ROMANIAN HOUSEHOLDS' INCOME INEQUALITY

PhD Maria MOLNAR
Institute of National Economy, Romanian Academy

Abstract

This paper presents the results of the measurement of Romanian households' income inequality during 1995-2008 years. The measurement is based on a set of inequality indicators, estimated by using data collected by household budget surveys. The estimates of all indicators applied in the evaluation show an increase in inequality from 2000 year to 2006, followed by a clear decrease during 2007 and 2008. The estimates for 1995 and 2000 didn't reveal an unambiguous tendency: some of them indicate an increase, while others suggest a decrease of income inequality. The paper is a first outcome of a research project on social inequality and polarization.

***Key words**: disposable income, inequality measurement, Gini coefficient, Theil index, Atkinson indices, between-group inequality, redistribution*

***

Romania is one of the EU Member States with the highest income inequality. In 2008, the Gini coefficient estimated for the monetary income distribution in Romania (36%) was by eleven percentage points higher than that estimated for Czech Republic and Hungary (the lowest level among EU Member States), and the income quintile share ratio (7:1) was two times higher.

The income inequality in Romania is perceived as very high by most people, while according to the Public Opinion Barometer Survey the greatest part of the population is thinking that the Romanian society should be an equalitarian one (Bădescu, 2003). That perception derives from the strong increase of inequality during the transition from the command to the market economy. The increase of the inequality along with the transition to the market economy is to a great extent defensible since that involves a transition from an equalitarian distribution to a distribution matching the rules and mechanisms of the market, i.e. a distribution marked by wider income differences required in order to reward hard and innovative work and its results, education, talent and risk taking, largely considered as a condition of the efficient use of the productive factors and a driving force of economic development.

However the inequality is deemed to be too high and unfair because of the deep gaps between the living conditions of the greater part of population

and the visibly luxurious life of rich, and because it is well known that many of the very high incomes and wealth come from activities or from capital gained in the shadow economy, from breaking the law or taking advantage of law weaknesses, and from corruption, while a lot of poor lack the opportunities and possibilities/capabilities to have a good employment, if any. The generally low living standard of households in Romania as compared to other European countries worsens the feeling that the distribution is unfair, which affects the economic and social behaviour, and social cohesion as well.

For equity and efficiency reasons the inequality, especially its excessive and uncontrolled widening, should be a subject of continuous concern for social and economic policy makers, as well as for social and economic researchers. To set suitable social and economic policies in order to keep the inequality in sound boundaries, information and analysis are needed on its extent and evolution, its determining factors and causes, and also on its relationship with economic growth and social development. Yet in Romania the income distribution has been less a subject of the economic research, and consistent evaluations of income/consumption inequality have been produced only since 1990 years, based on a new source of reliable data collected by households' surveys. Data on inequality indicators have been published by several reports and studies on poverty produced under the aegis of World Bank, UNDP, UNICEF, National Anti-Poverty and Social Inclusion Commission, Ministry of Labour and National Institute of Statistics. Two inequality indicators are estimated annually by the National Institute of Statistics in the framework of social inclusion indicators. **The study, some results of which are being presented in this paper, is a research project on income distribution in Romania, aiming first of all the measurement of income inequality and polarization (Molnar, 2009)**.

The paper has three parts. In the first part some methodological aspects of the income inequality measurement performed in this study are being reviewed, the results of the estimation of the main inequality indices during 1995-2008 and an evaluation of the narrowing effect of the income redistribution are being presented in the second and in the third part.

The measurement of income inequality supposes to solve two methodological questions: (i) the definition of the income concept and the estimation of the income values, and, and (ii) the choice of the inequality indices.

Since measuring income inequality we aim the measurement of a leading component of social inequality, the income concept that is used in my study is the equalized disposable income of households, that is the best income proxy of the household's welfare. The disposable income is estimated on the basis of information collected by the Households Budget Surveys, and according to its methodology the disposable income of each household is a

sum of the income earned by the household's members or by the household as a whole from all sources (the total gross income), less payments made by the households in redistribution (taxes and social contributions).

The total gross income comprises monetary incomes (wage earnings, cash income from agricultural and non agricultural independent activities, income from property, cash social benefits, transfers from other households and other cash incomes) and incomes in kind (the value of some benefits in kind received by employees and persons under the coverage of the social protection schemes, and the value of the agricultural food and non-food products consumed by household from own resources, mainly from own production, from private transfers in kind or payment in kind for work in other households' production). Unlike the income concept applied in Eurostat's current inequality estimates (the monetary disposable income), the disposable income that I use takes into account the income in kind. As the consumption from own resources is an important part of Romanian households' consumption, especially of households with low monetary income, not considering this income component is leading to the overestimation of the income inequality in Romania.

Of course, using a disposable income estimated by including income in kind, the inequality measures come close to the actual extent of inequality. In case of Romanian income distribution that means a lower inequality than estimated on the basis of monetary income[1]. However, it must be mentioned that an another important income in kind, the imputed rent (the value of the consumption that correspond to the use of the accommodation owned by household) is not taken into account, and it is likely that the inequality measures show a lower inequality, as almost all households are living in the accommodation they own and the households with higher income generally have better accommodations. The same lessening effect on inequality measures derives from the fact that, due to the seasonality of agricultural production and the survey sample design, the expenditure made for the household production cannot be subtracted from the income earned from this source by each household.

The households disposable incomes are equalized by using an equivalence scale applied in the measurement of absolute poverty in Romania. The number of adult equivalent units of a household is determined according to the formula $AE = (A + \alpha C)^{\theta} AE = (A + \alpha C)^{\theta}$, where A and C represent the number of adult persons and children in the household composition, and whose parameters, $\alpha = 0.5$ and $\theta = 0.9$, have been estimated on the basis of households' consumption expenditure.

To observe the evolution of the income inequality during a long period

the statistical information provided by two household surveys have to be used, namely the Households Integrated Survey (HIS) and the Households Budget Survey (HBS), conducted by the **National Institute of Statistics (NIS)** during 1995-2000 and since 2001, respectively. The income module of two surveys wasn't modified, so the estimates of inequality indicators are comparable since 1995 year. A household budget survey has been conducted yearly by NIS before 1995 year, but due to methodological differences, one can hardly estimate comparable inequality indices for the entire transition period. Also, the information necessary to estimate the evolution of inequality in the context of the present economic crisis are not available so far.

