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## **Increasing income inequality and attitudes to inequality: a cohort perspective**

*Márton Medgyesi*

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Márton Medgyesi



# 1. Introduction

Widening income disparities are said to have a range of detrimental social effects. In addition to increased risk of poverty and increased inequalities in later generations, increasing inequality tends to be associated with polarisation and fragmentation between communities, ethnic groups, regions and social classes, which reduces both social cohesion and the level of trust and cooperation within the society. As such, it can hinder social and political stability and economic growth, both through reducing productivity and deterring investment.

According to political economy models the most important effect of increasing inequalities in the political sphere is stronger demand for redistribution. In democracies increasing demand for redistribution might be expressed through voting for parties which promise more extensive redistributive programs. Also, if levels of inequalities exceed levels of tolerance to a large extent, people may contemplate giving up loyalty for voice (voting, protests, industrial affirmative actions, etc) or for exits (moving into black economy, emigrating and the like) – to use the terms by Hirschman (1970). But to have such political consequences, changes in inequalities first have to be perceived by the public and individuals must be capable of forming judgments about the actual and acceptable level of inequalities. In this study we investigate whether increasing income disparities lead to rising discontent with the prevailing level of income inequality in the society.

The question is whether opinions (or valuation) of income inequality respond to differences and changes in inequality. We investigate this issue using data from the World Values Survey, which is a large-scale cross-country survey of values spanning the past two decades. During this period, among the developed countries, the largest increase in income inequality has been observed in the former socialist states, which have seen rapidly widening income disparities during the first years of the process of transition to the market economy. In the second part of the paper we study the difference in the opinions regarding inequality between post-socialist countries and market economies. We analyze whether there is convergence of attitudes between ex-socialist and market economies and the mechanisms of this convergence.

The economic crisis of recent years has brought the fairness issue into the forefront of national politics. Throughout the countries that are most hardly hit by the recession, there is an increased attention paid to wage inequalities, to manager bonuses and government strategies to reduce inequality. This brings the issue

of inequality perceptions out from a purely scientific interest and makes it a central issue of the political processes in member states of the European Union as well.

The paper is structured as follows. Section 2 reviews theoretical accounts of attitudes towards inequalities and presents hypotheses of the study. Section 3 reviews earlier empirical evidence on these issues. Data, measurement of attitudes and empirical methodology is presented in section 4. Section 5 presents results on the effect of inequality change on attitudes towards inequality (5.1), and the difference between post-socialist countries and market economies. Section 6 concludes.





## 2. Theoretical considerations and research hypothesis

Research on societal opinions about distributional outcomes has a long tradition in sociology but it has drawn considerable attention more recently among economists and political scientists as well. Individuals might prefer a given level of inequality for reasons of self-interest and they might also endorse values regarding the acceptable level of inequality (for a review see Alesina and Giuliano, 2011). Most studies on attitudes towards inequalities acknowledge the role of self interest: high income (high status) people tend to accept higher inequalities, since they might loose with the redistribution of income, while low income people tend to accept lower degrees of inequality as legitimate because they hope to benefit from redistribution<sup>1</sup>. Opinions about the income distribution are not only influenced by self-interest, people might endorse values about the acceptable level of inequality (Alesina and Giuliano, 2011). For example those sharing egalitarian views will prefer distributions with lower inequality<sup>2</sup>.

Where do these views about social justice come from? The political sociology literature asserts that social justice norms affect the evaluation of inequality. Norms about the acceptable inequality might be different between countries with different welfare regimes, cultural or religious traditions or historical experiences (Lübker 2004, 2007). Andress and Heien (2001) state that attitudes can be the product of socialisation in a specific type of welfare regime. According to this theory, by everyday experience of the regime's institutions and its dominant ideology people internalise at least part of this ideology and this results in typical patterns of inequality tolerance between welfare-state types. Another important source of values about inequality could be religion. Protestantism places more emphasis on individual responsibility than Catholicism does, which might lead to Protestants being more willing to accept higher inequalities (Hadler 2005). Historical experience can also be a factor. Eg. a great number of studies examine the hypothesis of the effect of socialist experience on attitudes towards inequalities in countries of the former Eastern bloc. According to this hypothesis inhabitants of former socialist countries are more in favour of low inequality because of the effect of the socialist regime on their preferences (Gijsberts 2002).

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<sup>1</sup> Economists also acknowledge that people might be aware of social impacts of inequalities, which indirectly affect

<sup>2</sup> People might also hold views about the process, which leads to certain distributional outcomes. For example „libertarians” find all inequalities acceptable which arise from free exchanges departing from a just distribution of property rights (Konow 2003).

If opinions about an acceptable level of inequality are influenced by self-interest and norms what can be the effects of increasing inequalities on these opinions? Value-based theories of inequality acceptance would predict that increasing inequality is likely to increase discontent with inequalities. Individuals form their opinions about inequalities by comparing actual inequalities (as they perceive it) to their preferred level of inequality. If the level of preferred inequality is stable, rising inequality will increase the likelihood that the individual describes the level of inequality as “too large”. According to self-interest theories, increasing inequality might lead to rising discontent if opinions about inequality are influenced by considerations of relative deprivation. This means that people dislike rising inequality if it brings about a deterioration of their relative position compared to their reference group. Other theorists however emphasize that people might have a reason to accept rising inequality, if this informs them about a likely improvement of their own situation in the near future (Hirschman, 1973). Thus the empirical prediction of self-interest based theories is ambiguous: increasing inequality might be acceptable or unacceptable depending on whether the information effect or the status effect is dominant (Senik 2009).

The first part of this study will examine the relationship between income inequality and individual attitudes with data over two decades from the World Values Study. We study judgments or valuations made about the level inequality, whether people think that income inequality in their country is too large, or find its level acceptable.

H1: Higher inequality will lead more people to complain about inequality (accept statements like „inequalities are to large”, or „incomes should be more equal”).

The second issue we investigate concerns differences in attitudes between inhabitants of post-socialist countries and market economies. Before the transition, socialist countries were characterized by relatively low levels of inequality. The transition process brought about an increase in income inequality in most of these countries and some twenty years after transition we see this group having similar levels of inequality as middle-inequality or high-inequality European Union member states. Comparing income inequality in EU countries in 2008 Tóth and Medgyesi (2011) assert that there are, in general, no significant differences between old and new Member States in terms of the variance of overall income inequalities and relative poverty rates within the two country groups. New member states (NMS) appear across the whole country ranking of income inequality. Slovenia, Slovakia and also the Czech Republic belong to the group of less unequal countries of the EU, the three Baltic states belong to the most unequal group and the others countries have middle-level inequality compared to EU15 countries. Not only levels of inequality have become more similar but the processes through, which inequality is generated also. During the painful

years of transition post-socialist countries have adopted political and economic institutions which are broadly similar to those operating in EU15 countries and these countries joined the EU.

The issue investigated here is whether convergence in social structure and inequality levels will lead to convergence in opinions about inequality. According to modernization theories as countries get richer they develop similar economic, political and social structures and this leads to similar values and beliefs (Edlund 2009). On the contrary, the “socialist legacy” hypothesis asserts that inhabitants of former Eastern bloc countries would be more in favour of low inequality and state redistribution because of the effect of the socialist regime on their preferences. The hypothesis departs from the assumption that political preferences are result of socialization during adolescence or early adulthood (Pop-Eleches and Tucker 2011). Thus socialization in low inequality, massively redistributive states, which also transmitted the egalitarian ideology of communism, will make people more adverse to inequalities even after the fall of socialism (Alesina and Fuchs-Schündeln 2007). The socialist period was not homogeneous however. The effect of socialization during different periods (Stalinist, post-Stalinist or reformist) is expected to be different. Or if socialization is conceived as a cumulative process, it is the length of time spent under socialism which should matter. Thus the effect of socialism on attitudes is expected to vary by cohort.

H2: Difference in opinions about inequality between inhabitants of post-socialist countries and market economies tend to decrease as time since transition goes by.

H3: If the “socialist legacy” hypothesis is true convergence in attitude to inequality between Central European post-socialist countries and market economies should be slow and mostly driven by generational replacement. The theory predicts that we should see greater differences between inhabitants of post-socialist countries and market economies among older cohorts, and smaller differences among the younger cohorts and we should see attitudes within cohorts broadly unchanged (or only slowly changing) during the post-socialist period.

### 3. Earlier empirical studies

Among earlier studies we find relatively few that deal explicitly with the effect of actual inequalities on attitudes. Some studies use a cross-section of countries to investigate the relationship but results seem to be dependent on data and measurement. Suhrcke (2001) uses the ISSP 1999 data (only 23 countries) and controls for the Gini index of income inequality in ordinal logit model of agreement with the statement “inequalities are too large”. He finds a significant effect, with a higher Gini being associated with a higher probability of saying inequalities are too large. Murthi and Tiongson (2009) use the WVS wave 3 with wider country coverage and control also for the Gini index of income inequality. They also report a significant effect and the direction of the inequality effect is similar: higher inequality is associated with stronger frustration with inequalities. However, these articles do not discuss the need to account for the clustering of observations in countries (or multilevel analysis), and thus presumably underestimate the standard error of the coefficient of the Gini index of income inequality.

Lübker (2004) and Lübker (2007) use country-level regression to study the relationship between actual inequality and attitudes using the ISSP 1999 data (29 countries). He finds a significant effect of actual income inequality (as measured by the Gini index using LIS data) when controlling for country-groups (transition countries, market economies, Anglo-Saxon countries, US) in both studies. The result is again similar: a higher Gini is associated with a higher % of those agreeing that inequalities are too large. However, country-level analysis on cross-sectional data might suffer from the reverse causality problem: a stronger societal concern for inequality might also have an effect on the distribution of disposable incomes by increasing social support for redistribution policies. Country-level analyses also fail to control for compositional differences between countries.

The methodological problems of these studies were (at least partially) overcome by Hadler (2005) and also Andersen and Yaish (2012), who perform multilevel analysis of determinants of individual opinions about inequality on ISSP 1999 data. Hadler (2005) performs multilevel analysis on a sample of 30 countries, where the dependent variable is the agreement with the statement „inequality too large” and the model contains a wide range of individual-level and macro-level explanatory variables (Gini index of income inequality, GDP per capita, dominant religion, dominant ideology). The author finds no significant effect of the Gini index of income inequality on opinions about inequality. Andersen and Yaish (2012) focus on people’s opinion regarding the desired level of inequality and measure attitudes to inequality by the Gini

index of “ought to earn” earnings<sup>3</sup>. The result is obtained in a multilevel model on a more restricted sample (20 countries, 27 country-years). The authors control for the usual socio-demographic variables and parental background (father’s social class), while contextual effects other than inequality are GDP per capita, inequality of opportunity and a dummy for Post-Soviet countries. They find significant positive effect of the Gini index of actual income inequality on desired inequality<sup>4</sup>, meaning that higher actual inequality is associated with higher level of preferred inequality. These results are based only on cross-country variation of inequality and attitudes.

