THE DEVELOPMENT OF COMPETITIVENESS OF CZECH AGRICULTURAL HOLDINGS

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Abstract

The aim of the paper is to analyse competitiveness of agricultural holdings in the Czech Republic. Farm Net Value Added (FNVA) and FNVA per Annual Work Unit (AWU) obtained from Farm Accountancy Data Network (FADN) data are chosen as relevant indicators of farms' competitiveness. It is observed in time series from 2007 to 2014 according to economic size of the holding and legal type. The methodology used for comparison and evaluation is in accordance with the recommendation of the European Commission. 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. 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: agricultural holding, Farm Accountancy Data Network (FADN), Farm net value added (FNVA), competitiveness

JEL classification: J18, Q13

Introduction

Competitiveness and viability of the agricultural holdings in the Czech Republic goes hand in hand with innovations. "The development of the business sector is a subject of the future competitiveness of enterprises, and therefore they must be able to adapt to new demands from the market and the society in which they operate." (Adámek, 2013) 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. After the Czech Republic joined the European Union in 2004, the competitiveness of Czech agricultural holdings declined, because these businesses had to adapt to a different regime. Farms were no longer able to compete on the EU single market, the biggest loss recorded pig meat sector and other sectors producing mainly meat. However, this is a very

common phenomenon which in historical context appeared in most of the accession countries. Later the farms adapted to the conditions of the single market and the competitiveness of agricultural holdings improved.

The aim of the paper is to analyse competitiveness of agricultural holdings in the Czech Republic. Firstly, there are briefly introduced the methods and indicators of competitiveness' measurement. Then used data from FADN are described. Next section presents and discusses the results. Last section concludes.

1 Theoretical background

Various authors recommend different criteria for competitiveness measurement. 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. "Profitability can be defined in several ways, such as the difference between revenue and costs (gross margin), or the ratio between cost and revenue", Latruffe (2010). 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 amount of working hours. In our article we focus on criterial related to profitability and productivity. Particularly we utilize net added value and labour productivity. Extended review of the competitiveness indicators

can be found also in Kožená and Chládek (2012). They compare several methods of measuring competitiveness in selected enterprises from different sectors and states the advantages and their advantages or disadvantages.

Bahta and Malope (2013) examined the competitiveness and performance of the agricultural holdings in Botswana using costs and gross margin as key indicators. The results of their study 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.

2 Data and methodology

We used data from Farm Accountancy Data Network (FADN). It is an "an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy, (European Commission, 2017). It surveys accountancy data from representative samples in each Member State of the EU. FADN methodology to some extend corresponds to Czech accountancy system, although there are certain 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. Periodically produced and published set of statistics is called the standard results and are calculated from the farm returns. They describe in considerable detail

the economic situation of farmers by different groups. The system of the farm results is displayed at Figure 1.

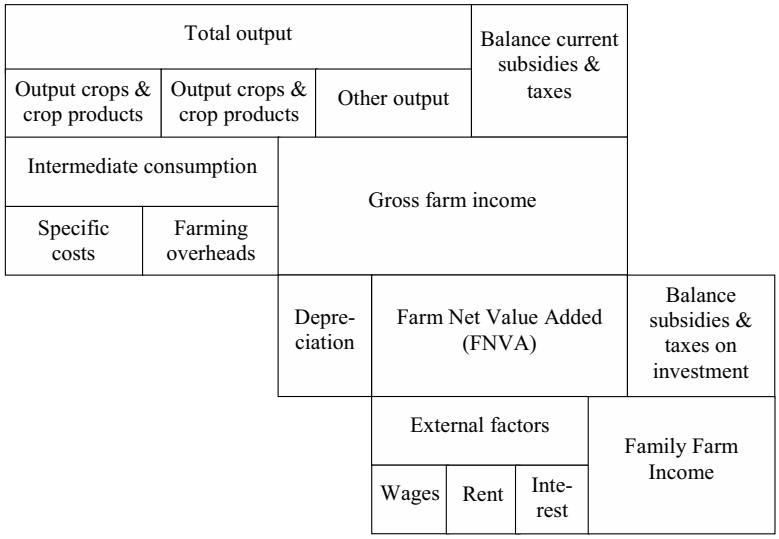

Figure 1: Construction of the FADN indicators. Source: FADN (2017a)

Firstly, total agricultural output of the holding is observed divided on crops and crop products, livestock and livestock products, and other production. Then, there are added subsidies and deducted taxes. This amount consists of intermediate consumption (specific costs plus farming overheads) and gross farm income. The 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 (and up to 2006 also per 1 ha in particular region). 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.

