Income Inequality in Nations and Sub-national Regions, Happiness and Economic Attitudes

Krzysztof Zagórski and Katarzyna Piotrowska
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Abstract

Impact exerted by income inequality on happiness and etatist (interventionist) versus liberal (pro free-market) economic attitudes are analyzed. Income inequality in different countries reduces happiness, understood as public satisfaction with material standard of living and with life as a whole. The results suggest also that income inequality, measured by GINI coefficients, calculated for representative samples of both sub-national (regional) and national populations, decreases public support for saving on social programs and increases public support for economic intervention by the governments. Two kinds of multi-level regression analysis (individual and national as well as individual and regional) bring similar results in this respect.
1. Background, research problems and hypotheses

The aim of this article is three-fold: (1) to contribute to earlier studies on influence of income inequality on happiness, (2) to analyze effects of this inequality on the attitudes concerning free-market and governmental intervention, (3) to prove that income inequality measured by GINI coefficients for representative samples of sub-national regions’ populations can be used as explanatory variable in social research. Thus, the article concerns the consequences of income inequality for subjective feelings and attitudes rather than the determinants of inequality. Our intended contribution to income inequality studies consists of the analysis of subjective well-being and economic attitudes as determined by inequality measured at national and, especially, regional levels.

Recent economic crisis has reinforced social scientists’ interest in the consequences of growing inequality. Joseph Stiglitz, the winner of Nobel Prize in economics, gave his newest book “The Price of Inequality” a subtitle “How Today’s Divided Society Endangers our Future” and stressed that “...as our economic system is seen to fail for most citizens, and as our political system seems to be captured by moneyed interests, confidence in our democracy and in our market economy will erode…” (Stiglitz, 2012, p.xii). The erosion of this confidence can be understood and operationalized in terms of general dissatisfaction with life (unhappiness) as well as in terms of negative public attitudes to particular aspects of free market and as postulates to increase the governmental intervention. Such feelings and attitudes may be instigated or strengthened by inequality. Linking individual’s satisfactions and attitudes to social (income) inequality implies investigating their determination not only by individuals’ characteristics and conditions but also by conditions of the society, community or social groups, to which the individuals belong (Van Praag & Ferrer-i-Carbonell, 2009). This may be accomplished in a theoretical framework of the reference group theory.

So many econometric and sociological analyses of determinants of income inequality have been conducted that it is impossible to offer a complete list even of most important ones. Less econometric work has been devoted to the determinants of subjective (perceived) inequalities (Ferrer-i-Carbonell & Van Praag, 2003), though social scientists tackle this problem in a their research of egalitarian versus non-egalitarian attitudes, public demands for redistribution and social justice (Hochschild, 1981; Kluegel & Smith, 1986; Kelley & Evans, 1993; Kluegel et al., 1995; Marshall et al., 1999; Orkeny & Szekelyi, 2000; Gijsberts 2002; Kelley & Zagorski, 2005; Osberg & Smeeding, 2006; Lubker, 2007; Kenworthy & McCall, 2008; Toth & Keller, 2011; Loveless & Whitefirdl, 2011).

We are more interested in consequences of inequality than in its determinants. It is assumed that the greater the inequality is, the stronger will be the preferences for various redistributive policies executed by the state (Lubker, 2007). The interrelations between income inequality and public attitudes are analyzed here with application of a mixed level research method. We use individual, country and regional level data. While macro-regional differences in inequality have been widely analyzed and discussed, especially those concerning the countries treated as macro-regions, they have engendered remarkably little theoretical discussion (Mann & Riley, 2007). Much less theoretical discussion and empirical research have concerned
inequality in sub-national regions. Our intention is to reduce this gap a bit. The first assumption of our analysis is that satisfaction and attitudes are shaped not only by an individual’s personal situation, material conditions included, but also by individual’s perception of situation of other people, especially those who constitute the so called reference groups. Our second assumption is that income inequality in the reference group influences individuals’ satisfactions and attitudes.

Reference group theory, formulated by Merton (1968) and further developed by many sociologists, can be used in social and economic research on life satisfaction and attitudes both as a framework for formulating research hypotheses and as a basis for interpreting the results. For an overview of this theory and its applications see Hyman and Singer (1968). For a brief rationale of its use in sociological research on relations between material conditions and satisfaction see Zagórski (2005) and Zagórski et al (2010). Its statistical operationalization and application in analyses concerning life satisfaction determinants was best presented by Van Praag and Ferrer-i-Carbonell (2008). The theory claims that the individuals evaluate their personal situation in comparison to the situation in their reference group, i.e. the group chosen as a benchmark. Thus, we assume that income inequality in reference group, especially such group to which the individuals belong, influences their feelings and opinions.

There are some serious problems in practical application of reference group theory in sociological and economic research. Theoretically, everybody may have one’s own specific reference group or groups, to which the personal situation is compared and which constitute one’s own individually significant social context. It would be practically impossible, or very difficult at least, to define reference groups specific for each individual separately and to use the attributes of such groups as explanatory variables in social research conducted on large representative samples of total populations. Thus, some researchers simply ask their respondents, to which group - out of a few a priori enumerated - they compare themselves (Sagi, 2012). While interesting per se, such an approach makes joint contextual analysis impossible. Thus, one has to try to predetermine the reference group for the investigated population. Van Praag and Ferrer-i-Carbonell (2009) have listed several possibilities in this respect, one of them is to define the reference group as a group to which all investigated persons belong, such as a whole nation, a regional population or a community.

