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Employment diversification strategies in rural areas across Polish regions

Paper prepared for presentation at the 150th EAAE Seminar

"The spatial dimension in analysing the linkages between agriculture, rural development and the environment"

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Introduction

France, Germany, Poland, Italy and Romania had the largest populations in predominantly rural regions. These five Member States were home to 60.5 % of the EU-27's population found to be living in predominantly rural regions (Eurostat, 2015). Rural inhabitants in Poland have been traditionally connected with agriculture. According to the data of the Central Statistical Office of Poland, on average 38% of inhabitants of predominantly rural areas were employed in agriculture, forestry and fishing in 2013. It illustrates the fact that these sectors have been still a very important part of the labour market. However, the situation is diversified across Polish regions. Proportion of inhabitants of predominantly rural regions employed in agriculture, forestry and fishing varied from 8% in the Silesia region to 45% in the Lubelskie region. Moreover, predominantly rural areas are also a place of significant relative decrease in employment in the primary sector and increase in the tertiary sector (Drejerska, 2014).

Research methods

The objective of the study is to investigate employment strategies in rural areas across Polish regions. For the purposes of this study, a new European Union (EU) typology of: predominantly rural, intermediate, and predominantly urban regions was applied (Eurostat, 2012).

The basic research question is to find if Polish NUTS 3 regions can be divided into clusters of similar employment strategies of rural inhabitants. In order to provide such analysis we will use principles of spatial autocorrelation. Analysis of the phenomenon of spatial autocorrelation is based on the values attributed to spatial objects. Spatial autocorrelation

means that the objects close geographically are more similar to each other than those far. This phenomenon causes usually the formation of spatial clusters of similar values. Research of spatial autocorrelation of employment is carried out using the Moran's statistics. This measure is discussed for example by Schabenberger and Goteway (2005) and was used for the employment analysis for example by Ahtonen (2003), Niebuhr (2003) or Drejerska and Chrzanowska (2014).

The value of Moran's statistic generally falls into the interval [-1, 1] and three different situations may occur:

- I = 0 - no autocorrelation
- I <0 - negative autocorrelation (objects that are located next to each other at a specified distance have different values
- I > 0 - positive autocorrelation (objects located next to each other, at a specified distance, have similar values).

The Global Moran's statistic is described by the formula (1):

$$I_i = \frac{n}{W} \frac{^2\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{n}(x_i - \bar{x})^2} \quad (1)$$

w_{ij} – weight of the connections between units *i* and *j* (1st order matrix standardised according to rows),

x_i x_j – value of the variables in spatial units *i* and *j* (1st order matrix standardised according to rows),

$\bar{x}$ - arithmetic mean value of the analysed variable for all spatial units.

The global Moran described only a certain pattern observed in the whole area. To investigate the changes in the individual spatial units, other measures (local ones) should be used. These indicators are determined separately for each region. This allowed accurate access to the diversity of the studied phenomenon. In other words, based on local statistics, we can judge whether the tested area is adjacent to areas of low or high values. Such an analysis allows to detect clusters of areas of high (or low) value of the tested variable, and also identify unusual areas (values of which significantly differ from their neighbours). The most commonly used measure is the local Moran's statistic (for more details see: Anselin, 1995). This characteristic is used to examine how the value of one region is formed in

comparison with neighbouring regions, as compared to a random distribution of values in the tested area. The local Moran's statistic is expressed by the formula:

$$I_i = \frac{(x_i - \bar{x})^2 \sum_{i=1}^{n} w_{ij}(x_j - \bar{x})}{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}} \quad (2)$$

Description as previously.

We analysed proportions of rural inhabitants (males and females) in:

- agriculture, forestry and fishing,
- industry and construction,
- trade; repair of motor vehicles; transportation and storage; accommodation and catering; information and communication;
- financial and insurance activities; real estate activities;
- other services.

Results

Clusters of NUTS 3 regions similar in case of proportions of rural inhabitants (also males and females) employed in particular sectors were presented below (figures 1-9). Regions marked with red represent clusters of similar regions in case of high proportion of employment in particular sector whereas those marked with blue represent clusters of similar regions in case of low proportion of employment in particular sector. There are also regions marked with pink, which means that they are outliers – they are surrounded by regions of a different pattern.

