Willing to redistribute? A hierarchical analysis for modelling country-level disparities in individual preferences for redistribution

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1 Introduction

Are Europeans more willing to redistribute than American citizens? And which variables are good predictors of support for redistribution in Europe and which in the Unites States? Answering these questions is not an easy task since relationship between preferences for redistribution, individuals characteristics and contextual variables have been proved theoretically rich, empirically composite and, in same cases, controversial. Self-interest economic theories, as captured in the Melzer-Richard model (1981), have traditionally dominated the debate on preferences towards redistribution in the economic literature. Recently, alternative theories have challenged the *homo economicus* approach introducing new ideas that embrace altruism, personal beliefs, religiosity and other political and cultural explanations in shaping individual preferences for redistribution (see Inglehart, 1990; Alesina and Glaeser, 2004; Scheve and Stasavaage, 2006; Larsen, 2008).

Our paper empirically evaluates the core assumption of the economic self-interest model, that is preferences towards government redistribution are strongly and negatively related to personal income, by comparing the role of income between Europe and United Stated in shaping demand for redistribution. Moreover, our aim is to evaluate the magnitude of the disparities across European countries and American States and to, eventually, identify which macro-variables contribute to explain the observed differences between countries or states. We focus on the role of income but we control for a set of individual characteristic for which the literature has enhanced potential association with the demand for redistribution.

We find personal income a significant predictor of propensity toward redistribution both in Europe and in the United States. While in the U.S. there is no almost geographical variation in the role of income, in Europe, instead, we detect a great regional variability. For some European countries attitudes toward redistribution are scarcely shaped by personal income, since we observe almost uniformity of propensity across different income groups. These results are robust even after the inclusion of a range of relevant control variables. To understand why these differences across

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regions still hold we also include country-level (or states-level) predictors, modelling demand for redistribution in a multilevel framework that provides a natural and suitable model for accounting different levels of variation, at individual level and at regional level, simultaneously.

Observed income inequality seems to be an important variable to explain cross-countries differences in Europe. Living in a country with a high level of inequality increases the probability that the average individual is prone to redistribute as well as attenuates the behavioral disparities across income groups. We also find that religious and ethnic fractionalization marginally contribute to explain differences in attitudes across countries.

Because of this great variability in Europe, our analysis attempts to model the unexplained variance by introducing a third level of disaggregation, that is sub-national regions within each European country. We find that the sub-national level variability accounts for 20% of the clustering variability, indicating that geography matters considerably and much effort should be devoted in identifying and constructing predictors at sub-national level.

The paper is articulated as follows. In the next section we briefly overview the most influential theories about formation of preferences on redistribution. Section 3 sketches multilevel modelling, giving some details on the varying-intercept and varying-slope model, which is our central fitted model. This section also illustrates the relevant characteristics of attitudes towards redistribution in Europe and in the United States according to our dataset, the European Social Survey and the General Social Survey, respectively, and describes the individual characteristics we chose as predictors of demand for redistribution. Section 4 reports the main empirical results of the fitted models. Throughout, we emphasize graphical summaries of the results. Some concluding remarks are given in Section 5.

2 Perspectives on attitudes towards redistribution

2.1 Economic self-interest

Standard public choice models motivate support for redistribution in terms of own monetary benefits individuals can gain from it. The well-known *median voter hypothesis*, theoretically formalized by Romer (1975), Metzer and Richardson (1981), states that, in democratic societies with proportional income taxes and uniform benefits, individuals with a pre-tax income below the mean are in favor of redistribution. Income distribution is typically right-skewed and consequently income of median voters, which are the decisive voters, is below the mean. The higher the ratio of mean income over the median, a measure of income inequality, the stronger is the will for redistributive spending of the median voter. This model allows redistribution to take place until it closes the gap between median and mean income.

Several reasons hinder such a "perfect" redistribution scheme. First of all, individuals are aware of disincentive effects created by redistribution on, e.g., their labor supply (Meltzer and Richard, 1981). Second, individuals can take redistribution and transfer spending as a form of insurance against future income shocks in unfavorable events like unemployment or sickness (Saint Paul and Verdier, 1996). Disadvantaged groups in the labor market, typically women and low educated, are also, *ceteris paribus*, more likely to support redistribution. Working in a sector more

exposed to international competition may also increase the degree of income volatility and thus the likelihood of supporting redistributive policies (Balcells Ventura, 2006). Generally, the degree of openness of a country increases the risk of income loss and this risk is positively associated to the demand for public social protection (Rodrik, 1998).

Another point is that the median voter theory is based on the hypotheses of lump-sum redistribution and linear tax rate. More realistic redistributive schemes have been investigated (Corneo and Grüner, 2001), to prove whether support for redistribution is still inversely related to individual positions in the income ladder. Moreover, the model can be extended to any public good that is equally benefitted by all citizens but paid the most by rich people (Perotti, 1992).

A dynamic perspective induces to include individuals' expected future incomes along with current income (Alesina and La Ferrara, 2005). People evaluate not only their current position but also take into account prospects of mobility (in both directions), consistently with Hirschman's idea of "tunnel effect" (Ravallion and Lokshin, 2000) and with the "prospect of upward mobility", hypothesis formulated by Benabou and Ok (2001). Expectations of mobility may be guided by past economic mobility experience and/or by the general current mobility pattern in societies (Alesina and La Ferrara, 2005).

2.2 Beyond monetary self-interest?

In the previous section we presented a brief overview of models of preferences for redistribution that are driven by financial self-interest. In this section we try to give account of alternative/complementary ideas that give reasons to different personal beliefs that go beyond monetary self-interest.

Individuals may have idiosyncratic beliefs upon the main factors determining their personal economic successes (Corneo and Grüner, 2001). If one believes that family background, in terms of wealth and human capital, or other factors beyond his control, e.g. luck, are the main drivers of his current and future income, then this person is expected to be in favor of redistribution, at least for a matter of justice, to correct for "unfair advantages" (Alesina and La Ferrara, 2005, p.5). On the contrary, if one thinks that individual effort and talent is responsible of his success, he is more willing to justify income inequality, on the grounds that inequality is the right outcome of enhanced marketable skills. These beliefs can be endogenously determined by past own economic mobility experience (Piketty, 1995). According to this approach, some societies are more tolerant towards inequality than others. Individuals perceive inequality in a different manner and observed level of inequality may be not a good predictor of support for redistribution, since its effect is mediated by subjective evaluation of inequality in societies.

Alesina and Glaeser (2004), using individual data from the World Values Surveys, document that European and Americans have different opinions about the nature of poverty and the degree of mobility in the society. The majority of Europeans think that the poor are condemned to stay poor and economic success is essentially a matter of luck, familiar background or social network. Americans, instead believe that poor people are essentially lazy and economic success is related to skills and effort. Perceived mobility is much higher in the "land of opportunities" than in the old continent, despite empirical evidence on actual mobility does not support the

statement of higher mobility in the United States (Checchi *et al.*, 1999; Eriksson and Pettersson, 2000; Gottschalk and Spolaore, 2002).

Alesina *et al.* (2004) examine the role of economic inequality on individual well-being, finding that Europeans get unhappier as inequality rises while American's happiness seems to be not related to the level of inequality in the country. On the contrary, Osberg and Smeeding (2006) analyzing the ISSP (International Social Survey Program) survey, do not find support for the hypothesis of systematically different preferences of Americans for economic equity and reduction of inequality compared to other industrialized countries.

People can be adverse to societal inequality for several reasons. Inequality may be seen as a social problem since it brings potential social conflicts or even unrest, it is associated with high levels of crime and threatening of property rights (Alesina *et al.*, 2004). Inequality is also often, but not necessarily, correlated with poverty. Alleviating observed poverty may increase the overall utility of upper-middle class people, which in turn induces them to be in favor of redistribution if they consider it as a substitutive form of charity. At this regard, people's preferences on redistribution are also influenced by form of altruism and generosity. On the other hand, reported poverty may have an opposite effect. An increasing number of people who live on welfare programs may induce people who work to reduce their support for redistribution, since they may feel to carry the burden of the social costs (Alesina and La Ferrara, 2005).

Demand for redistribution is also related to religion. Scheve and Stasavage (2006) document that in the United States people who frequently attend religious functions, irrespective of creed, tend to prefer less social spending. Their explanation is that religion allows individuals to cope with adverse economic events, like unemployment or shocks to income, by alleviating their physic costs. If standard consumption and physic consumption are partial substitutes, then religious individuals will prefer lower social insurance provision since phycological benefits from religion would compensate the monetary cost associated with an adverse event.

Recent studies emphasize the importance of religious and ethnic heterogeneity in shaping attitudes towards redistribution. Alesina and Glaeser (2004) state that individuals who belong to one ethnic group are less willing to support redistributive schemes that are perceived to help other ethnic groups. They find that ethnic fractionalization reduces support for welfare programs across countries. Lüttmer (2001) investigates the effects of ethnic heterogeneity on redistributive channels in the U.S. using survey micro-data and finds significant evidence of ethnic group loyalty, that is individuals increase their support as the share of local recipients from their own racial group rises.

Cross-national differences in support for redistribution have been explained by the comparative welfare state literature (Larsen, 2008), in terms of different institutional structures of different welfare regimes. This body of literature, based on Esping-Andersen's examination of the regime theory, considers that there is a path dependency between the institutions in place and future support for welfare policy.

The main conclusion of all these pieces of research is that people behave in a non selfish way, frequently with a sense of moral commitment. Contextual variables, such as level of inequality, poverty, religious and ethnic fractionalization, welfare state regime, play an important role when citizens state their preferences for redistribution.

3 Empirical strategy

3.1 Modelling preferences for redistribution

As it is clear from this overview of the literature, the relationships between individual characteristics, contextual variables and attitudes toward redistribution are theoretically rich, empirically complex to evaluate and, in some cases, controversial.

Our investigation is based on a strategy that refers to different levels of analysis. Demand for redistribution is measured at individual level rather than in aggregated form, and we use as predictors of personal attitude toward redistribution variables both at individual and country level. We explore a range of individual and country-level variables that, according to the existing literature, are likely to influence demand for redistribution. We focus on the role of personal and aggregate income and inequality in shaping preferences within and between countries. We also try to understand if sub-national factors contribute to explain observed variability among citizens in Europe and in the United States.

To explicitly account for the hierarchical nature of our data (individuals *within* countries) and for their different levels of variation, multilevel models are a natural and suitable statistical framework.

