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REGIONAL DIFFERENCES IN THE POPULATION NATURAL INCREASE IN THE REPUBLIC OF MACEDONIA

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Abstract: The vital statistic data analyses indicate major changes in the components of the natural increase of the population in Macedonia. The trend of decreasing number of births and increased number of deaths led to a reduction in the natural population increase rate that in 2013 reached the value of 1.9%. At the beginning of the 21st century there are obvious differences in the values of the natural population increase in demographic and spatial aspect. Particular attention is given to the differences in the level of the population natural increase among municipalities² and regions in the Republic of Macedonia. These problems come as a result of the impact of the social and economic transformations. This is the case of large part municipalities in Macedonia, which means that these municipalities are characterized by a negative population natural increase. At the same time, this leaves demographic, social and economic consequences to their development, followed by numerous problems. The main aim of this research is to determine the regional differences in the positive component of the population natural increase, i.e. crude birth rate, TFR and the natural increase rate and to identify the regions in the Republic of Macedonia that are highly disadvantaged.

Key words: population, natural increase, birth rate, total fertility rate, Republic of Macedonia

Introduction

This paper elaborates the issue of the population natural increase in the Republic of Macedonia at the beginning of the 21st century. The idea of this paper is to contribute a better understanding of the differences that can be noted while analyzing the natural population increase rate and the total fertility rate.

What characterizes this analyzed period (2002–2013), in the Republic of Macedonia, the most, is the constant decrease in the number of births (in 2002,

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² Due to the lack of information on the population natural growth at the regional level, before the implementation of the Nomenclature of Units for Territorial Statistics for the Republic of Macedonia, NUTS 3 classification in 2004 (Republic of Macedonia State Statistical Office, 2008), municipalities have been grouped by region, in order to obtain the necessary values.

the number of births was 24,154 while in 2013 it was 23,138)³ and the increase in the number of deaths (in 2002, the number of deaths was 17,866, while in 2013 it was 19,208)³. In the Republic of Macedonia, the value of the total fertility rate (1.50) reached in 2013, is far below the level necessary for simple replacement of generations. The main goal of the research is to perceive the differences in the positive component of the population natural increase among regions, to identify the trends in the development and to put them into the function of creating policies that will lead to the improvement of the overall demographic situation.

Previous research

The study of the population natural increase, the changes and differences that are manifested among regions are based on population natural change data, published by the Republic of Macedonia State Statistical Office, in the regular, annual publications titled “Natural population change” and on the previous research referring this issue. The census and vital statistics enable monitoring and comparison of the demographic process dynamics at different territorial levels and different time periods.

There are numerous studies in the national literature treating the differences in the population natural increase in many aspects. We can highlight the research carried out by Panov, mainly about the demographic changes between areas of depopulation and immigration (1976), Daskalovski, for the population natural growth, as a component of the population change (1978, 1984, 1995), Madjevikj (2005), about fertility, mortality and population natural increase (2000–2005), Dragovich, about the factors of lowering fertility in the Republic of Macedonia (2009), Jovanović, about fertility and family planning, (1985), Risteski, about the reasons for the regional differences in fertility values (2011 and 2015) and others.

Methodology

This paper analyses the period 2002–2013, where through appropriate indicators such as the total fertility rate, the crude birth rate and the population natural increase rate is pointed out the seriousness of the level that the component of the population natural increase has reached and the differences that are observed from a territorial point of view.

³ Republic of Macedonia State Statistical Office. Natural population change (2003–2014), 2002 and 2013

In this paper the accent is put on the positive component of the population natural increase because these values vary more on a regional level, as a result of the various reproduction models which appear as a consequence of the different cultural, religious, educational, social and other characteristics of the population and also the population age structure.

Through the application of appropriate mathematical and statistical methods, the values of the indicators needed were obtained, i.e. the crude birth rate, total fertility rate and the natural increase of the population. The calculations treating fertility and natural increase are based on the official published data from the vital statistics. For the population number ending with 2002, data were used by the publications from the censuses conducted so far. For the last analyzed year, the population estimates for June 30, 2013 are considered just in order to coincide with the time when the last census was conducted, June 2002. The analysis refers to the eight statistical regions in the Republic of Macedonia, i.e. the NUTS level 3, according the Nomenclature of Territorial Units for Statistics in the Republic of Macedonia.