There are only few studies which study the relationship between inequality and attitudes based on intertemporal variation. These studies compare country-level trends in inequality and attitudes. Lübker (2004) tries to establish a link between changes in inequality and changes of attitudes to inequality based on first three waves of the ISSP module on inequality. Rising inequality was most often associated with an increasing agreement with the statement that inequalities are too large. Kenworthy and McCall (2008) also use three waves of ISSP data to study the relationship between income inequality and perceptions of inequality for eight countries (US, UK, Australia, Canada, Italy, Germany, Sweden and Norway). They study both the relationship between actual and perceived earnings inequality and actual and perceived income inequality<sup>5</sup>. The analysis shows that changes in perceptions of pay inequality are more or less in line with changes of actual inequality. In four of the six countries with data on perceived earnings inequality, perceptions have the same trend than changes in actual inequality. In the case of market income inequalities the picture is different, only in one case out of eight (the USA) do they see perceived inequality

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<sup>3</sup> The International Social Survey Program (ISSP) employs a question where respondents are asked about actual earnings of a series of occupations, and the amount they „ought to be earning”. Based on these question researchers have defined measures for individuals preferred level of inequality, eg. Gini index of “ought to earn” earnings, or ratios of “ought to earn” earnings (eg. ratio of the pay a company chairman should earn and an unskilled worker should earn).

<sup>4</sup> Income inequality is measured by the Gini coefficient of the distribution of net (after tax and transfer) household incomes, taken from the Standardized World Income Inequality Database (SWIID).

<sup>5</sup> Perceived earnings inequality is measured by the ratio of perceived pay of company chairman and skilled/unskilled worker. Perceived income inequality is measured by agreement with the „inequality is far too large” statement. Earnings inequality is measured by pay differences (p90/p10) among full time employees (OECD data), while income inequality is measured by inequality of pre-tax/transfer household income (from LIS data).

following the same trend as actual inequality<sup>6</sup>. These studies compare trends without statistical modeling of the relationship due to a low number of countries covered.

The only study which presents a multivariate statistical analysis of the relationship between the change in inequality and attitudes is Kerr (2011). This study uses three waves of the ISSP (1987, 1992, 1999) and WVS (waves 1900, 1995, 2000) data and show using fixed effects models, that societies experiencing a rise in income inequality become more concerned about income differences, and agree more often that “inequalities are too large” in the country. On the other hand, the study also demonstrates that increasing inequality also increases individual’s preferred earnings ratio, as measured by the ratio of preferred earnings of a doctor and an unskilled worker. The author concludes, that individuals accept a substantial proportion but not all, of the rise in earnings differentials.

Another line of research uses inequality as a right-hand side variable in regressions on life satisfaction and makes inferences about individuals’ preferences towards inequality by examining how inequality decreases or increases individual overall satisfaction with life. Studies in this tradition are eg. Alesina et al. (2004) who analyze the difference in the effect of inequality on life satisfaction between European countries and US states. They conclude that inequality has a negative effect on life satisfaction among both European and American citizens, but the European poor are more negatively affected by inequality than the American poor. Verme (2011) studies the link between income inequality and life satisfaction on a pooled sample of countries from the WVS/EVS, and points out that results are highly dependent on modeling assumptions.

Earlier literature on differences between post-socialist countries and market economies show stronger preference for inequality in post-socialist countries in cross-sectional comparisons, which some authors interpret as a lasting effect of egalitarian socialist ideology (Delhey 1999, Verwiebe, R. and Wegener, B. 2000, Suhrcke 2001, Redmond G. et al. 2002, Hadler 2005, Murthi and Tiongson 2009, Keller, Medgyesi and Tóth 2009). There are fewer studies analysing change in attitudes towards inequalities. These studies show that people in post-socialist countries are willing to accept higher inequalities after transition than before the fall of communism (Austen 2002, Gijsberts 2002, Kelley and Zagorski 2004, Medgyesi 1997). Gijsberts (2002) concludes that after the transformation a convergence could be observed between state-socialist and market societies. Kelley and Zagorski (2004) also expect convergence in attitudes in the long run, although in the short run they see considerable increase in accepted inequality in transition countries and Central-East Europeans accepting substantially more income inequality than most Westerners think

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<sup>6</sup> McCall and Kenworthy (2009) also show that concern with inequality was on the rise between the mid 80s and mid 90s in the United States, when income inequality was increasing.

right. Grosfeld and Senik (2010) introduce income inequality as a predictor in regression models of life satisfaction and show decreasing inequality aversion during first years of transition in Poland. They also show that increasing inequality decreases satisfaction in later years. Guriev and Zhuravskaya (2009) finds negative effect of income inequality on life satisfaction among transition countries and concludes that increasing inequality is partly responsible for the life satisfaction gap between transition and nontransition countries.

As we have seen before, the socialist legacy hypothesis postulates that cohorts which have lived longer under the socialist system would have attitudes persistently different from those without the experience of socialism. There are only few studies which take into account the possible difference between different cohorts. Two of these studies focus on the comparison of demand for redistribution between East and West Germany. Alesina and Fuchs-Schündeln (2007) study the difference in demand for redistribution between those who were born in East and West Germany on GSOEP data (1997 and 2002 waves). They find a significant difference in attitudes between these groups almost a decade later than the two parts of the country were reunited. They interpret this finding as a lasting effect of Communism on preferences and show that the difference is larger among older, and smaller among young cohorts. They estimate that 2/3 of aggregate attitude change is attributable to preference change while 1/3 is due to generational replacement

Svallfors (2010) uses data from the ISSP Role of Government module and finds convergence in support for state intervention. In the Eastern part support for redistribution declined between 1990 and 2006, while support in West Germany remained stable. The East-West difference declined among older cohorts, but significant differences persist in 2006. For the youngest cohort no East-West difference has been detected. The authors interpret this finding as a suggesting that generational replacement is important driver in attitudinal convergence. Saar (2008) also provides cohort analysis of inequality attitudes in Estonia. These studies present but country-specific and it remains to be seen how attitudinal differences evolve in broader range of countries.

Fisher and Heath (2006) is the only study that studies convergence in egalitarianism and also looks at differences between cohorts. They use data from three waves of the Inequality Module of International Social Survey Program data to study the change in legitimate pay differentials but the country coverage is limited to five countries. They find no general decline in support for equality (the US, Austria and West Germany have recorded increasing support for equality). They do see convergence in national averages, but only because Hungary was moving from the most egalitarian to the one of the least. But within countries they see increasing standard deviation of the maximum income ratio in several countries, which implies no convergence. The analysis by cohorts shows that in Western countries younger age groups are more egalitarian than older groups. In Hungary the middle cohort is more egalitarian than the older and the younger and the baby boom cohort is less egalitarian than the preceding and following cohorts.

This study fills a gap in the literature in the sense that it explains intertemporal changes in judgments about inequality levels, focusing on the effect of actual inequality. The paper also examines the change in attitudinal difference between post-socialist countries and market economies with wider country and temporal coverage than previous studies, and also considers cohort differences in the evolution of attitudes.





## 4. Data, measurement and methods

### Data

In this study we use data from the Integrated Values Survey 1981-2008, which incorporates all waves of the World Values Survey (WVS 2009) and the European Values Study (EVS 2011), which had been carried out so far. The European Value Survey (EVS) and the World Value Survey (WVS) are two large-scale, cross-national and longitudinal survey research programs. They include a large number of questions, which have been replicated since the early eighties. About 102 countries/regions with altogether 423.084 respondents participated in the six waves conducted up to now: 1981-1984, 1989-1993, 1994-1999, 1999-2004, 2005-2006, and 2008-2010, but the first wave did not include the question on attitude towards inequality so it was not used in the analysis.

### Measurement

The WVS asks about how respondents value actual inequalities, whether they agree with the statement: „nowadays in (our country) income differences between people are far too large”. Responses are coded on a ten-point scale, where 1 means „incomes should be made more equal”, while 10 stands for „income differences should be larger to provide incentives for individual effort”. This question does not separate perception and valuation of inequalities. They refer to the normative judgment of the individual about the level of inequality as individuals perceive those inequalities. Different analyses are conducted on subsections of this data as availability of necessary variables permit. Estimation samples will be described below.

Our crucial explanatory variable is the level of income inequality. Several concepts of inequality might be employed. One crucial question is whether we use inequality of disposable household income, market income (that is income before taxes and transfers) or earnings as our main explanatory variable. The second question is what measure of inequality to use. For analysis over five waves of WVS, inequality data come from the Standardized World Income Inequality Database (Solt, 2008-09), where Gini indices are published. Also Ginis for pre- and post-redistribution income calculated by Wang and Caminada (2011) from Luxembourg Income Study are used as a robustness check. GDP data (GDP per capita, PPP (constant 2005 international \$)) come from World Bank.

## Regression models

In order to be able control for macro-level variables such as the degree of income inequality multilevel analysis is performed. Multilevel models are used in the social sciences when the structure of the data is hierarchical, that is, when individuals in the population are grouped in clusters (households, school classes, countries) and we have information on individuals (level-1 units) belonging to several groups or clusters (level-2 units). We might expect that two randomly selected individuals from the same group will tend to be more similar than two individuals selected from different groups. A multilevel model differs from the ordinary regression model in that it contains one (or more) error terms for each level (Snijders and Bosker 1999). Residuals at all levels are assumed to follow a normal distribution with zero mean, which allows partitioning total variance in two components, a within-group component and a between-group component. Random intercept models allow the intercept of the regression lines within groups to vary randomly across groups. Random slope models also allow the regression coefficient of a given explanatory variable to vary randomly across groups. Multilevel models also allow for the introduction of group-level explanatory variables, the estimation of correct standard errors for these variables and the study of cross-level interaction effects.

Another issue when estimating the effect of income inequality on attitudes is that of possible omitted variable bias. For example if there is a strong egalitarian norm prevailing in a country, we might observe low inequality of post-redistribution income and also people showing preference for low levels of inequality. If in our data we do not have a measure for such norms, the correlation we may find between inequality and attitudes cannot be interpreted as a causal effect of inequality since it is partly the consequence of both variables being correlated with a third one. A possible solution for this omitted variable problem would be to use individual panel data, which allows to control for all time-invariant individual traits that we are not measuring in the data. In our case we don't have real panel data, but we have a time-series of cross-section of countries, which allows to estimate the effect of inequality from intertemporal variation rather than from cross-country differences. To achieve this two empirical techniques will be employed, multilevel analysis and regression analysis with country fixed effects.

