FACTORS OF COMPETITIVENESS OF CZECH AGRICULTURAL HOLDINGS

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ABSTRACT

The aim of the paper is to analyse key factors of competitiveness of agricultural holdings in the Czech Republic and compare them between different types of farms. As a criterion of farms' competitiveness from economic performance point of view is used Farm Net Value Added (FNVA) and FNVA per Annual Work Unit (AWU) and from human resources view point is used AWU/100 ha or Family Work Unit (FWU)/ha. Data are obtained from Farm Accountancy Data Network and are observed in time series from 2007 to 2014 according to legal type, economic size of the holding and natural conditions (LFA/non LFA). FNVA in total increased after the economic crisis of 2008–2009 and that the largest companies have also the highest FNVA, both in CZK/ha and in CZK/AWU. Physical persons employ more FWU than AWU/100 ha. The smallest farms use the most AWU/100 ha. However, also the largest companies are relatively labour intensive. Farms in LFA are disadvantaged in terms of the competitiveness (their FNVA per ha and AWU is lower), but the number of AWU/100 ha is the lowest. Despite that competitiveness is an important issue, the agriculture is multifunctional and plays also ecological, social, esthetical and recreational roles that shall be considered.

KEYWORDS:

annual work unit (AWU), competitiveness, family work unit (FWU), Farm net value added (FNVA)

INTRODUCTION

According to OECD (1996) the competitiveness of the entrepreneurships, branches, regions and nations is to create relatively high profit and high employment on sustainable level, while facing international competition. Competitiveness and viability of the agricultural holdings can be therefore assessed from two points of view – economic and social. Performance comparison of business is used since emergence of industrial production (Kožená and Chládek, 2012), but today, the firms cannot observe only economic indicators, but must also accept the environmental and social issues. Important aspect of the competitiveness of companies are recently becoming human resources. "Creating this competitive advantage requires efficient management of the way these resources and capabilities are combined and the development of certain strategies," (Camisón and Fóres, 2015). Competitiveness requires innovation, and especially young employees can bring new ideas and enhance the capacity of organisations to anticipate and prepare for changes.

Therefore, the aim of the paper is to analyse key factors of competitiveness of agricultural holdings in the Czech Republic from two points of view: economic performance and human resources and to compare the indicators between different types of farms. Firstly, there are briefly introduced the methods and indicators of competitiveness' measurement. Then used data from Farm Accountancy Data Network (FADN) of the Czech Republic are described. Next section presents the results and is followed by the discussion. Last section concludes.

THEORETICAL BACKGROUND

Various authors recommend different criteria for competitiveness measurement. "The market-based view of the firm competitiveness believes that a firm can find its competitive advantage by considering the market conditions," (Delbari et al., 2016). The competitiveness of the firm is then formed by its position on the market and by its ability to react on the opportunities and threats coming from outside the company's environment. Basically, the holding shall be able to efficiently sell its products on the markets of goods and services, gain financial sources on the capital market and obtain quality workers on the labour market. On capital market, an important criterion is the value for investors measured by Economic Value Added (EVA). This indicator is defined as Net Operational Profit After Taxes (NOPAT) minus the costs of using capital (calculated as multiplication of the costs of capital and the volume of used capital). The difference between EVA and book profit is that it considers only operational profit, that is adjusted from accountancy bias as there are deducted not only explicit costs of interests, but also implicit costs of own capital. Combination of explicit and implicit costs of loaned and own capital (Weighted Average Costs of Capital – WACC) states the minimal yield that must be achieved by the holding to satisfy the investors. However, in agriculture, the holdings are

mostly of different types than shares companies and the usage of this indicator is limited. Latruffe (2010) gives a complex review of the literature on competitiveness, productivity and efficiency in the agricultural and agri-food sectors. She distinguishes trade and strategic management measures of competitiveness. Among strategic are included cost measures, profitability, and productivity and efficiency. Productivity in agricultural holdings is mostly expressed as the unite of the output on labour unit called AWU (Annual Work Unit) that represents recalculated real number of workers on full-time worker using annual number of working hours.

"On the other hand, the resource-based view of the firm competitiveness believes that a firm can attain competitive advantage by implementing its valuable resources and capabilities," (Delbari et al., 2016). In our article, we focus on economic performance criteria related to profitability and productivity and human resources. Particularly we utilize net added value and labour productivity and labour intensity.

