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Article

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ALINA JĘDRZEJCZAK*

Regional Income Inequalities In Poland And Italy

Abstract

Reducing regional inequality was one of the key means of promoting the “harmonious development” within Europe envisioned in the EEC Treaty of 1957. The pursuit of “economic, social and territorial cohesion” through ever closer regional and national harmonisation was also proclaimed in the 2007 Lisbon Treaty, but deepening European integration has not always been matched with convergence in living standards between sub-national regions. The gap between poorer and richer areas increased during the last economic crisis even in some developed economies, and the income discrepancy between richer and poorer regions is likely to widen further as government-spending cuts disproportionately hurt less prosperous regions.

Regional inequalities can be measured in many ways - the extent of inequality may be mapped in terms of demography, income and wealth, labour markets, and education and skills. The main objective of this presentation is to analyse regional inequalities in terms of household income distribution. The empirical evidence comes from the GUS, Istat and Bank of Italy databases and has been analysed by means of inequality and poverty indices calculated at NUTS 1 and NUTS 2 levels. In order to work out the intra-regional and inter-

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regional contributions to the overall inequality, the Gini index decomposition has been applied. While presenting similar levels of income concentration, Poland and Italy turned out to follow different regional inequality patterns.

Keywords: *income inequality, poverty, inequality decomposition*

1. Introduction

A poll by the BBC in February 2008 suggested that about two-thirds of the population in 34 countries thought that “the economic developments of the last few years” have not been shared fairly. The evidence on income distribution and poverty gathered for OECD countries in the latter part of the first decade of the 2000s confirms that there has been a significant increase in income inequality, which has grown since at least the mid-1980s, and probably since the mid-1970s. This widening gap has affected most (but not all) countries, with large increases recently in Canada, Germany, Italy and Poland, for example, but decreases in Mexico and the United Kingdom. Within the last 25 years income inequalities measured by the Gini index increased by almost 0.03 (see: *Growing Unequal*, OECD 2008; *Divided We Stand. Why Inequality Keeps Rising*. OECD 2011). Analysis conducted by *The Economist* reveals that the gap between poorer and richer regions increased during the last economic downturn in some developed economies and the income gap between richer and poorer areas is likely to widen further as government-spending cuts disproportionately hurt the less prosperous areas (*Regional Inequality*, *The Economist*, March 10th 2011). According to the *Tárki European Social Report* from 2009, a study on the intolerance to income inequality across countries confirmed a markedly lower level of acceptance of inequality in the post-socialist bloc than in other European countries.

Nonetheless income inequality in Poland increased significantly during the process of transformation from a centrally-planned to a market economy - the Gini index went up by approximately 10 percentage points. After the period of rapid economic changes the rate of growth of the Gini index slowed down and now we can observe only slight fluctuations, at about the level 0.34-0.35, according to the Household Budget Survey (HBS) data, and 0.31 according to EU-SILC. In Italy, after the post-war boom accompanied by extremely high income concentration, there was a clear decline in the income inequalities at the end of the 1970s (the Gini index decreased from the level of 0.39 in 1979 to 0.33 in 1990). In contrast, ten years later the Gini index rose dramatically and in 1995 exceeded 0.36. The decline corresponded with a period of economic expansion characterised by liberal policies, whereas the rapid increase coincided with the

striking economic crisis, which nearly led the country to bankruptcy. After 2008, the beginning year of the current financial crisis, inequality in Italy slightly increased again to the level 0.35 in terms of the value of the Gini coefficient. These regularities seem to partially confirm the well-known Kuznets' "inverted-U" relationship between the level of development and income inequality.

For Poland in the early stages of its economic development, increasing inequality was probably a necessary consequence of future growth as the transformation benefits were first concentrated among the wealthiest segments of the population. On the other hand, the Italian example from the 1980s was a good illustration of the right side of the Kuznets curve, typical for developed countries. It is worth noting that the discussion on the possible relationship between GDP and the inequality level, which has been present in the economic literature since the mid- 1950s, has produced very inconclusive results. We can find many countries (e.g. the Czech Republic) where the process of transformation was connected with no substantial inequality growth, while for many developed countries the inequality first declined, then increased again after a tipping point has been reached (e.g.: Italy in the 1990s). Deininger and Squire (1998, pp. 259-287), using their famous panel data on income inequality, did not find any significant relationship between income inequality and the level of development, even when country-effects were included into the analysis. Li, Squire and Zou (1998, pp.26-43) found out that the Kuznets relationship seems to work better in cross-sectional than time-series analyses. However, since income inequality has important implications for a country's development, one would rather look for the level of income inequality (specific for each country) which is optimal from the point of view of economic growth and social welfare (see: Sztaudynger, Kumor 2007, pp. 117-132; Krajewska 2010, pp. 85-116), or concentrate on inequality decomposition analysis.

Even when the data on GDP per capita and the estimates of household income suggest that there are substantial differences in regional income levels across countries, little can be deduced from this about differences within countries and the relative number of people in different regions with income below the poverty line, as defined at the national level. At first glance, in the last few years the income inequalities in Poland and Italy would seem to be the same, as the overall Gini index values are very similar. Nevertheless, the following questions arise: Did the process of growing inequalities over the last few decades affect both these countries uniformly? What can be concluded about the discrepancies between regions? Is the statement "inequality induces poverty" relevant to both these countries?

