

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Statistics



Bachelor Thesis

**Statistical analysis of farm economy with regard to the
change of less favoured areas payments**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Vojtěch Linhart

Economics and Management

Thesis title

Statistical analysis of farm economy with regard to the change of less favoured areas payments

Objectives of thesis

Bachelor thesis deals with evaluation of farm economy with regard to the change of less favoured areas (LFA) payments. The main goal is to evaluate economic performance of farms operating in the less favoured areas in the Czech Republic in light of LFA policy changes.

Methodology

The evaluation of farm economy and the impact of LFA policy changes on selected economic indicators will be carried out by statistical analysis, such as exploratory data analysis, distribution analysis, hypothesis testing and regression analysis.

The proposed extent of the thesis

30 – 40 pages

Keywords

Less favoured areas, Common Agricultural Policy, payment, current subsidies, statistical analysis

Recommended information sources

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VOSE, D. *Risk analysis. A quantitative guide*. England, Chichester: John Wiley and Sons. ISBN 978-0-470-51284-5.

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Declaration

I declare that I have worked on my bachelor thesis titled "Statistical analysis of farm economy with regard to the change of less favoured areas payments" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any third person.

In Prague, 9 March 2016

Vojtěch Linhart

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Statistical analysis of farm economy with regard to the change of less favoured areas payment

Summary

This bachelor thesis is devoted to subsidies in less favoured areas in the Czech Republic. The theoretical part is focused on the development of subsidies from 1970 to 2014. Author describes changes of area and methodology of calculation payments in less favoured areas. He compares the effect of payments as well as their amount in years 2004-2014, considering different points of view – production, size of farm or type of less favoured area.

The practical part is focused on changes of financial results of farms with and without payments. Author evaluates the importance of subsidies in regard to size of farm and type of less favoured area and compares results using statistical analysis of variances.

Keywords: less favoured area, subsidies, statistical analysis, LFA payments, Common Agricultural Policy

Statistická analýza ekonomiky farem s přihlédnutím ke změnám dotací v méně příznivých oblastech

Souhrn

Tato bakalářské práce se věnuje finančním podporám pro méně příznivé oblasti v České republice. V teoretické části autor srovnává vývoj kompenzačních příspěvků od roku 1970 až do roku 2014. Popisuje změny vymezení a metodologie výpočtů podpor pro méně příznivé oblasti. Srovnává vliv a velikost dotací na jednotlivé typy méně příznivých oblastí v letech 2004-2014 z několika hledisek – podle typu produkce, velikosti podniku či typu méně příznivé oblasti.

V praktické části autor zkoumá změny finančních výsledků zemědělských podniků s dotacemi a bez nich. Hodnotí důležitost dotací z hlediska velikosti podniku či zařazení do jednotlivého typu méně příznivé oblasti a výsledky mezi sebou porovnává pomocí statistické analýzy rozptylu.

Klíčová slova: méně příznivé oblasti, dotace, statistická analýza, LFA platby, Společná zemědělská politika

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1. Introduction

Agriculture is the main source of food for the human race. Historians estimate that first attempts of agriculture are almost 13 thousand year old, as people noticed, that wild forms of lentils, wheat etc. mutated into forms, which were easier to cultivate. Agriculture was the main source of revenues for the majority of population for centuries – ownership of field determined social position. Production of farms (livestock, potatoes, vegetables etc.) was used as a medium of exchange. (Science Mag, 2013)

Technological and scientific development changed agriculture – farmers had higher yield, they replaced people and animals with machines, they used chemicals instead of natural fertilisers. Unfortunately, not all changes are positive. As the intensive farming is using ideal conditions, areas with worse condition suffer. They cannot achieve the same yield for the same cost, but they are forced to sell their production for the same prices. All together, they have no chance to survive on the competitive market. Food is essential for human population, and, as it is not possible to farm with a loss, those farmers need help.

During communism, money was transferred from farm to farm so that all farms had “equal” profit. After Velvet Revolution, system was not ready for providing any help to farmers; therefore many farms were closed (especially in less favoured areas). These changes affected not only food industry; whole families had to move to cities, life of countryside changed.

With help from the European Union, LFA payments and Rural Development Program are aimed to help those areas, to help farmers become profitable and to motivate young people to live in villages, and in general improve standard of living there.

2. Thesis objective and methodology

The objective of this thesis is to analyse payments in less favoured areas in the Czech Republic and to compare them from different points of view. The purpose of theoretical part of the thesis is to clarify important terms and to explain the situation in the Czech Republic. For this part, it was used descriptive method. The majority of data used in theoretical part was from Annual Reports of the Ministry of Agriculture of the Czech Republic, which is called Zelená zpráva.

The analytical part of the thesis is focused on financial analysis of farms according to different criterions – size and type of LFA they belong to. The objective is to compare

financial results of farms with and without LFA payments. For statistical analysis was used analysis of variances (ANOVA) along with Scheffe's test for comparing of means. For all test, it was used 0.05 level of significance. Data, which had been used for analysis, were from Bisnode Albertina, which is databases of financial results of companies. For the analytical part, it had been used Microsoft Excel and SAS Enterprise Guide 7.1.

3. Theoretical part

3.1. History

3.1.1. Subsidies in the area of the Czech Republic in years 1948 and 1991

In Czechoslovakia, there was centrally planned economy since 1948. Until the liberalization of prices in 1991, products of agriculture were bought by state for prices that were fixed. Those prices were determined in regard to wages, natural conditions, expenses on production and other inputs. This system basically rearranged money; profit from farms with higher yield and better conditions was sent to farms with worse condition.

At the beginning of 1970s work on research of types of soil in the area of Czechoslovakia started. They made a map of Valuated Soil Ecological (BPEJ). In 1984, after long research, farms were divided into 42 production-economical groups (PES). Division was made according to the indicative area per hectare, which was computed as the weighted arithmetic mean of BPEJ for each production type per hectare (Equation 1). (Štolbová, 2012)

Equation 1: Indicative area

$$oP = C_p P - (nN_p P + nZ)$$

oP	indicative area
$C_p P$	price of parameterized production
$nN_p P$	normative cost of parameterized production
nZ	normative profit

Each PES had different rates of compensatory payments. The highest amount of subsidies was provided to PES 39-42 which got 80 CSK (Czechoslovak koruna) to 92 CSK for 100 CSK of revenue. Farmers who farmed on their own had no claim for those payments. As

more farms were added to the system of compensatory payments, the amount of money paid grew from 7 billion CSK in 1981 to 12.5 billion CSK in 1988. At the late 80s, this system was criticized and, therefore, the change was proposed. The first idea was to divide part of compensatory payments according to the area of agricultural land. It was opposed that this change could lead to growing crop with low cost of production and, therefore, it would not be beneficial for society. It was also suggested to change production in PES 41 and 42 to forestry. None of these changes was made because the central-planned economy was replaced with the market economy and in 1991 after liberalization of prices all compensatory payments were abolished. Since then more than 50% of farmers farmed in red numbers, therefore most of agricultural cooperatives stopped production of beef and started to focus on intensive farming. If the condition for farming was not good enough, they sold their farmlands. (Štolbová, 2012)

3.1.2. Since 1997 until accession to the European Union

In 1997, the Czech government passed a bill about agriculture, Act No. 252/1997. In section 2 paragraph 4 state proclaims, that it will “create conditions for supporting less favoured areas”. Government regulation No. 341/1997 Coll. sets programs for supporting activities for preserving of countryside, financial aid for less favoured areas (LFA) etc. LFA were defined as the cadastral community with price lower than 4 CZK for 1 m². During preparation of the Czech Republic for accession to the European Union and harmonizing Czech legislation with European’s, Minister of Agriculture ordered creating a proposal of government regulation to synchronize system with Council Regulation (EC) No 1257/1999 of 17 May 1999. That proposal ended up as a part of government regulation no. 505/2000 Coll. It defined LFA according to altitude (mountain areas H1 and H2), productivity of agricultural land of BPEJ (other areas O1, O2, and O3) and specific conditions (S1 and S2). Rate ranges from 6 points (cold, humid climate and with soil not suitable for farming) to 100 points (Chernozem in moderately humid climate).

- a) H1 – mountain areas with the altitude higher or equal to 600 meters, 1,914 CZK/ha – 2,900 CZK/ha
- b) H2 – mountain areas with the altitude between 500 and 600 meters and slope bigger than 6° on more than 50% of farmland, 1,716 CZK/ha – 2,600 CZK/ha

- c) O1 – other areas with the average productivity of agricultural land less than 37 points and slope bigger than 7° on more than 50% of farmland, 1,650 CZK – 2,500 CZK/ha
- d) O2 – other areas with the average productivity of agricultural land less than 34 points, 1,400 CZK – 2,100 CZK/ha
- e) O3 – other areas with average productivity of agricultural land from 34.01 to 38 points, 660 CZK/ha – 1,000 CZK/ha
- f) S1 – specific, undermined areas, 528 CZK/ha – 800 CZK/ha
- g) S2 – specific dry areas with lower probability of rains, 660 CZK/ha – 1,000 CZK/ha

In 2001, LFA represented 2,375 thousand hectares, which was 55.4% of all agricultural areas in the Czech Republic. The main goal of support was to motivate extensive farming in areas with worse condition. (Štolbová, 2012)

3.1.3. After accession to the European Union

European Commission recommended not using the cadastral community but the territory of the autonomous community. The limit for low-quality soil was changed to 80% of average soil of the Czech Republic, which is 34 points. They also added new criteria such as demographic density of population and share of farmers on economically active population. Mountain areas had the same conditions as before. Newly, other areas had to fulfill new conditions about demography (density of population have to be lower than 75 people/km², share of farmers at least 8%). Their average productivity of agricultural land had to be lower than 80% of average productivity of the Czech Republic. Specific areas were not defined precisely by European Commission and every country used different conditions. In the Czech Republic, the criterion was small point value of productivity of agricultural land. The system no longer took in consideration undermined or dry areas. Specific areas included lower parts of mountains that did not satisfy demographic specification for being classify as other area, areas with less than 34 points or areas with productivity of agricultural land from 34.01 to 38 points and slope is bigger than 7° for more than 50% of farmland.