The paper deals with the evaluation of two aspects of income inequality: the overall inequality and the differences between the incomes of different households' groups, the between-group income inequality.

The **overall inequality**, whose assessment is the main purpose of this paper, is the inequality between individual incomes and it is measured on the basis of data related to the distribution of individuals/households by the income level. To assess the inequality of Romanian households' income I used a set of indices: six quantile based indices (quintile and decile ratios, the quintile and decile share ratios, and the normalised extreme quintiles and deciles absolute gap), three indices derived from the common measures of variation (the Kuznets/Robin Hood index, Éltető-Frigyes indices and the variance of logarithms), the Gini coefficient, the Theil and the Atkinson indices.

Estimating inequality indices

The **quintile** and **decile ratios** are the ratios of the top to the bottom income quintiles (Q_4/Q_1) and deciles (D_9/D_1), respectively, while the normalised quintile and decile absolute gap is the difference between the top and bottom quintiles ($Q_4 - Q_1$)and deciles ($D_9 - D_1$), respectively, normalised by dividing to the median (Me). The **quintile share ratio** (S80/S20) is the ratio of total income received by the top quintile (the 20% of the country's population with the highest income) to that received by the bottom quintile (20% of the country's population with the lowest income) and **decile share ratio** (S90/S10) is the ratio between the total incomes received by the top and bottom deciles (the 10% of the population with the highest and the lowest income, respectively).

The **Kuznets index**, known under the name of Robin Hood index also, is a ratio of the mean deviation of individual incomes to the mean:

$$K = \frac{1}{2n}\sum_{i=1}^{n}\left|\frac{x_i}{\bar{x}} - 1\right|, \qquad (1)$$

where x_i denotes the income at the disposal of the individual *i* (the equalised disposable income of household to which the individual belongs), $\bar{x}$ $\bar{x}$ is the mean income and *n* is the population

The **Éltetö-Frigyes indices** measure the distance of the mean income of those disposing of income higher and lower ($\bar{x}_1\bar{x}_1$ and $\bar{x}_2\bar{x}_2$, respectively) than the general mean ($\bar{x}\bar{x}$). There are three indices:

$$EF_1 = \frac{\bar{x}_1}{\bar{x}_2}; \qquad EF_2 = \frac{\bar{x}_1}{\bar{\bar{x}}} \qquad EF_2 = \frac{\bar{x}_2}{\bar{\bar{x}}} \tag{2}$$

The **variance of logarithms** is based on the logarithms of the normalised individual incomes,

$$\sigma^2_{log} = \frac{1}{n}\sum_{i=1}^{n}\left(log\frac{x_i}{\bar{x}}\right)^2. \tag{3}$$

The **Gini coefficient**, is a measure of the mean distance between the individual incomes, and it is estimated by:

$$G = \frac{D_x}{2\bar{x}} = \frac{1}{2\bar{x}n^2}\sum_{i=1}^{n}\sum_{i=1}^{n}|x_i - x_j| \quad , \tag{4}$$

where D_x is the average difference between each income x_i and each income x_j.

The **Theil index** is an entropy measures and it is estimated as an average of the normalised individual incomes, weighted by the logarithm of the same normalised incomes:

$$T = \frac{1}{n}\sum_{i=1}^{n}\frac{x_i}{\bar{x}} ln\frac{x_i}{\bar{x}}. \tag{5}$$

The **Atkinson index** is constructed on the basis of an explicit welfare function, which implies the use of a normative parameter $\varepsilon \geq 0$, called "inequality aversion parameter". It is estimated by one of the following formulas:

$$A_\varepsilon = 1 - \left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{x_i}{\bar{x}}\right)^{1-\varepsilon}\right]^{\frac{1}{1-\varepsilon}}, \text{ for } \varepsilon \neq 1, \tag{6}$$

and

$$A_1 = 1 - \left[\prod_{i=1}^{n}\frac{x_i}{\bar{x}}\right]^{\frac{1}{n}}, \quad \text{for } \varepsilon = 1. \tag{7}$$

The indices are showing a higher degree of inequality as their values increase. Generally, the lowest limit of the index range is zero, corresponding to a perfectly equal income distribution, except for quantile based indices in which cases the index equals 1 if the distribution is a perfectly equalitarian one. The highest limit of the Gini coefficient, the Kuznets index and the Atkinson indices range is 1 (100%, if expressed in percentages), while quantiles based and Éltetö-Frigyes indices have higher values, and Theil index could have higher values as well.

***

I estimated several indices in order to get a refined evaluation of the inequality degree and its evolution in Romania and to prove the robustness of the conclusions based on the estimates, since each index has its advantages and weaknesses, and due to the fact that different indices are sensitive to changes in different parts of the income distribution (bottom, middle or top). Therefore I estimated, for instance, the Gini coefficient since it is the most frequently used index, the quintile share ratio, the Kuznets/Robin Hood index and the Éltetö-Frigyes indices due to their easy understanding and popular interpretation, having in mind however that the first weights more heavily the transfers affecting the middle of the distribution, the second is sensitive only to changes at the top and bottom of income distribution and the others are not sensitive to transfers on the same side of the mean/median income. The reason to estimate Theil index relates to the fact that it allows the inequality decomposition in within-group and between-group inequality and the assessment of the influence of household's characteristics on income inequality. The sound theoretical basis and the possibility to measure the inequality under different assumption related to the society's inequality sensitivity argue for the use of Atkinson indices as well, although its interpretation is not quite easy for everybody.

The evaluation of **between-group inequality** aims mainly to evidence the influence of some factors related to households' characteristics. It is measured using the mean incomes of groups, weighted by the groups' population shares. Besides the ratio of each group's mean equalised disposable income to the overall mean income, a statistical indicator generally used in such evaluations, I estimated also the inter-group coefficients of variation and the inter-group Theil and Gini indices.