Bahta and Malope (2014) assessed the competitiveness and performance of the agricultural holdings in Botswana using costs and gross margin as key indicators. The results indicated that "farmers incur more cost on feeds, fuel and maintenance and variable costs' pattern across different herd sizes suggests some diseconomies of scale". Also, gross margin generally varies positively with herd size. Hence, the herd size has significant influence on competitiveness of the farms.

Bavorová (2003) assessed the competitiveness of the Czech sugar industry compared to the EU15 during 1996–2000 by calculating labour productivity as the value added per employee. The productivity multiplied six-fold, and increased from making up 54% of the whole food sector´s labour productivity to 223%. Špička (2016) analysed 54 medium and large Czech and Polish poultry meat processors during the period 2008-2013. He used efficiency approach and constructed Malmquist index. "Data Envelopment Analysis and the Kolmogorov-Smirnov test of the differences between the Czech and Polish companies revealed that improvement of the production efficiency of poultry meat processors in Poland was significantly higher than in the Czech Republic," (Špička, 2016). The differences were significant in material and energy productivity, but not in labour and capital productivity.

DATA AND METHODOLOGY

The methodology used for comparison and evaluation is in accordance with the recommendation of the European Commission. Accountancy data were obtained from Czech FADN that regularly surveys a representative sample of agricultural holdings and periodically publishes so-called standard results (a set of statistics calculated from the farm returns). The system of the farm results is displayed at Figure 1. FADN methodology to some extend corresponds to Czech accountancy system, although there

are differences. The most significant is that it includes among agricultural production also wood production and agro-tourism. It does not consider associated production, nor the results of the economy resulting from financial or extraordinary activities of agricultural holding.

Basic indicator that characterize the economic contribution achieved in the agricultural holding from the point of view of the performance of the total operational activities is Farm net value added (FNVA). It is calculated from gross farm income after the deduction of depreciation. It is also recalculated per one AWU that corresponds to 1 800 worked hours per calendar year. FNVA is the results of the work of all workers (family or hired), usage of all capital (own or borrowed) and usage of all land (own or hired) for agricultural production. From human resources viewpoint, it is observed the number of AWU. As the companies have different size, the numbers of AWU is recalculated per 100 hectares and hence express the labour intensity at different farms.

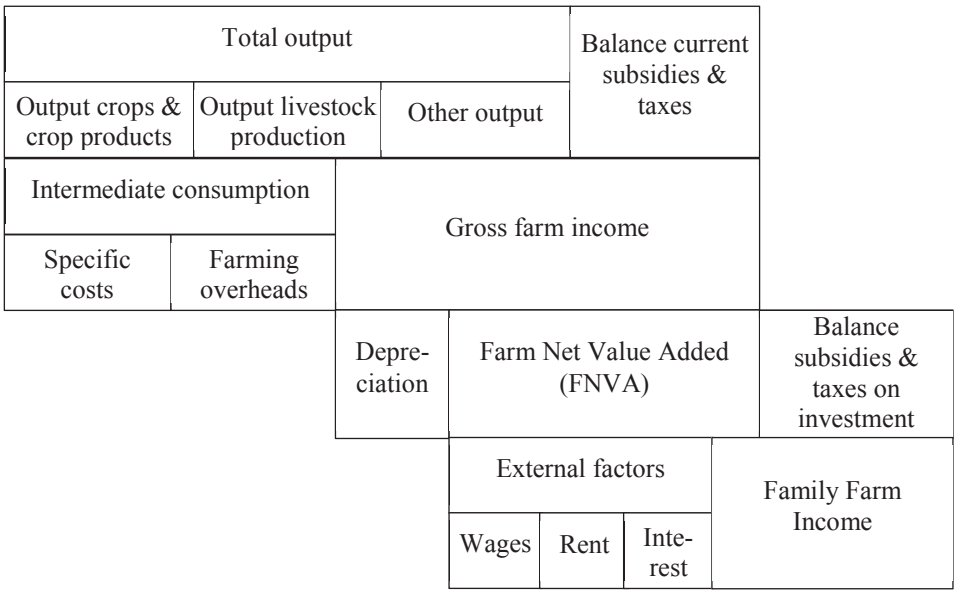

Figure 1: Construction of the FADN indicators. Source: FADN (2017a)

