Income variability in Romania: Decomposing income inequality by household characteristics

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Abstract

This paper aims at contributing to the better understanding of the income inequality determinants in Romania. In spite of positive economic evolutions and considerable governmental concerns, income inequality is still high in Romania and has remained almost unchanged during the past 15 years. Neither economic growth, nor the economic crisis that followed during recent years, has been equally distributed across households. The contribution of our paper lies in the decomposition of income inequality by groups of households based on socio-economic characteristics and the estimation of between and within group inequality. We assess the size of income inequality by using the Theil inequality index. Our findings suggest that education and status in employment are amongst the main determinants of income variability.

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Keywords: income inequality, decomposition, Theil index, household characteristics

1. Introduction

The Romanian population is highly vulnerable against income inequality, being among the first countries in the European Union in this regard. This is a serious concern, considering both the negative developments in recent years, but also the close relation of income inequality with the relative poverty indicator. Unfortunately, in Romania poverty has remained a pressing social and economic problem despite pre-crisis positive economic developments. The fight against poverty and social exclusion has to start with the analysis of inequalities in society, and continue

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with considerable involvement from governments, policy makers and society. The issue of income inequality becomes very important because the distribution of economic resources can have a direct influence on social inclusion and poverty reduction.

Worldwide, income inequality has increased both between and within countries as a consequence of the globalization process. The Nobel laureate for economics, Joseph Stiglitz argues that increasing inequality in most countries can be explained through the process in which the money has gone from those who were able to spend it toward those who already had so much money that they could not spend it all. Thus, he claims that the increasing economic inequality was the main cause that triggered the financial and economic crisis. For the Romania’s case, one can observe that right before the burst of the economic crisis, the level of income inequality was extremely high. Sir Anthony Atkinson, another influential economist in this field, believes that real household income stagnation caused households at the bottom of the income distribution (households with low incomes) to borrow in order to maintain a certain level of living and because these loans were not sustainable, they led to unprecedented pressure on financial institutions.

Our paper aims at contributing to the better understanding of income inequality in Romania by analysing the influence of certain household characteristics on income variability. The paper is organized as follows. The next section is briefly reviewing the relevant literature in the area of income inequality, than we expose our methodology, data and main results. The paper ends with a section of concluding remarks.

2. Literature review

Economic inequalities accounted for a long period a major socio-political debate. Although in times of economic growth in North America and Western Europe, this subject has been neglected, in the 60’s there was a turning point in the interest of researchers for the topic. Some of the first significant theoretical researches on economic inequalities belong to Sen in 1973 and Atkinson in 1975, while pioneers of income inequality are Kuznets (1955) and Mincer (1958). Kuznets has promoted the idea that between economic development and income inequalities there is a relation of a form of an inverted U-shaped curve. This relationship has been in the focus of many researchers since then and their findings show that this issue is far from being solved (Bourguignon and Morrisson, 1998; Ravaillon, 2004a,b), as may other variables than economic development have strong influences on income inequality, such as demographical, social and cultural factors (Checchi, 2000).

Income inequality is closely related to economic efficiency: it is desirable that the use of resources, which are limited, to be based on criteria of economic efficiency. This, however, may lead to benefits for some, but also to disadvantages for others. In addition, in any society a degree of inequality is not only unavoidable, but it is also necessary for a healthy functioning of the economy (Welch, 1999). Despite this, and even if the inequality is not a problem by itself, the causes and consequences of income inequality should be considered, analysed and mitigated (poverty, social exclusion, the level of delinquency, life expectancy, health - Salverda, Nolan and Smeeding, 2009), especially since recent research emphasizes that high levels of inequality could be a barrier to economic growth.

The income inequality is the core of economic inequality. When analysing these inequalities is particularly important to define the concept of income: income before transfers and taxes, disposable income, market income (Smeeding and Weinberg, 2001), because economic development can lead to increased income inequality, while fiscal and social policies (through taxes and social benefits systems) can counterbalance the effects of the economic growth.