LFA payments were meant to

- support environment-friendly farming systems
- help with preserving of beauty of countryside
- help to stabilize country life

- contribute to sustainable use of soil and protection of natural resources (especially water)
- provide financial help for farms with worse conditions

Thanks to European fund, compensatory payments were much higher. Fund provided almost 80% of whole amount, which was computed for grasslands only. (Štolbová, 2012)

3.2. Plan for period of 2014-2020

Diversity of systems of LFA payments between member states was criticized for a long time. The European Union did not think that payments are divided equally. Every country had their own inner specifications of environment, soil conditions etc. according which the funds were divided. European Court of Auditors joined complaints and, therefore, the definition of areas of LFAs had to be improved.

After discussions with all members of the EU, they set criterions, which were published in the regulation of the European Union as Annex II for supports rural development 2014-2020. The area can be proclaimed as a part of LFA if it fulfils those common criterions. They are classified into four groups. (Spolek pro obnovu venkova, 2012)

Climate

Sum of temperatures (daily-degree) defined as year sum of daily average temperature above 5 °C is lower than 1500 daily-degrees, or days with the average temperature higher than 5 °C is lower than 180 days. Ratio of total rainfall over potential evapotranspiration per year is lower than 0.5.

Climate and soil – surplus of soil moisture

Number of days, when amount of soil moisture is equal or higher than capacity of soil, is higher than 230 days.

Soil

Wet soils, defined as lands which are wet for significant part of the year, fulfilling those conditions: humidity at a height of 80 centimetres for more than 6 months, or humidity at a depth of 40 centimetres for more than 11 months, or the soil is poorly drained, or soil has colour which is typical for gleysoil at a depth of 40 centimetres.

Unfavourable texture and stoniness of soil are a measurement of the relative representation of clay, dust, sand, humus (as % of weight) and the amount of solid particles (% of volume). Texture of top layer of soil is classified as heavy clay (more or equal to 60% of clay), or top layer of soil is classified as sand (% of mud+2*% of clay is less or equal to 30%), or organic matter of soil is more or equal to 30%, or texture of top layer is classified as clay with special properties.

Soil depth from topsoil to solid subsoil is less than 30 centimetres.

Chemical properties are not satisfying, soil acidity, or presence of sodium in soil.

Terrain

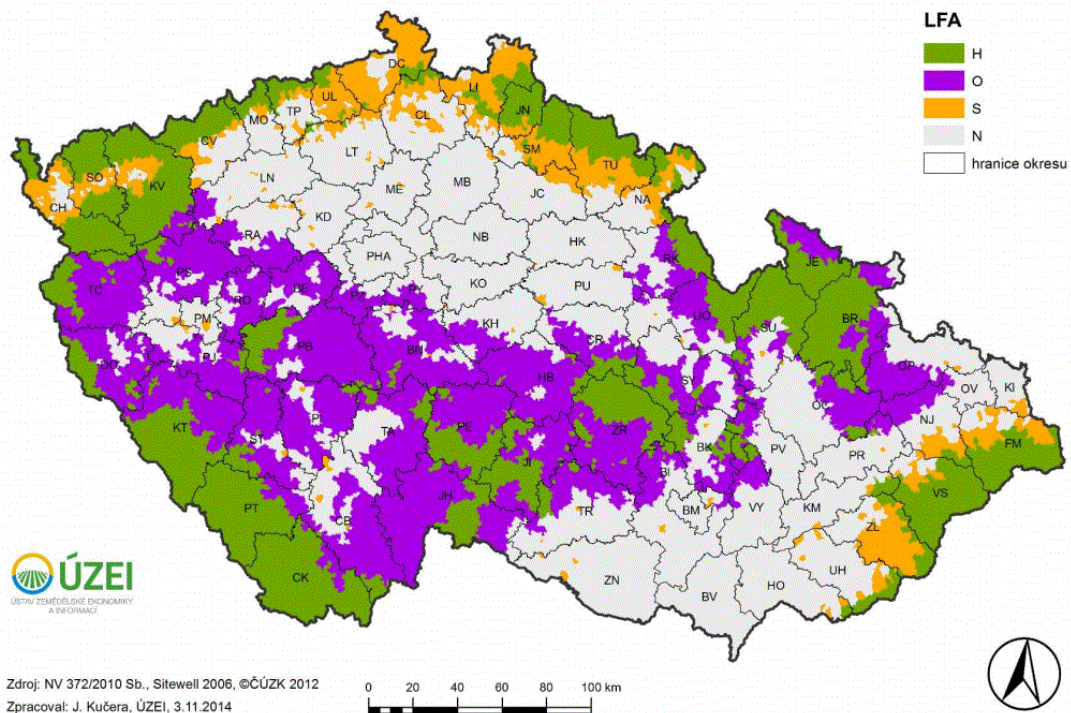
Change in altitude with respect to planimetric distance is more than or equal to 15%.

After applying new criteria to the system, each state has to remove areas that overcame their disadvantage by adjustment production (vineyards) or by investments (drainage, greenhouse etc.). Diversification of LFA remained the same – mountain LFA, other LFA and specific LFA. These changes have to be applied until the end of 2018. Along with change of re-evaluating areas of LFA, there will be change of methodology of calculation amount of payments in other LFA as well.

3.2.1. Areas of LFA

In the Czech Republic, LFA and not LFA areas are almost even – around 3,500 thousand hectares (excluding ponds and woodlands). Mountain areas (LFA-H) are usually at borders (Figure 1). In 2014, 1,040.1 thousand hectares were parts of mountain LFA, from which 140.7 thousand hectares were arable lands, 378.4 thousand hectares were grasslands and 521 thousand hectares were agricultural land. Because of difficult natural conditions, production in these areas focuses on livestock (more than 50%). On average total production is usually smaller than production cost. Other less favoured areas (LFA-O) included 2,089.3 thousand hectares of land, from which 1,046.8 thousand hectares were agricultural land. Specific areas (LFA-S) covered 413.2 thousand hectares of the area of the Czech Republic.

Figure 1: Area of the Czech Republic



LFA-H: green, LFA-O: purple, LFA-S: orange, not LFA: grey, white: district border; source: Program rozvoje venkova na období 2014-2020

3.2.2. Methodology for calculation

Along with new diversification of LFA, there was introduced a new system of calculation of compensatory payments. Experts and The Ministry of Agriculture agreed on the system, which compares difference between revenues and costs in LFA and not in LFA. This methodology expresses lost profit and/or additional expenses caused by worse natural conditions (lower production etc.). The data for this purpose were obtained from The Farm Accounting Data Network (FADN) from years 2009-2012. They used a sample of farms, excluding farms, which specialize their production in pork and poultry. This system of calculation takes into account that fixed cost is likely to be lower in LFA than in areas outside of LFA. Therefore, they set volume of fixed cost savings (Table 2). These savings are deducted from the difference between earnings of less favoured areas and not less favoured areas. For converting CZK to EUR, they used simplified exchange rate 26 CZK/EUR. (Ministry of Agriculture of the Czech Republic, 2015c)

Table 1: Method of calculation financial disadvantage of LFA

<i>Revenues and expenses</i>	Not LFA CZK/ha/year	LFA-H CZK/ha/year	LFA-S CZK/ha/year
Agricultural production	33,914	17,945	15,689
-Crop production	24,546	7,228	8,176
-Livestock production	9,368	10,717	7,513
Expenses	15,832	10,216	8,417
-Seed bought	2,212	556	482
-Seed owned	146	90	35
-Fertilizers bought	2,905	594	713
-Preparations for plant protection	2,758	529	621
-Other expenses of agricultural prod.	486	264	228
-Feed bought	2,445	2,291	1,343
-Feed owned	2,541	3,990	3,389
-Other expenses of livestock prod.	885	1,009	782
-Services	1,454	894	825
Working expenses	7,184.2	5,117.4	3,907.7
Earnings	10,898	2612	3,364
<i>Difference between not LFA and LFA</i>		8,286	7,533
<i>Fixed cost savings (Table 2)</i>		3,243	3,379
Economic disadvantage of LFA		5,043	4,154

Source: Ministry of Agriculture of the Czech Republic, 2015c

Table 2: Method of calculation fixed cost savings

<i>Fixed cost</i>	Not LFA CZK/ha/year	LFA-H CZK/ha/year	LFA-S CZK/ha/year
Maintenance of land and buildings	804.3	445.7	500
Insurance	774.5	422	422.9
Variable taxes	62.4	50.3	45.2
Other overheads	1,904.2	1,364.5	1,452.5
Rent paid	1749	820.8	848.2
Fixed taxes (from land and buildings)	225.9	104.2	120.7
Interests and charges	471.4	411.6	343
Depreciation	3,872.2	3,001.7	2,751.9
<i>Sum</i>	9,863.9	6,620.8	6,484.4
Difference between not LFA and LFA		3,243.1	3,379.5

Source: Ministry of Agriculture of the Czech Republic, 2015c

3.2.3. Mountain areas (LFA-H)

The rate of subsidy is then decided by natural conditions. For mountain areas, the average rate is 2,626 CZK (101 EUR) per hectare per year, which corresponds to 52% of calculated economic disadvantage. Rates range from 3,562 CZK/ha/year (H1) to 2,158 CZK/ha/year (H5 - Table 3). In total this financial support will covers approximately 520,000 hectares. Since 2015, compensatory payment is provided on agricultural land as well, not only on grasslands as before. (Ministry of Agriculture of the Czech Republic, 2015a)