Those indicators are observed in time series from 2007 (when new methodology was launched) to 2014 (last available data). The agricultural holdings are divided based on whether they are owned by legal and physical persons. Consequently, based on economic size that is measured as the total Standard Output (SO) of the holding expressed in euro. SO is the average monetary value of the agricultural output at farm-gate price of each agricultural product (crop or livestock). There are four categories: small (8 000–50 000 EUR), medium (50 001–500 000 EUR), large (500 001–1 000 000 EUR), the largest (over 1 000 000 EUR). Another criterion is the type of the production area, whether the farm is located in less favoured areas (LFA) where the agricultural holdings are disadvantaged in terms of the natural conditions and hence their economic results cannot be fully

comparable to those farms producing in normal conditions. There are two types of LFA – mountainous areas and others.

RESULTS AND DISCUSSION

In order to compare the farms of different sizes FNVA is recalculated per hectare or AWU and number of AWU is on 100 hectares. Figure 2 shows the development of FNVA during the period of 2008 to 2014. This indicator includes physical and legal persons and it is a result for all production areas of agricultural economics. The significant decline of FNVA is evident between years 2007 and 2009, which could be due to economic slowdown in 2008, when the economy as a whole lost its power. Since 2010, the indicator has increased steadily, although between 2011 and 2013 were the absolute increase lower. Hence, the power on the market of the agricultural holdings is increasing.

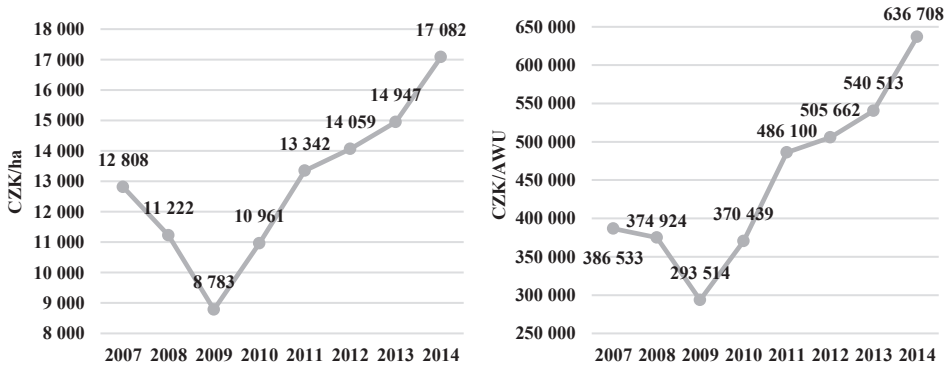

Figure 2: Development of FNVA in total (CZK/ha and CZK/AWU).
Source: own elaboration based on FADN (2017b) data

Regarding the human resources (see Figure 3), the need of paid employees is decreasing. While there was 2.78 of paid and 0.54 non-paid employees per 100 hectares needed in 2007, in 2014 it was only 2.01 and 0.67 respectively. This development is positive for the competitiveness of the agricultural holding in terms of the cost reduction (paid labour force is partially substituted by non-paid / family labour force), but from the social point of view, it reduces the employment in rural areas.

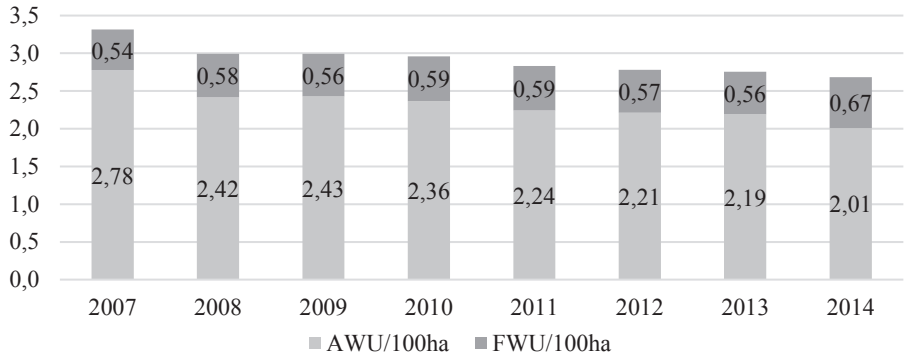

Figure 3: Development of AWU/100 ha and FWU/100 ha.
Source: own elaboration based on FADN (2017b) data

