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Preferences for redistribution in Europe

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Abstract

This paper analyses the determinants of preferences for redistribution in a pool of 33 European countries over the period 2002-2010. We find that income inequality affects positively the individual demand for redistribution and that the actual level of redistribution implemented in the country decreases the support for more redistribution. Furthermore, a fixed effect model applied to pseudo panels constructed over that period confirms that increases in income inequality over time raise the demand for redistribution. This result is predicted by standard political economy models but has found little empirical support. We show that at least in Europe growing income inequality leads to more individual support for redistribution.

JEL classification: D31, D63, D72, H20

Keywords: Redistribution, Income Inequality, Social Preferences, Pseudo-Panels

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1. Introduction

A common topic of interest for economists and other social scientists is the formation of preferences over how much income redistribution must be implemented, if any. As pointed by Alesina and Giuliano (2011), this is the most important dividing line between left and right political views concerning economic issues. Through the political voting, these preferences can play a significant role on the final level of redistribution accomplished by the government. Early models of voting (Meltzer and Richard, 1981) show that the median voter is decisive to push for redistribution when the median income is placed left to the mean of the income, i.e. when the income is unequally distributed. Although this model is insightful, there are missing mechanisms that if accounted for, it will produce different results. For example, individuals belonging to the lower part of the income distribution may have the expectation of upward mobility, so that they will prefer less redistribution (Piketty, 1995; Benabou and Ok, 2001). Alesina and Angeletos (2005) show that societies where individual effort is believed to be the main source of income formation will prefer less taxes and redistribution. The contrary holds for societies believing that luck is important to create income, so that they will prefer more redistribution. Furthermore, Karabarbounis (2011) finds empirical support for the ‘one dollar, one vote’ equilibrium, meaning that richer groups of individuals are able to put forward their agenda on less taxes and redistribution through their economic and political influence.

There are a number of studies analysing the determinants of preferences for redistribution, mainly exploiting the cross-country variation¹. Although all those works are important in the literature of preferences for redistribution, they do not address directly the determinants of changes in these preferences. One of the reasons of this lack is the scarcity of adequate data for this purpose, i.e. panel data surveys that include questions on social preferences.

The aim of this paper is to study the determinants of preferences for redistribution in Europe taking into account variation over time and country. Within this framework we pay particular

¹ Georgiadis and Manning (2012); Pittau et al. (2012); Kerr (2011), Alesina and Giuliano (2011); Alesina and La Ferrara (2005); Alesina and Fuchs-Schundeln (2007); Luttmer and Singhal (2011); Gillaud (2012); Corneo and Grüner (2002); Fong (2001); Yamamura (2012).

attention to the effects of income inequality on these preferences. In this way, we attempt to say whether growing income inequality, as is widely observed, has an effect on the formation of social preferences. It is important to mention that we do not deal with the realization of these preferences, meaning that we do not analyse the extent to which preferences for redistribution of the individuals of a country correspond to or impact on the actual degree of redistribution observed in that country. For such analysis one would need to use a longer period of observations in order to account for political and economic cycles (as in for example Georgiadis and Manning, 2012 for the UK). This paper differs from the existing empirical literature in several respects. We use a harmonized dataset composed of the five waves of the European Social Survey (ESS) carried out between 2002 and 2010, which comprises a total of 33 countries and almost 220,000 individuals. We first explore the determinants of the preferences for redistribution with a pooled sample trying to account for all possible country and time effects that can bias the results and using the controls frequently employed in the empirical literature. We then construct synthetic panels based on birth year cohorts, sex and country in order to use pseudo-panel techniques (Deaton, 1985) and study the changes in inequality and preferences more fully. For this purpose we use fixed effects estimators. This strategy allows us to overcome the data limitations and assess the role of changing inequality in the formation of preferences. Furthermore, we consider that individuals are not only influenced by the level of income inequality –as measured by the Gini coefficient of net income - but also by the degree of redistribution which is already taking place, which is different from previous studies.

Our results with pooled data indicate that income inequality positively affects the individual demand for redistribution under different specifications, even in a demanding structural estimation that considers country, time and country-time specific effects. The level of actual redistribution operates in the opposite direction, which helps us to explain why some welfarist oriented countries like Denmark, Norway and Sweden exhibit a lower preference for redistribution. This means that individuals living in economies with very substantial redistribution already do not want more redistribution. The pseudo-panel estimations confirm the direction and significance of most of the variables, and – importantly - that variations in income inequality affect those in preferences for redistribution. These findings are robust to different measures of income inequality and specifications

with different sizes and numbers of synthetic panels. Our results provide evidence that preferences for redistribution are not immobile and that their evolution is influenced by changing income inequality. These findings must be interpreted as short-time responses given the limited length of time our data cover.

The paper is organized as follows. In the next section we present a brief summary of the literature. The third section presents the data. The fourth section presents our modelling and results from estimation with the pooled data. Section 5 presents the pseudo panel estimates and section 6 concludes.

2. Studying preferences for redistribution

The implication of the works of Meltzer and Richard (1981, 1983) that the redistribution size is positively caused by the level of income inequality has led to the emergence of an important body of empirical papers trying to test its validity. This literature can be roughly subdivided into two branches: one uses measures of income inequality and redistribution (most often the gini coefficient and the ratio of median to mean income) at the country or state level; and the other uses individual preferences for redistribution. Under the first group, the effect of inequality on redistribution has mainly not received empirical support. Examples are Rodriguez (1999), Persson and Tabellini (1994), Perotti (1996), Moene and Wallerstein (2001, 2003), Lind (2005) and Shelton (2007). Exceptions are Milanovic (2000, 2010) and Karabarbounis (2011). The papers of the second branch study the determinants of the individual preferences for redistribution and few of them assess the effect of income inequality on these preferences. Examples of the last ones are Pittau et al (2012), Kerr (2011), Tóth and Keller (2011), Yamamura (2012) and Jaeger (2012). The results about the effect of inequality on the preferences for redistribution are mixed, although a majority of them find a positive effect. The analysis is mainly based on cross-country differences so that the problems of unobserved effects and reverse causality make us to be cautious when interpreting the results. However, Kerr (2011) use a IV model to detect a positive effect of inequality on the demand for redistributions across

American states. Furthermore, Jaeger (2012) uses a pseudo-panel approach, but his synthetic observations are based on identifiers that are not immobile over time neither observable for all individuals (education, age and an index of social class positions based on occupations), which is needed to build proper pseudo panels (Verbeek, 2008). Table 1 lists, although not comprehensively, recent papers on the determinants of preferences for redistribution.

