Differences in Value of Entrepreneurship Index in Rural Areas of the Lower Silesia Province

Izabela Klepacka-Dunajko, Damian Dunajko, Halina Kałuża
Siedlce University of Natural Sciences and Humanities, Poland

The article presents results of research on the relationship between the rate of entrepreneurship of rural and urban-rural province of Lower Silesia and the distance from the economic centres, as well as expenditures of counties on public roads.

It is assumed that the main economic centres are the county towns of the Lower Silesia Voivodship. Entrepreneurial activity rate was defined as the number of business entities registered in the REGON system per 10,000 population of working age. Distance of rural communities from economic centres were expressed as the shortest road distances. The research shows that there is no statistically significant relationship between the ratio value of entrepreneurship in the municipality and its distance from the economic centre, but it exists between the average rate of entrepreneurship of the districts and their expenditure on public roads.

Keywords: rural areas, entrepreneurship, distance, entrepreneurship rates, spatial layout, Lower Silesian Voivodship.

1. INTRODUCTION

"Socio-economic development takes place at a different pace and in a certain direction. This depends among others on the funds available, position towards large cities, routes, level of development and the structure of the economy." [Pałasz, 1999].

The basic condition for rural areas development is to increase their diversity, in particular by enhancing the structure of the socio-economic functions.

The development of all forms of entrepreneurship leads to the creation of new jobs, as well as to the diversification of the income of the population. Multifunctional and sustainable rural areas development implies their greater economic diversification.

It is an idea of activating rural areas and diversification of economic activities of the rural population. This development comes along with introducing an increasing number of new non-agricultural functions: production, trade, services into a rural area. This concept is aimed at creating new jobs and overcoming unemployment, searching for different sources of income in professions related to the environment of agriculture and economic activities unrelated to agriculture but using rural productive resources. [Sznajder i Przezbórska, 2006]

A new phenomenon is the emerging trend of migration of urban population to the countryside. The process of suburbanization contributes to the growth of the residential function in rural areas, particularly in the suburban areas of large cities. Municipalities adjacent to the agglomerations have good transport connections. It often happens that entrepreneurs move offices of their companies to the countryside. This creates the conditions for rural development.

T. Sztucki [1994] considers entrepreneurship a novelty, involving the search of actions different than before, finding more efficient ways of doing business, giving better products and more efficient commercial service, greater efficiency of resources engaged in the production, trade and services.

In the development of entrepreneurship important are not only individual personality traits, skills or experience, but also macro-environment. Local authorities should encourage these attitudes, because it is the mutual interest of residents and people responsible for the area development. The

development of entrepreneurship is usually accompanied by infrastructural development and improved infrastructural development may be essential for growth of entrepreneurship. Normally, mainly due to the benefits of agglomeration where there are attractive labour resources.

Measurement of entrepreneurship development can be done by means of e.g. entrepreneurial activity indicator.

Lower Silesia covers an area of 19,948 km2 and is inhabited by almost 3 million people [Central Statistical Office, 2014]. The settlement network of the region consists of 26 counties, which are divided into 36 urban municipalities, 55 rural-urban municipalities and 77 rural municipalities.

Lower Silesia is of strategic importance for the development of international transport systems because of its geographical location. Through voivodship runs the third Pan-European Transport Corridor Dresden (Berlin) - Wroclaw - Lviv - Kiev, crossing the traffic routes leading from southern Germany, Austria and the Czech Republic, as well as the European route E65. In addition, steps to implement inter-agreement for Central European Transport Corridor (CETC) are a great opportunity for the region (Fig. 1) [of Lower Silesia Regional Report, 2011].
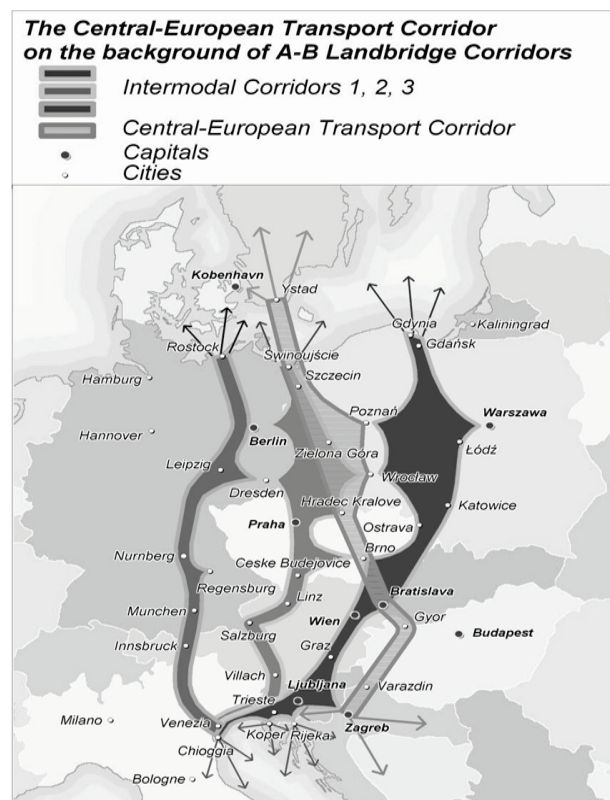