Income inequality analysis is based on household income distribution, the latter being influenced primarily by employment gains of household members. Other sources of revenue may be financial income (from rents, dividends, interest, etc.), income from social transfers (allowances, pensions, unemployment benefits, etc.). When analysing the income distribution one must consider its dynamics, as both income and household composition evolves over time (Salverda, Nolan and Smeeding, 2009). However, special attention must be paid when determining the period considered for investigation (Atkinson, 1983). Regarding the demographic unit referred to, it may be the household, the family unit, the taxation unit, the individual (Atkinson and Brandolini, 2001). This should be carefully selected, the more the unit of reference widens, the more the income inequality tends to diminish, due to aggregation of individual dispersions (Redmond, 1998).
The level of wage inequality generated through a country’s labour market is also important in understanding poverty and social stratification, since earnings are by far the most important component of national income. In this context, interventions outside labour market may lead to different results. Perhaps one of the clearest cases is the minimum wage: while imposing a minimum wage leads to raising the wage level at the bottom of the distribution, producing a positive effect on the earnings, on the other hand employment suffers (occurring loss of jobs, usually in low-paid industries, among vulnerable groups).

Due to globalization, income inequality has become increasingly present in developed countries, not only just a matter of academic debate. Unfortunately, Europe is experiencing a worsening economic inequality, with a huge impact on the population. Fredriksen (2012) claimed that “the poor performance of economic growth in Europe in recent decades has led to an increased concern for the income dispersion and social exclusion”. Furthermore, it was found that “at the end of the 2000s the income distribution in Europe was more unequal than the OECD average, although less unequal than in the United States.” Moreover, inequalities within countries are just as important (if not more important) than inequalities between European countries. The increase over recent years is not only due to new technologies and globalization, but also reflects the policies adopted on the labour and stock markets.

Supporting the idea that income inequality needs to be addressed globally in Europe, the Europe 2020 Strategy promotes inclusive growth as one of the three priorities for the European Union. One of the main objectives is that the number of those who are in poverty or at risk of poverty to decline by 20 million by 2020 (according to Eurostat, in 2010 the number of such persons was of 115 million).

In addition, one of the lessons of this economic crisis is the fact that wage setting is not an issue that governments may dispense. People have become increasingly aware of the fact that wages are not only a result of market forces, but they are also influenced by institutions and rigors that govern the behaviour of workers and employers (Atkinson, 2013), so that governments can influence the distribution of earnings (one example of this is the introduction of the minimum wage, which aims to tackle poverty at work).

At EU level, the average annual growth of disposable income was of 2.5%, with significant differences between countries, evidence of heterogeneity of the area. Italians have experienced the lowest revenue growth since 1995, while countries such as Ireland, Poland and Slovakia have gained the most. Differences between countries in the disposable income inequality are due to differences in labour market outcomes, household composition, financial and tax systems.

The evolution of inequality over time reveals a common pattern among the European countries: the top decile seems to comprise an increasing share of total income. The growth in top revenue in continental Europe seems modest compared to that experienced by some Anglo-Saxon countries, especially if we look at the richest 1% of people. Despite this, no consensus has been reached regarding the cause of this evolution (changes in the tax system, the existence of certain labour market institutions, globalization and technological change are among the possible causes).

In an analysis for the period 1975-2008, Piketty et al. (2011) found a strong negative relationship between the proportion of top income and income tax rates applied to these incomes (the analysis was restricted to the richest 1% of the population). In addition the authors claim that no country has experienced increases in the top income share without significant reductions in their correspondent income tax rates. Lowering taxes for high income increases income of the richest mainly because they negotiate higher wages and not because they work more or resort less to tax evasion. Globalization and technological change are also causes which led to an increase in revenues of the upper decile relative to the rest of population. At the other end of the distribution, the lower deciles registered a lower income growth as compared to the general population (within Europe). Once again the globalization process can explain at least part of this evolution: an increase in international trade may have reduced employment or income level of low-income workers if workers with high wages work mainly in exporting firms. Even changes over time in labour market appear to have played a role in this: the influence of institutions and policies declined in the last 20-25 years in many OECD countries (Fredriksen 2012): many such policies (e.g. employment protection legislation, the introduction of the minimum wage) have opposite effects on employment and wages, and the final impact on inequality remains undetermined.