We have proved in an earlier study that sub-national regions of different administrative levels, as well as functionally delineated metropolitan regions, constitute good units for statistical analyses of the relations between material conditions, life satisfaction and material satisfaction in Poland (Zagorski, 2011). A study by Kangas and Ritakallio (2007) has proved usefulness of measuring relative poverty in various European regions and interpreting the results in terms of social inequality. The relation between the risk of poverty and income distribution at the regional level was also analyzed by Ward (2007). The present analyses concern income inequality measured at both a country level and a sub-national administrative regional level in many countries. We assume that both the nation and the regional population, to which the individuals belong, may be treated as their reference groups influencing satisfaction and opinions.
The second difficulty is related to the question, whether the dominant impact of inequality on various dependent variables is exerted by the actual (real) inequality or by the perceived one or by both of them independently. Loveless and Whitefield (2011) have documented a very low, if not negligible, correlation between actual inequality in different countries and the assessment of this inequality by the citizens. They have measured the perceived inequality on a scale from “Too much social inequality” through “About the right amount of social inequality”, and “Not enough social inequality” to “No or almost no social inequality”. Since the same amount of inequality may be evaluated as “too much” in one country and “too little” in another, the factual (objectively measured) inequality may show stronger correlations with other dependent and independent variable than such subjective evaluations. GINI coefficient based on statistical data constitutes one of the best objective measures of actual income inequality. The “in-between” solution would to ask the respondents, as it is done in some sociological surveys, how much the representatives of various rich and poor socio-occupational groups earn on average in the country and then to compare high and low earners. Another solution would be to ask the respondents, how many rich and poor people exist in a country or how the respondents visualize the existing social pyramid or a ladder. In this article, we use GINI coefficients to measure income inequality in nations and in sub-national regions. We do not analyze the relations between actual inequality and its perceptions or evaluations.

Egalitarian attitudes and preference for redistribution can be interpreted in terms of dissatisfaction with income inequality. If too much inequality instigates egalitarian attitudes and creates demands for governmental redistributive policies, it may also create demands for other forms of state interventionism. The impact of inequality on attitudes depends on a perception of inequality that may differ from the reality, as well as on the accepted value system (e.g. egalitarian, paternalistic, liberal, meritocratic etc.), and on the individual’s self-interest (Kenworthy and McCall, 2008). It is also strongly moderated by individual’s expectations of possible promotion – a mechanism called “tunnel effect” or “hope factor” (Hirschman, 1981; Zagorski, 1994; Grosfeld & Senik, 2010). The actually existing inequality must be added to the list of determinants of the attitudes. The actual economic inequality may affect economic behavior by delineating potential possibilities and limitations, and indirectly influencing the attitudes through them. We have no data available for the present analysis on perceived inequality, thus – following the last assumption - we must limit our task to finding and measuring the influences of actual inequality on satisfactions and opinions.

Based on the above discussion, we offer four hypotheses to be verified by our analysis.

_Hypothesis 1._

The greater is income inequality, the lower is individuals’ satisfaction with income and with life and the stronger is public demand for governmental intervention in the economy.

Income inequality is sometimes treated as the source of almost all possible social ills, including poor health, short life expectancy, low social trust, low status of women, mental disorders, homicides, low social mobility, teenage pregnancies, illiteracy, alcoholism, drug abuse, crime, obesity and even unwillingness to recycle the waste (Wilkinson & Pickett, 2010), though some analyses prove that such claims are often
exaggerated, if not false, and may be ridiculed as “a new left theory of everything” (Snowdon, 2010). The ongoing discussion seems to prove at least the correctness of the bright observation by one of the opponents mentioned above that “…While natural scientists do not have to convince individual cells or atoms to accept their theories, social theorists are up against a plethora of individual views and powerful vested interests…” of those who constitute subject of their research (Wilkinson & Pickett, 2010, pp x-xi).

Regardless of whether perceptions of income inequality as a source of all social ills are accurate or exaggerated, one truth is widely accepted since the publication of a milestone paper by Alesina, Di Tella and MacCulloch (2004), namely that income inequality negatively affects life satisfaction. Subsequent study by Graham and Felton (2005), discussed by Van Praag and Ferrer-i-Carbonell (2009, p. 374), suggests the curvilinearity of this relationship, in Latin America at least. People from both low and high inequality countries are less happy than those from moderate inequality countries, though high inequality is still linked to less satisfaction than low inequality. Furthermore, Seidl, Traub and Morone (2005) have demonstrated that not only inequality in general, but the shape of income distribution influences the satisfaction. An average income satisfaction is highest for positively skewed income distribution and lowest for negatively skewed income distribution, though if a population is divided into different income size categories, each category is satisfied more when income distribution is negatively skewed. This spurious paradox is caused by different numbers of people in richer and poorer groups.

Analyzing aggregate data at the national (country) level in Europe and at the state level in the USA, Alesina et al. (2004) concluded that inequality has a stronger negative effect on happiness in Europe than in the USA. However, this conclusion stems from a comparison of somewhat different observation units. Whole nations constituted observation units in Europe, and they were compared to sub-populations (state populations) in the USA. One can assume that inequality in the American society as a whole is politically and psychologically more important for Americans than inequality in their states of residence. Since there is no evidence in this respect, one can also assume the opposite situation, namely a stronger influence of inequality in the states, where people live and gather their personal experience, than in their whole nation. Irrespective of that, American States are not functional equivalents of European nations, so one of main methodological rules concerning comparative research was not observed by Alesina et al. That does not affect their main general conclusion that inequalities reduce happiness. However, if the influence of inequalities is stronger when inequalities concern the whole American nation than when they concern the states’ populations, the conclusion that this influence is stronger in Europe than in the USA may be not correct or the differences between the two may be much smaller than claimed to be. In the opposite situation, the difference between the USA and Europe may be even greater than assessed by Alesina et al.

Thus, it might have been better to compare the USA as a whole to individual European nations. Social and

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1The counterargument may be that, given its scale, complexity and federal political system, the American nation cannot be compared to European nations at all. However, we believe in the wisdom of many economists and sociologists who have compared the American society as a whole to other societies.
psychological consequences of inequalities in American states should perhaps be better compared to consequences of inequalities in such European regional units like German federal lands.