Results and discussion

As a result of the previous demographic development, especially with the population natural changes influenced by various social and economic factors, in the Republic of Macedonia, the total number of the population in the last intercensus period 1994–2002 marked an increase of 3.90%. The average increase rate was 0.48% (Risteski, 2011).

Table 1. Population in the Republic of Macedonia in the Census years, 1994 and 2002 (by regions)

	1994	2002	Index
Regions	Population	Population	1994=100
Macedonia	1,945,932	2,022,547	103.94
Vardar	131,035	154,535	117.93
East	201,525	181,858	90.24
Southwest	212,874	221,546	104.07
Southeast	168,481	171,416	101.74
Pelagonia	242,596	238,136	98.16
Polog	280,352	304,125	108.48
Northeast	163,841	172,787	105.46
Skopje	545,228	578,144	106.04

Source: Republic of Macedonia State Statistical Office (1996; 2004) and own calculations

In the period 2002–2013, the number of the population increased by 2.05%. The average increase rate was even lower and amounted 0.18% (Risteski, 2015). This change was followed by the differences in the population distribution and a

clear determination of areas with a high concentration of population and other with depopulation.

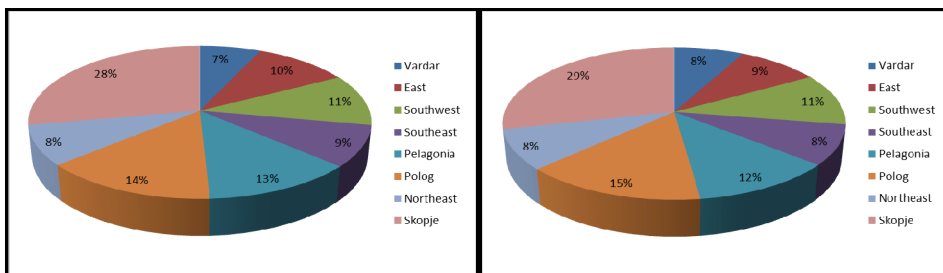


Figure 1a/b. Share of the population in 1994 and in 2002 (by regions)

The differences in the territorial distribution of the population are obvious and the tendency of the agglomeration of population is mainly focused in the Skopje Region. That marks a positive population dynamics of even 6.0% in the period 1994–2002. This region has the highest share of the total population number (28.2%) and it is also characterized by the highest population density (319 inhabitants/km²). Other regions participated with a smaller share in the total number of the population and had slower dynamics in the changes of the population number and a lower population density (Table 1 and Table 2).

Table 2. The population density in the Republic of Macedonia, 1994 and 2002 (by regions)

Regions	Area/km ²	%	1994	2002
			Inhabitants/km ²	Inhabitants/km ²
Macedonia	25,713	100.0	76.0	78.6
Vardar	4,042	16.2	32.4	38.2
East	3,537	14.2	57.0	51.4
Southwest	3,340	13.4	63.7	66.3
Southeast	2,739	11.0	61.5	62.6
Pelagonia	4,717	18.9	51.4	50.5
Polog	2,416	9.7	116.0	125.9
Northeast	2,310	9.3	70.9	74.8
Skopje	1,812	7.3	300.9	319.0

Source: Republic of Macedonia State Statistical Office (1996; 2004; 2015) and own calculations

The presented spatial distribution of the population is connected to the previous demographic trends, the demographic structure, and the overall situation in the country, the conditions for development and many other factors.

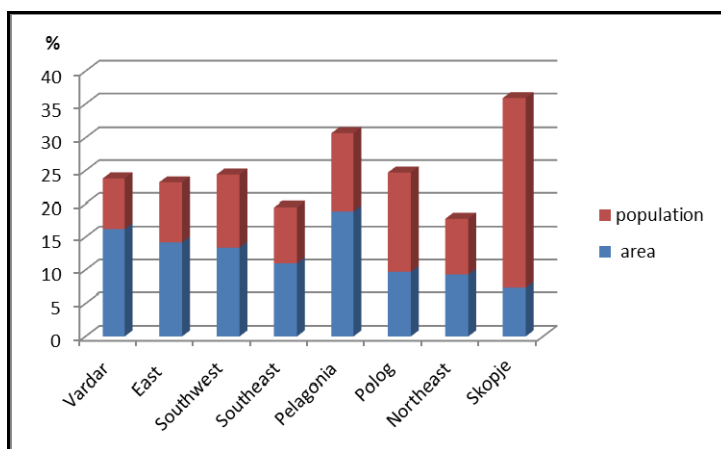


Figure 2. Share of the area and the population in 2002 (by regions)

One of the characteristics of the population in the Republic of Macedonia is the continued decrease in the number of births, expressed in absolute and relative terms. Compared to other Balkan countries, the birth rate in the Republic of Macedonia in the whole analyzed period is lower only than the birth rate in Albania (12.88‰) and Montenegro (11.62‰) (Table 3).

