Development of farms according to the LFA classification

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Abstract: The aim of the paper is to assess the situation and development of Czech agriculture by the production and economic ratios of a sample of farms. The development is evaluated using a database of farms from the Czech Republic since 2000, divided by the share of land included in the LFA. The year 2011 revealed a significant improvement in economic indicators over the previous year. A positive profit appeared in 95% of enterprises and economic results approached the results of 2007. An important trend is the reduction in the number of workers, when in 2011 the number of workers was equal to 70% to that in 2000, while labour productivity is increasing annually by an average of 7%. In the structure of production, the average farm revealed a revenue growth of crop production, the revenue from livestock production was declining, although the opposite trend appeared in mountain areas. In all categories of farms, there is a growing dependence on subsidies. Although the year 2011 was the second most productive since 2000, the profit after deducting subsidies was reached by 13% of farms only.

Key words: labour productivity, LFA, profit/loss, profitability, subsidies

In the nineties, Czech agriculture went through significant restructuring, not only as a sector but also in the terms of the ownership structure, reflecting the specific problems that the sector has not fully equalized. Another important milestone for Czech agriculture was the entry into the EU, which meant several changes for agriculture. Agriculture in the Czech Republic had to gradually adapt to the system of market regulation, the development of European legislation and had to adopt the rules of the deformed financing of agriculture in the New Member States granted them until 2013 by the Accession Treaty, that has only been a portion of the direct payments of the EU-15 countries.

In the long term, there has been a decline in the acreage of agricultural land since 2000, the area has decreased by 1.2%; and by 3.1% in arable land. On the other hand, the area of grassland increased by 4.1% (MA 2012a). The area structure of agricultural land is very diverse and shows important differences between the enterprises of legal persons and natural persons. Farms with an area of over 500 ha have represented more than 70% of the total (CSO 2012a).

The long-term trend has brought about the reduction of employment in agriculture, forestry and fisheries, where the proportion of workers in these sectors in the total employment of the national economy of the Czech Republic decreased from 4.8% in 2000 to 3.2% in 2011. At the same time, as in most European countries, aging of the farming population has been appearing.

The total production of agriculture in constant prices of 2000 revealed an average growth rate of 0.5%. The increase has been caused by a growth of plant production. Livestock production revealed a slight average decrease. Of the total harvested area of cereals in the Czech Republic in 2011, the largest share accounted for wheat and barley. The volume of cereal production in 2011 revealed a significant year-to-year increase of 20.5% and the third best harvest in the largest share last 20 years. The cattle population showed a slight decrease, the average dairy cow population fell by 1.2%, but, mainly due to the increased yield, the total milk production increased. The long-term continuing significant decline in the number of pigs in the Czech Republic and the decline of poultry appeared as well (MA 2012b).

In 2011, there was a year-to-year increase of agricultural products price by 19.1%, mainly due to cereals and oil plants regarding plant production, and due to milk and poultry regarding animal production. The production value of agriculture revealed an increase of 14.4% in the comparison of 2011 and 2010 (CSO 2012b).

Long-term favourable labour productivity figures were reported by the farms aimed at keeping suckler

cows. High operating subsidies, such as the LFA payments and payments for agri-environmental programs, allowed those farms to cover the total costs and to make a profit. Very low levels of profit were, on the contrary, reached by small farms with mixed production (MA 2012b).

METHODOLOGY AND LITERATURE REVIEW

The aim of the paper is to assess the situation and developments of Czech agriculture using production and economic indicators of a sample of farms classified by a share of land in the LFA. The results reported in the paper are the outputs of a research of a sample of farms classified into three groups by a ratio of the LFA and total agricultural area. The farms are classified by the FADN methodology (Farm ... 2012) as:

– Mountain areas (LFA M) – more than 50% of the area of the agricultural land in mountain LFA;
– Other LFA (LFA O) – more than 50% of the area of the agricultural land in the LFA other and specific, LFA M is less than 50%;
– NON-LFA – more than 50% of the area of the agricultural land is outside the LFA.

The paper used its own database of the sample survey of farms in the years 2000–2011, which contained 1456 observations. 24% of farms were in the mountain LFA, 40% in other LFA and 36% in the NON-LFA. Classified by their legal form, 47% of farms were cooperatives, 51% were business companies and 2% were the farms of individual owners.

The development since 2000 was analysed using economic and statistical methods, especially the financial analysis. Some ratios (labour productivity, profit, average wage, subsidies) were re-calculated per constant prices of 2000. The sample consisted of farms that keep accounts so that it includes mostly the farms of legal entities. The crucial data are collected from the copies of financial statements and statistics that are obligatory to be published (Balance Sheet, Profit/Loss Statement, the Annual Statement on Harvest, the Statement on Sowing Areas) completed by an original questionnaire with other production and economic indices.

Disadvantaged areas are inhabited by more than 30% of the population (Střeleček et al. 2010). These areas are characterized by a number of constraints such as a shorter growing season, lower average annual temperatures, poor transport infrastructure, a higher environmental protection and other. Less favoured areas represent 58.9% of the territory in the Czech Republic, of which 23.6% are mountainous areas. Mountainous areas are defined as the areas with a short vegetation period due to the high altitude or steep slope in the lower areas, or a combination of both criteria (the average altitude of the municipality and the cadastral area above 600 m above the sea level or the average elevation within the municipality or the cadastral 500 and 600 m above the sea level, together with slopes over 15% on more than 50% of the total area of land). Other less favoured areas are characterized by low fertility soils and a low population density, which is dependent on the agricultural activity (within the district, the average productivity of agricultural land less than 34 points and the population density of less than 75 inhabitants per 1 km^2 and the share of workers in agriculture, forestry and fishing on the economically active population greater than 8%) and the areas with specific handicaps are defined as those with the soil with a low fertility combined with higher costs of farming due to the slope of the land (MA 2010).

Different comparative analysis methods of classification have been used to classify the farms such as by the type of production by the FADN classification expressed in the form of the standard gross margin (Divila 2001), or by the agricultural production areas, or by the legal forms (Grznár and Szabo 2000). Tavernier and Tolomeo (2004) studied the relationship between the farm size and sustainable agriculture for different classes of farms. Daskalopoulou and Petrou (2002) used an ideal typology of farms in order to identify different types of farms according to their mode of survival, and the possibility to adopt alternative enterprises. Different authors suggested various methodologies to establish the farm types. Duvernoy (2000) successfully used the land cover as a criterion to identify the farm types.

