
ECONOMIC INEQUALITY IN BULGARIA IN THE 21ST CENTURY

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Abstract: Research of economic inequality underlies the design and implementation of an adequate economic or social policy. This paper presents a survey of income inequality in Bulgaria in the period from 2001 to 2015 by studying the dynamics of the Gini coefficient, the integral coefficient of uneven distribution and decile ratios. We prove that despite the increase registered in the values of these indices in some years, the trend towards decreasing inequality is still weak. We also establish that there was significant income polarisation measured through the S90/10 and the S80/20 decile ratios. We prove that it is necessary to study the relation between the growth rate of the median income received by households in the first six deciles and the income received by households in the last four deciles by employing the growth rates ratio.

Key words: economic inequality; measures of economic inequality; Gini coefficient; Lorenz curve; income differentiation; income polarisation.

JEL: E20, E29, I13.

Continuous technological advancements and investment in human capital have resulted in growing incomes and wealth. In many countries, however, the process has been accompanied by further widening of income gaps between different social groups. The onset of the new millennium marked the development of our country with several major events, two of them being Bulgaria's accession to the European Union and the global

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financial crisis with its impact and aftermath. Existing income inequality in the country was confirmed by the data we employed in our survey. As a EU member-state Bulgaria has to implement the Common European Policy on reducing excessive income inequality between different social groups and alleviate its impact on economic growth. It is therefore essential to identify the factors which lead to inequality and the effects they produce upon the economy, so as to apply adequate economic and social policies.

The **object** of our research was income inequality between different social groups. The **subject** of the research was economic inequality in the 21st century. We also compared the values of economic inequality measures which were registered in Bulgaria. The **objective** of the research was to study the dynamics of the indices employed to measure income differentiation and income polarization, as well as their underlying causes.

We defend the **thesis** that economic inequality occurs and can be measured based on the different incomes which households earn as a result of their engagement in the economic process and the social policy conducted by the government through social transfers.

1. Theoretical Concepts and Methods Employed

Economic inequality is an issue attracting the scholarly interest of both economists and social science researchers. They employ and focus on numerous methodological and empirical approaches. Two outstanding names in the field are Lorenz and Gini's since the methods and coefficients they proposed for measuring income inequality and income differentiation continue to be employed by scientists today (Forcina & Giorgi, 2005). There are some major differences in the approaches which Bulgarian scholars have applied to the issue of economic inequality since it is a complex phenomenon arising as a result of a number of factors. Hence, research workers deal with different interpretations of economic inequality, tend to research different historical periods and employ different scientific methods (Stoyanov, 2015).

Although there is some difference between the concepts of economic inequality and income inequality, income inequalities are subject to analysis when assessing the economic inequality between social groups. Historically, the major measure which has been employed to analyse economic inequality is Corrado Gini's coefficient which measures the unequal distribution of income within a group in terms of the deviation from a model of perfectly equal income distribution in which all members of the group have equal incomes (Giorgi, 2005).

Over the past years, attempts have been made to analyse economic inequalities over long periods of time and to compare economic inequalities in different countries. In their research, Wilkinson and Pickett, for example, (Wilkinson & Pickett, 2009) employed a regression analysis to clarify the relation between economic development and economic inequality and arrived at the conclusion that increased wealth and economic progress result in improved social indices.

The aftermath of the global financial crisis aroused intense scholarly interest in economic inequality and raised the issue of achieving social equality and justice. These were provoked by data published about the size of public wealth available to the most affluent social groups in advanced countries. This also resulted in the public discontent of other social groups and gave rise to pressure for establishing a new political model of a fairer distribution of public wealth.

The Lorenz curve is the graphical representation of unequal income distribution. The curve makes it possible to study the dynamics of the process of income distribution and the impact which an implemented tax policy has on income inequality. It presents graphically the degree to which real income distribution deviates from a (theoretically) perfect income distribution. Results are interpreted based on the distance between the line of perfect equality and the Lorenz curve – the smaller that distance, the more efficient the process of income redistribution among different social groups is, and vice versa. An insubstantial distance between the line of perfect equality and the Lorenz curve indicates that the implemented policy does not restrict income inequality within a society (Kirev, et al., 2010); (Hristov, 2013).