To assess the contribution of the **redistribution** in mitigating income inequality I used the difference between the Gini coefficients estimated for the total gross income before social transfers (pensions included in social transfers), for the total gross income before social transfers (pensions excluded from social transfers) and for the total gross income after social transfers, in addition to that estimated for the disposable income. The total effect of

the redistribution is estimated by the difference between the Gini coefficients of total gross income before social transfers (pensions included in social transfers) and those of disposable income, that is the difference between the inequality of income a household would dispose in the hypothetical situation of the absence of the redistribution and that of income it really disposes.

Estimates of inequality indices in Romania

To observe changes in income inequality during 1995-2008, I estimated the inequality indices for 1995, 2000, 2006, 2007 and 2008 years. It is a period marked by a severe decline, followed by a strong increase of households' income. Due to the economic downward and the high inflation that occurred in the second half of the 1990 years, the mean equalized disposable income of Romanian households was by 25% lower in 2000 compared to 1995 year, making worse the living standard already low during the command economy and further decreased in the first years of the transition to the market economy. Since 2001 the income increased year by year, so that in 2008 the mean income was twice that of the 2000 year's. During 2001-2008 the average annual growth rate of the households' income was of 9%, but in 2007 and 2008 the income increased more: by 13% and 18%, respectively.

Along with that dynamic evolution of the overall income, the **overall inequality** of income increased also: all indices are showing a higher inequality in 2006-2008 years compared to 1995 and 2000.

Main inequality indices in Romania

Table 1

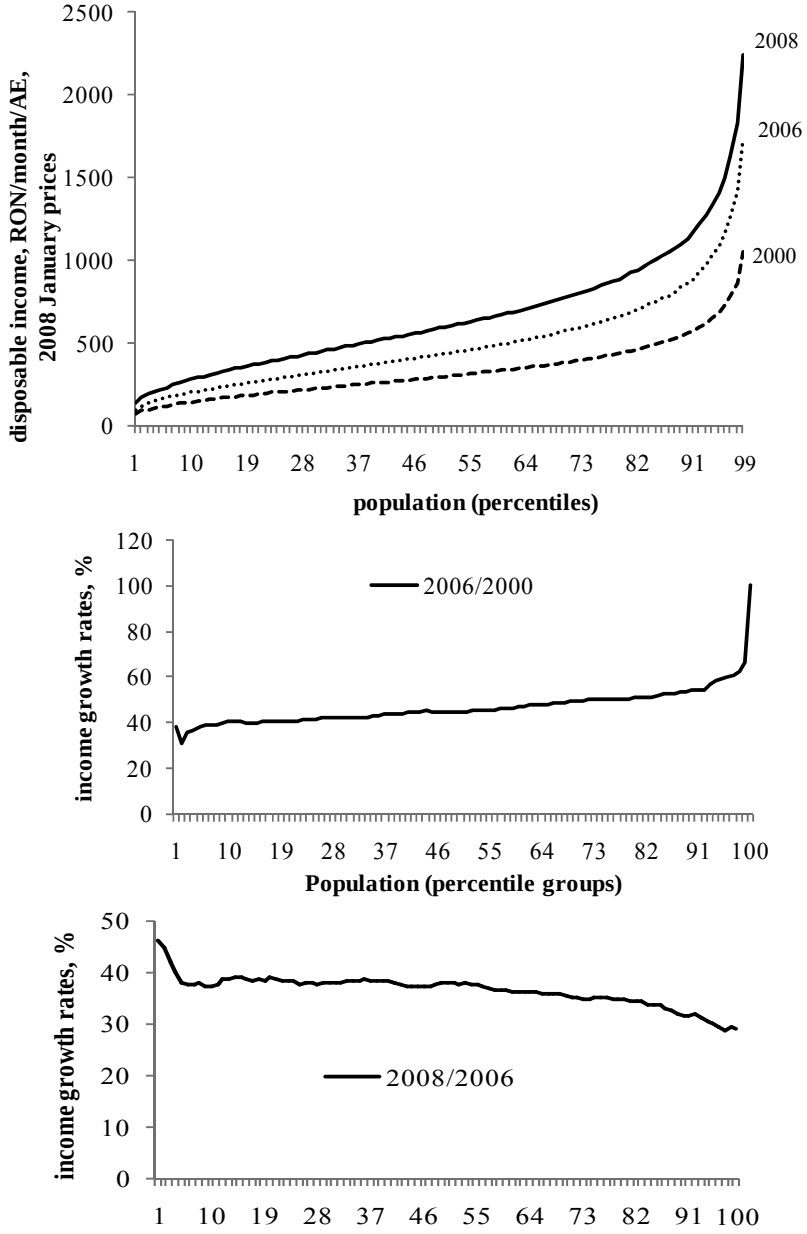
	1995	2000	2006	2007	2008
Quintile share ratio (S80/S20)	4.5	4.6	5.4	5.1	4.9
Quintile ratio (Q4/Q1)	2.3	2.4	2.5	2.5	2.5
Normalised quintile absolute gap ((Q4-Q1)/Me), %	82	87	95	94	91
Decile share ratio (S90/S10)	7.0	7.2	8.7	8.2	7.7
Decile ratio (D9/D1)	3.5	3.9	4.2	4.1	4.0
Normalised decile absolute gap ((D9-D1)/Me),%	131	140	153	149	144
Kuznets/Robin Hood index	0.206	0.208	0.230	0.225	0.216
Éltetö-Frigyes indices					
EF_1	2.36	2.30	2.54	2.53	2.41
EF_2	1.54	1.51	1.60	1.59	1.55
EF_3	0.65	0.66	0.63	0.63	0.64
Variance of logarithms	0.308	0.330	0.392	0.368	0.352
Gini coefficient	0.296	0.296	0.328	0.320	0.308
Theil index	0.189	0.158	0.216	0.200	0.173
Atkinson indices					
$\varepsilon = 0.25$	0.043	0.038	0.050	0.046	0.041
$\varepsilon = 0.50$	0.079	0.074	0.093	0.087	0.079
$\varepsilon = 1$	0.143	0.141	0.171	0.161	0.150
$\varepsilon = 2$	0.274	0.278	0.401	0.306	0.288

Source: Estimates based on NIS – HIS and HBS data

The widening of inequality was more evident in 2006 compared with 2000, the period of sustained economic growth, accompanied by a large increase of households' disposable income. However the top income increased more than the bottom ones, due to the large increase of property income and wage earnings, the setting up of the flat rate income tax and the lower growth of pensions[2].

