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The impact of investment support from the Rural Development Programme of the Czech Republic for 2007-2013 on the economic efficiency of farms

A comparison of the performance of farms within and outside Less Favoured Areas

European agriculture is highly mechanised and its development is to a large extent shaped by the constant need for investment. By combining private capital with public funds, the risk burden associated with investment can be shared. The general economic objective of investment support is to improve the efficiency of production factors, such as labour, land and capital. The Rural Development Programme of the Czech Republic for 2007-2013 included a preferential criterion, the objective of which was to give an advantage to farms in Less Favoured Areas (LFA) by facilitating their access to funding for investments. This paper evaluates the investment activities of agricultural holdings located in Czech LFAs in the period 2011-2015, compared to those that are not located in LFAs. Binary logistic regression was employed to identify factors, such as LFA type, farm size, share of other revenues, indebtedness of a farm and stocking density of cattle, that influenced whether a farm was or was not supported with an investment subsidy. We conclude that supported farms in LFAs have higher levels of economic performance and higher labour productivity than unsubsidised farms. It is evident that many farms, especially in mountain areas, are interested in investment activities and are trying to develop their businesses. They have a lower likelihood of business failure than those farms that do not invest.

Keywords: investment activity, subsidy, farm economy, less favoured areas

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Introduction

European agriculture is highly mechanised and its development is clearly determined by technical progress (Kirchweger *et al*., 2015). To a large extent it is shaped by the constant need for investment. By combining private capital with public funds, the risk burden associated with investment can be shared. A major source of public sector co-funding for farm investment activities in Europe is the European Union's (EU) Common Agricultural Policy. Much research, for example Lefebvre (2014), cited by Wieliczko (2015), has been devoted to the impact of agricultural policy on investment decisions. Kirchweger *et al*. (2015) show that farms participating in the Austrian farm investment programme increased their production significantly more than did non-participating farms. A study in the Czech Republic (Medonos *et al*., 2012) led to similar findings. Travnikar and Juvančič (2013) examined farms participating in the Slovenian Rural Development Plan. Their results showed a positive relationship between farm investment support and agricultural labour productivity.

The investments of farms are also relevant from the societal perspective. Society is interested in competitiveness since this is of consequence for local employment and regional competitiveness (Kirchweger *et al*., 2015). Small farms contribute significantly to the budgets of townships and rural communities. The decline in unemployment and the increase in investment incentives leads to an improvement in the quality of life and generally faster economic convergence, which is especially relevant for the countries of central and eastern Europe that joined the EU in 2004 (Jeníček, 2013).

According to Abrhám (2015), one of the crucial indicators for innovations and investment activities is the legal form of the farm. Limited liability companies tend to innovate more than other legal forms. There are two possible explanations to this: firstly, the limited liability companies are often represented by sole traders (one-person firms) and micro-enterprises that seek to establish a strong position in the market. These small farms tend to innovate and invest in new technologies and processes in order to beat the competition. Secondly, small farms are less cumbersome and more creative than large ones and can spend less time dealing with tax forms and the employment and health insurance agenda, and more time innovating their products or services.

Innovation and investment activities are very closely related to diversification of farm activities. Diversification activities may be undertaken for economic reasons but also for other, non-economic related factors (Barnes *et al*., 2015). Investments in new technologies enable creation of new products and new entrepreneurial activities. Barnes *et al.* (2015) concluded that diversified farms, in the sense that they obtain revenue from two or more business activities, are more viable. The role of investment and innovation in increasing a farm's competitiveness is directly linked to technical progress that is an important factor of growth in modern agricultural growth models (Rembisz and Floriańczyk, 2014, cited by Wieliczko, 2015). It drives productivity and efficiency in production and enhances farm profitability.