The major index employed to measure income inequality is the Gini coefficient. It was developed by the Italian statistician and sociologist Corrado Gini in 1912 to represent the deviation of income redistribution or consumption expenditure from a perfectly equal distribution (Giorgi, 2005). The Gini coefficient can range from 0 to 1. A Gini coefficient which is equal to 0 would indicate perfect income distribution, i.e. incomes are efficiently redistributed among social groups. A Gini coefficient which is equal to 1 would indicate that a single person receives the entire income.

The Gini coefficient is widely employed in the research of income inequality, while the findings of such studies are annually published by international institutions in order to analyse the economic and social policies which are conducted. Other measures employed when researching inequality include the Theil index, the Atkinson index and the integral coefficient of uneven distribution. The Theil index can range from 0 to $\log n$, yet its employment is more limited. The Atkinson index represents the intensity of inequality and can range from 0 to 1. These indices differ in terms of their

sensitivity to the different segments of distribution. The Theil index is more sensitive to lower income groups; the Gini coefficient is more sensitive to median income distribution, while the Atkinson index is more sensitive to the top sector of income distribution when the variable parameter is 0.5 (Tsanov & Bogdanov, 2012, p. 48). The integral inequality coefficient presents the level of income differentiation and can range from 0 to 1 (Gatev, 1995).

An essential element when studying economic inequality is the analysis of income polarization through deciles, i.e. the ratio between the income received in the lowest income decile, i.e. the 10% of households with the lowest income, and the income received in the highest income decile, i.e. the 10% of households with the highest income (S90/10) and the ratio between the mean incomes received by 20% of the poorest and 20% of the richest households (S80/20). The values obtained for those decile ratios indicate whether income polarization is deepening or decreasing.

The scope of our analysis may further be expanded by employing the Elteto and Frigyes indices. We employed two measures of the Elteto index (K_1 and K_2): we compute K_1 by dividing the average income of all households by the average income of households earning less than the median income and K_2 by dividing the average income of households earning more than the median income by the average income of households earning less than the median income. The Frigyes index is computed by dividing the average income of households with income above the median income by the average income of all households (Arnold, 2015); (Angelova, 2009); (Zhekova, 2012).

2. Empirical Analysis

In order to measure economic inequality in Bulgaria in the 21st century, we computed the Gini coefficient, the Atkinson index and the integral coefficient of uneven distribution, and plotted the Lorenz curve. Our research covered the period from 2001 to 2015 for which there are official statistics available. The statistical data we analysed were mainly provided in the findings of surveys of household budgets which were published by the National Statistical Institute in 'Household Budgets in the Republic of Bulgaria' (NSI, 2001 – 2015).

An approach which is predominantly employed when studying income and expenditure inequality is to compute the Gini coefficient and examine the dynamics of that coefficient. The values of the Gini coefficient over the period from 2001 to 2015 (Fig. 1) ranged from 0.25 to 0.3, which indicated a relatively low level of income differentiation.