Table 1: List of papers studying preferences for redistribution

Study	Dataset	Region	Modelling	Effect of inequality
Pittau et al (2012)	ESS 2002-2008 GSS 2000-2006	23 EU countries US states	Logit multilevel	+ -
Kerr (2011)	GSS 1972 -2000 ISSP 1987, 92, 99 WVS 1990, 95, 00	US (states) Many countries	OLS IV OLS	+ or insignificant
Tóth and Keller (2011)	Eurobarometer 1999	EU-27	OLS Multilevel	+
Yamamura (2012)	JGSS 2000-2008	Japan	Ordered Probit	+ for high-income earners, otherwise insignificant
Jaeger (2012)	ESS 2002-2008	31 EU countries	FE Pseudo Panels	insignificant
Luttmer and Singhal (2011)	ESS 2002-2006	32 EU countries	OLS	Not studied
Gillaud (2012)	ISSP 2006	33 countries	Ordered Logit	Not studied
Alesina and Giuliano (2011)	GSS 1972-2004 WVS 1981, 90, 95, 99	US Many others	OLS	Not studied
Alesina and Fuchs-Schündeln (2007)	Panel GSOEP 1997-2002	Germany	Probit	Not studied
Georgiadis and Manning (2012)	BSAS	UK	OLS	Not studied
Alesina and La Ferrara (2005)	GSS 1978-91	US	Ordered Probit	Not studied
Corneo and Grüner (2002)	ISSP 1992	12 developed countries	Logit	Not studied
Fong (2001)	Gallup Poll Social Audit Survey 1998	US	Ordered Probit	Not studied
<u>Acronyms:</u> ESS: European Social Survey ISSP: International Social Survey Program WVS: World Values Survey BSAS: British Social attitudes Survey GSOEP: German Socio Economic Panel GSS: General Social Survey JGSS: Japanese General Social Survey				

3. Data

We use the five available bi-annual rounds of the European Social Survey (ESS), from 2002 to 2010. This survey is designed to measure attitudes, beliefs, values and behaviour patterns of individuals in Europe. There is a core set of questions implemented in each wave and additional

modules in specific waves. Our key question measuring individual preferences for redistribution is repeated in each wave, which is “To what extent you agree or disagree with the statement: the government should take measures to reduce differences in income levels”. The individual must choose one of five responses, which we rescale in the following way: strongly agree (5); agree (4); neither agrees nor disagree (3); disagree (2) and strongly disagree (1). Therefore, the higher this number, the more in favour for redistribution. We use Gini coefficients from the Standardized World Income Inequality Database (SWIID) as our measure of income inequality (see Solt, 2009), because this – although not without its problems – provides the broadest coverage across countries and over time, allowing us to attain the largest number of observation points (whereas data on income inequality from Eurostat covers fewer countries and years), and SWIID also provides Gini coefficients computed with incomes both before and after taxes and transfers. (Pittau et al, 2012, also use data from SWIID to analyse preferences for redistribution, although they do not use their variation over time.) The other macro variable to be used in the analysis is GDP per capita, taken here from the World Development Indicators from the World Bank. The initial sample is composed of 117 country-year points and includes 218,990 observations with data on preferences for redistribution and macro variables².

The data shows a great deal of variability across countries and over time in redistributive preferences. For example, the mean score for the variable measuring preferences for redistribution (from 1 to 5) in each country over the full period is 3.90. The countries with the highest and lowest scores are Greece with 4.35 and Denmark with 3.04. Confirming some regional differences, the Mediterranean countries are placed well above the Nordic countries (see Figure 1). The relation between preferences for redistribution and income inequality is positive when we pay attention to cross-country differences, which is reported in the left-hand panel of Figure 2. At first glance, it is surprising that traditional pro-welfare states like the Nordic countries have low levels of inequality and lower preferences for redistribution at the same time. However, it is possible that individuals who in general are in favour of redistribution are less willing to favour more redistribution if the scale of

² This comprises a total of 33 countries, that are the EU-27 plus Norway, Iceland, Russia, Turkey, Ukraine and Israel.

redistribution already taking place is high enough. An indication of this can be observed in Figure 2's right-hand panel. The ratio of the Gini computed with pre-tax income to the Gini computed with net income may be interpreted as a rough measure of the degree of redistribution implemented. The closer this ratio is to unity, the lower the degree of redistribution. The figure suggests some tendency for preferences for redistribution to be lower where this ratio is higher.

Figure 1: Preferences for redistribution by country, 2002-2010

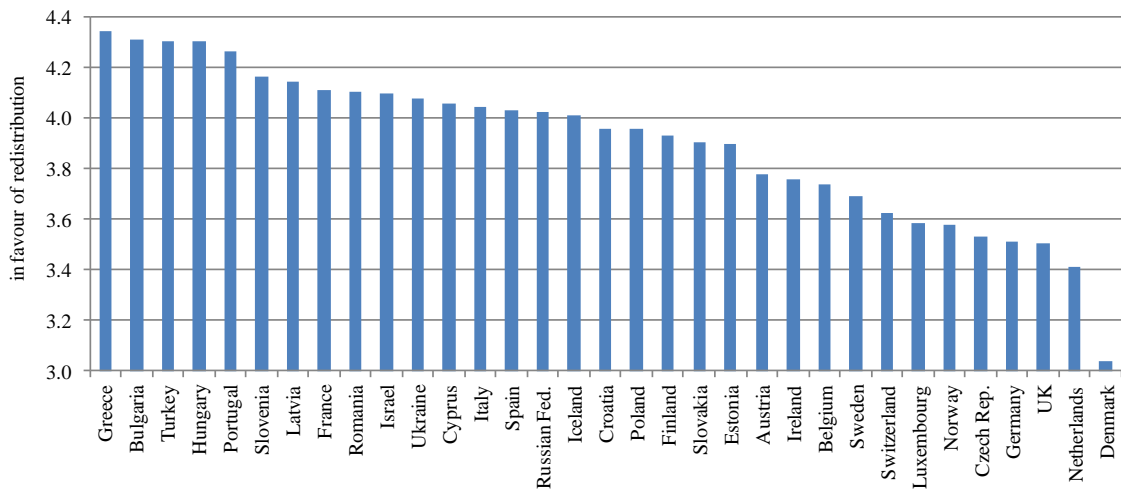
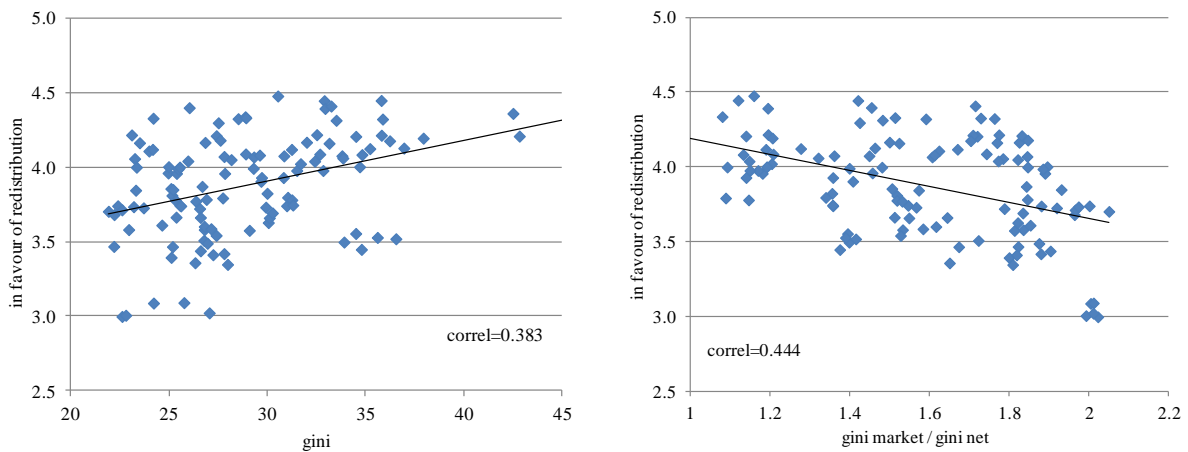


