Wieś i Rolnictwo 4 (173)/2016
ISSN 0137-1673
doi: 10.7366/wir042016/03

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Spatial Determinants of Business Location in Rural Areas

Abstract: The aim of the discussion in this paper was to identify types of gminas due to the dynamics of enterprise occurrence with respect to the level of socio-economic development. Four types of gminas were described, namely: sustainably developing, unstably developing, slowly developing ones as well as those immune to development. As a result of statistical analysis it was found out that the spatial distribution of the number of enterprises is not determined by the level of socio-economic development, which was confirmed by low correlation and low value of determination coefficient for the linear model.

A low dynamics of enterprises' development in northern Poland, and in the border gminas in the eastern and north-eastern parts of the country was noted. The map of types (models) of socio-economic development of Poland shows polarization. There is a clear division between gminas characterized by stable development, which are located mainly in the western and southern Poland, and the gminas featuring unstable development, which are located predominantly in the eastern part of Poland.

Key words: multifunctional development, enterprises, location factors, location of enterprises, socio-economic development.

1. Introduction

Economics as a science seeks answers to questions concerning the functioning of economic systems and explores factors that determine these systems. Modern economics focuses attention on the behavior of individuals (entrepreneurs) and their place in economic systems, and especially to the way how the economic behavior of individuals and their strategies respond to the aggregated systems, which are formed by those individuals (Domański 2012, cit. by Arthur 2007).

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Socio-economic dimension is a system comprising a number of elements,[1] including i.a. business actors, as well as many other factors which determine its functioning. The system achieves different levels of development, depending on its structure, quality and complexity of links between particular elements thereof. The functioning of a socio-economic system is determined by e.g. location advantages. They determine whether a given area is attractive to a given investor, in terms of business sector and the corresponding financial, technical and social conditions. It seems interesting to make an attempt at verifying a hypothesis, according to which the level of socio-economic development is not an important factor in investment location and does not influence the number of enterprises operating in a rural gminas. We should certainly assume varying degrees of intensity of the advantages, as well as their structure and mutual relationships, which will not always be possible for the purpose of operationalization and empirical verification of the hypothesis.

The aim of the study is to identify types of gminas based on the occurrence of enterprises. Typology will be prepared based on an analysis of changes in the occurrence of enterprises in relation to the level of socio-economic development of rural areas. It is hypothesized that there is a strong correlation between the number of enterprises and the level of socio-economic development. This is why it is necessary to analyse both unstable systems which feature low level of socio-economic development and high occurrence of enterprises, as well as gminas which are immune to development, featuring low level of socio-economic development and low incidence of enterprises. It was assumed that the lack of openness of an area to enterprise development and new investments is a consequence of the absence of appropriate advantages, such as social and economic potential.

In order to verify the hypothesis, we made use of assessments of the level of socio-economic development, which were conducted as a part of *Rural Development Monitoring Survey* (Rosner, Stanny 2014). For the purposes of constructing the index which describes changes in the number of enterprises in gminas in the period 2009–2013 we used data from Regional Data Bank of the Central Statistical Office on the number of enterprises registered in the REGON system. The source of these data is not entirely reliable due to imperfections of the registration system, which still includes entities which no longer operate, or which have suspended operations or have been liquidated. However, due to lack of other data concerning economic entities at this level of aggregation (gminas), this is the only source of information.

The interdependence of the phenomena studied was evaluated by means of linear regression model. In order to identify spatial differentiation, statistical analysis and cartography method were used.

[1] An interesting description of systems theory and examples relating to the social phenomena can be found in the work by M. Mazur, *Cybernetyka i charakter* (1999).