The Rural Development Programme (RDP) of the Czech Republic for 2007-2013 is based on the National Strategic Plan of Rural Development which was prepared in accordance with Council Regulation (EC) No. 1698/2005[1]. The RDP consisted of four axes and, within Axis I – 'Improving the competitiveness of agriculture and forestry', was a group of measures (I.1) aimed at restructuring and developing physical potential and promoting innovation (MoA, 2008). Among these, measure I.1.1.1 'Modernisation of agricultural

[1] Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

Box 1: Actions eligible for financial support under measure I.1.1.1 – 'Modernisation of agricultural holdings' of the Rural Development Programme of the Czech Republic, 2007-2013.

A. Investments in livestock production: (a) construction work; (b) machines and equipment; (c) breeding technology; (d) waste management.
B. Investments in plant production: (a) machines and equipment for cultivation; (b) irrigation technology; (c) postharvest processing technology; (d) storage technology; (e) garden buildings; (f) supporting constructions for permanent crops; (g) coverage constructions.
C. Common investments for plant and livestock production.
D. Renewable energy sources.
E. Project documentation – cross-sectional for plant as well as livestock production.
F. Technical documentation – cross-sectional for plant as well as livestock production.

Source: MoA (2008)

holdings', hereinafter 'Modernisation', was designed to support the modernisation of farms where there is an inadequate level of investments, in terms of both structures and technologies, in crop as well as animal production (Box 1). The general economic objective of this investment support was to improve the efficiency of production factors (labour, land and capital). Furthermore, the RDP included a preferential criterion, the objective of which was to give an advantage to farms in Less Favoured Areas (LFA) by facilitating their access to funding for investments.

Investment spending on projects of livestock production formed 76.1 per cent of the total investment spending in the 2007-2013 RDP. One fifth of the investment spending was focused on waste management, which is a very important type of investment in terms of positively influencing the environment. Other investment trends in livestock were projects focused on the technology of cattle breeding, or more precisely dairy cows (in total 15.6 per cent of the investment spending), and for construction or renovation of feed stores (15.5 per cent of the investment spending). Investments in plant production formed less than a quarter of the total amount. Farms invested the most money in storage technology (more than 60 per cent of the investment into plant production), which will enable them to increase the quality of stored products and achieve higher postharvest prices. Investments in machines and equipment for crop production, and supporting establishment of permanent crops (each accounting for 11 per cent of the investment into plant production) were also significant. The share of investment in the technology of biomass processing was negligible within the Modernisation measures (0.2 per cent of the investment spending).

The analysis of Štolbová and Míčová (2012) of the results of the structural survey of agriculture in the Czech Republic demonstrated a more efficient use of both human labour and machinery by the large farms situated in the LFAs than by the small farms. A more efficient use of machinery is reflected in the low depreciation per hectare of utilised agricultural area (UAA) in the case of large farms. As regards meeting the objectives of the LFA measure, it was found that the LFA payments, especially in mountain areas, compensate the economic losses in the LFAs to such an extent that their net value added per hectare of UAA has almost reached that of the farms in the more favoured areas. On the other hand, when net value added without LFA payments is considered, the level of net value added is much lower in LFAs than non-LFAs. The LFAs can be characterised as those with higher costs and lower efficiency. Lososová and Zdeněk (2013) also confirm the lower profitability of Czech LFAs.

This paper evaluates the investment activities of farms located in Czech LFAs in the period 2011-2015, compared to those that are not located in LFAs. The research questions are as follows: (a) Does the size of the enterprise affect the investment activity? and (b) Are there differences in investment activities between farms operating in different LFAs?

Methodology

As we focused on the second half of the programming period which is characterised by higher activity of farms in the Modernisation measure, the modelling is based on the time series 2011-2015. The database for modelling combines various sources: Albertina (economic indicators of farms, managed by the company Bisnode Česká republika, a.s.), the State Agricultural Intervention Fund (SAIF, data from the Czech Payment Agency about recipients of subsidies) and the Land Parcel Identification System (LPIS, territorial data about UAA, including LFAs, managed by the Ministry of Agriculture of the Czech Republic, MoA). For the specified time series, the database includes 6,051 farms, 1,313 of which are in mountain LFAs (LFA-M), 2,262 in non-mountain LFAs (LFA-O) and 2,476 in non-LFA. Only farms with more than 1 ha of UAA are considered. For the classification of farms into the groups LFA-M, LFA-O and non-LFA, their share of agricultural land in the LFA was determinant. If it exceeded 50 per cent in mountain LFAs, it was categorised as a representative of LFA-M, if it exceeded 50 per cent in other LFAs, a farm was a representative of LFA-O and if a farm cultivated more than 50 per cent of its agricultural land outside of LFAs, then it was assigned to the group of non-LFA. The localisation of mountain and other LFAs in the Czech Republic is shown in Figure 1.

