgetary policy. At the same time the author puts some suggestions for improvements. First of all, in his opinion, agricultural investment financed by the state budget should increase. Objectives and priorities of budgetary support for agricultural should be clarified. Other Entities to invest in agriculture should be attracted. Subsidy policy should be the same for different kinds of economic entities operating in agriculture and in rural areas, etc.

Detailed analysis was performed on ROA by legal form and by the share of the LFA (table 3).

Table 3: Development ROA by legal form and share LFA

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
ROA – legal form								
PLC´s	3,96%	1,76%	1,16%	5,40%	2,43%	-0,40%	2,09%	0,8993
Cooperatives	4,90%	2,59%	1,90%	6,53%	2,34%	-2,50%	2,17%	0,8733
Individuals	5,53%	8,56%	7,49%	4,25%	4,69%	-1,24%	2,18%	0,8560
Ltd.´s	7,91%	3,30%	1,83%	5,23%	4,68%	1,84%	4,25%	0,9017
ROA – share LFA								
Mountain	6,10%	5,39%	3,78%	5,55%	2,98%	0,09%	3,39%	0,9066
Other	4,71%	2,21%	1,50%	5,71%	1,22%	-1,41%	2,52%	0,9006
Outside	4,67%	2,17%	1,68%	5,96%	5,07%	-1,12%	1,66%	0,8419
Ambivalent	4,67%	0,65%	0,62%	6,44%	2,11%	-2,10%	2,02%	0,8693

Source: own calculations

It could be assumed that by the classification, individuals are the most successful group sort. However, as already mentioned, their number in the sample is very low, so that any conclusions could lead to misinterpretation. The ROA was positive except for 2009, but decreasing in all groups. Cooperatives were mostly affected by this fact. On the contrary, the best return on assets (ROA). In terms of classification by their share in the LFA, the total return decreased in all groups (mostly in outside areas). A closer look revealed mountain areas as the most profitable type with the average ROA. This is caused by two factors: at first, there is the smallest volume of assets (at 66 % level of the average farm) and on the other hand, their profit is at 82 % level of the average farm. Good results were caused by the subsidy policy to compensate for specific farming conditions in LFA areas. Worst profitability and the dynamics occurred in the farms located outside the LFA.

Table 4 illustrates by a turnover – as Total Assets Turnover (Revenue/Assets) and Fixed Assets Turnover (Revenue/long-term assets) they describe number of turnovers in time, usually in a year or they describe turnover time. Turnover time indices (better for assessing component parts of assets) describe how long are different parts fixed in assets. An average Collection Period (receivables/(revenues/360)) should be in line with a Creditors Payment Period (liabilities/(revenues/360)). Ideally, the Creditors Payment Period should be longer.

This applied in an average farm in last two years of monitoring. The shortest Creditors Payment Period and Inventory Turnover Ratio (inventory/(revenues/360)) were revealed for years successful in agriculture, i.e. in 2007. In 2007, the Inventory Turnover Ratio was about 110 days and Creditors Payment Period was about 52 days. The developments of all ratios of this group were of almost the same growth rate – with an average decrease up to 5%.

Table 4: Activity Ratios

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Total Assets Turnover	0.77	0.73	0.71	0.75	0.74	0.64	0.64	0.9701
Fixed Assets Turnover	1.53	1.40	1.35	1.42	1.39	1.17	1.14	0.9519
Average Collection Period (days)	63.25	64.16	63.39	62.61	59.05	55.46	60.06	0.9914
Inventory Turnover (days)	126.4	121.3	122.4	110.6	113.9	133.8	122.7	0.9950
Creditors Payment Period (days)	80.2	60.2	61.2	52.3	56.4	61.1	63.0	0.9606

Source: own calculations

Based on leverage ratios (Table 5) an assessment of financial structure of a farm can be performed. The greater the Debt ratio, calculated as Total Debt to Total Assets, the lower financial stability of an enterprise. On the contrary, a certain extent of debt is favourable for an enterprise as it helps to increase efficiency measured by Return on Equity.