I fit three-level random intercept multilevel regression models to take into account the clustering of observations in country-years nested in countries. Estimating multilevel models on the pooled sample would amount to assume that cross-country differences in inequality have the same effect as intertemporal differences in inequality. This is not necessary the case however, and as argued before, we are mostly interested in estimating the effect of changes in inequality on attitudes. Several authors such as Snijders and Bosker (1999) or Fairbrother and Martin (2013) proposes group-mean centering of the given variable to separate the effect of cross-country variation from the effect of intertemporal variation. This approach thus estimates the effect of cross-country variation and cross-year variation simultaneously.



$$\text{Attitude}_{i,c,t} = \alpha + \beta_1 \text{avGini}_c + \beta_2 (\text{Gini}_{c,t} - \text{avGini}_c) + \gamma M_c + z N_{c,t} + \delta X_{i,c,t} + \mu_c + \nu_{c,t} + \varepsilon_{i,c,t}$$

Where subscript  $i, c, t$  stands for individual  $i$  in country  $c$  at time  $t$ .  $\text{avGini}$  stands for country average of the Gini index over the years, while  $\text{Gini}_{c,t} - \text{avGini}_c$  shows the difference between the Gini index in the given country in the given year and the average Gini for that country over the years. Thus  $\beta_1$  coefficient will measure the effect of cross-country inequality differences on attitudes, while  $\beta_2$  coefficient will measure the effect of changes in inequality.  $M$  stands for other country-level variables,  $N$  are control variables at the country-year level and  $X$ s are individual-level controls,  $\alpha$ , the  $\beta$ s,  $\gamma$ ,  $z$ ,  $\delta$  are parameters to estimate,  $\nu_{c,t}$  is the residual at the country-year level,  $\mu_c$  the country level residual and  $\varepsilon_{i,c,t}$  is the individual error term. For the sake of simplicity I assume that the attitudes measure is continuous.

I also estimate fixed effects models with country dummies, and clustered standard errors. In the fixed effects model the coefficient  $\beta$  measures only the effect of changes in inequality on attitudes, cross country differences in inequality levels are absorbed in the country level intercept. This technique allows controlling for all time-constant country-level unobserved variables. This is an important step, as our variable of interest (inequality) is also measured at the country level. Thus if conclusions are based on intertemporal variation in inequality and attitudes we might get a step closer to uncover the “true” effect of inequality.

$$\text{Attitude}_{i,c,t} = \alpha_c + \beta \text{Gini}_{c,t} + \gamma M_{c,t} + \delta X_{i,c,t} + \varepsilon_{i,c,t}$$

Where notation is as before and  $\alpha_c$  represents country fixed effects.

When analyzing the effect of inequality on attitudes the set of control variables is somewhat restricted in order to allow the inclusion of most countries and country-years in the analysis. As Bryan and Jenkins (2013) assert, estimating the effect of macro-level variables with multilevel models is problematic when only a low number of countries is included in the analysis. The set of control variables is the following. Macro controls are log GDP per capita (in PPS terms) and country groups. Individual controls are: gender (dummy for female respondents), age in years and age squared, marital status (married/cohabiting vs other), education level as measured by the age when the individual left school (below 14, 14-17, 18-20, 21+), employment status (employee, self-employed, unemployed, inactive), occupation (employer/manager, professional, routine nonmanual, manual, never worked), relative income position

(position in cumulative frequency distribution), frequency of attendance at religious services (never, less than once a month, once a month or more). See the Appendix for more information on the definition of control variables.

When studying attitudinal change in post-socialist countries and market economies, our analysis is based on similar models as describe before. The only difference is that we add a dummy for post-socialist countries and interact this variable with time in order to study changes in the difference between the two country groups.

$$\text{Attitude}_{i,c,t} = \alpha + \beta_1 \text{PS} + \beta_2 \text{T} + \beta_3 \text{PS} * \text{T} + \gamma \text{M}_c + z \text{N}_{c,t} + \delta \text{X}_{i,c,t} + \mu_c + \nu_{c,t} + \epsilon_{i,c,t}$$

Where PS stands for the post-socialist dummy, T stands for time and the rest of the notation is similar as before (the Gini index of income inequality is part of the  $\text{N}_{c,t}$  variables). In case of the analysis on changes in attitudes in post-socialist countries and market economies, a restricted sample of countries is used in order to have a balanced sample. Controls included in the analysis were the following: gender, age, age<sup>2</sup>, marital status, education (age left school -14, 14-17, 18-20, 21+), employment status (employee, self-employed, unemployed, inactive), relative income position (position in cumulative frequency distribution), religion (Catholic, Protestant, other) while macro-level control variables were the Gini index of income inequality, log GDP per capita and percentage of Catholics in the country around year 2000.



## 5. Results

In this section we describe descriptive evidence regarding our research questions and results of multivariate regression analysis. In section 5.1 results on the effect of income inequality on attitudes will be described, while in section 5.2 we compare patterns of attitudinal change between post-socialist countries and market economies. Table A1 of the Appendix shows the averages of the variable measuring agreement with the statement that inequalities are too large on a 10-point scale in each country-year included in the analysis.

### 5.1. Estimates of the effect of income inequality on attitudes

To have an idea about the inequality-attitudes relationship in the raw data, Figure 1 shows the relationship between changes in income inequality and changes in attitudes in different country groups. On the horizontal axis the figure shows the difference between the Gini index in the given year and the average of Gini over the years, while the vertical axis shows similar information for attitudes to inequality. The figures show that in years with above average inequality the percentage of those who think income differences are too large is also above average in three of the four country-groups considered (EU15 countries and Anglo-Saxon countries; Central Eastern European countries and the Baltic states; CIS countries and Balkans), while no relationship can be seen in case of South-American, African and Asian countries.

The effect of changes in inequality was studied using multilevel and fixed-effects models as described above. First we use inequality data from the SWIID. Table 1 shows estimates from three-level multilevel models, where the dependent variable is the 10-point scale measure of agreement with the statement that “inequalities are too large”. First three models differ in the measurement of individual status. In the first model we use a continuous measure of the relative position of the individual in the income distribution as a measure of social status (see the Appendix). The position in the cumulative distribution of incomes shows the percentage of the population that has lower income than the respondent. In the second model we use a categorical version of the relative position of the individual: we divide the population into four groups. In the third model social status is measured by occupational status. The fourth model re-estimates the same specification as Model 1 but restricts the sample to EU or OECD countries.

The coefficient of interest, showing the effect of intertemporal variation in the Gini index (Gini difference in Table 1) is positive and significantly different from zero in all models, implying that an increase in income inequality as measured by the Gini index results in an increase in the discontent with inequality.

The magnitude of the effect is quite small however: a one point increase in the Gini leads to 0.05-0.06 increase in the dependent variable on the total sample of countries, while 0.08 in case of developed countries. This means that almost a 10 point increase in the Gini is needed to achieve an important change (around 0.5) in the dependent variable. A ten point increase in the Gini index is a huge change, it corresponds roughly to the difference between a relatively less unequal EU country (eg. Sweden) and a relatively unequal EU country (eg. Estonia). Thus we can assert that while the effect of inequality is statistically significant, it's magnitude is relatively small, since a huge increase is needed in the Gini index to modify societal judgment about the level of inequality to a significant extent. The coefficient of the "Mean Gini" variable in our models, which estimates the effect of cross-country differences on attitudes is very small and insignificant in all of the models.

The individual's position in the income distribution on the other hand has a strong effect on the acceptance of income inequality: belonging to the high income group decreases the value of the dependent variable by 0.71. We also see a strong effect of individual social status on attitudes towards inequality when status is measured by occupation. Relative to employers and managers, who were taken as the reference category, all occupations show a positive and significant coefficient. The largest difference was seen among manual workers, where the indicator of the inequality attitudes is 0.45 higher than for employers and managers *ceteris paribus*.

Table 2 shows coefficients of main explanatory variables from OLS and ordered logit models with country fixed effects. As discussed above, the coefficient of inequality in fixed-effect models shows the effect of intertemporal variation in the Gini coefficient on individual attitudes. Results on the sample including all countries again show a significant positive effect of the Gini coefficient implying that increasing inequality leads to an increasing discontent with inequalities. In the ordered logit model (Model 3) a coefficient of 0.0311 implies that on average over the sample a ten point increase in the value of the Gini coefficient increases the percentage of those with the strongest agreement that income differences are too large by 3,3% and those agreeing with the statement to some extent by 7%<sup>7</sup>. Thus we again see positive and significant effect of changes in inequality on the discontent with inequalities, although the magnitude of the effect is small. As seen before individual income position is also related to attitudes: with a better rank position in the income distribution discontent with the level of income inequality declines. On average, if one moves from being the poorest to the richest person in a country, the probability of finding him with the

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<sup>7</sup> These average marginal effects were calculated by STATA's margin command.

strongest agreement that inequalities are too large declines by 6% and the probability of some level of agreement with this statement declines by 13%.

As a robustness check we estimated the effect of inequality with using data on income inequality from the Luxembourg Income Study (LIS) instead of using data from the SWIID database. The LIS database contains harmonised microdata on household incomes from high- and middle-income countries around the world. The advantage of using this database is that from the LIS one can calculate measures of pre-redistribution income inequality. As pre-redistribution inequality might be regarded as a result of market forces and is not (or less) affected by egalitarian norms in a society, one can argue that estimates using pre-redistribution income might be less susceptible of omitted variables bias. The disadvantage of using LIS is that the country and country-year coverage of the analysis is reduced. Results based on inequality data from LIS (see Table A3 and A4 of the Appendix) show significant effects of inequality only in case of pre-redistribution (market) income. When estimating the effect with multilevel models, one-point increase in the Gini index of market income is associated with a 0.05 increase in our measure of discontent with the level of inequality. When using regression models with country fixed-effects a smaller, but still statistically significant effect (0.03) has been found.

Table A2 of the Appendix summarizes estimates of the effect of other individual control variables. The attitude towards income inequality depends on demographic characteristics of the individual. Women tend to agree more that inequalities are too large. The discontent with inequalities also increases with age, albeit the effect is declining in upper age groups (the effect of age squared is negative). Married or cohabiting people tend to agree less with the statement that inequalities are too large. Socio-economic variables such as education and labour market status are also affecting attitudes to inequality. More educated people tend to agree less that inequalities are too large. Employees and the self-employed agree less than inactive and unemployed people that inequalities are too large, but the difference is larger in case of the self-employed.

## **5.2. Results on attitudinal change in post-socialist countries and market economies**

In this section we investigate how the difference between attitudes of inhabitants of post-socialist countries and market economies evolved in the past two decades that have elapsed since the transition process started. The questions we ask is whether people living in post-socialist countries are becoming more similar

to people living in market economies in their judgments about the level of inequality? We also study the difference of attitudes by narrower country groups. We also study whether convergence of attitudes eventually takes place in different strata of the society. First we investigate whether opinions of individuals belonging to different income groups have become more similar, then we study evolution of opinions by cohort. Are younger cohorts (of ex-socialist and market economies) more similar in their attitudes than older cohorts? We investigate these questions on a subsample of countries, for which data are available in three periods: around 1990, around 1999, around 2009 in order to have a balanced sample of countries. There are 27 such countries, see the list in Table A3.