Table 3. The crude birth rate in the Balkan countries (in‰), for the period 2002–2013

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Albania	17.18	16.19	15.29	14.47	13.79	13.25	12.88	12.67	12.61	12.65	12.76	12.88
B & H	9.14	8.75	8.48	8.34	8.31	8.34	8.42	8.51	8.61	8.72	8.83	8.96
Bulgaria	8.50	8.60	9.00	9.20	9.60	10.00	10.40	10.90	10.20	9.60	9.50	9.20
Greece	9.40	9.50	9.60	9.70	10.10	10.00	10.60	10.50	10.30	9.60	9.00	8.50
Serbia	10.40	10.60	10.50	9.70	9.58	9.22	9.40	9.60	9.40	9.10	9.30	9.20
Croatia	9.00	8.90	9.10	9.56	9.33	9.40	9.90	10.10	9.80	9.60	9.80	9.40
Montenegro	13.11	12.99	12.88	12.76	12.63	12.50	12.36	12.21	12.06	11.90	11.75	11.62
Romania	9.70	9.80	10.10	10.40	10.40	10.30	10.80	10.90	10.50	9.70	10.00	8.80
Macedonia	11.99	11.76	11.57	11.42	11.29	11.19	11.10	11.02	10.94	10.86	10.77	10.69

Source: World Bank (2014)

The declining birth rate at a national level, which started during the second half of the twentieth century, continues till nowadays, (Table 4) (The number of live births, in the period 1948–2002 marks a declining trend, with an exception of the intercensus periods 1948–1953 and 1961–1971).

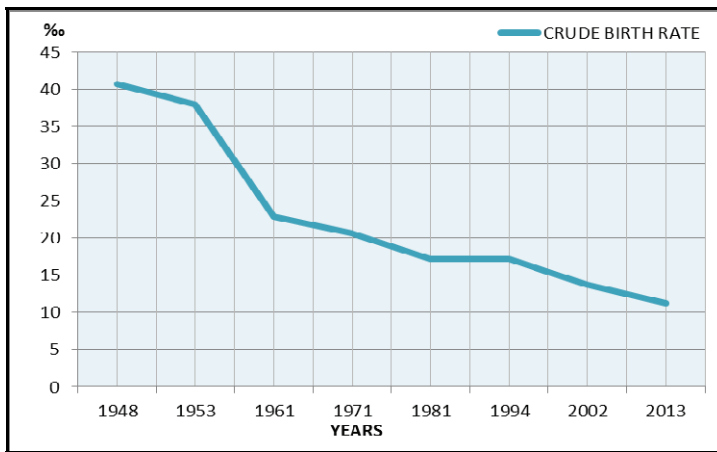


Figure 3. Crude birth rate the Republic of Macedonia in the period 1948–2002 (Source: Republic of Macedonia State Statistical Office 1995–2002; 2003–2014)

The number of live births in the period 1948–2002 dropped by 19,591, while the crude birth rate marks a constant declining trend in the whole-time (Stojmilov & Apostolovska Toshevska, 2016). This trend also continues in 2013 (Figure 4).

The changes in the natural increase of the population in large part determined the demographic situation, the guidelines on the dynamics in the number of population and its structure in certain regions, and of course, their future demographic and overall development.

