

Interregional inequalities at NUTS level 3 in Macedonia

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ABSTRACT

This article evaluates interregional inequality among Macedonian regions in the period 2008–2014 by employing statistical measures of regional inequality, including the coefficient of variation, Gini coefficient of concentration and Theil index. Regional inequality is analyzed by using socio-economic indicators, namely the GDP per capita, registered unemployment rate, gross fixed capital formation and entrepreneurial activity. The results show the changing interregional inequality at the level of NUTS 3 regions. The strong polarization between Skopje Region and the rest of the country is the most remarkable feature of regional development in Macedonia between 2008 and 2014.

KEYWORDS

regional inequalities; socio-economic indicators; coefficient of variation; Gini coefficient of concentration; Theil index; Macedonia

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1. Introduction

In the Republic of Macedonia, the problem of regional inequalities is a problem of several decades now and it derives by the political, social and economic factors and changes that have resulted with an inadequate regional distribution of the demographic trends, urbanization, industry and other economic activities. These factors have enabled Macedonia to be a country of two different spatial worlds, one of the dynamic demographic and economic concentration, and the other of an unused space, that is demographically and economically forgotten.

Reducing regional inequalities has been an essential part of the integration and cohesion process of the European Union. The research and analysis of the regions in the Republic of Macedonia and obtaining the concrete results about the problems and disparities in the socio-economic development are of particular importance for the country in the pre-accession period in which the country will have to prepare for the future implementation of structural funds of the European Union and cut the regional differences.

In this study, the subject of its interest is interregional inequalities. The aim of the paper is to measure the interregional inequalities in the Republic of Macedonia after 2008 through an analysis of select socio-economic indicators of Macedonian NUTS 3 regions, and scientifically and empirical to show that the interregional differences exist. Also, the purpose of this article is to find and the causes of differences and to give some recommendations. The whole research was based by theoretical attempts and practices according to the relevant international literature, from which the conceptual framework of the study developed.

In the study, the author has strived to emphasize the gap between the Skopje region and other regions in Macedonia. Hence, the author created the following two hypotheses: H1: There are significant interregional differences in the socio-economic development between the regions, especially between the Skopje region and the other regions; H2: The differences between regions would be decrease in the period 2008–2014. To find whether or not the first hypotheses and assumptions are valid, it was necessary to do several research tasks: (1) to collect statistical data on the value of the GDP per capita, the registered unemployment rate, the gross fixed capital formation and the entrepreneurial activity in 2008, 2011 and 2014; (2) to apply of an adequate statistical method (coefficient of variation, Gini coefficient of concentration and Theil index) to testing series of data and to analyze and quantify the interregional inequalities and their results to be compared; (3) to explore the political context and the government's role in policy-making of reducing the interregional inequalities and implementation at regional development.

The paper is organized into six sections. The next section explores the concept of the theoretical framework of regional inequalities and the theoretical contribution of the study. The third section discusses the research problem and method. The fourth section analyses the development of selected indicators in Macedonian NUTS 3 regions and measuring regional inequality by statistical measures. The fifth section discusses the government's role in regional development. The sixth section summarizes the study with certain conclusions and implications.

2. Theoretical background and contribution of the study

In literature, the best practices for social inequalities (Benyaklef 1997; Michálek and Podolák 2010) and economic inequalities in regional development (Arndt and Sundrum 1975; Banerjee and Jesenko 2015; Barjak 2001; Buckwalter 1995; Clercq and Naert 1985; Ezcurra and Rodríguez-Pose 2013; Galbraith and Garcilazo 2010; Huang, Kuo and Kao 2003; Pérez-Moreno and Angulo-Guerrero 2016) are scientifically elaborated. Trends in regional polarization and econometric model of regional disparities are successfully described in the article on Baláž (2007), and regional inequalities in the articles (Cardoso 1993; Casellas and Galley 1999; Dunford, Key Laboratory of Regional Sustainable Development Modeling (IGSNRR) and Perrons 2012; Ezcurra and Pascual 2007; Kluvánková-Oravská 2004; Lessmann 2014; Ozornoy 1991; Sawers 2006; Smętkowski 2013; Torrìsi et al. 2015).

In studying regional differences, inequalities between regions are based on the values of selected quantifiable indicators. Many empirical studies of regional disparities have used a single economic indicator such as the per capita income; however, this approach is not quite objective, because results are dependent on the selected indicator (Quadrado et al. 2001, as cited in Baštová, Hubáčková and Frantál 2011).

There are different approaches to the choice of indicators that are measuring the interregional inequality. For example the EU uses major indicators reflecting economic and social development such as GDP per capita and its sectoral distribution, demographic structure, population density, unemployment rate, etc. (Özaslan, Dincer and Ozgur 2006). The United Nations (UN) evaluates, using the human development index (HDI), mainly the level of development in observed regions, which includes GDP per capita and the level of education and health (average life expectancy) (Baštová et al. 2011: 3).

There are many disparities that can be measured by demographic, social, economic and other indicators, such as: literacy and education, health indicators, gross national product (GNP) per capita,

unemployment, foreign trade (Benyaklef 1997). Martin (1997) in showing regional differences in UK, as the main indicator takes into unemployment. In his study, he concludes that the regional unemployment differences are a long-standing feature of the British economic landscape. Barjak (2001) takes into account the following indicators: income indicators, employment opportunities, quality of the environment, training and educational opportunities, the satisfaction of the need to work etc. Berentsen (2006), show the results, based on analysis of changing distributional characteristics of GDP per capita, infant mortality, and unemployment. Gezici and Hewings (2007) in their study to determine regional differences as the main indicator take the following: GDP per capita, as well as Huang, Kuo and Kao (2003). It identified unemployment rates, urbanization rates, shares of the population with a university degree and share of foreign investors in total enterprises as major factors behind regional divergence (Baláž 2007). Goschin, Constantin, Roman, and Ileanu (2008) select just three main economic indicators such as GDP per capita, unemployment rate, and average monthly net earnings. Baštová et al. (2011) in their study used four main socioeconomic indicators (GDP per capita, registered unemployment rate, average monthly gross wage and entrepreneurial activity), to find the differences in the regional development of the Czech Republic.