Table 5: Leverage Ratios

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Debt Ratio (%)	47.16	44.41	45.11	41.72	43.34	41.58	41.57	0.9792
Debt to Equity	-7.62	2.51	2.71	1.21	-10.40	0.85	60.24	x
TIE	38.85	11.36	7.13	14.69	12.30	-7.45	12.61	0.8290

Source: own calculations

The debt ratio was about 43% in an average farm during the monitored period. The developments revealed a decrease. In the beginning of the period, the debt ratio had amounted to about 47% subsequently it decreased at 41.5%.

The Debt to Equity Ratio has a lot of disadvantages. First of all, it is influenced by the fact that farms have more than other enterprises negative equity given by cumulated loss from previous years. The TIE - Times Interest Earned Ratio (EBIT/Interest) was sufficient in all years with the exception of 2009 when it was negative due to a loss.

Studies (such as Grünwald, Holečková, 2007, p.126) described a threshold value (TIE = 1) expressing that all earnings before interest and taxes (EBIT) would be paid

to cover interests. Future revenues of creditors would be secured only by greater interest coverage, at least 5 times greater in the Czech Republic (that means that the EBIT can be decreased 5 times before an enterprise will become unable to pay costs to liabilities). It is evident, that an average enterprise had no problems with debts (the TIE ratio was more than many times greater that the threshold) with the exception of 2009.

Liquidity ratios (table 6) express possible abilities of enterprises to pay their liabilities.

Table 6: Liquidity Ratios

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Current Ratio	3.85	3.88	3.22	4.77	5.01	5.06	5.20	1.0512
Quick Asset Ratio	1.52	1.74	1.50	2.26	2.41	2.14	2.38	1.0781
Cash Position Ratio	0.41	0.65	0.53	0.88	0.79	1.05	1.08	1.1763
NWC/Assets	0.23	0.27	0.26	0.28	0.26	0.26	0.24	1.0072

Source: own calculations

Liquidity is usually expressed as the Current Ratio (current assets/current liabilities + short-term bank loans); Quick Asset Ratio (current assets – inventories/ current liabilities+short-term bank loans) and Cash Position Ratio (cash/current liabilities+ short-term bank loans). Net Working capital (NWC/Assets) also measures financial stability dealing with long-term sources paid to cover current assets to total capital of an enterprise. Liquidity of farms, measured by different ratios, was of good level. The developments revealed an increasing trend in recent years (a positive development) revealed also by average growth rates. Because the disadvantage of liquidity ratios is to take into account the structure of current assets, was completed in table 7.

Table 7: The structure of current assets

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Current assets	100%	100%	100%	100%	100%	100%	100%	1,0000
Inventory; of which:	60%	57%	57%	54%	57%	59%	57%	0,9901
- crop products	56%	55%	54%	55%	60%	61%	59%	1,0096
- animals	34%	34%	35%	32%	28%	29%	29%	0,9743
Receivables / long term	1%	1%	1%	1%	1%	0%	0%	0,8283
Receivables / short term	29%	27%	27%	28%	29%	24%	25%	0,9749
Financial assets / short term	10%	15%	15%	16%	14%	16%	18%	1,1096

Source: own calculations

In relation to farm type, it is not surprising that the inventory is approximately 60%. It consists of crop production products with 57% in average. Livestock production and animals are a specific question of the assets. The record keeping for animals is the most important issue as animals can be recorded as the inventory (young animals) or as depreciated tangible assets.

A certain outline of young animals is provided by the Regulation No. 500/2002 Coll., Implementing certain provisions of Act No. 563/1991 Coll., Accounting, which is however not completed so that in some cases not quoted by the act it depends on the accounting item and specific conditions.

The decisive guidance should be the economic utilization of an animal. If single income is expectable, such as with animals for fattening, these animals are recorded as inventory, while animals with expected long-term benefit are usually recorded as tangible assets. Adult animals are only represented by about 7% of total assets, young animals represent about 4% of total assets. In relation to inventory, an average of about 30% is contributing.