Table 4. Crude birth rate in the Republic of Macedonia (in ‰), for the period 2002–2013

Regions	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Macedonia	11.9	11.6	11.5	11.0	11.1	11.1	11.2	11.5	11.8	11.1	11.4	11.2
Vardar	10.9	10.6	11.2	10.1	10.1	10.5	10.8	11.0	11.2	10.1	11.3	10.4
East	10.2	9.9	9.7	8.9	9.3	9.1	9.2	10.0	9.9	8.7	9.3	8.6
Southwest	10.6	10.8	10.3	9.9	10.2	9.8	10.0	9.6	10.2	9.9	10.0	9.6
Southeast	11.8	11.6	11.5	10.6	10.3	10.8	11.6	11.7	11.9	10.4	11.5	11.1
Pelagonia	10.1	10.0	10.0	10.1	10.3	10.1	10.4	11.2	10.8	9.9	10.1	9.7
Polog	12.6	12.3	12.2	11.7	11.0	11.6	11.0	11.3	11.7	11.4	11.2	11.5
Northeast	13.3	13.2	12.7	11.6	11.5	11.4	11.2	11.8	12.2	11.1	11.9	11.4
Skopje	13.4	12.7	12.5	12.4	12.6	12.4	12.7	13.1	13.5	12.9	13.1	13.2

Source: Republic of Macedonia State Statistical Office (2013–2014)

With highest values of the crude birth rate stands out the Skopje Region (13.20‰), then comes the Polog Region (11.50‰) and the Northeast Region (11.40‰), while Pelagonia (9.70‰) and the Eastern Region (8.60‰) are the most disadvantaged.

The reduction in the number of births in the Republic of Macedonia also means a decline in the total fertility rate. The once high value ranging even more than 3.5 children per woman in the seventies of the last century, in the last twenty years, it has not reached any value that can provide a simple replacement of the population of 2.1 children per woman. Such has been the situation on a national level since 1994, but also on a regional level, because in none of the regions, the numbers do not exceed the above mentioned critical value (Table 4).

Compared to other Balkan countries, the total fertility rate in the Republic of Macedonia in the whole analyzed period is also lower only than the total fertility rate of Albania (1.77) and Montenegro (1.67) (Table 5).

Table 5. The total fertility rate in the Balkan countries, for the period 2000–2013

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Albania	2.19	2.09	2.00	1.92	1.85	1.79	1.76	1.74	1.74	1.75	1.76	1.77
B & H	1.27	1.23	1.21	1.19	1.19	1.21	1.22	1.23	1.24	1.25	1.27	1.28
Bulgaria	1.21	1.23	1.29	1.32	1.38	1.49	1.56	1.66	1.57	1.51	1.50	1.50
Greece	1.27	1.28	1.30	1.32	1.40	1.38	1.47	1.49	1.51	1.39	1.34	1.29
Serbia	1.57	1.59	1.57	1.45	1.43	1.38	1.40	1.44	1.40	1.40	1.45	1.45
Croatia	1.42	1.41	1.43	1.50	1.47	1.48	1.55	1.58	1.55	1.48	1.51	1.51
Montenegro	1.79	1.78	1.77	1.76	1.74	1.73	1.72	1.71	1.69	1.69	1.68	1.67
Romania	1.27	1.31	1.35	1.39	1.40	1.42	1.53	1.57	1.54	1.46	1.53	1.53
Macedonia	1.59	1.57	1.54	1.52	1.50	1.49	1.47	1.46	1.45	1.44	1.44	1.43

Source: World Bank (2014)

The total fertility rate in the Republic of Macedonia marks a constant decrease and since the last census conducted in 2002, this value is constantly below the critical value.

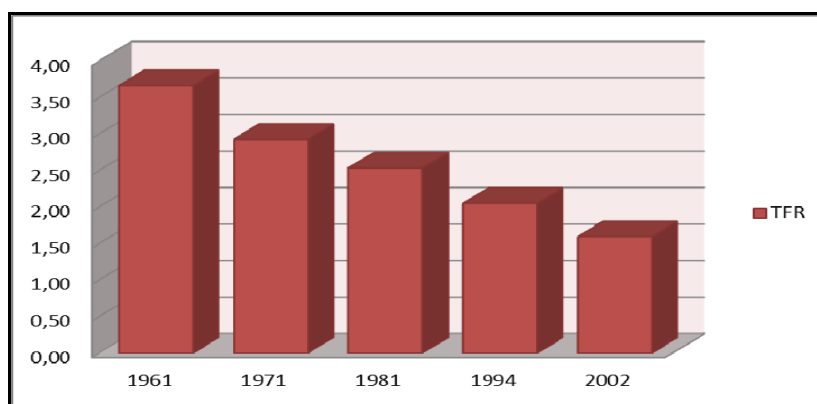


Figure 4. Total fertility rates in the Republic of Macedonia, in the period 1961–2002