Therefore, it is necessary to combine different variables to explain socioeconomic regional differences, but it is not always possible to collect selected indicators for certain period's combination with territorial units.

As in many other studies, this paper used a set of socioeconomic indicators and statistical measures as a framework of analysis to compute an interregional inequalities. However, it also pays particular attention to the role of government and politics influence regional development in Macedonia, and in so doing adds another dimension to the current research on regional development in developing countries. Its major theoretical contribution lies in its highlighting of the linkage between political context and government policy, on the one hand, and measuring regional inequality by selected indicators and inequality measures, on the other to understand better how complex are the regional development and the inequalities. The research assessing the interregional inequalities from this perspective has thus far been limited. Most studies focus on the traditional descriptive approach for measuring regional disparities according to various variables, and give little or no attention to the role of government policy.

This article is consistent with many other articles which found the different statistical methods and measures to be fully applicable for assessing the size of regional inequalities, such as the statistical method of the coefficient of variation (Kyriacou and Roca-Sagalés 2014; Lessmann 2014; Sacchi and Salotti

2014), then the Gini coefficient of concentration (Mussini 2017; Zubarevich and Safronov 2011, 2014), and the Theil index (Doran and Jordan 2013; Ezcurra and Rodríguez-Pose 2014; Martínez-Galarraga, Rosés and Tirado 2015).

3. Methodology

The main aim of this paper is to find interregional inequalities in the Republic of Macedonia in the period 2008–2014. For this analysis, years 2008, 2011, and 2014 were selected as reference years, which involved significant socioeconomic changes in the Macedonian society, after granting candidate status for membership in the European Union, during the beginning of the global economic crisis and after that.

To prepare the scientific work, the author used secondary data from the State Statistical Office of Macedonia. The primary data is obtained from the researches made by the author. Figure and tabular overviews are used to present regional inequalities. Due to the highly limited availability of data for smaller administrative units¹ (in terms of their existence, structure and timeliness), NTES level 3 which correspond to NUTS level 3 regions were chosen as territorial units for this analysis. The Nomenclature of Territorial Units for Statistics – NTES was adopted by the Government of the Republic of Macedonia in December 2007 (Official Gazette no. 158 of 28.12.2007); the last changes are prepared in January 2014 (Official Gazette no. 10 of 20.01.2014).

The Republic of Macedonia (25,713 km²) consists of eight NUTS 3 regions:

- *East Region* (14.2% of the territory of the Republic of Macedonia, 8.6% of the total population, a population density of 50.4 inhabitants per km²).
- *Northeast Region* (9.3% of the territory of the Republic of Macedonia, 8.5% of the total population, a population density of 76.1 inhabitants per km²).
- *Pelagonia Region* (18.9% of the territory of the Republic of Macedonia, 11.3% of the total population, a population density of 49.3 inhabitants per km²).
- *Polog Region* (9.7% of the territory of the Republic of Macedonia, 15.4% of the total population, a population density of 131.6 inhabitants per km²).
- *Skopje Region* (7.3% of the territory of the Republic of Macedonia, 29.7% of the total population, a population density of 337.8 inhabitants per km²).
- *Southeast Region* (10.9% of the territory of the Republic of Macedonia, 8.4% of the total population, a population density of 63.3 inhabitants per km²).

1 NTES level 4 there are municipalities (80 units) – correspond to LAU 1 and NTES level 5 there are settlements (1776 units) – correspond to LAU 2.

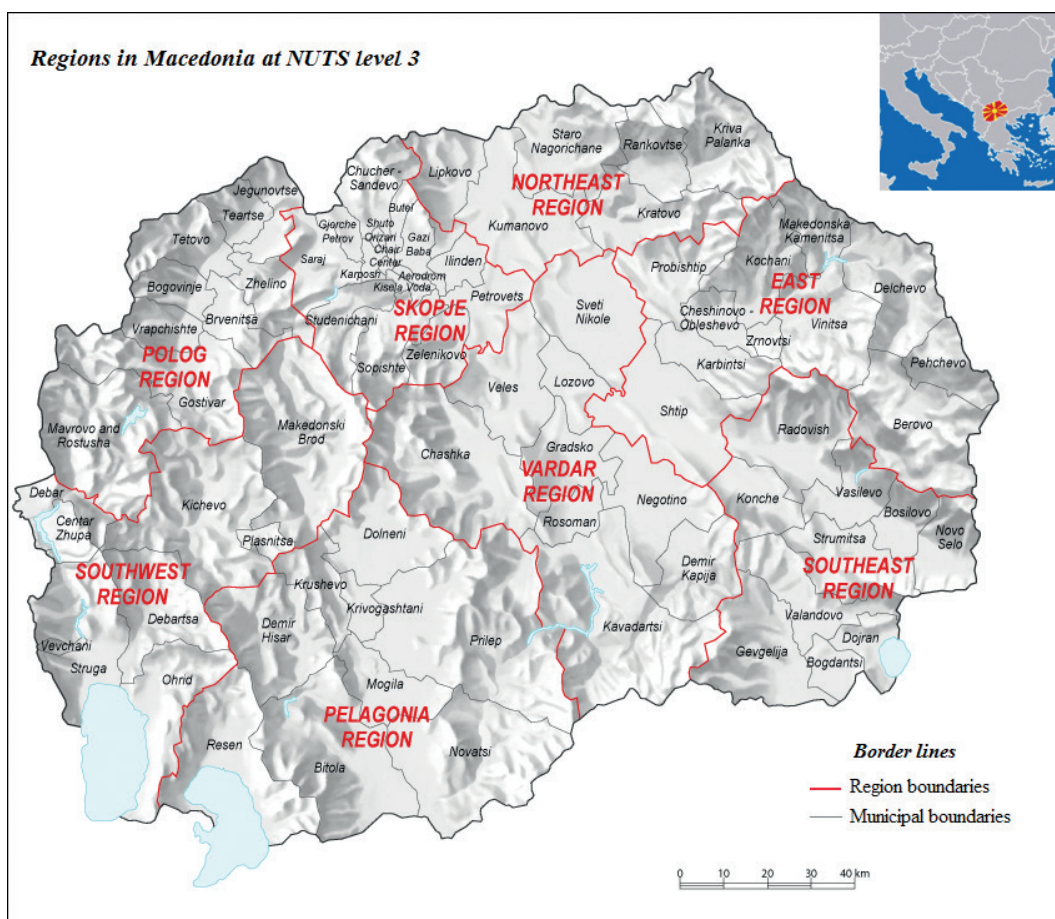


Fig. 1 Regions in Macedonia at NUTS level 3.

