

METHODOLOGICAL PROPOSAL FOR THE ASSESSMENT OF THE INCOME ASYMMETRY

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Abstract:

One of the fundamental issues in the field of social justice is economic polarization (income and/or wealth inequality). Starting from the statu quo of the social statistics methodology, the study examines for the point of view logical and algebraic the possibility of a new classification in the field of economic polarization based on the combination of two typical statistical values: median and arithmetic mean. The population distribution could be obtained according to two simultaneous criteria: a) positioning on the „income/wealth list”; b) the extent of the average value on the surface of the distribution. Finally, the study proposes calculating new statistical indicators with a higher significance in the interpretation of economic polarization.

Keywords: social justice, economic polarization, median, arithmetic mean, economic inequality

JEL classification: B49, E02, P16

Introduction

The income asymmetry is one of the most problematic outcomes of the free market and even of the democratic society in the modern world. Although the income²⁹ per capita (that is, the average income) permanently increases, the gap between the lowest income and the highest one increases or, in the best case, doesn't decreases. Such a situation put not only questions related to the social justice or social morality, but it has a significant potential to generate vulnerabilities for the sustainable character of the economic growth (Dinga, 2018, p.35) and the social progress. Consequently, it becomes of a great theoretical and methodological interest to correctly measure the discrepancies among different categories of income, or different categories of representative agents who receive incomes in the social process (especially, in the economic process). Of course, for a long time, many methods, techniques, and tools – either of statistical or of algebraic kind – have been developed and used, in such field is not at all a virgin territory. However, in the present short study we have a tentative to make a new proposal of such a measuring, starting from a perspective of the social justice (Dinga, 2018, p.282), in its two basic types – commutative and distributive. So, the main objective of the study is to formulate and analyse from the point of view logical and algebraic a possible measure (indicator) of the income asymmetry in Romania.

The methodology

The methodology used mainly consists in: a) logical assessment; b) statistical calculus and evaluation; c) algebraic construction; d) theoretically economic interpretation; e) social evaluation.

The research

1. Establishing the categories of representative social agents

In order to measure the degree of the income inequality (or income asymmetry) we need firstly to know who receive incomes. It must be mentioned that by income is here understood the income which is the result of contribution to the social product (Gross Domestic Product – GDP). So, the income can get by: a) salary; b) wage; c) pensions; d) capital; e) rents and so on. Because the empirical official data restrictions, we'll restrain the concept of income to employee compensation. So, we need to establish the representative social agents which receive employee compensation. By representative social agent³⁰ we understand a relatively homogenous group of employees (for example, based on the economic sector where they work, or other relevant criteria). Let's note with

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²⁹ For the present study, we consider as income the current income only (so, neither wealth nor permanent income will be taken into account)

³⁰ The concept of representative social agent is of the same kind of the concept of the representative agent understood in the economic theory as a medium homo oeconomicus.

$R(k)$ the class k of the representative social agent, where $k = 1, 2, \dots, n$, $k \in \mathbb{N}$. For simplicity (without reduce the generality of the approach) we'll assume that $n = (2k - 1)$, i.e., the number of classes of representative social agents are odd³¹ is. Assuming the average employee compensation for the class i of representative is i_k . Having the value for all i_k , we can now to order the classes of representatives, in a decreasing order, from left to right, as follows:

$$R_{k_1}, R_{k_2}, \dots, R_{\frac{k_{n+1}}{2}}, \dots, R_{k_n}$$

By rearranging a series of data, it put be written as:

$$R_1, R_2, \dots, R_{\frac{n-1}{2}}, R_{\frac{n+1}{2}}, R_{\frac{n+3}{2}}, \dots, R_{n-1}, R_n$$

On the middle position is the class $R_{\frac{n+1}{2}}$, that is, this is the median class. As to the median class corresponds the median income, we have, in fact, at the middle of the series, the median income.

2. Medium (average) and median in measuring the income asymmetry

The easiest way to split the income distribution by representative social agents is to use the medium (average) of the income. So, the asymmetry of the income distribution could be calculate based on the spread of the income around the medium (average), for example using the variance (or its root – standard deviation)³². We propose to use the geometric average instead of the arithmetic one, because, although the former reduces the absolute amplitude of the average value compared with the arithmetic average, it has a very interesting property: the values under the average influence more the average then the values upper the average (Roegen, 1998, p.118). This property acts as a genuine automatic stabilizer of the geometric value, which makes it more relevant in connection with the present study purpose. For example, if the income under the average increases with the same value as which the income upper the average decreases, the geometric average will increase, while the arithmetic average will remain constant. From the point of view of the income asymmetry at the society level, this property can be significant especially when the topic of the social justice is of interest³³ (Rawls, 2011, p.118).

Let's note the income values by the representative social agents with i_k . So, we can now calculate the geometric average (G_i) and the median (M_i) of income, as follows:

$$G_i = \sqrt[n]{\prod_{k=1}^n i_k} \equiv i^G$$

$$M_i = i_{\frac{n+1}{2}} = i^M$$

3. Organizing the income distribution by representative social agents

We'll proceed now to organize the n (with $n = 2k - 1$, and $k \in \mathbb{N}$) representative social agents, presumed as being ordered in a decreasing way after the level of income, as follows:

- top down $\frac{n-1}{2}$ representative social agents (RSA), named top-half of RSA (TH);
- the RSA corresponding to i^M , named separation RSA (S-RSA);
- bottom up $\frac{n-1}{2}$ representative social agents (RSA), named bottom-half of RSA (BH).

Now, let's calculate the geometric average and the median for the two half of a series, that is:

³¹ If $n = 2k$, that is n is an even number, the pair of values at the middle of the series will be considered in their average.