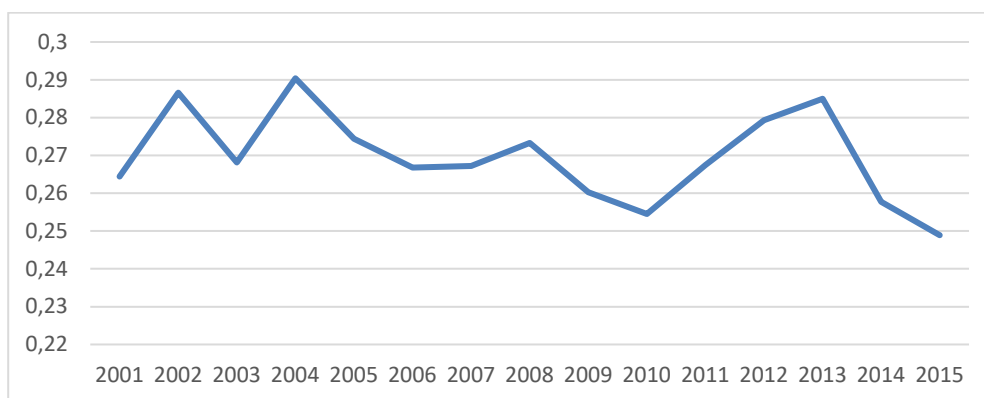


Figure 1. Dynamics of the Gini coefficient over the period from 2001 to 2015 ²

In 2001, the Gini coefficient was very close to the values registered over the previous few years, so there was no marked change in the index at the beginning of the 21st century.

Over the researched period, the highest value of the Gini coefficient was 0.2904 and was registered in 2004. In the period from 2004 to 2010 there was a steady decrease in income differentiation compared to the beginning of the period. The rate of economic growth was high until 2008, yet it dropped dramatically in 2009 with the onset of the economic crisis.

The Gini coefficient went up from 2011 till 2013, which indicated growing income differentiation. In 2014 and 2015, the impact of the crisis upon the economy and incomes decreased and the registered values of the coefficient were among the lowest for the researched period.

Our analysis of the values of the Gini coefficient over the researched period indicates that the biggest decrease in income differentiation compared to the previous year value was registered in 2014, the registered decrease being by nearly 9.6 %. Income differentiation also declined significantly in 2003 (-6.5%) and in 2005 (-5.5%). The decrease in income differentiation was also affected by the policy implemented during the period of economic growth – from 2001 to 2008, although there was no direct impact upon the growth in GDP and the decrease in income inequality. Nevertheless, the upsurge in economic activity and the favourable situation on international markets were prerequisites for restructuring the economy and hence, growing incomes and decreasing income differentiation, in other words, the envi-

² These figures are based on computations made by the author of the paper based on the total household income earned by deciles in the period from 2001 to 2015, according to the data published by the NSI in 'Household Budgets' (Byudzheti na domakinstvata na NSI).

ronment was favourable for implementing a socially oriented income policy. The growth rate of the Gini coefficient compared to its value over the previous year was the highest in 2002 (8.4%), in 2004 (8.3%) and in 2011 (5.1%). At the end of the researched period, the Gini coefficient decreased by 5.9% compared to the value registered at the beginning of the period. The average annual decline rate in the Gini coefficient over the entire researched period was 0.402%.

The conclusion that over the researched period there were no substantial changes in household income differentiation in Bulgaria was confirmed when we plotted the Lorenz curve. When we compared the Lorenz curves for the different years, we observed only slight changes in income differentiation which are graphically presented in Fig. 2 and Fig. 3 for the beginning and the end of the researched period, i.e. the years 2001 and 2015.