The data analysis indicates that till 2004, the Northeast Region was emphasized by the highest total fertility rate values (the average number of children per woman in 2002 was 1.78 and in 2004 was 1.71), then, due to the continuously highest total fertility rate, a positive change in the population number was recorded in the Skopje Region, which is however, not sufficient for the biological replacement of the population. The dynamics in the changes of the fertility values were different, so, the Polog Region and the Northeast Region have an emphasized decline in the total fertility rate. In the period 2002–2013, the total fertility rate values in the Northeast Region dropped by 16.7%, (1.50) and 18.8% in the Polog Region (1.30). The lowest rates are inherent in the East (1.20) and the Southwest Region (1.20), where the total fertility rate decreased by 14.3%. The total fertility rate value of the Southeast Region (1.50) is close to the national average value (1.52) (Table 5).

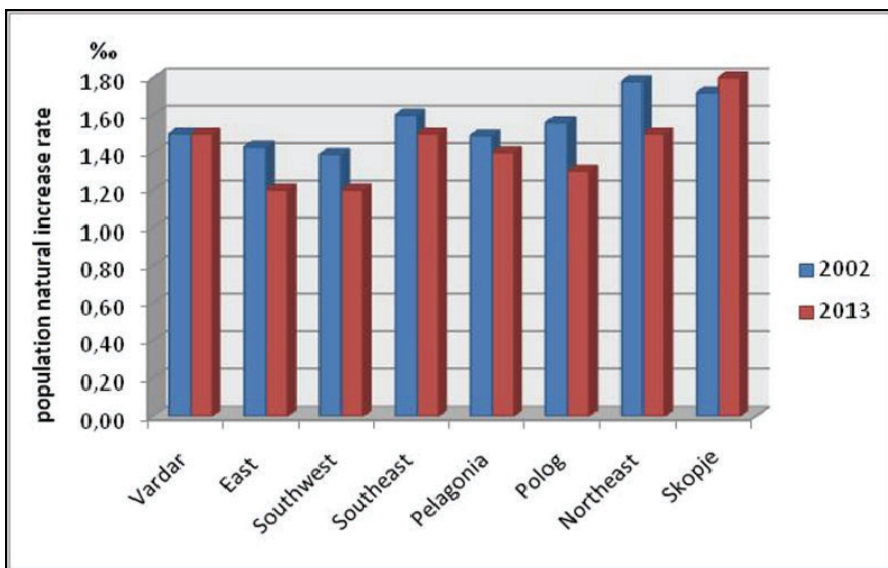


Figure 5. Population natural increase rate in the Republic of Macedonia, for the period 2002–2013 (by regions) (Source: Republic of Macedonia State Statistical Office (2013–2014) and own calculations)

In a demographic point of view, the value of the fertility level is determined by several different factors. The differences in the fertility level in the regions are mainly a consequence of the differences expressed in the bio-demographic structure of the population, but also in the intensity and direction of the natural and mechanical movement. Among all those general influences, one of the most important is the changed attitude of the population when it comes to their own reproduction, or changing the evaluation about the number of children in the

family, which is again a consequence of the overall social development, directly connected to the process of industrialization and urbanization (Jovanović, 1985).

In circumstances of declining number of births, a large number of live births abroad and other factors, some of the regions that were characterized by high total fertility rates in the past, now are facing lower total fertility rates as is the case of the Polog Region (1.30) and the Southwest Region (1.20). These regional differences are mainly due to the model of high fertility and extended reproduction, present among Albanian, Roma and Muslim population, and the model of low fertility and lack of reproduction, present among the Macedonians and other nationalities. Such contrasts of the natural movement of the population formed the analog spatial demographic imbalance (Devedžić & Mucić, 2011).

In the context of analyzing the reduced number of births, followed by an increase in the crude mortality rate it is necessary to analyze the population natural increase. The Republic of Macedonia is facing a permanent decline in the population natural increase, which in the past period was characterized by high values ranging from 26.3‰ in 1948, to 15.0‰ and even 20.0‰ in the late seventies of the last century. In the last decade of the twentieth century, the population natural increase is lower than 10.0‰, at the same time changes in the population are closely related to the overall process of transformation (Madjevikj, 2000). Today, the Republic of Macedonia is among the countries with low population natural increase values. In the period 2002–2013 it was realized a total population natural increase of 53,052 persons, or 4,421 persons per year, on average, which is seven times the lower value compared to the period just after the World War II (Table 6).