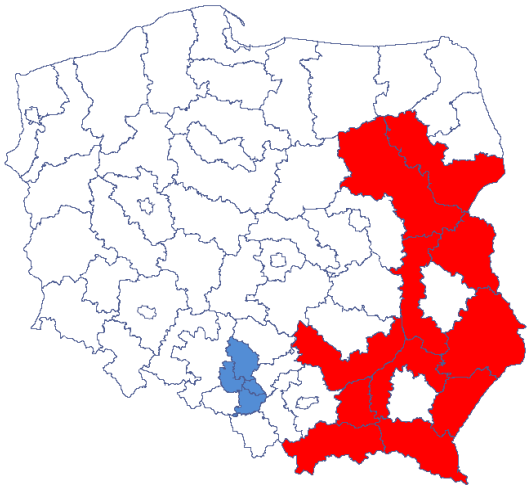

Figure 1. Clusters of NUTS 3 regions similar in case of **total employment in agriculture, forestry and fishing**

Source: own elaboration.

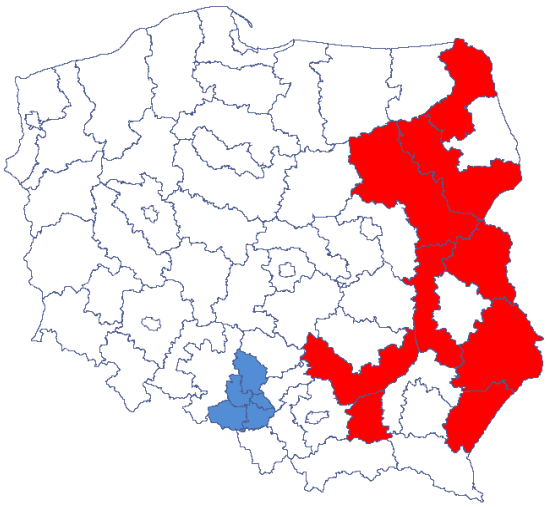

Figure 2. Clusters of NUTS 3 regions similar in case of **rural male employment in agriculture, forestry and fishing**

Source: own elaboration.

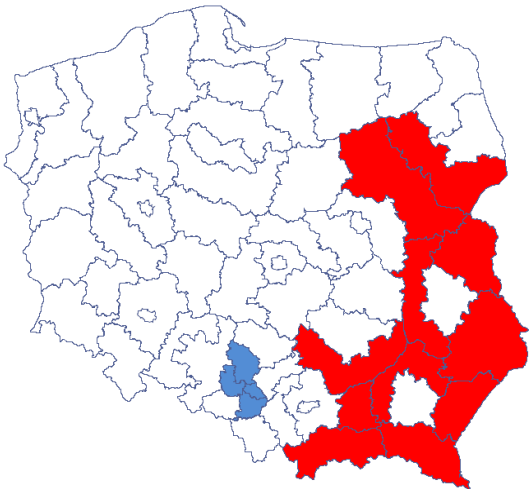

Figure 3. Clusters of NUTS 3 regions similar in case of **rural female employment in agriculture, forestry and fishing**

Source: own elaboration.

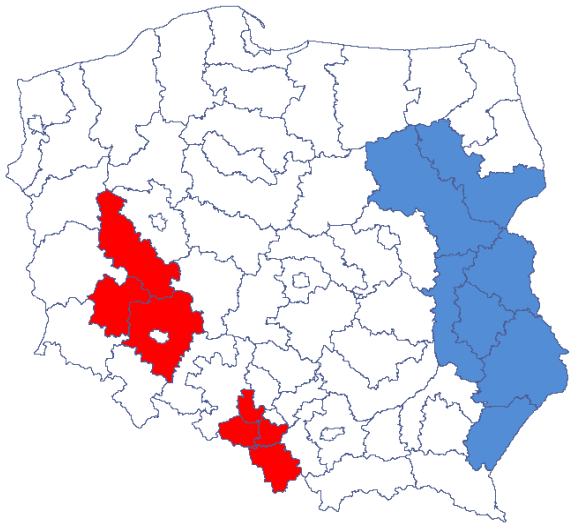

Figure 4. Clusters of NUTS 3 regions similar in case of **total employment in industry and construction**

Source: own elaboration.