Many factors in the national economy, outside the field of agricultural policy, have an impact on the farm revenue and income. The overall prosperity of farm producers is inevitably tied to the welfare of the entire population, the national employment or unemployment, international trade, monetary and fiscal policies. Furthermore, any changes in the macroeconomic environment are likely to have major effects on agriculture, taking as an example the latest global economic crisis (Zawojska 2009). The number of farms in Europe has continuously declined (Glauben et al. 2006; Breustedt and Glauben 2007). Farm exits accelerate the growth of the remaining farms by the redistribution of production factors. The declining number of farms not only has consequences for the agricultural sector but also for rural areas as a whole

(Zimmermann et al. 2009). The loss of farms may lead to a depopulation of the countryside, which in turn affects the demand for services and the infrastructure of local communities (Ballas et al. 2006; Piorr et al. 2009). Agriculture ensures the physical existence of the population and it creates a fund of basic foodstuffs. In addition, it produces non-food commodities as well as being a region forming and political element. It fulfils the function of an internal political stabilising factor and it is a requirement for an overall balanced development (Vošta 2010).

Čechura (2009) deals with the analysis of technical efficiency and the total factor productivity in Czech agriculture. The most important factors which determine both technical efficiency and total factor productivity are the factors connected with the institutional and economic changes, in particular a dramatic increase in the imports of meat and increasing subsidies. Grznár et al. (2009) in their analyses indicate that the main cause of disparities in Slovak agriculture compared to the EU advanced countries is a low level of the cost management and wrong strategic decisions on the production intensity. Kopta (2006) elaborated an analysis of farms that really went bankrupt, which revealed that the farms are in danger due to both the long-term negative profitability and by the steep fluctuation of the profit/loss followed by the negative cash flow from operations and financial insolvency. The permanently low or negative profitability affects especially farms in the mountain and sub-mountain regions. The profit/loss of such holdings was negative but without major fluctuations.

Production agriculture is heavily supported by the political and economic instruments, especially in the form of grant support. It is necessary to keep analysing the effectiveness of these supports. Kroupová and Malý (2010) argue that the analyzed political and economic instruments of the subsidy policy in the form of direct support of production has not been having a clear positive impact on improving the performance of organic farms. In the context of the EU CAP reform, the elimination of direct payments after 2013 was proposed. To what extent such changes could affect the dynamics of land use in Europe, including the impact of structural changes and the environment, these are the problems addressed, e.g. by Uthes et al. (2011). They concluded that the abolition of direct payments would be the hardest for regions with less favourable conditions for agriculture, the least affected would be the relatively competitive sectors and industries with a highly diversified agro-tourist potential, good marketing and sales structure. Acs et al. (2010) point to a real risk of land abandonment in mountain areas and reducing the numbers of cattle. Offermann et al. (2009) examine the status of organic farms. The results show that the specific support for organic agriculture will continue to play an important role in the profitability of organic farms.

RESULTS AND DISCUSSION

Land resources

Land resources of the average farm decreased during the evaluated period by 2%, while the area of arable land decreased minimally, in 2011, it was by about 0.02% lower than in 2000, while the acreage of permanent grassland (PG) was significantly reduced by 5.5%. In the period of 2000–2011, the average farm in the LFA M reduced the area of agricultural land by 16%, the proportion of the PG increased from 40% to 52% of agricultural land, arable land decreased from 59% to 48%. The LFA O decreased the share of agricultural land by 3.6%, arable land and grassland to farmland did not changed. In the NON-LFA, the acreage of farmland increased by 6.5% in the period, while the share of arable land in the total area increased from 85% to 89% and the PG share fell from 14% to 10%. In all reporting categories, the share of the rented land in the total utilized land of the average farm decreased, the share of the rented land in 2000 was 96% and in 2011 91% only. The largest reduction in the rented land was in the LFA M (7.3 percentage points – p.p.), in the LFA O it decreased by 5.1 p.p. and in the NON-LFA by 3.1 p.p.

Structure of production

The volume of production (total revenue) at current prices of the average farm increased from 60.8 million CZK in 2000 to 86.9 million CZK in 2011, the production volume increased in all regions, the fastest in the NON-LFA (50%), followed by the LFA O (40%) and in the LFA M only by about 12%. As mentioned, regarding production in constant prices of 2000, in the LFA M a decrease by 14% was noted; in other areas a slight increase occurred (in the LFA O by 7% and in the NON-LFA by 15%).

Figure 1 shows the evolution of the share of crop and livestock production in the total production (the remainder to 100%, the share of non-agricultural production). In disadvantaged areas (both mountain and others), the relationship between the animal and crop

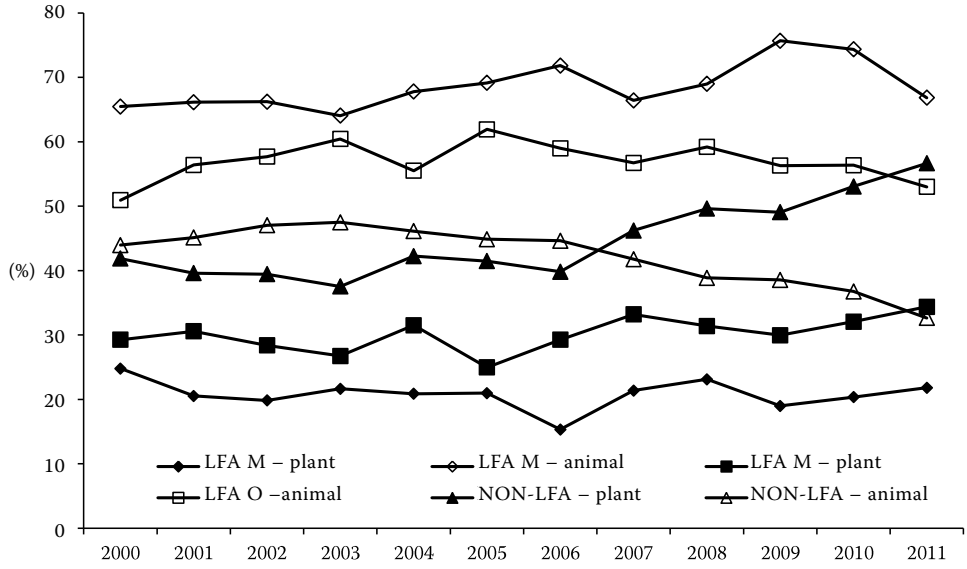

Figure 1. Share of animal and plant production in the total production

Source: Original survey of sample farms

production is maintained at a roughly constant level. In the LFA M, there is the ratio of 3.3, in the LFA O 1.9 in average. A significant shift in the production structure occurred in the production areas – a shift of revenues from animal production towards crop production; since 2007, crop production is crucial and its share of the income is still growing.