2. Multi-functional development as a system of social, economic and environmental diversity

Rural areas require changes, the aim of which must be the development of non-agricultural economic functions. According to Halamska, "absorption of the rural population must nowadays proceed according to new models, because the industrialization model has become obsolete in a post-industrial society. The only known model of absorbing the population is the development of the so-called tertiary and quaernary sector of the economy" (Halamska 2001, p. 55). This process requires multi-functional development, which is to be manifested by skillful incorporation of new non-agricultural functions into rural areas. This involves a departure from mono-functional development, which is based mainly on the production of agricultural raw materials (Kłodziński, Rosner 1997). However, it should be noted that the concept of multifunctional development of rural areas cannot be reduced only to the process of creating new jobs. Multifunctional development is a much broader concept related to local development, entrepreneurship, strategic development planning, diversification of agriculture, infrastructure development etc. (Kłodziński 1997). This is also how research should be conducted, namely in studying multifunctional rural development, rural areas and agricultural development must be treated comprehensively, which means that research should cover all the aspects of rural areas, not just selected elements thereof (Kłodziński 1997). The main components of rural development include social, economic and natural (spatial) conditions, the various combinations of which (quantitative and qualitative ones) are the starting point for the development of non-agricultural functions.

In economics, space is treated as a scarce good, which prompts decisions concerning space management and conscious shaping. The process of spatial shaping is determined by multiple factors that differ from one another in terms of the direction of the impact, as well as in terms of the strength of their interaction (Śleszyński 2007; Stanny 2013).

The need to use complex criteria for delimitation of space results from its complex nature, therefore the criteria accepted determine the shape, size and features of areas selected for research. A gmina is the basic unit of administrative division, which is characterized by specific values, structure, and the degree of space relations development, so we can analyze it in terms of a system. Each system is distinguished by its elements and defined by interactions between them. In regard of a gmina these elements include: households, enterprises, local authorities and public service institutions, land and land management, as well as natural values.

Therefore, a gmina may be described as a system of diversity, in which its individual elements are mutually determined, which results in the development

of social and economic structures, changes in spatial and economic development. The efficiency of the system depends on its reaction to a stimulus, or reactiveness, which is a ratio of the system's response to a stimulus applied to the system. It can result from intraregional conditions, i.e. location advantages for investment, such as: the level of human capital, the state of infrastructure or natural conditions.[2] System structures also determine the systems' ability to interact with each other or to move the systems' elements. In such case it will depend on a kind of "system shutdown" and the opportunities it creates for the development.[3]

The processes of spatial differentiation of socio-economic development are determined by the resources available in a gmina. These include tangible and intangible assets that are used for the production of goods and services, namely: land, human capital, investment assets and technologies.[4] Their significance in the development process and the dynamics of economic systems is changing, especially where there are less significant traditional factors of production such as a land in relation to knowledge, technology, social capital and institutional capital.

According to Gorzelak (2003) regional diversity deepens and becomes excessive due to instability of regional systems and cumulative processes. Spatial diversity of resources in the process of labor specialization and distribution causes social and economic inequalities in regions. This is due to the accumulation of negative processes or positive impulses resulting from intraregional conditions. Location of economic activity is subject to rational decisions in relation to the occurrence of resources, natural values and living conditions within a given area, as they are the basis for efficient labor distribution and they determine economic development of the region concerned.

Socio-economic development results in formation of gmina clusters featuring similar conditions for development. Those regularities are described in literature, i.a. by Rosner (2000, 2007), Stanny (2013) and both of these authors in their last book (2014). The first attempts at interpreting spatial changes in relation to the theory of monopolistic competition and oligopoly proved inadequate. Assuming that space is homogenous and that the cost of transportation is high results in the concentration of demand and production without transport. Production and trade processes are going to occur in one place, with no exchange whatsoever

[2] A municipality as a system demonstrates efficiency in terms of response to factors such as eg. the inflow of external capital and the programs and assistance funds. Depending on the internal conditions one can expect various effects of these factors on the municipality.

[3] An example would be the cooperation of municipalities at the administrative level or cooperation of business entities located in different municipalities. This results in exchange of eg. production factors or migration of real capital and human capital.

[4] Overview of approaches is presented by M. Stanny (2013).

between different locations, which does not explain the formation of economic agglomerations. This theory has not worked in relation to rural areas because of their spatial character, and thus a large dispersion of production of eg. food and diversity of population density.

Another approach to the problem involves an assumption that as a result of complex interaction socio-economic system, gminas become locally unstable. Their instability is a manifestation of a sensitive structure defined as chaos and is determined by endogenous conditions of the system rather than by external phenomena. Unstable systems are characterized by uncertain, difficult to predict fluctuations and these behaviors are characteristic of deterministic systems. Dynamic systems pass through multiple states of equilibrium and oscillate between different levels of development. Changes in the system due to the chaotic events increase the degree of freedom in the systems' behaviors. This creates a mechanism that generates a variety of elements. This in turn stimulates the development of the system's structure, wherein new structures are formed, the system transforming into the one featuring varying structural diversity (Domański 2012).