This indicator is observed in time series from 2007 (when new methodology was launched) to 2014 (last available data) according to various criteria. Particularly, the agricultural holdings are divided based on whether they are owned by legal and physical persons. Then the performance of farms of different size is observed. The economic size of an agricultural holding 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. There are so-called less favourable 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. FADN also distinguishes farms according to the type of the climatic region (corn, sugar beet, potato, potato-oat, mountainous) and type of production (field production, milk production, breeding of cattle, sheep, goats and other grazing livestock, mixed production, breeding pigs and poultry).

Unfortunately, it is not possible to test, whether the mean FNVA 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. Similarly, the time series is short and no statistical test can be utilized (the number of observation shall be at least 30).

Data were gained for the last available year as we supposed that they are more accurate. For example, FADN report for year 2014 contains data also of the year 2013 for comparison. Both datasets were included into the analysis. Similarly, report for year 2013 contains also data for year 2012, so the dataset used in our article takes from this report only data for year 2012 (not for 2013) etc. The methodology is consistent since 2008.

3 Results and discussion

Basic indicator that characterize economic benefits achieved in the firm from the point of view of the performance of all operational activities is net value added. FNVA in FADN data set is also recalculated per Annual Work Unit that corresponds to 1 800 worked hours per calendar year in order to compare the farms of different sizes.

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. Between years 2007 and 2009 the significant decline of FNVA is evident, 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 increases lower.

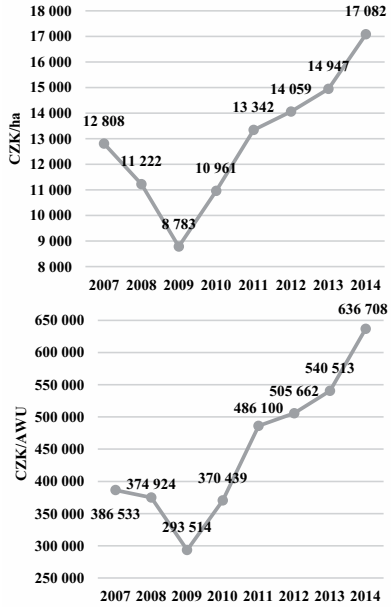

Figure 2: Development of FNVA in total (CZK/ha and CZK/AWU). Source: own elaboration based on FADN (2017b) data

Comparison of FNVA for physical and legal persons can be seen from Figure 3. When we consider results in CZK/ha, we can conclude that throughout the period from 2007 to 2014 the legal persons accounted in the amount of FNVA by more than 50%. 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. Physical persons had an absolute majority percentage (55%) in 2007. Its importance declined since that until 2010, when their share was 48%. The lowest share of physical persons was in 2014 (only 45%). Development between 2011 and 2013 was relatively stable.

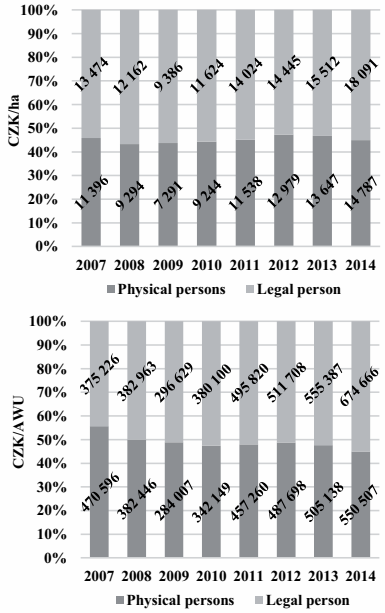

Figure 3: Development of FNVA in total (CZK/ha and CZK/AWU). Source: own elaboration based on FADN (2017b) data

It can be seen from Figure 4 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. Is again obvious from presented development the economic slowdown in 2008, which resulted in significant decline in 2009 (the values are lower than in the previous year in all size groups). Since year 2010 the FNVA gradually increased until 2014, except for the smallest agricultural holdings in the expression of CZK/AWU.