The increasing amount of micro data available at the regional level (EU -SILC, HBS etc.) makes it possible to examine this issue.

2. Inequality versus poverty

Income inequality refers to the degree of income differences among various individuals or segments of a population. The Gini index is a well-known and widely used synthetic inequality measure usually expressed in terms of the area under the Lorenz curve. In numerous works on income distribution it is considered the best synthetic measure of income inequality, which is mainly due to its statistical properties (see: Yitzhaki, Schechtman 2013 pp.11-31). It has also a clear economic interpretation (e.g. as the average expected gain of the population) and thus has been applied in various empirical studies and in policy research.

It is well known that high income inequality can have several undesirable political and social consequences, such as poverty and the polarization of particular economic groups. Although they are usually perceived as similar and are in fact highly related concepts, inequality and poverty may not always come together. One can imagine a strictly egalitarian distribution of incomes, where all the income receivers are poor, or a highly dispersed population without poverty. Setting aside these theoretical considerations, there is strong empirical evidence based on income data from many countries that confirms a strong positive correlation between inequality and poverty. As a consequence, the countries with a more dispersed income distribution tend to have a higher relative level of income poverty, with only a few exceptions. According to the Eurostat database, the Pearson correlation coefficient between the Gini index and the “at-risk-of-poverty” rate for the EU countries in 2011 was 0.86. However, it is worth mentioning that a few countries (including the United States and the United Kingdom) are traditionally characterized by relatively high income inequalities accompanied by relatively small poverty rates. This can be explained by the fact that the concept of inequality and poverty aversion developed under the social welfare approach (see: Atkinson 1996, pp.15-28). It has been shown that at the regional level the relationship between poverty and inequality can be twofold, depending on the country (see e.g.; *Social Inclusion and Income Distribution in the European Union*, European Commission Report, 2008). For some European countries the correlation is positive (Belgium, Spain, Italy) while for others a negative relationship was observed (Czech Republic, France, Finland, Poland).

The Gini coefficient, estimated using data relating to income for 2009 recorded by a survey on income and living conditions (Eu-SILC), directly comparable at the European level, places Italy (0.312) at a level similar to Poland (0.311) and slightly below Estonia (0.313), Greece (0.329) and Bulgaria (0.332). EU countries are nevertheless characterised by considerable differences. The countries that display the most unequal distributions are Lithuania (0.369), Latvia (0.361), Spain (0.339) and Portugal (0.337). At the opposite extreme, in Slovenia

(0.238), Hungary and Sweden (both 0.241) and the Czech Republic (0.249) the inequality is significantly lower. The estimates of regional characteristics of income distribution in Poland and Italy presented in a paper based on sample micro data coming from Eu-SILC, Polish HBS and Bank of Italy Survey of Income and Wealth. The basic results are contained in Tables 1 and 2.

Among Italian NUTS 2 regions (Table 2; Figs. 3 and 4), Sicilia has the lowest average annual income (22,575 euros, e.g. over 25 percent lower than the average Italian figure). Furthermore, based on the median income in this region 50 percent of households fall below 18,302 euros per year (about 1,525 euros per month). The autonomous province of Bolzano shows the highest average annual household income (35,116), followed by Emilia Romagna (33,827), Lombardia (33,511) and Valle d'Aosta (32,730). At the same time, the highest income concentration is also observed in Sicilia, with the value of the index standing at 0.343, and values above the average national value are also recorded in Calabria and Campania. Conversely, a high degree of income distribution equality is observed in the autonomous provinces of Trento and Bolzano, in Veneto, Umbria and Friuli-Venezia Giulia (see: Itstat, www.istat.it).

Table 1. Statistical characteristics of regional income distributions in Poland (NUTS 1, NUTS 2)

REGIONS GEOGRAPHICAL AREAS	Average income (in thds PLN)	Median income (in thds PLN)	Gini coefficient	At-risk-of- poverty rate (%)
NUTS 2				
Dolnośląskie	3.194	2.641	0.355	15.9
kujawsko-pomorskie	3.000	2.530	0.336	19.2
Lubelskie	2.779	2.260	0.367	30.7
Lubuskie	3.150	2.780	0.310	23.3
łódzkie	2.936	2.459	0.352	17.8
małopolskie	3.152	2.700	0.328	17.7
Mazowieckie	3.866	3.033	0.385	15.0
opolskie	3.052	2.596	0.343	14.7
podkarpackie	2.727	2.366	0.334	24.1
podlaskie	3.115	2.516	0.384	13.4
pomorskie	3.383	2.830	0.350	15.1
śląskie	3.056	2.710	0.310	12.4
świętokrzyskie	2.948	2.489	0.332	23.2
warmińsko-mazurskie	2.901	2.429	0.358	15.1
wielkopolskie	3.341	2.750	0.358	17.6
Zachodniopomorskie	3.067	2.638	0.331	17.4
NUTS 1				
Central	3.554	2.802	0.381	15.9
Southern	3.093	2.700	0.318	14.6

Eastern	2.861	2.395	0.355	24.3
North-Western	3.227	2.723	0.342	18.5
South-Western	3.159	2.630	0.352	15.6
Northern	3.122	2.618	0.348	16.6