The monitored period is characterized by the growth of production and yield of cereals. The proportion of cereal farmland showed no trend. It reached about 30% in the LFA M, around 40% in the LFA O and about 50% in the NON-LFA. The sown area of winter wheat decreased in the LFA – for farms in the mountain areas by 2.4 hectares per year, in the LFA O by 0.5 hectares per year, while outside the LFA it increased by 14.7 ha annually. Sown areas of spring barley revealed a declining trend in all areas, which is the most pronounced in the NON-LFA. The proportion of rape was around 6% in the LFA M and over 10% in all other areas, the percentage was generally increasing rapidly in the NON-LFA (by 0.33 percentage points per year). The proportion of root crops ranges from 1.5% in the LFA O and M and around 4% in the NON-LFA, with the fact that this share was slightly decreased.

Cereal yields reported an increase with strong annual oscillations. For winter wheat, the average yield achieved in 2011 was 5.46 t/ha in the LFA M (with the average annual growth of 0.074 t/ha) 5.52 t/ha in the LFA O (with average annual growth of 0.07 t/ha) and 6.48 t/ha in the NON-LFA (with an average annual growth of 0.11 t/ha). Yields of the rapeseed in the period oscillated more strongly around an average value of 3 t/ha. The differences between the regions were negligible.

The density of cattle per 1 hectare of agricultural land was declining, the fastest decrease was revealed in production areas (an average of 0.55 heads/100 ha per year), a slight increase was achieved only in the LFA M (about 0.16 heads/100 ha per year). Given the increase in the yield in average by 0.3% in the LFA O and M and 1% in the NON-LFA, beef production was slightly increasing. According to the analysis of Foltýn et al. (2010), all model results (without subsidies as well as with subsidies) with the current intensity of fattening cattle show a negative profitability of this sector. A prerequisite for achieving positive results in the sector would be a necessary increase of the intensity of the fattening level by at least 0.9 kg/day. In our group of farms, such performance is only the average enterprise in the NON-LFA and only in some years, e.g. in 2011 the daily performance reached 0.81 kg (in the LFA M) and 0.86 kg (in the LFA O) and 0.89 kg (in the NON-LFA).

The conditions for the production and processing of milk after joining the EU were influenced by the adoption of the common organization of the market in milk and the allocation of national quotas of 2682.1 thousand tons of milk. Although the quota for the Czech Republic was not always met, it represented a limiting factor for many producers. Although the population of cows in the average farm was not changed significantly, due to the growth in the sales of milk the yield increases in all areas. The average annual milk yield compared to 2000 increased from 5039 litres per cow per year to 6972 l in 2011, with the largest increase occurring in the NON-LFA (49%), in the LFA M it increased by 30% and by 35% in the LFA O compared to 2000 (Figure 2).

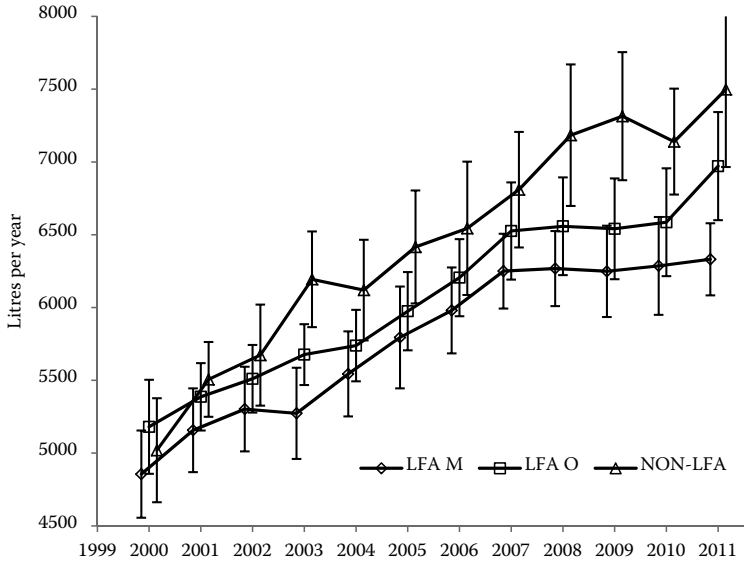

Figure 2. Development of the annual milk yield (95% confidence intervals)

Source: Original survey of sample farms

A significant long-term trend was the reducing of the number of pigs. The integration into the EU single market has put the pork production sector under a strong competitive pressure. Of all animal commodities, pig production underwent the most significant decline after 2004, not only because of the lower production efficiency of animals for slaughter and the lower competitiveness of the manufacturing industry, but also due to the unfavourable developments in the world and Europe (Baška 2010). The number of pigs in the average farm declined since 2000 from 920 heads to 449, i.e. by 51%. The most significant decrease occurred in the mountain LFA (from 505 to 145 heads, a decrease by 71%), followed by the NON-LFA (from 1393 to 559 animals, a decrease by 60%). The slowest decrease of the number of pigs occurred in the LFA M (35%, Figure 3). Sales of slaughter pigs in kg of liveweight decreased rapidly in mountain areas (28 831 kg per enterprise in 2011, the average decrease was of 8% per year), the LFA M reported a decrease to 50 340 kg (a decrease of 7% per year) and the 12 5941 kg in the NON-LFA (the average decrease of 4% per year).