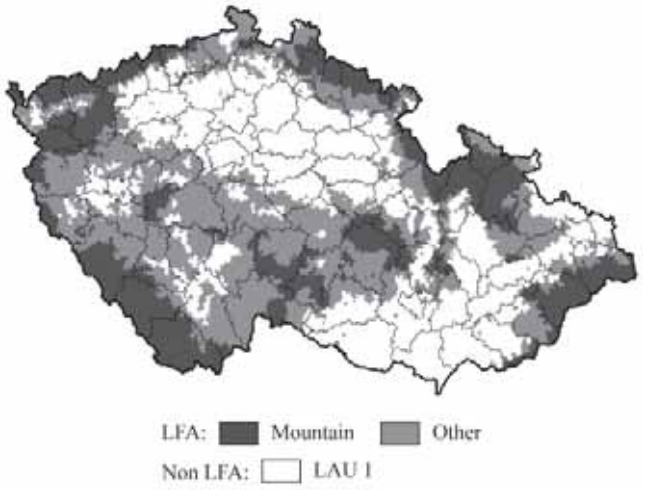

Figure 1: Distribution of Less Favoured Areas in the Czech Republic. LAU 1 administrative boundaries are also shown.
Source: own composition

Predictive model

Predictive modelling is a widely-used method in analyses of outputs in the agrarian sector. For example, Hughes *et al*. (1996); Castro-Tanzi *et al*. (2014); Di Paola *et al*. (2016) and Rad *et al*. (2015) applied predictive models for crop yield or crop production, which can be considered as an output in the agrarian sector. Thacher *et al*. (1996); Davis and Lopez-Carr (2014) and van der Sluis *et al*. (2016) dealt with the prediction of economic characteristics, such as the use of soil. The prediction of the behaviour of farmers and their involvement in profitable and non-profitable activities in agriculture was addressed by, for example, Hop *et al*. (2011) and Mzoughi (2011).

In most cases, predictive models are based on regression analysis; according to the nature of the data and their purpose, modifications are used, such as multiple regression or logistic regression. In contrast to multiple regression with a measurable response variable, a response variable in logistic regression is categorical – in our case binary (a farm was or was not supported by the Modernisation measure). The objective of our predictive logistic model is to achieve the best possible classification of farms (supported or not supported by the Modernisation measure) with regard to the selected input model variables listed in Table 1. The decision to use the logistic model was driven by the experience of authors such as Hop *et al*. (2011) and Mzoughi (2011). It is possible to use both measurable and immeasurable explanatory variables and there is no assumption of multidimensional normal distribution. The core of a logistic regression model is the odds ratio – the ratio of the outcome probabilities:

$$odds\ ratio = P(1)/[1-P(1)] \quad (1)$$

where $P(1)$ is the probability that the farm is supported.

The original relationship between the input and the odds ratio is exponential. It is converted into a linear relationship through the log of the odds ratio, we used natural logarithm ln (Abbott, 2014).

Logistic regression takes maximum likelihood estimation. In logistic regression, we maximise the likelihood of an accurate prediction when we find the set of coefficients that result in the greatest overall likelihood of obtaining this set of outcome values. The logistic model applied in the analysis in this paper is in the form:

$$\ln P(1)/[1-P(1)] = b_0 + b_1x_1 + b_2x_2 + \ldots + b_kx_k + \varepsilon \quad (2)$$

where b_0 is constant, b_1, b_2, …, b_k are the model coefficients, the variables x_1, x_2, …, x_k represent eight vectors of explanatory variables (Table 1). Let be ε residual part of the model.