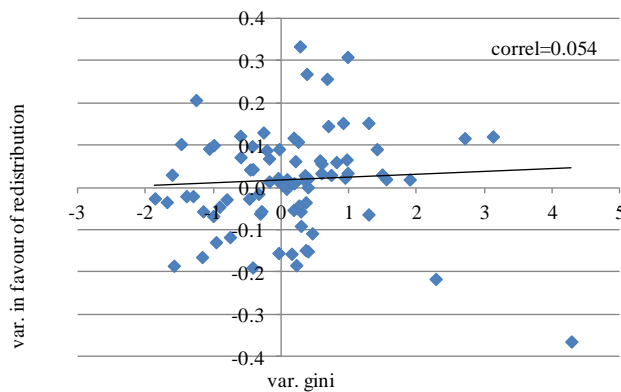
Figure 2: Preferences for redistribution and income inequality



Considering only the first and last years of data in each country, we observe an increase in the preference for redistribution over time in 16 countries and a decrease in 12 countries. The simple mean of this variation is 4.1% for the countries that experienced an increase, and -2.4% for the countries that experienced a reduction. Figure 3 plots the points of biannual variation of the

preferences for redistribution and Gini for all the country-year points with available data. The relation between the changes in preferences and Gini over time is also positive as in the case of cross country variation, but it is weaker (though dropping one outlier improves the correlation to 0.25). However, in the next sections we will implement a more robust analysis with the inclusion of controls that allow us to investigate the changes of preferences across countries and over time.

Figure 3: Changes in preferences for redistribution and income inequality (biannual periods)



4. Modelling preferences for redistribution

Our interest is to analyse the determinants of preferences for redistribution, and in particular the effects of income inequality. For this purpose, we take into account individual and country characteristics. We are aware that the structure of the data (from pooling of ESS rounds) prevents us from interpreting such results as causal effects, but it is still worth exploring the strength of the effects of inequality after including a variety of controls. In particular, we impose a structural estimation that considers country, time and country-time specific effects, which will absorb part of the cross-country and within-country variation but will help to mitigate the effects of spurious trends and contemporaneous error correlations.

4.1 The baseline model

The dependent variable is constructed from the question “To what extent you agree or disagree with the statement: the government should take measures to reduce differences in income

levels". We inverse the scale as follows: strongly agree (5), agree (4), neither agrees nor disagrees (3), disagree (2) to and strongly disagree (1). For simplicity we will perform OLS estimations³ to the following specification:

$$y_{i,c,t} = \theta_c + \delta_t + \theta_c \delta_t + \beta GINI_{c,t} + \alpha X_{c,t} + \gamma Z_{i,c,t} + \varepsilon_{i,c,t} \quad (1)$$

The subscripts i , c and t stand for individual, country and time, respectively. The dependent variable measures the preference for redistribution stated by each individual in the sample. The model includes θ_c and δ_t to control for country and year fixed effects, which accounts for other country characteristics and general trends over time. The inclusion of these variables is standard in the measure of preferences for redistribution with pooled datasets (Kerr, 2011; Luttmer and Singhal, 2011; Alesina and Giuliano, 2011; Alesina and La Ferrara, 2005). Furthermore, our equation includes the interaction between country and time fixed effects, $\theta_c \delta_t$, in order to control for shocks that are time and country specific. The Gini coefficient and the other macro variables $X_{c,t}$ are country and time specific. The GDP per capita is expressed in PPP real terms and in the form of logs. $\varepsilon_{i,c,t}$ is the error term. The estimations use robust standard errors clustered by country and year.

The variables of the vector $Z_{i,c,t}$ are individual specific and include the standard controls in the literature. This includes sex (*male*), age, squared age, the existence of a couple or spouse living with the respondent, education level in the form of ISCED dummies, belonging to a minority ethnic group in the country (*ethnic*), self-reported health status ranging from very good to very bad in five scales, how religious is the individual regardless of any particular religion (*religious*) in a scale from 1 (not at all) to 10 (very religious). The ESS has not a uniform question on personal income but we

³ In the empirical literature of preferences for redistribution is a common practice to use the multi-scale variable about preferences for redistribution and estimate with OLS. Examples of this are Georgiadis and Manning (2012), Kerr (2011), Alesina and Giuliano (2011a, 2011b) and Luttmer and Singhal (2011). All of them argue that the use of alternative modelling approaches such as the ordered logit model do not change the results. Differently, Pittau et al (2012) recode the original 5-scale question on preferences for redistribution into 1/0 and apply a logistic regression with multi-level modelling. Gillaud (2012) use an ordered logit and Alesina and La Ferrara (2005) use ordered probit and probit models.

include a proxy that is asked over all waves⁴. This is “which of the descriptions on this card comes closest to how you feel about your household's income nowadays?” with four possible scales: living comfortably on present income (1), coping on present income (2), difficult on present income (3) and very difficult on present income (4). Another group of variables refers to labour conditions of the individual, with dummy variables *union* (indicating current or past affiliation with a trade union or similar), *retired* and *unemployed*. Finally, *left-right scale* denotes the self position of the individual in the political spectrum from 0 (left) to 10 (right). We also include a variable indicating that the country is a former communist country in order to control for possible lasting effects of communism on preferences for redistribution as suggested by Alesina and Fuchs-Schundeln (2007). Table 2 contains the descriptive statistics.

Table 2: Descriptive statistics

Variable	2002		2004		2006		2008		2010		Total	
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
In favour of redistribution	3.79	1.05	3.84	1.05	3.87	1.03	3.88	1.02	3.90	1.06	3.85	1.04
Gini	28.45	4.04	29.00	4.58	29.30	4.82	30.50	5.43	28.94	4.31	29.30	4.76
Gini market	45.49	4.20	45.36	6.16	45.39	6.88	45.35	6.57	44.43	6.82	45.23	6.22
log gdp pc	10.22	0.34	10.12	0.50	10.12	0.49	10.09	0.40	10.14	0.34	10.14	0.42
communist	0.16	0.36	0.27	0.44	0.32	0.47	0.38	0.49	0.35	0.48	0.30	0.46
left-right scale	5.11	2.19	5.15	2.19	5.08	2.16	5.17	2.24	5.20	2.16	5.14	2.19
male	0.48	0.50	0.47	0.50	0.47	0.50	0.47	0.50	0.47	0.50	0.47	0.50
living with partner	0.63	0.48	0.62	0.48	0.63	0.48	0.63	0.48	0.62	0.49	0.63	0.48
age	45.27	17.87	45.39	18.07	46.30	18.20	46.17	18.13	47.61	18.45	46.10	18.15
age sq /100	23.69	17.28	23.87	17.44	24.74	17.75	24.60	17.72	26.07	18.25	24.54	17.69
iscsd: 1	0.15	0.35	0.16	0.37	0.12	0.33	0.14	0.35	0.13	0.34	0.14	0.35
iscsd: 2	0.24	0.43	0.21	0.40	0.20	0.40	0.20	0.40	0.17	0.38	0.20	0.40
iscsd: 3	0.38	0.49	0.39	0.49	0.38	0.49	0.38	0.49	0.40	0.49	0.39	0.49
iscsd: 4	0.01	0.12	0.02	0.15	0.03	0.16	0.02	0.14	0.05	0.21	0.03	0.16
iscsd: 5	0.22	0.41	0.22	0.41	0.27	0.44	0.26	0.44	0.25	0.43	0.24	0.43
iscsd: other	0.00	0.05	0.00	0.06	0.00	0.04	0.00	0.02	0.00	0.05	0.00	0.04
income nowadays: living comfort.	0.33	0.47	0.29	0.45	0.29	0.46	0.25	0.43	0.27	0.44	0.28	0.45
income nowadays: coping on	0.46	0.50	0.45	0.50	0.45	0.50	0.45	0.50	0.44	0.50	0.45	0.50
income nowadays: difficult on	0.16	0.37	0.19	0.39	0.19	0.39	0.22	0.41	0.20	0.40	0.19	0.39
income nowadays: very difficult on	0.05	0.21	0.07	0.26	0.08	0.26	0.09	0.28	0.10	0.29	0.08	0.26
health: very good	0.25	0.44	0.23	0.42	0.21	0.41	0.22	0.42	0.23	0.42	0.23	0.42
health: good	0.44	0.50	0.43	0.50	0.43	0.50	0.43	0.49	0.42	0.49	0.43	0.50
health :fair	0.24	0.43	0.26	0.44	0.28	0.45	0.27	0.44	0.26	0.44	0.26	0.44
health: bad	0.06	0.23	0.07	0.25	0.07	0.25	0.07	0.26	0.07	0.26	0.07	0.25
health: very bad	0.01	0.11	0.01	0.11	0.02	0.12	0.01	0.12	0.02	0.12	0.01	0.12
ethnic	0.04	0.19	0.04	0.20	0.06	0.24	0.07	0.25	0.05	0.23	0.05	0.23
religious	4.96	2.94	4.89	2.95	4.76	2.92	4.89	2.98	4.50	2.99	4.81	2.96
union	0.43	0.49	0.42	0.49	0.45	0.50	0.40	0.49	0.40	0.49	0.42	0.49
retired	0.20	0.40	0.22	0.41	0.23	0.42	0.22	0.42	0.26	0.44	0.23	0.42
unemployed	0.06	0.23	0.06	0.24	0.05	0.22	0.07	0.25	0.08	0.27	0.06	0.24