Efficiency of production factors

The relation of the revenue to farmland is characterizing the intensity of production, the relation of the revenue to the average number of workers is characterizing labour productivity, and the relation of revenue to assets is characterized by activity indicators. Increasing the amount of revenue in case of profitable production in the base period leads to returns to scale. Labour productivity growth leads to a theoretical savings of workers connected with

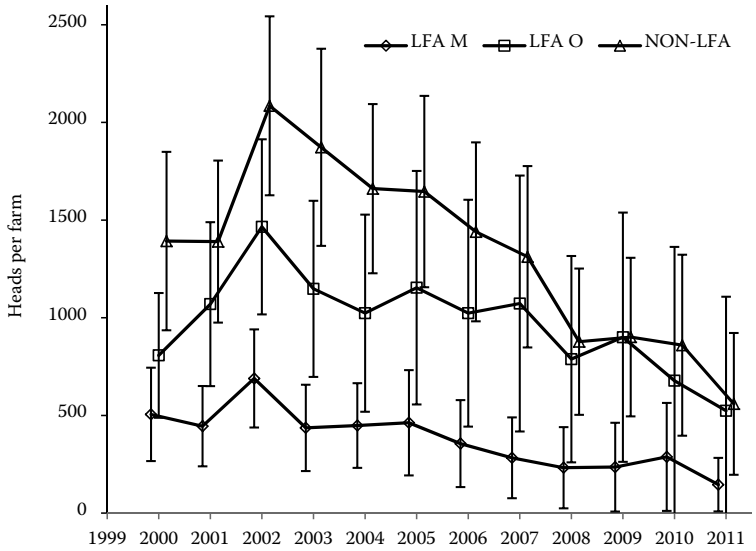

Figure 3. Development of the number of pigs (95% confidence intervals)

Source: Original survey of sample farms

the savings of labour costs. Reducing the revenue for the otherwise constant conditions leads to a reduction in the efficiency of the use of basic production factors and the associated additional costs.

The intensity of production at constant prices of 2000 showed a slightly increasing trend, the fastest growing in the LFA M, with an average of 0.97% per year – to 37 156 CZK per ha. The highest intensity of production was in the NON-LFA in 2011, the volume of revenues at constant prices per hectare of agricultural land reached to 44 751 CZK with the average annual growth of 0.69%. In mountainous areas, the revenue reached to 31 265 CZK per ha with an average growth of 0.27% per year. The average intensity of production of the farms in the LFA M reached 70.5% of the intensity of the farms in the NON-LFA. A lower intensity of production was mainly associated with extensive farming systems, which are characterized by lower inputs, but often a considerably lower output than intensive farming.

The tangible assets turnover ratio expresses the ability of assets to generate revenues. The values of this indicator did not show a clear trend. The indicator was oscillating due to the oscillation of yields, in the LFA M; its values were around 1; in the LFA O its values were of around 1.1 and in the NON-LFA at around 1.3. Intensive farming was placing greater demands on the technical equipment (as tangible assets in the NON-LFA were by 67% greater than in the LFA M), but its transformation into revenue is also greater.

Labour productivity at constant 2000 prices was growing the fastest in the LFA O (Figure 4). In the LFA M in 2011, it was 975 thousand CZK per 1 worker, which is an increase by 44% compared to 2000. In the LFA O, it was 1198 thousand CZK (65% increase) and in the NON-LFA, it reached 1335 thousand CZK, which is an increase by 54% compared to 2000. The causes of the increase in labour productivity among areas are different; their effect on the change in labour productivity can be quantified using methods such as logarithms indices. In mountain areas, labour productivity increased by 423 thousand CZK as an effect of reducing the number of workers together with a slight decrease in the volume of output at constant prices. The LFA O labour productivity growth is explained mainly by the decreasing number of workers (about 404 thousand CZK), and a slight increase of production (66 thousand CZK). In the NON-LFA, the influence of the output growth was the strongest (it caused an increase in productivity of 150 thousand CZK) and the decrease in the number of workers explained productivity growth of about 317 thousand CZK.

The decline of workers is a significant trend during the observed period. The number of employees in the average farm declined in the mountainous areas from 69 to 41 (i.e. to 60%) compared to 2000; in the NON-LFA to 66 workers in 2011 compared 88 workers in 2000 (to 75%). The LFA M share of cultivated land per 1 worker increased to 31.2 in 2011 compared to 22.3 ha in 2000. In the LFA O, it increased from 21.8 ha to 32.2 ha. An increase from 20.9 ha to 29.8 ha per 1 worker occurred in the NON-LFA. Employment in Czech agriculture indicates a possible further decline in the employment opportunities, particularly in the relation to reducing the livestock production and the pressure to increase the production efficiency. The LFA efforts to develop extensive farming cause a considerable reduction of jobs. The importance of agriculture for rural employment has been reduced permanently (Baška et al. 2010).

The average annual wage in current prices amounted to 126 thousand CZK in 2000 and it grew to almost

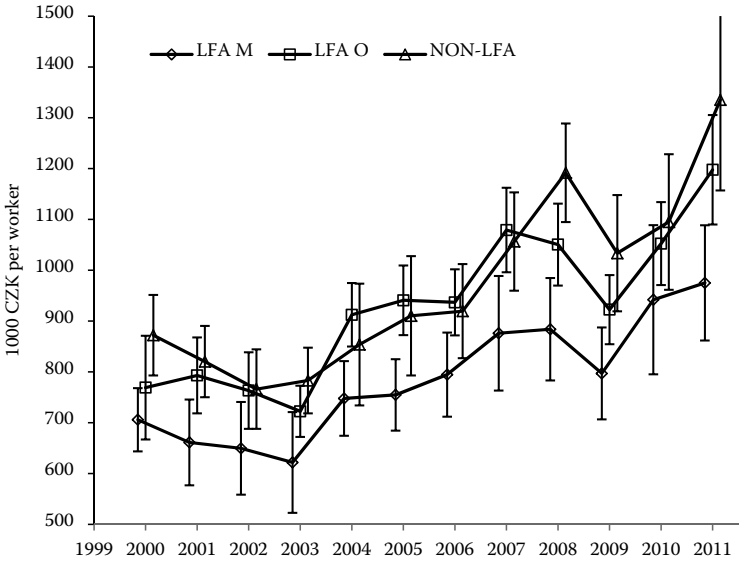

Figure 4. Labour productivity at constant 2000 prices (95% confidence intervals)

Source: Original survey of sample farms

double in 2011, i.e. to 244 thousand CZK, with an average growth rate of 6% per year; the average annual wage was 231 thousand CZK in the mountain area in 2011 and 247 thousand CZK in the NON-LFA. Till 2011, wages converted to constant 2000 prices increased by 45% in the mountainous region; by 52% in the LFA O and by 43% in the NON-LFA. In comparison with the national economy during the period, the income disparity of agriculture decreased slightly from 79% in 2000 to 83% of the average wage in 2011 (CSO 2012b).