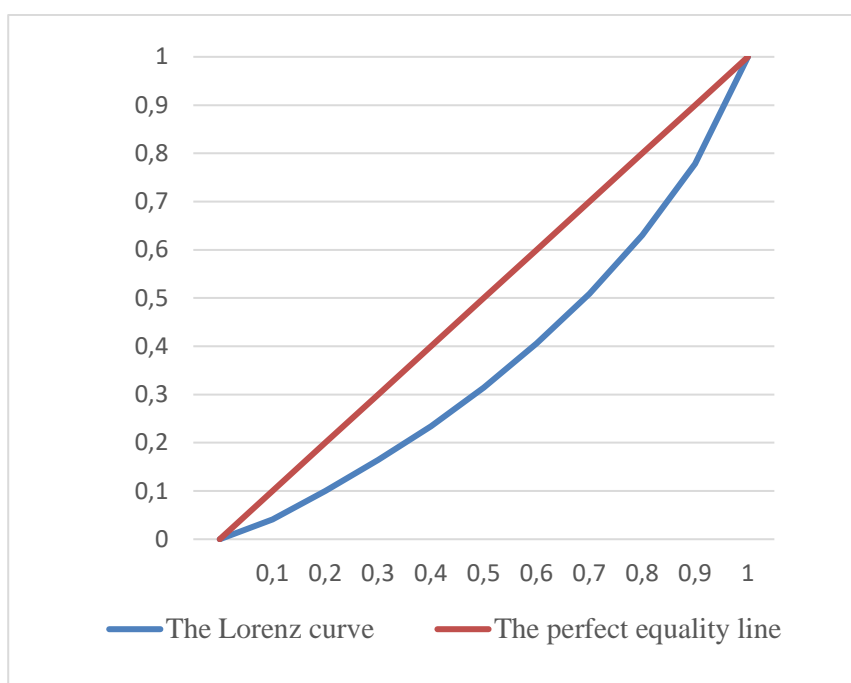


Figure 2. The Lorenz curve for the year 2001

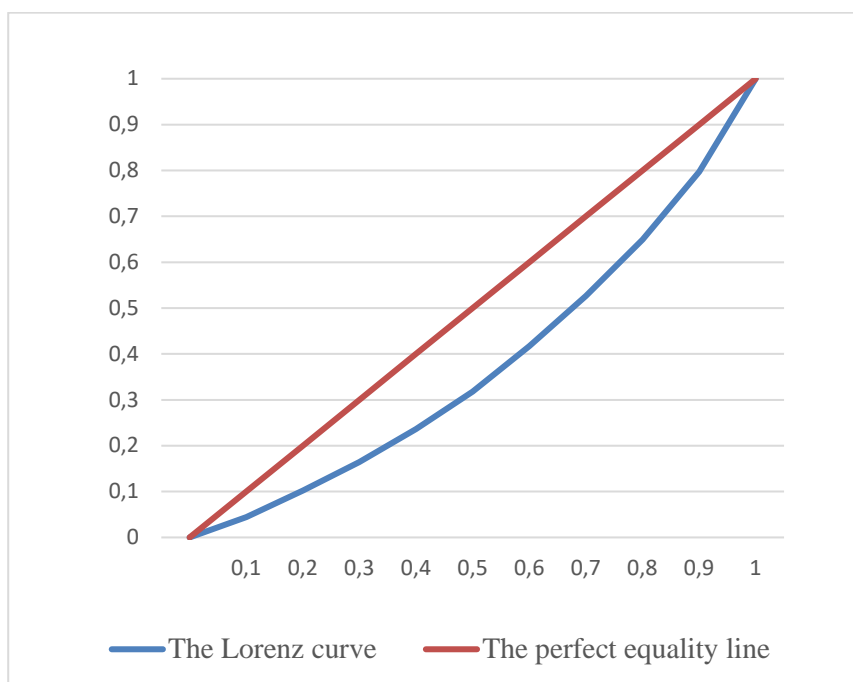


Figure 3. The Lorenz curve for the year 2015

That trend in the changes in income differentiation over the period from 2001 to 2015 was also established when employing the integral coefficient of uneven distribution (Fig. 4). Its values ranged from 0.30 to 0.37 and tended to indicate slightly more marked income differentiation.