Table 3: Payments in mountain LFA

<i>Type</i>	Characteristics	Rate/year	EUR/hectare/year
H1	Altitude 800 metres and more	136% of average rate	137 EUR
H2	Altitude from 700 to 800 metres	128% of average rate	129 EUR
H3	Altitude from 600 to 700 metres	90% of average rate	91 EUR
H4	Altitude up to 600 metres with slope higher than 15% on more than 50% of farmland	109% of average rate	110 EUR
H5	Altitude up to 600 metres with slope higher than 15% on less than 50% of farmland	82% of average rate	83 EUR

Source: Ministry of Agriculture of the Czech Republic, 2014b

3.2.4. Other areas (LFA-O)

Other LFA are areas that are considerably naturally disadvantaged. Those areas have to be redefined until 2018; until then the Czech Republic will use same methodology as before. The area can be defined as LFA-O if the density of population is lower than 75 people/km² and more than 8% of the population works in agriculture and/or profitability of soil is lower than 34 points (OA) or profitability of soil is higher or equal to 34 points (OB). The average rate remained the same – 111 EUR/ha, but from 2015, payments reach only 70% of rate in years 2007-2014. (Ministry of Agriculture of the Czech Republic, 2014b)

Table 4: Payments in other LFA

Type	Rate in 2007-2014	Rate since 2015	EUR/ha
OA	105% of average rate	70% of previous rate	82 EUR
OB	85% of average rate	61% of previous rate	57 EUR

Source: Ministry of Agriculture of the Czech Republic, 2014b

3.2.5. Specific areas (LFA-S)

Conditions defining specific LFA remain the same. It means that profitability of soil is lower than 34 points; or profitability of soil is between 34 and 38 points and slope is bigger than 12.3% on more than 50% of the area; or profitability of soil is between 34 and 38 points and grass covers more than 50% of the agricultural land of village. In specific LFA (LFA-S) rate is 83 EUR/ha/year (52% from calculated disadvantage) with no other differentiation. (Ministry of Agriculture of the Czech Republic, 2015a)

3.2.6. Degressivity

Rates are then lowered according to the area. There is quite interesting duality in the Czech Republic. In 2010, 85% of farms farmed in a small area; on the other hand, they cultivated only 8% of agricultural land. Agricultural companies, which were bigger than 500 hectares represented only 4% share of all farms; but they cultivated 71% of agricultural land. After analysis of variables production, land, capital, material, and work, it was set that farms with area bigger than 1000 hectares have higher technical efficiency. Therefore, degressivity of compensatory payments was set:

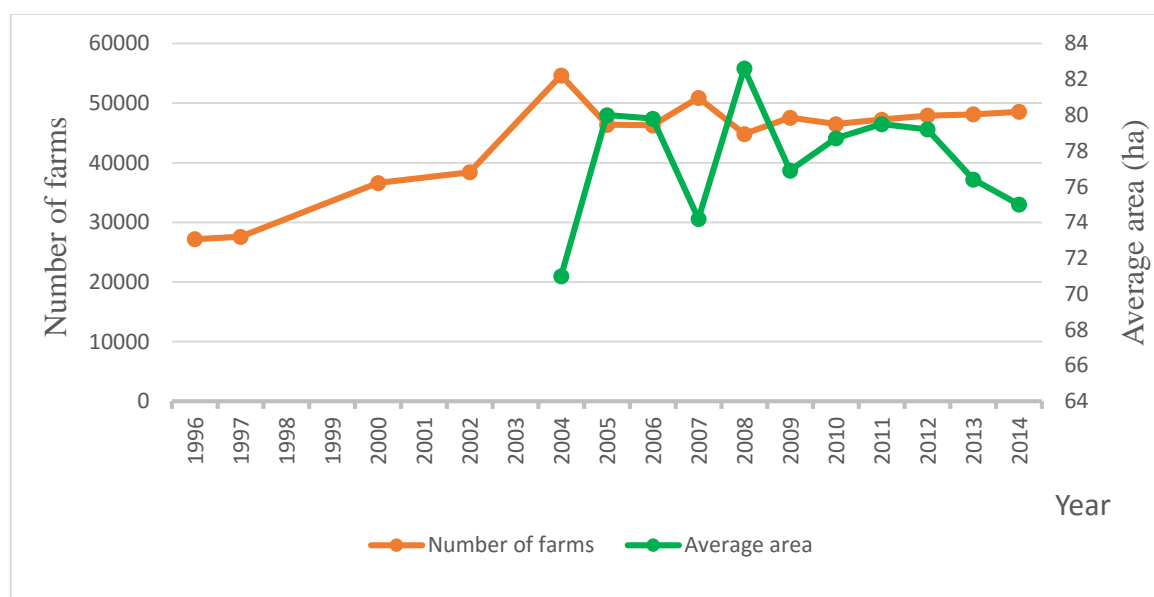
- Agricultural land smaller than 300 hectares – full payment
- Agricultural land from 300 hectares to 500 hectares – payment lowered by 10%
- Agricultural land from 500 hectares to 900 hectares – payment lowered by 18%
- Agricultural land from 900 hectares to 1,800 hectares – payment lowered by 22%
- Agricultural land from 1,800 hectares to 2,500 hectares – payment lowered by 27%
- Agricultural land bigger than 2,500 hectares - payment lowered by 30%

3.3. Development of LFA payments from 2004 to 2014

LFA payments play an important role in Czech agriculture. Those payments do not only support agriculturists; they provide them finance for staying at areas, which would be

uninhabited otherwise. They can provide job opportunities for inhabitants of small villages, who would have left the countryside otherwise. Thanks to help from the European Union, Czech agriculture is able to compete with production from other countries. Without financial support, their costs would be higher than revenues. The number of farms had almost doubled since 1996 (Figure 2). Along with free market and state support, we can see that more and more people see the opportunity in agriculture. The biggest increase was between years 2002 and 2004. People knew about financial support of LFA from the European Union, but not everyone was successful. Since 2005, number of farms have remained almost the same – around 47 000 – with a little swing in 2007 (new methodology of LFA payments was introduced).

Figure 2: Development of number of farms in the Czech Republic



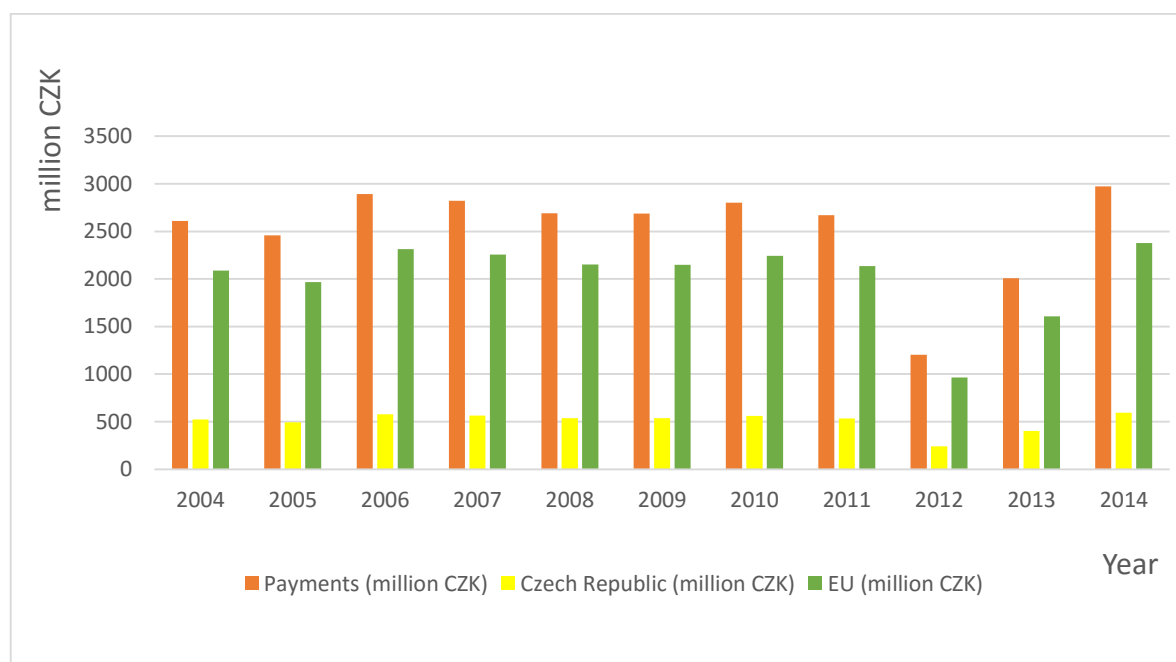
Source: Zelená zpráva from years 1997 to 2014

The average area of farms ranges from 71 hectares (2004) to 79.5 (2011). The area has opposite trend than number of farms; people who stop farming sell their land. In last year average size of farm went down and number of farms increased; it is caused by higher amount of people in agriculture as well as by lower area of agricultural land (4,264,000 hectares in 2004; 4,216,000 hectares in 2014). (Ministry of Agriculture, 1998-2014)

3.3.1. Financing of LFA

Since the Czech Republic accession to the European Union, we received approximately 22 billion CZK as support for LFA, which is 2.5 billion each year. The EU support covers almost 80% of payments; that means that the Czech Republic spent only 5.5 billion for 10 years. The amount of money received remains almost the same except the year 2012 (Figure 3). LFA payments are just a small part of government budget of the Czech Republic. The real budget for expenses of the Ministry of Agriculture for the year 2010 was 52 billion CZK. For LFA, it was used 560 million CZK, which is 1.06%. Without help from the EU, it would be 2.83 billion, 5.3% of expenses budget of the Ministry of Agriculture. (Ministry of Agriculture, 2004-2014)

Figure 3: Development amount of LFA payments



Source: Zelená zpráva from years 2004 to 2014

3.3.2. Comparison with other members of EU

FADN makes annual statistics about economy of members of the European Union. As LFA payments are dependent especially on natural conditions, we can see that even though the average of EU-27 is approximately 550 CZK/ha, some states obtain almost three times more (Slovakia – Table 5). In the Czech Republic, payments increased by 85 CZK/ha since 2008.