- Southwest Region (13.4% of the territory of the Republic of Macedonia, 10.7% of the total population, a population density of 66.0 inhabitants per km²).
- Vardar Region (16.2% of the territory of the Republic of Macedonia, 7.4% of the total population, a population density of 38 inhabitants per km²).

Due to the specific position of the Skopje Region, the regional inequalities will be analyzed twice: firstly in eight administrative regions including Skopje Region, and secondly in seven regions excluding Skopje Region. By applying this analysis, the distortions that are caused by extreme values of selected indicators of Skopje Region will be eliminated. In this way, a more objective evaluation of regional differences in the other seven regions will be allowed.

A key part of the first phase of the empirical analysis is the selection of proper indicators. It is very difficult to choose the set of indicators that will identify different areas and developed regions. Thus, it is necessary to combine various indicators to express overall socioeconomic regional inequality. Based on the literature review and data availability four indicators were selected: GDP per capita, registered unemployment rate, gross fixed capital formation and entrepreneurial activity. One of the main reasons for the selection of these four socio-economic indicators in

the analysis of regional inequalities was their availability and compatibility for the selected years of the monitored period, which was not the case with other indicators which can be used in analyzes.

GDP per capita is a widely used indicator mainly characterizing the economic performance of the region. Gross domestic product (GDP) at market prices is the final result of the production activity of the resident producer units and it is the sum of gross value added of the various institutional sectors or the various activities at basic prices plus value added tax and import duties less subsidies on products (which are not allocated by activities) (SSORM 2017: 358). Data for the calculation of GDP are determined by the Eurostat methodology of ESA 2010. But one should have in mind that the data on GDP per capita in certain regions is largely under the influence of the migration of the labor force, and it contributes in a given region to create GDP which is not a result of the resident population. That is one of the shortcomings of this indicator. According to own insights, the data on GDP per capita can be overestimated in the region where it is produced (e.g. the Skopje Region), and on the other hand, it can be underestimated in regions of the large outflow of workforce (for example, many people from the other regions are working in the Skopje Region and there they have registered their revenues).

The unemployment rate is a standard socio-economic indicator presenting the quality of life of the population and economic situation in the region. The unemployment rate as the participation of the number of unemployed in the total labour force is used to find interregional inequalities. The unemployment rate is calculated using the following equation:

$$\text{UNr} = \frac{\text{NUp}}{\text{TWf}} \cdot 100\%$$

where, UNr is the unemployment rate, NUp is the number of unemployed persons, and TWf is the total workforce.

The third indicator 'gross fixed capital formation' is often used for comparing the socio-economic level of regions. The data on Gross Fixed Capital Formation a result of the annual survey on Gross Fixed Capital Formation (INV.01) of private, cooperative, mixed and state enterprises and organizations, the commodity flow method and the calculation of investments for the entities which do not have the status of a legal person. The method used in the calculation of gross fixed capital formation is in line with the recommendations of SNA 2008 and ESA 2010 (SSORM).

The fourth indicator represents the rate of entrepreneurial activity. The calculation of entrepreneurial activity is based on data of the number of active businesses per 1000 inhabitants, following equation:

$$\text{Ea} = \frac{\text{NAb}}{\text{TNp}} \cdot 1000\%$$

where, Ea is entrepreneurial activity, NAb is the number of active business entities, and TNp is the total number of population.

Entrepreneurial activity was calculated from records of the number of active business entities listed in the Statistical Business Register. Active business entities are all business entities that contribute to the gross domestic product, and the basic criterion for determining the activity of the entity is the data on income and/or employees (SSORM 2017: 529).

For assessment of the size of regional inequalities in the selected years, it was also necessary to choose different methods. The author selects three statistical measures of regional inequalities such as the coefficient of variation, Gini coefficient of concentration, and Theil index. With the application of the three measures will be determined the variability measured by chosen indicators. These measures can be monitored through a time series and in this way it can be seen whether the inequalities are increasing or decreasing. Thus, only these three indices will be used in what follows in the text.

The most widely used measure of differences is the coefficient of variation (Vx). This measure based on mean logarithmic deviation, which is related to its average and is set in a percentage. The coefficient

of variation measuring regional inequality has the form:

$$Vx = \frac{\sigma}{\bar{x}} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}} \cdot \frac{1}{\bar{x}}$$

where n is the number of observational units, x_i is the value of indicator x for the i -th region and \bar{x} is the arithmetic mean of values of indicator x . The higher the value is, the greater the inequality of the distribution research phenomena.

According to Netrdová and Nosek (2009), this measure has a positive and negative side. The positive side of this measure is its non-dimensionality, through which it is possible to compare the variables in different measurement units. From the other side, the dependence of this measure on the average of the distribution is a negative feature, because this distribution is inappropriate within the scope of reality of very asymmetrical distribution of socioeconomic phenomena. So, the analysis of regional inequalities within a set of regions (e.g. 7 regions in Macedonia, excluding Skopje Region), which have a more symmetrical distribution of selected indicators, will refine the results.

Perhaps, the most used measure of determining inequality, especially in the measurement of income inequality, is the Gini coefficient of concentration (Gi). The Gini coefficient, proposed by Corrado Gini in 1914, has been the focus of many theoretical and empirical studies. The Gini coefficient of concentration can be respectively written as:

$$Gi = \frac{1}{2n^2\bar{x}} \sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|$$

where n is the number of observational units, x_i is the value of the indicator x for the i -th region, x_j is the value of the indicator x for j -th region and \bar{x} is the arithmetic mean of the indicator x values. The values range from $0 \leq Gi \leq 1$, where 0 represents absolute equality and 1 represents an absolute inequality of the distribution of the phenomenon.