We examined the theoretical relevance of the included variables, the significance of variables (we performed a Wald test for joint significance), multicollinearity (increases the standard errors of the regression coefficients) and the regression model regarding proportion of correctly predicted farms. In particular, we tested in the subsection 'Preferential points' differences in size of the Modernisation subsidy at farms with and without preferential points when they applied for the subsidy. Since data were not normally distributed, we used a non-parametric test. There we employed the Mann-Whitney test to test the equality of distributions in compared groups.

Results

Shares of farms receiving financial support

The areas of supported agricultural land as shares of the overall areas of agricultural land, according to the types of LFA, were derived from the database of receivers who requested support provided by the SAIF in the framework of the Modernisation measure of the 2007-2013 RDP, and who received the support in the period 2008-2015. The largest share of supported area, 52.9 per cent, was in non-mountain LFAs (LFA-O), compared to 45.7 per cent of the area in mountain LFAs (LFA-M) and 42.3 per cent in non-LFA (Table 2). In terms of the number of farms in the evaluated data set (Albertina, 2011-2015), a higher share of enterprises (7.84 per cent) in LFA-M was supported than LFA-O (6.01 per cent) and in non-LFA (4.00 per cent).

Indicators of economic performance

There are differences between the supported and unsupported farms in terms of economic performance (Table 3). In all three groups the former have a higher average net value added/worker (NVA/W), i.e. slightly higher viability, but they are characterised by fewer workers per 100 ha (W/100 ha). A higher value of assets per hectare indicates that the

Table 1: Variables used in analysis; descriptive analysis and logistic model including description.

Variable	Description
Model variables	
Cost factor	total costs / total revenues (CZK/CZK)
NVA/W	net value added / worker (CZK)
W/100ha	number of workers / 100 ha UAA
Share of other revenues	other revenues/total revenues (%)
LFA type	mountain LFA (LFA-M), non-mountain LFA (LFA-O), non-LFA
Size group (in ha UAA)	1: up to 300; 2: 300-499; 3: 500-899; 4: 900-1799; 5: 1800-2499; 6: >=2500
Indebtedness	(long- and short term liabilities) / (liabilities + equity)
Cattle density	number of livestock-cattle units / 100 ha
Other descriptive variables	
Labour productivity	total revenues / labour costs (CZK)
Fixed assets per ha	total fixed assets / UAA ha (CZK)

Source: own elaboration

Table 2: Utilised agricultural area (UAA) and numbers of farms that received financial support under measure I.1.1.1 Modernisation in the period 2008-2015, and UAA and numbers of all farms, by LFA type.

Area	Utilised agricultural area (ha)		Number of farms	
	Supported farms	Total	Supported	Total
LFA-M	238,690	522,600	103	1313
LFA-O	664,421	1,256,500	136	2262
Non-LFA	749,625	1,774,200	99	2476
Total	1,652,736	3,553,300	338	6051

For types of LFA see Table 1 and text
Data sources: Albertina, 2011-2015; SAIF, 2011-2015; MoA, 2016

Table 3: Selected economic indicators for farms supported and not supported under measure I.1.1.1 Modernisation by LFA type.

Area	Supported	NVA/W (CZK)	W/100 ha	Labour productivity (CZK/CZK)	Cattle density (head/ha)	Fixed assets/ha (CZK)
LFA-M	No	462,155	3.52	0.41	0.41	58,026
	Yes	571,347	2.91	0.55	0.48	66,349
LFA-O	No	525,460	3.65	1.11	0.39	63,158
	Yes	560,384	3.60	1.19	0.41	80,221
Non-LFA	No	655,465	3.81	1.01	0.27	67,986
	Yes	663,793	3.27	1.04	0.30	94,323

For types of LFA and details of variables see Table 1 and text
Data source: Albertina, 2011-2015

supported farms invest in the renewal of technology. In LFA-M, the supported farms have a higher average livestock density but in LFA-O and non-LFA the average livestock densities on the supported and unsupported farms are similar.