Thus, chaotic behavior of systems fosters diversity and system self-organization. Social and economic systems feature a certain degree of resilience and ability to absorb changes and distortions, due to their flexibility. Location advantages resulting from intraregional conditions are among the system components that shape its structure and form its flexibility. Some systems are characterized by low pace of change, which is especially evident in case of rural areas. Research conducted by Rosner shows that differences in the level of economic and social development of rural areas in the spatial arrangement do not decrease, despite declared and implemented policy of equal development opportunities (Rosner 2007). In addition, according to an analysis of internal profiles of socio-economic structure of rural area development, spatial polarization is a function of geographical location (center-periphery axis) and historical factors (east-west axis), whereby the level of development of rural areas is determined to a greater extent by economic factors rather than social ones (Stanny 2013). This is why it is necessary to analyze of the existence of enterprises as an important factor of economic change.

According to Śleszyński (2007), the most general features related to spatial location and impact of enterprises include: an increase in the economic importance, increase in the range of enterprise's operation, increasing diversity of operations and more complicated organizational structure.

The author concerned holds that these regularities result in a permanent spatial imbalance which involves a tendency to a divergence – i.e. an increase in spatial differences (socio-economic spatial polarization). This lack of permanence (instability) may be one of the main reasons why the hitherto theories and location

concepts provide insufficient explanation of issues concerning development and structure of socio-economic domain.

3. Determinants of enterprise development in rural areas

The list of factors that an investor takes into account when planning the location or further enterprise development varies depending on the type and characteristics of production. In general terms, we can identify investors' preferences which may involve the already mentioned labor costs, as well as the quality of human capital for highly specialized production, the availability of technical infrastructure and social infrastructure conditioning investment growth, institutional capital, corporate business environment as well as natural advantages and resources. Some creative investors also plan to cooperate with research centers, technology parks, as well as with research institutes within the framework of increasing innovation and generating new ideas and production technology.

Predispositions of a potential investor, as well as the quality of human and social capital are thought to be the most important for enterprise development. These are of course important aspects of enterprise development, however, it seems that without favorable conditions created by the regional socio-economic system, a big number of enterprises would never be established. Generally, it is assumed that the location of enterprises is conditioned by investment attractiveness. Potential investment attractiveness is a set of regional advantages (resources) of location, which impact the achievement of the investor's objectives (eg. cost of business, sales revenue, net profitability and competitiveness of the investment) (Godlewska-Majkowska 2013).

These values occur in the socio-economic domain with varying intensity, hence we can also talk about the spatial differentiation of the level of socio-economic development. Monika Stanny points out that the nature of socio-economic development is such that it involves simultaneously many factors which make up certain sets. The author also notes that it is debatable whether the technical and social infrastructure, capital resources and financial resources are components of development or are conditions thereof (Stanny 2013, p. 217).

In case of rural areas and measuring the socio-economic development we have a fairly universal set of factors which influence them, which factors are also conditions thereof. They include (by Stanny 2013, p. 216):

- place (terrain features and advantages of the place, local area values),
- environment (resource, values of local natural environment),
- conditions resulting from the spatial management (existing infrastructure),
- conditions related to the quality of the local community (socio-cultural features and characteristics of local community).

However, considering these factors, there are no universal indicators that will enable parameterization and measurement of socio-economic development. Therefore, evaluation of the level of socio-economic development is often determined by the availability of data on an assumed level of aggregation, e.g. gminas or counties.

Let's assume that the socio-economic development of a gmina is a process during which system components are changed. This change is determined by the initial state, i.e. a collection of resources available in the gmina. It is expected that the higher the quantitative and qualitative level of these resources, the higher the level of socio-economic development. Therefore, a question arises whether the level of gmina development can be an important determinant of enterprise development within the area. The research into mutual relationship between the level of socio-economic development (hereinafter referred WRSG) and the occurrence of enterprises (WDP) is defined by the matrix of possible combinations of different local (municipal) systems (Figure 1).