Profit/loss

The overall economic indicator of any company is the volume profit or loss. For our analysis and to maintain the comparability of data, the profit before tax adjusted per 1 hectare of agricultural land was monitored. Profit in this form is an expression of both the efficiency and the economy of the manufacturing process, significantly affected by the conditions of realization in addition to costs. During the reporting period, there were significant declines in profits in 2002, 2003 and 2009; the average profitability of farms was negative. The best profit was achieved in 2007 due to the extremely favourable climatic and economic conditions. The year 2011 saw mainly the second best result for the entire period, in the NON-LFA, the profitability was even higher than in 2007. Calculated per 1 hectare of agricultural land, the profit before tax reached 3037 CZK/ha in the LFA M, 3532 CZK/ha in the LFA O and 5056 CZK per ha in the NON-LFA.

One of the important elements of economic evaluation is to assess the effectiveness of the results of the management which is to assess the distribution of companies by the return on capital. If the distribution of companies is platykurtic, then there are significant reserves in the corporate governance in the frame of real economic conditions. On the other hand, the leptokurtic distribution with a low variability means that the quantitative reserves in management are depleted and a change can only occur due to the qualitative conditions (Střeleček et al. 2012). If we compare the distribution of farms by

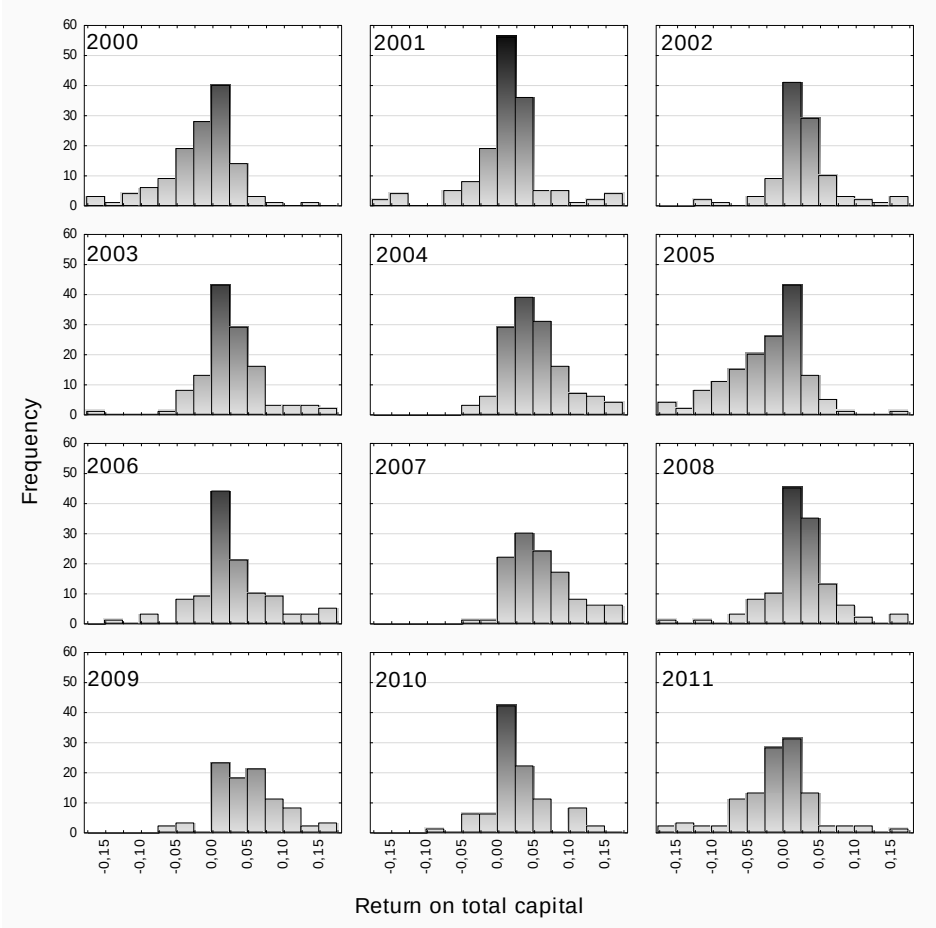

Figure 5. Distribution of farms by the return on total capital

Source: Original survey of sample farms

the size of profit, then it is clear that since 2000, the highest number of farms with a loss occurred in 2003 with 57.7% of farms, followed by 2002 (54.3%) and 54% in 2009. The lowest number of farms registering loss occurred in 2007 with only 1.7% of farms. In 2011, the share of farms with a loss reached to 5.5%. The surface shift in the direction for the worse, or vice versa for a better economic result highlights the growing influence of external factors, especially the prices and climatic conditions (Figure 5).

The basic indicator of profitability is the total profitability of the company. In the terms of business development, only the positive values are important, a negative profitability is always unsatisfactory. If we accept 4% as the lowest acceptable level of profitability, then it is clear that since 2000 the average farm reached this value only in the years 2004, 2007 and 2011. In 2011, the farm profitability in the NON-LFA was 6.23%, in the LFA O it was 4.77% and 4.41% in the LFA M. The number of farms with more than 4% profitability was highest in 2007 (64%); in 2011 it returned to 58%.

Development of subsidies

As shown in the figure revealing subsidies at constant prices converted per 1 hectare of agricultural land (Figure 6), the largest annual increase in subsidies occurred with the entry to the EU in 2004. In the first three years after, the growth of subsidies was the most dynamic. The average growth rate of subsidies since 2000 in constant prices was 9% in mountain areas, 8% in the LFA O and 7% in the NON-LFA. In 2011, the volume of subsidies in constant price was 8463 CZK/ha of agricultural land in mountain areas; 6723 CZK/ha in the LFA O and 6116 CZK/ha in the NON-LFA. Subtracting subsidies from the profit before tax, the average farm in all areas was in a loss, its trend was significantly increasing, and the sharpest decline in the profit after the deduction of subsidies would occur in the mountain areas. The proportion of farms that would make a profit after the deduction of subsidy varied from 0.8% (2006) to 22% (2001). In 2011, it was 13% of farms with profit without subsidies, two thirds of these farms were in the NON-LFA and one third in the LFA O, all farms in the mountain areas would report a loss.