Pen's " parade of dwarfs..." in 2000, 2006 and 2008 years and the income growth curves

Figure 1



Source: Estimates based on NIS – HIS and HBS data

So, while the incomes grew along the entire distribution (*Figure* 1) and the mean income increased by 52%, the income of the 20% of the population with the lowest income increased only by 39% and those of 20% of the population with the highest income increased by 62% (*Annex 1*).

The faster income growth that came about in 2007 and 2008 has been accompanied by a reversed inequality trend: the inequality narrowed, especially in 2008, as the low incomes increased faster than the high incomes The incomes of first four quintile groups grew by 39%, 38%, 37% and 36%, respectively, while those of the top quintile group increased only by 27% (*Annex 1*).

The raise of the guaranteed minimum wage and of pensions, mainly due to the fact that 2008 was an electoral year, has been the major determinant of the decrease in income inequality. The minimum wage has been raised from 330 RON monthly, in 2006, to 390 RON, in 2007, and to 500 and 540 RON, respectively, in the first nine and the last three months of 2008 year. The average monthly state insurance and farmer pensions have increased from 311 and 117 RON, respectively, in 2006, to 523 and 159 RON, in 2007, and to 593 and 253 RON, in 2008. Thus the real pension increased by 23% in 2007 and 34% in 2008, while the real wage earnings increased by 15% and 14%, respectively. The monthly child allowance has been raised also from 25 RON, in 2006 and 2007, to 40 RON in 2008.

The estimates of the indices didn't show an unambiguous tendency of income inequality between 1995 and 2000 years. The quantile based indices, the variance of logarithms and Atkinson (ε=2) index are showing a slight increase in inequality, the Theil index, the Éltetö-Frigyes indices and Atkinson (ε=0.25 and ε=0.5) indices are proving a decrease, while according to the Gini coefficient, the Kuznets/Robin Hood index and Atkinson (ε=1) index the inequality degree didn't changed during this period. These differences related to the changes in inequality derive from the design of income falling along the distribution, due to the larger decrease in the lower part of the distribution and to an important drop in the top income (*Figure 2* and *Annex 1*). The income of the first, second and ninths decile groups (10% of the population with the lowest incomes) decreased by 29%, 28% and 23%, respectively; those of the tenth group fell by 28%.

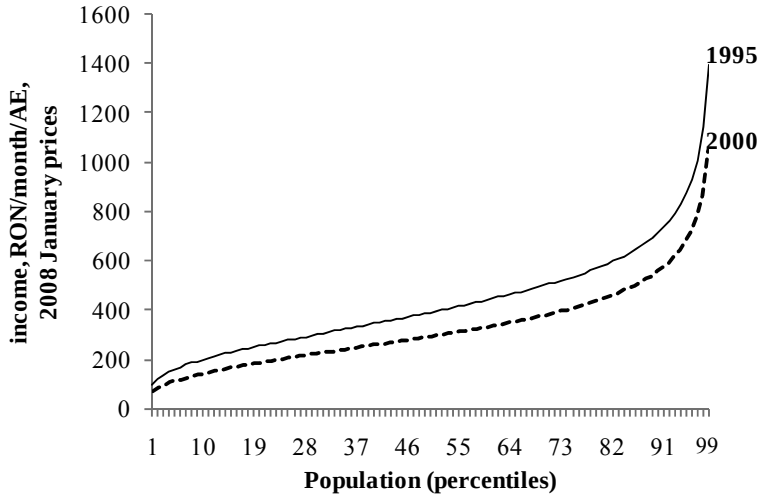
Hence the indices that are more sensible to changes of the top incomes are suggesting the narrowing of the inequality, those sensible to changes of the bottom incomes are indicating the widening of the inequality, and those that weight equally the changes in all parts of the distribution are showing no change (or no significant change) in inequality. It must be mentioned also that the Lorenz curves estimated for 1995 and 2000 years intersect in the top quarter of the distribution, i.e. in the largest part of the distribution the inequality was higher in 2000 compared with 1995, and only in the top part it decreased during the

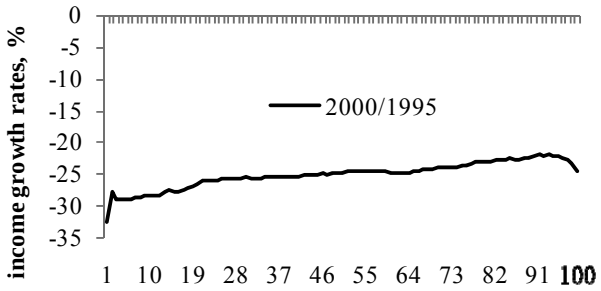
same period. Since we consider the great difficulties faced by households in the bottom of the distribution, that a large fall in their income means severe constrains in meeting some of the basic needs of their members, as well as the relatively high sensitivity of the Romanian society to the increasing poverty incidence and depth, we can take into account an increase in inequality during this period too, as it is suggested by the indices that are more sensitive to changes at the bottom of income distribution.

According to some evaluations based on information provided by the old Family Budget Survey, during the first years of transition to the market economy (1990-1994) there was a larger increase in inequality. It was a period marked by a strong economic decline, high inflation, the severe fall in employment, especially in salaried employment, the explosion of unemployment and the movement of the mass of workers displaced from many dismantled industrial units to the subsistence agricultural activities or to the pension system, as well as by a dramatic erosion of wage earnings and pensions' purchasing power. The Gini coefficients estimated for disposable income per household, increased from 0.237 in 1989 to 0.264 in 1994, and those estimated for gross households' income per capita increased from 0.233 to 0.286 during the same period (*UNU/WIDER*).