Comparison of FNVA for physical and legal persons can be seen from Figure 4. When we consider results in CZK/ha, we can conclude that throughout the period from 2007 to 2014 FNVA of legal persons accounted by more than 50%, hence the farms were more competitive. The most significant dominance of legal persons was in 2008, the smallest difference on the contrary was in the year 2007 and 2013. Other conclusion can be obtained when compared the results in CZK/AWU. FNVA per employee of physical persons was higher than of legal persons only in 2007. It declined since that until 2010, when the share of FNVA was 48%. The lowest share of physical persons was in 2014 (only 45%). Between 2011 and 2013 the share was relatively similar. Despite that legal persons have usually larger agricultural holdings and more employees, they are more competitive than farms of physical persons as they generate higher FNVA.

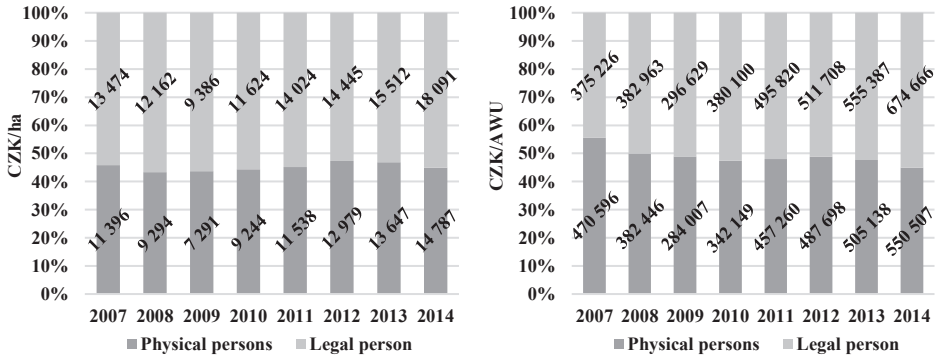

Figure 4: Development of FNVA of physical and legal persons (CZK/ha and CZK/AWU).
Source: own elaboration based on FADN (2017b) data

As it is seen from Figure 5, firms of legal persons employed 3.59 AWU/100 ha in 2007 and only 2.67 in 2014. Hence, the continual effort to reduce the labour costs is pronounced. Physical persons employed only 0.58 AWU/100 ha (naturally, physical persons are using

more FWU than legal persons) and 0.51 in 2017, but contrary to the case of legal persons, there was not a clear declining trend. What is more, the use of family labour force per 100 ha crossed the threshold of 2 in 2010. The need of FWU was the highest and of AWU was the lowest in 2014. There is almost no FWU employed at agricultural holdings of legal persons.

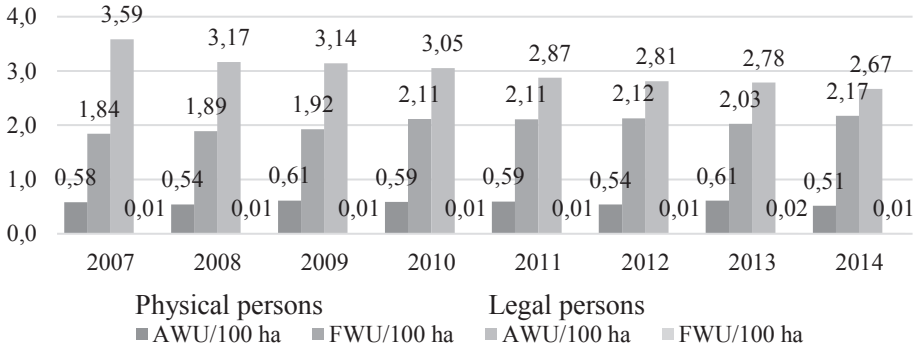

Figure 5: Development of AWU/100 ha and FWU/100 ha at farms of physical and legal persons. Source: own elaboration based on FADN (2017b) data

It can be seen from Figure 6 that the largest companies have also the highest FNVA. On average, the FNVA in small farms was 9 238 CZK per hectare, while the largest had on average 14 660 CZK/ha. Categories of middle and large farms were almost equal in 2009 and did not differ much in other years with exception of 2011. The economic slowdown is again obvious from development in 2008, which resulted in significant decline in 2009 (the FNVA values are lower than in the previous year in all size groups as their competitiveness significantly declined). In crisis years 2008 and 2009 and in 2013, large companies were less competitive than middle sized. Since year 2010 the FNVA gradually increased until 2014, except for small agricultural holdings in the expression of CZK/AWU. Hence, small farms were affected the most by the economic crises in 2008. While the largest farms are the most competitive (create the highest FNVA) when recalculated per 1 hectare of the acreage of the agricultural holding, it is not true when their outputs are given to relation with AWU. In all observed years, FNVA/AWU in the largest companies was always lower than in large companies. However, even large companies were overwhelmed by middle sized companies in years 2007, 2009 and 2010.