If we subtracted subsidies from the revenues at constant 2000 prices calculated per 1 hectare of agricultural land, the revenues would fluctuate at around 30 thousand CZK/ha in the LFA O; and at around 40 thousand CZK/ha in the NON-LFA. In the mountain areas, a slight downward trend in the revenues without subsidies was reported by an average of 1.6%. In 2011, the revenue at constant prices without subsidies in the mountain area reached to 22.8 thousand CZK per ha. The share of subsidies in the revenues in 2011 amounted to 27% in the mountain areas, to 18% in the LFA O and to 13.7% in the NON-LFA.

The increasing dependence of the economic situation of farms on subsidies is illustrated by the dependence on the subsidies index calculated as the ratio of costs to revenues excluding subsidies; the value of 100% represents the need for subsidies to cover the costs (CSO 2010). The highest value of this indicator in all categories was reported in the crisis year of 2009 (in the LFA M it is equal to 145% and 121% in the NON-LFA). In the subsequent years, this figure varied considerably, the average for the whole period was 122% in the LFA M, 114% in the LFA O and 109% in the NON-LFA.

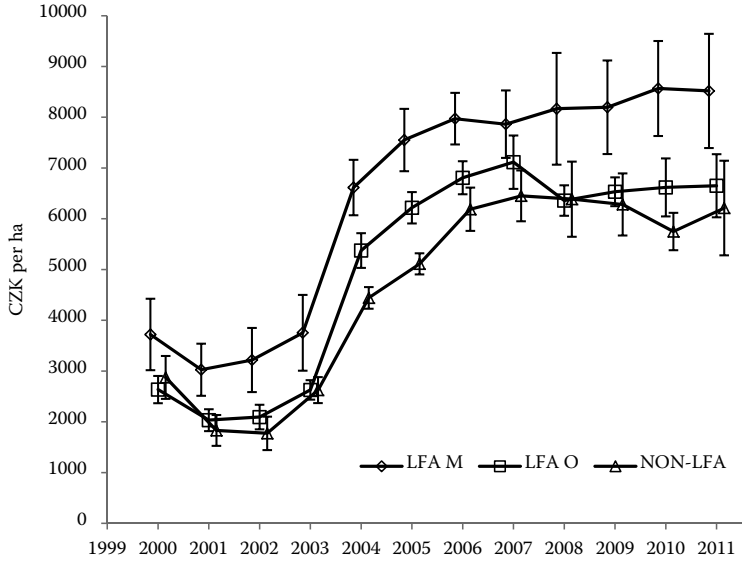

Figure 6. Development of subsidies per 1 hectare of agricultural land in constant 2000 prices (95% CI)

Source: Original survey of sample farms

Indebtedness and liquidity

Debt indicators assess the financial structure of the company in the long term and act as the indicators of the risks to which the company incurs in the structure of equity and debt, but also as a measure of the ability of the company to multiply the return on equity using debt. The debt ratio is the proportion of debt to the total capital; it must be considered together with the total return that the company achieves for the total invested capital in relation to the structure of debt. The debt ratio of the average farm in all areas was decreasing; the average annual change was –0.61 percentage points in the LFA M; –0.63 p.p. in the LFA O and –1.1 p.p. in the NON-LFA. Differences in the debt ratio among the areas were insignificant. In 2011, the value of the debt ratio in the NON-LFA reached 33.4%, 36.4% in the LFA O and 35.9% in the mountain areas.

Liquidity ratios indicate the company's ability to pay its liabilities due in the near future. The company is fully liquid if it has a sufficient amount of cash to cover its liabilities. The key indicator – the current ratio – is derived from the value of current assets, the higher the value, the more favourable is the preservation of the solvency of the company. This indicator should be around 2, in such case it is necessary to take into account the specificities of the agricultural sector, which is associated with the production cycle (storage of the crop production for its realization in the spring) or with a period of fattening animals. Too high values of the current ratio suggest non-productive means in liquid funds and break the operating cycle of the company. The current ratio for an average farm in the NON-LFA was 4.78 in 2011, 3.57 in the LFA O and 4.51 in the LFA M. The values of the current ratio oscillated and no relation between the LFA areas was revealed. However, the recommended interval was exceeded in all the years and in all areas. The deviation to the value of 3 occurred in all regions in 2003 – probably as a result of two consecutive climatically unfavourable years. For the quick ratio, the acceptable values range from 1 to 1.5. Values of the quick ratio ranged within the limit in all areas in this period to 2005 (in 2003 near its lower limit), in the following years, the quick ratio was improving up to the value of 2.17 in the LFA M, 1.44 in the LFA O and 2.18 in the NON-LFA for 2011. Other areas show below-average liquidity during the last 10 years.

Evaluation of the financial health

To evaluate the financial health, the methodology employed in the evaluation of applicants under the Rural Development Programme (SAIF 2011) was used. Indicators according to this methodology slightly differ from the standard content, such as used in the preceding text. Table 1 showed the development of the values of the individual components of the financial health of an average farm in the mountain area. The average farm farming in the mountain LFA achieved the maximum 31 points in most of the years; the decline was only in 2002, 2003 and 2009. The development in other areas for each year was very similar to 2003; an average farm belonged to the B category, to the A category since 2004 (with the exception of the year 2009 in the NON-LFA).