Table 6. Population natural increase in the Republic of Macedonia, in the census years and 2013⁴

Year	Population natural increase		Index 1948=100
	Total	Per 1000 inhabitants	
1948	30,588	26.3	100.0
1953	30,353	23.1	99.2
1961	29,041	20.6	94.9
1971	25,457	15.4	83.2
1981	26,105	13.6	85.3
1994	17,716	9.1	57.9
2002	9,799	4.8	32.0
2013	3,930	1.9	12.8

Source: Republic of Macedonia State Statistical Office (1995–2002; 2014)

⁴ Because the Census of the population that should have been conducted in 2011 was not realized, in the analysis was used data from the publication Estimations of the Population by Sex and Age, by Municipalities and by Statistical Regions, 30.06.2013 and 31.12.2013 by the Republic of Macedonia State Statistical Office.

The realized population natural increase has a different territorial distribution, so, in spatial terms, due to the differences that exist among regions in the demographic structure of the population, the level of socio-economic development and other, the changes and significant differences in the values of the population natural increase, on a regional level are more than obvious (Figure 6).

The participation of the Skopje Region that in 2013 amounted 71.30%, dominates in the total realized population natural increase. In all other regions, not only that can be marked a smaller percentage share in the population natural increase, but a decline is also marked in 2013 compared to 2002.

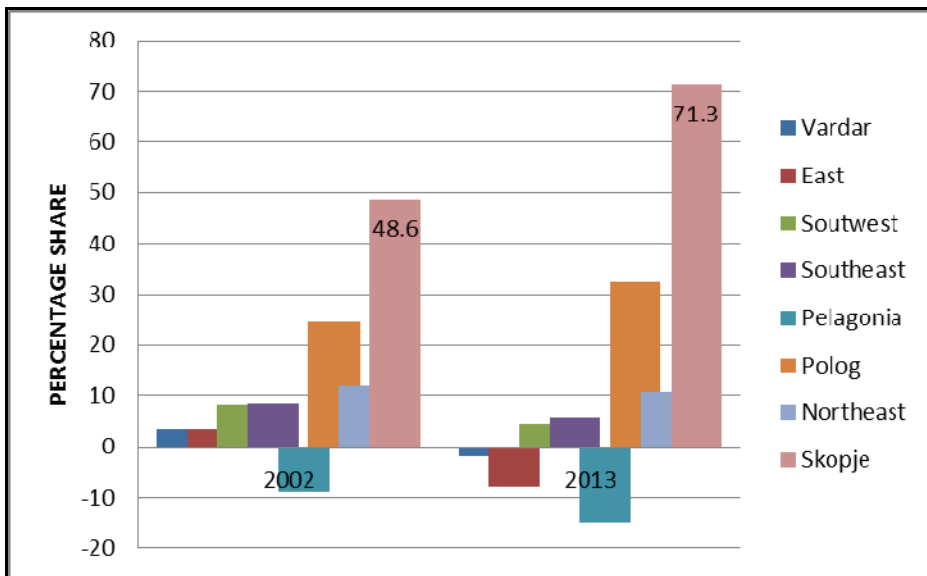


Figure 6. Population natural increase in the Republic of Macedonia, in 2002 and 2013 (by regions) (Source: Republic of Macedonia State Statistical Office, 2013–2014)

During the above-mentioned period, in the East Region (the number of live births in 2013 was 1,540, while the number of deaths was 1,851) and Pelagonia Region (number of live births in 2013 was 2,246, while the number of deaths was 2,836)³, the number of deaths was higher than the number of live births that resulted in negative population natural increase rate. The situation with the population natural increase realized in each of the regions can be traced through the differences in the population natural increase rates. Basically, the regions have a low or negative population natural increase rate and in all regions, the reduced rates are present. Since 2005, there are no recorded rates higher than 5%. The negative population natural increase in the analyzed period was first

marked in the Pelagonia Region (-2.30‰ in 2002), and since 2005, this region is accompanied by the East Region, and a few years ago, by the Vardar Region, (Figure 6).