Fig. 1. Central European Transport Corridor CETC against actual transportation corridors.
Source: www.cetc.pl

The objective of this article is to present the level of entrepreneurship development of the region of Lower Silesia and to examine whether there is a link between the rate of entrepreneurship and the distance of spatial units from economic centres and counties expenditures on public roads.

2. MATERIAL AND METHOD DEVELOPMENT

The paper presents results of research referring to the relationship between the entrepreneurial activity rate in rural areas of Lower Silesia Voivodship and the distance spatial units (rural municipalities) from economic centres and counties expenditures on public roads.

Entrepreneurial activity rate was expressed by means of a number of economic entities registered in the REGON system per 10,000 residents at working age. The formula is expressed in the following way [M. Iwańska, W. Bieńkowska, differentiation of index value of entrepreneurship in rural communities in the Mazowieckie voivodship spatial arrangement, [Acta Scientiarum Polonorum. Oeconomia 9 (3)].

$$Wp = P / L \times 10000 \quad (1)$$

where:
Wp - entrepreneurial activity rate
P- number of registered business entities
L - number of working-age population

The distance of individual spatial units from economic centres has been defined as the shortest road distance. It was assumed that economic centres are the cities of Zgorzelec district, Luban, Bolesławiec, Lwówek Śląski Jelenia Gora, Zlotoryja, Legnica, Polkowice, Glogow, Lubin, Jawor, Kamienna Góra Walbrzych, Swidnica, Kłodzko, Zabkowice Slaskie, Dzierżoniów, Strzelin, Olawa, Wroclaw, Oleśnica, Milicz, Trzebnica, Góra, Wołów, Sroda Slaska. For municipalities included in a given district. The outline of the province of Lower Silesia divided into districts is presented in Figure 2.

Fig. 2. Map of the Lower Silesia voidvoiship.
Source: www.administracja.mac.gov.pl

Counties' expenditures on public roads were expressed in Polish zlotys (PLN) [Central Statistical Office, 2013].

In order to determine the possible relationship between the rate of entrepreneurship and the distance from economic centres and counties expenditures on public roads, a correlation analysis was performed.

The study was based on data for 79 rural and 54 urban-rural municipalities of the Lower Silesia voivodship, from the Local Data Bank of Central Statistical Office. In the procedure for calculating the rate of establishment statistical data from 2013 (as of Dec. 31) were used.

3. THE RESULTS

Entrepreneurship index was calculated for all rural communes of the Lower Silesia voidvoiship. The units were subjected to a ranking procedure, prioritizing them from the municipalities where the indicator reached the highest value. Table 1 shows

the 10 municipalities with the highest rate of entrepreneurship and the 10 municipalities where the rate was the lowest.

The highest index values of entrepreneurship had counties of municipality of Wroclaw, and the lowest values occur in the district of Zgorzelec and Legnica (Table. 1).

Table 1. Communes' entrepreneurship indicator value and distance from the economic centre in 2013.

	District	Municipality	Entrepreneurial activity rate	District town distance[km]
1	Kobierzyce	wrocławski	2,291.90	18.2
2	Siechnice	wrocławski	1,985.20	11.8
3	Podgórzyn	jeleniogórski	1,981.40	9.7
4	Lewin Kłodzki	kłodzki	1,945.50	29.9
5	Janowice Wielkie	jeleniogórski	1,899.70	19.0
6	Oborniki Śląskie	trzebnicki	1,891.70	11.9
7	Kąty Wrocławskie	wrocławski	1,873.10	23.4
8	Czernica	wrocławski	1,846.20	19.1
9	Długołęka	wrocławski	1,843.30	14.2
10	Wisznia Mała	trzebnicki	1,837.10	7.8
123	Platerówka	lubański	888.90	11.5
124	Gromadka	bolesławiecki	870.50	19.4
125	Zagrodno	złotoryjski	851.40	9.1
126	Jemielno	górowski	850.70	17.9
127	Przemków	polkowicki	840.70	23.2
128	Niechlów	górowski	836.70	12.5
129	Kotla	głogowski	813.50	11.7
130	Grębocice	polkowicki	754.80	16.0
131	Ruja	legnicki	744.40	19.4
132	Sulików	zgorzelecki	725.60	10.0