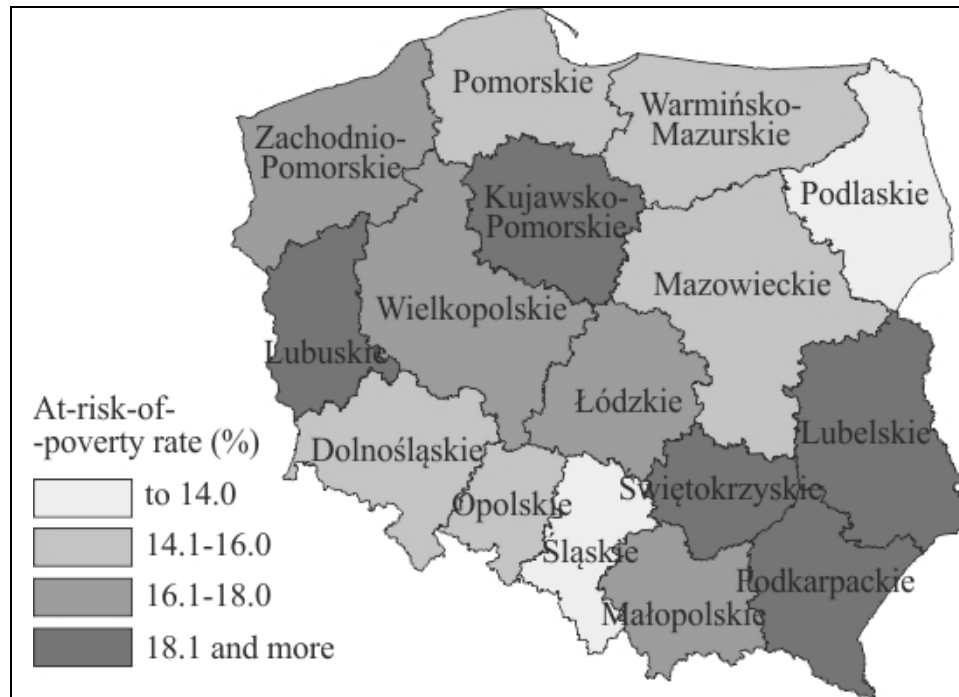
Source: author's own calculations based on micro data from the HBS 2009.

Table.1a. Correlation between regional characteristics of income distribution in Poland

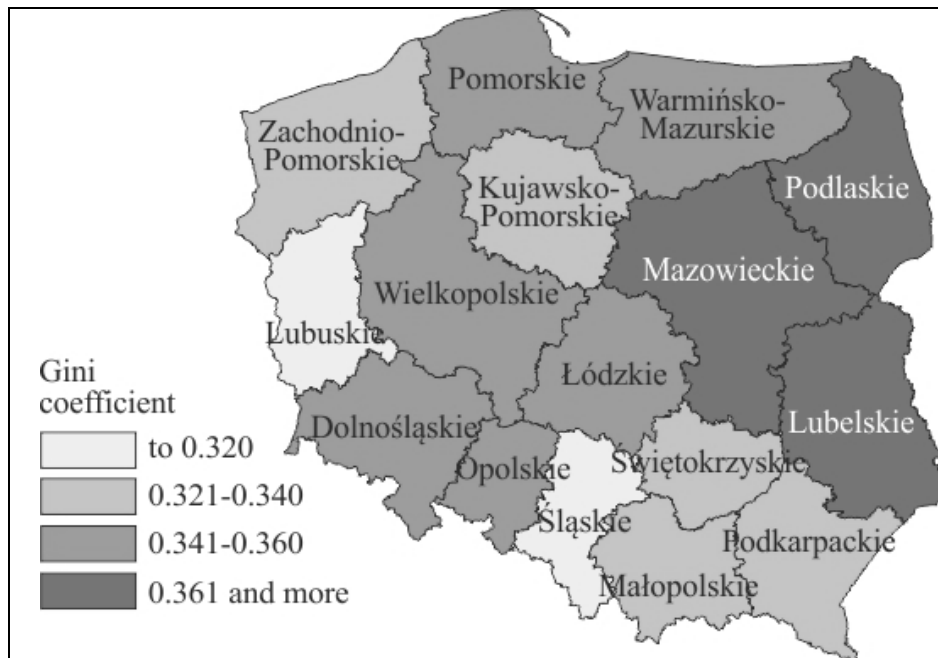
Statistical characteristic	Average income	Median income	Gini index	Poverty rate
Average income	1			
Median income	0.91459	1		
Gini index	0.40153	0.01070	1	
Poverty rate	-0.50876	-0.56911	-0.08145	1

Source: Author's own calculation based on Table 1.

Figure 1. Relatively poor households [in %] by region NUTS 2 in 2009



Source: "Incomes and living conditions of the population in Poland" (Report of EU- SILC 2009), GUS, Warszawa 2012.

Figure 2. Gini inequality coefficient by region NUTS 2 in 2009

Source: author's calculation based on micro data from the HBS 2009.