The low population natural increase values that the regions are facing come because of the increasingly smaller number of births and the increased crude population mortality rate. In 2002, the mortality rate in the Republic of Macedonia was 8.8‰, while in 2013 it reached the value of 9.3‰.³ The analysis of the population natural increase by municipalities shows that in more than half of the municipalities in the Republic of Macedonia a negative population natural increase was registered.³ At the very beginning, this phenomenon was recorded among municipalities characterized by small territory and a lower number of inhabitants. In the recent years, the negative population natural increase appears also in the major municipalities (Madjevikj, 2005).

The reasons for this unfavorable and alarming situation in terms of the population natural increase is located into the impact of many factors, as demographic, financial, economic, social and personal. Among regions, there are obvious economic differences that indirectly reflect the demographic processes. In economic terms, the Skopje Region is highlighted where in 2012 the highest GDP per capita (327 989 denars) was recorded with 42.8% in the total GDP of the Republic of Macedonia, while for example, the Northeast Region had the smallest share (5.5%).⁵

The negative trends in the natural increase of population reflected the population structure. The share of elderly groups is growing, which is not suitable for increasing of the population increase rate (Penjišević & Nikolović, 2011). The intensive process of demographic aging (the share of the population aged more than 65 years increased from 10.6% in 2002, to 12.2% in 2013), the emigration of the young working population that is in its optimal reproductive age, primarily towards the Skopje Region or abroad, the problems of unemployment, low living standards are just some of the reasons. The consequences of such a population change are enormous in terms of the demographic development, socio-economic processes and the network of settlements. The low fertility values directly reflected the dynamics of the population number, the territorial distribution of the population, its demographic structure, etc.

The present regional differences in demographic terms raise the issue of sustainability of the regions in terms of their population number, population

⁵ Republic of Macedonia State Statistical Office. Regions in the Republic of Macedonia, 2015

structure and its economic and social perspective. Especially serious is the situation in the regions where the demographic potential and the demographic development are already at risk, as well as the existence of particular settlements. The East Region stands out the most, because in the period 2002-2013, the total number of the population dropped by 11.2%, and the share of the population aged over 65 years, increased from 11.3% in 2002, to 13.5% in 2013.

Conclusion

The demographic development is taking place under the influence of general demographic rules and complex socio-economic factors. The Republic of Macedonia with a population of 2,022,547 inhabitants according to the 2002 Census is facing serious demographic processes as a result of the current development. The situation is particularly worrying when it comes to its biodynamic. The declining rates of the natural increase are one of the reasons that have led to changes in the number and territorial distribution of the population.

The participation of the Skopje Region by 28.60% in the total population number, dominates. A general feature for a long period is the reduced total fertility rate and the population natural increase and in this direction, there are differences between regions. For all the regions in the country, a common feature is having a total fertility rate that is below the value of 2.1 children per woman and does not allow biological replacement of generations in sufficient volume. The situation in three of eight regions is extremely worrying because of the presence of the negative population natural increase rate. The reasons for such a situation are complex, from demographic, economic, political, to cultural and health-related factors. Although the reasons have not been completely clarified, some of the reasons for the decreasing number of live births are the ageing of the fertile contingent, the rate of unemployment of women and their position in the family and society, the insufficient financial security, the small homes etc., which resulted in giving up on getting married and having children (Dragovich, 2009).

The detailed analysis of the components of the population natural increase, considering the demographic structure of the population and the socio-economic conditions in the Republic of Macedonia, allows anticipating of the future demographic trends. Basically, the unfavorable situation is apparent when it comes to the biological reproduction of the population. According to the medium scenario of the UN Department of Economic and Social Affairs, the total fertility rate of the population in the Republic of Macedonia, by the year

2050–2055 will account 1.85 children per woman, which is almost 23% higher than the one in 2013, (1.50), or an increase of 0.60% per year.

The occasional short-term improvements are not enough to change the situation seriously. At the national level, in conditions of low living standard, a greater increase in the total fertility rate can be hardly expected. Particularly alarming is the situation in the regions that are already facing a negative population natural increase. Many efforts should be made, at first, to reach a positive population natural increase value and of course, to retain those values. Complex measures should be implemented in order to support the population and family policies and to gain higher fertility rate values.

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