Multilevel modelling can be thought as (linear or generalized linear) regression in which the parameters, the varying group coefficients, are given a probability model. Classical regression can incorporate varying groups coefficients by including dummy variables, but the main difference between multilevel and classical regression is in the modelling of the variation between groups. The crucial multilevel modelling step is, in fact, that the group coefficients are themselves modelled (most simply a common distribution for the group coefficients or, more generally, a regression model that includes group-level predictors). Multilevel models can include group indicators (dummies) along with group-level predictors. As special cases of multilevel models are the classical regression models. When the variation between groups tends to zero, multilevel models collapse to complete-pooling models, while when the variation between groups goes to infinity they reduce to the no-pooling model. Given multilevel data, we can estimate the variation between groups. Therefore, there is no reason (except for convenience) to accept estimates that arbitrarily set this parameter to one of these two extreme values (Gelman and Hill, 2007). When the number of groups is large, there is typically enough information to accurately estimate group-level variation from the data alone and, as a result, multilevel models gain much beyond classical varying-coefficient models, that suffer from reduction in degrees of freedom (see Snijders and Bosker, 1999, for a general overview of multilevel models, and Gelman and Hill, 2007, for the notation used here).

Let $P(Y_i = 1) = \pi_i$ the probability that survey respondent i is favorable to redistribution, hence Y being a dummy variable equal 1 if the individual is willing to redistributive policies. Considering, for sake of simplicity, only one individual predictor, the *baseline* multilevel model of individual i resident in country j can be written as:

$$\pi_i = logit^{-1}(\alpha_{j[i]} + \beta x_i), \text{ for } i = 1, \ldots, n. \tag{1}$$

where $logit^{-1}$ is the inverse-logistic function, x is an individual-level predictor, as personal income, $j[i]$ indexes the country j where individual i resides, and α_j (in-

tercept) and β (slope) are the parameters of the model.

What makes this model "multilevel", is the modelling of the country-level intercepts α_j, that is:

$$\alpha_j \sim N(\mu_\alpha, \sigma_\alpha^2), \text{ for } j = 1, \ldots, J, \tag{2}$$

where N is a normal distribution with mean μ_α and variance σ_α^2.

In this analysis we estimate a *multilevel varying-intercept and varying-slope* model:

$$\pi_i = logit^{-1}(\alpha_{j[i]} + \beta_{j[i]} x_i), \text{ for } i = 1, \ldots, n, \tag{3}$$

where country-level intercepts α_j and slopes β_j are simultaneously modelled as:

$$\begin{pmatrix} \alpha_j \\ \beta_j \end{pmatrix} \sim \mathrm{N}\left(\begin{pmatrix} \mu_\alpha \\ \mu_\beta \end{pmatrix}, \begin{pmatrix} \sigma_\alpha^2 & \rho\sigma_\alpha\sigma_\beta \\ \rho\sigma_\alpha\sigma_\beta & \sigma_\beta^2 \end{pmatrix} \right), \text{ for } j = 1, \ldots, J \tag{4}$$

where μ_α and μ_β are the means of the country intercepts and slopes respectively, σ_α and σ_β their standard deviations and ρ the between-countries correlation parameter.

A further step of the model is to add group-level predictors to improve inference for the group coefficients α_j and the varying slopes β_j:

$$\alpha_j \sim \mathrm{N}(\gamma_0^\alpha + U_j\gamma^\alpha, \sigma_\alpha^2), \text{ for } j = 1, \ldots, J \tag{5}$$

$$\beta_j \sim \mathrm{N}(\gamma_0^\beta + U_j\gamma^\beta, \sigma_\beta^2), \ j = 1, \ldots, J \tag{6}$$

where U is a matrix of country-level predictors, γ^α the vector of coefficients for the country-level regression (5) and γ^β the vector of coefficients for the country-level regression (6).

Group-level predictors not only are themselves of interest, but play a special role in the multilevel context, since they may reduce the unexplained country-level variation, that is the standard deviation σ_α and σ_β. Reduction of unexplained country-level variation can be interpreted as a measure of the importance of the predictor.

Since our model focuses on the effects of economic variables, we let the coefficients of personal income vary by country. To control for socio-demographic characteristics, we add into the model other individual level predictors, as sex, age, marital status, education, religion, political attitudes, whose coefficients are unmodelled.

When we have multiple predictors, it is convenient to move to matrix notation in which there are J groups, K individual-level predictors whose coefficients vary by group (including the constant term), R individual-level predictors whose coefficients do not vary by group and L predictors in the group-level regression (including the constant term):

$$\begin{aligned} y_i &\sim \mathrm{N}(X_i^0\beta^0 + X_i B_{j[i]}, \ \sigma_y^2), \text{ for } i = 1, \ldots, n \\ B_j &\sim \mathrm{N}(M_B, \Sigma_B), \text{ for } j = 1, \ldots, J, \end{aligned} \tag{7}$$

where X^0 is the $n \times R$ matrix of individual predictors and β^0 the vector of their unmodelled regression coefficients; X is the $n \times K$ matrix of individual predictors (the first column is a column of 1's) that have coefficients varying by groups and B is the $J \times K$ matrix of their regression coefficients. Therefore, $B_{j[i]}$ is the j^{th} row of B, that is the vector representing the intercept and the slopes for the group

that includes unit i. M_B is a vector representing the mean of the distribution of the varying-intercepts and varying-slopes and Σ_B is the covariance matrix.

We can extend model (7) including group-level predictors:

$$\begin{aligned} y_i &\sim \text{N}(X_i^0\beta^0 + X_i B_{j[i]},\, \sigma_y^2),\ \text{for } i = 1, \ldots, n \\ B_j &\sim \text{N}(U_j G, \Sigma_B),\ \text{for } j = 1, \ldots, J, \end{aligned} \tag{8}$$

where B is the $J \times K$ matrix of individual-level coefficients, U is the $J \times L$ matrix of group-level predictors (including the constant term), and G is the $L \times K$ matrix of coefficients for the group-level regression.

3.2 Data on personal attitudes to redistribution

Our European data are drawn from a series of repeated cross-sectional sample surveys, the European Social Survey (henceforth ESS), that has started in 2002 and it is repeated every second year. Currently three rounds, from 2002 to 2006, are available. The survey collects data on the attitudes, beliefs and behavior patterns of citizens of over 30 European countries. We have selected 23 countries that have fielded at least two rounds, 21 of which are members of the European Union, and we have around 90,000 respondents.

The variable which captures individual support for redistribution is derived from the ESS question *GINCDIF*. More precisely, the question is: "*The government should take measures to reduce differences in income levels*". The ESS answers range from 1 to 5, 1 being "Agree strongly" and 5 "Disagree strongly". Table 1 reports the composition of the sample, by country and by year, of respondents to such question[1].

Data on United States are taken from the General Social Survey (GSS), which dates back to 1972. The survey initially took place almost every year until 1994 and thereafter every second year. The number of interviewed in the GSS has increased over time, reaching the number of 4,510 individuals in 2006, the last available year of the survey.

The variable on demand for redistribution comes from the question *EQWLTH*. The question is: "*Some people think that the government in Washington ought to reduce the income differences between the rich and the poor, perhaps by raising the taxes of wealthy families or by giving income assistance to the poor. Others think that the government should not concern itself with reducing this income difference between the rich and the poor*". Respondent could choose on a 1 to 7 scale from 1 ="Should" to 7 ="Should not".

Table 2 reports the GSS composition of the sample over the years 1990–2006, after having dropped the missing values in the variable. Given sample availability, States of residence of the respondents are grouped into nine (macro)-regions[2].

[1] "Don't know", "No answer" and "Not applicable" were coded as missing values.

[2] States are grouped as follows:

East North Central: Wisconsin, Illinois, Indiana, Michigan, Ohio;

East South Central: Kentucky, Tennessee, Alabama, Mississippi;

Middle Atlantic: New York, New Jersey, Pennsylvania;

Mountain: Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico;

New England: Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island;

Table 1: *Respondents to the ESS question* GINCDIF*, by year and by country (European data)*

		YEAR		
		2002	2004	2006
COUNTRY	Austria	1351	1147	1328
	Belgium	1371	1322	1483
	Switzerland	1547	1637	1407
	Czech Republic*	912	1770	0
	Germany	2203	2039	2067
	Denmark	1211	1203	1265
	Estonia**	0	1472	971
	Spain	885	965	1051
	Finland	1706	1772	1662
	France	1209	1459	1677
	Greece*	1741	1547	0
	Hungary	1367	1224	1219
	Ireland	1592	1633	1190
	Italy*	592	968	0
	Luxembourg*	820	901	0
	Netherlands	1982	1590	1616
	Norway	1923	1643	1601
	Poland	1597	1288	1260
	Portugal	997	1146	1152
	Sweden	1766	1732	1698
	Slovenia	1163	997	1068
	Slovakia**	0	826	969
	United Kingdom	1717	1424	1790
TOTAL		31654	33709	28480

Source: authors' calculation on data from ESS.
* Not present in Round 3.
** Not present in Round 1.

Table 2: *Respondents to the GSS question* EQWLTH*, by year and by region (U.S. data)*

REGION	YEAR										TOTAL
	1990	1991	1993	1994	1996	1998	2000	2002	2004	2006	
East North Central	109	118	125	213	213	218	191	103	79	224	1593
East South Central	42	40	46	73	66	67	70	40	29	57	530
Middle Atlantic	64	74	83	155	133	147	139	82	63	137	1077
Mountain	35	35	36	97	87	84	73	35	46	116	644
New England	34	40	29	58	73	54	48	27	14	54	431
Pacific	72	96	124	182	183	157	160	93	79	176	1322
South Atlantic	96	99	125	231	197	204	181	106	109	243	1591
West North Central	49	52	59	101	87	95	88	43	44	80	698
West South Central	40	46	60	115	98	116	102	58	57	118	810
TOTAL	541	600	687	1225	1137	1142	1052	587	520	1205	8696

Source: authors' calculation on data from GSS.

Both questions ask whether the government should reduce income differences between the rich and the poor. They are both policy-oriented and not purely "idealistic" but with some differences. The GSS question makes more explicit that there is a trade-off between social spending and taxation. Therefore we are aware that results are not strictly comparable.

In order to implement our multilevel logistic model, we have computed a dummy variable, Y_i, which is equal to 1 if respondent i thinks that government should intervene to reduce difference in income levels and 0 otherwise. More specifically, Y_i takes value 1 if $GINCDIF > 3$ (ESS version) or $EQWLTH > 4$ (GSS version) and zero otherwise. To be conservative, we have excluded, in both cases, the central categories, which represent mild preference towards redistribution.

Tables 3 and 4 report the distribution of the attitude towards the redistribution across countries and years, for Europe and U.S. respectively. Europeans seem more prone towards redistribution with respect to American citizens. In the 2006, average support from redistribution was 70.6 % in Europe and 46.6% in the United States.

However, there are substantial differences among European countries. The preference towards redistributions ranges from the very high rates observed for Hungary, Portugal and especially Greece, to rates comparable to that observed in the U.S., like in Denmark. Also taking into account the different categorization of the two variables, US preference for the redistribution is more equally distributed across region than the corresponding distribution across countries in Europe.