The third method 'Theil index' is defined as a weighted geometric mean of a relative phenomenon and it is mainly used to measure economic inequality. In this article, a non-weighted form of the index is used because the selected indicators have already been related to the population of the region. The Theil index (Th) is calculated with the equation:

$$Th = \frac{1}{n} \sum_{j=1}^n \frac{y_j}{\bar{y}} \ln \left(\frac{y_j}{\bar{y}} \right)$$

where n is the number of regions, \bar{y} expresses the arithmetic mean of the phenomenon, y_j is the value of the phenomenon in the region j . The values range from 0 which corresponds to absolute equality of distribution of the phenomenon, to 1 which

corresponds to absolute inequality of distribution of the phenomenon.

Many academic scholars used the decomposition of inequality measures. Thus, the most commonly used is the Theil index decomposition into (the within-group) and between (group components), where the total inequality is equal to the sum of these groups. Without the knowledge of data for the lower territorial levels (e.g. municipalities), it is not possible to undertake the decomposition. Because, the selected indicators in this paper were available only for NUTS 3 regions, the Theil index decomposition is not calculated.

4. Measuring regional inequality by selected indicators and inequality measures

In this part of the paper, a comparison of selected indicators' development in 2008, 2011, and 2014 as well as a comparison of inequality measures for selected variables are presented.

4.1 GDP per capita

GDP per capita increased on average by 32.7% in all regions during the analyzed period. The growth rate of by GDP per capita was higher in the period 2008–2011 compared with the period 2011–2014 in most regions. The most progressive increase of GDP per capita (80.8%) was recorded in the Southeast Region as the fastest growing region, and the smallest growth rate of by GDP per capita was recorded in

Skopje Region (16.5%). Above national average GDP per capita was recorded in the Skopje, Pelagonia, East, Southeast, and Vardar Region over the tracked period (2008–2014). On the other hand, regions with the lowest GDP per capita not varied. In 2008, the Northeast Region and Polog Region achieved the lowest level of GDP per capita. Also, in 2014 the lowest GDP per capita was recorded in the Northeast Region and Polog Region which underwent minimal increases of the indicator over the eight year period (Table 1). In Polog Region the gray economy has bigger dimensions compared to other regions in the country, so the data that shows a lower GDP per capita because of the unregistered economy and it should be taken with caution. Also, the foreign currencies that are sent from abroad mostly are remittances for people who live in the Polog Region, which only indicates that the population of this region had a higher standard than other less developed regions (e.g. the Northeast Region is traditionally poorer).

There are several reasons that contribute to the development of GDP per capita in particular regions. Thus, one of the main causes of regional inequalities is the sector structure of regional economies. For example, the economic performance of Skopje Region is driven by commercial services, trade, financial and insurance activities, manufacturing, construction, information and communication etc.; the Southeast Region is significantly more involved in agriculture and service activities compared with the others region. Also, in the Northeast Region, an unfavourable sector structure of manufacturing might be the cause of the low value of GDP per capita.

Tab. 1 Regional differences in GDP per capita and registered unemployment rate in Macedonian regions.

Region	GDP per capita (MKD)			Registered unemployment rate (%)		
	2008	2011	2014	2008	2011	2014
East	173.815	224.455	244.272	20.0	16.4	20.1
Northeast	122.014	146.047	148.745	58.0	59.6	44.0
Pelagonia	208.990	224.485	251.988	34.5	31.4	18.7
Polog	95.277	114.113	117.284	26.4	31.8	30.7
Skopje	314.531	319.717	366.482	37.3	30.7	29.0
Southeast	168.211	251.471	304.140	11.7	9.3	20.8
Southwest	150.771	174.509	189.109	39.3	42.8	36.4
Vardar	196.028	220.590	274.404	43.6	36.4	27.6
Dataset including Skopje Region						
Vx	0.3470	0.2866	0.3246	0.3989	0.4457	0.2877
Gi	0.1846	0.1582	0.1836	0.2232	0.2426	0.1593
Th	0.0571	0.0419	0.0547	0.0845	0.1055	0.0403
Dataset excluding Skopje Region						
Vx	0.2333	0.2384	0.2905	0.4307	0.4727	0.3083
Gi	0.1312	0.1304	0.1634	0.2435	0.2619	0.1706
Th	0.0286	0.0302	0.0447	0.0972	0.1195	0.0462

Source: Computed by author based on data from Stat Statistical Office of the Republic of Macedonia.

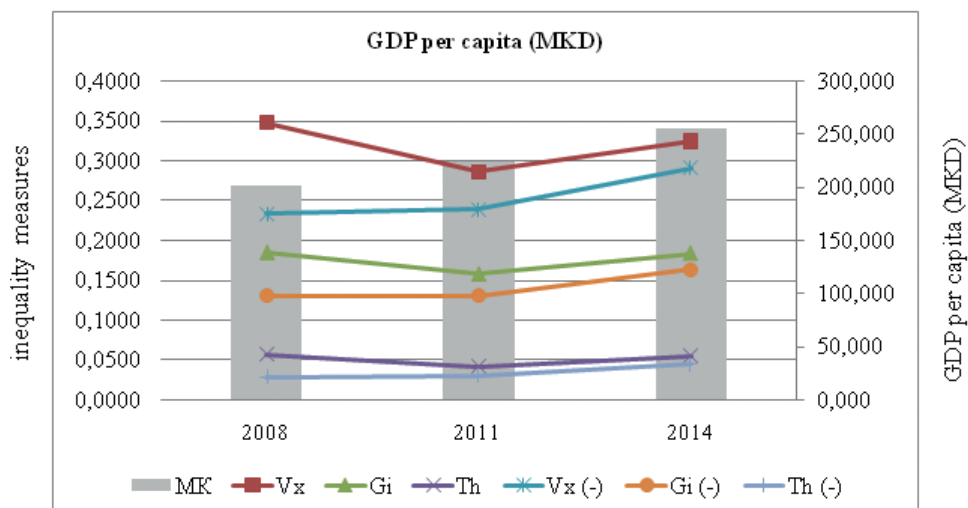


Fig. 2 GDP per capita in Macedonian regions (including Skopje Region and excluding Skopje Region) in 2008, 2011, and 2014 (coefficient of variation, Gini coefficient of concentration, Theil index).