We take a quick look on the evolution of mean score on the 10-point attitudinal scale on Figure 2. The figure shows that in 1990 on average post-socialist countries recorded lower score of agreement with the statement that inequalities are too large than market economies. In 2009 post-socialist countries continue to have a lower average but the difference has decreased from almost 1 to 0.3. The raw data thus shows convergence of typical opinions between the two country groups. The figure also shows that there is heterogeneity in typical opinions within these broad country groups. Among post-socialist countries in Central European countries there is a much stronger agreement with the statement that inequalities are too large, while in the Baltic states and the CIS countries people agree less with this statement. This might be surprising since income disparities are larger in the latter groups of countries, and are lower among the Central European states. Nevertheless, all three country groups show similar time trends: agreement with the statement that inequalities are large increased between 1990 and 1999, while in the second decade it has changed only marginally. Among market economies agreement with the statement is highest in Western European countries, it fluctuates around average in the case of North European states, while it is lower than average in case of Anglo-Saxon countries and in Southern European countries at the end of the period. Discontent with the level of inequalities has been rising in Western European, Northern European and Anglo-Saxon countries, while in the Southern European states we see broad stagnation of the indicator over the two decades covered by the data. Of course there is still more heterogeneity of opinions at the country level (for details see Table A5 of the Appendix).

Figures 3-5 show details of this convergence process. Figure 3 shows evolution of attitudes by narrower country groups. Subsequent panels show groups of post-socialist countries together with all groups of countries among the market economies. The first two panels suggest that the CIS countries and the Baltic states become more similar to Southern European states, while differences with other country groups are not narrowing. The CEE countries show quite similar attitudes to the Northern European countries throughout the period studies. There seems to be some convergence to Western EU countries, while distance to Southern European countries and Anglo-Saxon countries does not seem to diminish.



Figure 4 shows the evolution of attitudes by income groups. In three of the four income groups we see clear pattern of convergence of opinions about income inequality. In the lowest income group, the 3<sup>rd</sup> income group and the highest income group the difference between post-socialist countries and market economies declines over time. In the 2<sup>nd</sup> income group the difference declines between 1990 and 1999, but starts to increase in the second half of the period studied. Figure 5 shows evolution of attitudes by cohort. In the case of the three middle cohorts the pattern is that of clear convergence. In 1990 individuals in post-socialist countries agree less that inequalities are too large but the difference practically vanishes by 1999, and there is no difference between the two country groups in 2009 either. The case of the oldest cohort is to some extent different from the middle cohorts, because in 1999, inhabitants of post-socialist countries seem to show more discontent with the level of inequalities than people in the same cohort living in market economies. The difference somewhat diminishes by 2009, so there is some convergence in the second half of the period studied. For the youngest cohort there is sign of divergence: in 1999 we see no difference between the two country groups, but difference increases by 2009.

These results however do not take into account changes important changes in societal composition and country-level contextual characteristics that have occurred in the post-socialist societies and also in market economies over the two decades covered by the study. Eg. inequality levels have increased in the post-socialist countries, so we can ask whether the convergence in opinions about inequality can be fully explained by converging inequality levels, or there is also convergence in the opinions towards similar levels of inequality. In order to control for such compositional and contextual changes we estimated regression models as explained in section 4, augmented with a dummy for post-socialist countries and the interaction of time with the post-socialist dummy.

Results are shown in Table 3. In this specification the coefficient of the post-socialist dummy shows the difference between the two groups in the first wave, that is around 1990. In the total sample (Table 3, Model 1) this variable is significant and negative, which means that in 1990, people of post-socialist countries were less complaining about inequalities than their Westerners did, even when controlling for compositional and contextual differences (such as the GDP level, or level of inequality). This result is similar to that by Kelley and Zagorski (2004), who documented that East-Europeans have more inequality-friendly attitudes at the time of the transition than West-Europeans.

Moreover, the results of Model 1 in Table 3 show, that the difference between post-socialist countries and market economies declines during the two decades covered by our data. The difference between inhabitants of post-socialist countries and other states in 2000 and 2009 can be found by summing the coefficient of the post-socialist dummy with the coefficient of the respective interaction variable. This difference, which was

significant around the year of transition (1990), disappears a decade after the transition and does not reappear 20 years after systemic change in these countries. Overall, we see that opinion towards inequality became quite similar in post-socialist countries than in western societies. As there is considerable variation within the post-socialist and the market economies country groups, we also analysed the evolution of the difference by considering narrower country groups (same as in Figure 3). The analysis is similar as before, but we compare one narrower country group from the post-socialist countries with one country group among the market economies (Results are summarised in Table A6 of the Appendix). Our analysis shows that all groups of post-socialist countries (Central Europe, Baltic states, CIS countries) became more similar to Western European countries. There is also sign of Central European countries and the Baltic states converging to Southern European countries. In contrast we don't find the pattern of converging attitudes between post-socialist countries and Northern European or Anglo-Saxon countries.

We also investigated whether this convergence pattern can be found in different subgroups of the countries concerned. In Models 2 to 5 in Table 3 we analyse whether this pattern of convergence can also be seen in different income groups of the society. The pattern of coefficients is basically the same in all income groups. The coefficient of the post-socialist dummy is significant and negative, while those of the interaction variables are significant and positive, implying that the difference between post-socialist countries and market economies declines over time, and more or less vanishes by 1999. The magnitude of the interaction variables is similar, which suggests that the difference between post-socialist countries and market economies is reduced (and is close to zero) also in 2009.

In case of Table 4 the analysis is repeated by cohort. The coefficients of the post-socialist dummy are significant and negative for all, but the youngest cohort. This means that in the year of transition inhabitants of post-socialist countries were feeling less discontent about the level of inequalities, than people in market economies in all cohorts only exception being the youngest cohort, which is not significantly different from the young people living in other countries around year 2000 (they did not participate in the survey before). The coefficients show that the convergence process takes place in all but the youngest cohort. Coefficients of the time variables are negative and significant, which show that even people in Western countries are more and more complaining about inequalities. But the negative interaction variables show that in the case of inhabitants of post-socialist countries this negative sentiment towards inequalities grows even faster. In the case of the youngest cohort, the interaction variable is non-significant, which means that there is no important difference between the evolution of the attitude among the youngsters of the two country-groups.

Results obtained by cohort are relevant for our third hypothesis, which relates to whether convergence is taking place by uniform shift of values or by generational replacement. Our results suggest, that attitudinal change is important, since opinions of all cohorts have become similar to their western contemporaries and there is no sign of persistent attitudinal differences, that would only disappear with generational replacement.

## 6. Conclusion

This study examines the effect of income inequality on attitudes towards inequalities. More precisely, I investigate whether discontent with the level of inequalities is responsive to changes in income inequality. Thus the focus is to estimate the effect of inequality from intertemporal variation in the Gini index of income inequality rather than from cross-country differences as most previous studies have done. Moreover, as during the past two decades, biggest changes in levels of income inequality were seen in countries which underwent transition from a socialist to the market economy, we also study whether opinions about inequality in these countries became more similar to opinions in countries with no experience of socialism. The analysis uses data from the World Values Study to study the relationship between inequality attitudes.

On the total sample of countries our results show a statistically significant effect of changes in inequality as measured by the Gini index on the discontent with the level of inequality. When inequality is on the rise, the agreement with the statement that inequalities are too large increases. This result is robust to changes in the measurement of individual social status (income, occupation) and modelling strategy (multilevel, regression with country fixed effects). Results on the restricted sample of developed countries show significant effect only in the case of multilevel models, coefficients in fixed effect specifications are also positive but nonsignificant. The basic finding of the positive effect of inequality change on discontent with inequalities is consistent with those of Kerr (2011) who uses models with country fixed-effects on data from waves 2 to 4 of the WVS, while partially differ from those of Schimdt (2012), who finds a positive effect only from some threshold value of the Gini index in a pseudo-panel analysis on WVS data.

The size of the effect of inequality change on the judgments about the level of inequality is relatively small however: a 10-point increase in the Gini is needed to achieve an important increase in the discontent with inequalities (increase in the dependent variable by 0.5). A ten-point increase in the Gini index is a huge change, it corresponds roughly to the difference between a relatively less unequal EU country (eg. Sweden) and a relatively unequal EU country (eg. Estonia). Thus we can assert that while the effect of inequality is statistically significant, it's magnitude is relatively small, since a huge increase is needed in the Gini index to modify societal judgment about the level of inequality to a significant extent.

Countries that experienced the largest increase in income inequality in the past two decades were countries that underwent transition from the socialist to the market economy. Inequality levels generally increased in

these countries and became more similar to inequality levels in countries with market economies. Our analysis shows that during the 1990-2010 period attitudes in post-socialist countries did converge to attitudes in market economies. This convergence was not only the result of these societies becoming more similar to market economies in societal composition and country-level context (GDP level, inequality level), since attitudinal convergence can be seen also after controlling for these factors.

The analysis also shows that the convergence in attitudes can be seen in different income groups and also in different cohorts with the exception of the youngest cohort, born after 1979. This result suggests, that the convergence in attitudes takes place by attitudes changing in all segments of the society. Convergence by generational replacement seems less important, since there is no sign of persistent attitudinal differences that would only disappear with the disappearance of cohorts carrying the “legacy of socialism”.

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# Annexes

## Dependent variables

### Occupation:

Based on variable x036, except for EVS 2008-2010, where it was based on x035\_2.

### Education

Based on variable x023, which records at what age the respondent completed full time education, either at school or at an institution of higher education. In cases when this information was missing, but information on highest level of education (variable x025) was available, we imputed age of school leaving.

### Relative income:

The basic variable, x047 (except in EVS 2008-2010) is a ten-point scale of incomes, which sets income ranges where respondents have to position themselves (bracket values are recorded for most of the countries, but in case of approx 25% of countries-waves bracket values are not recorded). In some cases however the ten-point scale refers to income deciles and respondents have to position themselves into deciles as they perceive the income distribution. According to Donnelly and Pop-Eleches (2012) there are 13 country-years with this kind of question. There are another few cases incomes were asked directly and then recoded to income ranges. In case of EVS 2008-2010 countries have different income scales (not necessarily 10-point).

There are other variables in the database:

-x047r is 3-category version of x047, but exists only for EVS waves and for WVS 1999-2004

-x047cs is in principle based on x047 but includes also country-specific information in income brackets. In some cases however it is not based on x047. for example in case of the US 2006 data, x047 asks households to position themselves in income deciles, while x047cs contains a 15-bracket income ladder which is presumably based on another question (precise info is not available in the questionnaire).

In our case we would basically use this income variable to measure respondents relative position in the income distribution. In order to do this we base our income variable on the original ten-point variable (x047) and x047c\_01 in the case of EVS 2008-2010 and use the cumulative frequency distribution of the variable. (Using the already recoded x047r or info on income values from X047cs would result in an important loss in sample size).