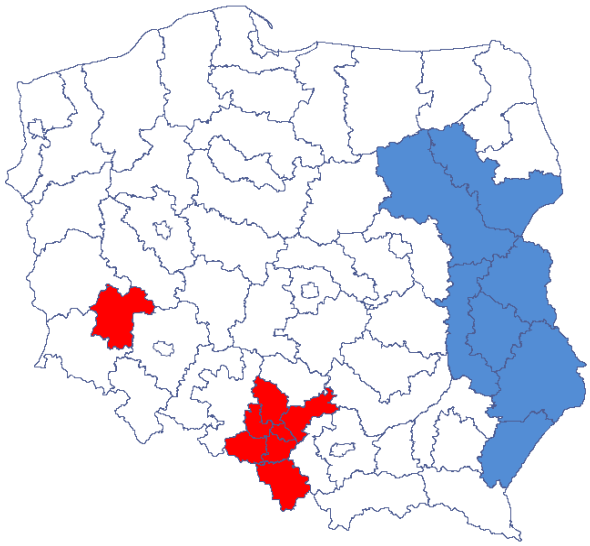

Figure 5. Clusters of NUTS 3 regions similar in case of **rural male employment in industry and construction**

Source: own elaboration.

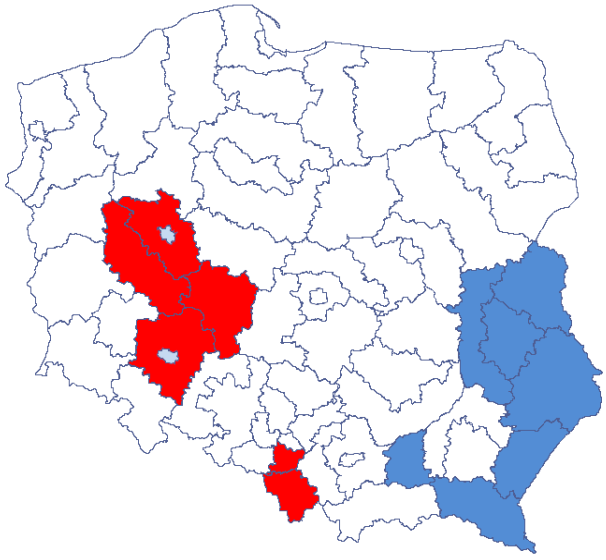

Figure 6. Clusters of NUTS 3 regions similar in case of **rural female employment in industry and construction**

Source: own elaboration.

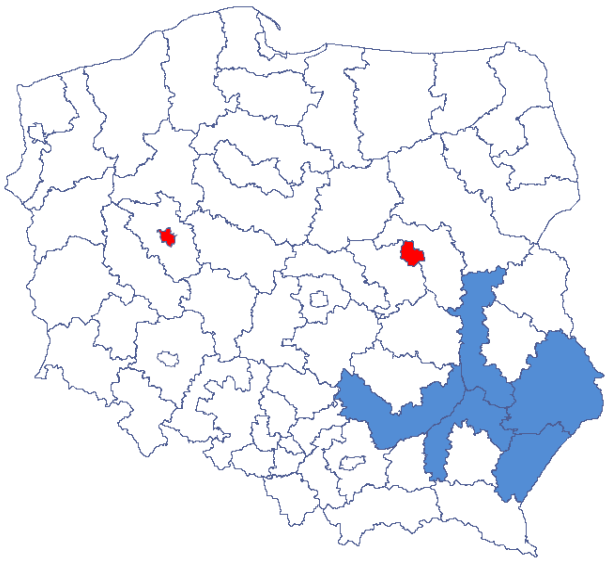

Figure 7. Clusters of NUTS 3 regions similar in case of **total employment in trade; repair of motor vehicles; transportation and storage; accommodation and catering; information and communication**

Source: own elaboration.