⁴ The ESS includes a question that indicates which range of total household income the individual belongs to. However, there are two problems to use this question over the full waves. There are 12 ranges in waves 2002-2006, and 10 in waves 2008-2010. Furthermore, there is a high percentage of individuals that do not answer the income question of the survey (29% of the full sample).

4.2 Main results

The results of the regression indicated in equation 1 are in table 3. The first column only considers the variables at country level. Over the next columns, we first add socio-demographic controls at individual levels, then we control for political attitudes. In the last column we add the variable *Gini market* which is the Gini coefficient measured with incomes before taxes and transfers. This variable will help us to assess the effect of actual redistribution in the country on individual preferences for redistribution. All these specifications include country and year fixed effects and the interactions between countries and years.

It is remarkable that the coefficient of income inequality (*Gini*) is positive and significant over all specifications. This means that individuals demand more redistribution when income inequality is larger in a given country. This is true even after the inclusion of political preferences in the regressions, which may absorb a large part of the variability in the dependent variable. We observe that an additional percentage point in the Gini is associated with an increase between 0.32% and 0.62% in the score of the demand for redistribution evaluated at sample means. This positive and significant result is in line with that of Pittau et al (2012) who find a positive relation between income inequality and preferences for redistribution for 23 European countries, although they use a Gini that only varies across countries but not over time. Similarly, Kerr (2011) also finds a positive effect of the Gini coefficient in a sample of developing and developed countries although the Gini is lagged one period. However, the redistribution demand of individuals from different regions can respond differently to inequality. For example, Pittau et al (2012) find that Gini affects negatively the individual demand for redistribution in American states and Yamamura (2012) finds the same relation with Japanese prefectures. The different perceptions and social preferences between Americans and Europeans about redistribution have been documented in Alesina and Glaeser (2004), Alesina et al (2004) and Alesina and Giuliano (2011).

The inclusion of *Gini market* allows us to measure the effects of actual redistribution in the country on the individual demand. A variable equal to $Gini\ market - Gini$ roughly indicates how much of the initial income inequality is being reduced by the taxes and transfers. An increase in *Gini*

market, holding *Gini* and the rest of variables constant, means that redistribution is increasing as the distance between the two *Ginis* increases. Therefore, given the negative direction of the coefficient *Gini market*, we observe that more actual redistribution is associated with less support for redistribution. Similarly, a decrease in the coefficient on *Gini* implies that the redistribution with respect to the initial distribution of pre-tax incomes is larger and hence the demand for redistribution is lower. This result means that in general, individuals may be in favour of redistribution when the income inequality is high, but this preference loses strength if the size of the redistribution taking place in the country is already high. This can explain why some traditional welfare oriented countries, like Denmark, Norway and Sweden may have a lower preference for redistribution as we noted before. Pittau et al (2012) use a proxy to control for the welfare state consisting of the ratio of social transfers over GDP, which is found to be negatively associated with the individual demand for redistribution. This variable can capture some cross-country differences of the generosity of the welfare system, but this is imperfect because taxes are not considered.

Table 3: OLS estimates for preferences for redistribution

variables	(1)	(2)	(3)	(4)
Gini	0.0165*** (0.0000)	0.0202*** (0.0004)	0.0123*** (0.0004)	0.0237*** (0.0005)
Gini market				-0.0012*** (0.0004)
log gdp pc	-0.2778*** (0.0000)	-0.1777*** (0.0042)	-0.0597*** (0.0091)	-0.1957*** (0.0039)
communist	-0.4676*** (0.0000)	-0.4808*** (0.0090)	-0.5383*** (0.0112)	-0.4786*** (0.0100)
left-right scale			-0.0770*** (0.0055)	-0.0770*** (0.0055)
Male		-0.1282*** (0.0078)	-0.1139*** (0.0074)	-0.1139*** (0.0074)
living with partner		-0.0284*** (0.0062)	-0.0228*** (0.0063)	-0.0228*** (0.0063)
Age		0.0076*** (0.0012)	0.0075*** (0.0013)	0.0075*** (0.0013)
age sq /100		-0.0063*** (0.0011)	-0.0057*** (0.0012)	-0.0057*** (0.0012)
iscsd: 1		<i>(omitted)</i>		
iscsd: 2		0.0322** (0.0157)	0.0346** (0.0164)	0.0346** (0.0164)
iscsd: 3		-0.0230 (0.0164)	-0.0187 (0.0162)	-0.0187 (0.0162)
iscsd: 4		-0.0992*** (0.0249)	-0.0946*** (0.0247)	-0.0946*** (0.0247)
iscsd: 5		-0.2362*** (0.0186)	-0.2362*** (0.0178)	-0.2362*** (0.0178)
iscsd: other		-0.2137*** (0.0720)	-0.2199*** (0.0800)	-0.2199*** (0.0800)

variables	(1)	(2)	(3)	(4)
income nowadays: living comfort.		-0.4352*** (0.0235)	-0.4010*** (0.0218)	-0.4010*** (0.0218)
income nowadays: coping on		-0.2206*** (0.0209)	-0.1989*** (0.0194)	-0.1989*** (0.0194)
income nowadays: difficult on		-0.0831*** (0.0155)	-0.0680*** (0.0141)	-0.0680*** (0.0141)
income nowadays: very difficult on		(omitted)		
health: very good		-0.1426*** (0.0223)	-0.1131*** (0.0265)	-0.1131*** (0.0265)
health: good		-0.1450*** (0.0206)	-0.1168*** (0.0246)	-0.1168*** (0.0246)
health :fair		-0.0909*** (0.0208)	-0.0729*** (0.0249)	-0.0729*** (0.0249)
health: bad		-0.0631*** (0.0195)	-0.0516** (0.0248)	-0.0516** (0.0248)
health: very bad		(omitted)		
ethnic		0.0920*** (0.0164)	0.0476** (0.0185)	0.0476** (0.0185)
religious		-0.0031* (0.0016)	0.0063*** (0.0018)	0.0063*** (0.0018)
union		0.1387*** (0.0104)	0.1130*** (0.0093)	0.1130*** (0.0093)
retired		0.0590*** (0.0102)	0.0606*** (0.0108)	0.0606*** (0.0108)
unemployed		0.0923*** (0.0127)	0.0887*** (0.0131)	0.0887*** (0.0131)
Observations	218990	205747	178767	178767
Adjusted R^2	0.100	0.144	0.167	0.167

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust cluster standard errors are in parentheses.
Each regression controls for country and year fixed effects and their interactions.