³² If must be get comparisons among some series, then it is better to use the coefficient of variation – the standard deviation over the average).

³³ See, here, the principle of difference in getting the social justice, especially from the perspective of the distributive social justice (the principle of difference in the social justice is detailed examined by John Rawls)

$$G_i^{TH} = \sqrt{\frac{n-1}{2} \prod_{k=1}^{\frac{n-1}{2}} i_k^{TH}} = i_{TH}^G$$

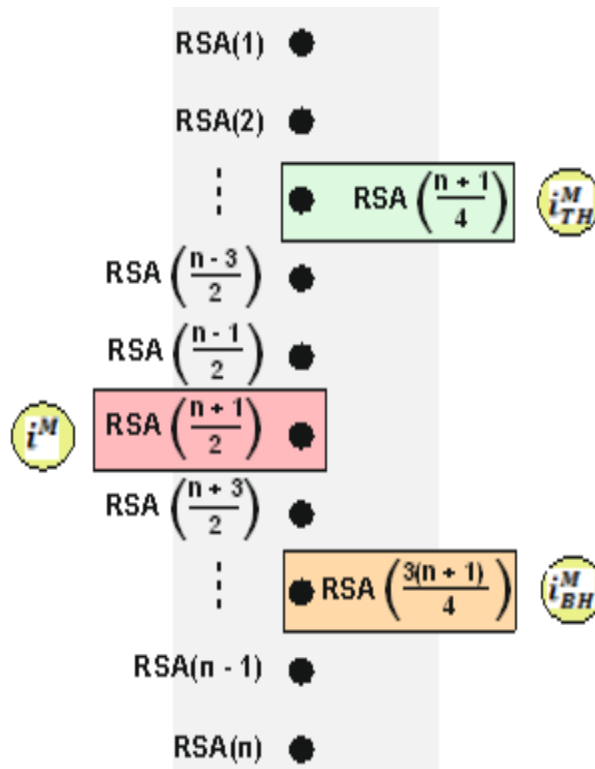
$$G_i^{BH} = \sqrt{\frac{n-1}{2} \prod_{k=1}^{\frac{n-1}{2}} i_k^{BH}} = i_{BH}^G$$

$$M_i^{TH} = i_{\frac{n+1}{4}} = i_{TH}^M$$

$$M_i^{BH} = i_{\frac{3(n+1)}{4}} = i_{BH}^M$$

In figure 1 is visualized this reorganizing of a initial series of the RSA.

Figure 1. Distribution of RSA series in decreasing order of income value



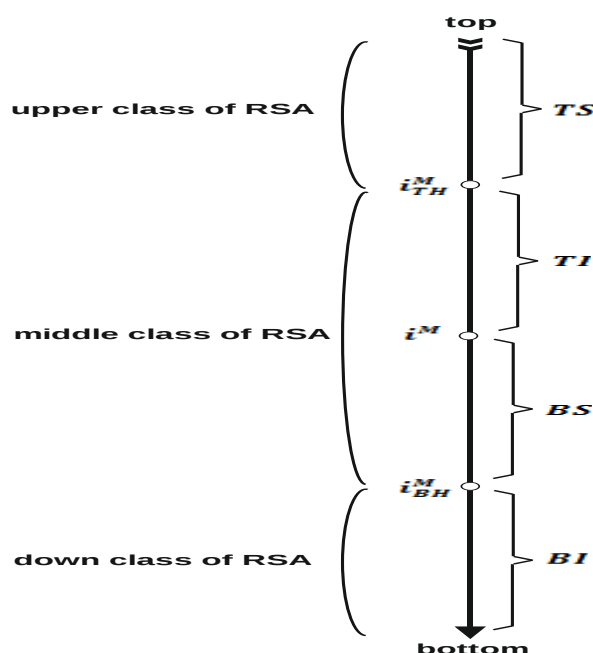
Source: author construction.

4. Structuring the ordered a series of RSA

Based on figure 1, we will extract the following modules of RSA (figure 2 visually illustrates them):

- I. the top-superior income RSA (*TS*): comprises the RSA between $RSA(1)$ and $RSA\left(\frac{n-3}{4}\right)$;
- II. the top-inferior income RSA (*TI*): comprises the RSA between $RSA\left(\frac{n+5}{4}\right)$ and $RSA\left(\frac{n-1}{2}\right)$;
- III. the bottom-superior income RSA (*BS*): comprises the RSA between $RSA\left(\frac{n+1}{2}\right)$ and $RSA\left(\frac{3n-1}{4}\right)$;
- IV. the bottom-inferior income RSA (*BI*): comprises the RSA between $RSA\left(\frac{3n+7}{4}\right)$ and $RSA(n)$

Figure 2. The four modules and the three classes of RSA for the asymmetry analysis



Source: author construction.

Conclusions

The paper has brought some theoretical contributions, of a logical and algebraic nature, regarding the identification of new calculation methods, of some indicators with a higher significance in interpreting the phenomenon of economic polarization.

The issue of income asymmetry can not be solved from the perspective of social justice or social morality and generates vulnerabilities in terms of the sustainability of economic growth and social progress.

In measuring the level of income inequality, the criterion of relatively homogeneous group (classes) of employee (representative social agents - RSA) was taken into account and by identifying the middle position- the median class (corresponding to the income value) based on algebraic calculus using the geometric average (which shows that the values under the average influence more the average then the values upper the average). This property of the geometric mean acts as an automatic stabilizer relevant to the present purpose of the work.

Finally, in the paper, four modules and three classes of RSA have been identified theoretically for the income asymmetry analysis.

Future possible developments

In order to continue the research, based on the general theoretical research carried out in the present paper, an empirical study will be conducted on the income asymmetry, by categories of representative social agents (RSA), regarding the current income, both nominal and real using official data sources.

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