Table 2. Statistical characteristics of regional income distributions in Italy (NUTS 1 and NUTS 2)

REGIONS GEOGRAPHICAL AREAS	Average income (in euro)	Median income (in euro)	Gini coefficient	At-risk- of- poverty rate (%)
NUTS 2				
Piemonte	2 621	2 145	0.301	5.3
Valle d'Aosta/Vallée d'Aoste	2 728	2 176	0.289	7.5
Lombardia	2 793	2 344	0.301	4.0
Liguria	2 398	1 977	0.283	6.9
Trentino-Alto Adige/Südtirol	2 813	2 464	0.263	7.6
Bolzano/Bozen	2 926	2 519	0.269	9.5
Trento	2 710	2 375	0.255	5.9
Veneto	2 568	2 306	0.257	5.3
Friuli-Venezia Giulia	2 511	2 073	0.271	5.6
Emilia-Romagna	2 819	2 244	0.301	4.5
Toscana	2 575	2 186	0.276	5.3

Umbria	2 474	2 060	0.271	4.9
Marche	2 553	2 203	0.274	8.5
Lazio	2 658	2 181	0.312	6.6
Abruzzo	2 255	1 915	0.274	14.3
Molise	2 178	1 757	0.307	16.0
Campania	2 084	1 743	0.329	23.2
Puglia	2 193	1 815	0.298	21.1
Basilicata	2 077	1 717	0.309	28.3
Calabria	2 042	1 659	0.324	26.0
Sicilia	1 881	1 525	0.343	27.0
Sardegna	2 318	1 914	0.277	18.5
NUTS 1				
North-west	2 701	2 254	0.299	4.7
North-east	2 682	2 255	0.279	5.2
Centre	2 667	2 173	0.292	6.3
Centre-north	2 603	2 224	0.293	5.3
South and Islands	2 083	1 717	0.319	23.0

Source: Istat, on the basis of the micro data from EU-SILC 2009.

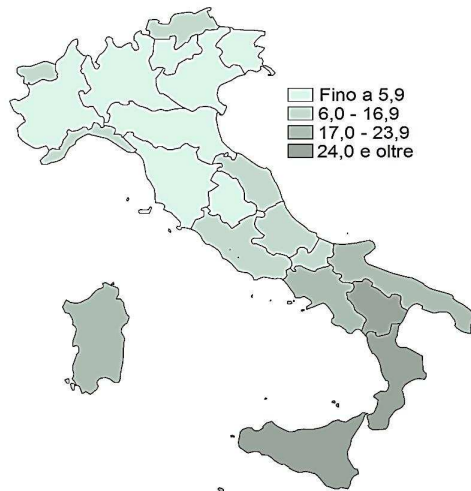
Table 2a. Correlation between regional characteristics of income distribution in Italy

Statistical characteristic	Average income	Median income	Gini index	PovertyRate
Average income	1			
Median income	0.99112	1		
Gini index	-0.60330	-0.69892	1	
Poverty rate	-0.88619	-0.86181	0.63419	1

Source: author's own calculation based on Table 2.

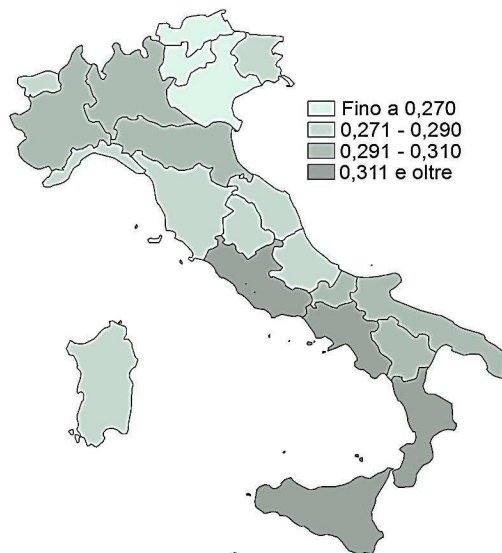
In Poland (Table 1; Figs. 1 and 2), the lowest median income was observed in *lubelskie*, where 50 percent of households fall below 2,260 PLN per month), while the most affluent region was *mazowieckie*, with its highest values of both average (3,866 PLN) and median income (3,033 PLN). Contrary to the Italian case, maximum inequality was recorded not only in the poorest but also in the most affluent regions. In particular, the Gini index estimate was high not only in relatively poor voivodships such as *podlaskie* (0.384) and *lubelskie* (0.367), but also in the wealthy voivodship of *mazowieckie* (0.385), where the highest Gini value was recorded. This situation is quite untypical and could be the result of the rapid economic growth in some regions (e.g. *mazowieckie*) that took place in the transformation period (see for example: Krajewska 2010, pp. 85-116).

Figure 3. Relative poor households by region in 2009 (percentage values)



Source: Istat: EU-SILC 2009.

Figure 4. Income distribution inequality by region in 2009 (Gini coefficient on net household income excluding imputed rent)



Source: Istat: EU-SILC 2009.

Similarly to the differences between mean and median incomes, there are wide variations in the proportion of the population at risk of poverty between regions in both countries, measured in the conventional way, i.e. as those with equivalised income below 60% of the national (rather than the regional) median (Tables 1 and 2; Figs. 2 and 4). In Poland, the regions with a high inequality level contain a relatively low percentage of people living below the poverty threshold and the correlation between the Gini index and at-risk-of poverty rate is slightly negative (Tables 1 and 1a). By contrast in Italy the poor provinces - Sicilia, Calabria, Sardegna, Puglia, Campania and Basilicata – contain the highest proportions of poor households (Tables 2 and 2a). It is worth mentioning that many Italian provinces placed in the north of the country show a negligible incidence of poverty, such as Lombardia (where the at-risk-of-poverty rate is only 4%), followed by Emilia Romagna (4.5%). In consequence, the correlation between the poverty rate and the Gini index is high and positive, taking the value of 0.63.