Pen's " parade of dwarfs..." in 1995 and 2000 years and the income growth curve

Figure 2

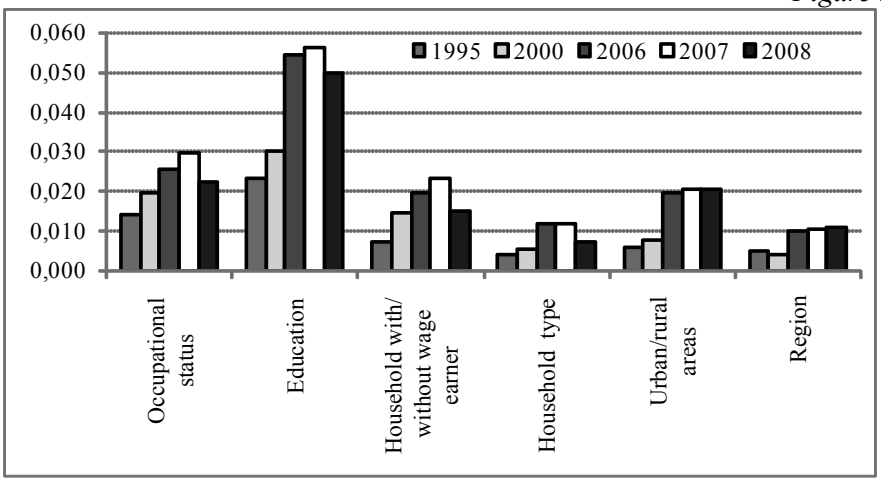




The **between-group inequality** increased also. During these periods of falling and growing incomes, some population groups lost more or received less than others, so that income gaps between different categories of households have increased between 1995 and 2008.

Between-group Theil indices, by main household characteristics

Figure 3



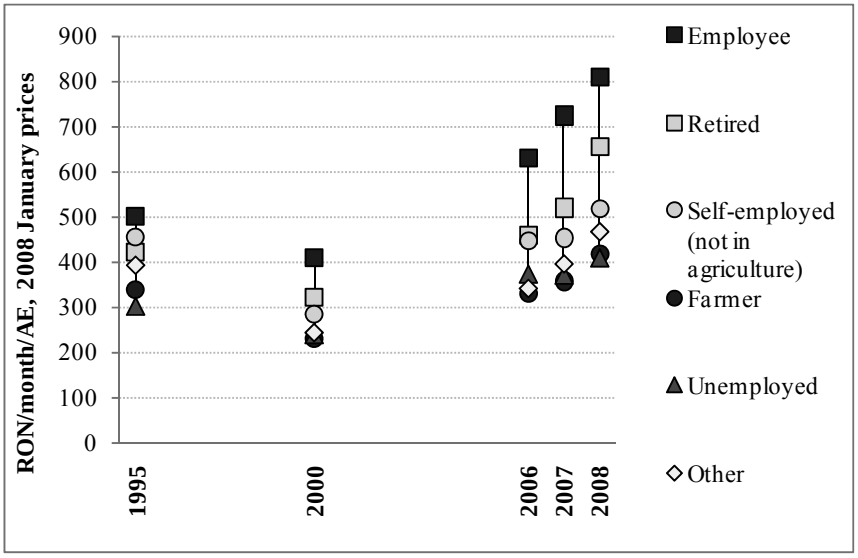
Data on average equalized incomes show large differences between the income of households grouped by employment status and education of household head and between the income of households living in urban and rural areas. The differences between household types and the region of residence are also important, as well as those related to the age and gender of individuals or of households' head. The estimates of the groups' mean incomes ratios to the overall mean and the between-group Theil and Gini indices and the coefficients of variation show an increasing tendency of the intergroup

income inequality during 1995-2007 period, and its decrease in 2008, except for grouping by residence areas and region.

Regarding to income differences by **occupational status** of household head, one can expect that households headed by employed persons have higher income than those headed by unemployed or inactive persons, since the amount of income received by a household depends on the position of its members in the labour market. However, according to Household Budget Survey, in Romania only the mean incomes of households whose reference person is employee (wage earner)[3] exceed the overall mean. The farmer households have one of the lowest incomes, close to the incomes of unemployed headed households. In 2008, the mean incomes of these two household categories were by 39% and 40%, respectively, below the overall mean, and two times lower than the income of households headed by wage earners. In time, due to the quick increase of wage earnings, the income gap between the first two and the last household categories widened, and the same tendency has been recorded by the gap between the mean incomes of households whose reference person is a non-agricultural self-employed or an inactive (especially other than retired) and those of employees' households. Although the pensions are much lower than the wage earnings, the mean equalised income of households headed by retired is not too far from that of employees' households, due to the fact that the size of the retired headed households is usually smaller and because a part of them are mixed households, including employees. However, the gap between their mean income and that of employees' households increased. Only in 2008 this trend has reversed due to the increase in the pension level; increase that led to a substantial drop of between-group income inequality, as it is showed by the coefficients of variation, and by Gini and Theil indices.

Mean equalised disposable income, by occupational status of household head

Figure 4



In general households with at least one employee (wage earner) or employer in their composition have higher incomes than those in which these categories of active persons are missing. In 2008, the mean equalized disposable income of the first household group was by 50% higher than that of the second group, and the gap was higher during 2006-2008 compared with 1995 and 2000 years.