Source: Author chart based on data from Stat Statistical Office of the Republic of Macedonia. Notes: MK = national average; Vx and Vx (-) = coefficient of variation calculated from the dataset including and excluding Skopje Region; Gi and Gi (-) = Gini coefficient of concentration calculated from the dataset including and excluding Skopje Region; Th and Th (-) = Theil index calculated from the dataset including and excluding Skopje Region.

The indicator of GDP per capita is influenced by the high value of GDP per capita in Skopje Region in the long-term. The increasing economic performance of Skopje Region can be explained by a comparison of the inequality measures computed with Skopje Region and without it. The inequality measures of GDP per capita computed with Skopje Region recorded 1.5 times (2008), 1.2 times (2011) and 1.1 times (2014) higher values of the coefficient of variation; 1.4 times (2008), 1.2 times (2011), and 1.1 times (2014) higher values of the Gini coefficient of concentration; 2.0 times (2008), 1.4 times (2011) and 1.2 times (2014) higher values in the case of the Theil index in comparison with values of these inequality measures based on dataset excluding Skopje Region (Table 1).

The comparison of values of inequality measures for GDP per capita in selected years shows that there are no statistically significant trends in the development of these differences. In the period 2008-2014, the values of inequality measures based on a dataset including Skopje Region, are reduced. On the other hand, a very slight growth was recorded for the values of inequality measures based on dataset excluding Skopje Region, but these differences can be considered as flat (Figure 2). These small deviations are likely to have been caused by the increase of economic performance in East Region, Southeast Region and Vardar Region compared to other regions (increase by 40.5%, 80.8% and 40.0% between 2008 and 2014). In contrast, the Skopje Region in this period registered a smaller increase of 16.5% of GDP per capita.

4.2 Registered unemployment rate

The unemployment rate of the population at a regional level shows a difference compared to the overall rate level in Macedonia. With the highest the

unemployment rate above the national average is the Northeast, Pelagonia, Skopje, Southwest and Vardar Region in 2008 and Northeast, Polog, Skopje and Southwest Region in 2014 (Table 1). As long as the unemployment rate in a given region is above average, a tendency to higher emigration and lower immigration is expected (Michálek and Podolák 2010: 41).

During the reference period, in terms of average registered unemployment rate, there was a change in the values of interregional inequalities, but this change was being not statistically significant. Although computed inequality measures (coefficient of variation, Gini coefficient of concentration, Theil index) for registered unemployment rate show a slight decrease in the monitored period, the results are statistically insignificant (Figure 3).

The above-mentioned slight decline in the size of interregional differences was consequence mainly by the decline of registered unemployment rates in Northeast, Pelagonia, Skopje, Southwest and Vardar Region. This can be seen especially in 2014 when the Vardar Region recorded the largest decrease of unemployment in the Republic of Macedonia. One of the reasons for this decrease could have been the new work positions, which opened with the construction of the Dräxlmaier factory in Kavadarci Municipality. The highest unemployment rate of 44% in the Northeast Region is a consequence of the emigration of many people outside the country, who are registered as residents in Macedonia (mostly unemployed for using free health insurance), as well as the considerable number of engaged workers in agriculture and the informal sector who are registered as unemployed.

The problems with the increased level of unemployment are more than obvious in less developed regions sparking the labour migration flows towards

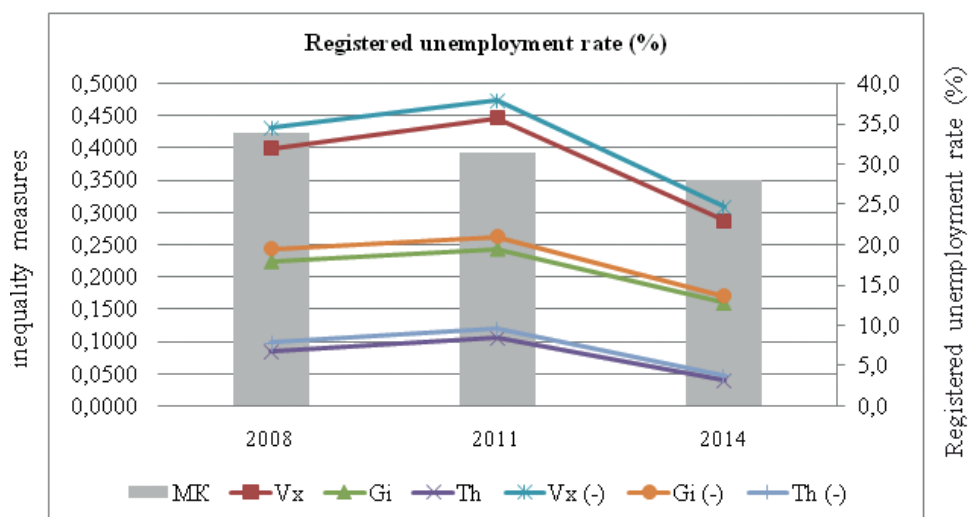


Fig. 3 Registered unemployment rate in Macedonian regions (including Skopje Region and excluding Skopje Region) in 2008, 2011, and 2014 (coefficient of variation, Gini coefficient of concentration, Theil index).

Source: Author chart based on data from Stat Statistical Office of the Republic of Macedonia.

Notes: MK = national average; Vx and Vx (-) = coefficient of variation calculated from the dataset including and excluding Skopje Region; Gi and Gi (-) = Gini coefficient of concentration calculated from the dataset including and excluding Skopje Region; Th and Th (-) = Theil index calculated from the dataset including and excluding Skopje Region.

more developed ones and, consequently, reducing the regional perspectives for more dynamic economic growth. At the same time, one may note a higher concentration of poor population in less developed regions with certain implications in terms of social exclusion (Rocheska, Angeleski, Milevska, Kostoska, 2014: 71–72). Also, some unemployed move out of the region, mostly the young and educated labour force. Emigration of the educated young labour force causes a structural lack of qualified labour. Thus, the region can attract only enterprises with low innovation levels.

