EMPIRICAL ANALYSIS OF REGIONAL DISPARITIES IN INCOME INEQUALITY

Iva Raycheva[1]

Abstract: *In this paper are presented selected results from an empirical analysis of the income inequality in Bulgarian regions. As we know from the economic theory the income that people receive is a basic measure of living standards. Which from your end is related with the risk of poverty or social exclusion? Disparities of the regions is an actual question which is investigated by many researchers. The current research is investigating inequality and related indicators.*

Keywords: *Cluster analysis, Comparative analysis, Income inequality, Bulgarian region, Indicators of inequality.*

1. INTRODUCTION

In the last decade we have followed the rise in the technology and development of human capital. As a consequence, there is an increase in the incomes and well-being of humanity. At the same time, there is an increase in income inequality in some countries.

„The relation between economic growth and income inequality is very complex."[2] According to Gyorgy Andor in the countries of Central and Eastern Europe, the transition process and EU cohesion occur simultaneously with the overall effects of globalization, which in turn influences the development of inequality in these countries.

Bulgaria is one of those countries that has a negative trend in income distribution, especially in terms of population distribution by region. The problem of regional economic development is increasing in the country. The indicator reflecting the economic development in the country, Gross Domestic Product is indicative of the huge differences between the regions. The gap between the individual districts in Bulgaria is not only related to economic indicators, but also to social ones.

„Political and ideological differences generally make reaching a consensus on how to address inequality of outcomes such as income extremely difficult."[3] The study of income inequality is one of the challenges of contemporary economic research. Fundamental to the measurement of inequality is the principle of equal opportunity for John Romer in 1993 and 1998.

In 2013 Stoyan Hristov[4] analyzes inequality in Bulgaria, reflecting the dynamics and looking for the causes of the profound differences in Bulgaria. In 2013 Stoyan Hristov analyzed inequal-

---

[1]   University of National and World Economy (UNWE), Studentski Grad, 1700 Sofia, Bulgaria

[2]   Gyorgy Andor, „Inequality Problems In Central And Eastern Europe", Fourth International Scientific Conference ERAZ 2018

[3]   Ana Abras, Alejandro Hoyos, Ambar Narayan and Sailesh Tiwari, Abras, „Inequality of opportunities in the labor market: evidence from life in transition surveys in Europe and Central Asia", al. IZA Journal of Labor & Development 2013, 2:7

[4]   Stojan Hristov, „Neravenstvoto v Bălgarija dinamika, sravnitelen analiz i pričini", Institut za pazarna ikonomika

ity in Bulgaria, reflecting the dynamics and looking for the causes of the profound differences in Bulgaria, also examining income inequality, using basic coefficients and indicators reflecting income distribution problems.

2. INFORMATION BASIS OF THE STUDY

In this study, the main indicators used in field work are based on the inequality measures used in theory. Data on the variables in this survey by region for the period 2008-2018 are provided on the website of the National Statistical Institute (NSI).

- The first indicator which is used at the current study is ***Gini's coefficient*** [5] by planning regions in the period 2008-2018. It is one of the main coefficients used in the analysis of income inequality. „It is often used as a gauge of economic inequality, measuring income distribution or, less commonly, wealth distribution among a population."[6];
- The second indicator which is present in the report is ***Population at risk of poverty or social exclusion (% of population)*** by regions in the period 2008-2018. (% of the total);
- The next variable used for present economic inequality is ***Percentage of population living with material deprivation*** by regions in the period 2008-2018. (% of the total).

3. ANALYSIS OF REGIONAL DISPARITIES IN INCOME INEQUALITY IN BULGARIA DURING THE PERIOD 2008-2018

The imbalances in the regions of the country in terms of income inequality could be mainly represented by the following indicators.

- The main indicator of inequality considered by economic theory is ***the Gini's index***. The coefficient measures the extent to which income redistribution or consumption expenditure in the economy diverts from perfect (equal) distribution.[7] In table 1 are presented the regions of planning with maximal and minimal values of Gini's index during the period 2008 - 2018.