We do not intend to verify the findings concerning the differences between Europe and the USA, since we have no available evidence supporting the claim that inequalities in American states are more (or less) important for shaping peoples’ happiness than inequalities in the whole American nation. However, seeing the potential problem, we wish to analyze the impact exerted on social attitudes by inequalities existing in different regions of European countries and – separately - in their whole societies. Two opposite hypotheses can be formulated in this respect.

Hypothesis 2.
If people react to inequality on the basis of their personal experience and everyday perceptions, their satisfactions and attitudes are influenced more by income inequality in their region of residence, which may directly influence their life situation, than by inequality in the whole nation.

Hypothesis 3.
If people react to inequality on the basis of economic and other news concerning mainly their country as a whole, inequality in their nation have a stronger impact on their attitudes and satisfactions than inequalities in sub-national, regional units have.

Unfortunately, our data do not allow to compare the consequences of income inequality in nations to the consequences of inequality in regions. There are too few nations for which regional data are available to conduct the analysis at both aggregate levels for the same number of nations. Thus, we have to leave the hypotheses 2 and 3 to be verified by further research. Practical consideration forces us to formulate more modest hypothesis concerning the relation between inequality and economic attitudes. Several studies instigated and coordinated by GINI Project in the frame of Network on Income Distribution and Living Conditions have provided a good base for such a hypothesis (Ward et al 2009, Van de Werfhorst et al 2012). These studies have documented inter alia that income inequality negatively influences political attitudes and political and social participation depending on these attitudes (Lancee & van de Werfhorst 2011, Horn, 2011). Inequality is also reducing social solidarity (Paskov & Devilde 2011), decreasing tolerance and social trust (Stein & Lancee 2011), though this relation differs between rich and poor countries, increasing authoritarian acceptance of obedience (Carneo 2011) and instigating anti-globalist attitudes (Burgon 2011). The fact that income inequality influences socio-political attitudes and that it reinforces redistributive demands (Toth & Keller 2011) provide a good rationale for the hypothesis that it also influences the attitudes to various forms of economic intervention by the government.

Hypothesis 4.
Economic attitudes, particularly those concerning governmental intervention, are significantly influenced by income inequality measured both at national and regional aggregate levels. Public in more unequal countries and regions tend to have more etatist attitudes.

Our hypotheses assume not only that income inequalities reduce life satisfaction or satisfaction with material living conditions but also that they influence public attitudes toward the economic and political
system. While we are unable to determine whether income inequalities in nations or in regions are more important in this respect, we wish to document that they influence the satisfactions and the attitudes in a similar way.

According to the well-established research tradition (e.g. Veenhoven, 1989; Easterlin, 1995; Van Praag & Ferrer-i-Carbonell, 2009; Zagórski, 2011), we treat life satisfaction and income satisfaction as two aspects of subjective well-being or happiness.

Van Praag and Ferrer-i-Carbonell (2009) have concluded their contribution to “The Oxford Handbook of Economic Inequality” (Salverda et al, 2009) with a very modest statement that “…although the happiness literature is still in its early years, it is entirely possible to add a happiness or satisfaction dimension to inequality studies” (p. 379). We would like add an attitudinal dimension to these studies. Since this is socially important, heuristically interesting, and practically possible, it should be done.

We will begin our empirical analysis by supporting Alesina’s findings that the relations between income inequality and satisfaction with material standard of living as well as with life in general are negative, though our main task will be to subsequently extend these considerations by analyzing the relations between inequality and economic attitudes, using two types of reference groups (contextual variables), namely nations and regions.
2. Inequality and happiness in Europe

a. Data and methods

The data used in this section are taken from the European Quality of Life survey conducted in 2003 on representative samples in 28 European countries: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, and the UK. We had to omit Slovakia, since there was no GINI coefficient available for that country.

The available data set contains, among other variables, the individual level data on equivalent household income of all respondents (converted to Euros), their satisfaction with living standard and with life in general (expressed on a scale from 1 to 10) and their countries income inequality (expressed as a New Cronos GINI index 1997-2002).

The equivalency of household income is achieved by dividing total household monthly income by the number of equivalent persons (first adult = 1; each additional adult = .5; each child = .3) rather than by the number of family members. This is commonly considered to be a much better solution than calculating per capita income, since it takes into account the economy of scale. Consistent with common practice in econometrics and with diminishing marginal utility theory, we have used the natural logarithm of equivalent income in order to take into account the curvilinearity of most relations between income and its subjective consequences.

Since GINI indices included in our data set concern different years in different countries (six years before the survey in the most extreme cases), we have no other choice than to assume that the inequality in particular countries does not change rapidly so the differences between them are relatively well reflected despite time differences.

In our opinion, there is no good reason to believe that marginal utility theory applies to GINI. However, we wanted to assess the curvilinearity of the relations between inequality and satisfaction. Thus, both GINI indices and their squared terms were included in regression models. This is consistent with the practice of many sociological analyses, which includes additional squared terms in their regression models more often than the logarithm to take account of curvilinear relations.

GINI’s squared term is expressed as:

\[ \text{GINI}_{sq} \text{ in a country} = (\text{country’s GINI} - \text{unweighted mean of countries’ GINIS})^2. \]

This part of our analysis was conducted by simple methods of correlation (Pearson’s “r”) and o.l.s. regression. Both unsquared and squared GINI coefficients were included in the regression models. Thus, the final o.l.s. regression models of satisfactions determination take the following form:

\[ \text{Mean satisfaction in a country} = \ln \text{of mean equivalent income in a country} + \text{country’s GINI} + \text{country’s GINI}_{sq} + \text{constant}. \]

In order to conduct the analysis at the aggregate (country) level, we have calculated mean satisfactions for each country, separately for living standard and for life as a whole.
In order to assess the difference in correlation between inequality and satisfactions under assumptions of curvilinear and monotonous influence, the natural logarithm of GINI rather than its squared term was used in the correlational analysis (but not in regression models).

b. The findings

Consistent with previous surveys discussed above, satisfactions with both living conditions and with life in general, measured as means for each country, are positively correlated with mean household income and negatively correlated with income inequality.