The development of selected economic characteristics was generally more favourable for the supported farms. A bigger increase in average net value added/worker occurred at the supported farms in LFA-O in the period 2011-2015 (Table 4). Labour productivity increased the most (31 per cent) at the supported farms in LFA-M but productivity growth was much more modest at the supported farms in LFA-O and non-LFA (14 and 9 per cent respectively). By contrast, the unsupported farms showed either stagnation (non-LFA) or slight increases (LFA-M and LFA-O) in labour productivity. The rate of diversification level, measured by the ratio of other revenues to total revenues, was generally higher in LFA-M, nevertheless, the trend in the monitored time series (2011-2015) is constant. Slight average increases in the rate of diversification are evident for both the supported as well as the unsupported farms in LFA-O, while a more significant increase is recorded for the supported farms in non-LFA.

Table 4: Changes in selected indicators for farms supported and not supported under measure I.1.1.1 Modernisation over the period 2011-2015 by LFA type.

Indicator	Supported	LFA-M	LFA-O	Non-LFA
		change (%)		
Net value added/worker (CZK)	No	14	25	27
	Yes	20	41	18
Labour productivity (CZK/CZK)	No	14	11	5
	Yes	31	14	9
Share of other revenues (%)	No	2	8	15
	Yes	5	13	21

For types of LFA see Table 1 and text
Data sources: Albertina, 2011-2015; SAIF, 2011-2015

Predictive model

The MoA, as the administrator of the RDP including the Modernisation measure I.1.1.1, is interested in the extent to which this measure has influenced the management of farms, how selected indicators of farms have changed and how their performance has improved. Based on our evaluated database of farms, the factors that significantly contribute to the fact that an enterprise will, with higher probability, use the subsidy title I.1.1.1 Modernisation were monitored. For these purposes, a logistic model was set up with a binary dependent variable 'supported within the Modernisation measure' with two options – supported and not supported. The results of the modelling are shown in Table 5.

Table 5: Logistic model: analysis of factors influencing the variable 'supported within the Modernisation measure'.

Parameter	Model 1			Model 2		
	B	S.E.	Odds ratio	B	S.E.	Odds ratio
Cost factor	-0.167	0.192	0.822			
NVA/W	0.002	0.001	1			
W/100ha	-0.06	0.043	0.895			
Share of other revenues	0.218	0.107*	1.212	0.214	0.107*	1.208
LFA type						
LFA-M	0.478	0.191*	1.624	0.419	0.181*	1.584
Non-LFA	-0.411	0.233*	0.744	-0.390	0.197*	0.658
Size group:						
1	-2.12	0.318*	0.091	-2.679	0.308**	0.071
2	-1.315	0.416***	0.283	-1.287	0.396***	0.224
3	-1.355	0.346***	0.318	-1.309	0.302**	0.308
4	-0.345	0.29*	0.797	-0.349	0.274*	0.743
5	0.047	0.351*	1.031	0.056	0.365*	1.053
Indebtedness	0.62	0.312*	1.916	0.55	0.282*	1.742
Cattle density	0.547	0.225*	1.553	0.329	0.194**	1.248
Constant	-1.711	0.415**	0.227	-2.586	0.389**	0.154
Whole model	Chi-square = 314.12***			Chi-square = 302.18***		

Note: ***, **, and * denote significance at the 0.1%, 1%, and 5% level; predicted correctly 93.2%. B = parameter estimates, S.E. = standard error
Data sources: Albertina, 2011-2015; SAIF, 2011-2015

In total, the influences of eight factors were modelled, two of which (the LFA type and size group) were of categorical nature. Two models were created. In the first model it is evident that the influence of the factors costs, net value added/worker (NVA/W) and number of workers per 100 ha (W/100 ha) are not significant for identifying whether or not a farm was supported. The second model works only with the significant variables. The variables that have the odds ratio higher than one increase the chances of support. If it is a categorical variable, a category is always determined to which the others are compared and the odds ratios are calculated. For the variable LFA, LFA-O is selected as a comparative base of the category. Based on the resulting model, the odds ratio for LFA-M is 1.584. For the representatives of this category there is an increasing chance of support in comparison to the representatives of LFA-O, by approximately 1.6 times. On the other hand, the non-LFA farms have a decreasing chance in comparison to the LFA-O farms (the odds ratio is 0.658).