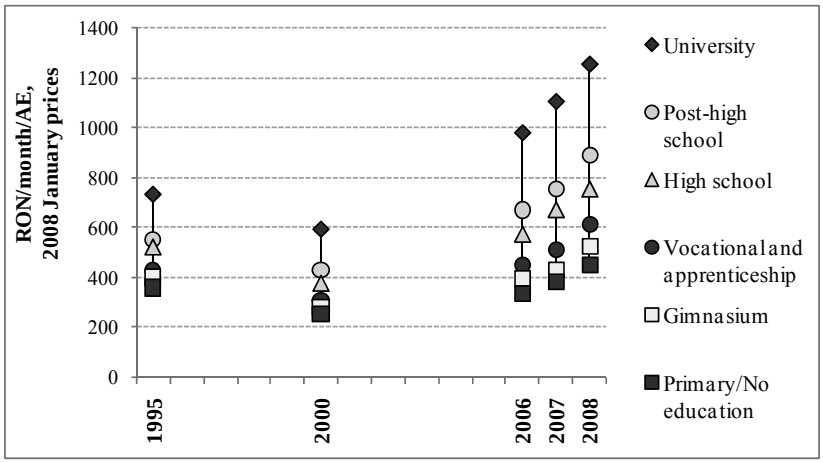
According to between-group Theil indices, in 2008, 13% of the overall income inequality has been related to living in households headed by persons with different occupational statuses and the impact of this factor doubled between 1995 (8%) and 2007 (15%). The influence of living in households with or without wage earners has also increased (*Annex 3*).

The differences related to the **education** are the highest, since the possibility to find a well paid job, to perform an efficient independent activity or to start a successful business, as well as the income from work and the pension are depending to the educational attainment to a large extent. In 2008, the mean income of households headed by a person with university education was 2.8 times higher than that of households which household head has only primary or no education, and the gap increased from 2.1, in 1995,

and 2.3, in 2000, to 3.0, in 2006, due to the faster income growth in case of households whose reference person attained higher education. The between-group coefficient of variation, the highest as compared to those related to other characteristics, is showing also a large increase, from 23%, in 1995, to 36% and 34%, respectively, in 2007 and 2008. The education has the largest impact on inequality: in 2008 the education caused 29% of the total income inequality, more than twice the extent of the impact recorded in 1995 year.

Mean equalised disposable income, by education of household head

Figure 5



The **household type** is also an important differentiating factor of households' equalized incomes. There are differences between the income of households with and without dependent children, as well as between the income of younger and older single persons or households. In 2008 the mean income of single persons younger than 65 years was by 60% higher than that of single parents with dependent children, the mean income of two adults younger than 65 years without dependent children was by 10%, 38% and two times higher than those of two adults with one child, two children and three or more children, and the mean income of three or more adults without dependent children exceeded by 32% that of households formed by three or more adults and dependent children. As regards the last household type it worth to mention that in Romania many households belongs to this type: in 2008, 13.4% of total households and 23.6% of total population. Their average size exceeds five persons and to a large extent they are multigenerational households, formed in order to support the relatives in need (elderly supported by the families of their

sons/daughters or other relatives, as well as young families or single parents with children supported by their parents); a traditional form of solidarity within the extended family, that explains partly their relatively low income and the high poverty rate among these households.

Living in **urban areas** seems to be an advantage as compared to having the residence in **rural areas**, since the income of urban households are considerably higher than those at the disposal of rural ones: by 52% on average, in 2008. The differences in occupational status of the population living in urban and rural areas are leading to this income gap, namely the fact that farmer households and retired in the farmers' pension system (which pensions were extremely low until the setting up of the social minimum pension, in 2009) are living in rural areas, while most wage earners are working and living in urban areas. Likewise, a great proportion of single elderly (mainly single very old women), households with three or more children and multigenerational households of three or more adults with dependent children are living in rural areas, as well as most low educated people. As a matter of fact, the underdevelopment of the agriculture, of rural economy in general, the persistence of subsistence agriculture and the lack of opportunity to get salaried employment and to attain the required education to cope with the new economic environment are the major determinants of low incomes in rural areas. Living in urban or rural areas explains more than a tenth of income inequality (12% in 2008).

The determinants of income inequality by **region** are the same, as the income differences between the eight regions are mostly related by the population share of urban/rural areas. The highest income level is recorded in the region of capital city, Bucharest, and the lowest in North-East region. In 2008, the disposable income of households living in the Bucharest region exceeded those of households in North-East region by 65%, more than in 1995 and 2000 years (38% and 40%, respectively). Besides there is a large gap between Bucharest region and the other regions: the income in the former are by 36% to 65% higher than in the other regions, while the gap was of 1% to 38%, in 1995, and of 14% to 40%, in 2000. It must be mentioned also that the mean incomes in all Eastern and Southern regions (North-East, South-East, South and South-West) are lower than those in Western and Central regions (West, North-West and Centre).

The impact of redistribution on inequality

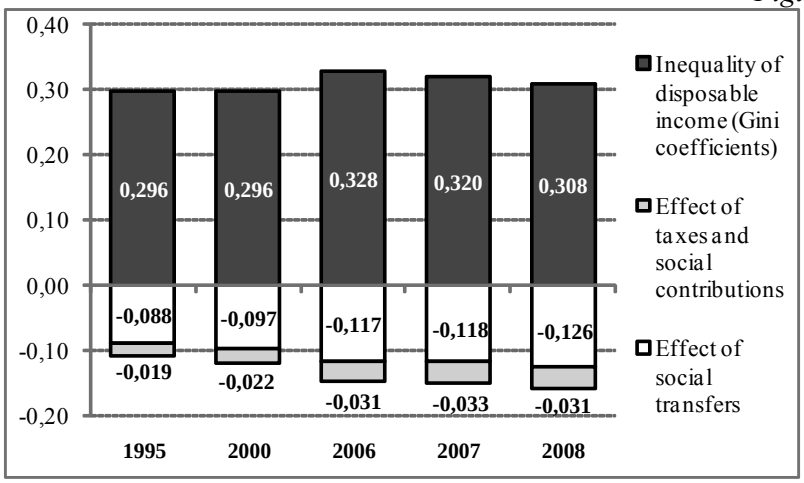
The estimates of Gini coefficients for different income concepts reveal large and growing differences between the inequality before and after redistribution, i.e. before and after social transfers and payment of taxes and contributions to social protection schemes (*Figure 6* and *Annex 4*). In 2008, the

Gini coefficient of the gross income before social transfers was of 0.465 and that of the disposable income (the net income after social transfers) was of 0.308, so one can suppose that the redistribution led to a lessening of income inequality by 34%. Most of the total effect of redistribution was due to social transfers (80%, out of which 67% to pensions and 13% to the others social benefits).