Source: Authors' calculation based on Central Statistical Office and www.mapa.pf.pl

The average value of entrepreneurship in the surveyed municipalities is 1,297.42, and the average distance of the units from industrial centres is 13.2 km. These values are varied in the different districts of the province (table 2).

Table 2. Diversity of the communes' entrepreneurship indicator average value and average distance to the economic centres in 2013

	District	Average value of entrepreneurial activity rate	The average value of the distance from an economic center [km]
1	wrocławski	1,71406	22.4
2	jeleniogórski	1,690.66	11.3
3	trzebnicki	1,529.78	10.5
4	wałbrzyski	1,508.46	14.6
5	ząbkowicki	1,409.13	11.1
6	średzki	1,381.18	11.6
7	kłodzki	1,376.64	22.0
8	świdnicki	1,326.33	11.3
9	legnicki	1,271.70	13.8
10	oleśnicki	1,270.29	18.2
11	kamiennogórski	1,269.43	6.2
12	milicki	1,262.37	7.8
13	lwówecki	1,259.98	15.2
14	oławski	1,236.90	8.5
15	jaworski	1,236.52	10.8
16	lubański	1,222.56	8.1
17	wołowski	1,210.87	8.4
18	dzierżoniowski	1,206.00	10.0
19	zgorzelecki	1,163.82	16.0
20	lubiński	1,163.13	9.8
21	złotoryjski	1,115.65	8.6
22	górowski	1,050.58	12.0
23	głogowski	1,024.18	8.1
24	polkowicki	1,018.87	15.3
25	strzeliński	1,010.50	9.9
26	bolesławiecki	990.82	12

Source: Authors' calculations

Rural municipalities located in the district of Wroclaw and Jelenia Gora are characterized by the highest average index values of entrepreneurship.

Wrocław and the district of Wrocław have the highest entrepreneurial activity rate, in terms of infrastructure they both are the attractive Lower Silesia region. The shortest average distances of studied territorial units from the main economic centres has kamiennogórski district.

An important determinant is the communication infrastructure of Lower Silesia, as it belongs to densest networks in the country (fourth place in the country after the Silesian Province, Lesser Poland and Świętokrzyskie) [Lower Silesian Voivodship Regional Report, 2011].

The calculated entrepreneurial activity rate for all rural communities of the Lower Silesian voivodship allowed to assign them to the appropriate classes, distinguished on the basis of:
- Class 1 - a high level of entrepreneurship,
- Class 2 - an average level of entrepreneurship,
- Class 3 - low level of entrepreneurship,
- Class 4 - a very low level of entrepreneurship.

To determine the classes the average value of the enterprise ratio $Wp = 1297$ and the standard deviation $S\_Wp = 305$ were taken as the criterion. The division of municipalities due to the size of a class is presented in Table 3.

Distribution of rural and urban-rural counties of the Lower Silesia voivodship in 57.1% belongs to class of low and very low level of entrepreneurship, and a significant part of them belongs to the northern part of the province.

This may be caused by various factors. According to J. Zmija [1999] development of entrepreneurship in rural areas can also be achieved through the activity of local governments and their populations. A chance to revive the economy should be sought in developed strategic plans of municipalities or region, i.e. several municipalities which should take into account the multifunctional development of these areas.

Most municipalities in Class 1 with the highest level of entrepreneurship belong within the province capital - Wrocław, which has the best transport connection with nodes of A4 motorway. Within this class are also the southern districts, characterized by a strong development of therapeutic functions, spas and recreational tourism.

Table 3. Communes' classes dependent on the entrepreneurship indicator.