Table 1. Values of the indicators of financial health of the average farm in the LFA M

Indicator	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Size of the sample	30	32	32	28	30	27	27	27	24	21
ROA (%)	–1.34	–1.24	5.59	3.95	3.18	6.30	4.03	0.85	3.53	5.09
Long-term profitability (%)	10.7	9.9	15.6	16.9	25.0	28.9	31.0	29.3	31.1	32.4
Added value/inputs (%)	55.1	53.2	52.4	43.6	36.7	46.3	37.1	23.8	35.4	40.6
Return performance of CF (%)	12.9	13.7	26.9	28.1	29.3	33.8	28.4	29.9	32.9	31.9
Total debt (%)	41.7	40.6	39.8	36.0	39.3	37.7	36.9	37.4	40.2	35.2
Interest coverage	–1.88	–1.96	9.21	7.07	4.95	8.08	4.92	1.02	4.34	5.83
The maturity of debt of CF (years)	6.93	6.43	3.24	2.92	2.99	2.29	2.96	3.61	3.43	2.58
Coverage inventory net working capital	0.90	0.87	1.08	1.30	1.27	1.32	1.20	1.24	1.32	1.37
Total liquidity	2.62	2.41	2.61	3.12	3.13	3.56	3.25	3.32	3.15	3.25
Number of points	24	24	31	31	31	31	31	26	31	31

Source: Original survey of sample farms

Table 2. Relative frequencies of farms meeting the condition of the financial health (in %)

	LFA M	LFA O	NON-LFA
2002	93.3	93.4	94.6
2003	96.9	88.5	89.3
2004	100.0	94.5	98.1
2005	100.0	94.0	93.6
2006	100.0	88.2	97.8
2007	100.0	100.0	97.7
2008	100.0	89.6	97.6
2009	100.0	91.1	92.5
2010	100.0	90.0	97.1
2011	100.0	94.7	96.9

Source: Original survey of sample farms

Based on the above mentioned methodology, the maximum number of points possible to reach was 31, while the number of points obtained by the farms divided them into five categories, as A (more than 25 points), B (> 17 and ≤ 25), C (> 15 and ≤ 17) D (> 12.5 and ≤ 15) and E (> 12.5 and ≤ 9). The farms included in the categories A, B or C, i.e. the farms that reached more than 15 points, are considered as financially healthy. Table 2 showed the share of farms considered financially healthy classified by the LFA in each year. As the table showed, farms in the mountain areas deal best with the unfavourable conditions. On the other hand, most farms classified as D or E in the unfavourable years were in the LFA O.

CONCLUSION

After the accession to the EU and its common market, changes in the Czech agriculture have started to match the approximation to developed countries and adapting to new conditions. An important trend in the development years 2000–2011 was reducing the number of employees, up to 70% of the year 2000. The average annual wage in constant 2000 prices increased since 2000 by 47.5% and the drop in comparison to the average wage in the national economy decreased from 79% to 83%. The proportion of land of an average farm declined during the period by 2%, while the area of arable land did not change much, but the acreage of grassland was reduced. These changes are very different for an average farm in the LFA compared to the NON-LFA. In the mountain areas, grasslands were growing strongly, on the other hand, they declined in the NON-LFA together with an increase of arable land.

Production at constant 2000 prices converted per 1 hectare of agricultural land increased after joining the EU (average 2005–2011) by 6% both in the LFA M and in the NON-LFA; in the LFA O, it increased by 8% compared with the pre-accession period (average 2000–2004). The average rate of growth since 2000 in the LFA M corresponds to 0.3% per year, in the LFA O it was 1% per year and 0.7% in the NON-LFA. The period was characterized by a change in the structure of agricultural production, which varies for the LFA and NON-LFA. The average farm in the NON-LFA decreased the share of revenues from non-agricultural and animal production and increased the share of revenues from crop production. In the mountain areas, however, there increased the revenues from livestock and decreased in the crop production due to grassing and decreased transition to extensive farming. The most noticeable change in the structure of production was a significant long-term decline in breeding pigs caused by both decreased permanently unprofitable production and by decreased increased imports of cheaper meat from abroad (Foltýn and Zedníčková 2010). In the sample, 52% of the breeders stopped pig production during the period.

The intensity of production at constant prices of 2000 showed a slightly increasing trend, the fastest growing in the LFA O by 1% per year in average. The highest intensity of production was revealed in the NON-LFA. The causes of the increase in labour productivity in decreased particular areas were different. In decreased mountain areas, decreased rising labour productivity was due to decreased workforce reduction, together with a slight decrease in the volume of output at constant prices. The LFA O labour productivity growth was influenced more by the decrease in the number of workers with a moderate production growth. In the NON-LFA, there was the fastest growth in production and a lower decrease in workers.

The development of profit/loss led to considerable fluctuations within the period. A significant decline in profits occurred in 2002, 2003 and 2009. The best profit was achieved in 2007 and 2011. In the observed period, a significant surface shift of farms to the worse, or vice versa better economic performance was revealed, which highlighted the crucial influence of external factors. The growing dependence on subsidies was evident in all categories of the LFA. The index of dependence on subsidies was growing, the greatest dependence on subsides occurred in the mountain areas.

The largest annual increase in subsidies occurred with the entry to the EU in 2004. In the first three years after, the growth of subsidies was the most dynamic. In 2011, the volume of subsidies in constant price was 8463 CZK/ha of agricultural land in the mountain areas; 6723 CZK/ha in the LFA O and 6116 CZK per ha in the NON-LFA. Subtracting subsidies from the profit before tax, an average farm in all areas was in a loss, the trend was significantly increasing, and the sharpest decline in the profit after deduction of subsidies would occur in the mountain areas. The influence of subsidies on economic indicators is the most significant the LFA M. Farms in mountain areas are the most dependent on subsides, on the other hand, they best deal with the impact of unfavourable conditions. Subsides are paid as a compensation of lower revenues in less favoured conditions as well as the compensation for the non-production functions and the public services that farmers provide.

REFERENCES

Acs S., Hanley N., Dallimer M., Gaston K.J., Robertson P., Wilson P., Armsworth P.R. (2010): The effect of decoupling on marginal agricultural systems: Implications for farm incomes, land use and upland ecology. Land Use Policy, *27*: 550–563.

Ballas D., Clarke G.P., Wiemers E. (2006): Spatial microsimulation for rural policy analysis in Ireland: the implications of CAP reforms for the national spatial strategy. Journal of Rural Studies, *22*: 367–378.

Baška V. et al. (2010): České zemědělství šest let po vstupu do evropské unie. (Czech Agriculture Six Years after EU Accession.) Praha, ÚZEI; ISBN 978-80-86671-81-9.

Breustedt G., Glauben T. (2007): Driving forces behind exiting from farming in Western Europe. Journal of Agricultural Economics, *58*: 115–127.