Most debt includes short-term receivables (with a clear predominance of trade receivables - 63%, followed by tax receivables - 13%) and participates in current assets with less than 28% in the average, Probably the most essential group are short-term financial assets mainly consisting of cash, with less than 15%.

A liquidity recorded growth since 2007 due to the increase already defined in inventories (which had also linked the increase in receivables due to increased sales) with a relatively stable development of short-term liabilities. Increase in inventories and receivables are unambiguously associated with climate successful seasons and fertile years.

Table 8: Productivity Ratios

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Labour productivity I (thousand CZK)	990	1 031	1 053	1 244	1 363	1 214	1 379	1.0567
Labour productivity II (thousand CZK)	242	216	186	281	267	156	243	1.0004
Labour productivity III (CZK)	4.64	4.39	4.29	4.56	4.59	4.16	4.45	0.9932
Labour productivity IV (CZK)	1.12	0.90	0.73	1.02	0.89	0.53	0.78	0.9426
Average gross wages (thousand CZK)	12.92	14.32	14.81	16.43	17.91	17.85	18.73	1.0638
Wage costs (CZK)	0.246	0.247	0.252	0.248	0.239	0.250	0.248	1.0012

Source: own calculations, czso.cz

Analysis of efficiency is appropriate to be completed with production factor´s efficiency analysis (productivity ratios). Table 8 revealed a calculation of labour productivity by different ratios. Labour productivity calculated as revenue per one worker (Labour productivity I) was increasing during the period with the biggest increase in successful years in agriculture in 2007 and 2008. However, the same increase was not revealed for the second ratio, added value per one worker (Labour

productivity II). The annual decline here takes place primarily at the beginning of the period, i.e. until 2007. In 2007, value added per worker was increased 1.5 times. A significant drop in the value added per worker was recorded in 2009, which again may be attributed to both less successful period for the farmers and also to the impact of the global crisis.

For the farms this is probably the result of operating subsidies which are recorded in the accounting records in other operating income. When calculating the productivity of value added (the difference of performance and power consumption) subsidies are not included. In fact, it means that the productivity and efficiency of production factor displays work by including subsidies and labour productivity II without the effect of subsidies. This is evident not only different development levels of these indicators, but also the dynamics, the only successful years in terms of agriculture indicators disrupt the trend (e.g. in 2007). From Table 6 it is also clear that while labour productivity measured by revenue per worker has undergone, a significant increase since 2004 compared to 2010, this partial conclusion cannot be drawn for labour productivity measured by value added.

In 2010, the value of this indicator was at approximately at the same level as in 2004. Regarding labour productivity III (per 1 CZK of personal costs), it can be stated that this indicator is moving throughout the period at about the same level. One reason may be that the ratio of these indicators is not much influenced by the rate of inflation, because it may be expected that the influence of price increases incomes, and on the other hand it also increase wages (but not equally).

Labour productivity IV (value added per one CZK of personal costs) tended to decrease with the exception of successful years in agriculture, i.e. in 2004 and 2007. The most significant fall appeared in the crisis year of 2009, when one CZK of personal cost created added value of CZK 0.53. Wage Cost (labour costs / revenues) ranged throughout the period at approximately the same level, it even did not significantly increase in 2009. Approximately 0.247 CZK of personal expenses was paid 1 CZK of revenue throughout the period.

For a more detailed analysis of the indicator of labour productivity I ensured by legal form and by the share LFA (table 9).