Table 1. Correlations between income, income inequality, satisfaction with living conditions and with life (at the national level).

<table>
<thead>
<tr>
<th></th>
<th>Satisfaction with living standard</th>
<th>Life satisfaction</th>
<th>GINI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson’s “r”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent household monthly income</td>
<td>.89**</td>
<td>.88**</td>
<td>-.43*</td>
</tr>
<tr>
<td>Ln of equivalent household monthly income</td>
<td>.91**</td>
<td>.92**</td>
<td>-.39*</td>
</tr>
<tr>
<td>GINI</td>
<td>-.51**</td>
<td>-.47*</td>
<td></td>
</tr>
<tr>
<td>Ln GINI</td>
<td>-.49**</td>
<td>-.47*</td>
<td>x</td>
</tr>
</tbody>
</table>

**) Significant at .01 level. *) Significant at .05 level. N=27. Data source: European Quality of Life 2004 survey (27 countries).

As stated previously, logged rather than absolute income is commonly used in econometric analyses, consistent with diminishing marginal utility theory. Thus, it is not surprising that logged equivalent income is somewhat more strongly correlated with people’s satisfactions than absolute income. Since the diminishing marginal utility theory would make less sense if applied to income inequality than if applied to income size, the correlations of logged GINI coefficients with the satisfactions do not differ from the correlations of not logged ones.

Because of high correlations between the measures of income and inequality, net impacts exerted by them on satisfactions have to be assessed by o.l.s. regression. Regression models presented in Table 2 show gross and net impacts of income and inequality exerted on satisfaction with material standard of living and with life in general. Determination patterns of both kinds of satisfaction are very similar. This is not surprising, given that both kinds of satisfaction are very highly correlated. The positive impact of income is
much stronger than the negative impact of inequality – however, the latter is very substantial as well. Beta coefficients close to -.50 indicate that the increase of a country’s GINI by its one standard deviation produces decline of satisfaction by almost half of its standard deviation, which is a very strong negative impact, indeed.

Table 2. Models of determination of satisfaction with standard of living and with life.  
(Country level; o.l.s. regression models; standardized “β” coefficients in parentheses).

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Satisfaction with standard of living</th>
<th>Life satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td>Ln equivalent household income</td>
<td>1.127**</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>(.909)</td>
<td>...</td>
</tr>
<tr>
<td>GINI</td>
<td>-.104**</td>
<td>-.088*</td>
</tr>
<tr>
<td></td>
<td>(-.508)</td>
<td>(-.431)</td>
</tr>
<tr>
<td>GINIsq</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>R squared</td>
<td>.826</td>
<td>.258</td>
</tr>
</tbody>
</table>

** Significant at .01 level. * Significant at .05 level. a) Less than .001.  N=27. Data source: European Quality of Life 2004 survey (27 countries).

Satisfaction with material living conditions and with life in general is influenced by household income much stronger than by inequality, so the inclusion of all variables in one regression equation (Model 4) grossly reduces the effect of inequality. It is reduced below its statistical significance, though that should be associated first of all with a very low number of cases (only 27 countries). As the subject of this study is the entire population of West, Central-East, Nordic and South European countries rather than a representative sample of countries, we may disregard formal statistical significance. The value of “β” exceeding +-.05 is usually considered in social sciences as weak but still worthy of being noticed. GINI’s “β” exceeds -.10 in determination models with both income and inequality included as independent variables. Thus, we may conclude that the inequality’s effect can be still considered as substantial despite being greatly reduced by the inclusion of income size in regression models and despite being statistically insignificant due to the
small number of observation units. The coefficients of squared GINIs are lower but also substantially affecting satisfaction with living conditions at least. Figure 1 depicts both actual (observed) and estimated (by regression Model 3) relations between inequality and satisfaction with standard of living.

**Figure 1.**

![Graph showing mean satisfaction with living conditions in European countries by income inequality.](image)


The negative impact of inequality on satisfaction with material living conditions is quite visible and the curvilinearity of this relation is clearly marked. The less inequality there is, the smaller are the effects of the same increment of it on material satisfaction. The graph depicting the impact of GINI on countries’ life satisfaction looks almost the same as the graph depicting this impact on material satisfaction, only with the curvilinearity less pronounced, so it is not presented here for the sake of simplicity.

Using regression Model 4 from Table 2, we have estimated mean satisfactions in each country under three different assumptions that the mean monthly equivalent income in the country equals 150 Euro (close to the mean for 5 poorest countries), 850 Euro (close to the mean for all countries) and 1550 Euro (close to the mean for 5 richest countries). Estimated impacts of both equivalent income size and its inequality on satisfactions are depicted in Figures 2 and 3. They illustrate much stronger impact exerted on both kinds of satisfactions by income that by inequality. While the increase of GINI coefficient from about 20 to about 45 increases life satisfaction by about half-a-point and material satisfaction by about one point only on a ten points scale, the effect of raising income is much more apparent.

**Figure 2.**
The increase of income by the same 700 Euro results in increase of life satisfaction by about 3 points of a scale if the income rises from 150 to 850 Euro and only by 1 point if the income rises by the same amount from 850 to 1750 Euro monthly. The increase of satisfaction with living conditions caused by increase of the income by 700 Euro is also two times bigger when concerns the difference between low and middle income than when it concerns the difference between middle and high income.