Generally, the indicator of registered unemployment rate recorded minimal differences among inequality measures computed in two separate ways (including and excluding data of the Skopje Region). This means that the very high values of the registered unemployment rate in Skopje Region have no impact upon overall regional differentiation. Unlike, with measuring regional inequality by selected inequality measures based on the data excluding Skopje Region, it can be noted that regional inequalities are larger but insignificant (Table 1).

4.3 Gross fixed capital formation

Referring to the values of the inequality measures used, the highest interregional differences are in gross fixed capital formation. This fact is probably the result of the opposite values of gross fixed capital formation: very high values in the Skopje Region, and very low values in the other 7 regions (Table 2). Average by gross fixed capital formation constantly increased between the monitored years in the Republic of Macedonia (national average increased by 26.4% between 2008 and 2011, and by 13.1% between 2011 and 2014).

The highest value of gross fixed capital formation during this period is present in the Skopje Region, which has 4.6 times higher value than the national average. The other regions have a value below the national average. In the monitored period, the highest growth rate of gross fixed capital formation was recorded in the Southwest Region (145.5%). Also, the high growth rate of this indicator was registered in Southeast Region (87.2%), East Region (83.1%), Vardar Region (65.3%), Pelagonia Region (40.0%) and Skopje Region (32.5%). The smallest growth rate was recorded in the Polog Region (6.3%) and Northeast Region (17.6%).

One of the main reasons of regional differences is the sector structure of the gross fixed capital formation. Observed by sectors of activity by regions, in all sectors, except Agriculture, the Skopje Region had the highest share. For example, the sector Construction had the highest share (35.4%) in total gross fixed capital formation or 51.1% share on national level. In the monitored period, the sector Construction is the driving force of economic growth in the Skopje Region. This was a consequence of a stable real estate market, as well as projects for infrastructure investments, especially in the urban project ‘Skopje 2014’, which had a significant contribution to increasing the capacities in the construction sector.

Table 2 illustrates the regional differentiation of gross fixed capital formation in the Republic of Macedonia. This differentiation is generally great, as shown by the high values of inequality measures. The size of interregional differences in gross fixed capital formation was nearly the same in all monitored years, but with a minimum reduction in the last analyzed year as confirmed by individual inequality measures

Tab. 2 Regional differences in gross fixed capital formation and entrepreneurial activity in Macedonian regions.

Region	Gross fixed capital formation (MKD)			Entrepreneurial activity (%)		
	2008	2011	2014	2008	2011	2014
East	5.558	5.070	10.175	29.40	32.58	31.94
Northeast	2.163	1.353	2.543	21.18	24.41	23.63
Pelagonia	5.950	5.765	8.329	32.03	35.56	35.06
Polog	6.637	7.708	7.058	19.35	22.47	22.96
Skopje	54.082	74.086	71.681	39.93	46.37	43.59
Southeast	3.708	5.355	6.940	31.93	36.10	34.40
Southwest	3.859	4.241	9.473	29.19	33.34	32.33
Vardar	4.445	5.642	7.350	31.37	38.08	35.47
Dataset including Skopje Region						
Vx	1.5197	1.6775	1.3833	0.2078	0.2111	0.1926
Gi	0.5577	0.6053	0.5143	0.1112	0.1155	0.1036
Th	0.7094	0.8499	0.6062	0.0222	0.0227	0.0189
Dataset excluding Skopje Region						
Vx	0.3084	0.3559	0.3094	0.1760	0.1750	0.1596
Gi	0.1733	0.1846	0.1610	0.0907	0.0940	0.0832
Th	0.0506	0.0761	0.0569	0.0164	0.0161	0.0134

Source: Computed by author based on data from Stat Statistical Office of the Republic of Macedonia.

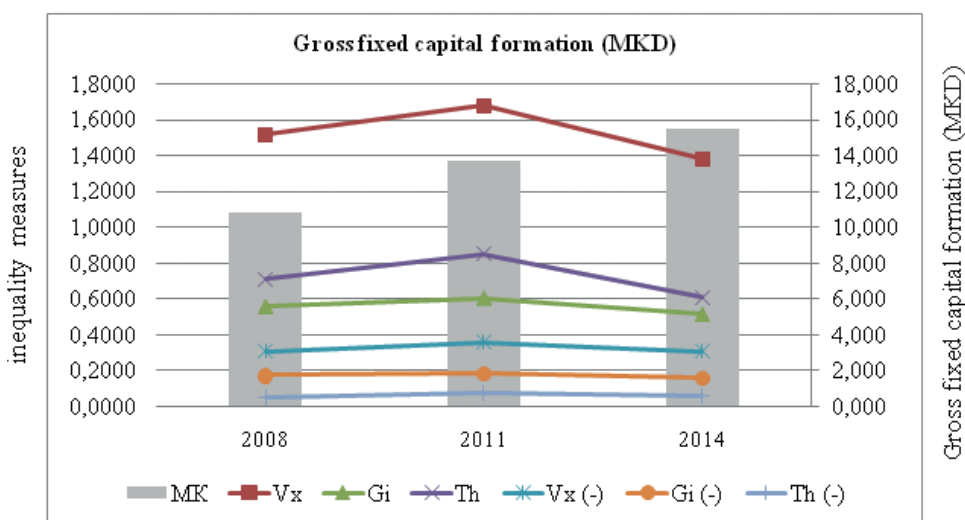


Fig. 4 Gross fixed capital formation in Macedonian regions (including Skopje Region and excluding Skopje Region) in 2008, 2011, and 2014 (coefficient of variation, Gini coefficient of concentration, Theil index).

Source: Author chart based on data from Stat Statistical Office of the Republic of Macedonia

Notes: MK = national average; Vx and Vx (-) = coefficient of variation calculated from the dataset including and excluding Skopje Region; Gi and Gi (-) = Gini coefficient of concentration calculated from the dataset including and excluding Skopje Region; Th and Th (-) = Theil index calculated from the dataset including and excluding Skopje Region.