Table 9: Labour productivity I by legal form and by share LFA

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Labour productivity I – legal form								
PLC´s	975	1 010	1 047	1 249	1 365	1 193	1 313	1,0510
Cooperatives	970	1 063	1 055	1 222	1 362	1 215	1 404	1,0636
Individuals	1 771	1 920	1 711	1 746	1 154	1 058	1 224	0,9403
Ltd.´s	1 099	997	1 080	1 264	1 373	1 280	1 474	1,0502
Labour productivity I – share LFA								
Mountain	939	1 019	1 015	1 083	1 104	1 054	1 284	1,0535
Other	994	1 031	1 058	1 269	1 318	1 178	1 309	1,0469
Outside	1 111	1 103	1 136	1 318	1 618	1 413	1 562	1,0585
Ambivalent	972	1 058	1 056	1 283	1 424	1 273	1 406	1,0635

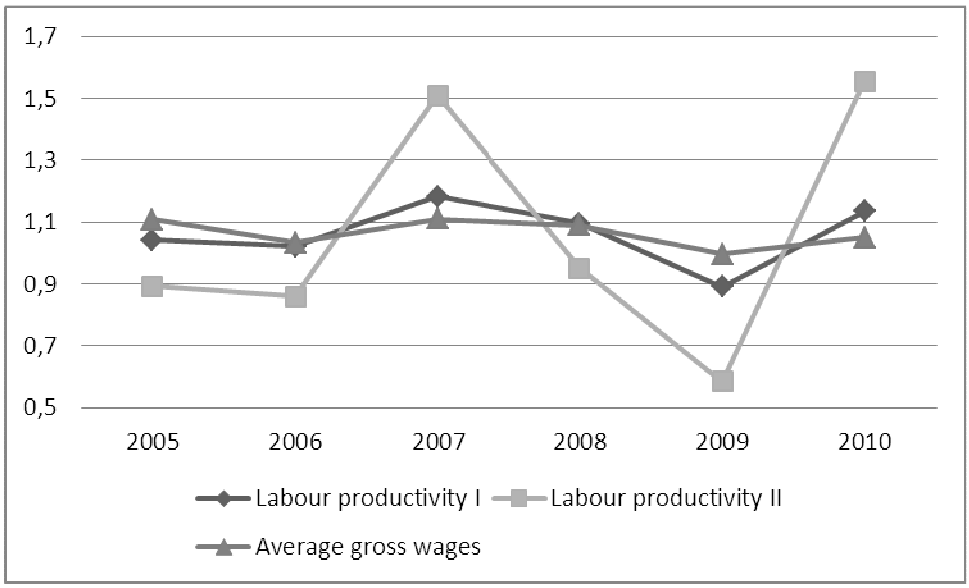
Source: own calculations

The productivity indicators (table 9) had already revealed some differences between the legal natural persons. Again, the best results are achieved Ltd.´s which usually belongs in size to smaller enterprises. The following is a cooperative, a traditional form of agricultural enterprises. In terms of classification of farm by LFA, the biggest productivity was reached by the outsides and the lowest productivity occurred in mountain areas. These areas have not seen a larger decline in labor productivity through subsidies and their results are closer to the average farm.

A comparison of the development of the average wages in agriculture and average wage in the Czech Republic revealed that in agriculture wages are lower by approximately 21% compared to the average for all sectors of the economy. A similar situation is also in Slovakia (Chrastinová, Burianová 2012), where the entry of Slovakia into the EU, agricultural businesses achieve positive financial result, which was affected by CAP support. Higher income for farmers but are not reflected in the wages of employees. Wages in agriculture were about 20% lower than the average wage in the national economy of Slovakia, with not even a stabilization of the labour force or increasing employment.

In terms of demand of performance growth, each company is trying to increase productivity. It is necessary to recall the important relation of labour productivity and average wages. The point is that the dynamics of labour productivity should be higher than the growth in average wages. Otherwise, the wage cost of the company grew, thereby decreasing profitability of a company. A comparison of the dynamics of labour productivity calculated from income and average wages (Figure 1) shows that in 2005 and 2009, wages grow faster than productivity, in other years it has been a positive development. Overall, for the reference interval is the average wage growth rate consistent with the average growth rate of labour productivity. Comparing the dynamics of labour productivity calculated as value added to the dynamics of the average wage, it is clear that a relation of these indicators was developed positively only in successful years for agriculture, i.e. in 2007 and 2010.