In the case of the categorical variable, the group with more than 2,500 ha of UAA is determined as a reference group. The analysis implies that the farms with less land have a decreasing chance of support (the odds ratio is lower than 1). On contrary, those in size group no. 5 (1,800 – 2,500 ha of UAA) have an increasing chance of support. Furthermore,

Table 6: Average value of support under Modernisation measure I.1.1.1, according to farm size and location.

Farm size group (ha UAA)	LFA-M	LFA-O	Non-LFA
		CZK/ha	
up to 300	10,529	12,126	11,147
300-500	2,682	4,869	5,117
500-900	5,621	5,081	6,424
900-1800	2,810	3,456	1,924
1800-2500	3,556	2,092	2,158
>= 2500	1,453	1,518	1,146

For types of LFA see Table 1 and text
Data sources: Albertina, 2011-2015; SAIF, 2011-2015

the results imply that the chance for support within the Modernisation measure is increasing for the farms with a higher share of other production, i.e. farms with more diversification. Another finding is that the supported farms can be characterised by higher indebtedness and cattle stocking rates. The analysis implied that more diversification is evident for the supported farms in LFA-M; however, these farms also had greater indebtedness. The supported farms in LFA-M are also more oriented to livestock production, to where the most resources of the Modernisation measure flowed.

The average values of support in CZK/ha divided according to six farm size groups (ha UAA) are given in Table 6. The smallest size group benefited from the highest level of per-hectare support, while the largest group received the lowest level of support. This support was not tied to the size in hectares of a farm but to an investment, for example, machinery or buildings. Consequently, farms with various areas of UAA could receive a similar amount of subsidy. An overall lower level of supported per-hectare area is evident in LFA-M. Generally, a higher level is than reported by farms in LFAs. In relation to the group averages, the farms with up to 300 ha of UAA in LFA-M report roughly twice the level, in LFA-O and non-LFA a three times higher level. The size group 500-900 ha of UAA in LFA-M, LFA-O as well as non-LFA reported values above the average.

Preferential points

The enterprises farming in LFAs may gain an advantage in financing of projects approved within the Modernisation measure. If it is a construction investment, it is necessary to locate its realisation in the LFA. The condition for an applicant in case of a mobile investment (e.g. mobile milking parlour) is to have at least 75 per cent of the total land area registered in LPIS situated in a LFA. The farms that meet the conditions have the maximum level of non-refundable grants increased by 10 per cent. The subsidy for one project ranges from CZK 100 thousand to CZK 30 million inclusive.

We tested whether the average value of subsidies received by farms with preferential points was significantly different from that received by farms without preferential points. The data sources were Albertina, 2011-2015 and SAIF, 2011-2015. This testing was not conducted for the LFA-M farm subset, because all farms in this group met the conditions for preferential points. In total, 136 LFA-O farms were supported, 87 of which were with preferential points. The amount of subsidy calculated per ha of UAA differs among the groups by approximately CZK 150 per ha (CZK 4,472 for farms with preferential points; SD=6,059, CV=1.35, cf. CZK 4,613 for those without; SD=5,141, CV=1.11). In both groups the coefficients of variation exceed a value of 1, indicating that the variability in the value of the subsidies among farms is very high. The differentiation between both sets of farms was tested by non-parametric Mann-Whitney test, as both groups did not show normality of data distribution. The null hypothesis was that distributions of subsidies in the two groups of farms are equal. Based on the rank-order Mann-Whitney test, the p-value of which was 0.328, it is not possible to reject the null hypothesis of equality at the 5 per cent level of significance. Thus, based on our data we failed to show that the values of the subsidies received by the two groups were significantly different.