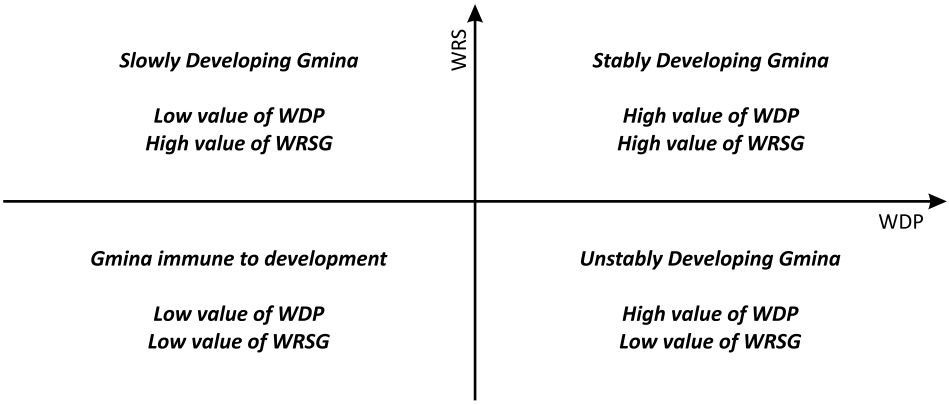

Figure 1. Matrix of the types of gminas due to the level of socio-economic development of gminas and occurrence of the dynamics of the occurrence enterprises

Source: own research.

Slowly Developing Gminas are characterized by low dynamics of enterprise development and high level of socio-economic development. These are gminas which so far have not made use of the high economic potential and are currently witnessing some processes involving slow development of multi-functional market and production structures. Their development is often determined by natural values which foster tourism development, which results in the development and

dominance of tourism enterprises and services related to that sector, e.g. trade, transportation or construction.

Unstably Developing Gminas are characterized by high dynamics of enterprises development and low level of socio-economic development. Economic systems featuring a small number of enterprises are characterized by instability of economic structures and high dynamics of change. This means that within the structures featuring a small number of enterprises relative changes in the number of operators are more noticeable than in complex systems with a large number of them. In areas of unstable development attempts are made to stimulate endogenous potential externally. This includes the implementation of all kinds of economic revival programs with considerable state support.

Stably Developing Gminas is characterized by huge number of enterprises and a high level of development. These are the gminas highly attractive in terms of investment, which feature outstanding location advantages and well-developed production level at the same time. In such systems, the relative growth of entrepreneurship is not high, and the gminas of this type are characterized by clusters formation within an area. A high volume of entrepreneurship is conducive to formation of economic structures with a high degree of interdependence and mutual movement of production factors, information technology and human capital. Their development is often determined by geographical location in relation to large urban centers, which involves the transfer of the positive effects of development as well as migration of local production factors.

Gminas immune to development feature low dynamics of enterprises development, as well as low level of socio-economic development. Constraints to the development in such gminas are mainly due to low potential values for investment location. In rural areas, which suffer from depopulation, small local demand hinders the development of enterprises, the operations of which are intended to cover small territorial range (Rosner 2012). These gminas are inhabited by low income population, which translates to low demand for the services and products offered (cf. Kłodziński 2001). In most cases, such gminas have already reached the optimum level of enterprises development, but lack of creative entrepreneurship and properly oriented manufacturing, especially exports, slows down the development process. These gminas rely mostly on institutional support systems, investment incentives and the preparation of investment areas.

In addition to the matrix types of gminas description the following concepts of a simple system and complex system should be introduced. The difference between these systems results from the volume of production and number of participants in the process, as well as the number and quality of interrelationships between the systems. Complex systems are characterized by a large number business entities,

hence the dynamics of relative changes that occur in such a system is low, which can be described as stable system. In simple systems, the processes of change that are occurring in the environment featuring a small number of business entities are more dynamic and noticeable in the local production domain, so despite low growth they potentially feature high change dynamics, which leads to unstable economic structures. A theoretical model typology of rural gminas will be used in the further part of the study to identify the types of rural areas in Poland.

4. Typology of rural areas in Poland with regard to economic activity

Assuming that gmina systems are characterized by a dynamic and changing economic and social structure we can raise a question about changes in the number of enterprises, which are determined by endogenous factors such as the level of socio-economic development.

