The Regional Differences of the Concentration of Bankruptcy Enterprises in Poland in the Years 2007 – 2014

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Abstract

The aim of the article is to present and analyze the phenomenon of bankruptcy in all regions in Poland. Below is presented analysis of changes in the number of bankruptcies compared to the number of registered enterprises in the voivodships, the level of bankruptcies and the level of regional concentration. This analysis shows the differentiations occurring in regional terms, taking into account the concentration of the number of enterprises in given provinces, and present the changes in the years 2007-2014 and the present trends.

Keywords: bankruptcy, bankruptcy concentration, regional concentration of bankruptcy

1 Introduction

The phenomenon of bankruptcy is an integral part of the market economy. Economic transformation, which took place in Poland in 1990, restored the proper role of the economic mechanism of natural selection, which had led to crowding out both unprofitable businesses and those that did not match the requirements of a

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market economy. As pointed out by E.I. Altman manifestation of the creation of a new economic order, new rules for competing enterprises was growing wave of bankruptcies and closures of enterprises [4]. It is true that the bankruptcy of enterprises also have positive consequences, which include primarily the elimination of the weak, inefficient entities, or better allocation of economic resources, but it cannot be ignored the socio-economic cost of this phenomenon. Among the negative effects of bankruptcy is the deterioration of the economic situation of enterprises which cooperate with bankrupts. It is common that the increase in concentration of bankruptcy in one region produces different kinds of crises in others. Also, do not forget about the social costs of the phenomenon of bankruptcy, which directly contribute to the deterioration of the material situation of persons employed in the bankrupt company, which often have difficulty in finding a new job and this effect has an impact on the deterioration of the situation in the whole region. The growing importance of bankruptcy in conditions of intensified competition in both domestic makes that issue is increasingly becoming the main point of discussion and empirical research scientists. Moreover, the issue of bankruptcy is very popular also among practitioners - owners or managers. According to K. Kuciński "growing association of companies operating in the open global economic systems makes bankruptcy (...) becomes a problem, more and more stakeholders of a company or business, but increasingly regional, macroeconomic and even global" [6]. Due to the indirect impact of closures on the economic situation, not only individual countries but also united Europe, consider the scale of this phenomenon and its symptoms occurring in the European economy.

Evaluation of the rate of bankruptcy in regional terms, can pose many difficulties, and the problem is worsened by the small achievements of empirical research on this topic. The aim of this paper is therefore to present the phenomenon of bankruptcy in the Polish economy by region (province) and try to determine the reasons for changes in the trend of this phenomenon over the last few years. The analysis included an eight-year period of the phenomenon of bankruptcy of enterprises in all 16 provinces in Poland. As the period of study adopted the years 2007 to 2014 which is the period preceding the year of the great economic crisis in the world in 2008.

2 The essence of bankruptcy analysis

The complexity of the issues relating to bankruptcy of enterprises and the associated lack of a comprehensive theory of this phenomenon make the concept of bankruptcy is present in many fields of science, which adopt a different interpretation of it. Particularly noteworthy are those aspects that most frequently appear in the definitions of the insolvency presented in the literature. The first emphasizes of the economic nature of bankruptcy, defining it as the culmination of
a lack of money, loss of ability to pay, which does not tend disappear, and transforms into a permanent phenomenon. This situation is caused by an inability to keep costs below the level of income, so it is a disease anemic, unprofitable business processes [1]. While bankruptcy in the legal aspect is an institution which aims to break the rising debt and mitigate the negative effects caused by it, and involves liquidation of the debtor's assets. [3] In addition, should be put an attention to the fact that in scientific publications often occurs term bankruptcy. Although some people think of bankruptcy and insolvency, as a phenomenon identical, it is important to determine the differences between these concepts [5, 6] (table 1).

### Table 1 Insolvency and bankruptcy

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>BANKRUPTCY</th>
<th>INSOLVENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character/type</td>
<td>Legal and economic</td>
<td>Economic</td>
</tr>
<tr>
<td>The settlement with the creditors of the debtor</td>
<td>Possible</td>
<td>Impossible</td>
</tr>
<tr>
<td>The definition in the Polish law</td>
<td>Exist</td>
<td>Absence</td>
</tr>
<tr>
<td>The size of the debtor's assets</td>
<td>It covers the costs of the bankruptcy proceedings and possibly part of the obligations of creditors</td>
<td>not enough even to cover the costs of bankruptcy proceedings</td>
</tr>
</tbody>
</table>

Source: [2]

The term of bankruptcy as opposed to bankruptcy is defined in Polish law, which taking under consideration the economic nature also includes the legal aspect of business operations, which have the ability to bankruptcy. While the bankruptcy of the company is possible, if the market value of its assets allows, at least covering the costs of bankruptcy proceedings and a portion of outstanding commitments, it is considered bankrupt operator actually do not have assets available for sale. Moreover, in contrast to bankruptcy, insolvency creates the possibility of a settlement with its creditors and the debtor (bankruptcy with the possibility of the system), which allows you to not only cater as much as possible their interests, but also to ensure the continuity of business operations.