Regarding other variables at country level, we find that individuals from wealthier counties demand less redistribution; the coefficient of GDP per capita is negative and significant in all specifications. Furthermore, respondents from former communist countries are less in favour of redistribution. This result is stable in direction, size and significance across different specifications, even after controlling by political views. This contrasts with the results by Alesina and Fuchs-Schundeln (2007) that find lasting positive effects of communism on the preferences for redistribution in a German panel taken between 1997 and 2002. As proposed by the authors, we also introduce dummies for cohorts and their interactions with the dummy *communist* (first column of table 4) but we do not find substantial differences between cohorts of former communist countries and the rest. One would expect that older cohorts would be more in favour of redistribution in communist countries as evidence of the effects of indoctrination (Alesina and Fuchs-Schundeln, 2007); but we find that within each group of countries (former communist or not), older cohorts are more in favour for redistribution with respect to younger cohorts at similar rates. Furthermore, Corneo and Grüner (2002)

find that individuals from former socialist countries are more in favour of redistribution, but those results come from the International Social Survey Programme (ISSP) taken in 1992. So, it is possible the effects of living in a former socialist country on the demand for redistribution have weakened over time.

Table 4: Additional OLS estimates for preferences for redistribution

(1)		(2)		(3)	
variables	coef.	variables	coef.	variables	coef.
Gini net	0.0231*** (0.0005)	Gini net	0.0234*** (0.0005)	Gini net	0.0221*** (0.0005)
Gini market	-0.0009** (0.0004)	Gini market	-0.0007* (0.0004)	Gini market	-0.0007* (0.0004)
communist	-0.4855*** (0.0193)	communist	-0.4451*** (0.0105)	communist	-0.4278*** (0.0108)
lef-right scale	-0.0767*** (0.0055)	lef-right scale		lef-right scale	-0.0311*** (0.0042)
born <1946	0.0844*** (0.0190)	lrscale=1	-0.0260 (0.0243)	iscd2	-0.0165*** (0.0047)
born 1946-1960	0.0837*** (0.0166)	lrscale=2	-0.0375* (0.0223)	iscd3	-0.0414*** (0.0059)
born 1961-1975	0.0148 (0.0124)	lrscale=3	-0.1385*** (0.0206)	iscd4	-0.0537*** (0.0135)
born <1946*commu	-0.0023 (0.0341)	lrscale=4	-0.2596*** (0.0211)	iscd5	-0.1013*** (0.0090)
born 1946-60*commu	-0.0135 (0.0299)	lrscale=5	-0.3229*** (0.0237)	iscd6	-0.1035** (0.0398)
born 1961-75*commu	-0.0065 (0.0212)	lrscale=6	-0.4619*** (0.0275)	iscd2*lrscale	0.1194*** (0.0295)
		lrscale=7	-0.5864*** (0.0343)	iscd3*lrscale	0.1934*** (0.0331)
		lrscale=8	-0.6142*** (0.0388)	iscd4*lrscale	0.1811*** (0.0655)
		lrscale=9	-0.6038*** (0.0463)	iscd5*lrscale	0.2842*** (0.0432)
		lrscale=10	-0.4790*** (0.0450)	iscd6*lrscale	0.3172* (0.1706)
Observations	178767		178767		178767
Adjusted R ²	0.167		0.171		0.172

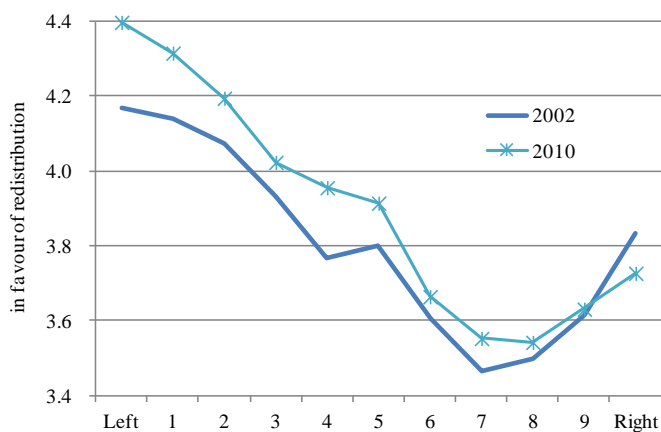
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust cluster standard errors are in parentheses.

Each regression controls for country and year fixed effects and their interactions and the variables of the baseline regression.

As expected, we find that the self-position in the political scale (from 0=left to 10=right) is significant and negative, i.e. leftists are more in favour of redistribution than individuals in the right, which is also found in Alesina et al. (2004), Alesina and Giuliano (2011) and Pittau et al. (2012). However, it is interesting to note that within each political scale there is variation and that an important part of people in the far right support redistribution. In figure 4, the demand for redistribution declines when one moves from left to right up to the scale 7, and then there is raise in the demand for redistribution along the far right groups. Another feature revealed by the figure is an

increase of the support of redistribution between 2002 and 2010 for the leftists but a decrease for the individuals in the extreme right. In the second column of table 4 we include dummies for each political scale instead of the scale itself in order to observe non-linearity effects. The results indicate a similar pattern as observed in figure 4, i.e. a decrease in the support of inequality from the left to the right but an increase in the far right. Furthermore, the direction and size of the other variables in the equation do not change markedly, although the significance of *Gini market* weakens to $p\text{-value}=0.096$.

Figure 4: Preferences for redistribution and political scale



Education affects negatively and significantly the support for redistribution even we use a proxy for family income. Only individuals with at least lower secondary education (iscd 2) seem to support redistribution. For the next levels of education, it is clear that individuals demand less redistribution. We also introduce interactions between the political scale and education level (last column of table 4) and detect that having more education makes left-wing individuals more favourable to redistribution. The contrary holds for right-wing people. Consistent with other studies, we find that being woman, younger, single or belonging to a minority ethnic group in the country increases the demand for redistribution. Although older people are more in favour of redistribution, this effect grows at decreasing rate with the age. Healthier people are less in favour of redistribution, but we must bear in mind that the self-reported health is correlated with income and thus we cannot completely isolate the effects of health. The proxy for family income indicates that income matters on

the demand for redistribution. As other studies show, individuals with better incomes are less in favour of redistribution, which support the hypothesis of preferences governed by self-interest. Religiosity, irrespective of any particular religion, has a positive effect on the demand for redistribution once we control for political ideology. This result may be indicating a relation between the altruism underlying in some religions and the preferences to distribute to the less advantaged (Pittau et al, 2012). The final individual controls are the variables related to the labour market. As expected, being in a union, retired or unemployed increases the demand for redistribution as these conditions are closely related to the reception of social benefits.