Table 1. Regions with maximal and minimal values of Gini's index

	Maximal	Minimal
2008	Northwest	Southwestern
2009	Northwest	Southwestern
2010	Southeast	Southwestern
2011	Northwest	South central
2012	Southeast	South central
2013	Southwestern	North Central
2014	Southeast	North Central
2015	Northeast	North Central
2016	Northeast; Southwestern	North Central
2017	Southwestern	North Central
2018	Southwestern	Southeast

---

[5]   World Bank – Gini Index - Italian statistician and sociologist Corrado Gini 1912

[6]   Investopedia - https://www.investopedia.com/terms/g/gini-index.asp

[7]   World Bank, Gini Ratio Definition, as interpreted by „Neravenstvoto v Bălgarija dinamika, sravnitelen analiz i pričini", Stojan Hristov, Institut za pazarna ikonomika.

The table 1 shows the regions with the maximum and the regions with the minimum values of the Gini's coefficient. In 2008 and 2009, the highest levels of inequality in Northwest and the lowest levels of inequality in Southwestern as Southwestern continued to maintain the lowest coefficient values in 2010.

While the highest values are in the Southeast. During the period 2011-2018 maximal levels of inequality support again Northwest in 2011, Southeast for 2012 and 2014, Northeast for 2016 and Southwestern which has highest level of inequality except for 2016, 2017 and 2018, the last years of the investigated period.
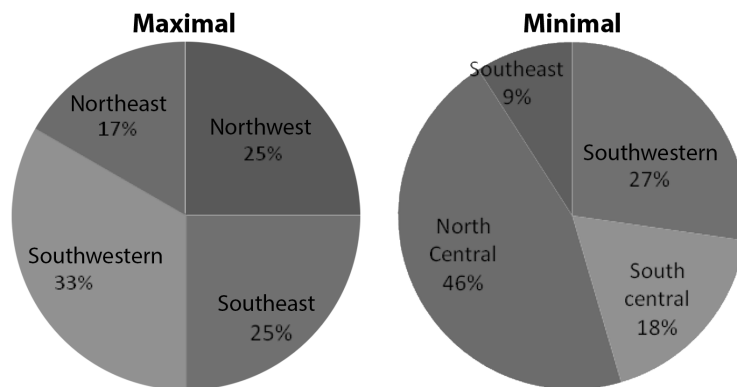

Figure 1. Regions with maximal and minimal values of Gini's index
for whole period 2008-2018

As Figure 1 indicates, during the investigated period maximal levels of Gini's index is observed in the region Southwestern. As in the last years to this region income inequality is the highest compared to other regions. The regions South Central and North Central did not maintain the highest levels of the index in any year of the study period. Even, region of North Central during the biggest part (46% from the investigated period) there were minimal levels of income inequality. This is the region with the smallest imbalance. It is the median of minimal values of the index for the regions. The median, as we can see, of the region's biggest imbalance concerning inequality in income is the Southwestern. According to Gini's index in Bulgarian regions are observed disparities in income inequality.
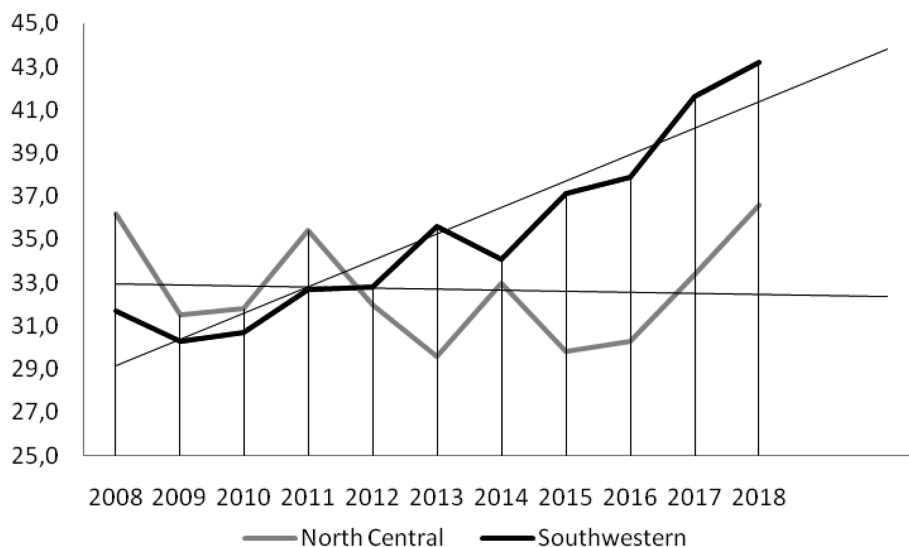

Figure 2. Gini's index for North Central and Southwestern during the period 2008-2018

In Figure 2 is presented the Gini's index for North Central and Southwestern during the investigated period 2008-2018. North Central is with the index which is the most common minimum, while Southwestern is median for maximal levels of the values of the coefficient. In the period from 2008 to 2012 the index in Southwestern there were values smaller than the values in North Central but in 2012 year there was an observed intersection of curves. The opposite trend can be traced after 2012 to 2018 as the values of index. The trend line for North Central – there is decreasing trend and the index, there are the smallest values of income inequality, while the trend line for Southwestern shows sharp increase in income inequality.