In order to verify this phenomenon a synthetic indicator of socio-economic development of rural areas in Poland in 2010 was used, published in the *Monitoring of rural area development* (Rosner, Stanny 2014). Components of the scale included: spatial availability, the degree deagrarianisation of local economy, agriculture, non-agricultural sector, local public finances, demographic issues, the degree of balance in the labor market, issues concerning education, social activity, wealth and cohesion of the community and housing conditions. For each of these components appropriate weights are assigned (Table 1).

Table 1. Components of socio-economic development level by Monitoring rural development

Components of socio-economic development level	Relative weight (sum = 100)
Spatial availability	10
Degree of deagrarianisation local economy	12
Agricultural sector	8
Non-agricultural sector	8
Local public finances	10
Demographic issues	11
Degree of balance in the labor market	11
Educational issues	7
Social activity	7
Wealth and cohesion of the local community	10
Housing conditions	6

Source: Rosner, Stanny 2014, p. 213.

The second index, adopted to identify the rural gminas immune to development, calculated as the dynamics of enterprises occurrence in 2013 in relation to 2009. The appearance of new enterprises in the gmina invokes a number of positive phenomena, including multiplier effects in the local economy, increase of employment and increase of local (gminas) residents' income and local budget revenues. Low dynamics of enterprise occurrence or the lack of it can mean that the region is immune to investment and development.

Research conducted by other authors, concerning the changes in the number of enterprises after the accession of Poland to the European Union for the years 2001–2004 and 2004–2007, showed a decrease, inertia, spatial polarization and spatial mosaic structure of private enterprise development dynamics.

It has been observed, among others, that metropolitan areas feature greater dynamics as far as enterprise development and the number of enterprises per resident population; also, a stronger economic urbanization processes in western Poland (i.e. west from the Vistula River) were highlighted (Śleszyński 2009).

The spatial distribution of enterprises development dynamics in 2009–2013 shows low dynamics in northern Poland, especially in areas which were formerly dominated by state-owned farms, and in the border gminas in the eastern and north-eastern part of Poland (Figure 2). At the same time, rural areas around large regional urban centers located relatively on the peripheries of Poland (Białystok, Lublin, Zielona Góra, Opole) show a much higher dynamics of enterprise development than it is the case with a few major cities in Poland (as Poznań, Kraków, Katowice, Szczecin). Large clusters of gminas with a big number of enterprises are also noticeable in central Poland, on the eastern border of Wielkopolska, in a subregion of Śląsk Opolski and Górny Śląsk and also in the north-eastern part of Mazowsze.

Noteworthy is the formation of large clusters of gminas featuring extremely different dynamics of enterprises development. In this case, to evaluate this phenomenon, reference must be made to the local conditions in those areas, i.e. location factors and the level of socio-economic development.

According to the previously proposed matrix types of gminas, the analysis was performed using the two indicators. The level of socio-economic development of the gmina (WRSG), was described by the index, whose values were normalized in relation to the average for the whole set of gminas (2,173). To determine the occurrence of enterprises in the gminas the second indicator was used, which is characterized by the number of enterprises per capita in the gmina (WDP). Its value is also normalized in relation to the average for the group. The multi-criteria analysis creates a matrix types of gminas. The value of socio-economic development index is interpreted relative to the normalized values which mean positive situation in the gmina when they exceed one. This result in comparison with the dynamics

of enterprise development allows to determine the type of gmina and its chances for further development. It also enables to determine gminas which are immune to enterprises development.