CLASS OF MUNICIPALITIES	CRITERIA	NUMERICAL RANGE	CLASS SIZE
Class 1 – a high level of entrepreneurship	max W_p; $\overline{W}_p + s_{wp}$	<2292; 1602>	26
Class 2 – an average level of entrepreneurship,	$(\overline{W}_p + s_{wp}$; $\overline{W}_p$	(1602; 1297>	31
Class 3 – low level of entrepreneurship	$(\overline{W}_p$; $\overline{W}_p - s_{wp}$	(1297; 992>	58
Class 4 - a very low level of entrepreneurship	$(\overline{W}_p - s_{wp}$; min W_p	(992; 726>	18

Source: Authors' calculation

Table 3 shows that most rural and semi-urban areas of the Lower Silesian voivodship belongs to the class 3, ie. a low level of entrepreneurship. The smallest group are the municipalities with very low level of entrepreneurship, that is, Class 4, in which there are 15 units. In Figure 3, you will notice the presence of individuals with high rates of entrepreneurial around the economic centre - Wroclaw.

18% of class 4 are municipalities, for which is a major economic centre is the town of Bolesławiec.

Table 4. Numbers of communes in each class with reference to the nearest economic centre.

No.	Economic centre	The number of Class 1 municipalities	The number of Class 2 municipalities	The number of Class 3 municipalities	The number of Class 4 municipalities
1	Bolesławiec	0	0	1	5
2	Dzierżoniów	0	1	2	0
3	Głogów	0	1	2	2
4	Góra	0	1	1	2
5	Jawor	0	2	3	0
6	Jelenia Góra	3	2	0	0
7	Kamienna Góra	0	1	2	0
8	Kłodzko	2	3	4	0
9	Legnica	1	2	3	1
10	Lubań	1	0	3	1
11	Lubin	0	1	1	1
12	Lwówek Śląski	0	2	3	0
13	Milicz	1	0	2	0
14	Oleśnica	0	3	3	1
15	Oława	0	1	2	0
16	Polkowice	0	1	3	2
17	Strzelin	1	0	3	1
18	Środa Śląska	2	1	2	0
19	Świdnica	1	2	3	0
20	Trzebnica	3	0	3	0
21	Wałbrzych	2	2	1	0
22	Wołów	0	1	2	0
23	Wrocław	7	0	1	1
24	Ząbkowice Śląskie	2	2	3	0
25	Zgorzelec	0	1	3	1
26	Złotoryja	0	1	2	1

Source: Authors' calculation.

It follows that the distance from economic centre is not an important factor in determining the level of entrepreneurship. You may have noticed the lack of any relationship between these two variables. For verification of the above hypothesis, correlation analysis was performed.

The measure of strength of the relationship between the two straight measurable characteristics is the Pearson correlation coefficient [W. Oktaba, 1980], which is calculated by the following formula:

$$r = \frac{cov(x,y)}{s(x)s(y)} \qquad (2)$$

where:
y - correlation coefficient
cov (x, y) - the ratio of covariance of variables x and y,

s (x) p (y) - a product of deviations of the variables x and y.