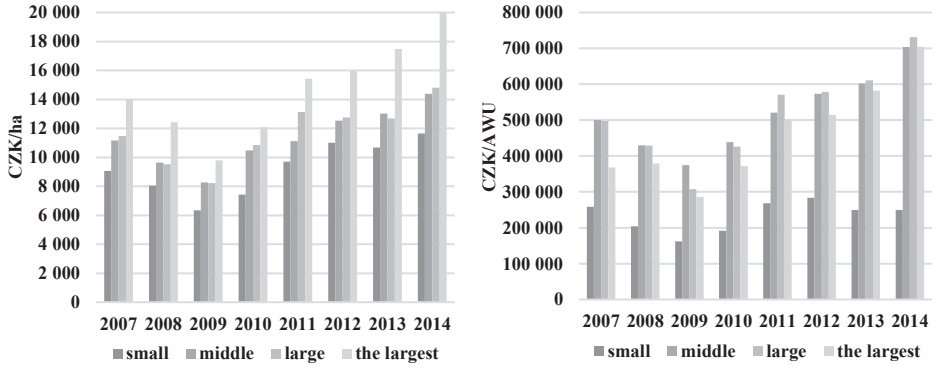

Figure 6: FNVA according to farm size (CZK/ha and CZK/AWU).
Source: own elaboration based on FADN (2017b) data

In terms of annual work units (see Figure 7), small companies are employing the most paid labour force per 100 hectares. The lowest labour intensity points on the fact that the social aspect is pronounced in those companies. The number increased on 4.67 AWU/100 ha in 2014. Also, the largest companies employed high number of AWU/100 ha (3.80 in 2007), but there was a declining trend marked on 2.86 in 2014 as they were trying to cut the labour costs. Labour intensity is almost similar in middle and large firms. While there was 2.23 AWU/100 ha in 2007 in middle-sized companies, there were 2.30 in large firms and the share stayed the same until 2014 (2.04, 2.02 respectively).

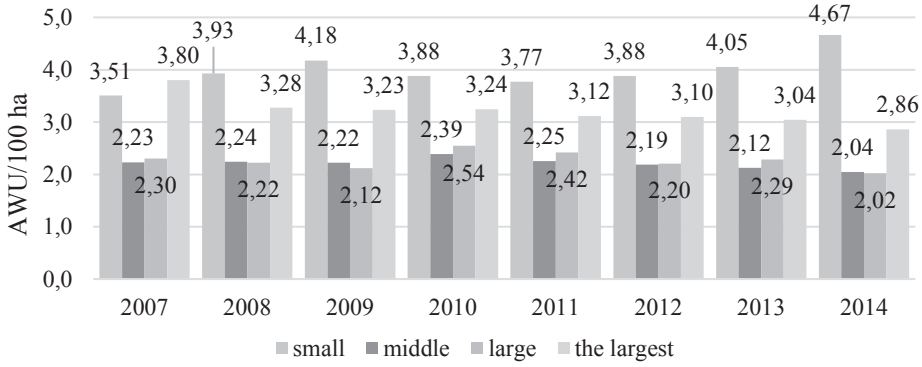

Figure 7: Development of AWU/100 ha according to farm size.
Source: own elaboration based on FADN (2017b) data

Despite that it may seem that larger farms shall be more preferred as they are more competitive (measured by FNVA in CZK per hectare and per AWU), there are other aspects that shall be taken into account. As stated in the definition of OECD (1996) at the beginning of the article, the entrepreneurships shall keep relatively high employment on sustainable level. From this point of view, the smallest farms play important role. Besides, the largest companies also employ quite high number of AWU/100 ha, but the trend is declining as the agricultural holdings are cutting costs.