3. Inequality decomposition

In the analysis of income inequality it may be relevant to assign inequality contributions to various income components (such as labor income or property income) or to various population subgroups associated with various socio-economic characteristics of individuals (age, sex, occupation, composition of their household, ethnic groups, regions etc.). Such an approach can be useful to help social policy makers better understand the influence of various socio-economic determinants on income levels and income inequality. When a country has been partitioned into regions according to some criterion, one common application of inequality measurement is evaluation of the relationship between inequality in the whole country and inequality in its constituent regions, in order to work out the intra- and the inter-regional contributions to the overall inequality. The differences between regions are often not as great as the disparities within them. It is worth mentioning that poor people in regions with a high mean income and a wide income distribution (high inequality) can have a lower living standard than poor people in regions with a lower mean income but more equal distribution.

The most widespread approach to the group decomposition of the Gini index was given by Dagum (1997, pp. 515-531; Dagum, 2008, pp. 131-160) and is based on the concept of economic distance between distributions and relative economic affluence (REA). It takes into account different variances and asymmetries of income distributions in subpopulations and makes an important contribution to the understanding of the overlapping term.

The Gini index of inequality is usually defined by means of a geometric formula since it can be expressed as double the area between the Lorenz curve and the straight line called the line of equal shares. The Gini index can also be seen as a relative dispersion measure when expressed by means of the mean difference Δ , a dispersion measure which is defined as the average absolute difference between all possible pairs of income observations. This concept can be called a statistical approach and was introduced by Gini in 1912. It was subsequently used by many authors to derive various Gini index decompositions, but the most interesting and informative decomposition by subpopulations was undoubtedly that proposed by Dagum (1997, pp. 515-531). The starting point for this decomposition was the Gini index formula based on the Gini mean difference, extended to the case of a population divided into k subpopulations (groups):

$$G = \frac{\Delta}{2\bar{Y}} = \frac{\sum_{r=1}^n \sum_{i=1}^n |Y_i - Y_r|}{2n^2\bar{Y}} = \frac{\sum_{j=1}^k \sum_{h=1}^k \sum_{i=1}^{n_j} \sum_{r=1}^{n_h} |y_{ji} - y_{hr}|}{2n^2\bar{y}} \quad (1)$$

The Gini index expressed in terms of the Gini mean difference can also be generalized for a two-population case, measuring the between-populations (or intra-groups) inequality. Thus the extended Gini index between groups j and h can be written as follows:

$$G_{jh} = \frac{\Delta_{jh}}{\bar{Y}_j - \bar{Y}_h} = \frac{1}{\bar{Y}_j - \bar{Y}_h} \sum_{i=1}^{n_j} \sum_{r=1}^{n_h} |y_{ji} - y_{hr}| / n_j n_h \quad (2)$$

where: Δ_{jh} - mean difference modified for two income distributions.

The Gini index for a population of economic units partitioned into k subpopulations of sizes n_j ($j = 1, \dots, k$), can be expressed as the weighted sum of the extended Gini ratios (eq. 2) weighted by the products of the j -th group population share p_j and the h -th group income share s_h . Using the symmetry properties of G_{jh} and Δ_{jh} the Gini index can be decomposed into two elements: the **within** G_w and **gross-between** G_{gb} inequality:

$$G = \sum_{j=1}^k G_{jj} p_j s_j + \sum_{j=2}^k \sum_{h=1}^{j-1} G_{jh} (p_j s_h + p_h s_j) = G_w + G_{gb} \quad (3)$$

where: $G_{jj} = \frac{\Delta}{2\bar{y}_j} = \frac{1}{2\bar{y}_j} \sum_{r=1}^{n_j} \sum_{i=1}^{n_j} |y_{ji} - y_{jr}| / n_j^2$ is the Gini index for the subpopulation j , \bar{y}_j - mean income in group j , n_j - frequency in group j .

The formula for G_{gb} given above suggests the possibility of further decomposition of the Gini index by subgroups. The contribution of gross between-groups inequality can be divided into two separate parts: the first one consistent with the differences between the mean incomes and the remaining part, called “transvariation” (*transvariazione*). Such a decomposition enables to analyse and to interpret income inequality in a population partitioned into subpopulations more precisely. Finally, the total Gini ratio of a population of size n divided into k subpopulations can be decomposed as follows:

$$G = G_w + G_b + G_t$$

G_w – the contribution of **within-groups inequality** to the Gini index (see; eq. 3),

G_b – the contribution of **net between-groups inequality** to the Gini index, which can be given by the following formula:

$$G_b = \sum_{j=2}^k \sum_{h=1}^{j-1} G_{jh} (p_j s_h + p_h s_j) D_{jh} , \quad (4)$$

G_t – the contribution of “**transvariation**” to the Gini index which can be written as:

$$G_t = \sum_{j=2}^k \sum_{h=1}^{j-1} G_{jh} (p_j s_h + p_h s_j) (1 - D_{jh}) \quad (5)$$

where: D_{jh} – “economic distance” ratio (Dagum, 1980, pp. 1791-1803).