Figure 1.

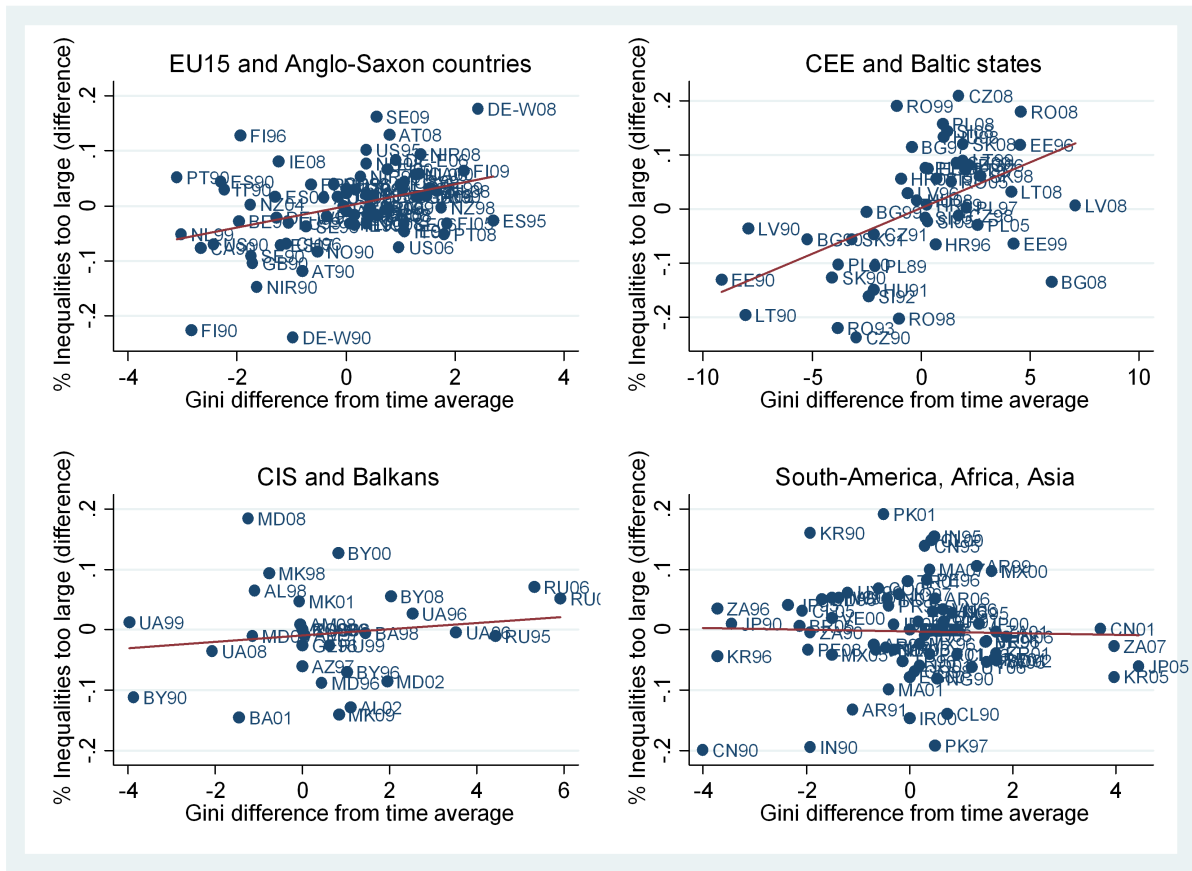
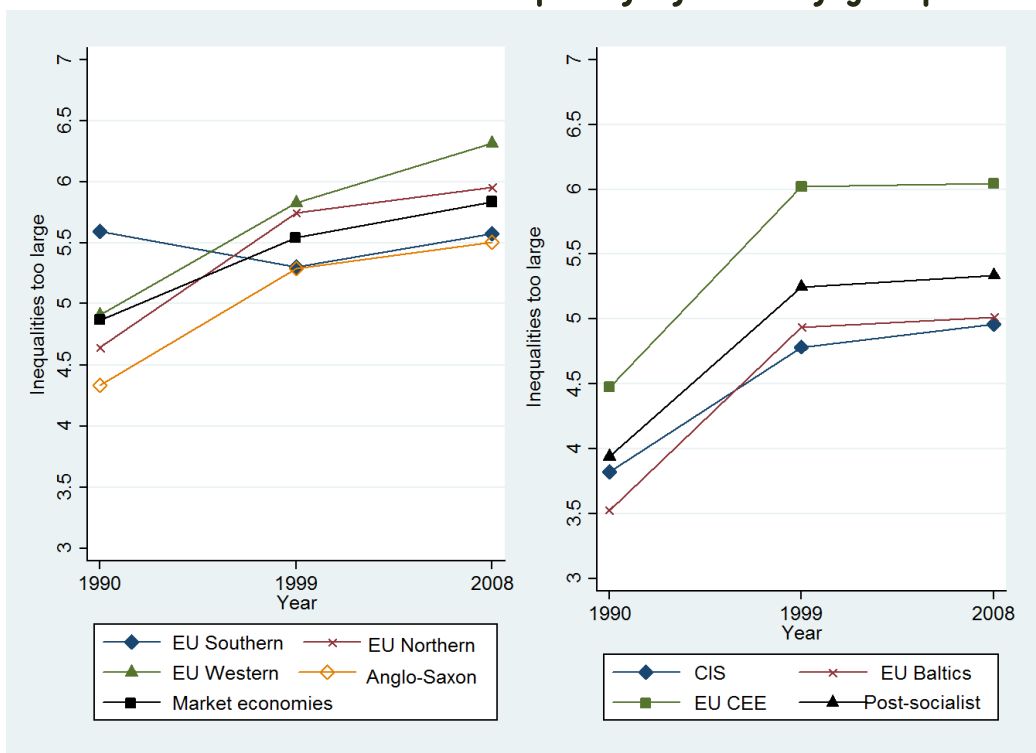
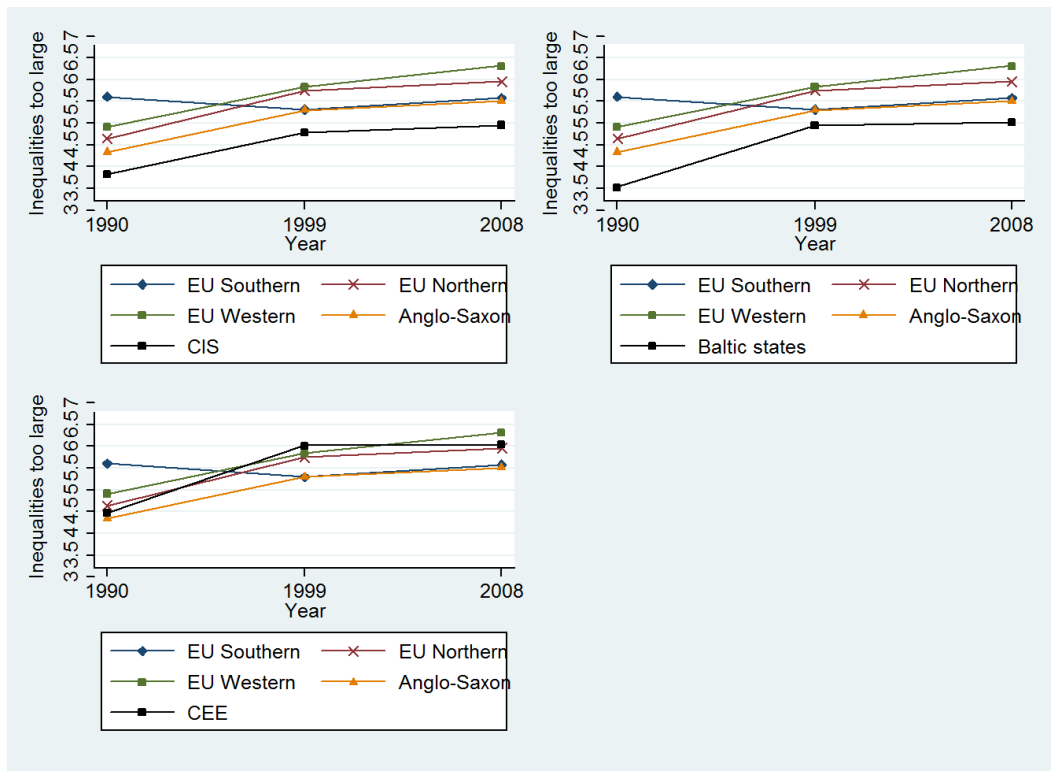