Our results support the findings by Alesina et al (2004). Latin American findings by Graham and Felton (2005) are partly confirmed, since assumed curvilinearity is apparent only in material satisfaction determination model but not in model for life satisfaction. However, all graphs presented above suggest that the negative regression coefficients of investigated relations are very much driven by one outstanding
case of relatively poor and the most unequal Turkey. Should more of such inegalitarian and low income countries be considered, all the examined relations may become statistically significant and the curvilinearity may become more apparent.
3. Inequality and support for governmental intervention in economy

a. Data and methods

The data analyzed in the following section of the article are from the Role of Government modules from two waves of International Social Survey Programme (ISSP) conducted in 1996 and 2006.

Two composite indices of etatist (supporting governmental intervention) versus liberal (supporting free market) attitudes, concerning desired socio-economic goals of governmental spending and various other forms of governmental intervention, have been constructed at the individual level by factor analysis, specifically by principal component analysis, using standard SPSS program. Since we had two separate and differently formulated sets of questions concerning government spending and other forms of intervention, we decided to run two separate factor analyses. Each set of questions produced comprehensive and consistent first unrotated principal component (factor, composite index). Factor scores of all respondents on both first components, concerning spending and other kinds of intervention, have been estimated by the regression procedure constituting the element of the SPSS principal component program. This analysis concerned pooled individual level data set from Australia, the Czech Republic, Germany, Hungary, Italy (only in 1996), Latvia, Norway, the Philippines, Russia, Slovenia, Sweden, Switzerland, the UK and the USA.

Our aim, established by the hypothesis 4, was to conduct multilevel regression analysis with individual and country level variables, and – separately - with individual and regional level variables. Our earlier analysis, conducted on a much larger Polish sample, have proved that mean household incomes calculated for sub-national regions provide very good contextual variables for explaining happiness in these regions (Zagórski, 2011). Here, we have used regional divisions of the countries as applied in an international survey by national researchers from these countries and as available in a data set. Since not all countries presented their data for the regions with populations big enough in representative national samples, we have limited our regional analyses to those for which acceptable data are available, namely Australia (only in 2006), Italy (only in 1996), Latvia, Norway, the Philippines, Sweden, Switzerland, the UK and the USA. National level analyses were conducted for all fourteen countries listed previously.

In order to ensure that a sufficient number of individual records (people) are available in the regions for which the inequality was measured, we have produced a data file including the populations of only those regions, in which the sample size was greater than 100. Since the national survey samples were stratified by regions, we have assumed that they are representative for both national and regional populations. The inclusion of reasonably big regions only (at least 100 respondents in the sample) was done because we wanted to have samples of their residents big enough to calculate GINI coefficients for each region separately.

ISSP data files do not contain countries’ GINI indices. Moreover, we are not aware of any previously published GINI coefficient for the sub-national administrative regions used in our study. Thus, we have
decided to compute both national and regional GINI indices using household income data provided by the ISSP survey. Income inequality was measured by GINI coefficient according to the formula:

$$G(y) = \frac{\sum_{i=1}^{n} (2i - n - 1) y_i}{n^2 \bar{y}}$$

where:

- $G(y)$ = country’s/region’s GINI coefficient concerning household incomes,
- $y_i$ = income of household $i$,
- $\bar{y}$ = mean household income in a country/region.

Our own computation of GINI indices for particular countries and regions ensures that the same measure of inequality is used in each country and that the inequality is measured for the year of the survey. This is not always the case when published GINI coefficients are used. While all survey samples were representative at the national level, we have a full right to assume that GINI coefficients calculated for such representative samples correctly depict income inequalities at national levels. We have also assumed that the samples were designed in such a way that they were representative for particular sub-national regions, especially that we have included large regions only in the analysis. This assumption constitutes perhaps the weakest part of our research, but it cannot be rejected as unreasonable if the results show logical and consistent patterns.

### b. The findings

Principal component analysis has produced two composite indices of attitudes: support for governmental spending on different social programs and support for other forms of governmental intervention. The first set of analyzed questions was whether the government should spend more or less money on various programs. The possible answers constituted an interval scale: 1 spend much more, 2 spend somewhat more, 3 spend as much as now, 4 spend somewhat less and 5 spend much less. Since the current financial crisis, especially in Europe, makes it necessary for the governments to reduce their budgetary deficits by cutting social spending, we have decided not to reverse the scale’s direction. Thus, it reflects the supposedly liberal (in European rather than American meaning) idea of government’s saving on social welfare. The second set of questions concerned the ideas of governmental responsibility for various economic interventions or welfare provisions. The original answers constituted the following scale regarding how responsible the government should be: 1 definitely responsible, 2 rather responsible, 3 rather not responsible, 4 definitely not responsible. We have reversed this scale in order to produce the index of pro-intervention attitudes. The composition of the indices is presented in Table 3.

### Table 3. Factor analysis of etatist — liberal attitudes (first unrotated principal components).

<table>
<thead>
<tr>
<th>SUPPORT FOR DECREASING GOVERNMENTAL</th>
<th>SUPPORT FOR GOVERNMENTAL</th>
</tr>
</thead>
</table>

---

Income Inequality in Nations and Sub-national Regions, Happiness and Economic Attitudes
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>FACTOR LOADINGS</th>
<th>VARIABLES</th>
<th>FACTOR LOADINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment protection</td>
<td>.53</td>
<td>Provide jobs for everyone</td>
<td>.68</td>
</tr>
<tr>
<td>Health services</td>
<td>.71</td>
<td>Control prices</td>
<td>.63</td>
</tr>
<tr>
<td>Law enforcement</td>
<td>.40</td>
<td>Provide health care for</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the sick</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.67</td>
<td>Provide decent living</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>conditions for the old</td>
<td></td>
</tr>
<tr>
<td>Retirement</td>
<td>.67</td>
<td>Help the growth of</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>industries</td>
<td></td>
</tr>
<tr>
<td>Unemployment benefits</td>
<td>.57</td>
<td>Provide decent living</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>conditions for the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>unemployed</td>
<td></td>
</tr>
<tr>
<td>Culture and arts</td>
<td>.57</td>
<td>Reduce income differences</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>between the rich and the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>poor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Help the students</td>
<td>.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>financially</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide decent housing</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for all</td>
<td></td>
</tr>
</tbody>
</table>

Note: Factor loadings can be interpreted as correlation coefficients between particular variables and composite index to which they contribute. We have used European rather than American meaning of liberalism (support for free market) and etatism (support for governmental intervention).