The basis for the inequality decomposition presented in this paper was the micro data coming from the Household Budget Survey (HBS) conducted by the Central Statistical Office of Poland (GUS) in 2009. The data obtained from the HBS allow for the detailed analysis of the living conditions in Poland, being the basic source of information on the revenues and expenditure of the population. In 2009 the randomly selected sample covered 37,302 households, i.e. approximately 0.3% of the total number of households. The adopted sampling scheme was a geographically stratified and two-stage one, with different selection probabilities at the first stage. The estimation of inequality measures and their components incorporated “survey weights” based on inverse inclusion probabilities calculated for each household. In order to maintain the relation between the structure of the surveyed population and the socio-demographic structure of the total population, the data obtained from HBS were weighted with the structure of households by number of persons and class of locality, coming from Population and Housing Census 2002.

The inequality analysis (Table 3) was carried out after dividing the overall sample by NUTS 1 regions, constructed according to the Eurostat classification. The variable of interest was a household's available income, which can be considered as the basic characteristic of its economic condition. It is defined as the sum of households' current incomes from various sources, reduced by prepayments on personal income taxes made on behalf of a tax payer by a tax-remitter (this is the case of income derived from hired work, social security benefits, and other social benefits); by tax on income from property; taxes paid by self-employed persons (including professionals and individual farmers), and by social security and health insurance premiums. A similar calculation for Italy has been conducted by Costa (2009, pp. 229-241) on the basis of the database: Survey of Income and Wealth, Bank of Italy (Table 4).

The decomposition of the Gini index presented in Tables 3 and 4 takes into account the splitting up into several NUTS 1 administrative regions, separately for Poland and Italy. The results of the calculations can assist in answering the questions: To what extent do particular regions contribute to the overall income inequality? What is the contribution of inter-regional differences? Do the NUTS1 regions in both countries constitute separate or overlapping groups?

Table 3. Inequality decomposition in Poland by NUTS 1 regions

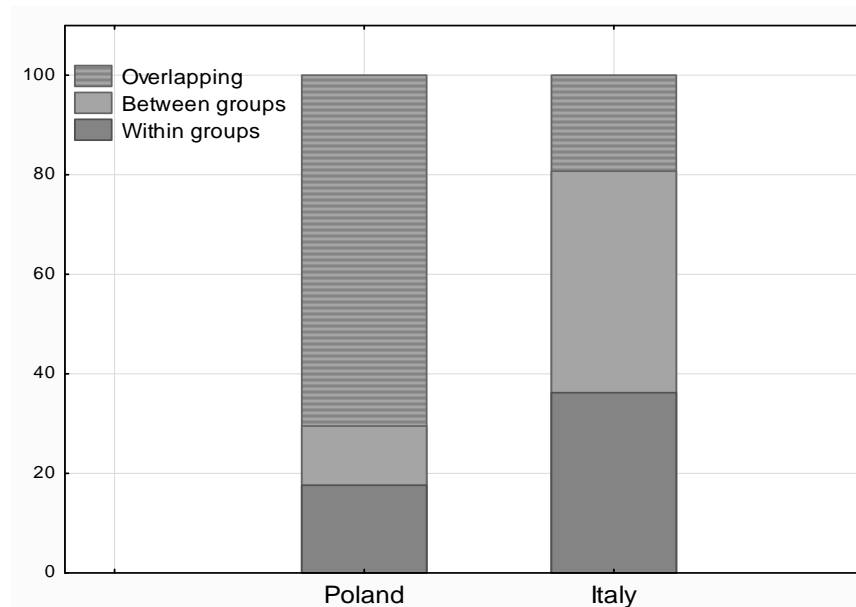
Measure	Region of Poland						Total
	Central	Southern	Eastern	N-Western	S-Western	Northern	
Mean income [1000zł]	3.554	3.093	2.861	3.227	3.159	3.122	3.186
Population share p_i	0.218	0.208	0.168	0.154	0.107	0.145	1
Income share s_i	0.243	0.202	0.151	0.156	0.106	0.142	1
Gini index G_i	0.381	0.318	0.355	0.342	0.352	0.348	0.352
Within-groups term (D)	0.020	0.013	0.009	0.008	0.004	0.007	0.062
Between-groups term (D)							0.042
Overlapping term (Gini transvariation) (D)							0.248

Source: author's own calculations based on the HBS data, GUS 2009.

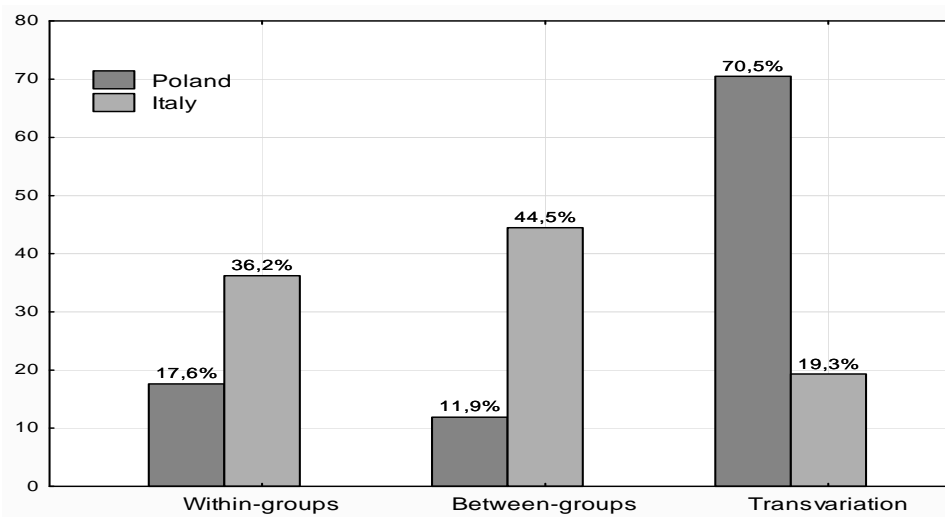
Table 4. Inequality decomposition in Italy by NUTS 1 regions