Obviously, the redistribution has a greater mitigating effect on the inequality between the income of households grouped by the occupational status of household head, since for some households' groups social benefits are the main income source and the taxes and social contributions are been paid mainly by the other households' groups. In 2008, the between-group Gini coefficient estimated for the mean disposable income of these households' groups was by 57% lower than that estimated for the gross income before social transfers. The largest part of the difference between the two Gini coefficients was also due to social transfers (70%), but the effect of taxes and social contributions was greater than on the overall inequality (30% compared with 20%).

Gini coefficients of disposable income inequality and the lessening effect of redistribution

Figure 6



The impact of the redistribution on the inequality between the incomes of households with and without at least one wage earner/employer and between the mean incomes by household type is also large, while the impact on the inequality related to education, residence areas and region is smaller (*Annex 5*).

Conclusions

The income distribution in Romania is marked by the general low income level and a relatively high and increasing inequality. The inequality increased along the transition to the market economy, during periods of economic downturn and economic growth as well, with some trend breaks related mainly to elections. At the beginning the income inequality raised because most households suffered income losses due to high inflation and economic recession and some became rich or very rich, by fair or unfair means. Then the growth of property income and of wage earnings and income from independent activity related to some professions and jobs and the persistence of a large proportion of households with low and very low incomes, related to missing qualifications and employment opportunities as well as to family burden, were the determinants of inequality widening.

The economic crisis that is affecting Romanian economy already for the second year has a strong negative impact on household incomes, as it stopped the impetuous income increase during the previous eight years and led to income losses for an increasing number of unemployed and for many of working people. So the number of households with low income is larger and it is likely that those located at the bottom side of the distribution become poorer in absolute terms, leading to an increase in inequality. However these developments hit also persons with middle and high income levels, so it is difficult to say if the income distribution is more or less unequal compared with the previous one.

Although the social protection is low, the redistribution of income has an important contribution in levelling of income distribution, especially by social transfers. However, to diminish the present inequality and to prevent its excessive increase the redistribution is not enough. Of course, its contribution can improve, by raising its level and by improving its efficiency, as well as by providing the necessary resources, including a better collection of taxes and social contributions, and by allocating more to social protection while sharing out the fruits of economic growth.

Policies to increase and to improve employment, especially of those experiencing difficulties in finding jobs, to reduce the employment on informal and black market and to motivate participation in work are also very important as they can contribute to dwindle the population with low income. The development of the agriculture, of the rural economy in general, as well as the regional development is crucial for poverty alleviation and reducing inequality, while improving education and training, and providing equal opportunities to education is a factor that can contribute to reducing inequality in the long term.

NOTES

1. In 2008, for example, the difference between the Gini coefficients estimated on the basis of disposable income, calculated by excluding and, respectively, including consumption from own resources, was of four percentage points.

2. During 2001-2006, the real net wage earnings and the real state social insurance pension increased by 64% and 55%, respectively.

3. In general, households headed by employers have the highest income levels, but statistical data on that household's category don't allow relevant estimations concerning its mean income, because of the high non-response rate of these households in the survey. In fact, missing enough data on these households' income is affecting the possibility to have a fine representation of the top of income distribution.

Bibliography

- Asad A., Murthi M., Yemtsov R., Murrugarra E., Dudwick N., Hamilton E., Tiongson E. (2005), "*Growth, Poverty, and Inequality. Eastern Europe and the Former Soviet Union",* The World Bank, Washington DC.

- Atkinson A.B. (1970), "On the Measurement of Inequality*", Journal of Economic Theory*, 2(1970): 244-63.

- Bădescu, G. (2003) "*Atitudini si perceptii privind inegalitatea socială în România* " (Attitudes and Perceptions on Social Inequality in Romania. Public Opinion Barometer Survey Report), Open Society Institute – international Policy Fellowships, http://www.policy.hu/index.php?m=publication&id=21052.

- Betti, G. and Lemmi A.. eds.(2008), " *Advances on Income Inequality and Concentration Measures"*. Routledge, London and New York.

- Champernown, D.G. and Cowell F.A. (1998)," *Economic inequality and income distribution"*, Cambridge University Press, Cambridge.

- Cowell, F.A. (2006)," *Inequality: Measurement",* London School of Economics and Political Science – STICERD, Distributional Analysis Research Programme Discussion Paper (DARP), 86.

- *"Tendinţe sociale"*, 2001, ..., 2009, Institutul Naţional de Statistică

- *"Coordonate ale nivelului de trai. Veniturile şi consumul populaţiei"*, 2001, ..., 2008, Institutul Naţional de Statistică

- *"Aspecte ale calităţii vieţii",* 1995, ..., 2000, Institutul Naţional de Statistică

- Litchfield J. A. (1999), "*Inequality: Methods and Tools"*, Text for World Bank's Web Site on Inequality, Poverty, and Socio-economic Performance, http://www.worldbank.org/poverty/inequal/index.htm.

- Milanovic, B. (1999), "Explaining the increase in inequality during transition", *Economics of transition*, 7(2): 299-341.

- Molnar, M. (2009) "*Distribuţia veniturilor populaţiei din România. Inegalitate si polarizare*", Institutul de Economie Naţională – Academia Română.

- Molnar, M. (2005) *"Caracteristici ale distributiei veniturilor. Inegalitate si polarizare"*, Institutul Naţional Statistică şi Societatea Română de Statistică, Seminarul Naţional „Octav Onicescu", Bucureşti, 5 iunie 2005.

- OECD (2008), "*Growing Unequal: Income Distribution and Poverty in OECD Countries"*, OECD, Paris.

- Piketty, T. (2004), "*Économie des inégalités"*, 5e edition, Paris: La Découverte.

- Poenaru, M. (2009) "*Politica sociala in Romania. Provocari actuale si viitoare*",

Academia Română, Institutul de Economie Națională.

- Sautory, O. (1996) "*Les principales mesures d'inégalité*", Insee Méthodes, 69-70-71: 235-267, http://jms.insee.fr/files/documents/1996/533_1-JMS1996_S3-1_SAUTORY.PDF

- Sen, A. K. (1973), "*On Economic Inequality"*, Clarendon Press, Oxford.