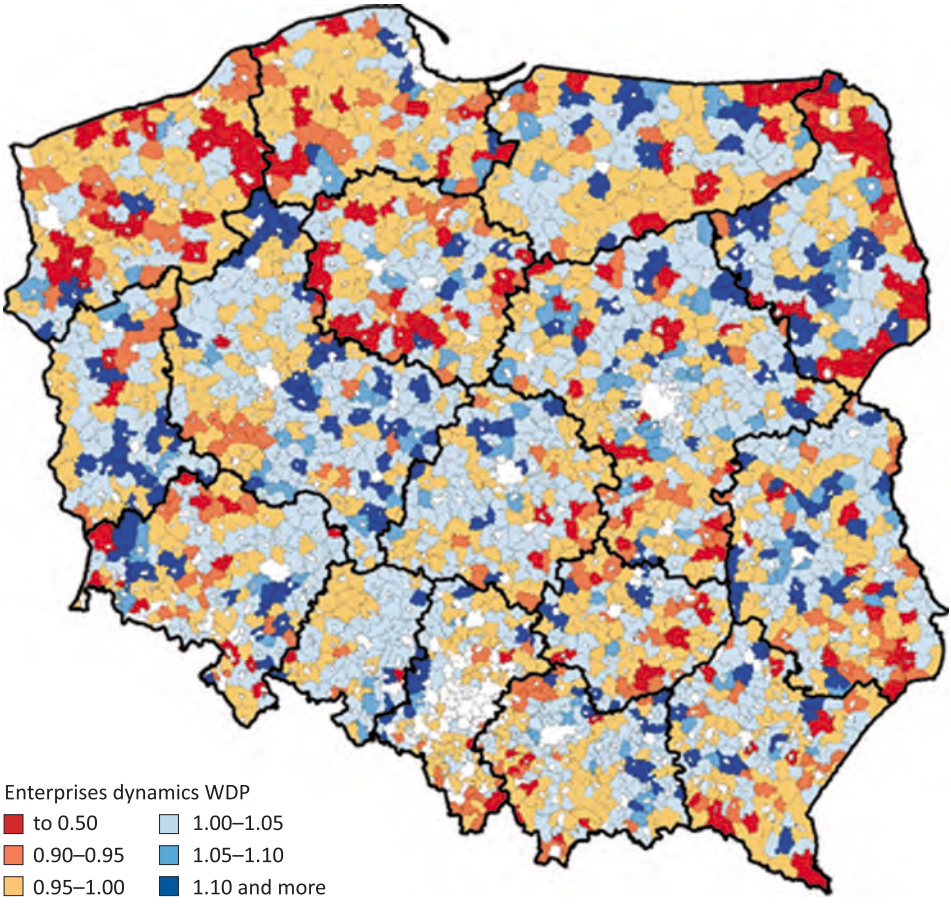

Figure 2. The dynamics of enterprise development in rural areas of Poland in the period 2009–2013

Source: own research.

Preliminary analysis of the results, using linear regression, showed no correlation between the level of socio-economic development and the dynamics of enterprise development (Figure 3). Linear correlation coefficient for indicators was $r = 0.0513$.

Determination coefficient for the linear regression model was $R^2 = 0.0026$. It indicates a poor adjustment of the model, in which only a small part (0.2%) of

analyzed cases of variation in enterprise development dynamics in the gminas can be explained by the level of socio-economic development. This result confirms the accepted hypothesis about the lack of correlation between the analyzed phenomena.

Analyzed gminas are statistically distributed and occur in all fields of the matrix, which is illustrated by the graph (Figure 3).

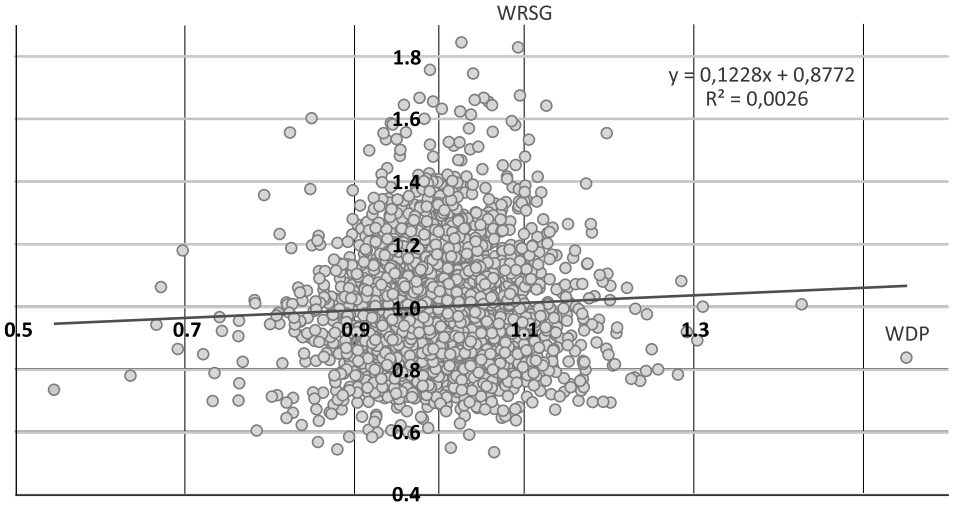

Figure 3. The interdependence of dynamics of enterprise occurrence and socio-economic development in the studied gminas

Source: own research.