Figure 2. Evolution of attitudes to inequality by country groups

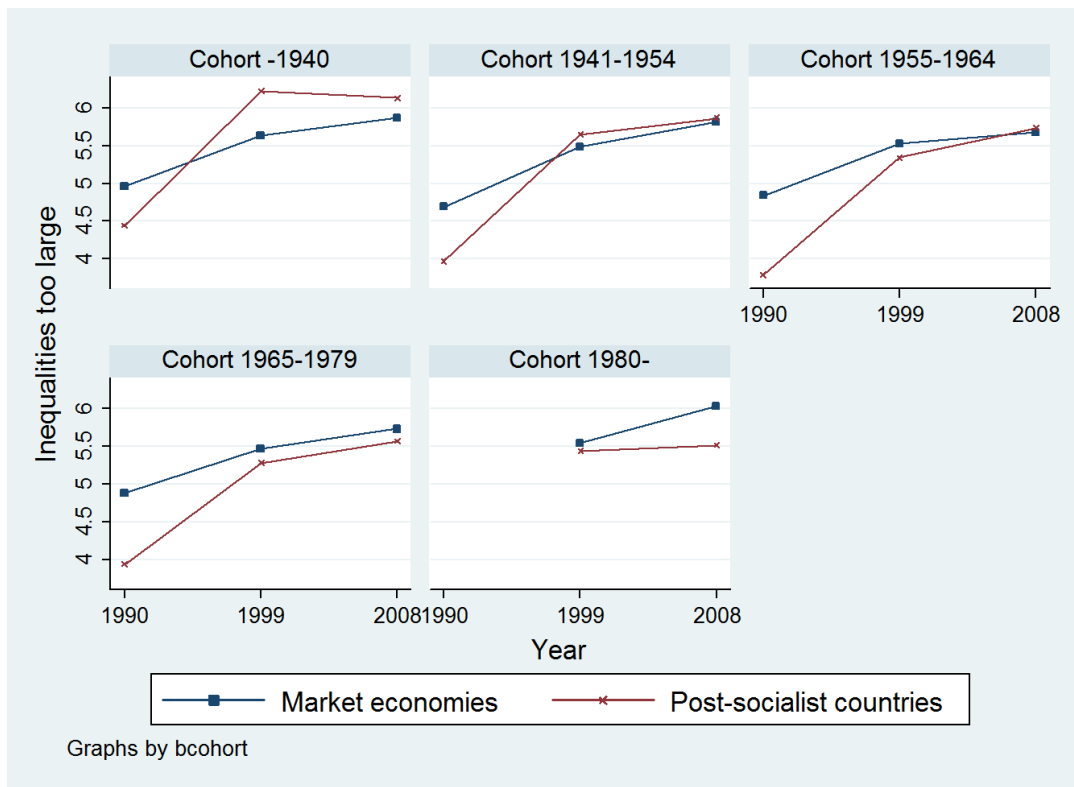




**Figure 3 Patterns of convergence between country-groups**

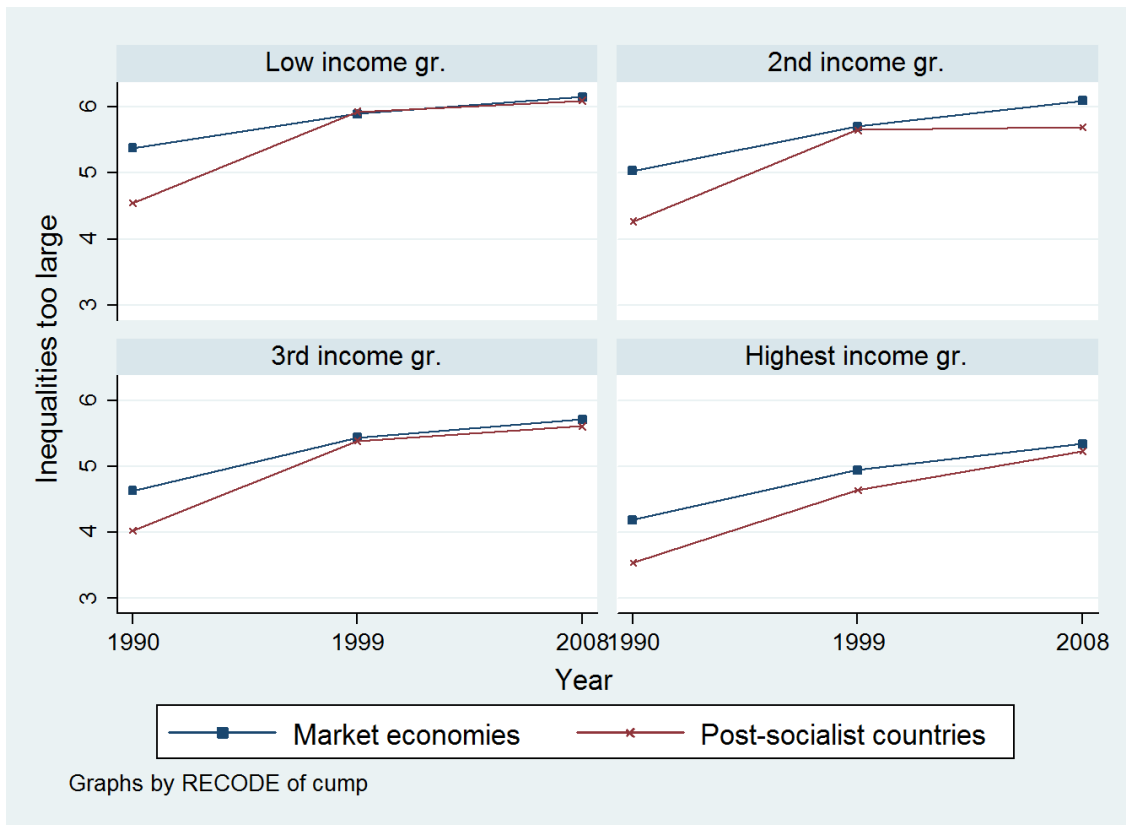


**Figure 4 Evolution of inequality attitudes by cohort**



Graphs by bcohort

Figure 5 Evolution of inequality attitude by income group





## Table 1. Results of multilevel regression models

|                                 | Model 1               | Model 2               | Model3              | Model 1 developed countries |
|---------------------------------|-----------------------|-----------------------|---------------------|-----------------------------|
| Gini difference                 | 0.0575**<br>(2.66)    | 0.0578**<br>(2.67)    | 0.0554*<br>(2.44)   | 0.0827**<br>(2.63)          |
| Mean Gini                       | -0.00357<br>(-0.25)   | -0.00344<br>(-0.24)   | -0.00493<br>(-0.34) | -0.00335<br>(-0.14)         |
| LnGDPpc                         | 0.311*<br>(2.13)      | 0.305*<br>(2.09)      | 0.313*<br>(2.14)    | 0.452<br>(1.53)             |
| Anglo-Saxon                     | -0.440<br>(-1.28)     | -0.436<br>(-1.27)     | -0.390<br>(-1.13)   | -0.454<br>(-1.31)           |
| CEE/Baltics                     | 0.0928<br>(0.31)      | 0.0833<br>(0.28)      | 0.0911<br>(0.30)    | 0.0992<br>(0.26)            |
| Balkan/CIS                      | -0.292<br>(-0.75)     | -0.308<br>(-0.79)     | -0.332<br>(-0.85)   | .<br>.                      |
| Other OECD                      | 0.301<br>(0.63)       | 0.297<br>(0.63)       | 0.349<br>(0.73)     | 0.439<br>(0.80)             |
| Other countries                 | -0.0150<br>(-0.03)    | -0.0296<br>(-0.06)    | -0.0484<br>(-0.11)  | .<br>.                      |
| Income position<br>(continuous) | -1.010***<br>(-40.35) |                       |                     | -1.132***<br>(-37.31)       |
| 2 <sup>nd</sup> income group    |                       | -0.151***<br>(-8.18)  |                     |                             |
| 3 <sup>rd</sup> income group    |                       | -0.372***<br>(-19.58) |                     |                             |
| High income group               |                       | -0.737***<br>(-37.54) |                     |                             |
| Professional occ.               |                       |                       | 0.250***<br>(8.75)  |                             |
| Routine nonmanual               |                       |                       | 0.440***<br>(16.02) |                             |
| Manual                          |                       |                       | 0.761***<br>(29.60) |                             |
| Never worked                    |                       |                       | 0.456***<br>(13.25) |                             |
| Constant                        | 3.249*<br>(2.08)      | 3.057*<br>(1.96)      | 2.135<br>(1.36)     | 1.826<br>(0.54)             |
| Individual controls             | Yes                   | Yes                   | Yes                 | Yes                         |
| N of individuals                | 199102                | 199102                | 194183              | 129186                      |
| N of countries                  | 57                    | 57                    | 57                  | 35                          |
| N of country-years              | 182                   | 182                   | 182                 | 121                         |

Notes: t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. Reference categories: Country groups: EU13 countries (EU15 without UK, Ireland which are in the Anglo-Saxon group), income categories: low income group, occupation: employer, manager. Results on socio-demographic controls can be seen in Table.

**Table 2. Models with country fixed-effects**

|                     | Model 1<br>(OLS regression) | Model 1<br>developed countries | Model 2<br>(Ordered logit<br>model) | Model2<br>developed countries |
|---------------------|-----------------------------|--------------------------------|-------------------------------------|-------------------------------|
| Gini                | 0.0482*<br>(2.45)           | 0.0592<br>(1.71)               | 0.0311*<br>(2.28)                   | 0.0430<br>(1.85)              |
| LnGDPpc             | 0.633*<br>(2.47)            | 1.081**<br>(3.35)              | 0.388*<br>(2.30)                    | 0.667**<br>(3.14)             |
| Income position     | -0.995***<br>(-18.54)       | -1.106***<br>(-18.51)          | -0.597***<br>(-16.98)               | -0.702***<br>(-16.77)         |
| Constant            | -0.453<br>(-0.20)           | -8.221*<br>(-2.26)             | 5.512***<br>(3.77)                  | 10.03***<br>(4.40)            |
| Individual controls | Yes                         | Yes                            | Yes                                 | Yes                           |
| Country dummies     | Yes                         | Yes                            | Yes                                 | Yes                           |
| N of individuals    | 199102                      | 129186                         | 199102                              | 129186                        |
| N of countries      | 57                          | 35                             | 57                                  | 35                            |
| N of country-years  | 182                         | 121                            | 182                                 | 121                           |

Notes: t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Reference category: Income categories: low income group, Occupation: employer, manager

Results on socio-demographic controls can be seen in Table



**Table 3. Multilevel regression of inequality attitude, total sample and by income groups**

|                              | Total sample          | Low income group      | 2nd income group     | 3rd income group     | Highest income group |
|------------------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|
| Wave 1999                    | 0.106<br>(0.46)       | 0.297<br>(1.39)       | 0.559*<br>(2.50)     | 0.577*<br>(2.55)     | 0.660**<br>(3.10)    |
| Wave 2008                    | 0.303<br>(1.20)       | 0.537*<br>(2.37)      | 0.886***<br>(3.65)   | 0.877***<br>(3.56)   | 1.061***<br>(4.69)   |
| Post-socialist               | -1.218***<br>(-8.25)  | -1.619***<br>(-8.04)  | -1.249***<br>(-4.72) | -1.621***<br>(-7.80) | -1.206***<br>(-5.62) |
| Int: Post-socialist          | 1.598***<br>(9.08)    | 1.596***<br>(5.70)    | 1.342***<br>(4.58)   | 1.565***<br>(5.56)   | 1.027***<br>(3.57)   |
| *Wave 1999                   |                       |                       |                      |                      |                      |
| Int: Post-socialist          | 1.277***<br>(8.41)    | 1.414***<br>(5.91)    | 1.084***<br>(3.68)   | 1.253***<br>(4.43)   | 1.149***<br>(4.46)   |
| *Wave 2008                   |                       |                       |                      |                      |                      |
| 2 <sup>nd</sup> income group | -0.180***<br>(-6.86)  |                       |                      |                      |                      |
| 3 <sup>rd</sup> income group | -0.358***<br>(-12.86) |                       |                      |                      |                      |
| High income group            | -0.725***<br>(-25.47) |                       |                      |                      |                      |
| Gini difference              | 0.0700*<br>(2.15)     | -0.0377<br>(-1.25)    | -0.0400<br>(-1.25)   | -0.0355<br>(-1.08)   | -0.0221<br>(-0.74)   |
| Mean Gini                    | -0.0700**<br>(-2.66)  | -0.0962***<br>(-3.72) | -0.0761**<br>(-2.69) | -0.0845**<br>(-3.13) | -0.0528*<br>(-2.15)  |
| Log GDPpc                    | 0.199<br>(0.93)       | -0.148<br>(-0.66)     | 0.0912<br>(0.37)     | -0.186<br>(-0.79)    | -0.0482<br>(-0.22)   |
| Employment rate              | 0.0396**<br>(2.62)    | 0.0160<br>(1.13)      | 0.0213<br>(1.38)     | 0.0301*<br>(2.00)    | 0.0206<br>(1.48)     |
| Proportion Catholic          | 0.930*<br>(2.36)      | 0.751<br>(1.94)       | 0.717<br>(1.69)      | 0.961*<br>(2.34)     | 0.798*<br>(2.17)     |
| Constant                     | 4.062*<br>(2.43)      | 7.358***<br>(4.53)    | 5.197**<br>(2.99)    | 5.870***<br>(3.43)   | 5.182**<br>(3.27)    |
| Individual controls          | Yes                   | Yes                   | Yes                  | Yes                  | Yes                  |
| N                            | 86328                 | 23636                 | 21585                | 20051                | 21056                |
| N of countries               | 27                    | 27                    | 27                   | 27                   | 27                   |