In 2012, the Czech Republic's average was 300 more than average of the European Union. That means that natural conditions for agriculture are in the Czech Republic worse than in other parts of Europe. Even more difficult conditions are in Slovakia, which received 1 258 CZK/ha. The biggest percent growth is in Hungary. Their payments were increased by 800% since 2006, but still count as very small. Hungary has very good conditions for agriculture.

Table 5: LFA payments in selected state from EU

Year/state	2006 (CZK/ha)	2008 (CZK/ha)	2010 (CZK/ha)	2012 (CZK/ha)
Czech Republic	764	750	819	835
France	549	480	483	498
Hungary	8	20	69	64
Poland	717	752	591	526
Slovakia	1,458	1,484	1,670	1,258
EU	645	555	552	538

Source: Zelená zpráva from years 2006 to 2012

It is not possible to look for any trends in the development of LFA payments because as conditions for getting payments are changing, states are in the process of transformation. The European Union gives time for preparation and implementation new conditions of LFA payments; that mean that some country uses old system at time when other country uses new one. We can only compare states with average of EU or see development at each country separately.

3.3.3. Comparison of LFA payments according to size of farms

Degressivity makes a huge impact on payment. FADN divides farms into classes according to the classification of economic size. Economic size represents a standard output of farm. There are 14 classes; class 1 represents farms with standard output smaller than 2,000 euro, class 14 big agricultural companies with at least 3 million euro of standard output. FADN uses four subcategories; small size companies' output, which represents classes 4-6, is between 8,000 and 50,000 euro, medium size companies, class 7-9, are companies with output between 50,000 and 500,000 euro. As large companies are considered farms with

output between 500,000 and 1,000,000 euro, class 9 -10. The huge companies, classes 12, 13 and 14, with output higher than 1,000,000 euro, represent the last category.

Small farms

Small size farms usually operate on smaller areas, approximately 36 hectares. In 2013 almost 58% of their production was fodder crops, 28% cereals and 9% other crops. They usually have to rent agricultural land, land, which they own, represents about 50% of their need. They owned approximately 33.9 DJ (*dobyččí jednotka-livestock unit, represents converted amount of animals e.g. one cow is 1 DJ, sheep is 0.1 DJ*)(The Government of the Czech and Slovak Federative Republic, 1991) for 100 hectares of land. Their total production was 21,226 CZK/ha, from which 14,046 CZK/ha was crop production, 5,456 CZK/ha was livestock production, and 1,724 CZK/ha was other production. Total cost were 22,620 CZK/ha. They received 11,095 CZK/ha as a form of subsidy, from which 1,655 CZK/ha were LFA payments. (Ministry of Agriculture, 2014c)

Medium farms

In 2013, medium size farms' average agricultural land used by farm was 212.6 hectares, from which 76.8% was rented from others. Farms specialized in fodder crops (47.8%), cereals (16%), other crops took only small area of production (16%). Livestock was smaller than livestock of small farms – 25.8 DJ for 100 hectares. Total production was 24,133 CZK/ha, 17,377 CZK/ha covered crop production, 5,023 CZK/ha livestock. Other production was almost the same as in case of small farms – 1,733 CZK/ha. Total cost were 27,515 CZK/ha. All payments received as a support were 10,841 CZK/ha in total, LFA payments were 12.2% - 1,319 CZK/ha. (Ministry of Agriculture, 2014c)

Large farms

Each large farm (farm with output between 500,000 and 1,000,000 euro) in 2013 was using 813.2 hectares in average, from which only 13% was owned by them. Distribution of crop production was more balanced: 33.9% cereals, 33.1% fodder crops and 20.2% other crops. Their livestock was 27.9 DJ. Total cost of big farm was 37,609 CZK/ha. Average total production of big farm was 32,447 CZK/ha, 20,400 CZK/ha was crop production, 8,324 CZK/ha was livestock production, 3,723 CZK/ha was other production. They received

9,783 CZK/ha as a form of financial support, 699 CZK/ha was as LFA payment. (Ministry of Agriculture, 2014c)

Huge farms

In 2013 average area managed by huge farm was 1,788.8 hectares. The majority of land was rented from other persons, 88.2%. 46% of land was used for cereals production, 39.3% for fodder crops and 20.4% for other crops. On average farm owned 44.1 DJ. Total production of farm was 45,595 CZK/ha, from which 24,773 CZK/ha was crop production, 17,063 CZK/ha was livestock production, and 3,759 CZK/ha was other production. Total cost was 51,581 CZK/ha. Financial support received was 10,697 CZK/ha, but only 372 CZK/ha was part of LFA payments. (Ministry of Agriculture, 2014c)

By this comparison, we can see that the bigger farm is, the smaller is LFA payments. Big farms usually focus on intensive farming, the biggest part of their production is cereal production. They operate at areas, which are suited for farming (Central Bohemia etc.). They can save money with economies of scale; therefore their share in LFA payments is the smallest. On the other hand small farms focuses especially on livestock production (fodder crop production was almost 58%), because financial cost on cultivating land would be too high. They are part of extensive farming system.

Table 6: LFA payments according to size of farm

	2008 CZK/ha	2009 CZK/ha	2010 CZK/ha	2011 CZK/ha	2012 CZK/ha	2013 CZK/ha
Small	1,496	566	1,670	1,650	1,756	1,655
Medium	1,268	753	1,265	1,275	1,367	1,319
Large	1,103	612	602	670	656	699
Huge	452	304	393	357	418	372

Source: Zelená zpráva from years 2008 to 2014

The main goal of the European Union in Rural Development Plan is to increase population in rural parts so that countryside remains the same. Therefore LFA payments were increase especially in small farms since 2008 (by 159 CZK/ha). With new system of calculation in

mountain areas differences might be even bigger in the future. (Ministry of Agriculture, 2015d)

3.3.4. Composition of subsidies

LFA payments represent just small parts of all subsidies, which farmers obtain. Without any financial help, agriculture would be very different. Globalisation force farmers to sell their products with almost negative profit. Supply is higher than demand; supermarkets have special requirements on size, quality, and prize of products; products imported from other countries are very often cheaper than products from the Czech Republic. Yield of agriculture is also very dependent on weather – even farms focusing on livestock production are dependent on fodder crops (if their production does not cover all feed they need, they have to buy it for a higher prize). All those conditions mentioned before makes whole sector of agriculture very difficult to compete in. Unfortunately, as the consumers try to decrease price as low as possible and do not care about agriculturists in the Czech Republic, farmers need more and more subsidies to retain profitable. In recent years, the situation got better (profit in the year 2014 was 22.9 billion CZK) (Hospodářské noviny, 2015), but still this profit is mainly created by subsidies (which were 32.9 billion CZK in 2014). Without any support, agricultural sector would be still in loss. After joining the EU in 2004 volume of subsidies increased by almost 13 billion CZK (from 13.2 billion CZK to 26 billion CZK) (Asociace soukromého zemědělství ČR, 2006). Farmers stopped being in the red, their conditions got better, which attracted new people to agriculture. The most crucial role play direct payments, which are not part of Rural Development program. In 2013, SAPS (Single area payment scheme which *“provides a flat-rate decoupled area payment paid for eligible agricultural land and replaces almost all payments granted in other than new member states”*) (European commission, 2015) represented almost 50% of all subsidies (20 billion CZK from the budget of 45 billion CZK). Prime payments are covered from the European funds for almost 100%. The Czech Republic financial participation was very low – 67 million CZK from 22,666 million CZK.

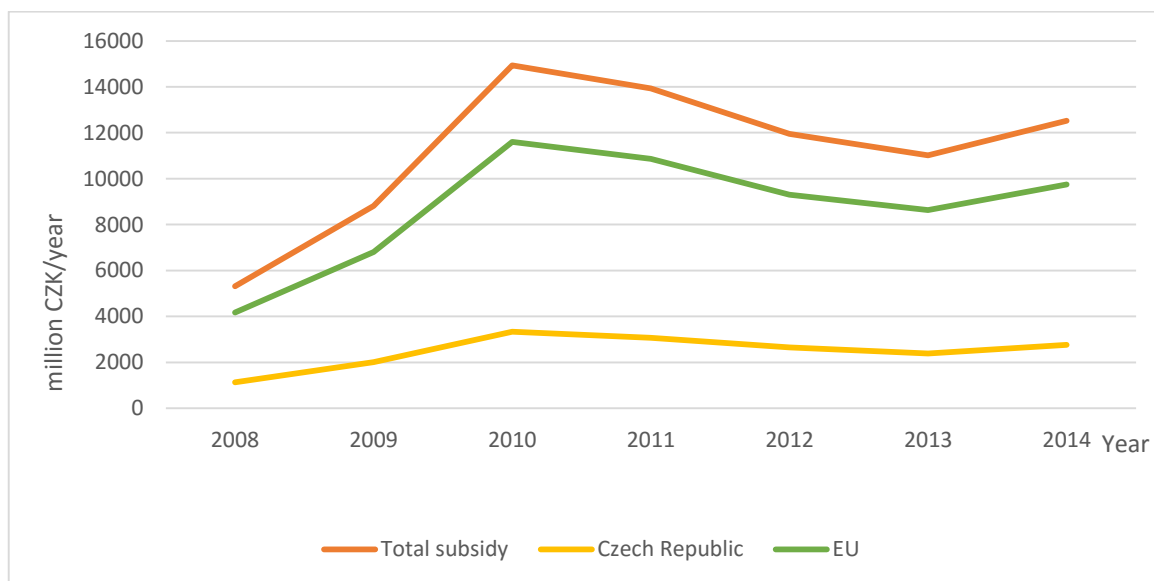
Total subsidies, which served for agronomical purposes (that means not only support for farmers, but support for development, export etc.), were 46 billion CZK, from which 32 billion was obtained from European fund, 14 billion invested from government budget (31% of all subsidies). That means that Czech agriculture is very dependent on the European Union. (Ministry of Agriculture, 2014c)