Gini index is an aggregate measure of income inequality that provides a simple and robust measure. The values of the index range between 0 and 1, where 0 means that everyone has the same income, and 1 that the overall income lies in the hands of a single individual. From mid-1990s until 2008 Gini decreased (meaning a reduction of
income inequality) in Greece, Hungary and Italy, while in the Netherlands has increased significantly. During 2004-2008 the biggest change occurred in Eastern Europe, where inequality decreased, and in Sweden, where the inequality went up.

In the long term, sustained economic growth is essential for poverty reduction. The rapid economic growth experienced in recent decades in many countries (e.g. China and India) led to an unprecedented reduction in poverty. Although a certain degree of inequality is an integral part of the efficient functioning of a market economy (Chaudhuri and Ravallion, 2006), too much inequality can be harmful for growth. Berg and Ostry (2011) argue that beyond the risk that economic inequality amplify crisis effects, it may generate political instability (which can discourage investment), but may also lead to hinder difficult, but necessary decisions.

The studies referring to Romania are scarce and addressing only certain aspects of the issue. In a study from 2010, Molnar analysed household income inequality in Romania, stating that our country is one of the EU Member States with the highest level of inequality: the Gini coefficient for 2008 was estimated to 0.36, with 11 percentage points higher than that of the Czech Republic and Hungary. In 2013 the situation has not changed much: the Gini index is 0.34. The author concludes that the Romanian labour market is characterized by a rather low level of income and relatively high level of inequality. Still, she believes that despite a relatively low level of social protection, income redistribution plays a crucial role in mitigating inequality.

Precupetu (2013) considers that the most vulnerable in terms of risk of poverty are the children, the youths, the families with dependent children (especially those with 3 or more children), single people with and without dependent children, the unemployed, the self-employed in agriculture and the low-skilled workers. In addition, the author states that the poorest people live in fairly high proportion in rural areas (76.7% in 2010). Analysing the equivalent median income, in 2010, it appears that Romania is the last among EU countries, the median income being 10 times lower than in developed countries. In a 2012 paper prepared for the European Commission, Avram et al. (2012) estimate that in Romania, but also in Greece, Spain, Italy, Latvia and UK, progressive income cuts affected mostly the high-income households. Avram et al. (2014) argue that social contributions in Romania lead to increased inequality (as in Netherlands), while in Ireland or Belgium they act the opposite way.

3. Data and methodology

Our analysis on income inequality in Romania is based on the EU-SILC data, which provides national representative information on household and individual income, on the main sources of income, but also on other variables of interest: household composition, employment status of household members, education, socio-demographic variables, etc.

The evolution of household income distribution in Romania in the period 2007-2013 can be divided into three distinct phases: a period of revenue growth (2007-2008), a period of decreasing revenues during the peak of the crisis (2009-2011) and a period of stabilization of income (2012-2013). The uneven dynamics of income conducted to a more equitable income distribution in 2013 compared to 2007, judging by the Gini index which had a downward trend after 2007, indicating a decrease of income inequality among households.

The concept of income used in measurements in this paper is the disposable income of the household, calculated by adding social transfers received, and excluding direct taxes and social contributions from the original (market) income. The incomes of all household members are summed up and the total income of the household is adjusted for differences in household composition using an equivalence scale. In this analysis, we have used the OECD equivalence scale, which assigns value 1 to the first adult in the household, 0.5 to any other member aged 14 and over, and 0.3 to any child less than 14 years. The equivalent income calculated in this way is then assigned to each household member.