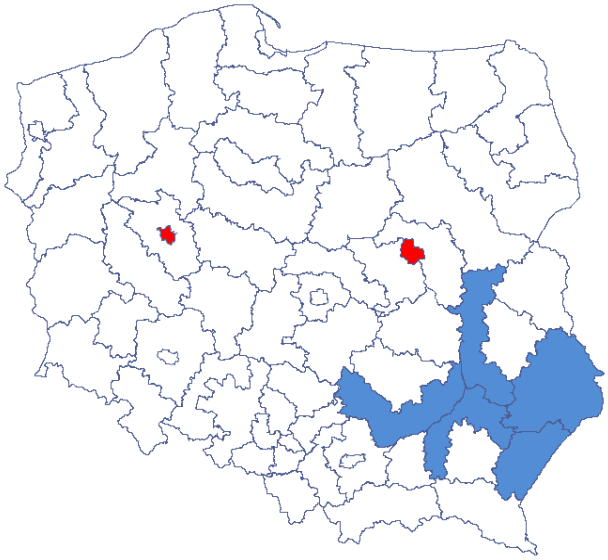

Figure 8. Clusters of NUTS 3 regions similar in case of **rural male employment in trade; repair of motor vehicles; transportation and storage; accommodation and catering; information and communication**

Source: own elaboration.

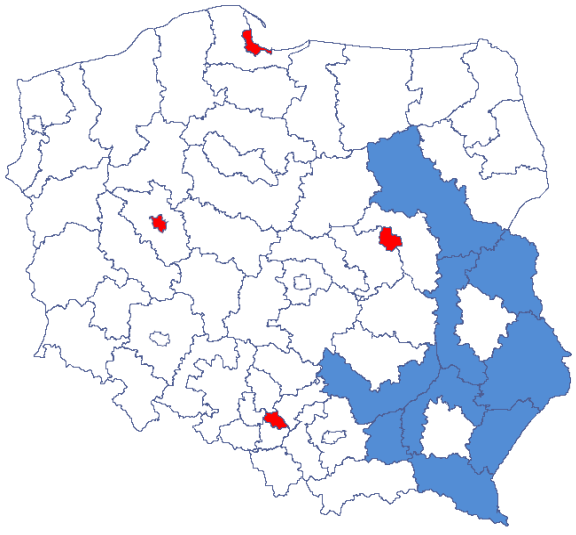

Figure 9. Clusters of NUTS 3 regions similar in case of **rural female employment in trade; repair of motor vehicles; transportation and storage; accommodation and catering; information and communication**

Source: own elaboration.

For employment in financial and insurance activities, real estate activities as well as other services, there were not such clear results in case of spatial patterns of employment, especially for total and male employment. There are some results

Conclusions

Undoubtedly, there is a cluster of regions in south-east Poland, where employment in agriculture, forestry and fishing is a significant trend of predominantly rural areas. To the contrary, such trends cannot be noticed in the west part of Poland. There were identified clusters of predominantly rural regions in the west-south part of Poland, where employment in industry and construction is a significant as an employment strategy, whereas in south-east Poland there are clusters of regions similar with a low scale of employment in this sector.

Identification of such employment strategies in rural areas can contribute for example to planning education facilities or instruments of labour market.

References:

Ahtonen S-M., 2003: Spatial autocorrelation in employment-output relation https://www.jyu.fi/ersa2003/cdrom/papers/209.pdf

Anselin L. (1995), Local Indicators of Spatial Association – LISA; Geographical Analysis, 27(2): 93–115

Drejerska N., 2014: Obszary przeważająco wiejskie w Polsce - perspektywa rynku pracy. in: Drejerska N., (ed.): Rolnictwo, gospodarka żywnościowa, obszary wiejskie - 10 lat w Unii Europejskiej. Publishing House SGGW, Warsaw, pp. 57-68.

Drejerska N., Chrzanowska M., 2014: Commuting in the Warsaw suburban area from a spatial perspective - an example of empirical research. Acta Universitatis Lodziensis. Folia Oeconomica 2014, Vol. 6, no 309, pp. 87-96.

Eurostat, 2012: Eurostat regional yearbook 2012. Publications Office of the European Union, Luxembourg, pp. 195-200.

Eurostat, 2015: Agriculture - rural development statistics http://ec.europa.eu/eurostat/statistics-explained/index.php/Agriculture_-_rural_development_statistics

Niebuhr A., 2003: Spatial Interaction and Regional Unemployment in Europe. in: European Journal of Spatial Development, no 5, pp. 1-26.

Schabenberger O. and Goteway C. A., 2005: Statistical method for Spatial Data Analysis, Chapman&Hall, London, pp. 23-25.