Measure	Region of Italy			Total
	North	Center	South	
Mean income \bar{y}_i [euro]	2781	2748	1788	2456
Population share p_i	0.477	0.203	0.320	1
Income share s_i	0.540	0.227	0.233	1
Gini index G_i	0.337	0.323	0.348	0.353
Within-groups term (D)	0.087	0.015	0.026	0.128
Between-groups term (D)				0.157
Overlapping term (Gini transvariation) (D)				0.068

Source: Costa (2009, pp.229-241), based on: Survey of Income and Wealth, Bank of Italy, 2004.

Figure 5. Inequality decomposition by regions in Poland and Italy

Source: author's calculations based on Tables 3 and 4.

Figure 5. Shares [in %] of inequality components in Poland and Italy

Source: author's calculations based on Tables 3 and 4.

The within-group component reflects the inner polarization of different groups of households: households of self-employed; households of employees (managers, office workers, blue-collar workers, school teachers etc.); households of not employed (retirees and pensioners); households of other not employed (mainly unemployed); and households of farmers. Income polarization within regions gives rise to remarkable differentials in average income between managers and blue-collar workers within the group of employees, between entrepreneurs and the others within the group of self-employed, and between retirees and pensioners. In Poland the within-group contribution to overall income inequality is rather small and equals 17.6%, in contrast to Italy, where the discrepancies within regions account for 36.2% of all income differences. According to formula (3), the contributions of within-group components depend on the Gini index among the households of each group, and on income and population shares of the group in relation to the total population of households. Because of the very small income and population shares, the income disparities among smaller regions (*South-western* in Poland and *Central* in Italy) weigh only slightly on the total inequality. The region with the highest share (6%) in the overall Gini index in Poland is definitely the *Central* region, presenting the highest values of the Gini index (0.381) as well as of income and population shares. In Italy, the inequalities within the most affluent *North* region contribute 25% to the total Gini index, which reflects similar regularities, except for the fact that the Gini index for Italian *Northern* provinces is rather intermediate (0.337).

Turning to the inequality between regions (eq. 4), the net between-group component of the Gini index contributes only 11.9% of the overall income inequality in Poland, while the “transvariation” component (eq. 5), describing the overlapping of the subpopulations, accounts for the remaining 70.5 % of this measure (Table 3; Figs.: 5, 6). Thus, the reasons for income differences mentioned above are located mainly within regions, which are relatively similar to each other. Nevertheless the discrepancies between regions of Poland (mainly between western and eastern ones) are significant, which can be easily noticed in Figures 1 and 2, but slightly underestimated due to the negative correlation between the Gini indices and the mean incomes.

In Italy the situation is quite opposite - the main component of the overall income inequality is the between-region one, which accounts for 44.5% of all income differences, leaving the “transvariation” term quite small 19.3% (Table 4; Figs.: 5, 6). This is because of huge disparities between the North and South, which began in the 1980’s as a consequence of the second oil crisis, and even increased both during the economic crisis of 1992 and the crisis of 2008.

The empirical evidence demonstrates that the pattern observed for the Italian case persists at the local level, with the Southern regions more affected by the national economic condition than the rest of the country. The regional income disparities in Poland are rather small: the between regions inequality is only 1/10 of the total Gini. The substantial contribution of transvariation is evidence of the notable overlapping of income distributions for NUTS1 regions. In analyzing the problem more thoroughly one can observe differences between the basic statistical characteristics of regions (mean and median incomes) measuring the relative economic affluence of one region with respect to another (Table 1). It can be easily noticed that only the *Central* region is significantly more affluent than the others. As a result, the transvariation component is dominated mainly by the overlap between the distributions of the *Central* region and the other regions. The highest distance between the means was observed for the *Central* and *Eastern* regions. The Gini ratios and means within regions do not differ significantly, so the contributions of particular subpopulations to overall inequality are determined mainly by their sizes.

It is worth mentioning that the main source of income inequality in Poland are wages and salaries, which have the biggest influence on the overall inequality measurement. The contribution of this factor to the total Gini index is about 60%. In contrast to wages and salaries, the contribution of other income components which are negatively correlated with the total income, such as pensions and social benefits, can be negative, and income increases within these income sources can reduce overall inequality. Such a situation was observed in Poland (Jędrzejczak, 2010, pp. 109-123), and is partially connected with the defective system of social

assistance and social transfers (Aksman, 2008, pp.1-6). Moreover, a large share of pensioners can paradoxically reduce the Gini index value as this income component makes a substantial contribution to the total household income in Poland (about 30%), and presents a relatively small level of inner concentration.