**Table 4: Multilevel regression of inequality attitude, total sample and by cohort**

|                                   | Cohort born<br>before 1940 | Cohort<br>1941-1954  | Cohort<br>1955-1964  | Cohort<br>1965-1979  | Cohort<br>1980-   |
|-----------------------------------|----------------------------|----------------------|----------------------|----------------------|-------------------|
| Wave 1999                         | 0.441*<br>(2.08)           | 0.458*<br>(2.03)     | 0.512*<br>(2.33)     | 0.415<br>(1.81)      | -0.134<br>(-0.61) |
| Wave 2008                         | 0.702**<br>(3.03)          | 0.814**<br>(3.24)    | 0.565*<br>(2.25)     | 0.773**<br>(3.02)    | .                 |
| Post-socialist                    | -1.366***<br>(-7.27)       | -1.507***<br>(-6.98) | -1.542***<br>(-6.99) | -1.492***<br>(-5.40) | -0.441<br>(-1.30) |
| Int: Post-socialist<br>*Wave 1999 | 1.637***<br>(6.31)         | 1.374***<br>(4.89)   | 1.070***<br>(3.75)   | 1.280***<br>(4.12)   | 0.0500<br>(0.18)  |
| Int: Post-socialist<br>*Wave 2008 | 1.373***<br>(5.15)         | 1.233***<br>(4.73)   | 1.455***<br>(5.49)   | 1.308***<br>(4.40)   | .                 |
| Individual controls               | Yes                        | Yes                  | Yes                  | Yes                  | Yes               |
| Macro controls                    | Yes                        | Yes                  | Yes                  | Yes                  | Yes               |
| N                                 | 22760                      | 21668                | 19565                | 17387                | 4948              |
| N of countries                    | 27                         | 27                   | 27                   | 27                   | 27                |





# Appendix

**Table A1. Means of agreement with “Inequalities are too large” statement (10–point scale)**

|   | Wave 2<br>(around<br>1990) | Wave 3<br>(around<br>1995) | Wave 4<br>(around<br>2000) | Wave 5<br>(around<br>2005) | Wave 6<br>(around<br>2008) |
|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Anglo-Saxon countries                   |                            |                            |                            |                            |                            |
| Australia                               |                            | 5,4                        |                            | 5,3                        |                            |
| Canada                                  | 4,2                        |                            | 5,5                        | 5,2                        |                            |
| Ireland                                 | 4,6                        |                            | 4,8                        |                            | 5,6                        |
| Great Britain                           | 4,4                        |                            | 5,4                        | 5,7                        | 5,6                        |
| United States                           | 4,1                        | 5,5                        | 5,2                        | 4,9                        |                            |
| Northern Ireland                        | 3,8                        |                            | 5,3                        |                            | 6,0                        |
| European countries (North, South, West) |                            |                            |                            |                            |                            |
| Austria                                 | 5,5                        |                            | 6,3                        |                            | 7,5                        |
| Belgium                                 | 5,2                        |                            | 5,4                        |                            | 5,4                        |
| Cyprus                                  |                            |                            |                            | 5,8                        | 6,0                        |
| Denmark                                 | 4,5                        |                            |                            |                            | 4,1                        |
| Finland                                 | 4,4                        | 6,8                        | 6,5                        | 6,0                        | 6,4                        |
| France                                  | 5,9                        |                            | 6,1                        | 5,9                        | 5,8                        |
| Germany West                            |                            |                            |                            |                            |                            |
| Germany East                            |                            |                            |                            |                            |                            |
| Italy                                   | 5,2                        |                            | 5,0                        | 5,0                        | 5,0                        |
| Luxembourg                              |                            |                            | 4,3                        |                            | 4,6                        |
| Netherlands                             | 4,8                        |                            | 4,9                        | 5,4                        | 5,2                        |
| Norway                                  | 4,9                        | 5,7                        |                            | 5,9                        | 5,4                        |
| Portugal                                | 6,4                        |                            |                            |                            | 5,8                        |
| Spain                                   | 6,0                        | 5,4                        | 5,9                        | 5,3                        | 5,9                        |
| Sweden                                  |                            | 5,1                        |                            | 4,9                        | 6,1                        |
| Central and Eastern Europe, Baltics     |                            |                            |                            |                            |                            |
| Bulgaria                                | 4,2                        | 5,7                        | 4,9                        | 5,3                        | 3,4                        |
| Croatia                                 |                            |                            | 6,9                        |                            | 6,8                        |
| Czech Republic                          | 4,2                        | 4,8                        | 5,5                        |                            | 6,4                        |
| Estonia                                 |                            | 5,5                        | 4,1                        |                            | 5,1                        |
| Hungary                                 | 5,2                        |                            |                            |                            | 6,3                        |
| Latvia                                  | 3,8                        | 4,6                        |                            |                            | 4,4                        |
| Lithuania                               |                            | 5,7                        | 6,1                        |                            | 5,6                        |
| Poland                                  | 3,5                        |                            | 4,9                        | 4,2                        | 5,7                        |
| Romania                                 | 4,6                        | 4,7                        | 7,3                        | 6,4                        | 7,3                        |
| Slovakia                                | 4,7                        | 5,4                        |                            |                            | 5,8                        |
| Slovenia                                | 5,4                        |                            | 6,9                        | 6,3                        | 7,3                        |

Table A1. (continued)

|                          | Wave 2<br>(around<br>1990) | Wave 3<br>(around<br>1995) | Wave 4<br>(around<br>2000) | Wave 5<br>(around<br>2005) | Wave 6<br>(around<br>2008) |
|--------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Balkans and CIS          |                            |                            |                            |                            |                            |
| Albania                  |                            | 6,0                        | 5,0                        |                            |                            |
| Bosnia                   |                            | 5,5                        | 4,9                        |                            |                            |
| Belarus                  | 3,8                        | 4,3                        | 5,7                        |                            | 5,4                        |
| Moldova                  |                            | 4,0                        | 4,3                        | 5,1                        | 6,0                        |
| Russian Federation       | 4,2                        | 4,5                        | 3,8                        | 4,4                        | 4,4                        |
| Ukraine                  |                            | 4,4                        | 3,7                        | 4,0                        | 3,3                        |
| Macedonia                |                            | 6,2                        | 5,7                        |                            | 3,1                        |
| Other OECD countries     |                            |                            |                            |                            |                            |
| Chile                    | 5,2                        | 5,9                        | 7,0                        | 6,3                        |                            |
| Japan                    | 5,4                        | 5,4                        | 5,2                        | 4,8                        |                            |
| South Korea              |                            | 4,3                        | 4,5                        | 4,6                        |                            |
| Mexico                   | 5,4                        | 5,0                        | 5,9                        | 4,9                        |                            |
| Turkey                   | 6,4                        | 5,9                        | 7,0                        |                            |                            |
| Other non-OECD countries |                            |                            |                            |                            |                            |
| Argentina                | 4,4                        | 5,0                        | 6,0                        |                            |                            |
| Bangladesh               |                            | 3,9                        | 3,3                        |                            |                            |
| Brazil                   | 5,2                        | 5,0                        |                            | 5,2                        |                            |
| China                    | 3,2                        |                            | 4,7                        |                            |                            |
| Taiwan                   |                            | 5,0                        |                            | 4,3                        |                            |
| Colombia                 |                            | 4,8                        |                            | 5,4                        |                            |
| India                    | 5,2                        | 7,0                        | 6,5                        | 6,1                        |                            |
| Indonesia                |                            |                            | 3,7                        | 3,6                        |                            |
| Nigeria                  | 3,0                        | 4,3                        | 4,7                        |                            |                            |
| Peru                     |                            | 4,2                        | 3,5                        | 3,5                        |                            |
| Vietnam                  |                            |                            | 4,4                        | 5,0                        |                            |
| South Africa             |                            | 6,0                        | 5,6                        | 5,4                        |                            |
| Uruguay                  |                            | 5,9                        |                            | 5,9                        |                            |
| Venezuela                |                            | 5,4                        | 5,5                        |                            |                            |



## Table A2. Effect of socio-demographic controls

|  | Model 1                 | Model 2                 | Model 3                  | Model 1 developed countries |
|--|-------------------------|-------------------------|--------------------------|-----------------------------|
| Female                                 | 0.152***<br>(11.71)     | 0.155***<br>(11.90)     | 0.219***<br>(16.25)      | 0.201***<br>(12.97)         |
| Age (years)                            | 0.00855***<br>(3.64)    | 0.00858***<br>(3.65)    | 0.0116***<br>(4.81)      | 0.0100***<br>(3.63)         |
| Age squared                            | -0.0000771**<br>(-3.07) | -0.0000736**<br>(-2.94) | -0.0000846***<br>(-3.31) | -0.000106***<br>(-3.66)     |
| Married/cohabiting                     | -0.0443**<br>(-3.03)    | -0.0649***<br>(-4.43)   | -0.125***<br>(-8.60)     | -0.0272<br>(-1.55)          |
| School until 14-17y                    | -0.240***<br>(-9.88)    | -0.250***<br>(-10.31)   | -0.290***<br>(-11.56)    | -0.194***<br>(-6.34)        |
| School until 18-20y                    | -0.464***<br>(-18.27)   | -0.480***<br>(-18.91)   | -0.502***<br>(-19.02)    | -0.462***<br>(-14.31)       |
| School until 21+y                      | -0.669***<br>(-25.78)   | -0.680***<br>(-26.27)   | -0.667***<br>(-23.97)    | -0.657***<br>(-19.77)       |
| Employee                               | -0.0577***<br>(-3.47)   | -0.0656***<br>(-3.94)   | -0.124***<br>(-6.46)     | -0.0285<br>(-1.42)          |
| Self-employed                          | -0.318***<br>(-12.04)   | -0.318***<br>(-12.03)   | -0.318***<br>(-11.26)    | -0.403***<br>(-12.01)       |
| Unemployed                             | 0.0537*<br>(2.00)       | 0.0698**<br>(2.59)      | 0.143***<br>(4.87)       | 0.129***<br>(3.60)          |
| Religious service less often           | -0.0714***<br>(-4.29)   | -0.0731***<br>(-4.40)   | -0.0685***<br>(-4.12)    | -0.124***<br>(-6.54)        |
| Religious service: at least once month | -0.0260<br>(-1.42)      | -0.0270<br>(-1.48)      | -0.0103<br>(-0.56)       | -0.0664**<br>(-3.17)        |