The distribution of attitude towards redistribution in Europe remains practically unchanged over the period 2002–2006, although some countries joined the survey and some withdrew from it, while in the U.S. preferences towards redistribution show a significant U-shape trend, with its minimum in 1994[3]. For sake of better comparability with European data, our subsequent analysis for the U.S. include only

Pacific: Washington, Oregon, California, Alaska, Hawaii;

South Atlantic: Delaware, Maryland, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, District of Columbia;

West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas;

West South Central: Arkansas, Oklahoma, Louisiana, Texas.

[3]US data could be affected by the high rates of missing values for this variable, that range from 35% in 1990s to almost 70% in 2002 and 2004.

Table 3: *Attitude toward redistribution (European data): percentage of respondents*

Government should reduce differences in income levels						
		NO	2	3	4	YES
COUNTRY	Austria	3.03	11.27	16.47	39.44	29.80
	Belgium	2.99	14.25	13.34	43.99	25.43
	Switzerland	3.14	17.62	13.16	47.27	18.82
	Czech Republic*	8.09	16.03	14.80	33.07	28.00
	Germany	3.36	18.51	16.93	43.33	17.86
	Denmark	8.29	31.37	19.68	31.04	9.62
	Estonia**	0.86	6.59	12.69	47.93	31.93
	Spain	1.07	5.45	10.44	49.78	33.26
	Finland	2.55	9.09	14.14	39.16	35.06
	France	2.85	6.61	8.17	35.83	46.54
	Greece*	0.64	1.92	5.32	41.15	50.97
	Hungary	1.10	3.60	8.53	38.24	48.53
	Ireland	1.29	11.78	12.75	55.67	18.51
	Italy*	1.15	6.35	11.22	48.08	33.21
	Luxembourg*	5.75	14.93	12.78	40.67	25.86
	Netherlands	3.05	21.92	15.81	45.14	14.09
	Norway	1.86	15.02	17.46	47.26	18.41
	Poland	1.62	8.90	8.15	48.08	33.24
	Portugal	0.70	3.25	9.07	47.83	39.15
	Sweden	1.48	11.91	17.90	51.33	17.38
	Slovenia	1.12	5.51	9.11	46.38	37.89
	Slovakia**	1.67	8.47	12.26	47.13	30.47
	United Kingdom	2.80	18.35	18.70	45.93	14.22
YEAR	2002	2.82	13.76	11.59	46.66	25.17
	2004	2.60	11.72	14.10	43.08	28.50
	2006	2.37	12.03	14.92	42.74	27.94
TOTAL		2.61	12.50	13.50	44.19	27.21

Source: authors' calculation on weighted data from ESS.
* Not present in Round 3.
** Not present in Round 1.

respondents in the GSS surveys conducted after 1998.

3.3 European and US predictors

3.3.1 Estimation of personal income

Since our focus is on the relationship between preference for redistribution and income distribution, we document in more detail how we estimated personal income from the surveys.

In the ESS questionnaire, the definition of income is given by the annual total net income of the household from all sources. Income includes not only earnings but also state benefits, occupational and other pensions, unearned income such as interest from savings, rent, etc. after deductions of income tax, national insurance, contributory pension payments and so on. GSS definition of income refers to total family income before taxes, from all sources, of the year previous to the interview[4].

In both surveys, income levels are bracketed and refer to current value. Each

[4]GSS definition of income is more appropriate than the ESS one, since transfer programs are usually related to income before taxes. However, we think that this discrepancy should affect results only marginally.

Table 4: *Attitude toward redistribution (U.S. data): percentage of respondents*

		Should government reduce income differences between rich and poor ?						
		NO						YES
		1	2	3	4	5	6	7
REGION	East North Central	11.86	8.66	13.68	20.46	19.27	10.86	15.19
	East South Central	17.92	5.66	13.21	20.00	16.79	11.32	15.09
	Middle Atlantic	10.86	7.61	13.65	19.31	19.59	11.51	17.46
	Mountain	12.58	9.47	14.91	18.32	19.72	10.87	14.13
	New England	9.51	5.80	15.31	22.27	18.33	9.98	18.79
	Pacific	14.60	10.21	14.37	19.21	17.78	10.29	13.54
	South Atlantic	15.71	9.05	13.64	19.23	16.72	9.55	16.09
	West North Central	11.60	10.46	13.47	20.20	21.20	10.89	12.18
	West South Central	16.05	11.11	13.09	19.51	16.05	8.64	15.56
YEAR	1990	10.72	7.76	11.83	19.78	18.11	12.20	19.59
	1991	8.50	8.00	14.83	21.33	19.00	11.17	17.17
	1993	12.37	8.88	15.28	15.57	20.67	11.35	15.87
	1994	16.41	8.98	16.08	21.06	16.49	8.82	12.16
	1996	13.37	9.67	13.02	20.05	17.59	10.73	15.57
	1998	16.81	8.76	11.30	21.37	19.79	9.19	12.78
	2000	14.35	10.36	15.49	17.49	17.49	12.26	12.55
	2002	12.61	9.03	12.78	20.10	20.44	8.69	16.35
	2004	15.77	7.50	13.65	18.46	17.31	9.81	17.50
	2006	10.87	8.80	13.53	20.17	17.93	10.54	18.17
	TOTAL	13.53	8.95	13.85	19.70	18.31	10.40	15.27

Source: authors' calculation on weighted data from GSS.

respondent is asked to indicate in which category his total family income falls. The ESS respondent is allowed to indicate indifferently weekly, monthly or annual income, so we convert income figure as annual.

The number of categories is twelve in the ESS. Income categories remain the same across rounds and, with few exceptions[5], across countries. Even if inflation could weaken especially the higher income categories over time, due to the short period observed this is likely to loosely affect income distribution.

Since the longer span, in case of US data, inflation poses a more serious problem. For this reason we have considered several income variables, which added higher brackets to the income card in 1998 and 2006. The variable *INCOME*98 has been used to estimate income levels in 1998–2004, and *INCOME*06 for reconstructing income levels in 2006.

In both surveys, we consider midpoints of each categories as a proxy of actual total income. However, the top category has no upper limit and, thus, this value is extrapolated using a formula based on the Pareto curve, as explained in Hout (2004). In addition, all figures are expressed at 2000 prices after deflation by the consumer price index and, as for European data, are converted at purchasing power parity (PPP) to make a correction for different cost of living across countries (source Eurostat). To take into account household composition, all data are adjusted using the Luxembourg Income Study (LIS) equivalence scale, the square root of the number of household members.

We also recoded the data in a cruder way, keeping the income variable as categorical (1–12) and adding in the model as predictor the number of members of the

[5] A different categorization of income level has been used in the first round in France, Hungary and Ireland, and in the third round in Hungary. In France and Hungary, income categories refer to monthly income. In Hungary, income is expressed in the national currency.

household to control for household size. Results are robust to this different choice of measurement.

3.3.2 Description of other individual predictors

The relationship between attitude toward redistribution and income levels may be partly spurious, and there are other determinants to control for. For this reason we have also considered other individual predictors, such as age, sex, marital status, religious beliefs, employment status, education, race and political views. For all of them there are reasons to believe that they may influence individual attitude towards redistribution.

The following is a list of the variables we use for our analysis on European data.

Demographics:

age25-, **age25-30**, **age30-45**, **age45-60**, **age60+** = dummy variables equal to 1 if the respondent is less than 25 years old, with age between 25 to 30, 30 to 45, 45 to 60 and is more than 60 years old, respectively. "age25-" is the benchmark variable.

married = dummy variable equal to 1 if the respondent has ever been married, or in a civil partnership.

children = dummy variable equal to 1 if the respondent has ever had children living in household.

female = dummy variable equal to 1 if the respondent is female.

Employment status:

selfemp = dummy variable equal to 1 if the respondent is self employed.

unemp5 = dummy variable equal to 1 if respondent has been unemployed in the last 5 years.

Education:

educ12, **educ12.16**, **educ16** = dummy variables equal to 1 if the respondent has less than 12 years of education, more than 12 but less than 16 years of education and more than 16 years of education, respectively. "educ12.16" is the benchmark variable.

educ>fath = dummy variable equal to 1 if the respondent has achieved a level of education higher than the one achieved by her father. It is a proxy of social mobility.

Personal beliefs:

discrim = dummy variable equal to 1 if the respondent describes herself as being a member of a group that is discriminated against in this country. Discrimination could be on the grounds of age, gender, nationality, disability, race, language, religion and sexual orientation.

left, **right** = dummy variables equal to 1 if the respondent describes herself as particularly close to the left/right, politically speaking. These variables are obtained from the ESS variable *LRSCALE* that measures placement on left/right scale, 0 being "left" and 10 being "right". We have coded "left" those who have values from 0 to 3, and "right" those who have values from 7 to 10, , regardless of how they actually vote. The remaining respondents are labelled as "center", that is the benchmark variable.

not rel., **catholic**, **protestant**, **othrelig** = dummy variables equal to 1 if the respondent professes no religious belief, is Catholic, is Protestant, is religious but

not Catholic or Protestant, respectively. "not rel." is the benchmark variable.

attend.rel = dummy variable equal to 1 if the respondent attends religious services more than once a month.

Regarding the model for the United States, where possible, we used the same individual predictors as the model for Europe. Here we report only those variables that have a different definition, with respect to the European version, or are not present in the European data.

black = dummy variable equal to 1 if the respondent is African American.

jprestige = dummy variable equal to 1 if respondent's job prestige score (as described in Nakao and Treas, 1990) is higher than father's. It is a proxy of social mobility.

unemp10 = dummy variable equal to 1 if respondent has been unemployed in the last 10 years.

educ>fath = years of education of the respondent minus years of education of the father. It is a proxy of social mobility.

dem, **rep** = dummy variables equal to 1 if the respondent describes herself as particularly close to the Democratic or to the Republican party, respectively. These variables are obtained from the GSS variable *PARTYID* that detects the political party affiliation. We have coded "dem" those who think of themselves as Democrats or strong Democrats, and "rep" those who think of themselves as Republicans or strong Republicans, regardless of how they actually vote. The remaining respondents are labelled as "indep", i.e. Independent, that is the benchmark variable.

4 Main results

4.1 Europe *versus* the U.S.

4.1.1 Influence of individual characteristics

Individual characteristics influence Europeans' and Americans' willingness of redistribution differently. Figure 1 shows the coefficients of the multilevel logistic regression (7), along with their confidence intervals[6], on the individual determinants of preferences for redistribution in Europe. In the model, coefficients of personal income are allowed to vary across countries, while coefficients of other individual characteristics are unmodelled. Figure 2, instead, reports coefficients and relative standard errors of the analogous multilevel logit regression for the United States. Standard errors of the comparable coefficients are, on average, higher for the U.S., given the smaller sample size. Time indicator variables are included in the models, but are not reported in the Figures. The zeros correspond to the "baseline" categories for each categorical variable.

Results give interesting peculiarities in several aspects, and differences between what observed in Europe and in the United States.