Čechura L. (2009): Zdroje a limity růstu agrárního sektoru. (Sources and Limits of Growth of Agrarian Sector.) Praha, Wolters Kluwer ČR; ISBN 978-80-7357-493-2.

CSO (2010): Analýza zemědělství na základě souhrnného zemědělského účtu. (Analysis of agriculture based on the agriculture account.) Available at http://www.czso.cz/csu/2010edicniplan.nsf/p/2134-10 (accessed November 2012).

CSO (2012a): Agrocenzus 2010 – Strukturální šetření v zemědělství a metody zemědělské výroby. Available at http://www.czso.cz/csu/2011edicniplan.nsf/p/2136-11 (accessed November 2012).

CSO (2012b): Časové řady. (Time series.) Available at http://www.czso.cz/csu/redakce.nsf/i/casove_rady (accessed November 2012).

Daskalopoulou I., Petrou A. (2002): Utilising a farm typology to identify potential adopters of alternative farming activities in Greek agriculture. Journal of Rural Studies, *18*: 95–103.

Divila E. (2001): Agrární struktura v České republice – současný stav a předpoklady dalšího vývoje. (Agriculture structure in the Czech Republic – present state and outlook of its development.) Politická ekonomie, *49*: 227–240.

Duvernoy I. (2000): Use of a land cover model to identify farm types in the Misiones agrarian frontier (Argentina). Agriculturals Systems, *64*: 137–149.

Farm Accountancy Data Network (FADN): standard results. Available at http://www.vsbox.cz/fadn/index.htm (accessed August 2012).

Foltýn I. et al. (2010): Predikce rentability zemědělských komodit do roku 2014. (Prediction of Profitability of Agricultural Commodities to 2014.) Praha, ÚZEI (No. 30430/2010-17200).

Foltýn I., Zedníčková I. (2010): Rentabilita zemědělských komodit. (Profitability of Agricultural Commodities.) Praha, ÚZEI; ISBN 978-80-86671-80-2.

Glauben T., Tietje H., Weiss C. (2006): Agriculture on the move: exploring regional differences in farm exit rates in western Germany. Jahrbuch für Regionalwissenschaft, *26*: 103–118.

Grznár M., Szabo L. (2000): Bariéry efektívnosti reprodukčného procesu v agrárnom sektore Slovenskej republiky. (Boundaries in the reproduction process efficiency in the agrarian sector of the Slovak Republic.) Ekonomický časopis, *48*: 333–348.

Grznár M., Szabo L., Jankelová, N. (2009): Agrárny sektor Slovenskej republiky po vstupe do Európskej únie. (The agrarian sector of the Slovak Republic after the entry to the European Union.) Ekonomický časopis, *57*: 903–917.

Kopta D. (2006): Use of indicators in assessing the financial health of farm businesses. In: Proceedings of the international Conference on Hradec Economic Days 2006: Business and Regional Development. Hradec Králové, Feb 7–8, 2006, pp. 245–252; ISBN 978-80-7041-895-6.

Kroupová Z., Malý M. (2010): Analýza nástrojů zemědělské dotační politiky – aplikace produkčních funkcí. (Analysis of agriculture subsidy policy tools – aplication of production function.) Politická ekonomie, *58*: 774–794.

Ministry of Agriculture (2010): Program rozvoje venkova České republiky na období 2007–2013. (Rural Development Programme CR 2007–2013.) Available at http://eagri.cz/public/web/file/130926/prv_srpen2011.pdf. (accessed January 2013).

Ministry of Agriculture (2012a): Situační a výhledová zpráva PŮDA. (Situation and Outlook Report LAND.) Available at http://eagri.cz/public/web/file/181775/Zprava_Puda_kniha_web__1_.pdf (accessed January 2013).

Ministry of Agriculture (2012b): Zpráva o stavu zemědělství ČR za rok 2011 – "Zelená zpráva". (Report on the State of Agriculture in the Czech Republic in 2011). Available at http://www.komora.cz (accessed October 2012).

Offermann F., Nieberg H., Zander K. (2009): Dependency of organic farms on direct payments in selected EU member states: Today and tomorrow. Food Policy, *34*: 273–279.

Piorr A., Ungaro F., Ciancaglini A., Happe K., Sahrbacher A., Sattler C., Uthes S., Zander P. (2009): Integrated assessment of future CAP policies: land use changes, spatial patterns and targeting. Environmental Science & Policy, *12*: 1112–1136.

SAIF (2011): Program rozvoje venkova: Finanční zdraví. (Rural development programme. Financial health.) Available at http://www.szif.cz/irj/portal/anonymous/eafrd/ekonomika (accessed October 2012).

Střeleček F., Kopta D., Lososová J., Zdeněk R. (2012): Economic results of agricultural enterprises in 2010. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, *60*: 315–328.

Střeleček F., Zdeněk R., Lososová J. (2010): Vývoj zaměstnanosti v znevýhodněných oblastech v letech 2002–2006. (Development of employment in less favoured areas in 2002–2006.) Politická ekonomie, *58*: 761–773.

Tavernier E. A., Tolomeo V. (2004): Farm typology and sustainable agriculture: Does size matter? Journal of Sustainable Agriculture, *24*: 33–46.

Uthes S., Piorr A., Zander P., Bieńkowski J., Ungaro F., Dalgaard T., Stolze M., Moschitz M., Schader Ch., Happe K., Sahrbacher A., Damgaard M., Toussaint V., Claudia Sattler C., Reinhardt F.-J., Kjeldsen Ch., Casini L., Müller K. (2011): Regional impacts of abolishing direct payments: An integrated analysis in four European regions. Agricultural Systems, *104*: 110–121.

Vošta M. (2010): Společná zemědělská politika EU a její aplikace v České republice. (Common agricultural policy of the EU and their application in the Czech Republic.) Současná Evropa, No. 2: 127–142.

Zawojska A. (2009): Impact Assessment of the European Union Funds to Support Rural Population and Economy in Poland. In: Proceedings of the International Conference on Economic Science for Rural Development, Jelgava, Latvia, April 23–24, 2009, pp. 150–156.

Zimmermann A., Heckelei T., Domínguez I. P. (2009): Modelling farm structural change for integrated ex-ante assessment: review of methods and determinants. Environmental Science & Policy, *12*: 601–618.

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