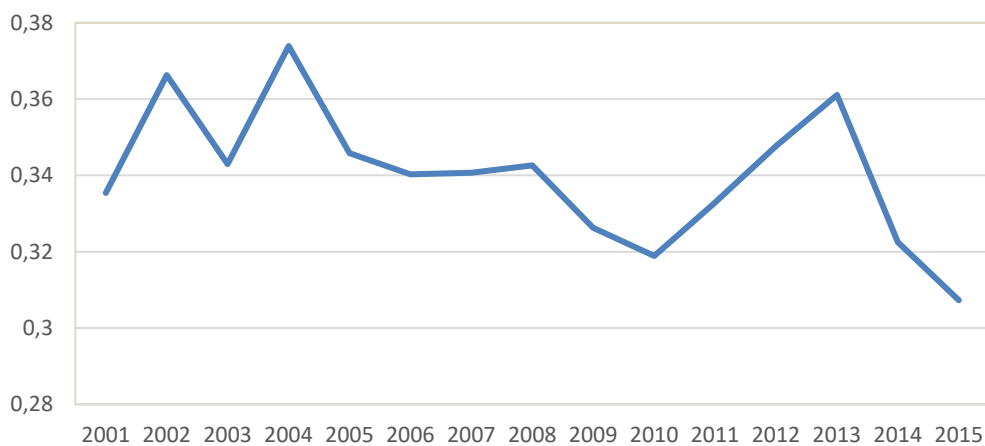


Figure 4. Dynamics of the integral coefficient of uneven distribution

When examining the rate of change of the integral coefficient of uneven distribution, we established that income differentiation decreased most notably in the year 2014 compared to 2013 (the rate of change being -10.7%). The results also indicated a decrease in income differentiation in 2005 (-7.5%) and in 2003 (-6.4%). The integral coefficient of uneven distribution rose at a significant rate compared to the previous year in 2002 (9.2%), in 2004 (9%) and in 2011 (4.4%). Compared to 2001, the index decreased by 5.4% in 2015, while the average annual decline over the period was by 0.58%.

Over the period from 2001 to 2015, the values of the Atkinson index ranged from 0.04797 to 0.06672 (Fig. 5). The values of the index declined from 2004 till 2010, in other words, there was a decline in income inequality in the country. The impact of the economic crisis was felt in the following years (2011, 2012 and 2013), the increase in income inequality being the result of reduced production, a slower growth rate of incomes, smaller budget transfers, etc.

Income inequality declined considerably in 2015 and if the downward trend is preserved or income inequality remains close to that level, this will indicate that the microeconomic environment and the economic and social situation of the population are improving.

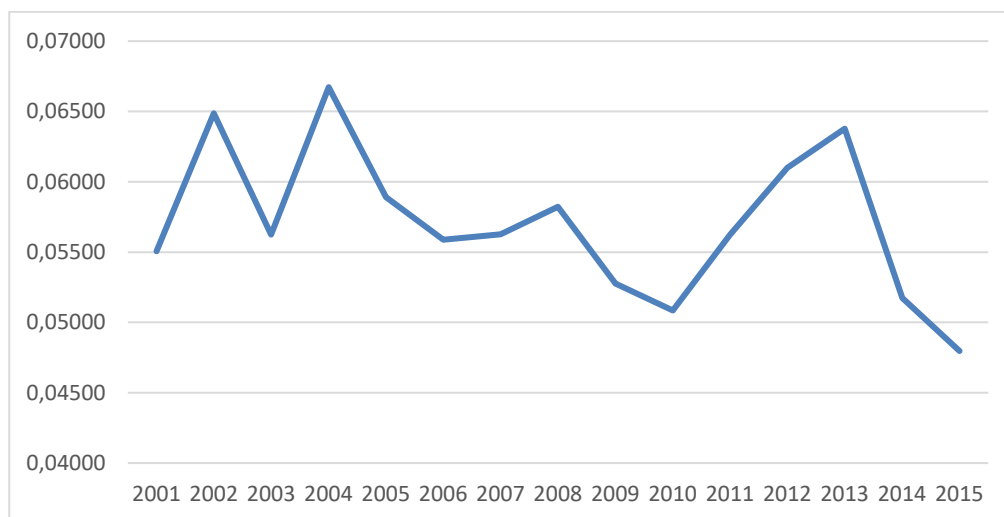


Figure 5. Dynamics of the Atkinson index

When studying economic inequalities another important aspect which is indicative of the degree of income differentiation is examining income polarization through decile ratios, i.e. the ratio between the mean income received by the 10% of the population with the lowest income to that received

by the 10% of the population with the highest income (90/10) and the ratio of the income received by the 20% of the population with the lowest income to that received by the 20% of the population with the highest income (S80/20).