In order to assess the overall income inequality, we have calculated the Theil index (entropy class index) of income inequality based on equivalised household disposable income and then decomposed it based on certain household characteristics, such as educational level of the household head, labour market status of the household head, area of residence and the gender of the household head. The choice of this inequality index is justified by its property of being additively decomposable, thus the total inequality can be written as a sum of within and between group inequalities. The Theil index also satisfies several desirable properties for inequality indices, such as mean
independence (or income-zero-homogeneity), the principle of population replication (or population-size independence) and the Pigou-Dalton principle of transfers (Bourguignon 1979; Shorrocks 1980).

The formula that we use for the calculation of the Theil index ($T$) is the following:

$$T = \frac{1}{N} \sum_{i=1}^{N} \frac{y_i}{\bar{y}} \ln \left( \frac{y_i}{\bar{y}} \right),$$

(1)

where $y_i$ is the equivalised disposable household income, $\bar{y}$ is the mean income and $N$ is the number of observations. The values of the Theil index range between 0 (if everyone has the same income) and $\ln N$ (if one person has all the income). The Theil index has been decomposed by household characteristics in order to capture the contribution of each group to the total inequality. As already mentioned, the groups were constructed based on characteristics of the household head, such as education, labour market status, gender and the location of the household following the area of residence. The decomposition formula that we use is the following:

$$T = \sum_{i=1}^{m} s_i T_i + \sum_{i=1}^{m} s_i \ln \frac{\bar{y}_i}{\bar{y}},$$

(2)

where $s_i$ is the income share of group $i$ in total income, $T_i$ is the Theil index $T$ for the group $i$, $\bar{y}_i$ is the mean income of group $i$.

4. Main findings

First of all, the households have been divided into five groups according to the educational level of the household head (following ISCED): primary (or less than primary), lower secondary, upper secondary, post-secondary and tertiary. As expected, there is a positive correlation between the educational level of the household head and the household placement on the income distribution. Half of the households from the first two quintiles of the income distribution (40% of all households) are headed by a person with at most primary education, while in the richest quintile, less than 10% of the households have as a head a person with low education. Income variability is significant among households broken down in groups by the education of the household head. On average, a household headed by a tertiary educated person has twice as much income than a household headed by a post-secondary educated person. And the gap is widening as the educational level decreases. A household headed by a person with primary or lower secondary education has to cope with daily expenses with only one quarter of the income of a household in which the head holds a tertiary education degree. In order to gather the income variability in one single measure, we have computed the Theil inequality index and decomposed it by the educational level of the household head. We present the results for year 2012, mentioning though that there have not been substantial changes in the indices during 2009 and 2012 (see Table 1 below).

<table>
<thead>
<tr>
<th>Education of the household head</th>
<th>Inequality index</th>
<th>Contribution to total inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>primary</td>
<td>0.103</td>
<td>4.6%</td>
</tr>
<tr>
<td>lower secondary</td>
<td>0.167</td>
<td>13.5%</td>
</tr>
<tr>
<td>upper secondary</td>
<td>0.125</td>
<td>34.6%</td>
</tr>
<tr>
<td>post-secondary</td>
<td>0.071</td>
<td>3.2%</td>
</tr>
<tr>
<td>tertiary</td>
<td>0.092</td>
<td>11.5%</td>
</tr>
<tr>
<td>All groups</td>
<td>0.175</td>
<td></td>
</tr>
<tr>
<td>Within groups</td>
<td>0.115</td>
<td>65.7%</td>
</tr>
<tr>
<td>Between groups</td>
<td>0.060</td>
<td>34.3%</td>
</tr>
</tbody>
</table>

Source: own calculations using EU-SILC data
As it can be seen in the table above (Table 1), from the total inequality, two thirds are attributable to within educational group inequalities, whilst one third of the inequality is the result of income variability between groups. We notice as well that the inequality index is higher within households with secondary education (both lower and upper), meaning that within this groups the income variability is more pronounced. It is worth mentioning the important contribution brought by the households with tertiary education (of their head) to the total income inequality, compared to primary or post-secondary educated households. Nevertheless, the contribution to total inequality depends on the share of the group in total population.