As a part of the basic axes of research highlighted in the publication relating to the analysis of the phenomenon of bankruptcy *retrospective as prospective* the characteristics of the process announced bankruptcy proceedings enterprises in Poland carried out with the use of appropriate regulations to the formal and legal. Therefore, we present an analysis of the course and structure of the announced bankruptcy proceedings from the economic point of view, distinguishing them proceeding to the liquidation of assets (completion of activity) and dealing with the possibility of an agreement (to remain independent economic existence by the company), and breakdowns by region and type of run activity. Subsequently - with the use of measures in the factor of bankruptcies (OU) and the Regional Barometer of Bankruptcy (RBU) - made regional analysis of bankruptcy (by province).
Undertaken thread analysis has also become a differentiation bankruptcy process in terms of forms of legal and organizational entities involved in it. Analysis of the phenomenon of bankruptcy of enterprises in Poland covered a range of changes to both the size of the absolute number of players qualified for the group of entities that were in bankruptcy, and the dynamics of their changes in total and by region. Similarly to the analysis of structural changes the study involved the calculation of structural indicators, which are proportional of the size of the components, analyzed and evaluated structures.

3 The number and structure of judicial bankruptcy proceedings (SPU)

Analysis of the number of court announced bankruptcy proceedings points to their highest level in the whole period of analysis in Mazowieckie (Figure 1). A significant number of announced SPU also appeared in the provinces of Dolnośląskie and Silesia. In the provinces of Dolnośląskie, Mazowieckie and Śląskie we observed a strong upward trend in the number and in the other provinces with lower intensity. Based on the data presented in Figure 1 it can be stated that the largest number of bankruptcy proceedings were observed in Mazowieckie in the first half of 2012, while in the Dolnośląskie in 2013 is reported the maximum number of levels of court bankruptcy proceedings for the region, with clearly outlined a strong upward trend. A similar situation occurred in Kujawsko-Pomorskie, Małopolskie, Śląskie and Wielkopolskie province in the second half of 2013. It was characterized by a decrease in the number of court bankruptcy proceedings in all provinces except Mazowieckie, Wielkopolskie and Świętokrzyskie. Opolskie province was the only province in which the second part of 2009. Not announced any bankruptcy proceedings, and the number of bankruptcy proceedings was at the lowest level in Poland.

Figure 1. Number of court announced bankruptcy proceedings (SPU) by provinces in the period first half of 2007 – second half 2014.
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Carrying a statistical analysis of the regional distribution of the number of court announced bankruptcy proceedings can point out that the highest average value obtained in Mazowieckie, then Śląskie and Dolnośląskie. In these regions the highest number of peaks SPU. Analysis of variation indicates a high their level in the Mazowieckie, Dolnośląskie, Wielkopolska and Małopolskie. The most stable situation (low volatility) and a small number of court announced bankruptcy proceedings were observed in the provinces of Opolskie, Warmińsko-Mazurskie, Lubuskie and Świętokrzyskie.

Figure 2. Evolution of the average value of the number of court Announced bankruptcy Proceedings (SPU) of enterprises and its changes during 2007-2014

Notes: □ – standard deviation; the standard determined by the center of box, ◀ ◀ – minimum and maximum values.

Source: Author’s
The next step was to analyze the current changes in the number of court bankruptcy proceedings in the regional context with the pace of change indicator, which points to its high volatility and lack of clear direction changes. There was a difficulty in isolating the periods of regular changes and the appointment of permanent trends. A clear signal indicating a short-term improvement of the situation may be that reducing the rate of momentum in the second half of 2013 and the first half of 2014. in all provinces, with the exception of Mazowieckie and Świętokrzyskie.

Figure 3. The pace of change in the number of court bankruptcy proceedings (SPU) by provinces in the period first half of 2007 – second half of 2014.

Analysis of number of announced SPU in the period from the first half of 2007 to the second half of 2014. It indicates that the clear leader in this area is the state of California, which was, announced 896 bankruptcy proceedings. This represents 19% of all SPU in Poland at that time and 13 times more than in the Opolskie province, which declared bankruptcy at the lowest level. In the Małopolskie province the number of bankruptcy proceedings was 2.5 time lower than in Mazowieckie, and their share accounted for 8% in the Polish scale. Graphical illustration of the geographical diversification of the number of court announced bankruptcy proceedings and the concentration of the number of employees in these regions are presented on the map of Poland.