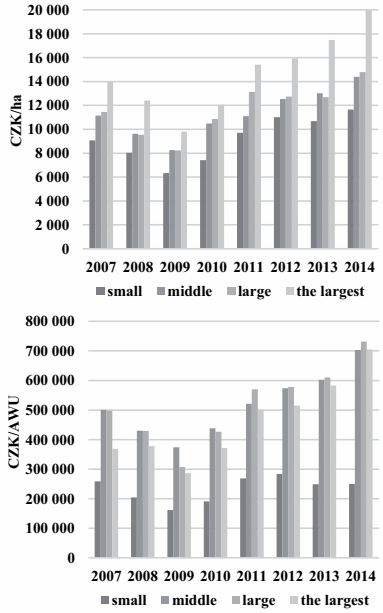

Figure 4: FNVA according to farm size (CZK/ha and CZK/AWU). Source: own elaboration based on FADN (2017b) data

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. 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 5 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.

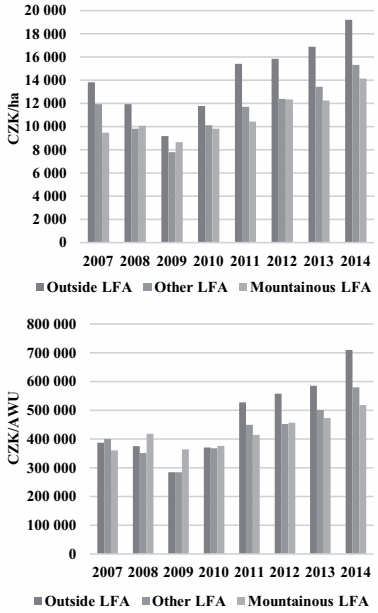

Figure 5: FNVA according to type of area (CZK/ha and CZK/AWU). Source: own elaboration based on FADN (2017b) data

Possible different way how to measure the performance and competitiveness of the companies 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.

Our research has the limitations in the concept of competitiveness. 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 to assess the 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 and social indicators in order to assess the agricultural holdings multicriterially.

Conclusion

The aim of the paper was to assess the competitiveness of the agricultural holdings in the Czech Republic based on the indicator of Farm Net Value Added (FNVA) and FNVA recalculated per annual work unit. 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 favourable 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.

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References

Adámek, P. (2013). Využívání společné odpovědnosti podnikání v České republice [An Exploitation of the Corporate Social Responsibility in the Czech Republic]. In K. Mičudová (Ed.), *Business Trends 2013*. Plzeň: University of West Bohemia, 1–10.

Batha, S., Malope, P. (2014). Measurement of competitiveness in smallholder livestock systems and emerging policy advocacy: An application to Botswana. *Food Policy*, 49(2), 408–417.

Bavorová, M. (2003). Influence of policy measures on the competitiveness of the sugar industry in the Czech Republic. *Agricultural Economics – Czech*, 49(6), 266–274.

European Commission (2017). *Agriculture and Rural Development – Farm Accountancy Data Network* [online], [2016-04-05]. Retrieved from: http://ec.europa.eu/agriculture/rica/

FADN (2017a). *Metodiky FADN CZ: Odvození ukazatelů ekonomických výsledků podle metodiky FADN EU* [online], [2016-04-05]. Ústav zemědělské ekonomiky a informací / Zemědělská účetní a datová síť, kontaktní pracoviště FADN CZ. Retrieved from: http://www.vsbox.cz/fadn/AHTM/METODIKY_UKAZATELE.htm

FADN (2017b). *Výsledky šetření za rok 2014: Tabulková část A – Souhrnné výsledky výběrového šetření* [online], [2016-04-05]. Ústav zemědělské ekonomiky a informací / Zemědělská účetní a datová síť, kontaktní pracoviště FADN CZ. Retrieved from: http://www.vsbox.cz/fadn/AHTM/DATA_14_C.htm

Kožená, M., Chládek, T. (2012). Company Competitiveness Measurement Depending on its Size and Field of Activities. *Procedia - Social and Behavioral Sciences*, Vol. 58, 1085–1090.

Łącka, I. (2015). Innovativeness and Competitiveness of the New European Union States in Variable Economic Situation between 2006 and 2013. *Procedia - Social and Behavioral Sciences*, Vol. 213, 185–191.

Latruffe, L. (2010). Competitiveness, Productivity and Efficiency in the Agricultural and Agri-Food Sectors. *OECD Food, Agriculture and Fisheries Papers*, No. 30, OECD Publishing, Paris, 1–63.

Špička, J. (2016). Efficiency improvement of the Czech and Polish processors of poultry meat in 2008-2013. In *Proceedings of the 2016 International Conference "Economic Science for Rural Development"*, No 42, Jelgava, LLU ESAF, 274–281.

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