Discussion

Measure I.1.1.1 'Modernisation of agricultural holdings' of the Rural Development Programme of the Czech Republic for 2007-2013 aims to improve labour productivity, and increase net added value and the overall efficiency of production factors of farms. A higher subsidy per hectare of UAA is evident in LFAs than in non-LFAs. Within LFAs, a higher activity with a higher share of interested farms was observed in mountain LFAs. The subsidy paid per hectare of UAA was the highest for the smallest farms (up to 300 ha), again higher in LFAs than in non-LFAs. Farms with the largest areas, above 2,500 ha of UAA, recorded the lowest investment activity in terms of number of submitted projects. In LFAs, the most financial subsidies were channelled to livestock production (up to 85 per cent), in non-LFAs, roughly 60 per cent of the resources. These included especially investments in waste management and technologies connected with breeding of cattle. In non-LFAs, projects focused on investments in plant production, such as stores, machines and so on, dominated.

The analyses showed that the main determinants of farm involvement in the Modernisation measure are type of LFA, size group of a farm, share of other production, indebtedness of a farm and density of cattle. In case of the type of LFA, a higher probability of obtaining support is showed by the group of farms in LFA-M, while in case of non-LFA the probability of support is decreasing. The importance of farm size is confirmed also by Abrhám (2015), who found that farms with more UAA were less active, while the amount of financial resources per hectare of UAA was higher for farms with less UAA. Another significant factor is the share of other production as an indicator of diversification of the activities of a farm. Farms with a higher share of other revenues and thus more diversified are more likely to be involved in the Modernisation measure. Those with the highest share of other revenues are primarily located in LFA-M. A higher share of diversification, which is closely related to multifunctional agriculture, decreases the sensitivity of farm management to external shocks, which can be related to financial or production outages in crop or livestock production.

Investments in technological development increase productivity and efficiency and improve profitability of a farm (Wieliczko, 2015). The results of our analyses confirm these

conclusions: investment activities have a positive impact on the development of agricultural enterprises in Czech LFAs. The farms supported by the Modernisation measure show, especially in LFA-M, higher viability measured by the ratio NVA/W. These findings confirm those of Kirchweger *et al*. (2015) and Medonos *et al*. (2012). Furthermore, innovations and modernisation of technologies lead to savings in workforce. Our data show that the supported farms in LFA-M and LFA-O have a higher labour productivity and a higher value of fixed assets per hectare than non-supported farms (Table 3). This suggests that these farms have invested in modernised technology and that the applied innovation enabled either higher production or the same level of production as previously but with fewer workers. These findings are consistent with the conclusions of Abrhám (2015), who primarily considers farms with fewer employees as more active in innovations.

Furthermore, the development trends of selected economic indicators, such as NVA/W, share of other revenues and labour productivity, were also more favourable for the farms which were supported by subsidies. In the case of NVA/W, the highest increases were recorded over the period 2011-2015 in LFA-O and in non-LFA, in both cases for the farms that were financially supported. In the case of LFA-M, a more significant increase occurred for the supported farms; at the unsupported farms the increase was smaller. Labour productivity increased more significantly in LFA-M, and especially at the supported farms, in line with the findings of Travnikar and Juvančič (2013). The increase was milder at the supported farms in LFA-O and non-LFA, and there was no significant change in the given period for the unsupported farms. Other revenues are generally highest in LFA-M, especially in the period 2011-2015, however, this was not significant; values rather stagnated. A significant increase is evident at the supported farms, especially in non-LFAs.

The effects of investment support under the Modernisation measure in the form of improved net added value per worker were remarkable. In LFAs, the supported farms differ from those that were not indebted. Higher indebtedness was recorded at the former, and public sector support improves access to loans and thus facilitates investment, which is in line with one of the primary goals of the policy. Special focus should be put on smaller farms and family farms in the new EU programming period from 2020 onwards: their access to financial support under the Modernisation measure was at a lower level than for larger farms (mostly agriholdings). Smaller farms and family farms are not so competitive (they usually have higher unit costs, while larger farms have economies of scale and stronger capital structures). Smaller and family farms are more connected with the particular rural locality (they usually own the land; while the family members are often involved in the community activities in the village or within LEADER Local Action Groups.

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