In terms of demographics, in Europe the older an individual the more is propense toward redistribution, while in the U.S. younger people are less adverse and aged

[6] Estimates of the models are obtained by the `lmer` function in R (R development core team, 2006) and are based on the restricted maximum likelihood procedure (REML). The REML procedure corrects the downwards bias of the maximum likelihood estimator of variance components related to the lost of degrees of freedom in estimating the fixed effects.

people over 60 are the most adverse. Women are more likely to redistribute than men in both continents: with an estimated positive difference approximately[7] of 7% when compared to men in Europe and an approximate positive difference of 6% in the United States. In the U.S., being African Americans is associated with a a significant and positive effect on redistribution. Being married or having children has a small significant effect with opposite sign in Europe and in the United States: married Europeans are less favorable to redistribution than married Americans. Having children slightly increases the probability of supporting redistribution in Europe, while people with children in the U.S. have an opposite view on redistribution.

Employment status affects the attitude towards redistribution in the same way. Having experienced an unemployment spell increases support to redistribution, probably due to the need of social insurance against the volatility of income. In both side of the ocean personal experience of a period of unemployment increases the probability of being in favor of redistribution by approximately 7%. European and American self-employed are more averse to income redistribution. Being self-employed reduces this probability by approximately the same percentage.

In terms of education, it is interesting to note that, *ceteris paribus*, more educated people are less prone to redistribution in Europe but this evidence is not confirmed in the United States. In the U.S., more educated people are more prone to redistribution with respect to those with average education. However, the interpretation of this result is undermined by a relatively large standard error.

As observed in in Alesina and Glaeser (2004), support for redistribution is also involved with social issues, like mobility of the society. Unfortunately, ESS does not provide direct measures of this characteristics. Hence we rely on a proxy, the education level of the individual with respect with his/her father, that is a measure of social mobility, at least at an inter-generational level. Individuals that have an education level higher than their fathers' are less averse to redistribution. GSS provides two proxy of social mobility: the difference between years of education of the respondent and those of her father, and a comparison between the respondent's job prestige and that of the father's. Results from this two variables are inconclusive, since they have opposite signs and are both scarcely significant.

Coefficients of self-identified left-right political orientation of individuals have the expected signs. Individuals who think of themselves as right-wing (in Europe) or Republicans (in the U.S.) are more averse to redistribution, while left-wing or Democrats are more favorable.

In terms of internal cohesion, we could include in the European model the perception of discrimination in the society. Those who think that are members of a group that is discriminated on some grounds are more prone to redistribution.

European individuals who are religious but not catholics are predicted to prefer lower levels of redistribution than will individuals who are secular. A more puzzling pattern is detected in the U.S., where catholics have an opposite attitude toward government provision. Protestants also are for lower level of redistribution, while individuals of different religious denominations look a bit more altruistic.

However, the most relevant cleavage for supporting redistribution in the U.S. and in Europe is between those who frequently attend religious functions, irrespec-

[7] We applied the "divide by 4 rule" to get an upper bound of the predictive difference in the probability of being in favor of redistribution moving from the baseline category to the comparison category (Gelman and Hill, 2007)

tive of their denomination, and those who do not. In the U.S., attending regularly religious functions reduces the probability of being supportive towards redistribution by approximately 5%, while in Europe the probability increases by about 4%. Therefore it may be that in the U.S. religiosity can serve as an alternative to social insurance for individuals to buffer themselves against adverse life events (Scheve and Stasavage, 2006), while in Europe church-goers become more altruistic, advocating greater spending on the disadvantaged.

Overall, after controlling for individual observable characteristics, geographical differences appear more clearly in Europe than in the United States. Intercepts have an estimated standard deviation of 0.62 and of 0.09 in the European regression and in the U.S. regression, respectively. For a quick interpretation, we can say that European 'baseline' individuals (the individuals with personal characteristics corresponding to the baseline categories, in the year 2002 and with personal income equal to country average) are expected to vary their probability of supporting redistribution from 52% to 79% if they live in a country one standard deviation below or above the European mean. On the contrary, the American 'baseline' individuals have a probability of supporting redistribution ranging from 49% to 54% according to the macro-region where they live.

4.1.2 Influence of personal income

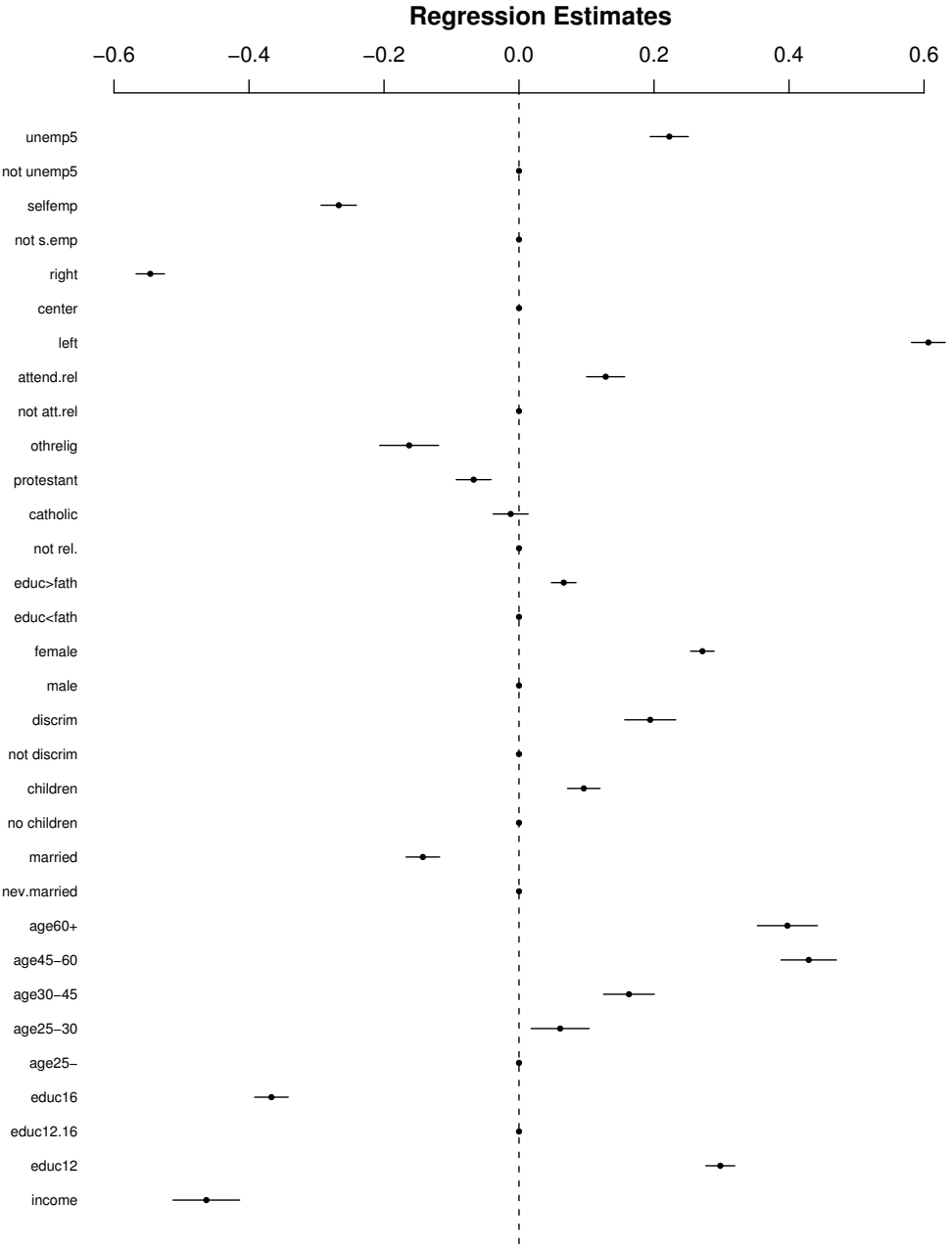
Income is a crucial variable in determining preferences for redistribution. In accordance with the theoretical literature, after controlling for individual characteristics and personal beliefs, richer people are more averse to redistribution: income is negatively associated with support for redistribution, but the effect is stronger in the United States than in Europe (on average $\beta_j = -0.46$ in Europe and $\beta_j = -0.60$ in the United States). Applying the "divide by 4 rule" this means that a movement of one standard deviation along the income scale reduces the probability of supporting redistribution by approximately 13% in Europe and by 15% in the United States.

However, there is almost no variation in the size of income coefficients among US macro regions, but strong variation among countries in the role of income predicting support for redistribution in Europe. Estimated standard deviation of β_j is $\widehat{\sigma}_\beta = 0.22$ for European data and $\widehat{\sigma}_\beta = 0.06$ for American data. Roughly speaking, the negative difference in the probability of supporting redistribution induced by an increase of one standard deviation in personal income, is expected to vary from to 14% to 17% across US macro regions and from 6% to 17% across European countries ($\pm\widehat{\sigma}_\beta$), confirming once again sizable cross-countries disparities in European citizens attitudes and relative homogeneity across the United States.

More uniform attitudes across income groups toward redistribution are detected in those countries with coefficients close to zero, that are notably: Portugal, Slovakia, Greece, Austria, Spain, Belgium, Norway, Italy. Instead, countries with coefficients more negative than average, markedly Slovenia, Poland, Sweden, Finland, France, lend more support to the assumption that economic self-interest shapes preferences for redistribution. The theoretical assumption of the median voter hypothesis seems confirmed in the United Stated but not for all the European countries.