- Theil, H. (1967)," *Economics and Information Theory",* Amsterdam: North Holland.

- UNU/WIDER World Income Inequality Database (WIID2C).

- Voinea, L. and Mihaescu F. (2009) "The Impact of the Flat Tax Reform on Inequality. The Case of Romania", *Romanian Journal of Economic Forecasting,* 6(4): 19-41.

- Wolfson M.C. (1997), "*Divergent Inequality – Theory and Empirical Results",* Research Paper Series – Analytical Studies Branch, No. 66 (Revised), Statistics Canada.

Growth rates of disposable income by quantiles

Annex 1

Growth rates of income quantiles (%)				**Growth rates of quantile groups' mean incomes (%)**			
	2000/1995	**2006/2000**	**2008/2006**		**2000/1995**	**2006/2000**	**2008/2006**
Median	-25	45	38				
Quintiles				Quintile groups			
Q1	-26	41	39	MQ1	-28	39	39
Q2	-25	44	38	MQ2	-26	42	38
Q3	-25	47	36	MQ3	-25	45	37
Q4	-23	51	35	MQ4	-24	49	36
				MQ5	-26	62	27
Deciles				Decile groups			
D1	-29	41	38	MD1	-29	38	39
D2	-26	41	39	MD2	-28	40	39
D3	-26	42	38	MD3	-26	42	38
D4	-25	44	38	MD4	-26	43	38
D5	-25	45	38	MD5	-25	45	38
D6	-25	47	36	MD6	-25	46	37
D7	-24	49	35	MD7	-24	48	36
D8	-23	51	35	MD8	-24	50	35
D9	-22	54	31	MD9	-23	52	33
				MD10	-28	68	24

Values of Lorenz curves corresponding to the deciles of the income distribution

Annex 2

	Lorenz curve values (%)				Sign of differences between the values of curves		
	1995	**2000**	**2006**	**2008**	**2000-1995**	**2006-2000**	**2008-2006**
10	3.4	3.3	3.0	3.1	-	-	+
20	8.5	8.2	7.6	7.9	-	-	+
30	14.7	14.4	13.3	13.9	-	-	+
40	22.0	21.6	20.1	21.0	-	-	+
50	30.2	29.9	28.0	29.1	-	-	+
60	39.4	39.2	37.0	38.4	-	-	+
70	49.8	49.8	47.4	49.0	-	-	+
80	61.8	62.0	59.5	61.3	+	-	+
90	75.9	76.7	74.3	76.1	+	-	+

Between-group inequality indices, by households' characteristics and their impact on overall inequality

Annex 3

	1995	2000	2006	2007	2008
Coefficient of variation (%) by:					
Occupational status	17.6	19.7	22.6	24.3	20.5
Household with/without employees	12.0	16.8	19.6	21.2	17.2
Education	22.6	26.0	35.1	35.6	33.5
Household type	16.7	17.2	18.7	18.5	17.8
Urban/rural areas	10.7	12.4	19.8	20.0	20.2
Region	10.0	9.2	14.9	15.3	15.5
Gini coefficient by:					
Occupational status	0.078	0.107	0.119	0.130	0.108
Household with/without employees	0.057	0.083	0.096	0.103	0.083
Education	0.113	0.127	0.173	0.178	0.168
Household type	0.095	0.097	0.103	0.104	0.101
Urban/rural areas	0.053	0.062	0.098	0.100	0.100
Region	0.054	0.049	0.068	0.071	0.071
Theil index by:					
Occupational status	0.014	0.020	0.026	0.030	0.022
Household with/without employees	0.007	0.014	0.020	0.024	0.015
Education	0.023	0.030	0.054	0.056	0.050
Household type	0.004	0.006	0.012	0.012	0.007
Urban/rural areas	0.006	0.008	0.020	0.020	0.021
Region	0.005	0.004	0.010	0.011	0.011
Overall Theil index	0.189	0.158	0.216	0.200	0.173
Theil between-group indices, as % of the overall Theil index					
Occupational status	8	13	12	15	13
Household with/without employees	4	9	9	12	9
Education	12	19	25	28	29
Household type	2	4	6	6	4
Urban/rural areas	3	5	9	10	12
Region	3	3	5	5	6

The mitigating effect of the income redistribution on overall inequality

Annex 4

	1995	2000	2006	2007	2008
Gini coefficients estimated for					
-Disposable income	0.296	0.296	0.328	0.320	0.308
-Gross income	0.315	0.318	0.359	0.353	0.339
-Gross income, before social transfers (pension included in social transfers)	0.403	0.415	0.476	0.471	0.465
-Gross income, before social transfers (pension excluded from social transfers)	0.332	0.336	0.383	0.375	0.360
Absolute inequality lessening due to redistribution					
Total	-0.107	-0.119	-0.148	-0.151	-0.157
Social transfers contribution, total	-0.088	-0.097	-0.117	-0.118	-0.126
out of which, the contribution of					
- pensions	-0.071	-0.079	-0.093	-0.096	-0.105
- other social transfers	-0.017	-0.018	-0.024	-0.022	-0.021
Tax contribution (income taxes and contribution to social protection schemes)	-0.019	-0.022	-0.031	-0.033	-0.031
As % of total absolute lessening of inequality due to redistribution					
Total	100	100	100	100	100
Social transfers contribution, total	82	81	79	78	80
out of which, the contribution of					
- pensions	66	66	63	64	67
- other social transfers	16	15	16	14	13
Tax contribution (income taxes and contribution to social protection schemes)	18	19	21	22	20
Relative inequality lessening due to redistribution, total (%)	-27	-29	-31	-32	-34

Relative lessening of between-group income inequality due to redistribution (%)

Annex 5

	1995	**2000**	**2006**	**2007**	**2008**
Occupational status of household head	-59	-49	-53	-51	-57
Household with/without employees/ employer	-65	-56	-57	-59	-54
Education of household head	-38	-34	-33	-32	-36
Household type	-37	-37	-47	-46	-48
Urban/rural areas	-36	-27	-30	-30	-31
Region	-14	-18	-25	-25	-27