Since all earlier studies have more or less conclusively documented the negative effect of income inequality on happiness, we may assume that less happy people would expect their governments to reduce inequalities, to provide various economic and social services, and to conduct such actions that would reduce negative consequences of inequality. They would also be likely to oppose austerity measures, especially cutting the spending on socio-economic programs. The Table 4 proves that to be correct.
Table 4. Determinants of support for the reduction of governmental spending on social programs in 1996 and 2006. (Multilevel regression coefficients — individual and country levels)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
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<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MODEL 0</td>
<td>MODEL 1</td>
<td>MODEL 2</td>
<td>MODEL 0</td>
<td>MODEL 1</td>
<td>MODEL 2</td>
</tr>
<tr>
<td>Intercept $\gamma_{00}$</td>
<td>-.0086</td>
<td>.2858*</td>
<td>1.9654*</td>
<td>-.0511</td>
<td>.3089*</td>
<td>2.0684**</td>
</tr>
<tr>
<td></td>
<td>(.1296)</td>
<td>(.1319)</td>
<td>(.6901)</td>
<td>(.1018)</td>
<td>(.1085)</td>
<td>(.3298)</td>
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<tr>
<td>Gender (female) $\gamma_{10}$</td>
<td>-.1606**</td>
<td>-.1606**</td>
<td>-.1201**</td>
<td>-.1201**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0116)</td>
<td>(.0116)</td>
<td>(.0132)</td>
<td>(.0132)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years) $\gamma_{20}$</td>
<td>-.0010**</td>
<td>-.0010**</td>
<td>-.0038**</td>
<td>-.0038**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (years) $\gamma_{30}$</td>
<td>-.0004</td>
<td>-.0004</td>
<td>.0002</td>
<td>.0002</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0004)</td>
<td>(.0004)</td>
<td>(.0004)</td>
<td>(.0004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GINI (countries) $\gamma_{01}$</td>
<td>-5.0505*</td>
<td>-4.8910**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.0472)</td>
<td>(2.0472)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td><strong>Random effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept $\tau_{00}$</td>
<td>.2348*</td>
<td>.2342*</td>
<td>.1682*</td>
<td>.1342*</td>
<td>.1413*</td>
<td>.0414*</td>
</tr>
<tr>
<td></td>
<td>(.0923)</td>
<td>(.0920)</td>
<td>(.0689)</td>
<td>(.0550)</td>
<td>(.0579)</td>
<td>(.0179)</td>
</tr>
<tr>
<td>Residual $\sigma^2$</td>
<td>.7630**</td>
<td>.7562**</td>
<td>.7562**</td>
<td>.7828**</td>
<td>.7759**</td>
<td>.7759**</td>
</tr>
<tr>
<td></td>
<td>(.0071)</td>
<td>(.0071)</td>
<td>(.0071)</td>
<td>(.0082)</td>
<td>(.0082)</td>
<td>(.0082)</td>
</tr>
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<td><strong>Model fit statistics</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>AIC</td>
<td>59363.57</td>
<td>57840.09</td>
<td>57831.52</td>
<td>47823.17</td>
<td>46711.36</td>
<td>46694.10</td>
</tr>
<tr>
<td>BIC</td>
<td>59379.67</td>
<td>57856.13</td>
<td>57847.57</td>
<td>47838.81</td>
<td>46726.96</td>
<td>46709.70</td>
</tr>
</tbody>
</table>


First of all, it should be noted that women and older people are more against the reduction of social spending than men and the young. Surprisingly, there is no statistically significant effect of education in this respect.
Unfortunately, ISSP surveys do not provide internationally comparable data on income. Thus, income inequality can be measured for each country separately but the average incomes cannot be compared between different countries. Such comparison would require exact data on purchasing power of the currencies or on exchange ratios at least. Since many earlier studies show a universally strong correlation between education and income, we may treat the level of education as a proxy for income or as a strong determinant of income at least. Since people who are materially and socially better off are usually less inclined to support governmental intervention, we may assume that more educated individuals would be more inclined to agree with austerity measures than the less educated. However, our results do not support this assumption: regression coefficients for education are insignificant in both 1996 and 2006.

Consistent with our hypothesis, a country’s GINI coefficient, included in the model as a contextual variable, exerts a significantly negative effect on the tendency to agree with the reduction of social spending in both 1996 and 2006, though the inclusion of GINI in the model does not produce impressive improvement in fit statistics.

Table 5 addresses the question whether similar relations can be seen when income inequalities are measured for sub-national regions rather than for the countries as a whole.