In order to structure and summarize the Gini's coefficient data, a cluster analysis was conducted. In order to distinguish between the number of regions with high coefficients and the number of regions with low index values, 2 cluster groups were predefined in the analysis. In the *first cluster group* are concentrated regions with high coefficient values, respectively, in which high income inequality is observed. The *second cluster group* concentrates in itself, regions with low indicators or with low income inequality. Clustering was done for each year of the study period individually to see if there were any imbalances between the studied regions in the investigated time series. Figure 3 summarizes the information from the cluster analysis performed.
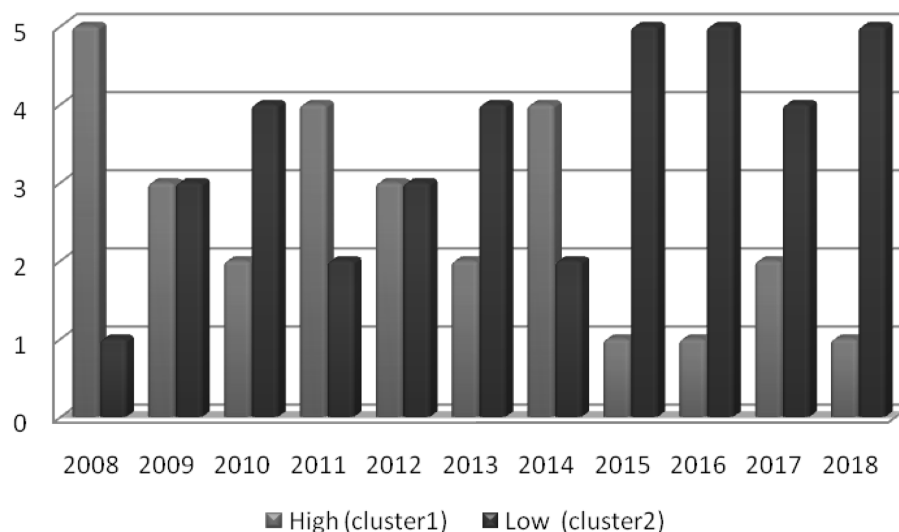

Figure 3. Results from a regional cluster of analyzes over the period 2008-2018

If we follow, in Figure3, the line of pillars that reflect high levels of the Gini's index, we will see that during the first part of the period they are higher. Whereas in recent years the number of regions falling into this cluster is smaller. This shows a positive downward trend in the number of regions with high levels of income inequality. Respectively, the pillars reflecting the number of regions falling into the cluster with low index levels are increasing. This confirms the positive trend of increasing the number of regions falling into the cluster with low levels of inequality.

Figure 3 indicates that during the investigated period is observed disparities in the part of Bulgarian regions because in the timeline, we can see that the number of regions in the two clusters is constantly changing and this indicates an imbalance in the planning regions in terms of income inequality. We can follow 3 from the regions which have no significant disparities in the cluster to which they belong. The region North Central in 91% from the investigated period is included to Cluster 1 (High level of the index). The regions Southeast and Southwestern in 82% from the period are included in Cluster 2 and they maintain some of the lowest levels of income inequality.

From the other side the arithmetic mean (average) for the 6th regions for 2008 of the Gini's index is 35.9%, but for 2018 is 36.9%. This shows that there is 10% growth from the beginning to the end of the period. So, it should be noted that the coefficient must be reached in Cluster 1 at the beginning of the period cannot be collected as at the end of the period. Thus, the cluster analysis testifies only to the *imbalance between regions regarding income inequality* due to the constant change in the number of regions falling within the two clusters.