4. Conclusions

The empirical evidence presented in this paper enables the detailed analysis of income distributions in Poland and Italy. In particular, the household income disparities have been verified from the point of view of inequality decomposition by region. Moreover, the relationship between poverty and inequality in regional distributions has been considered in order to characterise national inequality patterns. The analysis, based on the Dagum group decomposition of the Gini inequality coefficient, helped to formulate several conclusions.

- Income inequality in Poland and Italy followed different patterns across regions.
- In Italy the poorest regions are usually also those with the highest income inequality, as measured by the Gini index.
- Contrary to the Italian case, maximum inequality in Poland was recorded not only in the poorest but also in the most affluent regions.
- In Poland the regions with a high inequality level contain a relatively low percentage of people living below the poverty threshold, and the correlation between the Gini index and at-risk-of poverty rate is slightly negative.
- By contrast, the correlation between the poverty rate and the Gini index in Italy is high and positive.
- In Italy the basic contribution to the overall income inequality is due to inter-regional discrepancies which account for almost half of all income differences.
- In Poland, the reasons for major income differences are located mainly within regions, which are relatively similar to each other.

These results can be helpful for social policy-makers in making policy decisions concerning the reduction of income inequality and poverty (which may not always go hand-in-hand). One should be conscious, however, that the more the income distribution varies between regions, the greater is the risk to social cohesion, even if inequalities at the national level are kept within bounds.

References

- Atkinson, A.B. (1996), *Income distribution in Europe and the United States*, Oxford Review of Economic Policy, 12.
- Aksman E. (2008), *Koncentracja i regresywność świadczeń społecznych*, Polityka Społeczna 2.
- Costa M., (2009), *Transvariation and Inequality Between Subpopulations in the Dagum's Gini Index Decomposition*, METRON - International Journal of Statistics, vol. LXVII, 3.
- Dagum, C. (1980), *Inequality Measures Between Income Distributions with Applications*, Econometrica 48(7).
- Dagum, C.,(1997), *A New Approach to the Decomposition of the Gini Income Inequality Ratio*. Empirical Economics, 22.
- Dagum, C., (2008), *Inequality decomposition, directional economic distance, metric distance, and Gini dissimilarity between income distributions*. In: Betti, G., Lemmi, A. (Eds.), *Advances on Income Inequality and Concentration Measures*. Routledge, London.
- Deininger, K. and Squire, L., (1998), *New Ways of Looking at Old Issues: Inequality and Growth*, Journal of Development Economics, 57(2).
- Jędrzejczak A. (2010), *Decomposition Analysis of Income Inequality in Poland by Subpopulations and Factor Components*, Argumenta Oeconomica, 1(24).
- Krajewska A. (2010), *Wzrost zróżnicowania dochodów w Polsce. Przyczyny i konsekwencje*, Gospodarka Narodowa 7-8.
- Li, H., Squire, L. and Zou H., (1998), *Explaining International and Intertemporal Variations in Income Inequality*, Economic Journal 108.
- Sztaudynger J., Kumor P., (2007), *The Optimal Inequality of Earnings- The Econometric Analysis*, Comparative Economic Research 1/2.
- Yitzhaki S., Schechtman E. (2013), *The Gini Methodology*, Springer, New York.

Streszczenie

ROZKŁAD NIERÓWNOŚCI WEDŁUG REGIONÓW W POLSCE I WE WŁOSZECH

Redukcja różnic między regionami Europy była głównym celem polityki "zrównoważonego rozwoju", której założenia znalazły się już w tzw. Traktatach Rzymskich (1957). Postępujący proces integracji europejskiej tworzył wciąż nowe instrumenty i inicjatywy (tzw. mechanizmy solidarności), wyrażające dążenie do niwelowania ekonomicznej i społecznej nierównowagi między regionami. Okazało się jednak, że różnice

między regionami biednymi i bogatymi w wielu krajach wcale się nie zmniejszają, a spowolnienie gospodarcze spowodowało odwrócenie pozytywnych tendencji nawet w krajach relatywnie najbardziej rozwiniętych.

Różnice między regionami (NUTS -Nomenclature of Territorial Units for Statistics) można mierzyć z punktu widzenia rozwoju demograficznego, poziomu dochodów i zamożności, sytuacji na rynku pracy, edukacji itp. Głównym celem prezentacji jest analiza porównawcza różnic regionalnych w Polsce i we Włoszech, biorąc pod uwagę rozkłady dochodów gospodarstw domowych. Parametry tych rozkładów, a w szczególności miary nierówności i ubóstwa, oszacowane zostały dla jednostek terytorialnych na poziomie NUTS 1 i NUTS 2 na podstawie danych pochodzących z badań reprezentacyjnych prowadzonych przez GUS, Istat oraz Bank of Italy. Przeprowadzono następnie analizę wpływu różnic między regionami oraz różnic wewnątrz regionów na całkowitą nierównomierność rozkładu dochodów w każdym z analizowanych krajów, wykorzystując do tego celu dekompozycję współczynnika Giniego według podpopulacji. Pozwoliło to na wykrycie istotnych różnic w rozkładzie nierówności dochodowych w Polsce i we Włoszech, mimo zbliżonego poziomu współczynnika Giniego.

Słowa kluczowe: nierówność dochodu, ubóstwo, rozkład nierówności