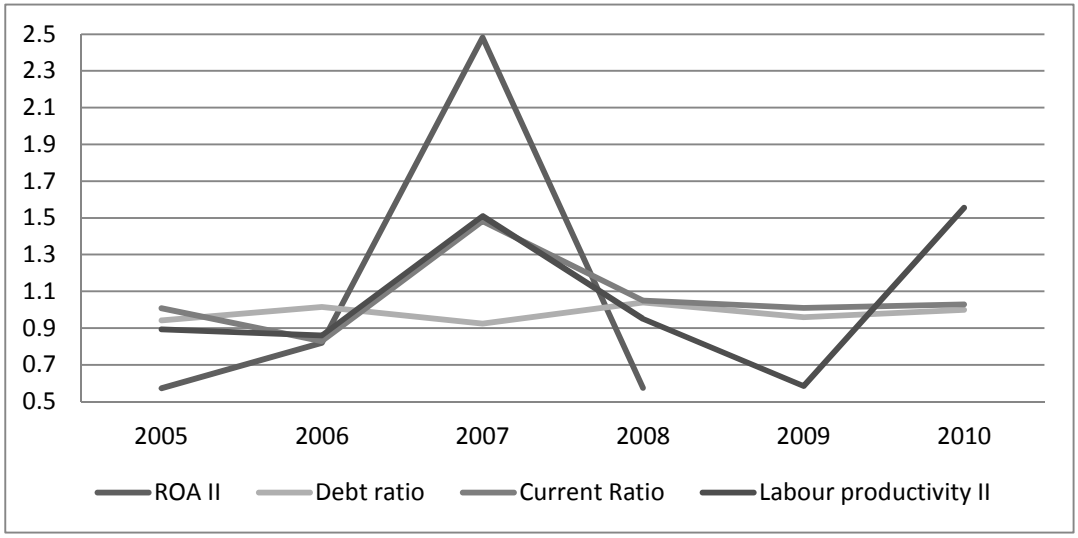
Figure 1: Development of average wage and labour productivity



Source: own calculations

Using Figure 2, which represents the average annual rate of selected ratios of different scoring areas, it is possible to read the context of the development of an average farm. Development of the ROA is illustrated for 2009 and 2010. In this period, the return on assets is negative and the calculation of a particular interpretation of the index is very problematic. The development of selected ratios revealed successful years for an average farm. The highest growth of all ratios occurred in 2007, with increased both the return on assets (even 2.48 times i.e. 148%) and labour productivity calculated from the value added tax (increase of 51%) and current liquidity, a debt declined slightly. The farms met their basic function i.e. the production function. However, also other non-production functions were important (such as landscape function, socio-cultural, recreational, etc.).

Figure 2: Growth rates of ratios



Source: own calculations

The paper (Zhengrei, Lansink, 2006) uses to modelling the impact of capital structure on measured performance. Malmquist productivity growth index and ROE are constructed in agriculture (farms in Dutch). Debt rations were found to have no effect on farms´ ROE at the 5% significance level. However, the authors show that long-term debt has a positive effect on productivity growth (at the 5 % significance level).

To prove a linear relation of performance indicators of farms a correlation matrix was constructed. The matrix was used to define pair correlation coefficients (see e.g. Hindls at al., 2007).

Table 10 : Correlation matrix of selected financial ratios

Item	ROA II	ROE	Debet ratio	Labour productivity I	Labour productivity II
ROA II	1.00	-0.10	-0.03	0.22	0.31
ROE	-0.10	1.00	-0.06	0.03	0.03
Debt ratio	-0.03	-0.06	1.00	-0.02	-0.23
Labour productivity I	0.22	0.03	-0.02	1.00	0.41
Labour productivity II	0.31	0.03	-0.23	0.41	1.00

Marked correlations are significant at the level p < 0.05, N=832
Source: own calculations

Correlation matrixes of ratios in farms (table 10) assessed mostly the relation of debt and profitability measured by the ROE and ROA II, and labour productivity measured by revenue and added value per one worker. Pair correlation coefficients were revealed as quite low, that is connected to low linear relations.