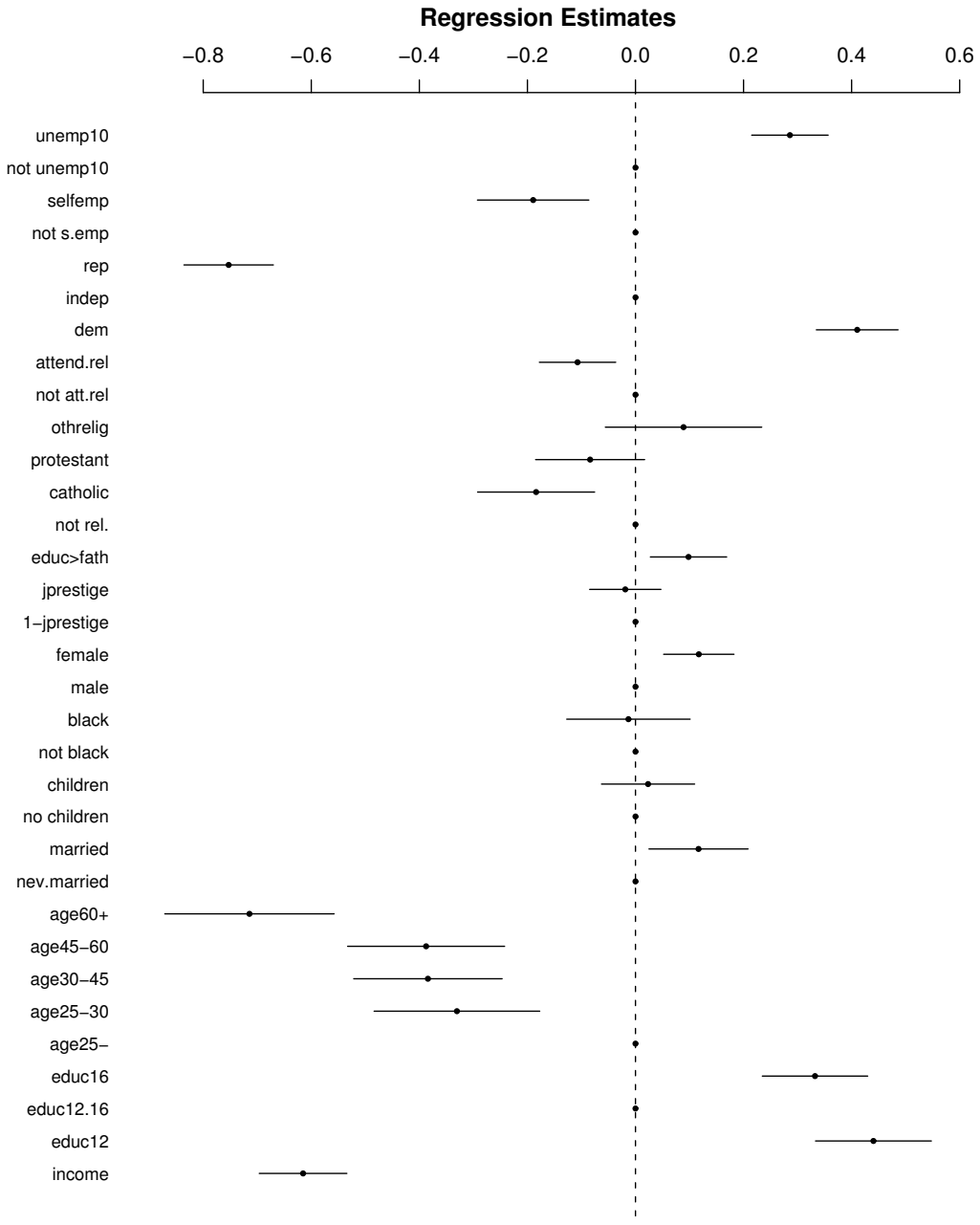
Going back to the data, this empirical evidence is corroborated by contrasting propensity toward redistribution with income quintiles for each countries in Europe

Figure 1: *Multilevel logit regression with varying-intercept varying-slopes (European data)*



Source: authors' calculation on data from ESS.
Note: dependent variable: Government should reduce differences in income levels (binary version).
Greece, Italy and Luxembourg are not present in Round 3.

Figure 2: *Multilevel logit regression with varying-intercept varying-slopes (U.S. data)*



Source: authors' calculation on data from GSS.
Note: Dependent variable: Should government reduce income differences between rich and poor? (binary version)

and for each regions in the United States[8]. Propensity towards redistribution is the percentage of respondents that agree with the statement that Government should reduce income differences (see Figures 3 and 4).

Differences in attitude between poor and rich are more marked in the U.S. than in Europe. For instance, more than 80% of people in the first quintile in Europe support redistributive policies, while in the U.S. only 55% of relatively poor are favorable to income redistribution.

Continental Europe, Benelux, U.K. and Ireland display similar pattern. Differences in attitude between rich and poor are more noticeable in the Netherlands, in U.K. and in Germany. Scandinavian countries, besides Denmark, report figures in line with those detected in Continental Europe. Denmark display levels of average propensity toward redistribution similar to those observed in the U.S., but the Danish aversion to redistribution is more spread across income classes. In fact, data show that among the poor (first quintile), only 48% are in favor of redistributive policies, in the median classes (third quintile) the percentage is 41%, and among the rich (top quintile) the percentage goes to 31%. Instead, in the UK for example, 70% of the poor support redistribution and 44% of the rich.

Mediterranean countries are, on average, more favorable to redistributive policies than the rest of Europe, with the partial exception of France. These countries also exhibit little differences in redistribution between wealthier people and the less well-off. As an example, in Greece, 89% of people in the top quintile support redistribution, and in the whole Mediterranean area percentage ranges from 88% to 80%.

Eastern European countries have average propensity similar to Mediterranean countries but for most of them there is a notable drop in demand for redistribution among the rich group[9], enhancing the theoretical hypothesis of the median voter.

American regions, instead, display similar patterns, even though curves are more negatively sloped in the South. In New England and Middle Atlantic, which comprise some of the richer States, there is relatively less support to redistribution from people in the bottom end of the income distribution. Wealthier people in these States are more likely to be prone towards redistributive policies than their peers in the rest of the United States.

Given the results obtained for Europe and for the United States we will more concentrate in the next Section on understanding the sizable cross-country heterogeneity in Europe.

4.2 Predicting cross-country variation in Europe

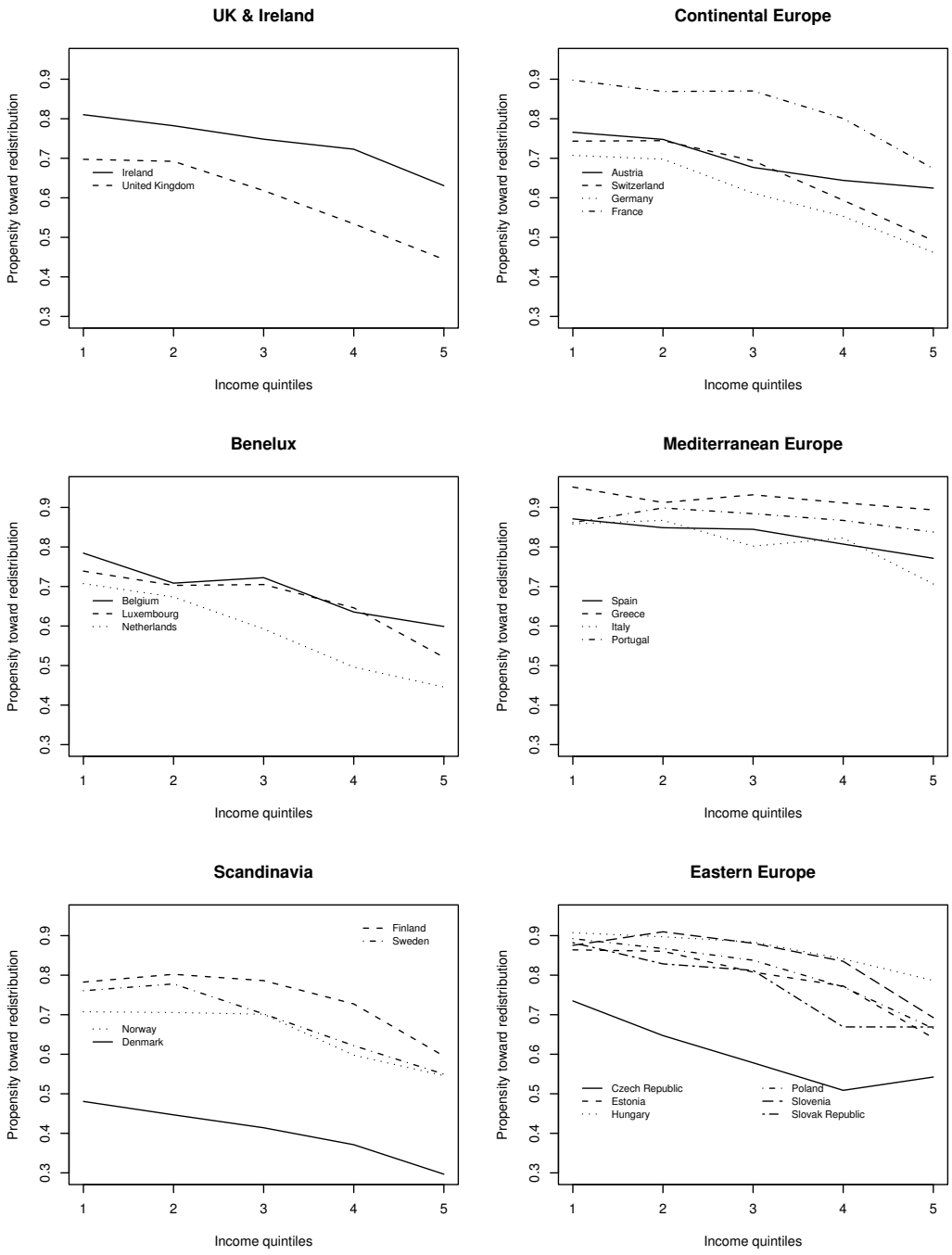
4.2.1 Influence of country-level variables on the income slopes

Results of the previous section indicate a significant variation of the effect of income across European countries but not across U.S. macro regions. To understand if there are influential contextual variables associated with income effect and also with average support towards redistribution we estimate, for European data, model (8) in

[8]Quintiles has been computed separately for each country (region) and for year. Subsequently, we have pooled all the individuals, in each country (region) that fall in each quintile and the average propensity toward redistribution has been computed on this pooled sub-sample.