Among the analyzed gminas the type of gminas immune to development (27%) and unstably developing gminas (26%) are dominant. Other types are characterized by high levels of socio-economic development and their share is smaller: stably developing gminas (24%) and slowly developing gminas (23%).

There were also cases where, despite the low level of socio-economic development there is a high growth in the number of enterprises. Such a situation results from the influence of statistically non-measurable factors and relate to qualitative and random phenomena occurring within a given gmina and region, e.g. universities and research institutes operating in the region, technology parks, special economic zones or other factors that determine the development of entrepreneurship.

In the Polish economic domain, we can observe certain regularities in the distribution of gminas due to the model (type) of socio-economic development. There is a clear division between the types of stably developing gminas which are located mainly in the western and southern part of Poland, as well as the unstably

developing gminas which are concentrated in the east. Between these types of gminas there are gminas characterized by slow growth and gminas immune to development. Gminas immuned to investments feature a relatively low values of components of the development ratio adopted in the model (Table 1). In each of the analyzed groups we can identify general constraints preventing entry to the market, as well as constraints concerning individual industries. However, this requires further study and taking into account a wider range of location factors. The constraints which result from low levels of socio-economic development dominate mainly in the gminas of eastern Poland (Figure 4).

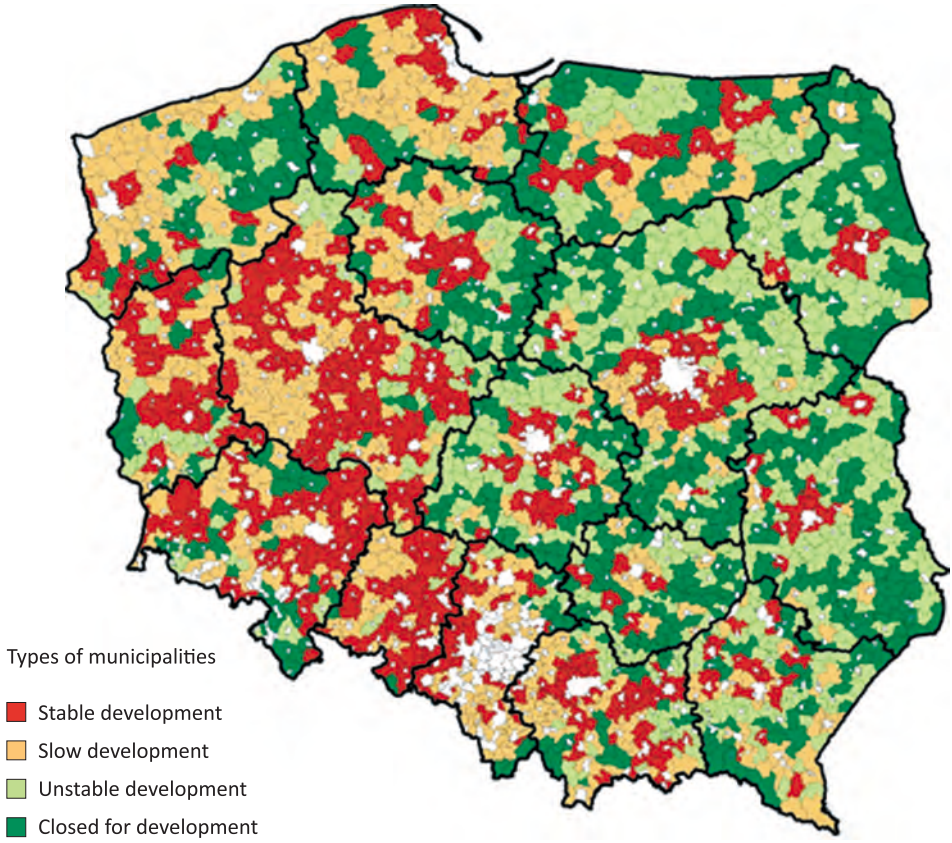

Figure 4. Typology of rural gminas due to the dynamics of enterprise development in relation to the level of socio-economic development

Source: own research.