Surprisingly, there was a negative relation between added value per worker and debt (-0.23). However, it is necessary to consider that added value per worker measures an efficiency of labour as a production factor only, not considering other production factors efficiency.

The relation of the ROA II and added value per worker is worth mentioning as well. Although 0.31 suggests quite low linear relation, it was proved at selected level of significance. Increasing the added value per worker influences farm´s profitability, on the other hand it is only one of factors influencing performance of agricultural farms.

To construct a system of indices, the following are distinguished:

- Systems of hierarchic indices such as pyramid systems used to identify logic and economic relations between indices by decomposition.
- Purposeful selection of indices constructed by comparative and analytic or mathematic and statistical methods. The aim of such construction is to construct such systems that would be able to diagnose financial situation (health) of an enterprise and to predict possible crisis (financial distress). They are classified as
    - Value (diagnostic) models that use one synthetic index replacing analytic indices of different predictive ability that is able to express financial situation or position (a comparison between companies).
    - Bankruptcy (predictive) models used as a sort of early warning system as they can predict possible risk of company´s financial health (Sedláček 2001).

Table 11: System of indicators (models)

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
Altman	2.3773	2.4145	2.3705	2.7563	2.6450	2.5371	2.5710	1.0131
IN 95	7.2419	3.6663	2.9796	4.9715	4.0632	0.9856	3.9929	0.9055
IN99	0.6527	0.5159	0.4659	0.6964	0.5613	0.3201	0.4962	0.9553
IN01	2.6838	1.4912	1.2307	1.8852	1.6811	0.7386	1.6921	0.9260
IN05	2.6868	1.4929	1.2321	1.8887	1.6831	0.7386	1.6940	0.9260
Králicek	3.1391	3.0779	3.0551	3.2696	3.1272	2.9464	3.1199	0.9990
Index bonity	0.9564	0.8590	0.8548	1.1469	0.8911	0.6570	0.9169	0.9930
Mze - FZ	A (27.7)	A (27.2)	A (26.7)	A (28.5)	A (27.2)	B (24.9)	A (26.6)	0.9934

Source: own calculations

The Altman Z- score is the most common and used in the Czech Republic. This index helps to assess bankruptcy risk. The value of 2.7 (94% of enterprise with the Z-score lower than 2.7 bankrupted in a year) was proven to be the threshold. On the other hand 97% of enterprises with the Z-score greater than 2.7 survived. Values ranging from 1.81 to 2.99 are the grey zone. The analysis revealed that Czech farms are in the grey zone, although there is a slight improvement and the 2.7 threshold was exceeded in 2007 only. However, it is not significantly prove if Czech farms are at risk of bankruptcy. The developments of the score indicate that the situation is becoming to improve slightly.

Mr. and Mrs. Neumaier calculated a series of indices (IN indices) based on empiric research applied for conditions in the Czech Republic (they assess the performance of Czech enterprises). Currently, the following indices are uses:

- IN95 – aimed at creditor´s point of view
- IN99 – aimed at owner´s point of view
- IN01 – combination of IN95 and IN99
- IN05 – more current version of IN01

The IN95 of more than 2 is of an enterprise with good financial health. An enterprise ranging from 1 to 2 is neither ill nor healthy, but it is an enterprise with possible problems. The IN95 with less than 1 is an enterprise with bad financial health. The IN95 was not so strict measure for Czech farms, as with the exception of 2009, the analysis revealed very good financial health although there was a slight decrease of growth rates.

If Czech farms create a positive economic value, this can be measured by the IN99. If a farm reaches the IN99 of greater value than 2.07, the firm has a positive value of economic profit. On the other hand, the IN99 below 0.684 reveals a negative value of economic profit. An interval of „grey zone" is quite broad - it is a zone where there is not a clear situation of an enterprise with a sign of certain problems. The results showed that Czech farms reached unfortunately negative economic values, while the overall average rate is declining. Farms according to this index have more significant problems.