Table 5. Determinants of support for reduction of governmental spending on social programs in 1996 and 2006. (Multilevel regression coefficients – individual and regional levels)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>1996</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MODEL 0</td>
<td>MODEL 1</td>
</tr>
<tr>
<td><strong>Fixed effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept ( y_{00} )</td>
<td>(.1709^*)</td>
<td>(.3763^{**})</td>
</tr>
<tr>
<td></td>
<td>(.0646)</td>
<td>(.0732)</td>
</tr>
<tr>
<td>Gender (female) ( y_{10} )</td>
<td>(-.1598^{**})</td>
<td>(-.1547^{**})</td>
</tr>
<tr>
<td></td>
<td>(.0156)</td>
<td>(.0161)</td>
</tr>
<tr>
<td>Age (years) ( y_{20} )</td>
<td>(.0008)</td>
<td>(.0009)</td>
</tr>
<tr>
<td></td>
<td>(.0005)</td>
<td>(.0005)</td>
</tr>
<tr>
<td>Education (years) ( y_{30} )</td>
<td>(.0003)</td>
<td>(.0002)</td>
</tr>
<tr>
<td></td>
<td>(.0006)</td>
<td>(.0006)</td>
</tr>
<tr>
<td>GINI (regions) ( y_{01} )</td>
<td>(-3.9009^{**})</td>
<td>(-4.3007^{**})</td>
</tr>
<tr>
<td></td>
<td>(.9848)</td>
<td>(.6976)</td>
</tr>
</tbody>
</table>
The analyses of GINIs impact on public consent with reduction of social spending yield similar results at national and regional levels. Women and seniors are less inclined to agree with the reduction of government spending. More importantly, income inequality has a significantly negative effect on this consent. It is difficult to state conclusively whether inequality is a stronger determinant at the national or the regional level. While regression coefficients of regional GINIs are lower than those of national ones, model fit statistics are better for regions than for countries. However, it has to be stressed that the national level analysis concerned more countries than the regional level analysis. The latter concerned more regions but fewer nations than the former. The patterns of determination of other forms of governmental intervention then the spending are presented in Tables 6 and 7.

Table 6. Determinants of support for governmental intervention in 1996 and 2006. (Multilevel regression coefficients — individual and national levels)
<table>
<thead>
<tr>
<th></th>
<th>$\gamma_{00}$</th>
<th>$\gamma_{10}$</th>
<th>$\gamma_{20}$</th>
<th>$\gamma_{30}$</th>
<th>$\gamma_{01}$</th>
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<tbody>
<tr>
<td>Intercept</td>
<td>$-.0170$</td>
<td>$-.4597^{**}$</td>
<td>$-.5491$</td>
<td>$-.0707$</td>
<td>$-.4073^{**}$</td>
</tr>
<tr>
<td></td>
<td>(.1072)</td>
<td>(.1111)</td>
<td>(.7054)</td>
<td>(.0959)</td>
<td>(.1030)</td>
</tr>
<tr>
<td>Gender (female)</td>
<td></td>
<td>$.2221^{**}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.0122)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>$.0030^{**}$</td>
<td></td>
<td>$.0030^{**}$</td>
<td></td>
<td>$.0022^{**}$</td>
</tr>
<tr>
<td></td>
<td>(.0004)</td>
<td></td>
<td>(.0004)</td>
<td></td>
<td>(.0004)</td>
</tr>
<tr>
<td>Education (years)</td>
<td>$-.0021^{**}$</td>
<td></td>
<td>$-.0021^{**}$</td>
<td>$-.0020^{**}$</td>
<td>$-.0020^{**}$</td>
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<tr>
<td></td>
<td>(.0004)</td>
<td></td>
<td>(.0004)</td>
<td></td>
<td>(.0004)</td>
</tr>
<tr>
<td>GINI (countries)</td>
<td></td>
<td>$.2689$</td>
<td></td>
<td></td>
<td>$3.2692^{*}$</td>
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<tr>
<td></td>
<td></td>
<td>(2.0926)</td>
<td></td>
<td></td>
<td>(1.2936)</td>
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</table>

**Random effects**

<table>
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<tr>
<th></th>
<th>$\tau_{00}$</th>
<th>$\tau_{01}$</th>
<th>$\tau_{02}$</th>
<th>$\tau_{03}$</th>
<th>$\tau_{04}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>$.1603^{*}$</td>
<td>$.1624^{*}$</td>
<td>$.1757^{*}$</td>
<td>$.1189^{*}$</td>
<td>$.1255^{*}$</td>
</tr>
<tr>
<td></td>
<td>(.0631)</td>
<td>(.0640)</td>
<td>(.0720)</td>
<td>(.0488)</td>
<td>(.0515)</td>
</tr>
<tr>
<td>Residual $\sigma^2$</td>
<td>$.8550^{**}$</td>
<td>$.8381^{**}$</td>
<td>$.8381^{**}$</td>
<td>$.8299^{**}$</td>
<td>$.8189^{**}$</td>
</tr>
<tr>
<td></td>
<td>(.0080)</td>
<td>(.0079)</td>
<td>(.0079)</td>
<td>(.0087)</td>
<td>(.0086)</td>
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</table>

**Model fit statistics**

<table>
<thead>
<tr>
<th></th>
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<th>BIC</th>
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<tr>
<td>Intercept</td>
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<td>62003.04</td>
</tr>
<tr>
<td>Gender</td>
<td>60151.09</td>
<td>60167.14</td>
</tr>
<tr>
<td>Age</td>
<td>60147.80</td>
<td>60163.85</td>
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<tr>
<td>Education</td>
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</tr>
<tr>
<td>GINI</td>
<td>47681.36</td>
<td>47696.96</td>
</tr>
</tbody>
</table>