On this basis it can be stated that much less bankruptcy proceedings announced in the eastern and north-eastern part of Poland, and the smallest number was observed in the provinces of Opolskie, Podlaskie, Świętokrzyskie and Lubuskie.
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Figure 4. Regional differentiation in the number of court bankruptcy proceedings in the period 2007 - 2014.

Notes: SPU number on a scale from low (green) to the highest (red). The size of the wheel corresponds to the share in the number of employed (ULP).

Source: Author’s

Based on the structure of the number of court announced bankruptcy proceedings (in regional terms), the structure of registered enterprises in the individual provinces it has been observed that Mazowieckie have a greater share of the total announced SPU (19%) than the number of enterprises (17%). A similar situation was reported in the provinces of Dolnośląskie, Zachodniopomorskie and Warmińsko-Mazurskie. In the Małopolskie province, the situation was different, where the share of bankruptcies was lower than a number of enterprises, which is the signal for the region.

Figure 5. Regional differentiation in the number of court bankruptcy proceedings - bankruptcy (left panel) and the structure of the number of enterprises (right panel) in the period 2007 - 2014.

Source: Author’s
In order to determine the rate of change in the number of court bankruptcy proceedings in the regional context in relation to the rate of change in the number of SPU Poland uses an advance coefficient (values above 1 indicate above-average dynamics of change in the region relative to the total change in Poland). Based on a detailed analysis, it can be indicated in the Mazowieckie, Małopolskie, Dolnośląskie, Podlaskie and Wielkopolskie, the dynamics of the number of court bankruptcy proceedings in most half-years was higher than the growth in total in Poland.

Figure 6. Regional differentiation factor overtake the number of court bankruptcy proceedings - SPU in Poland at the time 2007 - 2014.

Source: Author’s

4 Regional analysis of the percentage of bankruptcies (OU)

In order to determine the scale of bankruptcies in the particular sections has been defined indicator bankruptcies (OU) in the analyzed groups and its changes over the analysis period. It is a relation of the number of enterprises for which declared bankruptcy proceedings to the total number of enterprises on an annual basis per 10,000 as a constant reference basis. It takes values from the interval <0; 10,000>, pointing to the deteriorating economic situation or an improvement in companies. OU value is calculated using the following formula:

\[ OU = \frac{\sum Lu}{\sum Lp} \times 10000 \]

where:

OU - the percentage of bankruptcy analyzed group in the total number of,
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Lu - the number of companies that bankruptcy,
Lp - the total number of enterprises in total.

Changes of the calculated indicators value over time help to identify the components of analyzed structure, which shares increase, decrease, no change, or change only slightly. The analysis of structural changes in the period are the basis for the assessment of the differences between the compared structures are differences in the values of indicators characterizing the structure of the same indicators of compared structures.

Analysis of changes in the value OU on a regional basis points to its highest levels in the analyzed period in the Zachodniopomorskie, Dolnośląskie and Mazowieckie. In all regions reported some increase value OU, with the biggest changes concerned the Dolnośląskie province. Since 2011 there are strong upward trend in the value of the OU in all provinces in Poland. In 2013 in the following provinces: Dolnośląskie, Kujawsko-Pomorskie, Lubuskie, Małopolskie, Podlaskie, Świętokrzyskie and Warmińsko-Mazurskie OU value was at maximum levels. In the second half of 2013 compared to first half of 2013. We observed a decrease in the value OU in most provinces and increase again in 2014.

Figure 7. Value of bankruptcies (OU) by provinces in the period 2007 - 2014

Source: Author’s

Analysis of the average value OU and its standard deviation by region shows the highest levels and their volatility in the Zachodniopomorskie and Mazowieckie.
High average levels observe also in the Warmińsko-Mazurskie, Dolnośląskie, Śląskie and Kujawsko-Pomorskie. Małopolskie province located at the 9th positions in terms of the average value of OU, and its average value is three times lower than the average in Zachodnio-pomorskie. The highest (maximum) value of OU was recorded in the regions of Dolnośląskie and Zachodniopomorskie.

Figure 8. The OU its descriptive statistics (left panel) and geographic shape (right panel) by provinces in Poland in the period 2007 - 2014.

Notes: □ – standard deviation; the standard determined by the center of box, ↓↑ – minimum and maximum values.

The value of the percentage of bankruptcy (OU) on a scale from low (green) to the highest (red).