The correlation coefficient is in the closed interval [-1,1]. The higher the absolute value of the ratio, the stronger the linear relationship between the two variables. The coefficient r = 0 means no linear relationship between the variables, r = 1 indicates an exact linear relationship between the measured trait. If the coefficient equals r = -1 it indicates a negative linear relationship between the variables. That is, if the variable x increases, the variable y decreases and vice versa [W Oktaba, 1980]. The relationship between the distance from the economic centre (variable x) and the level of entrepreneurship (variable y) is shown in Figure 3.
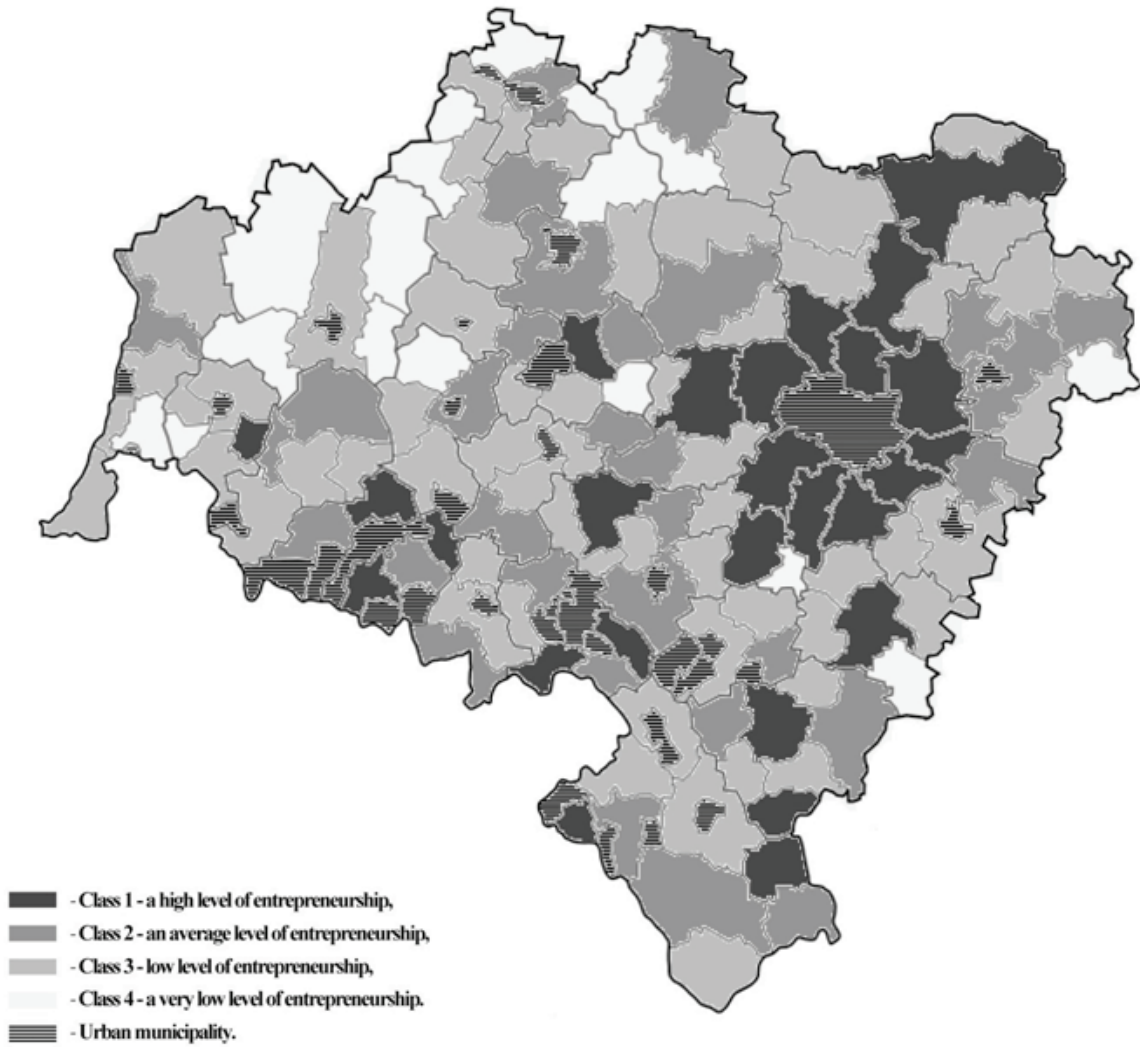
Fig. 3. Communes position dependent on the level of entrepreneurship.
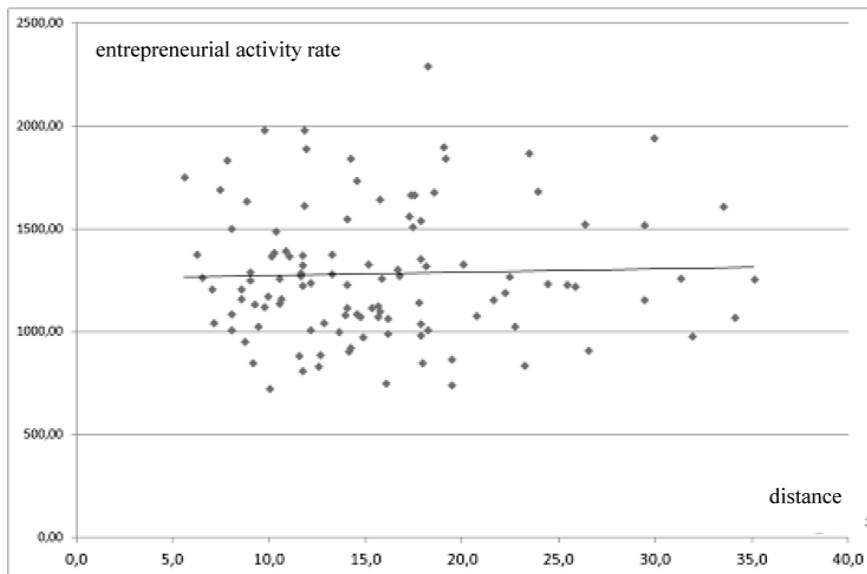*Source: Authors' calculation.*

Fig. 4. Commune's entrepreneurship level dependent on the distance to the economic centre.
Source: Authors' calculation.