(Figure 4). On the other hand, there is a considerable difference between the inequality measures of gross fixed capital formation computed with and without the Skopje Region. The high value of gross fixed capital formation in Skopje Region distorts the results. Thus the inequality measures of Macedonian regions without Skopje Region are actually by 4.9 times (2008), 4.7 times (2011) and 4.5 times (2014) lower values of the coefficient of variation; 3.2 times (2008), 3.3 times (2011) and 3.2 times (2014) lower values of the Gini

coefficient of concentration; 14.0 times (2008), 11.2 times (2011) and 10.7 times (2014) lower values of the theil index in comparison with values of these inequality measures based on dataset including Skopje Region (Table 2).

4.4 Entrepreneurial activity

The indicator of entrepreneurial activity, demonstrated an increase in the monitored period (10.7%). The highest increase of entrepreneurial activity

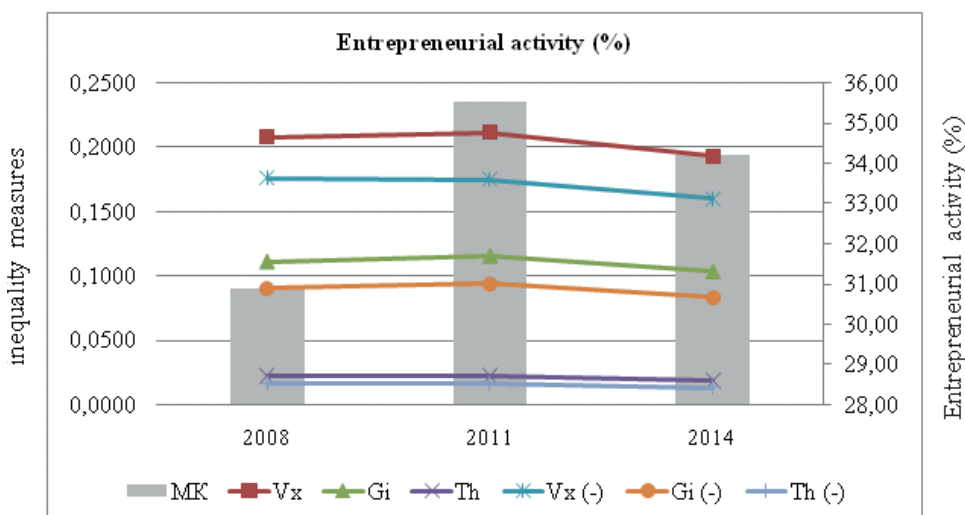


Fig. 5 Entrepreneurial activity in Macedonian regions (including Skopje Region and excluding Skopje Region) in 2008, 2011, and 2014 (coefficient of variation, Gini coefficient of concentration, Theil index).

Source: Author chart based on data from Stat Statistical Office of the Republic of Macedonia.

Notes: MK = national average; Vx and Vx (-) = coefficient of variation calculated from the dataset including and excluding Skopje Region; Gi and Gi (-) = Gini coefficient of concentration calculated from the dataset including and excluding Skopje Region; Th and Th (-) = Theil index calculated from the dataset including and excluding Skopje Region.

was reported in the Polog Region (18.7%), followed by Vardar Region (13.1%). Conversely, the lowest increase of entrepreneurial activity was experienced in the Southeast Region (7.7%), followed by East Region (8.6%).

In all monitored years, entrepreneurial activity reached the highest values in Skopje Region. This region is traditionally most attractive in terms of businesses. For example, in 2014, the data on the structure of enterprise births by regions show that the highest share of 37.1% belongs to the Skopje Region, while the Northeast Region had the lowest share of 5.6%. Also, the data on the structure of active business entities by regions show that the highest share of 38.0% belongs to the Skopje Region, while the Northeast Region had the lowest share of 5.9%. Simultaneously, 1/3 of the population of the country lives in Skopje. On the high values of entrepreneurial activity in Skopje may be influenced by the fact that a considerable part of companies operating in other regions in the country have their headquarters registered in Skopje.

The Polog Region reached the highest growth rate of entrepreneurial activity in the monitored period. This fact is quite surprising with regard to the lowest values of GDP per capita in this region. High values of entrepreneurial activity can be caused by developed trade enterprises, catering business entities, construction business and real estate activities. For example, in 2014, the data on the structure of enterprise births by regions show that the second highest share of 12.9% belongs to the Polog Region. Conversely, the low value of entrepreneurial activity is found in the Northeast Region, which corresponds to the low GDP in the region.

The impact of the development of entrepreneurial activity on the level of regional differences is presented by the values of inequality measures (Table 2). It can be observed that these measures achieved relatively the lowest level of interregional differences within the monitored indicators. However, the size of interregional inequalities of entrepreneurial activity is statistically insignificant especially with regard to the low values of the Gini coefficient of concentration and the Theil index. Generally, there are no important trends indicated in the development of these differences, except in the insignificant reduced values between 2011 and 2014 (Figure 5).

The comparison of values of individual inequality measures computed by including and excluding data for the Skopje Region, shows the impact of entrepreneurial activity in the Skopje Region on the overall size of regional differentiation. It should be noted that in the monitored period (2008–2014), the values of inequality measures based on the dataset including and excluding Skopje Region, are reduced. However, these inequalities can be considered as flat (Figure 5).