Fig. 6 presents graphically the values of decile ratios. Both indices followed the same trend over the researched period. The value of the S90/10 ratio was the highest in 2002 and 2004 – the income of the 10% of the population with the highest income was more than 6 times as high as the income of the 10% of the population with the lowest income. The high values of the S80/20 ratio also indicated substantial income polarization – the income received by 20% of the population with the highest income was more than 4 times as high as that received by 20% of the population with the lowest income.

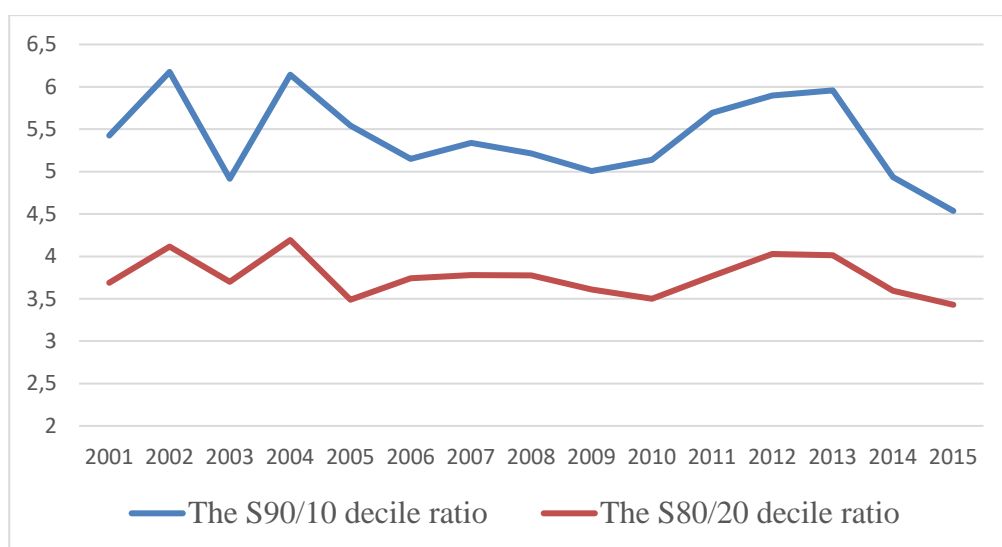


Figure 6. Dynamics of the S90/10 and S80/20 decile ratios

The analysis of the decile ratios indicated that they were relatively steady or changed insignificantly over the periods in which their lowest values were registered, i.e. between 2005 and 2010. Both indices have indicated a downward trend in household income polarization since 2013, yet it is difficult to predict whether this trend will be preserved or how long it will continue.

Social transfers are an essential tool for reducing income inequality and the polarization between the incomes received by the poorest and the most affluent segments of the population. Their importance will continue to

grow due to the aging of the population and the growing rate of unemployment in certain age groups.

Our findings about income polarization were also confirmed by the computed Elteto (K_1 and K_2) and Frigyes coefficients. Their values indicated income polarization over the researched period despite the slight downward trend (Fig. 7).