The correlation coefficient between the variable x - an indicator of entrepreneurship, and the variable y - the distance from the economic centre is 0.03. This indicates the absence of a correlation between the measured trait.

Verification of the hypothesis argues that the growth of the rural commune distance from economic centre does not decrease the level of entrepreneurship.

necessary to develop infrastructure, provide advice and contacts with potential investors. Local authorities, while having instruments to support the development of entrepreneurship should permanently promote economic activity in their area and create good conditions for existing businesses.

The research carried out on the basis of statistical material in rural and semi-urban areas of
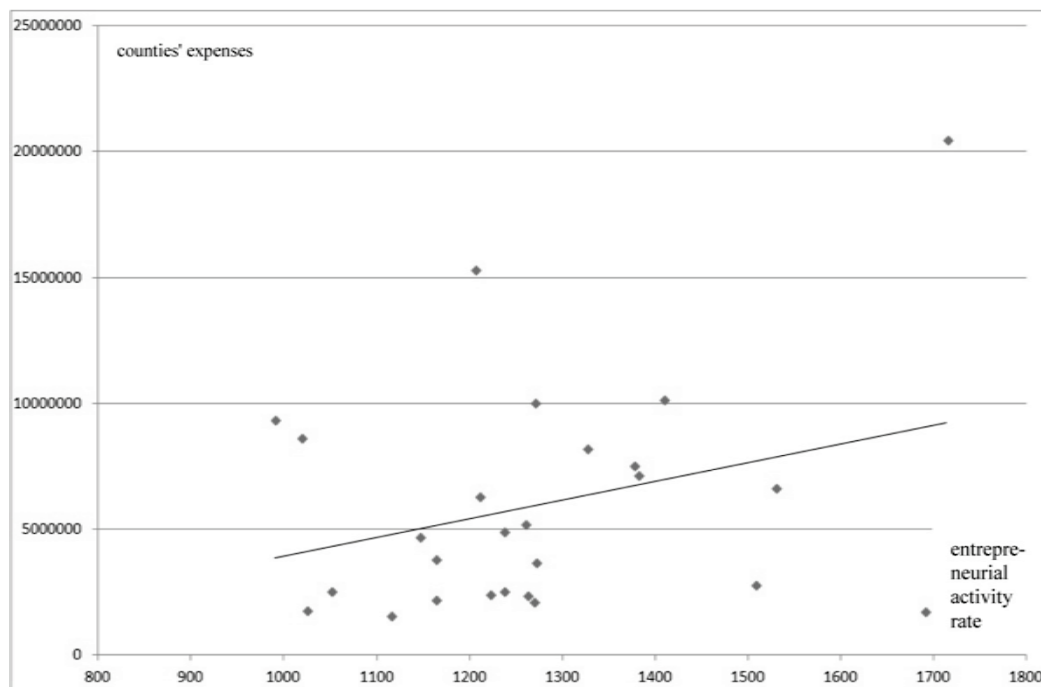

Fig. 5. Commune's entrepreneurship level dependent on the distance to the economic centre.
Source: Authors' calculation.

The correlation coefficient between the variable x - entrepreneurial activity rate, and the variable y - the expenses counties on public roads is 0.3. This indicates a weak but clear correlation between the measured trait.

Verification of the hypothesis argues that the increase in expenditure of the county on public roads causes an increase in the average level of entrepreneurship of the examined county.

4. SUMMARY AND CONCLUSIONS

There are many factors that determine the level of entrepreneurship, and the important ones include: investment potential, demographic, or the level of unemployment. Lower Silesia is diverse in terms of counties' area. The largest area, numbering 110,365 hectares, is Bolesławiec county, also having the lowest entrepreneurial activity rate.

In order to activate the economic municipalities with low and very low rate of entrepreneurship it is

the Lower Silesia voivodship showed that there is no statistical relationship between the level of entrepreneurship in the studied territorial units and their remoteness from the main economic centre.

Along with the distance the number of business entities does not decrease, which may indicate a lack of connection between activities in rural areas and local functions.

The study showed however a statistical relationship between the average entrepreneurial activity rate in the surveyed counties and their expenditures on public roads.

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Izabela Klepacka-Dunajko
Siedlce University of Natural Sciences and
Humanities, Poland
izabela.klepacka@interia.pl

Halina Kałuża
Siedlce University of Natural Sciences and
Humanities, Poland
halina.kaluza@interia.pl