Besides, the ecological aspect shall be observed. Agricultural holdings perform a multifunctional role in the society. Due to area character of agriculture it forms the countryside, cultivate the land and shall play certain ecological role – e.g. to prevent soil erosion. However, large farms often prefer economic point of view at the expenses of soil. Economy and competitiveness shall not be achieved for the price of environmental pressures generated by farming systems. Especially in LFA, the farming and soil management should be adjusted to the natural conditions.

From Figure 8 can be seen that agricultural holding outside LFA has much higher FNVA and hence are more competitive. On the other hand, the most disadvantaged are mountainous LFA. This implies that the compensations provided to farms in those areas are just as they are justified by their lower competitiveness. After 2009 and the end of economic slowdown the agriculture holdings situated outside LFA generated higher increases of both FNVA in CZK/ha and FNVA in CZK/AWU and this increase was more pronounced than in the case of other LFA and mountainous LFA.

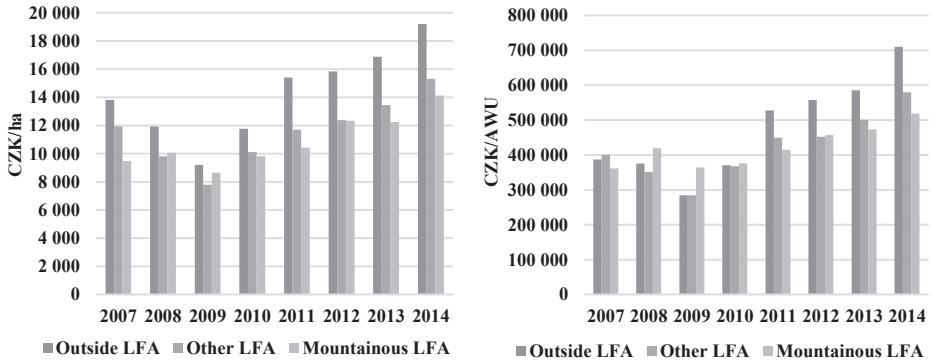

Figure 8: FNVA according to type of area (CZK/ha and CZK/AWU).
Source: own elaboration based on FADN (2017b) data

As it can be observed from Figure 9, the most AWU/100 ha is employed in farms outside LFA. It was 3.57 AWU/100 ha, but declined on 2.70 until 2014. In mountainous areas, the labour intensity is the lowest as there are mainly permanent pastures, which does not need much maintenance. Despite that, the trend is increasing since 2008, when there were 2.40 AWU/100 ha, up to 2.72 AWU/100 ha in 2014. The trend of employment in other LFA areas can be characterized as slightly decreasing.

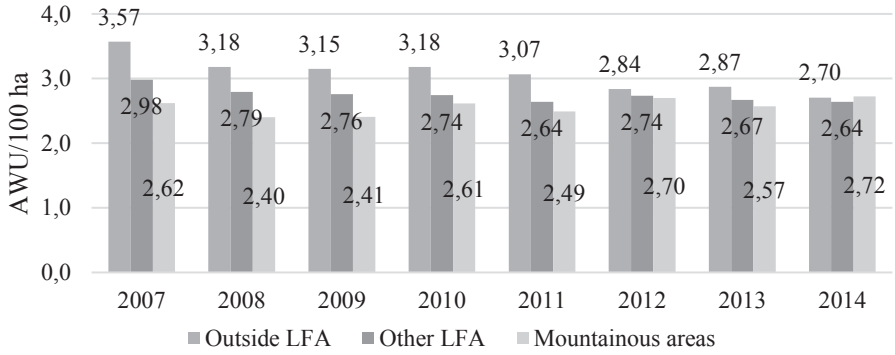

Figure 9: FNVA according to type of area (CZK/ha and CZK/AWU).
Source: own elaboration based on FADN (2017b) data

DISCUSSION

The competitiveness of Czech agricultural holdings declined after the Czech Republic joined the European Union in 2004, because these businesses had to adapt to wider market. Farms were no longer able to compete on the EU single market, the biggest loss recorded pig meat sector Later the farms adapted to the conditions of the single market and the competitiveness of agricultural holdings improved. Recently, the situation on some markets stabilized, but sometimes in some sectors occasional crisis appear. The competitiveness of different types of agricultural holdings measured by FNVA/ha, FNVA/AWU and AWU/100 ha differs based on whether the farm is owned by physical or legal person, is small or large, or located in LFA. Our article provided a detailed comparison. Unfortunately, it is not possible to test, whether the mean indicators of competitiveness among various categories statistically significantly differs. The data are available only in the aggregated form for the whole groups (not individually for each holding), so the statistical t-test about the differences of the mean values cannot be applied.