Assessment of the IN01, which is a combination of both creditor´s and owner´s point of view is ranging as follows: of if the value is greater than 1.77, then firms are 67% likely to make profit so that the economic value is positive. On the contrary, the company's existence is threatened if the index is lower than 0.78 and is heading for bankruptcy with probability of 86%. As in previous cases, the tendency is a general decrease of an average rate of growth; however, the results for each year are diverse. Years rated positively can be described only in 2004 and 2007. Negative values were revealed only in 2009. The other years, had to be evaluated as the grey zone.

Updating the empirical analysis of the IN01 is made by the IN05. A situation with index> 1.6 is evaluated as satisfactory and vice versa the situation with an index value below 0.9 is described as serious financial problems. The overall assessment and values are almost the same as the IN01.

Enterprise´s value by the Kralicek Quick test is determined by the score in the sub-calculations. A value of more than 3 means that an enterprise is reputable, values in the range of 1-3 mean the grey zone, values of less than 1 indicate problems in the

financial management of an enterprise. The above mentioned table shows that values above 3 were achieved in all years (except 2009, although there was only a small deviation). This model evaluated farms as creditworthy – they have sufficient financial stability and profit situation.

The higher the credibility index reached; the financially better economic situation of an enterprise. More precise conclusions can be pronounced using the following rating scale: -3 to -2 (extremely poor), -2 to -1 (very bad) -1 to 0 (poor), 0 to +1 (some problems), +1 to +2 (good), +2 to +3 (extremely good). The results obtained showed that financially economic situation is relatively stable, because enterprises are mostly located in the interval of about 1 and therefore can be evaluated as well as certain problems.

To evaluate the financial health by the methodology of the Ministry of Agriculture, 9 economic indicators are used (profitability, stability, activity and liquidity), which are allocated by the results of achieved points. Overall, a maximum of 31 points can be reached. The calculation is performed for each year and the final score for the assessment is the arithmetic average of the last three years. Farms are then divided by the number of points assigned to categories A, B, C, D, E (farms in category A are more than 25 points; in B over 17 points; in C over 15 points; and D and E, i.e. less than 15 points are excluded from the evaluation of the possibility of obtaining a subsidy). The analysis showed a very good position of selected farms. All were classified as A in almost all years (except 2009, although only very tightly). The average score was at the level of about 27 points. Based on these positive results, unlike other ratio systems, this index can be considered as less strict. Here, it is perhaps speculative to believe it could be an MA plan that most farms received options to achieve the EU resources.

Model IN95 evaluation was extended to the calculation by legal form and by the share LFA (table 12).

Table 12: Model IN95 by legal form and by share LFA

Item	2004	2005	2006	2007	2008	2009	2010	Ø growth
IN 95 – legal form								
PLC´s	4,94	2,88	2,86	4,96	5,16	0,61	4,94	0,9760
Cooperatives	4,41	3,58	2,77	4,88	3,17	0,67	4,41	0,9581
Individuals	112,65	13,87	7,96	4,37	3,75	1,08	112,65	0,5044
Ltd.´s	6,66	4,56	3,24	5,01	4,03	2,99	6,66	0,9654
IN 95 – share LFA								
Mountain	4,92	5,73	3,77	5,24	6,04	-0,39	4,91	0,9996
Other	6,66	3,22	2,80	4,98	2,49	1,29	4,18	0,9252
Outside	12,03	3,75	3,34	4,66	4,85	1,64	2,75	0,7821
Ambivalent	4,19	2,38	2,32	5,23	3,82	1,55	4,13	0,9973

Source: own calculations

According to the IN95, which is based on the Czech conditions, the Ltd.´s reached the highest average value of the indicator (4.5) i.e. that were able to meet their obligations - and even in 2009, when the value of other legal forms fell below 1 (i.e. the possible insolvency). The PLC´s and cooperatives had the same development of

indicators (with the average of 3.5); the similar development was in the average farm (unsorted). Overall rating of the IN95 areas was satisfactory for all types of LFA (with 3 as the average) and can therefore be stated that no influence of different farming conditions on the credibility of enterprises was found.