Both of the indicators which present the poverty, which is invariably linked to income inequality, are Population at risk of poverty or social exclusion and Percentage of population living with material deprivation. They are presented in the below Figures 4 and 5.
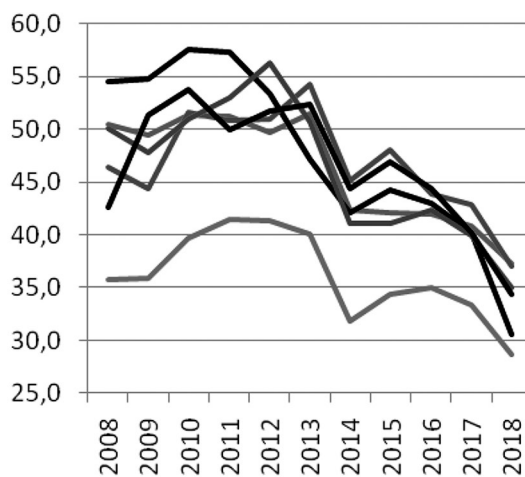

Figure 4. Population at risk of poverty or social exclusion
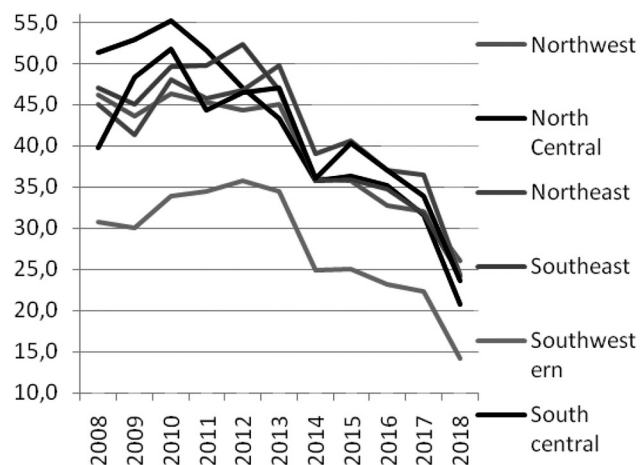
Figure 5. Percentage of population living with material deprivation

Figures 4 and 5 indicate that both coefficients show approximately equal percentages so we can see that the region Southwestern is with the low levels of the both coefficients which present the poverty. When comparing and with Gini's index in Figures 1 and 2 it can be concluded that the region with the lowest value according to poverty is the most common region with the highest values for income inequality. The region North Central in Figures 1 and 2 is with lowest values for the Gini's index. This dependence needs to be more thoroughly examined with statistical methods based on correlation relationships.

4. CONCLUSION

The regional disparities in income inequality are a specific topic that is most commonly explored in theory through the Gini Index. The inequality „has a fairly complex and nuanced structure".[8]

In this empirical study, through comparative analysis and cluster analysis, the existence of imbalance between the different planning regions in Bulgaria in terms of income inequality in the period 2008-2018 was found. Most of the Bulgarian regions have significant differences in terms of income.

---

[8]   Aghion, P., Caroli, E., & Garcia-Penalosa, C., 1999. Inequality and economic growth: the perspective of the new growth theories. *Journal of Economic literature*, 37(4), 1615-1660.

The report established that Southwestern region is with the lowest levels of the both coefficients which present the poverty, at the same time, it is the most common region with the highest values for income inequality. Inverse relationship was found for North Central region, too, but with the highest values of the both coefficients it showed the poverty with the lowest values for the Gini's index. This relation must be clarified by precise statistical measures. Since this assertion is based solely on comparative analysis it is not sufficient to confirm the information.

REFERENCES

Gyorgy Andor, Inequality Problems In Central and Eastern Europe, Fourth International Scientific Conference ERAZ 2018

Ana Abras, Alejandro Hoyos, Ambar Narayan and Sailesh Tiwari, Abras, „Inequality of opportunities in the labor market: evidence from life in transition surveys in Europe and Central Asia", al. IZA Journal of Labor & Development 2013, 2:7

World Bank - https://www.worldbank.org/

Investopedia - https://www.investopedia.com/terms/g/gini-index.asp

Aghion, P., Caroli, E., & Garcia-Penalosa, C., 1999. Inequality and economic growth: the perspective of the new growth theories. *Journal of Economic literature*, 37(4), 1615-1660.

Stojan Hristov, „Neravenstvoto v Bălgarija dinamika, sravnitelen analiz i pričini", Institut za pazarna ikonomika.