5. Conclusions

Spatial differentiation of the dynamics of enterprise occurrence is a phenomenon of complex structure and causality, which involves simultaneous influence of social, economic and natural factors, albeit with different strength. There are various combinations of factors whose identification may become the basis for a typology of gminas in Poland. At gmina level, these factors interact with each other and operate like socio-economic systems.

This system creates specific conditions for a given area and determines the functioning of all existing, as well as new components of the system. As a result of statistical analysis, it was found that the spatial dynamics of enterprise development is not determined by the level of socio-economic development, as confirmed by the low correlation and low coefficient of determination for the linear model. The conducted typology showed that the majority of gminas were immune to development or were categorized as unstably developing.

In most cases those gminas are situated in eastern and northern Poland. Immunity to investment is the result of inadequate socio-economic development, including the historically economic structures developed and demographic disadvantages of gminas in relation to transport routes, low level of natural advantages and limited access to the agglomeration benefit. Recommendation for those gminas include relying on the systems of institutional support, investment incentives and preparation of investment areas.

The Polish map of socio-economic types (models) clearly features polarization. Gminas categorized as stably developing and slowly developing are located in the western part of Poland and around big cities. High dynamics of enterprise development in this case is the result of the agglomeration benefits. Entrepreneurship focuses on the areas which feature high demand and good access to production factors, including human capital and potential partners for cooperation.

It should be assumed that the typology of gminas due to the dynamics of enterprise development is an important part of region development research. Investors who analyse the map of potential locations for investment need to consider factors which are important for the investment. The results obtained are also a guideline for local authorities and local governments who are responsible for developing and implementing strategies of cohesion and regional development. The elimination of constraints which make gminas immune to investment and enterprise development should be a key element in the effort towards economic revival of gminas lagging behind in economic development.

The dynamics of business occurrence is spatially varied and it should be assumed that it is influenced by many factors of different nature, which are often

not statistically measurable. It is also an indication for further research to take into account a wider range of location factors. This will require the use of statistical methods, including spatial autocorrelation and regression, which will determine the degree of influence (elasticity model) of particular factors on enterprise development in gminas forming clusters of similar economic characteristics.

In the case of rural areas and the study of the potential for non-agricultural economic activities development one should primarily consider natural values, which are a basis for green jobs creation and searching for "small opportunities" for enterprise development.

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Uwarunkowania przestrzenne aktywności gospodarczej na obszarach wiejskich

Streszczenie: Celem rozważań w niniejszym opracowaniu była identyfikacja typów gmin ze względu na dynamikę występowania przedsiębiorstw w odniesieniu do poziomu rozwoju społeczno-gospodarczego. Opisano odpowiednio cztery typy gmin: stabilnego rozwoju, niestabilnego rozwoju, powolnego rozwoju oraz gmin zamkniętych dla rozwoju. W wyniku przeprowadzonej analizy statystycznej stwierdzono, że rozkład przestrzenny dynamiki liczby przedsiębiorstw nie jest determinowany poziomem rozwoju społeczno-gospodarczego, co potwierdziła niska korelacja i niska wartość współczynnika determinacji dla modelu liniowego.

Zauważono niską dynamikę zmian liczby przedsiębiorstw w Polsce północnej oraz w pasie gmin przygranicznych we wschodniej i północno-wschodniej części kraju. Na mapie typów (modeli) rozwoju społeczno-gospodarczego Polski ujawniło się wyraźnie zjawisko jego polaryzacji i koncentracji wokół aglomeracji miejskich. Wyraźnie widoczny jest podział na typy gmin stabilnego rozwoju, które są zlokalizowane głównie w zachodniej i południowej Polsce, jak również gmin niestabilnego rozwoju z dominacją lokalizacji na wschodzie kraju.

Słowa kluczowe: rozwój wielofunkcyjny, przedsiębiorstwo, czynniki lokalizacji, lokalizacja przedsiębiorstw, rozwój społeczno-gospodarczy.