5. The government’s role in regional development

As a result of the problems arising from unequal regional development in Macedonia, it started legally and institutionally to be regulated by the Law on Balanced Regional Development (Official Gazette no. 63/2007) and the Strategy for Regional Development of the Republic of Macedonia 2009–2019. The Law stipulates the establishment of the planning regions which corresponds to the regionite of the NUTS 3

nomenclature and the realization of the measures and instruments for the improvement of the development. In accordance with the Law, the planning regions are the basic territorial units for development in the Strategy for Regional Development. The Law on Regional Development stipulates the objectives of the regional development policy in the Republic of Macedonia, such as: balanced and sustainable development based on the model of polycentric development; reducing disparities between regions; increasing competitiveness and developing the special identity of the regions; revitalization of villages and development of areas with specific development needs; support to inter-municipal and cross-border cooperation. Based on these purposes, in the Strategy are defined the strategic purposes and priorities of the policy for stimulating the balanced regional development of the Republic of Macedonia for the period 2009–2019. Also, an attempt has been made to closely align the Strategic objectives of the Strategy for Regional Development with the priorities of the EU's economic and social cohesion policy. The Strategy is a national strategic document that is primarily intended for the Government and the Ministry of Local Self-Government, which is responsible for the management and implementation of the regional development policy. As a separate entity within the Ministry of Local Self-Government, the Bureau for Regional Development has the role of the main operational unit in the policy implementation.

The realization of the purposes provided in the Strategy for Regional Development of the Republic of Macedonia is related to significant financial resources. In accordance with the Law on Balanced Regional Development, as sources of financing of regional development are: the Budget of the Republic of Macedonia; the budgets of the units of local self-government; available EU funds; other international sources; donations and sponsorships from individuals and legal entities and other means determined by Law.

One of the Government's role is to divide funds for financing, which is an important precondition for implementing the model of polycentric regional development. Thus, almost all regions are envisaged to receive twice as many funds compared to the Skopje Region for which 6.4% of the total available funds will be allocated. These funds are provided by the Government from the Budget of the Republic of Macedonia (Assembly of the Republic of Macedonia, 2009). Thus, from the aspect of regional development, it is very important to ensure greater acceleration of economic growth in the less developed planning regions, which is directly conditioned by the dispersion of investments by regions.

The Law stipulates for the stimulation of balanced regional development from the Budget of the Republic of Macedonia annually allocating funds for at least 1% of GDP. These funds further need to be allocated to 70% financing of projects about the development

of the planned regions, 20% for financing projects for the development of areas with specific developmental needs and 10% for financing projects for the development of villages. For example, in 2009, in the Budget of the Republic of Macedonia, 4,568 million MKD was planned to support regional development, which represents 1.15% of the GDP. Later, in 2010, 6,308 million MKD were provided for regional development, which represents 1.53% of the GDP.

Finally, the monitoring of the implementation of the Strategy for Regional Development is under the authority of the Government of the Republic of Macedonia through an annual report on the implementation of the Action Plan of the Strategy.

6. Conclusion, recommendations, limitations and future research

The paper studies the size and the development of interregional inequalities in the Republic of Macedonia by selected socioeconomic indicators in 2008, 2011 and 2014. Because of the highly limited availability of data, NUTS 3 regions were chosen as territorial units for this analysis. The interregional inequalities were computed from the dataset including the data of the Skopje Region and the dataset excluding Skopje Region. That allowed to show the expected discrepancy caused by the high values of selected indicators of Skopje Region. Three different statistical measures of variability were used for the assessment of interregional inequalities (the coefficient of variation, Gini coefficient of concentration, and Theil index).

The results show that the interregional inequalities in monitored indicators are small, especially in the set of regions excluding Skopje Region. In this case, the highest values of inequality measures were recognized in the indicator of registered unemployment rate computed by the coefficient of variation (0.4457 in 2011), Gini coefficient of concentration (0.2426 in 2011) and Theil index (0.1055 in 2011). The interregional inequalities based on the dataset including Skopje Region achieved values several times higher; however, the values were still relatively low in some inequality measures. In this case, the highest values of the coefficient of variation were recognized in the indicator of the gross fixed capital formation (1.6775 in 2011), the Gini coefficient of concentration (0.6053 in 2011) and Theil index (0.8499 in 2011). It should be noted that the values of the Theil index were lower than 0.1060 for all indicators in all selected years, except for the indicator of the gross fixed capital formation based on the set of regions including Skopje Region. These results indicate show that significant cause of inequalities at the level of NUTS 3 regions are the high values of the Skopje Region in all monitored indicators as expected.

The comparison of inequality measures between the individual indicators reveals some inequalities

where the relatively highest values were found in the gross fixed capital formation and GDP per capita. The other indicators (registered unemployment rate and entrepreneurial activity) shows smaller interregional inequalities, which are however statistically insignificant. Furthermore, it was revealed that the Theil index reports the lower level of inequality for all selected indicators in comparison with the other measures, especially in dataset excluding Skopje Region. On the other hand, it was found that the coefficient of variation reports the higher level of inequality for all selected indicators in comparison with the other measures.

Generally, the size of interregional inequalities in the monitored socioeconomic indicators did not change significantly in the selected years, ie there is no clear trend in the development of interregional inequalities. Thus, the results did not confirm the expected impacts in the Republic of Macedonia after granting candidate status for membership in the European Union, during the beginning of the global economic crisis and period after that, in terms of greater reduction of regional differences.

Supporting the current regional development requires government intervention in a number of ways, particularly by facilitating systematic change and by fostering the less developed regions. As priority measures to cut inequalities at the regional level, I emphasize: demographic revitalization of the less developed regions, raising the level of social development, enhancing the economic growth and more uniform dispersion of investments and employees between regions, the development of the modern infrastructure, an improvement on the technical and technological basis for supporting the industries and utilizing the creative potential, valorization of the level of human assets, the creation of competitive advantages of the regions, an responsible use and valorization of the natural resources and the energetic potentials, the development and support of underdeveloped areas and areas with specific developmental needs, development of the cross-border cooperation of regions and so on.

Due to the limited size of this paper, research was limited to four socioeconomic indicators that can also serve as productive starting points for future research. Thus, the future research could be enhanced by the addition of more socioeconomic indicators to better assess and further identify regional inequalities. Also, future research could employ multiple inequality measures and theories relevant to find the interregional inequalities. It would be more effective to analyze regional inequalities at the level of lower administrative units, where higher regional inequalities can be expected. However, in these conditions, this is limited by the non-availability of data for lower administrative units. Thus, the future research could focus on increasing the number of administrative units (NUTS level 4), where higher regional inequalities can be expected. Overall, the research paper

generated useful findings and points to valuable directions for further research.

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