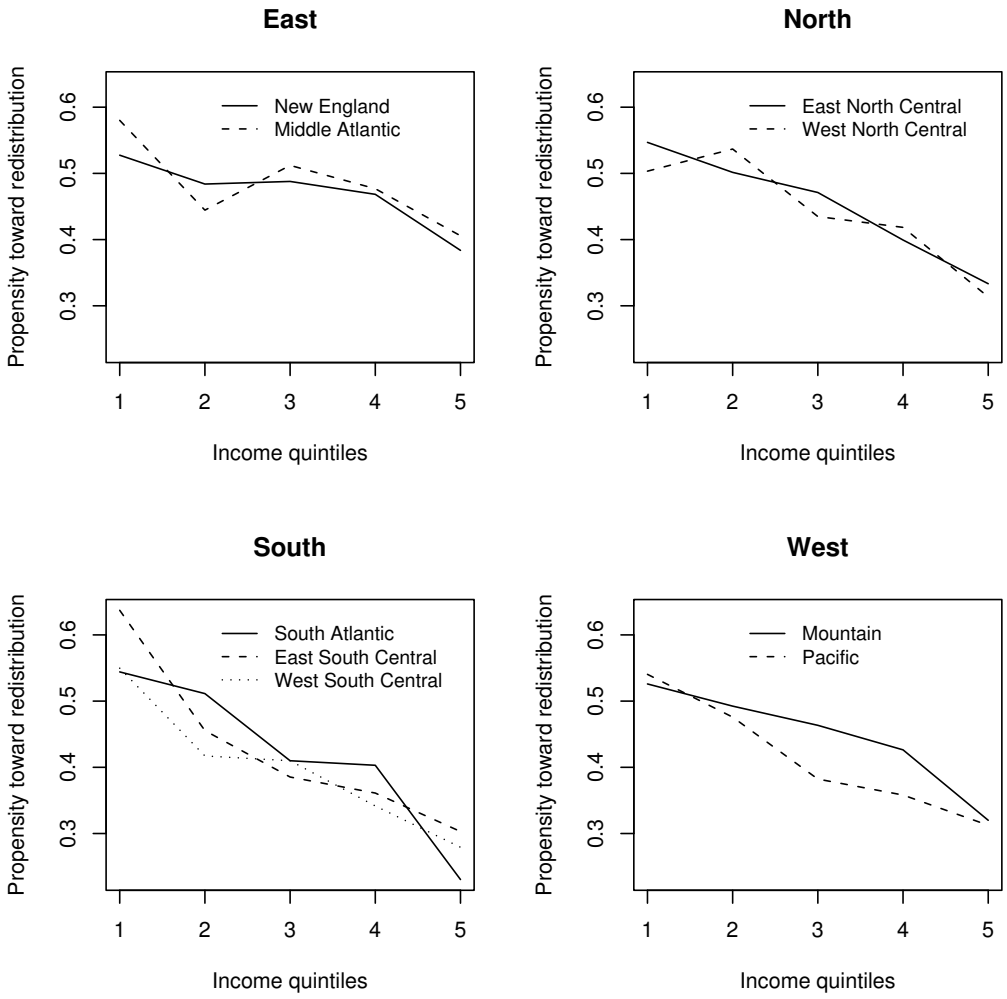
[9]Some puzzling results are for Czech Republic and, to a lesser extent, for Slovak Republic.

Figure 3: *Propensity towards redistribution by income quintiles (European data)*



Source: authors' calculation on data from ESS.
Note: the propensity towards redistribution is the percentage of respondents that agree with the statement that Government should reduce income differences (Values 4 and 5 for ESS variable *GINCDIF*).
Greece, Italy and Luxembourg are not present in Round 3.

Figure 4: *Propensity towards redistribution by income quintiles (U.S. data)*



Source: authors' calculation on data from GSS.
Note: the propensity towards redistribution is the percentage of respondents that agree with the statement that Government should reduce income differences (Values 5 to 7 for the GSS variable *EQWLTH*.).

which we add country predictors for income slopes and intercepts. Specifically, we want to explore if income inequality and poverty rates observed in the European countries significantly contribute to reduce the unexplained variability of β_j's and of α_j's. Following Alesina and Gleser (2004), we also discuss the role of fractionalization, ethnic and religious indices, measured at country level, that are supposed to influence propensity toward redistribution. To evaluate the robustness to alternative specifications, we control for the per capita GDP and for welfare state size of each country. The per capita GDP is converted to national purchasing power standard (PPP). The welfare state size is measured as the social transfers as a percentage of GDP (source Eurostat).

Figure 5 shows the estimated slopes for the European countries in the varying-intercept varying-slope regression model plotted versus country-level predictors.

Inequality figures are from LIS (Luxemburg Income Study) and are taken from Brandolini and Smeeding (2008). This source ensures a good level of comparability across countries. This measure of inequality is calculated on incomes net of taxes.

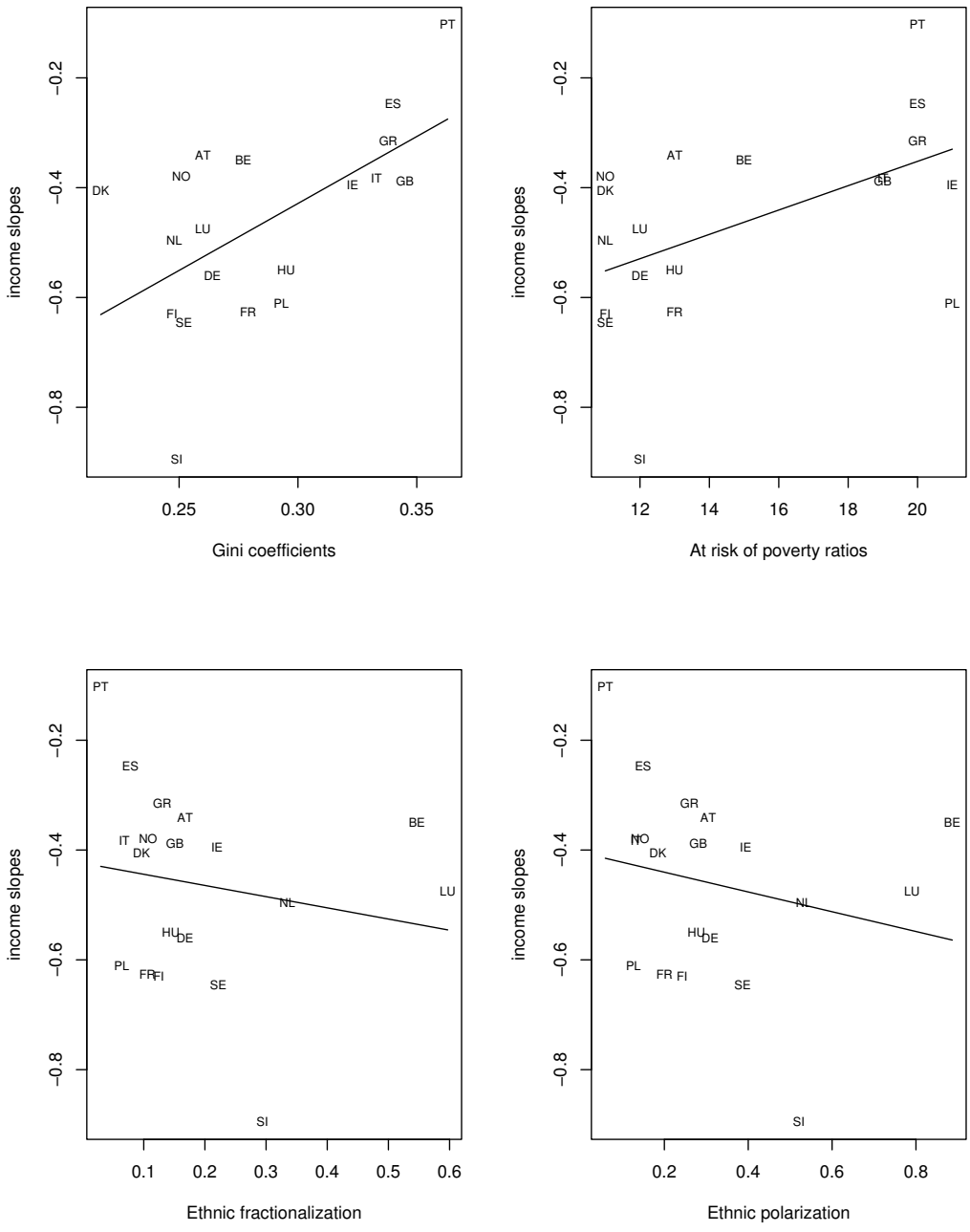
Country poverty rates are calculated according to the Eurostat poverty line fixed at 60% of the median equivalent income and figures are from Eurostat.

The fractionalization index is a measure of heterogeneity that gives us the probability that two randomly selected individuals in a country belong to two different (ethic or religious) groups. Alesina et al. (2003) calculate a religious fractionalization index as well as an ethic fractionalization index. These two indices are considered potential predictors in our analysis. However, we also considered alternative measures of heterogeneity proposed by Montalvo and Reynal-Querol (2005). These measures are polarization indices and are more associated to the idea of social conflicts (Esteban and Ray, 1994).

Table 5 reports the estimated coefficients of country level predictors for the income slopes (β_j) in model (8). Because of the sample size, in all the estimated models there are at most two country level predictors. The Gini index is striking positively associated with the slope, suggesting that personal income matters more in more equal countries than in those with high level of inequality. In fact, on average, more equal countries exhibit steeper income slopes. Similar results are obtained for poverty rates. The evidence that the rich are more supportive of redistribution in unequal countries is difficult to reconcile with the self-interest hypothesis and suggests that influence of economic inequality (and poverty) goes beyond the aggregation of individual incomes in each country. Adding one of these country level predictors in the model, alternatively, reduces the unexplained variance by around 23%.

The inclusion of fractionalization indices does not contribute as much. The estimated coefficients are not statistically significant even though they have the expected negative sign. The controlling variables, always statically significant, have a negative effect and contribute in reducing the unexplained variance. The richer is a country, the steeper will be the income slope, or put it differently rich individual in richer areas are less prone to redistribution than rich individuals who live in poorer areas. Analogously, the magnitude of the welfare state is negative associated with the β_j's, indicating that the greater is the percentage of social transfers the weaker is the support of the upper income class to redistribution.

Figure 5: *Income slopes vs. country-level predictors*



Source: authors' calculation on data from ESS.
Note: estimated country income slopes in the varying-intercept varying-slope regression model (8) plotted versus country-level predictors. A regression line is fitted to the estimates.
Greece, Italy and Luxembourg are not present in Round 3.

Table 5: *Estimated coefficients of country-level predictors: varying slopes*

Country-level predictors	MODEL 1	2	3	4	5	6	7	8	9	10	11	12	13
GINI	0.171	0.227	0.286	0.221									
	(0.087)	(0.105)	(0.107)	(0.099)									
POVERTY RATE					0.196	0.223	0.292						
					(0.089)	(0.114)	(0.116)						
RFI									-.085	-0.080	-0.130		
									(0.100)	(0.110)	(0.126)		
EFI												-0.092	
												(0.095)	
GDP PER CAPITA			-0.144	-0.064			-0.320	-0.188			-0.227		
			(0.108)	(0.101)			(0.181)	(0.078)			(0.115)		
WELFARE SIZE		-0.250		-0.221		-0.231				-0.329			-0.184
		(0.104)		(0.112)		(0.112)				(0.105)			(0.086)
σ_α	0.526	0.488	0.474	0.465	0.539	0.499	0.485	0.557	0.582	0.496	0.453	0.617	0.568
σ_β	0.203	0.179	0.203	0.169	0.198	0.181	0.207	0.193	0.217	0.194	0.235	0.217	0.197
ρ	0.173	0.074	0.069	0.022	0.159	0.088	0.083	0.176	0.307	0.199	0.201	0.344	0.221

Source: authors' calculation on data from ESS.
Note: estimated coefficients of country predictors of the income slopes in the regression model (8)
Standard error in parenthesis

4.2.2 Influence of country-level variables on the intercepts

After controlling for individual characteristics and income varying-slope, still significant unexplained variation across-country remains. As reported in the previous section, the estimated (unexplained) standard deviation of α_j is $\widehat{\sigma}_\alpha = 0.62$.