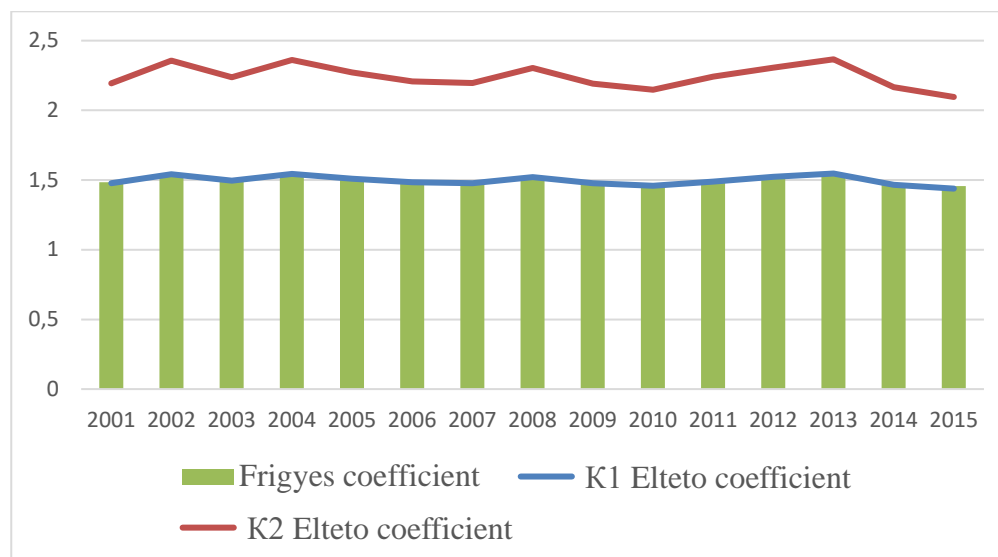


Figure 7. Dynamics of the Elteto and Frigyes coefficients

The values of the Frigyes and the Elteto K_1 coefficients were quite close and almost coincided. The value of the Elteto K_2 coefficient differed considerably since there was a marked difference between the average income of households with income above the median one and the average income of households with income below the median one. This indicated substantial and deepening income polarization. The findings of our survey also indicate that over the researched period households in the first six deciles received an income which was below the median one, while households in the last four deciles received an average income which was below the median one.

By employing the growth rates ratio we estimated the difference between the growth rates of the median income received by households in the first six deciles and of the median income received by households in last four deciles.

The computed values of the growth rates ratio indicate that the dynamics of the median income received by the households in the last four deciles was more clearly marked, i.e. its growth rate was higher compared to the

growth rate of the median income received by households in the first six deciles. This implies that there is still an upward trend in terms of income polarization and in order to reverse the trend the mean income of the households in the first six deciles must start growing faster. The greatest difference in the dynamics of the researched indices was registered in 2011 – 13.56. The growth rates of the median income received by households in the first deciles were higher when the value of the growth rates ratio was below 1. This was the case in the period from 2003 to 2007, as well as in 2014 and 2015, yet that growth rate was insufficient to compensate for the accumulated difference between the median incomes received in the deciles (Fig. 8.)