Rural Development Program

Subsidies are distributed as part of different programs for supporting agriculture. LFA payments are part of Rural Development Program (RDP), after transferring them from Horizontal Plan for Rural Development, which was terminated in 2007. RDP are divided into five parts. Osa I is a financial support which aim is to help farmers to compete with other farmers, as well as increase number of companies in following food-processing industry. Osa II's aim is to increase diversity of agriculture production, help with dealing with climatic changes, as well as preserving quality of water. Osa III focuses on supporting life in rural areas, increasing job opportunities and usage of solar energy. Osa IV supports independent projects, which were chose as a part of program LEADER. Osa V covers expenses, which are needed for realizing, controlling, and evaluating Rural Development Program.

Since 2008, subsidies increased from 5.3 billion CZK to 12.5 billion CZK. The Czech Republic's volume of money paid out remained almost the same since 2008 (average 2.5 billion CZK/year), financial support from the European Union went through bigger change; from 4.2 billion CZK in 2008 to 9.8 billion CZK in 2014 (Figure 4).

Figure 4: Development of Rural Development Program subsidies



Source: Zelená zpráva from years 2008 to 2014

Financial support from the funds of the European Union covers approximately 80% of money distributed. In 2008, 50% of the money from RDP was used for LFA payments (2 billion CZK). This amount did not really change, on the other hand, there was a big increase of subsidies in general, therefore in 2014, LFA payments represented only 24% (which is still majority from Osa II, 40%). (Ministry of Agriculture, 2014c)

3.3.5. Comparison of LFA payments according to type of production

Agriculture production usually has to undergo natural conditions. Some types of production would not be profitable (production of crops in mountain areas) or their opportunity costs would be too high (extensive livestock production on big fields with Chernozem). Therefore, farmers choose lands very precisely.

Table 7: LFA payments according to type of production

Type of production	2008 CZK/ha	2009 CZK/ha	2010 CZK/ha	2011 CZK/ha	2012 CZK/ha	2013 CZK/ha
Production on fields	98	63	68	71	76	65
Milk production	2,017	1,433	1,444	1,417	1,528	1,395
Livestock production	2,963	1,483	2,871	2,854	2,999	2,834
Mixed production	748	458	516	480	544	567

Source: Zelená zpráva from years 2008 to 2014

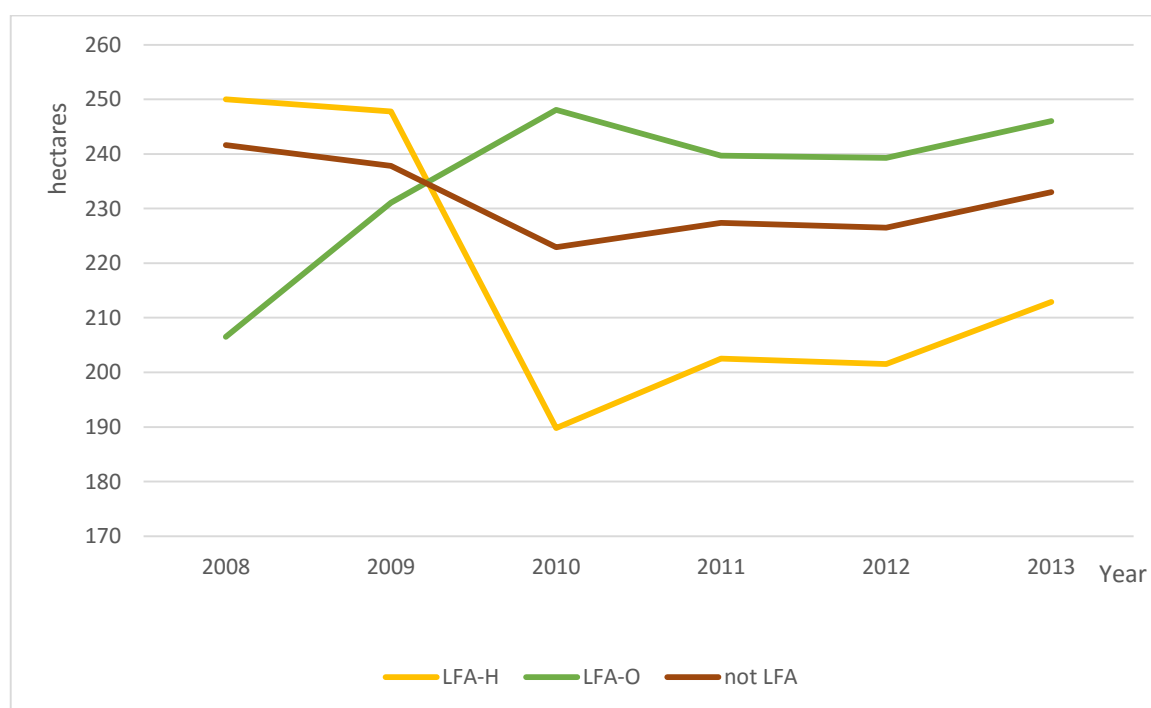
The biggest financial support from LFA system of compensatory payments receives livestock production (Table 7). Livestock production does not require big areas; the average area in 2013 was 152.2 hectares for farm. They use almost all this land for fodder crops, which does not make any revenue. Total expenses are the lowest from all types of production, 19,919 CZK/ha, on the other hand, total production is the lowest as well, 11,453 CZK/ha. Farms are usually located in mountain areas which are not suited for any other production. As mentioned before, those small farms are helping with preserving rural areas. Second biggest financial support receives milk production. Total expenses are much higher than in the case of the livestock production – 47,081 CZK/ha, milk production is very demanding on human work. Total production was 39,455 CZK/ha in 2013. From total financial support received from the state (12,997 CZK/ha), LFA payments represented

almost 11%, in the case of livestock production it was over 20%. Production on fields is very little affected by LFA payments – only 0.77% represents LFA payments. Production is usually not located in less favored areas because the most suitable conditions are in lowlands with good soil quality. Production of pigs and poultry had been excluded from this comparison; they do not receive many payments because their production is not directly dependent on land (as they are breed in halls or sheds). (Ministry of Agriculture, 2014c)

3.3.6. Comparison of LFA payments according to LFA type

Between years 2008 and 2013, areas of mountain LFA (LFA-H) decreased from 250 hectares to 212.2 hectares per farm. The biggest drop was between years 2009 and 2010 (Figure 5) which was caused by decreasing LFA payments in year the 2009. The average payment per hectare dropped from 2,900 CZK to 1,658 CZK (Table 8).

Figure 5: Development of area of agricultural land



Source: Zelená zpráva from years 2008 to 2014

Since 2010, after reevaluating payments, average agricultural land per farm is only increasing (from 189.9 hectares in 2010 to 212.9 hectares in 2013). It means that agriculturist

in mountain areas successfully farming and they are able to overcome natural disadvantages. Other LFA's average area was increasing until 2010, since then they are basically stagnating.

Table 8: LFA payments according to type of LFA

Type of LFA	2008 CZK/ha	2009 CZK/ha	2010 CZK/ha	2011 CZK/ha	2012 CZK/ha	2013 CZK/ha
LFA-H	2,900	1,658	2,747	2,752	2,745	2,761
LFA-O	1,155	698	1,094	993	1,079	1,050
not LFA	187	120	110	70	53	53

Source: Zelená zpráva from years 2008 to 2013

Not LFA do not get very much – in 2013 it was only 53 CZ/ha. Average area has not changed significantly in last 6 years; from 241.6 hectares per farm in 2008 to 223 hectares per farm in 2013. (Ministry of Agriculture, 2008-2014)

3.4. Current development

Subsidies are a necessity in agriculture. Environment, which forces agriculturists sell their production for dumping prices, is very competitive. Supermarkets and big companies dictate prices and conditions under which they are willing to buy their production. Global market disadvantages production in developed economies with higher cost. Subsidies are the easiest type of solution; unfortunately, it is against common sense – why should I give money to the producer if I am able to buy the same product cheaper? The system of compensatory payments provides not only financial support, but it also helps countryside to remain habitable. Main goals of the plan for rural development 2014-2020 are “*fostering the competitiveness of agriculture; ensuring the sustainable management of natural resources, and climate action; and achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment*” (European commission, 2016). The Czech Republic will put their effort especially developing a strategy for improving conditions for agriculturists – higher cooperation between agriculture and food industry, support farms with seminars about marketing, innovative management

(Ministry of Agriculture of the Czech Republic, 2014a), improve age structure of agriculture, creating new job positions, decreasing of water pollution etc. All these ideas will improve less favoured areas and conditions for living.