Notes: t statistics in parentheses \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Reference categories: Schooling until age 13, Labour market status: inactive, Religion: never attends religious services

**Table A3. Multilevel model, LIS inequality data**

|   | Model 1           | Model 1<br>developed<br>countries | Model 2             | Model2<br>developed<br>countries |
|---|-------------------|-----------------------------------|---------------------|----------------------------------|
| Gini difference<br><i>disposable income</i> | 0.0348<br>(1.68)  | 0.0314<br>(1.51)                  |                     |                                  |
| Mean Gini<br><i>disposable income</i>       | 0.0238<br>(0.90)  | 0.0397<br>(1.20)                  |                     |                                  |
| Gini difference:<br><i>market income</i>    |                   |                                   | 0.0471*<br>(2.03)   | 0.0502*<br>(1.99)                |
| Mean Gini:<br><i>market income</i>          |                   |                                   | -0.00393<br>(-0.17) | -0.00507<br>(-0.16)              |
| LnGDPpc                                     | 0.620<br>(1.60)   | 0.974*<br>(2.13)                  | 0.745<br>(1.94)     | 0.628<br>(1.33)                  |
| Anglo-Saxon                                 | -0.617<br>(-1.53) | -0.724<br>(-1.77)                 | -0.438<br>(-1.27)   | -0.430<br>(-1.20)                |
| CEE/Baltics                                 | -0.110<br>(-0.23) | 0.186<br>(0.36)                   | 0.0366<br>(0.08)    | -0.0673<br>(-0.13)               |
| Balkan/CIS                                  | -1.180<br>(-1.07) |                                   | -0.481<br>(-0.58)   |                                  |
| Other OECD                                  | -0.216<br>(-0.27) | -0.0720<br>(-0.08)                | 0.299<br>(0.46)     | 0.161<br>(0.22)                  |
| Other countries                             | 0.00575<br>(0.01) |                                   | 0.431<br>(0.60)     |                                  |
| Constant                                    | -0.605<br>(-0.15) | -4.627<br>(-0.96)                 | -1.116<br>(-0.28)   | 0.224<br>(0.04)                  |
| Individual controls                         | Yes               | Yes                               | Yes                 | Yes                              |
| N   | 82328             | 71128                             | 81383               | 68584                            |
| N of countries                              | 35                | 27                                | 35                  | 27                               |
| N of country-years                          | 74                | 63                                | 74                  | 63                               |

Notes: t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table A4: Fixed effect models (LIS inequality data)**

|                                  | Model 3          | Model 3<br>developed<br>countries | Model 4            | Model4<br>developed<br>countries |
|----------------------------------|------------------|-----------------------------------|--------------------|----------------------------------|
| Gini<br><i>disposable income</i> | 0.0168<br>(1.93) | 0.0177<br>(1.90)                  |                    |                                  |
| Gini<br><i>market income</i>     |                  |                                   | 0.0309**<br>(2.63) | 0.0313*<br>(2.34)                |
| LnGDPpc                          | 1.117*<br>(2.34) | 1.212*<br>(2.44)                  | 0.645*<br>(2.15)   | 0.742<br>(1.96)                  |
| Individual controls              | Yes              | Yes                               | Yes                | Yes                              |
| Country dummies                  | Yes              | Yes                               | Yes                | Yes                              |
| N                                | 82328            | 71128                             | 81383              | 68584                            |
| N of countries                   | 35               | 27                                | 35                 | 27                               |
| N of country-years               | 74               | 63                                | 74                 | 63                               |

Notes: t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



## Table A5: Gini indices and country averages of inequality attitudes

|                          | Gini index of income inequality |      |      | Average discontent with inequalities |      |      |
|--------------------------|---------------------------------|------|------|--------------------------------------|------|------|
|                          | 1990                            | 1999 | 2008 | 1990                                 | 1999 | 2008 |
| Market economies         |                                 |      |      |                                      |      |      |
| Austria                  | 25,1                            | 25,9 | 26,7 | 5,5                                  | 6,4  | 7,5  |
| Belgium                  | 23,3                            | 26,8 | 25,7 | 5,1                                  | 5,5  | 5,3  |
| Canada                   | 27,5                            | 31,5 | 31,5 | 4,2                                  | 5,6  | 5,2  |
| Finland                  | 21,0                            | 24,6 | 26,0 | 4,4                                  | 6,4  | 6,4  |
| France                   | 27,1                            | 26,8 | 28,0 | 5,7                                  | 6,2  | 5,8  |
| Ireland                  | 33,0                            | 32,1 | 30,7 | 4,6                                  | 4,9  | 5,8  |
| Italy                    | 30,7                            | 33,7 | 33,3 | 5,2                                  | 5,0  | 5,1  |
| Netherlands              | 26,2                            | 23,1 | 27,8 | 4,9                                  | 4,8  | 5,1  |
| Norway                   | 23,2                            | 23,5 | 24,1 | 5,0                                  | 5,7  | 5,3  |
| Spain                    | 30,3                            | 33,6 | 31,3 | 6,0                                  | 5,9  | 6,0  |
| Sweden                   | 20,7                            | 21,7 | 23,0 | 4,5                                  | 5,1  | 6,2  |
| Great Britain            | 32,8                            | 34,7 | 35,8 | 4,5                                  | 5,4  | 5,6  |
| United States            | 33,5                            | 37,0 | 36,9 | 4,2                                  | 5,3  | 4,9  |
| Germany West             | 26,6                            | 26,3 | 30,0 | 4,8                                  | 5,6  | 7,0  |
| Market econom.           | 27,2                            | 28,7 | 29,3 | 4,9                                  | 5,6  | 5,8  |
| Post-socialist countries |                                 |      |      |                                      |      |      |
| Bulgaria                 | 22,4                            | 25,1 | 33,6 | 4,3                                  | 4,9  | 3,5  |
| Belarus                  | 20,9                            | 25,6 | 26,8 | 3,7                                  | 5,7  | 5,4  |
| Czech Rep.               | 21,2                            | 25,2 | 25,3 | 4,1                                  | 5,5  | 6,3  |
| Estonia                  | 22,5                            | 35,9 | 32,0 | 3,2                                  | 4,1  | 5,1  |
| Hungary                  | 25,7                            | 28,9 | 27,7 | 5,2                                  | 7,2  | 6,4  |
| Latvia                   | 22,8                            | 30,1 | 37,8 | 3,7                                  | 4,5  | 4,4  |
| Lithuania                | 22,7                            | 32,7 | 34,9 | 3,7                                  | 6,2  | 5,6  |
| Poland                   | 25,7                            | 28,9 | 29,7 | 3,3                                  | 4,9  | 5,7  |
| Romania                  | 24,6                            | 27,3 | 33,0 | 4,5                                  | 7,3  | 7,4  |
| Russia                   | 24,0                            | 40,9 | 46,2 | 4,0                                  | 3,8  | 4,5  |
| Slovakia                 | 17,6                            | 23,8 | 23,0 | 4,7                                  | 5,4  | 5,7  |
| Slovenia                 | 21,8                            | 24,9 | 25,4 | 5,3                                  | 6,9  | 7,3  |
| Germany East             | 26,6                            | 26,3 | 30,0 | 3,4                                  | 6,5  | 7,2  |
| Post-socialist c.        | 23,0                            | 28,9 | 31,2 | 4,1                                  | 5,6  | 5,7  |

Table A6: Convergence of attitudes by country-group

|                         | Country groups of market economies |                     |                     |                    |
|-------------------------|------------------------------------|---------------------|---------------------|--------------------|
|                         | EU Southern                        | EU Northern         | EU Western          | Anglo-Saxon        |
| Post-socialist: CEE     |                                    |                     |                     |                    |
| Wave 1999               | -0.226<br>(-0.79)                  | 0.740<br>(1.07)     | 0.554*<br>(2.25)    | 1.090**<br>(3.61)  |
| Wave 2008               | -0.559<br>(-1.45)                  | 1.398*<br>(2.38)    | 0.832<br>(1.72)     | 1.145***<br>(4.67) |
| Post-socialist          | -2.930<br>(-1.89)                  | -0.855<br>(-0.65)   | -1.499*<br>(-2.77)  | -0.423<br>(-0.39)  |
| Int: Post-socialist     | 2.400***                           | 1.035               | 1.512***            | 0.761              |
| *Wave 1999              | (5.35)                             | (1.01)              | (5.96)              | (1.53)             |
| Int: Post-socialist     | 3.091**                            | 0.735               | 1.587**             | 1.066              |
| *Wave 2008              | (4.18)                             | (0.80)              | (3.61)              | (1.99)             |
| Post-socialist: CIS     |                                    |                     |                     |                    |
| Wave 1999               | -0.796**<br>(-12.20)               | 0.153<br>(0.47)     | 0.539<br>(2.29)     | 1.130***<br>(5.97) |
| Wave 2008               | -0.786**<br>(-10.45)               | 0.497*<br>(3.11)    | 0.922<br>(1.94)     | 1.190**<br>(5.50)  |
| Post-socialist          | -5.359**<br>(-11.22)               | -3.021**<br>(-7.54) | -1.402*<br>(-3.26)  | -2.316*<br>(-3.62) |
| Int: Post-socialist     | -2.245***                          | -6.531***           | 1.807*              | -0.542             |
| *Wave 1999              | (-13.74)                           | (-21.48)            | (3.50)              | (-0.94)            |
| Int: Post-socialist     | -2.783***                          | -7.329***           | 2.010**             | -0.108             |
| *Wave 2008              | (-14.93)                           | (-12.05)            | (3.86)              | (-0.26)            |
| Post-socialist: Baltics |                                    |                     |                     |                    |
| Wave 1999               | 0.0581<br>(0.75)                   | 0.808<br>(2.40)     | 0.597*<br>(2.70)    | 1.037**<br>(4.09)  |
| Wave 2008               | -0.0924<br>(-0.28)                 | 1.549**<br>(4.81)   | 1.071<br>(2.10)     | 1.134***<br>(5.65) |
| Post-socialist          | -3.430<br>(-1.29)                  | -0.110<br>(-0.14)   | -1.409**<br>(-4.04) | -1.422<br>(-1.55)  |
| Int: Post-socialist     | 2.765*                             | -0.382              | 1.949***            | 0.622              |
| *Wave 1999              | (2.87)                             | (-0.39)             | (5.91)              | (1.13)             |
| Int: Post-socialist     | 3.284*                             | -0.188              | 1.813**             | 0.660              |
| *Wave 2008              | (3.27)                             | (-0.22)             | (5.29)              | (1.33)             |

Note: based on OLS regression models with all individual and country-level controls.

Notes: t statistics in parentheses \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



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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](http://www.gini-research.org)**





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