The labour market status of the household head is influential for the household income level. Thus, households headed by employees have a disposable income which exceeds by 17% that of a household headed by a pensioner, for instance. Households that are headed by a self-employed person hold on average half of the income of a similar household headed by an employee. In Romania, self-employment is often associated with agricultural activities, which provide no more than a subsistence level of income. As in the case of the educational level, we have decomposed the total income inequality by the labour market status of the household head and found out that less than 17% of the total inequality can be attributed to differences between the labour market statuses of the household head, whilst more than 83% of the inequality arises from within groups. The largest income variability comes from the households headed by employees. Less variation we observe in the groups of households headed either by an unemployed or an inactive person. Because both unemployed and inactive persons receive social benefits which have similar (or close to similar) amounts, the income variability within this groups is limited.

<table>
<thead>
<tr>
<th>Labour market status of the household head</th>
<th>Inequality index</th>
<th>Contribution to total inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>self-employed</td>
<td>0.307</td>
<td>18.6%</td>
</tr>
<tr>
<td>employee</td>
<td>0.136</td>
<td>41.1%</td>
</tr>
<tr>
<td>retired</td>
<td>0.107</td>
<td>20.4%</td>
</tr>
<tr>
<td>unemployed</td>
<td>0.224</td>
<td>1.8%</td>
</tr>
<tr>
<td>student</td>
<td>0.083</td>
<td>0.1%</td>
</tr>
<tr>
<td>inactive</td>
<td>0.107</td>
<td>0.4%</td>
</tr>
<tr>
<td>other</td>
<td>0.130</td>
<td>0.7%</td>
</tr>
<tr>
<td>All groups</td>
<td>0.175</td>
<td></td>
</tr>
<tr>
<td>Within groups</td>
<td>0.145</td>
<td>83.1%</td>
</tr>
<tr>
<td>Between groups</td>
<td>0.030</td>
<td>16.9%</td>
</tr>
</tbody>
</table>

Source: own calculations using EU-SILC data

The income gap between the urban and the rural area is well-known in Romania. On average, a household in the urban area has twice the income level of a household in the rural area. However, the contribution of between rural and urban inequality to total inequality is around 20%. Income variability is considerable in the urban area and less significant in the rural area, where the income levels are more uniformly distributed.

We have studied the income variability between households headed by males and females as well, in order to understand whether we can talk about a gender dimension in the inequality of household income. The results have shown that less than 1% of the income inequality can be explained by the gender of the household head. Therefore, we conclude that gender is not a characteristic that contributes to income inequality formation between households.

5. Conclusions

This paper has attempted to contribute to the better understanding of the determinants of income inequality in Romania at household level. We have studied the influence of several household characteristics on income inequality by decomposing total inequality into two components: within group and between group inequality. We have assessed the size of income inequality by using the Theil inequality index. We have built our analysis on EU-SILC data. Our calculations were based on the household disposable income.

The results suggest that the level of education of the household head is the most influential factor of income variability between households. More than one third of the total income inequality between households can be
attributed to the level of education of the household head. The labour market status of the household head contributes as well to the overall level of income inequality, but to a smaller extent than the level of education. Some other characteristic of the household, namely area of residence, explains one fifth of the overall inequality. However, the level of income inequality is significantly influenced by the within group inequality, as for instance within the groups of employees or secondary educated persons there is a considerable amount of income variability.

Nevertheless, we have to bear in mind that inequality in disposable income has two layers: earnings inequality and the redistribution through the tax-benefit system. Although Romania has a progressive tax-benefit system which reduces almost half of the income inequality arising from market incomes, still earnings inequality (dependent on education and labour market status) is primarily determinant for the level of inequality in disposable income.

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