As subsidies are limited, the commission has to analyse and choose the biggest problems. One of the biggest threat is change of climate and natural conditions. The Ministry of Agriculture has to motivate people to act in accordance with nature. Degradation of water and soil, retaining of biodiversity, those problems will be main part of Rural Development Program's budget. The Czech Republic will invest 84 billion CZK to agriculture in next years, from which 63 billion CZK will be from the EU, 21 billion will come from government budget. Biggest part will be used for antipollution measures (64%), competitiveness of agriculture (17%), and agricultural development (LEADER – 7.5%). (Ministry of Agriculture of the Czech Republic, 2015b)

4. Analytical part

For measuring financial performance are used different financial metric. In this case, the best measurements are those who compare profitability. For comparison of ratios had been used ANOVA along with Scheffe's test. (Hlavsa, 2014)

4.1. Methods of financial analysis

Return on Assets (ROA)

ROA shows us percentage of profitability of assets. It expresses how big part of revenue was generated from assets. The higher value is, the more profitable the company is. It is computed as earnings before interests and taxes (EBIT) over total assets. (Gitman, 2011)

Return on Equity (ROE)

ROE is used for measure profitability of equity (how big part of profit was generated from equity). It is computed as Earnings after Taxes (EAT) divided by equity. The result is shown in percentage. The higher percentage is the better. (Gitman, 2011)

Return on Sales (ROS)

ROS is a measurement showing percentage share of profitability over sales. In general, it expresses how many percent the firm earned per one CZK of revenue. It is computed as EBIT over revenues of sale. Higher percentage means higher profit. (Investopedia, 2016)

Farms are organized according to degressivity into six categories.

4.2. Analysis of farm groups

First group

In the first category, farms with the area smaller than 300 hectares, there were 546 samples. In total, 222 farms were assigned to LFA-H category, 178 farms were in LFA-O category, 43 farms were from LFA-S category, and the rest, 103 farms, were in not assigned to any LFA category. The average area of this category is 150.9 hectares, minimum 1.51 ha, maximum 299.97 ha. Standard deviation of the area was 94.8 ha. It means that samples are widely distributed throughout all values. Average total revenue was 8 million CZK; average total costs were 7.8 million CZK. That means that in average farmers were successful. After removing extreme values, average ROA of this group was -2%, after including LFA payments to earnings, ROA value was 3.2%. The difference was almost 5.2%. Average ROE of this group was 3.6% (LFA payments included in earnings) and -10%, so the difference was 13.6%. Return on sale's means values was -4.2% (LFA payments no included in earnings) and 0.07% (LFA payments included in earnings), which is 4.27% difference.

Second group

Farms with area between 300 and 500 hectares were second category. There were 576 samples, from which 189 were part of LFA-H, 146 were part of LFA-O, 92 were part of LFA-S, and 149 not in LFA. Average total agricultural land was 403.55 hectares. Average total revenue was 27.1 million CZK, average total costs were 26.1 million per farm. Average ROA of this category was 1% (excluding LFA payments from earnings); including payments in earnings, it was 5.5%. Average ROE was -1.8%, if LFA payments were including in earnings, ROE was 4.7%. Average ROS was 0.3% and 3.9% (LFA payments included in earnings).

Third group

The third group includes farms with area between 500 and 900 hectares. This category contains 1,379 samples; 379 of those samples were assigned to LFA-H category, 479 samples were assigned to LFA-O category, 175 were part of LFA-S category, and rest, 346 samples, was not assigned to any LFA category. Agriculture area of farms in the third category was 711 hectares in average. Revenues, earned by farms in this category, were 29.4 million; average costs were 27.9 million. Average ROA of farms included in the third category was 2.3% and 5.4% (LFA payments included in earnings). The difference was 3.1%. Average ROE was -0.8%, after including LFA payments into earnings, ROE was 4.6%. Average ROS was 0.9%, and 3.2% (LFA payments included in earnings).

Fourth group

Fourth category is the largest; there were 2,597 samples; 19% was part of LFA-H (489), 36% was part of LFA-O (923), 7% was part of LFA-S (194) and the rest 38% (991) was not included in LFA. Area of the fourth category ranges from 900 to 1,800 hectares. Average agriculture land of this category was 1,222 hectares. Average revenues of farms in this category were 53.2 million, average costs were 50.3 million. Average ROA of farms in this category was 3.4% (LFA payments excluded from earnings), and 5.2%. The mean value of ROE was 2.1% (LFA payments excluded from earnings), after including LFA to earnings, mean value of ROE was 3.1%. Average value of ROS was 1.5%, after including LFA payments to earnings ROS was 2.1%.

Fifth group

Area of farms in fifth category ranges from 1,800 hectares to 2,500 hectares. Average area of agricultural land in this category is 2106 hectares. In this category, there were 994 samples, from which 86 from LFA-H, 384 from LFA-O, 18 from LFA-S, and 506 was not included in LFA. Revenues were 108.6 million CZK in average. Costs were 102.9 million CZK. Average ROA was 3.8%, and it raised to 4.8% after including LFA payments in earnings. ROE was 2.1%, including LFA payments in earnings ROE was 3.1%. ROS was 1.5% (LFA payments not included in earnings) and 2.1%.

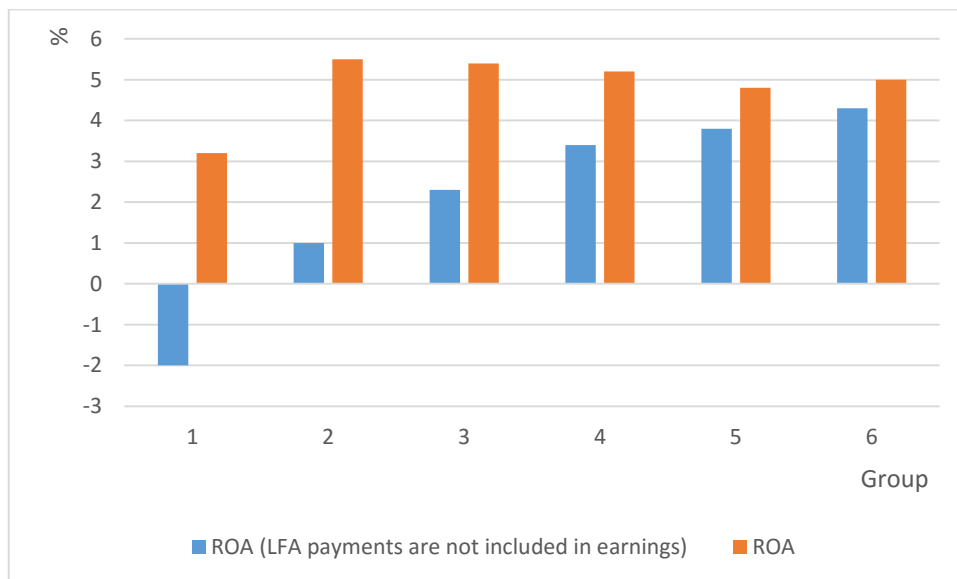
Sixth group

Sixth group includes farms with agriculture land bigger than 2,500 hectares. There were 859 samples; LFA-H included 62 samples, LFA-O included 281 samples, LFA-S included 22 samples and 494 samples was not part of LFA areas. Average area of farm was 3,459 hectares. Average revenues were 194 million CZK, average costs were 182 million. Average ROA was 4.3% (LFA payments not included in earnings); with payments included in earnings, it was 5%. Average ROE was 2.3%, after including LFA payments in earnings it was 2.9%. Average ROS was 1.9% and 2.2% (LFA payments included in earnings).

4.2.1. Comparison of ROA between groups

After including LFA payments, return on sales went up in all cases. The biggest change was in the first group (5.2%); the smallest change was in the sixth group (0.7%). Thanks to LFA payments, the first group became profitable and its ROA was almost the same as others (Figure 6).

Figure 6: Comparison of ROA between groups



The null hypothesis for analysis of variance was that there is not a significant difference between mean values. Without LFA payments, p-value of ANOVA test is smaller than 0.001. That means at least one mean is different from others. Scheffe's test showed us that sixth group has equal mean as groups 4, 5; fifth group has also equal mean as fourth group; and second and third group has equal means as well.

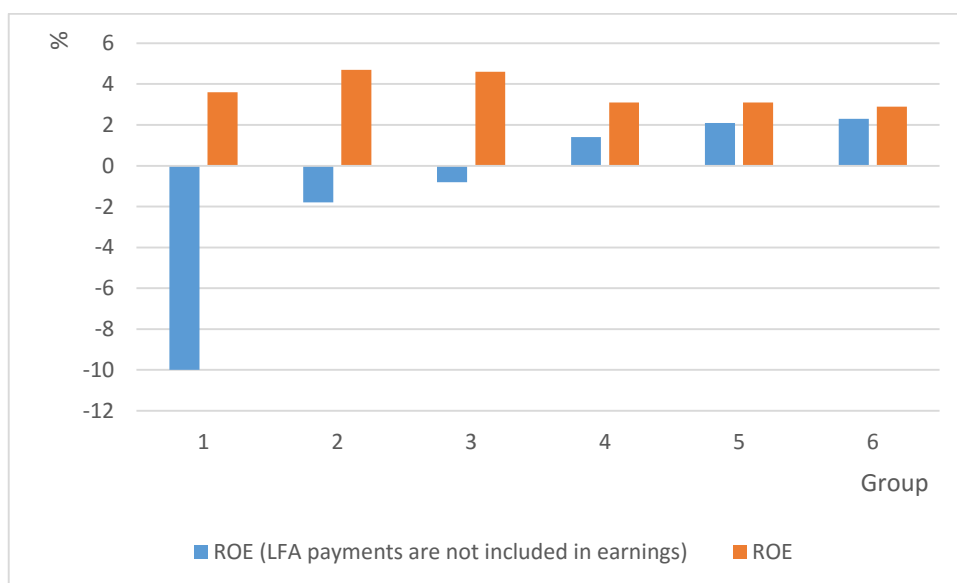
After including LFA payments in earnings, p-value of ANOVA was still smaller than 0.001; that means there is at least one mean, which is not equal to others. Scheffe's test explained which means are not equal; the first group does not have mean equal to any other group, other groups have equal means between each other.