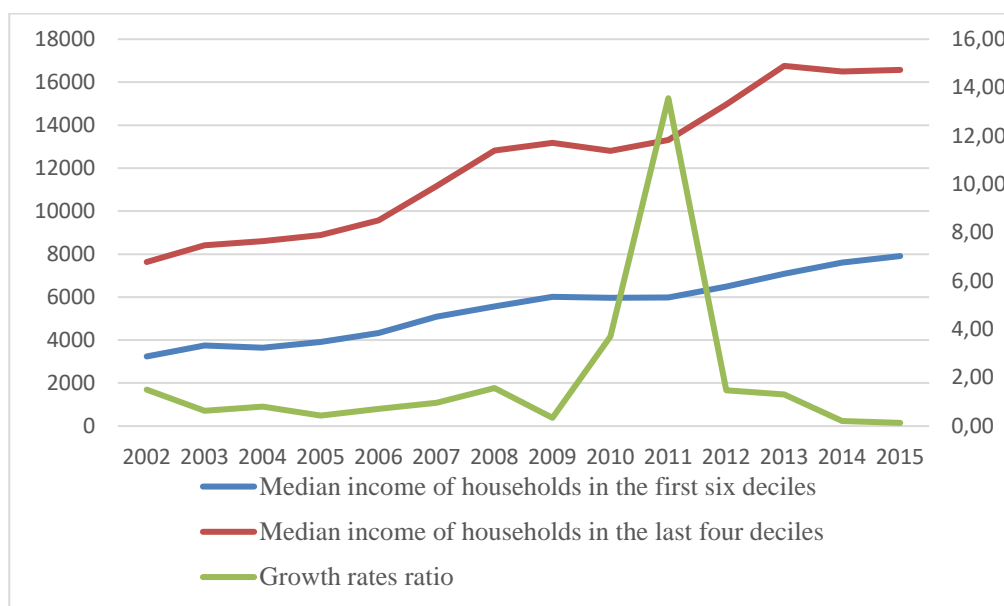


Figure 8. Mean income received by the first six and the last four deciles and the growth rates ratio

Over the researched period, income inequality in Bulgaria, measured through the Gini coefficient ranged from 0.25 to 0.30, which was slightly lower than the average global value of about 0.35. Income inequality in Bulgaria was higher than the average value registered in the EU. The only highest values were registered in Estonia and Lithuania.

According to data provided by Eurostat, in 2015 there were major income inequalities in EU member states – 20 % of the population with the highest equivalised disposable income received incomes which were 5.2 times as high as the income received by the 20% of the population with the lowest equivalised disposable income (Eurostat, 2017). The values registered for the

index in different EU countries differed significantly, the highest value being registered in Romania (8.3) and the lowest - in Slovakia and the Czech Republic (3.5). The registered values of the income inequality ratio in Germany, France, Luxemburg, Denmark, Belgium, Austria, the Netherlands and Hungary were below the EU average and ranged from 3.8 to 4.8. The registered value of the index in Bulgaria was 7.1; higher values were registered only in Lithuania (7.5) and Romania (8.3), which indicated substantial income inequalities in those countries. Obviously, a further widening of the income gap will increase the risk of poverty and social exclusion.

Findings and Conclusion

Economic inequalities pose a problem of immense social significance which can be solved by implementing adequate economic and social policies. As of the beginning of the 21st century, there have been no major changes in economic inequality in Bulgaria – the value of the Gini coefficient is quite close to the values which were registered over the last year of the 20th century.

The findings of our analysis indicate that over the period from 2001 to 2015 there were no significant changes in household income differentiation in Bulgaria. This was also confirmed when comparing the Lorenz curves for the different years. The integral coefficient of uneven distribution indicated a slightly more marked income differentiation. After analysing the dynamics of the Gini coefficient, the Atkinson index, the Lorenz curve and the integral coefficient of uneven distribution, we came to the conclusion that despite the increase which was registered in the values of the indices in some of the years, the downward trend in inequality was very weak.

There was substantial income polarization measured through the decile ratios S90/10 and S80/20, since the income of the 10% of the population with the highest income was more than 6 times as high as the income of the 10% of the population with the lowest income, while the income received by 20% of the population with the highest income was more than 4 times as high as that received by 20% of the population with the lowest income. An essential tool for reducing income inequality and income polarization between the incomes received by the poorest and the most affluent segments of the population are social transfers, especially in light of the aging of the population and the growing rate of unemployment in certain age groups.

Over the researched period, households in the first six deciles received an income which was below the median one, while households in the last four deciles received an average income which was above the median one. The registered values of the growth rates ratio indicate that the dynamics of the

median income received by the households in the last four deciles was more clearly marked, i.e. that the growth rate of their income was higher than the growth rate of the median income received by the households in the first deciles.

A comparison with the indices registered for EU member-states indicates that Bulgaria was in the group of countries with marked economic inequality – the income received by the 20% of the population with the highest equivalised disposable income was 7.1 times as high as the income received by the 20% of the population with the lowest equivalised disposable income, while the value of the index for the EU was 5.2.

The findings of our analysis indicate that the measures which have been applied so far to reduce economic inequality have failed to produce the desirable results. It is therefore necessary to introduce certain changes in the implemented income policy; to encourage employment and reduce unemployment and to correct labour market imbalances. Improving the quality and the training of the workforce are some of the measures which can be employed to reduce economic inequalities.

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