4.3 Additional checks

It is important to know that our econometric results do not change if we use other estimators than OLS. For instance, if we use a probit model and a dependent variable that takes value 1 if the individual strongly agrees or agrees with redistribution and zero otherwise, we will obtain similar results about the directions and significance found with OLS. The inclusion of Russian Federation in our sample, with observations in 2006 and 2008 in the ESS, could be contested on the basis that this country has less democratic institutions. But recall that we control for country and time effects and that this inclusion adds variability to our sample. The results of the effects of inequality, actual redistribution and the individual controls do not change if we replicate our estimation of Table 3 in a sample without the observations from Russia. Only the direction of GDP per capita and the dummy for communist countries is reversed in the specification with full controls. Furthermore, the inclusion of year 2010 can represent an important noise in the building of social preferences due to the spread of effects of economic crisis in many European countries. But, our results do not change even if we remove the observations of that year from the sample. We notice that the variable measuring political views reduce the sample from 205,747 to 178,767 observations so that the results of the specifications including this variable can be influenced by the composition of the sample. We discard this after running all the specifications in a sample including only the observations where the political scale variable is not missing, and observe that the results do not change.

5. Preferences for redistribution over time

The analysis so far has shown a positive relationship between income inequality and preferences for redistribution, and a negative relationship between the extent of income redistribution already in place and those preferences. Such results must be interpreted as associations based on cross-country differences because they are based in pooled data of different respondents in each year. Even though we have controlled for country and time effects and their interactions, we cannot fully assure that changes in income inequality or redistribution over time have the same effects over the preferences for redistribution. A panel data will help to study the effects of income inequality over time because we will be able to follow the same unit over time and study its reactions to changing inequality. The application of a fixed effects model will allow us to control for time-invariant observed and unobserved effects. This is an essential distinction with respect to the pooled model of previous section because the differences in the demand for redistribution may vary irrespective of the differences in income inequality across countries. In that case, the difference in the demand for redistribution will be more related to specific and persistent factors of the country that shape the social preferences of their citizens. For example, Karabarbounis (2011) cite legal origins, political institutions, persistent cultural characteristics, ethnic fragmentation, prospects of upward mobility, social beliefs about fairness, etc. Country differences in culture (Berigan and Irwin, 2011) and national identity (Shayo, 2009) are also part of those specific factors that can affect on the demand for redistribution. In a panel data structure with $i=1, \dots, N$ individuals followed across $t=1, \dots, T$ periods, it is common to use the following specification:

$$y_{it} = \delta_t + \alpha_i + \beta GINI_{it} + \varphi X_{it} + \mu_{it} \quad (2)$$

The dependent variable y_{it} measures the individual preference for redistribution in year t . The Gini will be the same for individuals of the same country and year, and X_{it} denotes individual and time specific socio-demographic variables. The term α_i is the year-invariant individual unobserved effect; δ_t is a common unobservable year-specific effect and μ_{it} is the time-varying individual

specific idiosyncratic error. It is well established in the empirical literature that if α_i is not controlled for and instead is let to be part of the composite error, the estimators will be inconsistent. In particular, the Ginis and other explanatory variables can be correlated with the unobserved individual effects, so that the estimation without dealing with these effects will suffer from omitted-variables problem. A fixed effect estimator (FE) will take away the individual unobserved effects by subtracting the time means of each variable for every individual in the model. The interesting point is that this procedure will allow the unobserved effect α_i to be arbitrarily correlated with the time-varying explanatory variables.

Unfortunately there is not a panel survey to study the preferences for redistribution in Europe, but we can construct a pseudo panel dataset (a practice initiated by Deaton, 1985) with the ESS. A pseudo panel dataset is conformed by groups -generally individuals grouped in birth cohorts- that can be followed over time. The characteristics of these groups are built averaging that of the individuals identified in each group. It is important that these groups can be identified by variables that do not change over time; year of birth, sex and regions are the usual identifiers. These groups are called synthetic or pseudo panels and will appear over time in different cross-sections of harmonized and comparable surveys. An important characteristic is that these cross-sections must be random samples of the population, which is fulfilled by the ESS. We use the following specification in our transformed dataset, where the sub-index g indicates a particular synthetic panel:

$$\bar{y}_{gt} = \delta_t + \alpha_g + \beta_g \overline{GINI}_{gt} + \varphi_g \bar{X}_{gt} + \mu_{gt} \quad (3)$$

We create pseudo panels based in 10 birth year cohorts spaced every seven years⁵, sex and country over the five rounds of ESS, so that the maximum number of synthetic observations is $10 \times 2 \times 33 \times 5 = 3,300$. However, our total number of groups is 2,182 because some countries have only one observation in time or are not surveyed in all years, some cohorts have not observations in all years and the dependent variable or the Ginis are not available for all countries. In equation 3, the

⁵ The oldest birth cohort is 1920-1926, and the youngest is 1983-1989.

unobserved cohort effect α_g is the average of the unobserved effects over time, but it is standard to assume that this is time-invariant. If cohort averages are based on a large number of individuals, this is a reasonable assumption and we can obtain consistent estimators with a FE model (Verbeek, 2008). Another condition to obtain consistent estimators is that the cohort averages show genuine time variation. It should be a balance between the number and size of the cohorts. More cohorts will refrain from small sample problems in the estimators, but fewer individuals in each cohort will rest quality to the cohort averages. For more about the asymptotic properties and conditions of pseudo panel estimators, see Verbeek (2008), Verbeek and Vella (2005), Collado (1997) and Moffit (1993).

Table 5: Composition of the pseudo panels

Cohort	2002	2004	2006	2008	2010	Total of pseudo panels	Total of respondents
1920-26	37	29	22	13	3	104	4,877
1927-33	44	48	45	44	31	212	13,299
1934-40	44	50	46	54	38	232	19,360
1941-47	44	51	46	54	38	233	22,996
1948-54	44	52	46	54	38	234	26,243
1955-61	44	52	46	54	38	234	26,967
1962-68	44	52	46	54	38	234	27,993
1969-75	44	52	46	54	38	234	26,106
1976-82	44	52	46	54	38	234	23,407
1983-89	42	51	46	54	38	231	20,348
Total	431	489	435	489	338	2,182	211,596

Table 5 reports the composition of the pseudo panels over time and by birth year. There are a total of 2,182 synthetic observations that summarize the information of 211,596 individuals. To arrive to that composition we remove 158 cells (mainly those of the oldest cohort) with less than 30 respondents because the averaged variables may not be a good estimate of the characteristics of the cohort. We estimate a fixed effects model based on equation 3, use robust standard errors and include year dummies to control for time effects. The time effects help to mitigate the effects of spurious trends and contemporaneous panel error correlations (Karabarbounis, 2011). The explanatory variables are the same we use in the pooled estimation, except those that do not vary over time (*male* and *communist*). Table 6 shows the results of different specifications and reports only the significant coefficients.