In this case, LFA payments significantly helped to equal conditions. Even though the biggest difference between ROAs in one category (including and not including payments in earnings) was in the first category (5.2%), it was not enough for those small farms to be on the same profitable level as other groups. Since majority of those farms would operate in loss without LFA payments, the payments are crucial for them.

4.2.2. Comparison of ROE between groups

ROE ranged from -10% (first group) to 2.3% (sixth group) if LFA payments were not included in earnings. With payments included in earnings, the highest ROE was of the second group (4.7%), the lowest was ROE of the sixth group (2.9%). The biggest difference between percentages within one group was in the first group (13.6% - Figure 7). Bigger companies have bigger equity in general; therefore, LFA payments do not make that big difference in change of ROE than in comparison with small farms. The majority of bigger farms also do not operate in less favoured areas; therefore, they do not receive many payments.

Figure 7: Comparison of ROE between groups



The null hypothesis of ANOVA testing was that there is not a significant difference between mean values of groups. In case of ROE with payments excluded from earnings, p-value was smaller than 0.001, we can say, that at least one of the mean is different from others. Scheffe's test for comparison of means showed us that only first group has different mean from all other groups. We can say that other groups' means are equal.

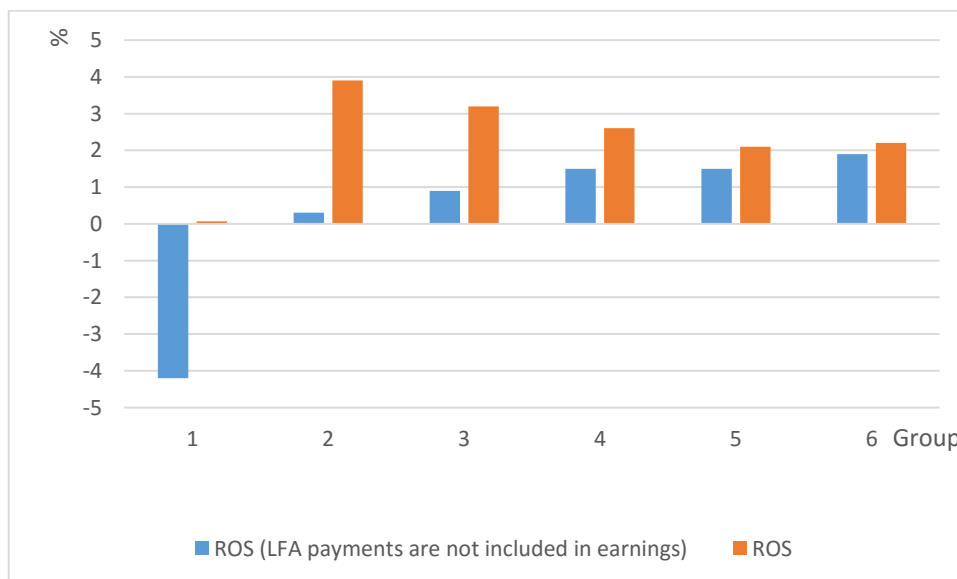
After including LFA payments in ROE, p-value of ANOVA was 0.0163, which is still smaller than 0.05; that means that at least two means are not equal. Scheffe's test explained which groups do not have equal means: the sixth group has different mean with groups 2 and 3; other groups' means can be considered as equal.

In this case, LFA payments equalized return on equity almost on the same level throughout all groups. As small farms' equity is much smaller than big farms' equity, the improvement can be easily seen.

4.2.3. Comparison of ROS between groups

The lowest mean of return on sales was in the first group (-4.2%), the highest mean was in sixth group (1.9%) (LFA payments are not included in earnings). After including LFA payments, the highest ROS was in the second group as well (3.9%), the lowest was in the first group (0.07%). The biggest difference between ROS with and without LFA payments was in the first group (4.27% - Figure 8).

Figure 8: Comparison of ROS between groups



P-value of ANOVA was smaller than 0.001. That means that there is at least one mean, which is different from others. Scheffe's test showed which groups' means are significantly different: first group's mean is not equal to any other mean; the second group has different mean from group 4 and 6; other groups' means are considered to be equal.

If include LFA payments in earnings, p-value of ANOVA test of ROS is still smaller than 0.001, which means that at least one mean is different from others. If we compared mean values using Scheffe's test, it has been found out that the fourth group has equal mean as group 3, 5 and 6, the fifth group has equal mean as the sixth group and the second group has equal mean as group 3. Other means are different from each other. As in case of ROE, LFA payments helped especially first group, which was unprofitable. Differences between means are bigger while including LFA payments in earnings; it is caused by higher share of not less favoured areas as the area of agricultural land of farm rises (18% of not LFA in first group, 57.5% of not LFA in sixth group) – their profit is not raised by that much in oppose to LFA. The first group generates very little profit from sales, which is caused by selling less than big companies sell.

4.3. Analysis of types of LFA

Agricultural land is assigned into one of four category – mountain LFA, other LFA, specific LFA, and not LFA. Category, to which farm belongs, is decided according to the majority of land of farm. It means that if 55% of agricultural land belongs to LFA-H, 25% belongs to LFA-O and 20% is not part of LFA, the whole area will be considered as LFA-H.

Mountain LFA (LFA-H)

In mountain LFA, there are 1,303 samples, from which 1,050 was profitable. The average area of agricultural land is 944.5 hectares for a farm. Average revenue of company from this category was 44.2 million CZK with LFA payments; average cost was 41.3 million CZK. Average subsidies received were 8.2 million, from which 2.3 million were part of LFA payments (28%). Average ROA of LFA-H was -1.2%, after including LFA payments into earnings it increased to 6.1%. Return on equity was -6.6%, and 5.2% with payments (LFA payments included in earnings). ROS was -1% without payments and 4.9% after including payments to earnings.

Other LFA (LFA-O)

There were 2,262 samples in this category. Average area of farm in this category was 1,412 hectares. 1,788 farms were profitable, with average revenue 63 million CZK and average cost 60 million CZK. Average subsidies received per farm were 8.95 million CZK, from which only 1 million CZK were LFA payments. Return on assets was 2%, after including LFA payments to earnings it increased by 2%, to 4%. In this category, ROEs were -0.1% and 3.2% (LFA payments included in earnings). ROS was 0.6% and 1.6% while payments included in earnings.

Specific LFA (LFA-S)

In specific LFA, there were 510 samples with average area 908.6 hectares. There were 426 farms, which were profitable. Average revenue was 33 million CZK; average cost was 31 million CZK. Subsidies received were approximately 7.2 million CZK per farm, LFA payments were only 487 thousand CZK. At LFA-S category, mean ROA was 5.4% (LFA payments not included in earnings) and 7.3%. The mean value of ROE was 2.9% and 6% with LFA payments included in earnings. In this category, ROS was 3.4% (payments not included in earnings) and 4.5%.

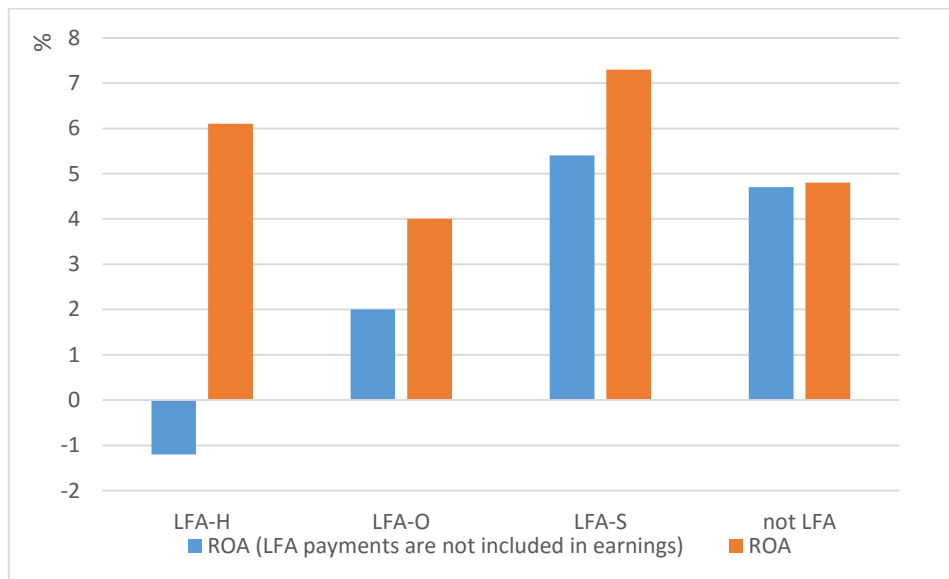
Not LFA

There were 2,476 samples, which 1,984 ended up with profit at the end of the year. The average area of this category was 1,738 hectares. Average revenue of companies, which were not assigned to any less-favoured area, was 97.7 million CZK, average costs were 92.2 million CZK. Average subsidies were 10.6 million CZK, average LFA payments were 115 thousand CZK (if the farm has big part of its agricultural land in LFA but majority is not in LFA, owner can ask for LFA payment anyway). As the LFA payments are very small in this category, the difference between ROA, ROE and ROS is very small. ROA was 4.7%, after including LFA payments in earnings it was 4.8%. ROE was 3% (payments not included in earnings) and 3.14%. ROS was 1.8%, 1.81% with LFA payments included in earnings.

4.3.1. Comparison of ROA between LFA categories

The biggest mean value of ROA (payments not included in earnings) was in category LFA-S (5.4%), the biggest ROA (payments included in earnings) was in LFA-S as well (7.3%). Mean of LFA-H increased the most – by 7.3% (Figure 9).