Our research also has the limitations in the concept of competitiveness. There are other possible ways how to measure the performance and competitiveness of the companies. For example, several indicators can be taken over from annual Reports on the state of Czech agriculture (so-called Green report). There is the efficiency of performance of the agricultural and food companies measured by accountancy value added. Performance is in turn measured by the volume of sales of own products and services.

Despite that competitiveness is an important issue, (Łącka (2015) even states that “states that do not have such strengts of innovation, always achieve a lower level of innovation and consequently are less competitive in the global economy”), it shall not be the only measure of success of Czech farms. Agriculture is multifunctional and taking into account only the economy of farms can lead to exploation of the environment. Agriculture shall be mainly sustatinable – i.e. economically viable and environmental friendly. Hence,

the competitiveness criteria shall be given in future research to the relation with environmental indicators in order to assess the agricultural holdings multicriterially.

CONCLUSION

The goal of this paper was analysing key factors of competitiveness of agricultural holdings in the Czech Republic from two points of view: economic performance and human resources and to compare the indicators between different types of farms. As an indicator of economic performance was chosen Farm Net Value Added (FNVA) and FNVA recalculated per annual work unit (AWU). Then we used labour intensity (AWU and FWU per 100 ha) as social indicator. Different types of farms (owned by legal or physical person), farms of various economic sizes (small, middle, large and the largest) farming in different conditions (inside or outside less favoured areas) were compared. It was found that according to expectations FNVA decreased during economic crises, legal persons, larger agricultural holdings and those farmers farming in non-LFA areas tent to have higher FNVA and hence seem to be more competitive. However, other criteria such as environmental and social shall be taken into account in order to assess the role of the agricultural holdings in a complex way. Despite that the largest farm are the most competitive in terms of FNVA and FNVA/AWU, they also employ relatively high number of employees per 100 ha, but the trend was decreasing. Mainly the most labour intensive were small farms, farms outside LFA and owned by physical persons. However, the last-mentioned type of farms used much more family work units (FWU) than AWU. Hence, not only cutting the costs to achieve competitiveness, but also social aspect is pronounced here.

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ABSTRACT

Cílem článku je analyzovat klíčové faktory konkurenceschopnosti zemědělských podniků v České republice a porovnat je mezi různými druhy zemědělských farem. Jako kritérium konkurenceschopnosti zemědělských podniků z pohledu ekonomických výkonů se používá zemědělská čistá přidaná hodnota ZČPH (Farm Net Value Added – FNVA) a ZČPH na roční pracovní jednotku (Annual Work Unit – AWU). Z pohledu lidských zdrojů se pak používá AWU/100 ha nebo jednotka rodinné práce (Family Work Unit) FWU/ha. Údaje jsou získávány ze Zemědělské účetní datové sítě (Farm Accountancy Data Network – FADN) a jsou sledovány v časových řadách od roku 2007 do roku 2014 podle typu, velikosti hospodářství a přírodních podmínek (Less Favoured Areas LFA / mimo LFA). ZČPH celkově vzrostla po hospodářské krizi v letech 2008–2009 a proto také mají největší společnosti nejvyšší ZČPH, a to jak ve vyjádření Kč/ha, tak v Kč/AWU. Fyzické osoby zaměstnávají více FWU než AWU/100 ha. Nejmenší farmy používají nejvíce AWU/100 ha. Nicméně i největší společnosti jsou poměrně náročné na práci. Farmy v LFA jsou znevýhodněny z hlediska konkurenceschopnosti (jejich ZČPH na ha a AWU je nižší), a počet AWU/100 ha je celkově nejnižší. I přesto, že konkurenceschopnost je důležitou otázkou, zemědělství je multifunkční a hraje také ekologické, společenské, estetické a rekreační role, které je třeba vzít v úvahu.

KEYWORDS:

roční pracovní jednotka (AWU), konkurenceschopnost, rodinná pracovní jednotka (FWU), zemědělská čistá přidaná hodnota (ZČPH)