Conclusion

The paper was dealing with assessing financial situation of farms in the Czech Republic after the EU accession in 2004. The analysis was based on a sample of farms gathered at the University of South Bohemia every year. The analysis revealed the following conclusions:

An average farm realized an average profit of 3.2 million CZK during the time of monitoring (with the exception of 2009). Profitability can be considered in terms of the positive values of its component indicators as positive; however, the average value did not exceed 4%, which is already satisfactory. Here it is necessary to emphasize the character of agricultural production -the influence of climatic conditions. Even the best manager cannot eliminate this factor significantly in their plans and actions. A typical example is this year's floods that hit most of the country. The estimate of the damage by the Agrarian Chamber of the Czech Republic said the floods would be devastating for many farmers. Due to the specifics of the agricultural sector and its functions the CAP is implemented.

In compliance with Czech accounting legislation, most of the subsidies is a part of other operating income (excluding the RDP – Axis II, OP RD, and SAPARD). The share of these total subsidies – excluding on investments in operating as well as total income was approximately 16% with an average growth rate of 3%. The values of profit/loss and total profitability without subsidies are, however, alarming. Without subsidies, the farms would report a loss (9 million CZK in average) connected to negative profitability. The long-term unprofitable agricultural production is dependent on high alert subsidies. Therefore, it is not possible to say that entering the EU would significantly improved the profitability by other way than the subsidies (Lososová, Svoboda, 2013).

A very positive feature was the liquidity that achieved generally accepted positive values. The total debt that did not exceed 50% was satisfactory as well. Although it should be noted that long-term under-funding of the agricultural sector binds necessity of long-term investment, financed by long-term bank loans (in the case of co-financing by investment subsidies from the EU funds). Interest payments on these loans cause financial loss of about 1 million CZK every year.

Due to a decrease of a number of workers in agriculture, labour productivity calculated as revenue per worker increases. On the other hand, added value (not including operation subsidies) does not change much. Probably, this is one of possible explanation for decreasing of average wages is agriculture (compared to other sectors by about 21%). An increase of wages has to be supported by an increase of labour productivity in order to ensure healthy development of a farm and not to make economic situation worse.

The assessment of farms by bankruptcy and value models proved that majority of farms are of good financial health. They ranged in outer limits of positive ratings. The best results were scored by the financial health model by the Czech Ministry of

Agriculture. This was not as surprising as the model is prepared for conditions of the Czech agrarian sector. On the other hand, in spite of relatively positive evaluation of value or bankruptcy risks, farms did not create economic added value (EVA) measured by the Czech IN99.

Best results are achieved in a limited liability company in most indicators. This is due to the structure of farms classified as small in the sample; however they were mostly focused on livestock production. The lack of effect of scale is offset by higher subsidies per hectare of agricultural land, which ultimately means higher performance of the group.

Rate by this sort has the closest connection to wage subsidies (especially in the HRDP measures / RDP). In particular, for that reason, mountain area can be considered the most profitable group, but in terms of labour productivity without subsidies, this group reported the worst rating.

Subsidies therefore help to balance economic drops thanks to the LFA farming, but this group is closer to productivity of the average farm. However, the highest labour productivity was reported in areas outside LFA.

Overall analysis revealed that there is a tight relation to the CAP subsidy policy. Czech Republic was one of such states which was reconciling the principles and procedures of this policy, up to the level of 100% of the subsidies that were paid in the old EU member states. In subsequent years, the country is going to have fully functional system of the CAP. However, as always there is a correction of the parameters, the newly updated system will show how such change could affect Czech agrarian sector.

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