Table 6: Fixed Effects estimates for preferences for redistribution

variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gini	0.0189*** (0.0045)	0.0195*** (0.0034)										
Gini market	0.0004 (0.0021)		0.0060*** (0.0016)									
Gini [-1]				0.0114** (0.0045)	0.0129*** (0.0033)							
Gini market [-1]				0.0012 (0.0023)		0.0048*** (0.0017)						
Gini [-2]							0.0018 (0.0043)	0.0064** (0.0029)				
Gini market [-2]							0.0034 (0.0022)		0.0040*** (0.0015)			
Gini [1,2]										0.0074 (0.0046)	0.0106*** (0.0032)	
Gini market [1,2]										0.0025 (0.0023)		0.0048*** (0.0017)
left-right scale	-0.0445*** (0.0137)	-0.0448*** (0.0135)	-0.0376*** (0.0136)	-0.0449*** (0.0141)	-0.0461*** (0.0138)	-0.0381*** (0.0136)	-0.0420*** (0.0140)	-0.0444*** (0.0139)	-0.0410*** (0.0135)	-0.0437*** (0.0142)	-0.0458*** (0.0139)	-0.0393*** (0.0136)
age sq /100	-0.0115** (0.0057)	-0.0115** (0.0057)	-0.0115** (0.0057)	-0.0116** (0.0058)	-0.0115** (0.0058)	-0.0118** (0.0058)	-0.0112* (0.0058)	-0.0113* (0.0058)	-0.0112* (0.0058)	-0.0105* (0.0059)	-0.0106* (0.0059)	-0.0107* (0.0059)
iscsd: 2	0.0255 (0.0875)	0.0245 (0.0868)	0.0311 (0.0873)	0.0131 (0.0882)	0.0108 (0.0879)	0.0195 (0.0875)	0.0132 (0.0887)	0.0067 (0.0885)	0.0145 (0.0883)	0.0225 (0.0890)	0.0177 (0.0887)	0.0268 (0.0883)
iscsd: 3	0.0034 (0.0841)	0.0025 (0.0835)	0.0175 (0.0834)	0.0003 (0.0842)	0.0005 (0.0845)	0.0038 (0.0836)	0.0037 (0.0852)	0.0030 (0.0855)	0.0048 (0.0848)	0.0183 (0.0850)	0.0183 (0.0853)	0.0208 (0.0844)
iscsd: 4	0.4049*** (0.1487)	0.4025*** (0.1480)	0.4155*** (0.1482)	0.4180*** (0.1501)	0.4140*** (0.1500)	0.4044*** (0.1493)	0.3843** (0.1497)	0.3848** (0.1502)	0.3788** (0.1497)	0.4218*** (0.1503)	0.4176*** (0.1507)	0.4055*** (0.1498)
iscsd: 5	-0.2206** (0.0935)	-0.2216** (0.0927)	-0.2026** (0.0931)	-0.2192** (0.0941)	-0.2207** (0.0939)	-0.2108** (0.0937)	-0.2142** (0.0948)	-0.2202** (0.0947)	-0.2126** (0.0945)	-0.2158** (0.0968)	-0.2195** (0.0966)	-0.2098** (0.0962)
iscsd: other	0.4705 (0.4651)	0.4652 (0.4632)	0.5418 (0.4632)	0.4460 (0.4664)	0.4418 (0.4661)	0.4725 (0.4657)	0.4583 (0.4662)	0.4625 (0.4650)	0.4595 (0.4659)	0.6840 (0.4870)	0.6810 (0.4861)	0.6868 (0.4870)
income: living comfort.	-0.3757** (0.1573)	-0.3703** (0.1538)	-0.4483*** (0.1557)	-0.3615** (0.1568)	-0.3498** (0.1543)	-0.3976** (0.1548)	-0.4051*** (0.1547)	-0.3636** (0.1527)	-0.4124*** (0.1527)	-0.3809** (0.1571)	-0.3532** (0.1546)	-0.4076*** (0.1547)
income: coping on	-0.1399 (0.1545)	-0.1347 (0.1513)	-0.2061 (0.1532)	-0.1193 (0.1546)	-0.1075 (0.1523)	-0.1550 (0.1523)	-0.1698 (0.1521)	-0.1258 (0.1504)	-0.1773 (0.1497)	-0.1336 (0.1550)	-0.1049 (0.1527)	-0.1606 (0.1521)
income: difficult on	-0.0803 (0.1683)	-0.0761 (0.1654)	-0.1370 (0.1671)	-0.0739 (0.1692)	-0.0661 (0.1679)	-0.1007 (0.1676)	-0.1015 (0.1682)	-0.0702 (0.1676)	-0.1077 (0.1663)	-0.0857 (0.1704)	-0.0660 (0.1692)	-0.1071 (0.1682)
religious	0.0340*** (0.0119)	0.0343*** (0.0118)	0.0291** (0.0118)	0.0325*** (0.0120)	0.0332*** (0.0119)	0.0301** (0.0119)	0.0305** (0.0121)	0.0334*** (0.0119)	0.0299** (0.0119)	0.0308** (0.0121)	0.0326*** (0.0120)	0.0289** (0.0119)
retired	0.1249** (0.0578)	0.1245** (0.0578)	0.1261** (0.0586)	0.1202** (0.0586)	0.1189** (0.0588)	0.1223** (0.0590)	0.1186** (0.0594)	0.1152* (0.0598)	0.1190** (0.0594)	0.1194** (0.0599)	0.1168* (0.0602)	0.1210** (0.0603)
constant	3.4433*** (1.1940)	3.4774*** (1.1832)	3.4761*** (1.1605)	4.2690*** (1.1294)	4.3205*** (1.1219)	4.4833*** (1.1035)	3.8961*** (1.1179)	4.0225*** (1.1134)	3.9184*** (1.1181)	4.1989*** (1.1639)	4.2999*** (1.1576)	4.3089*** (1.1502)
Observations	2142	2142	2142	2142	2142	2142	2142	2142	2142	2123	2123	2123
R ² (within)	0.1399	0.1399	0.1295	0.1291	0.1289	0.1252	0.1252	0.1237	0.1251	0.1289	0.1282	0.1273

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors are in parentheses. Each regression includes year dummies and the full explanatory variables. Only significant variables are reported.

The results reported in column 1 of table 6 confirm that an increase in the income inequality can raise the preferences for redistribution over time. The coefficient of the Gini measured with market incomes is positive and no significant, so that the effect of actual redistribution on the preferences is not significant. Having together the Ginis computed with net and market incomes in the same regression can confound the effects of income inequality on the demand for redistribution. If income inequality with net incomes is a simultaneous result of contemporaneous taxation applied to market incomes, then both Ginis can be correlated and produce multicollinearity in the regressors. Column 2 and 3 show that income inequality measured with either net or market income affects positively and significantly the demand for redistribution. The significance of both Ginis improves when they are placed alone each other. Another possibility is that the synthetic individuals are not fully able to observe contemporaneous inequality, and they are in better position to account for past inequality. In columns 4 to 6 we use the first year lag of Ginis combined or alone and find the same results as before in terms of significance and direction. Similar results occur when we use the second year lag and find that income inequality is only significant when the regression includes one Gini at once (columns 7 to 9). Using the contemporaneous Gini or lags of one or two years does not change the signs and significance of the coefficients of income inequality, although the magnitude of the effect decreases with further periods. The last three columns of table 6 use the averages of the Gini lagged one and two periods; for example, in 2010 the Gini is the average of the figures for years 2008 and 2009. This procedure reduces serial correlation and measurement error. Again, the coefficients for the Ginis, separately, are positive and significant.