Source: Author’s

5 Analysis of the regional concentration of bankruptcy (RBU)

Analyzing the processes of bankruptcy not only in the national scale, but also in particular regions shows intensity to the number of companies registered in the province. In this way it is relativized assessment of bankruptcy proceedings in relation to the intensity of economic processes in particular region of the country. In order to analyze the concentration of state bankruptcy has been used measure, used in economic geography, taking into account the level of density, defined as a location indicator (LQ) [1]. For the purposes pursued in the component EWS research it determined that the ratio of RBU is a relative assessment of concentration fallen in particular region [Luw / LPW] relatively to the total number of enterprises, belonging to the analyzed population in the economy in relation to
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all entities operating in the national economy [Luo / Lpo]. This is determined by the following formula:

\[ RBU = \frac{\sum L_{wu}}{\sum L_{pw}} \]

where

\( RBU \) - index of regional concentration of bankruptcy,

\( L_{wu} \) - number of companies declared the bankruptcy proceedings in particular region,

\( L_{pw} \) - the number of companies that have been placed in bankruptcy in the region (province),

\( L_{uo} \) - the number of companies that have been placed in a state of total bankruptcy,

\( L_{po} \) - the total number of enterprises in total.

Because the coefficient of RBU is used to determine the intensity level of the examined phenomenon in the region in relation to the overall economy, it is assumed that the RBU exceeding 1 indicate an above-average concentration of the analyzed phenomena in the region. Using index RBU it is possible to create a chronological list of regions, thus indicating areas over and below the average concentration of bankruptcy.

Thus, the Regional Barometer of Bankruptcy (RBU) is a relative assessment of concentrations of bankruptcy in a particular group of entities in relation to the total number of companies belonging to the analyzed population in the economy in relation to the total number of entities operating in the national economy. It is assumed that the index value exceeding the above average indicates the concentration of the analyzed events in particular group.

Defined measure in the form of a regional barometer of bankruptcy is used to determine the level of intensity of the examined phenomenon in the region in relation to the overall economy (RBU values in excess of 1 means above-average concentration phenomena in the region). By using measures of RBU it is possible to create a list of regions, thus indicating areas above average and below average concentration of bankruptcy.

The highest concentration of bankruptcies is not recorded in Mazowieckie, which announced it was most bankruptcy proceedings, but in Zachodnio-pomorskie, where, during the period of analysis RBU value of the indicator was at the level above 1. In seven provinces average periodic concentration phenomenon bankrupt-
cy was at the above-average level. The geographical distribution of provinces with above-average RBU, unlike the number of announced bankruptcy, indicates the north-eastern part of Poland.

Figure 9. The RBU and the descriptive statistics (left panel) and its Administrative shape (right panel) according to the provinces in the period 2007 - 2014.

Notes: □ – standard deviation; the standard determined by the center of box,
         ▲▲ – minimum and maximum values.

Source: Author’s

Above-average value of the RBU since 2007- As in the case of OU - occurred in the Zachodniopomorskie and Dolnośląskie. In the Małopolskie province RBU value of the index fluctuated in the vicinity of 1 to 2013. The year in which it significantly exceeded. The lowest index value RBU was recorded in Podlaskie and Pomorskie. In the Lodz region as the only value of the indicator RBU over the analysis period was below the value of 1.

The analysis of the curves showing the value of the index RBU in the period indicates a significant increase in its value in the Dolnośląskie. In Świętokrzyskie, Dolnośląskie and Malopolskie since 2012. It is seen a strong growth of the RBU. The clear downward trend is observed in the provinces of Lublin, Warmińsko-mazurskie, Zachodniopomorskie and Mazowieckie. In the second part of 2014 in 7 provinces measure the value of RBU was above 1, while in p. 2007. It was 8 provinces, of which 4 occurred in two moments of observation (Mazowieckie, Dolnośląskie, Kujawsko-Pomorskie, Świętokrzyskie).
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Figure 10. Differentiation of Regional Barometer Bankruptcy (RBU) in the period 2007 - 2014.

Source: Author’s

6 Conclusions

Analysis of the phenomenon of bankruptcy in Poland in terms of regional points to its large diversity. It shows clear its concentration in the provinces in the eastern part of the Polish and in those where there is a large concentration of the number of registered entities. In five provinces (Śląskie, Zachodniopomorskie, Dolnośląskie, Mazowieckie, Małopolskie) were an above-average level of concentration of bankruptcy with a clear upward trend in the two provinces. In the western provinces of Dolnośląskie and experience a high level of volatility phenomenon, which depicted the highest level of standard deviation. Analysis of the changes in the level OU indicates a upward trend in almost all provinces. In addition, it should be mentioned that both in Poland and in most European Union countries there is a problem with the application of insolvency laws. The number of actual bankrupts is much greater than the level of the announced bankruptcy of enterprises. There are no statistical data on bankruptcies of companies disturbs the image of the actual number of companies that have become insolvent, therefore, be reasonable considered to carry out further analyzes in this area. The impact of closures on the economic situation of the economy and justify the need for broadening the scope of further research on the issue of bankruptcy.
References


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