Figure 9: Comparison of ROA between LFA categories

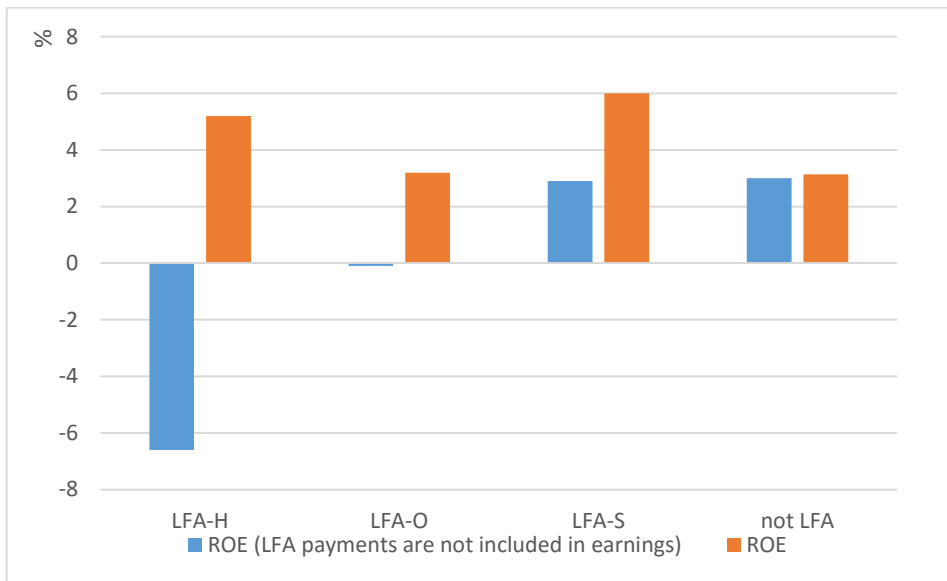


P-value of ANOVA testing in case of ROA (payments not included in earnings) was smaller than 0.001, which means, that we can claim that there is difference between mean values of at least one category. Result of Scheffe's test of equal variances showed that it is significant that there are not differences between means of categories LFA-S and not LFA. In case of ROA (payments included in earnings), p-value of ANOVA test was also smaller than 0.001. Scheffe's test confirmed that mean values of LFA-S and LFA-H are considered to be equal.

4.3.2. Comparison of ROE between LFA categories

Not including LFA payments to earnings, ROE categories were very different. The biggest average ROE was in category not LFA, the smallest was in category LFA-H. Huge difference between ROEs was in category LFA-H – 11.8% (Figure 10).

Figure 10: Comparison of ROE between LFA categories



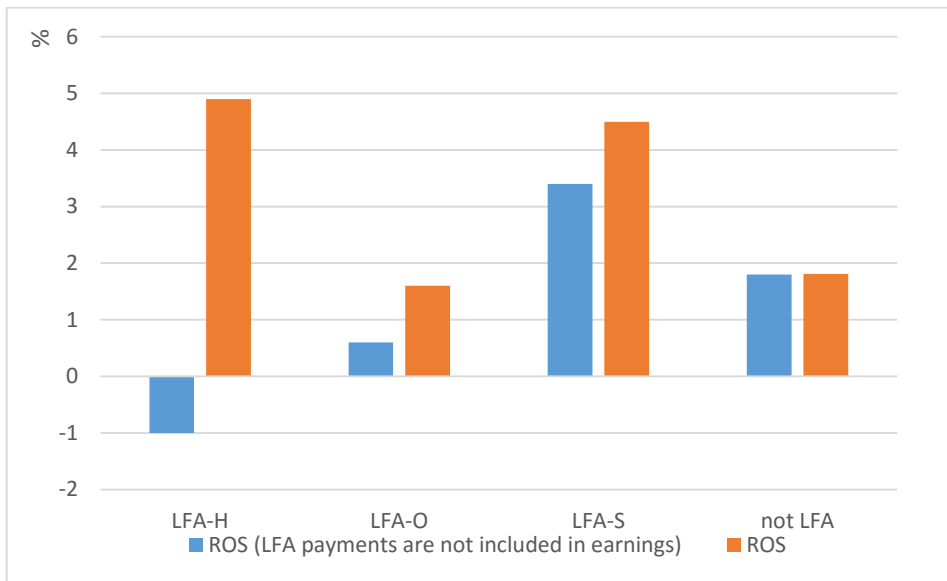
P-value of ANOVA testing was smaller than 0.001; at least one mean of one group is different from others. Using Scheffe’s method, it was find out equal means are between group LFA-H and not LFA, and LFA-O and LFA-S.

Including LFA payments in earnings, p-value was smaller than 0.001 as well; there is strong evidence that at least one mean is different from others. Equal means are between groups LFA-S and LFA-H, and between not LFA and LFA-O.

4.3.3. Comparison of ROS between LFA categories

The smallest return on sale had LFA-H category, -1% (LFA payments not include in earnings). After including those payments in earnings, the smallest ROS had category LFA-O (Figure 11). The biggest difference between ROSs was in category LFA-H – 5.9 % (-1% without payments, 4.9% with payments).

Figure 11: Comparison of ROS between LFA categories



P-value of ANOVA (not including LFA payments in earnings) was smaller than 0.001, which means that at least one of the means is different from others. Scheffe's test for ROS stated that all means are significantly different from each other.

If LFA payments were included in earnings, p-value of ANOVA was smaller than 0.05; that means that at least one of the means is significantly different. Scheffe's test explained means of groups LFA-H and LFA-S, and not LFA and LFA-O, are not significantly different.

5. Results and Discussion

After applying LFA payments to earnings of farms, financial ratios went up. The biggest differences were between values of the first group, the second group, and LFA-H. Those groups are highly dependent on payments; their economical and/or natural conditions are the worst. Scheffe's test explained that differences between means are smaller with payments; it means that LFA payments are helping to reduce a gap between earnings among groups.

The smallest difference, between values of ratios with included and not included LFA payments in earnings, is in sixth group. The share of less favoured areas is very small, as well as their revenue is much bigger in comparison with small farms. Thus, their ratios are not very affected by LFA payments. Small farms, especially those, which are smaller than 300 hectares, are dependent on LFA payments, as they operate in loss without them. On the other hand, it cannot be said that big farms do not need LFA payments; as more than 50%

of farms does not receive financial help as a part of less favoured areas, still, the influence on the other half can be significant.

After analysing areas separately, without LFA payments, mountain less favoured areas operates in loss. After including LFA to earnings, their ratios of return went up significantly. With applying LFA payments, the worst conditions were in other less favoured areas. The reason is simply: farms in those areas are receiving much smaller payments than mountain areas, as their disadvantage is less serious, which means that payments do not improve their situation that significantly. On the other hand, they operate on the same level as not less favoured areas, which mean that their level of income can be considered as sustainable.

6. Conclusion

In 2004, the Czech Republic became part of the European Union. Since then, conditions for agriculture in the Czech Republic started to be better and better. The European Union provides many subsidies, one of them are LFA payments. Since conditions for agriculture are quite difficult in the Czech Republic, LFA payments include about 50% of agricultural land. In 2014, we received 2300 billion CZK from EU for LFA payments. The Czech Republic paid 595 million from own budget.

The European Union tries to simplify and centralize system of LFA payments. Since every country has its inner specification, it is not easy to set conditions, which could be applied to every member state. Since 2007, the Ministry of Agriculture, along with other institutes, works on redefining less favoured areas and remaking the methodology for computing payments. The European Union hopes, that in the future, LFA payments will be defined evenly in all states, only with small amount of exception; so that the level of subsidies will be comparable among states. Currently, there is running Rural Development Program, which is meant to improve conditions in rural areas (which are from the big part less favoured areas). It focuses on improving conditions for farmers, attracting new people to rural areas, decreasing pollution etc.

In recent years, a number of farms increased (44 833 in 2008, 48 554 in 2014); on the other hand, the average area of farms went down (82.6 hectares in 2008 to 75 hectares in 2014). It means that more and more people are entering sector of agriculture.

The highest payment in the Czech Republic receives farms in mountain areas, which are specializing in livestock and milk production. Usually, their area is smaller in comparison with farms from other categories. Surprisingly, their returns, after including LFA payments in earnings, were much better than in other types of less favoured areas. LFA payments play crucial role in their revenue.

After involving LFA payments in the model, all financial ratios started to be more balanced. In every case, small farms had the lowest ratios; their revenues are made basically only from LFA payments (without them, they would operate with a loss). Only in the case of return on sales, the result was slightly different – there were big differences between groups. It is caused by higher share of sales in bigger groups. The most balanced model was the model of return on equity; after including LFA payments, the differences between groups were very small.

Comparison of areas separately proved that mountain areas are not profitable at all. All ratios were negative, which means that without LFA payments, they would operate with big loss. On the other hand, other and specific areas were able to generate profit even without LFA payments. After including payments, most profitable were specific LFA and mountain LFA. Whole analysis proved that without payments, less favoured areas would have to deal with serious economic problems. If we consider, that LFA payments are only one of all subsidies, agriculture, in general, has to solve a big problem for future development: Does it make sense to have market, which is actually forcing suppliers (farmers) to be unprofitable?

LFA payments do not serve only for improving conditions of farmers, they are meant to help people living in areas, which would have leave otherwise. And considering the development of areas in recent years along with analysis of LFA payments, we can claim that it is actually happening. In average, LFA payments help to equalize economic results of small and big farms, farms dealing worse natural conditions and farms with better conditions, different kind of productions, different cost of production and different revenue; payments are helping overcome all types of problems. The main goal of environmental development is to preserve quality of countryside in the Czech Republic. And without subsidies paid to less favoured areas, it would not be possible.

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