In multilevel models the variance partition coefficient (VPC) represents the percentage variance explained by the higher level (country, in this case). The VPC for binary response models is a function of the predictor variables and is more difficult to calculate, so it is only possible to get an approximate measure of the clustering effect. Following a latent variable approach (Snijders and Bosker, 1999) the VPC evaluated at the mean of the random coefficient predictor (income) is:

$$VPC = \frac{\sigma_\alpha^2}{\sigma_\alpha^2 + \pi^2/3} \simeq 10.0\%.$$

This means that approximately 10% of the unexplained variability in demand for redistribution can be purely attributed to differences across countries.

The introduction of country variables contribute to evaluate the role of contextual effects. Figure 6 reports estimated coefficients of country level predictors for the intercepts (α_j) in model (8) with country-level predictors. We start fitting the European model introducing the Gini coefficient, which has a marked negative sign and it is highly significant. Its introduction in the model reduces the unexplained group-level standard deviation by over 27%, indicating the relative importance of this predictor in understanding propensity disparities across European countries. We also include as control variables per capita GDP and the social transfers as percentage of GDP. In all these case, level of inequality is significant. This indicate that, consistently with the financial self-interest theories, the greater is the inequality the greater is the support for redistribution of the "median" voter. Same conclusions can be drawn when the poverty rate is added. This is not surprising since the high correlation between these two variables at least for European countries. Remarkable outliers are Greece and Denmark for which none of the country-level predictors we used seems to capture their peculiarities.

Ethnic fractionalization, instead, is not significant while religious fractionalization is slightly negatively significant, and its contribution to reducing the unex-

Table 6: *Estimated coefficients of country level predictors: varying intercepts*

Country-level predictors	MODEL 1	2	3	4	5	6	7	8	9	10	11	12	13
GINI	0.616	0.461	0.476	0.410									
	(0.209)	(0.212)	(0.195)	(0.208)									
POVERTY RATE					0.599	0.430	0.450						
					(0.223)	(0.234)	(0.215)						
RFI									-0.430	-0.412	-0.585		
									(0.251)	(0.216)	(0.205)		
EFI												-0.059	
												(0.247)	
GDP PER CAPITA			-0.314	-0.268			-0.320	-0.447			-0.563		
			(0.176)	(0.176)			(0.181)	(0.194)			(0.167)		
WELFARE SIZE		-0.285		-0.193		-0.296				-0.484			-0.467
		(0.207)		(0.212)		(0.220)				(0.201)			(0.226)
σ_α	0.526	0.488	0.474	0.465	0.539	0.499	0.485	0.557	0.582	0.496	0.453	0.617	0.568
σ_β	0.203	0.179	0.203	0.169	0.198	0.181	0.207	0.193	0.217	0.194	0.235	0.217	0.197
ρ	0.173	0.074	0.069	0.022	0.159	0.088	0.083	0.176	0.307	0.199	0.201	0.344	0.221

Source: authors' calculation on data from ESS.
Note: estimated coefficients of country-level predictors of the income slopes in the regression model (8)
Standard error in parenthesis

plained country variability is modest (9%). The size of the welfare state and the general wealth of a country (measured by its per capita GDP) are negatively significant and contribute in reducing the unexplained variability. Table 6 reports the estimated coefficients of country-level predictors for the intercepts in model (8) for several robustness checks.

It is interesting to note that adding the Gini coefficient as regional predictor in the US model (the Gini coefficient is computed on the PSID data) contributes only marginally to explain the cross-region variability of the income slopes and of the intercepts. Moreover the sign associated to inequality is opposite to that observed for European countries. Although the effect is modest, in the United States the more unequal is the income distribution the more adverse to redistribution are individuals (see Figure 7).

4.2.3 Also a sub-national matter?

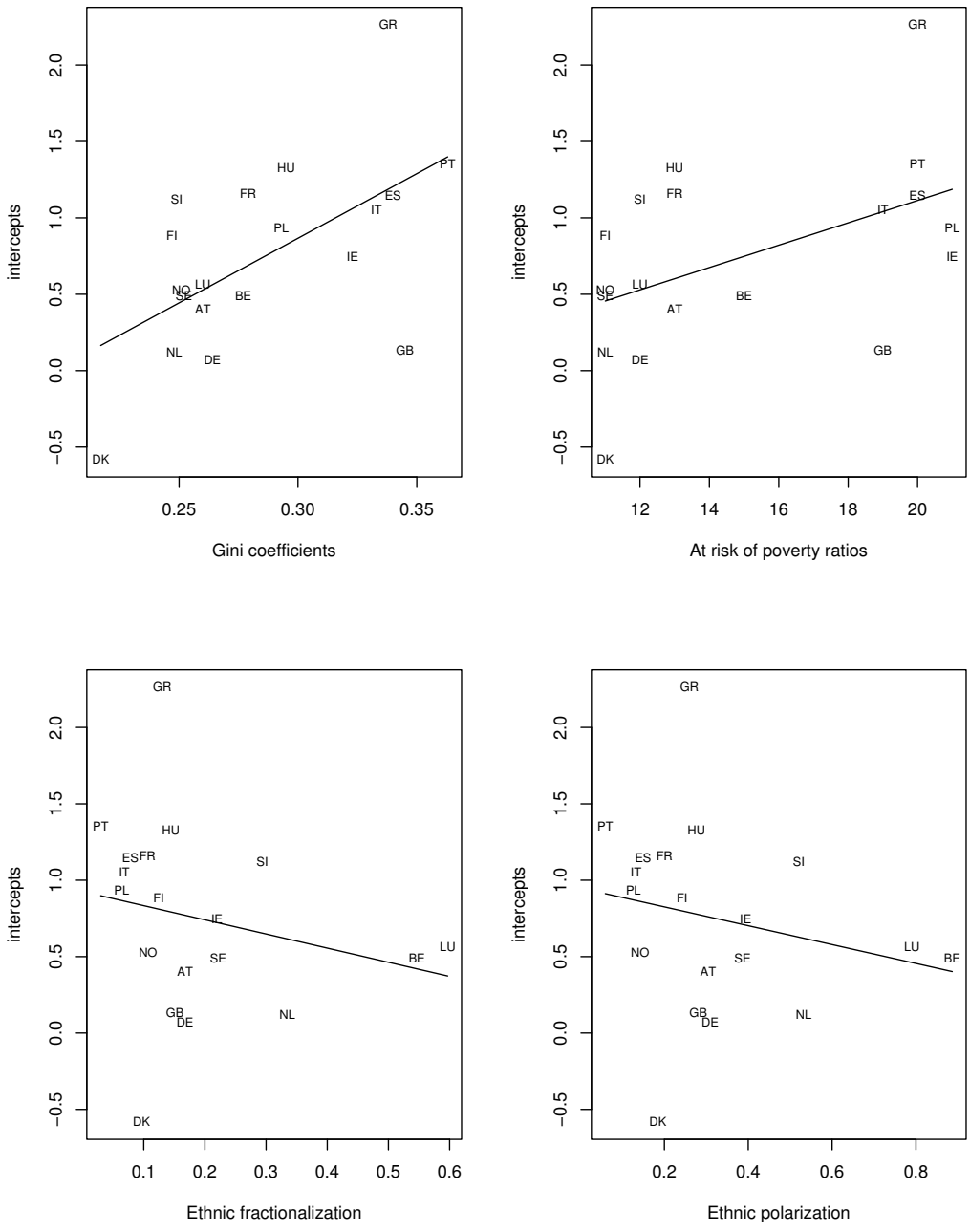
As a final step, we want to investigate if there are significant regional disparities in the European countries and to what extent variation between regions within countries can account for the differences in preferences for redistribution, after controlling for observed individual characteristics.

Therefore, we reclassified the geographical ESS codes according to the most recent nomenclature of territorial units for statistics (NUTS). We took the first level of the classification (NUTS1) for most of the countries and we considered further levels only for those countries for which the NUTS1 code coincides with the country level. Overall we obtained 107 regions for the 20 European countries of the EU (we excluded the non-EU members, Switzerland and Norway, and Luxembourg).

To account for regional variation, we implemented a three-level model, where individuals are nested in regions (NUTS) and regions are nested in countries. Technically, a three-level model is a straightforward development of a two-level model.

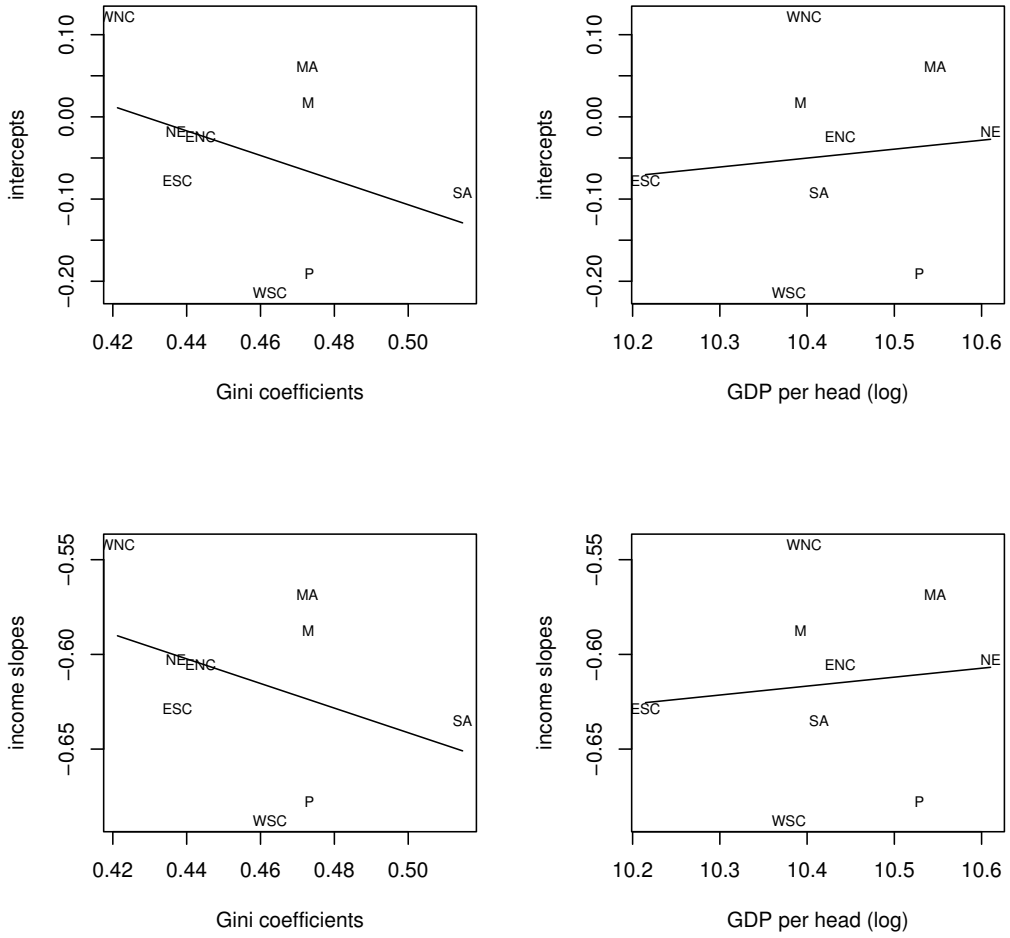
In this model, geographical variability can be partitioned in between country variation, that accounts for 80%, and between-region variation within countries, that accounts for the remaining 20%. In terms of differences in personal income effects, variation of β between regions within countries is relevant, since it accounts

Figure 6: *Country intercepts vs. country-level predictors*



Source: authors' calculation on data from ESS.
Note: estimated country intercepts in the varying-intercept varying-slope regression model (8) plotted versus country-level predictors.
A regression line is fitted to the estimates.
Greece, Italy and Luxembourg are not present in Round 3.