**Significant at .01 level. * Significant at .05 level. Standard errors in parentheses. Data source: International Social Survey Project, 1996, 2006.**
### Table 7. Determinants of support for governmental intervention in 1996 and 2006. (Multilevel regression coefficients — individual and regional levels)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>1996</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MODEL 0</td>
<td>MODEL 1</td>
</tr>
<tr>
<td><strong>Fixed effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept $\gamma_{00}$</td>
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<td>-.4998**</td>
</tr>
<tr>
<td></td>
<td>(.0662)</td>
<td>(.0759)</td>
</tr>
<tr>
<td>Gender (female) $\gamma_{10}$</td>
<td>.2314**</td>
<td>.2329**</td>
</tr>
<tr>
<td></td>
<td>(.0169)</td>
<td>(.0175)</td>
</tr>
<tr>
<td>Age (years) $\gamma_{20}$</td>
<td>0.0013*</td>
<td>0.0010</td>
</tr>
<tr>
<td></td>
<td>(.0005)</td>
<td>(0.0006)</td>
</tr>
<tr>
<td>Education (years) $\gamma_{30}$</td>
<td>-.0019**</td>
<td>-.0018**</td>
</tr>
<tr>
<td></td>
<td>(.0007)</td>
<td>(.0007)</td>
</tr>
<tr>
<td>GINI (regions) $\gamma_{01}$</td>
<td>-.6909</td>
<td>(1.2473)</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Random effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept $\tau_{00}$</td>
<td>.2057**</td>
<td>.2068**</td>
</tr>
<tr>
<td></td>
<td>(.0434)</td>
<td>(.0437)</td>
</tr>
<tr>
<td>Residual $\sigma^2$</td>
<td>.8556**</td>
<td>.8395**</td>
</tr>
<tr>
<td></td>
<td>(.0110)</td>
<td>(.0109)</td>
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<tr>
<td>AIC</td>
<td>32871.45</td>
<td>31966.71</td>
</tr>
<tr>
<td>BIC</td>
<td>32886.26</td>
<td>31981.48</td>
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</tbody>
</table>


Regression models containing national GINIs as contextual determinants of interventionist (etatist) attitudes at both the regional and the national level confirm our previous findings. Women and older people are more in favor of governmental intervention. There is one difference, however. Educational level, which was not significant determinant of attitudes toward spending reductions, exerts a significantly
negative effect on support for governmental intervention. More importantly, income inequality, measured both for the nations and for the regions, reinforces public support for intervention, though this impact is statistically significant for 2006 only.
4. Conclusions

Our analysis conducted at the national aggregate level support earlier findings that income inequality reduces happiness.

Moreover, the results support our Hypothesis 1 that income inequality causes the dissatisfaction with standard of living and with life in general as well as increases public demand for governmental spending on social programs and for other kinds of governmental intervention in economy.

Regarding hypotheses 2 and 3, regression coefficients reflecting the impact of GINI coefficients are higher at the national level than at the regional one. This may partly result from small samples of regional populations. GINI coefficients calculated for these samples may be less reliable than those calculated for much larger national samples. Moreover, as we have already stressed, the regional level analysis was conducted for a smaller number of countries (though greater number of regions) than the national level analysis. Numbers of all individuals in the samples was also different at the national and the regional level of the analysis. Thus, the observation units in national and regional analyses were too different to compare relative strength of independent variables between the two. Nonetheless, we have proved that income inequality exerts significant effect on support for governmental spending and other forms of economic interventionism at both aggregation levels. Thus, both regional and national populations can be used as reference groups and it makes sense to calculate GINI coefficients both for the nations and the regions. This is consistent with our Hypothesis 4.

An additional finding that seems to be of importance suggest that impact of income inequality is growing. In three out of four cases (regional and national level of GINI’s impact on attitudes to spending and to other forms of intervention), the regression coefficients measuring this impact are greater for 2006 than for 1996. Moreover, in two out of four cases, the coefficients for 1996 have statistically insignificant effect, though similar in direction to their statistically significant equivalents for 2006.

Further research should attempt to establish whether satisfactions and economic attitudes are determined more strongly by actual inequality or by subjective assessment of its scale or by its evaluations as too big or too small. Though we believe that our findings correctly reflect a general regularity, our analysis concerning inequalities in sub-national regions as contextual determinants may need further confirmation. They may somehow change when regions from many more countries, much more differentiated in terms of social inequalities, are taken into account. A further comparison of effect exerted by national and regional income inequality on subjective
variables, such as happiness and attitudes, should concern the same large number of very different countries.
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Information on the GINI project

Aims

The core objective of GINI is to deliver important new answers to questions of great interest to European societies: What are the social, cultural and political impacts that increasing inequalities in income, wealth and education may have? For the answers, GINI combines an interdisciplinary analysis that draws on economics, sociology, political science and health studies, with improved methodologies, uniform measurement, wide country coverage, a clear policy dimension and broad dissemination.

Methodologically, GINI aims to:

- exploit differences between and within 29 countries in inequality levels and trends for understanding the impacts and teasing out implications for policy and institutions,
- elaborate on the effects of both individual distributional positions and aggregate inequalities, and
- allow for feedback from impacts to inequality in a two-way causality approach.

The project operates in a framework of policy-oriented debate and international comparisons across all EU countries (except Cyprus and Malta), the USA, Japan, Canada and Australia.

Inequality Impacts and Analysis

Social impacts of inequality include educational access and achievement, individual employment opportunities and labour market behaviour, household joblessness, living standards and deprivation, family and household formation/breakdown, housing and intergenerational social mobility, individual health and life expectancy, and social cohesion versus polarisation. Underlying long-term trends, the economic cycle and the current financial and economic crisis will be incorporated. Politico-cultural impacts investigated are: Do increasing income/educational inequalities widen cultural and political ‘distances’, alienating people from politics, globalisation and European integration? Do they affect individuals’ participation and general social trust? Is acceptance of inequality and policies of redistribution affected by inequality itself? What effects do political systems (coalitions/winner-takes-all) have? Finally, it focuses on costs and benefits of policies limiting income inequality and its efficiency for mitigating other inequalities (health, housing, education and opportunity), and addresses the question what contributions policy making itself may have made to the growth of inequalities.

Support and Activities

The project receives EU research support to the amount of Euro 2.7 million. The work will result in four main reports and a final report, some 70 discussion papers and 29 country reports. The start of the project is 1 February 2010 for a three-year period. Detailed information can be found on the website.

www.gini-research.org