A possible concern about our modelling is the existence of reverse causality, meaning that the level of income inequality in a society depends on the preferences for redistribution of its members. This will be true if the government genuinely aligns its policies with the social preferences of the individuals and set up a taxation system that will cancel out any increase in pre-tax income inequality. However, it is difficult that a change in the preferences leads to a change in the taxation system at least in the short-run. Recall that we are analysing biannual data between 2002 and 2008, so that the period is too short to expect a relation running from preferences to inequality. In any case, we have detected that pre-income inequality affects positively and significantly the demand for redistribution

when this is used instead of net income inequality. As pointed by Karabarbounis (2011), the use of pre-tax incomes instead of net incomes to construct the measure of inequality relaxes somewhat the reverse causation because net incomes vary automatically with the fiscal system, whilst pre-tax incomes vary only through the endogenous response of labour supply or the general equilibrium effects on factor prices. The same author uses lags of gross income inequality and their averages to mitigate the effects of redistribution on inequality through labour supply and general equilibrium effect. As reported in table 6, our results are robust with lags of pre-tax and net income inequality or averages of those lags.

Regarding other explanatory variables, the political scale is important to explain changes in preferences for redistribution. The groups in the right political spectrum have been growing between 2002 and 2010 in detriment of the centrists and leftists, so that any raise in the demand for redistribution due to increasing income inequality is counterweighted by the increase of importance of the right wings. An increase in tertiary education leads to a decrease in the support for redistribution, but a raise in post-secondary education increases such support. The effects of age and its square are negative but this is only significant for the latter. Furthermore, having a larger family income decreases the demand for redistribution. Finally, being retired or religious increases the preferences for redistribution. All these effects are in line with the results reported with the pooled OLS estimators of section 4.

Imposing a minimum size for the number of observations within the pseudo panels can create some small sample problems. However, we observe that the coefficients and significance practically do not change if we impose no limits in the cohort size or if we use a minimum of 50 observations instead of 30 for the size of the cells. Although the within R^2 is slightly reduced in the first case and increased in the second case. Another concern for the consistency of the pseudo panel estimators is the number of synthetic individuals. We construct two alternative datasets by changing the birth year ranges of the cohorts to be spaced every 10 or 5 years instead of 7. In the first case, there are 7 birth year cohorts producing a total of 1,557 synthetic observations with data. In the second case, there are

14 birth year cohorts and a total of 2,822 synthetic observations⁶. Our results do not change substantively under both alternatives when we analyze the effects of contemporaneous, one-year lagged, two-year lagged and year averaged income inequality (with pre-tax and net incomes). Only in the dataset with fewer birth cohorts, we find that the net income inequality lagged two years is not significant. Furthermore, in that dataset we detect that the within R^2 improves slightly (see the results of these regressions in the appendix). All of these results reassure us that inequality - measured either with pre-tax or post-tax incomes – positively affects the demand for redistribution.

6. Conclusions

In this paper we have shown that income inequality matters for preferences for redistribution, not only when analysing cross-country differences but also when focusing on changes over time. These results arise from fixed effects estimators applied to pseudo-panels for the period 2002-2010 in Europe. Our findings are robust to different measures of income inequality and specifications with different sizes and numbers of synthetic panels. We report that increases in pre- or post-tax income inequality over time raise the demand for redistribution, which is line with early political economy models (Meltzer and Richard, 1981) that have not found much empirical support. In other models, it is possible that the individual demands less redistribution if he has the expectation of upward mobility or if he believes that own effort – as opposed to luck - is the main influence on income. Therefore, at least in Europe and bearing in mind the short length of our dataset, we can observe that increasing income inequality leads to more individual support for redistribution.

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⁶ In both datasets we keep the minimum size of the cells at 30 observations. The average cell size of the dataset based in birth cohorts spaced each 10 years is 131. In the other one, the average size is 65.

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Appendix: FE estimators with different sizes and numbers of synthetic individuals

With a minimum cohort size of 50 observations												
variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
gini	0.0207*** (0.0046)	0.0212*** (0.0035)										
gini market	0.0003 (0.0022)		0.0064*** (0.0017)									
gini [-1]				0.0133*** (0.0047)	0.0153*** (0.0034)							
gini market [-1]				0.0015 (0.0024)		0.0057*** (0.0018)						
gini [-2]							0.0027 (0.0047)	0.0082*** (0.0031)				
gini market [-2]							0.0041* (0.0024)		0.0049*** (0.0016)			
gini [1,2]										0.0088* (0.0049)	0.0128*** (0.0034)	
gini market [1,2]										0.0030 (0.0025)		0.0059*** (0.0018)
Observations	1941	1941	1941	1941	1941	1941	1941	1941	1941	1923	1923	1923
R ² (within)	0.1736	0.1736	0.1607	0.1618	0.1615	0.1563	0.1570	0.1547	0.1568	0.1615	0.1603	0.1591

With no minimum cohort size												
variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
gini	0.0206*** (0.0047)	0.0227*** (0.0035)										
gini market	0.0015 (0.0021)		0.0074*** (0.0016)									
gini [-1]				0.0891 (0.1579)	0.0828 (0.1576)	0.1254 (0.1597)						
gini market [-1]				0.0271** (0.0127)	0.0276** (0.0126)	0.0256** (0.0127)						
gini [-2]							0.1803*** (0.0613)	0.1759*** (0.0617)	0.1807*** (0.0615)			
gini market [-2]							0.1590 (0.1618)	0.1659 (0.1601)	0.1577 (0.1619)			
gini [1,2]										0.1703*** (0.0537)	0.1735*** (0.0538)	0.1633*** (0.0538)
gini market [1,2]										0.1545* (0.0803)	0.1556* (0.0804)	0.1477* (0.0807)
Observations	2300	2300	2300	2300	2300	2300	2300	2300	2300	2280	2280	2280
R ² (within)	0.1380	0.1377	0.1269	0.1245	0.1241	0.1208	0.1203	0.1181	0.1202	0.1234	0.1222	0.1219

With 7 birth year cohorts

variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
gini	0.0160*** (0.0047)	0.0184*** (0.0037)										
gini market	0.0017 (0.0023)		0.0065*** (0.0018)									
gini [-1]				0.0083* (0.0047)	0.0113*** (0.0035)							
gini market [-1]				0.0024 (0.0025)		0.0050*** (0.0019)						
gini [-2]							-0.0018 (0.0046)	0.0047 (0.0030)				
gini market [-2]							0.0048* (0.0025)		0.0042** (0.0017)			
gini [1,2]										0.0039 (0.0048)	0.0090*** (0.0034)	
gini market [1,2]										0.0039 (0.0026)		0.0052*** (0.0018)
Observations	1557	1557	1557	1557	1557	1557	1557	1557	1557	1543	1543	1543
R ² (within)	0.1873	0.1868	0.1783	0.1743	0.1735	0.1719	0.1723	0.1687	0.1722	0.1755	0.1733	0.1750

With 14 birth year cohorts

variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
gini	0.0207*** (0.0042)	0.0204*** (0.0032)										
gini market	-0.0002 (0.0019)		0.0059*** (0.0015)									
gini [-1]				0.0133*** (0.0042)	0.0148*** (0.0032)							
gini market [-1]				0.0011 (0.0021)		0.0054*** (0.0017)						
gini [-2]							0.0018 (0.0040)	0.0077*** (0.0028)				
gini market [-2]							0.0043** (0.0021)		0.0049*** (0.0015)			
gini [1,2]										0.0082* (0.0043)	0.0123*** (0.0031)	
gini market [1,2]										0.0031 (0.0022)		0.0057*** (0.0016)
Observations	2822	2822	2822	2822	2822	2822	2822	2822	2822	2797	2797	2797
R ² (within)	0.1501	0.1501	0.1391	0.1409	0.1408	0.1363	0.1374	0.1351	0.1373	0.1411	0.1400	0.1393