Figure 7: *Region intercepts and income slopes vs. region level predictors (US data)*



Source: authors' calculation on data from GSS.
Note: estimated region intercepts and income slopes in the varying-intercept varying-slope regression model (8) plotted versus region-level predictors.
A regression line is fitted to the estimates.

for 42% of the clustering variability of the slopes.

To give an idea, Figure 8 shows the deviation of the estimated NUTS intercepts from the corresponding country intercept and Figure 9 reports the estimated intercepts for the European sub-national regions plotted against their per capita GDP. The figures confirm large disparities across European regions, giving support for further investigations on the role of local contextual effects.

5 Concluding remarks

In both sides of the Atlantic ocean, personal income matters in predicting individual preferences towards redistribution but the assumption that economic self-interest shapes preferences over redistribution is most likely to be true in North America than in Europe. Moreover, individual characteristics other than income influence Europeans and Americans willingness of redistribution differently.

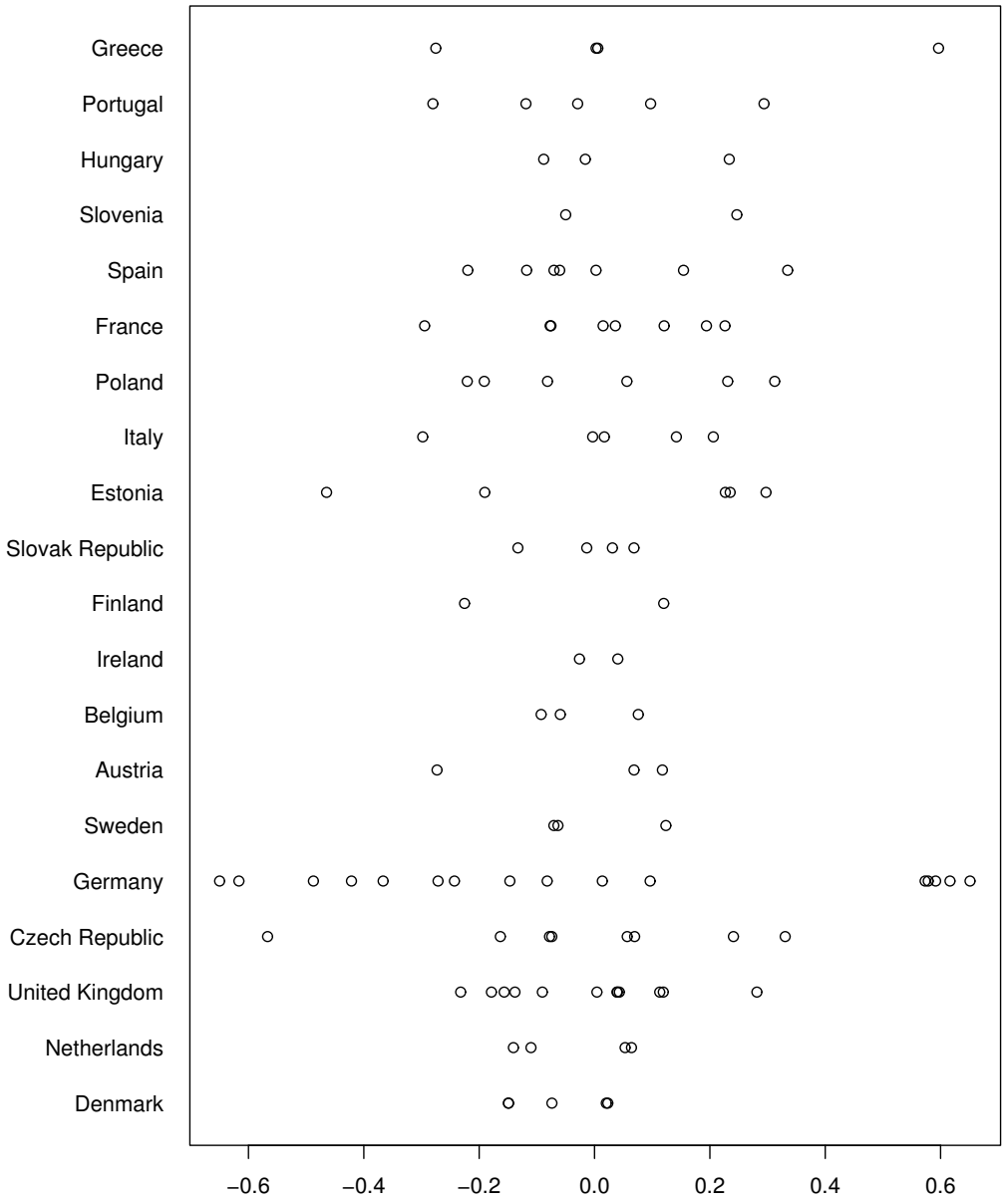
Our analysis has also emphasized geographical variability of the influence of personal income that is sizeable across Europe and almost negligible in the United States, even after controlling for a set of individual observable characteristics. Our main finding is that in Europe personal income matters more in more equal countries than in those with high level of inequality. The introduction in the model of the Gini index reduces this variability by over 23% in Europe and only by 8% in the United States. The evidence that the rich are more supportive of redistribution in unequal countries is difficult to reconcile with the self-interest hypothesis and suggests that influence of economic inequality (and poverty) goes beyond the aggregation of individual incomes in each country. Instead, although the effect is modest, in the United States the sign associated to inequality is opposite: the more unequal is the income distribution the more adverse to redistribution are individuals.

In Europe, approximately 10% of the unexplained variability in demand for redistribution can be purely attributed to differences between countries, while only 0.5% in the United States. Inequality reduces European unexplained region-level standard deviation by over 27%, indicating the relative importance of this predictor in understanding propensity disparities across European countries. Consistently with the financial self-interest theories, the greater is the inequality the greater is the support for redistribution of the "median" voter.

Because of the observed large variability in Europe, we also investigate if there are significant regional disparities inside European countries. Preliminary results indicate that part of the unobserved variability can be attributed to between sub-national variation within same countries, suggesting further investigation on the role of local contextual variables.

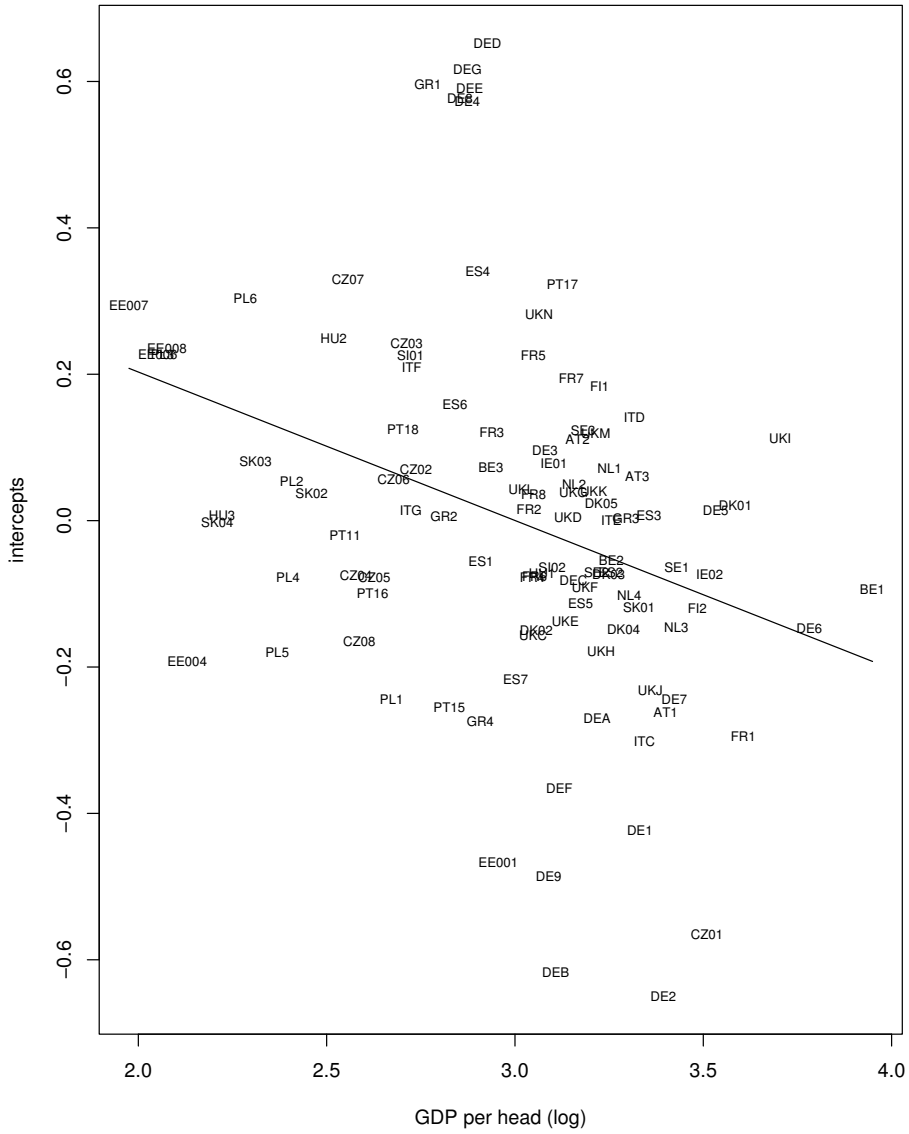
Multilevel models is a natural framework for understanding these patterns and for modelling hierarchical data, individual characteristics within regions or states. With respect to traditional alternatives, multilevel modelling has allowed us to estimate differences between groups and to analyze a three-level source of variation (individuals within EU macro regions within countries) and to model data coming from different sources inside the same model.

Figure 8: *Sub-national (NUTS) differences of the intercepts (European data)*



Source: authors' calculation on data from ESS.
Note: estimated NUTS intercepts in the three level model with respect to the corresponding country intercept. Countries are ordered from the most willing to redistribute (Greece) to the least (Denmark).

Figure 9: *Sub-national intercepts vs. sub-national per capita GDP (European data)*



Source: authors' calculation on data from ESS.

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