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**Working Paper**

## The Median Voter Takes it All: Preferences for Redistribution and Income Inequality in the EU-28

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## JRC TECHNICAL REPORTS

# The Median Voter Takes it All

*Preferences for  
Redistribution and  
Income Inequality in the  
EU-28*

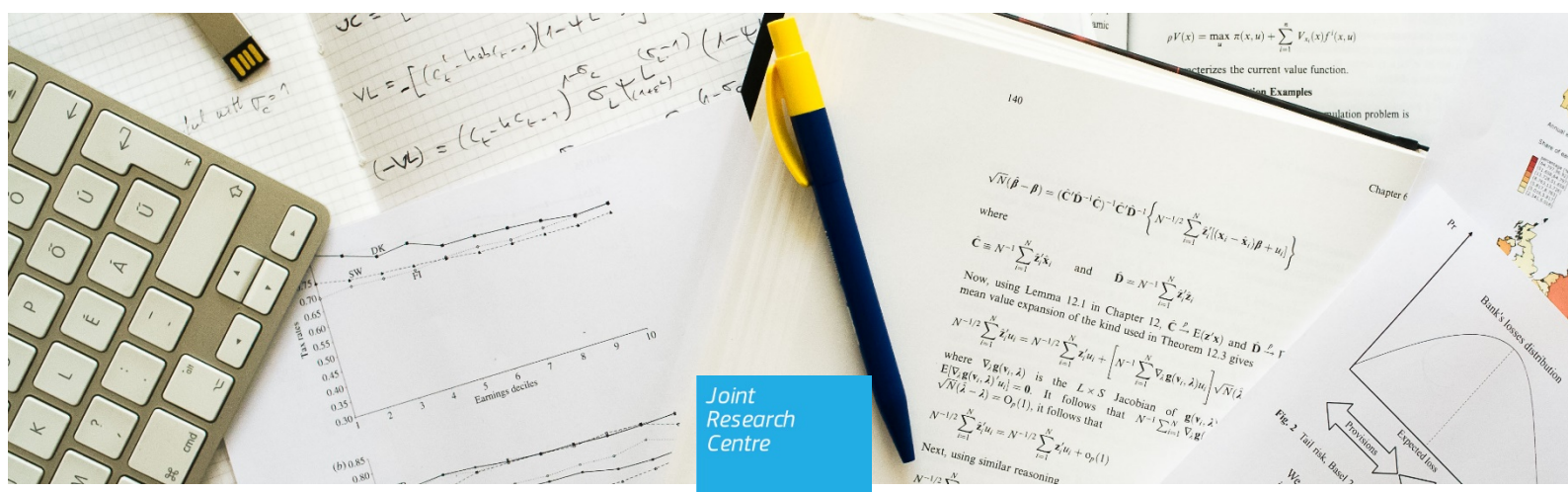
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# The Median Voter Takes it All: Preferences for Redistribution and Income Inequality in the EU-28

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## Abstract

The relation between income inequality and support for redistributive policies has long been debated by social scientists, albeit with mostly contrasting findings. We shed light on this puzzle by exploiting a novel EU-28 wide survey (Eurobarometer 471) and matching it with an array of regional and national inequality measures. Using binary choice models, we show that support for redistribution is positively linked with the level of income inequality. The same association is found for perceptions of inequality being too high. In addition, we exploit alternative proxies of socio-economic status as well as subjective beliefs about fairness in the society. We document that individuals believing to be at the top of the social ladder, as well as people considering equal opportunities to be in place, are less supportive of government intervention to reduce inequalities. Our results are robust to different measures of inequalities, additional controls as well as a cross-validation with a widely recognized survey (ESS). We conclude that for the planning of policies based on social preferences, inequality matters.

**Keywords:** Income inequality; preferences for redistribution; perceptions of inequality.

**JEL:** D31; D63; H53

## 1 Introduction

Individual preferences for redistribution have the potential to largely impact governments' budget. In fact, redistributive policies cover a broad array of economic actions, ranging from direct government transfers and tax progressivity to expenditures on social security and healthcare. Further, neglecting such demand can potentially lead to a perception of economic unfairness and may compromise trust in political institutions. It is therefore crucial to understand the mechanisms behind support for (or opposition to) redistribution (Alesina et al., 2018).

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Economic theory postulates that the share of income redistributed by the government is determined by individuals' relative income positions (Romer, 1975; Meltzer and Richard, 1983). In a majority-voting equilibrium, higher levels of pre-tax income inequality promote redistributive policies through the preferences of the median voter. Conversely, as the income distribution becomes more equal, redistribution becomes less appealing to the median voter who will not benefit from such policies which he/she shall finance (Dallinger, 2010).

Given the sharp rise in economic inequality in most developed economies during the last decades (Fredriksen, 2012), the demand for redistribution should have then increased. Yet, this has not always been the case. When confronted with factual data, the Meltzer and Richard (M-R) theorem rarely holds; research testing the median-voter theorem resulted in mixed evidence (Guillaud, 2013). While some authors found the expected positive relation between income inequality and demand for redistribution (e.g. Milanovic, 2000; Finseraas, 2009), others documented a negative one (e.g. Gouveia and Masia, 1998; Moene and Wallerstein, 2003; Rodriguez, 1999). More often, scholars uncovered a non-significant association (e.g. Pontusson and Rueda, 2010; Jæger, 2011; Scervini, 2012; Pecoraro, 2014).

Several concurring factors have been put forward to explain this “important unsolved puzzle for comparative political economy” (Iversen, 2005, p. 85). First, the M-R theorem assumes that individuals have complete information about the size of government, their relative income position, and the consequences of taxation and income redistribution. Yet, the bulk of the current evidence suggests that people on average misperceive the actual level of income inequality in their countries as well as its variation over time (Gimpelson and Treisman, 2018; Hauser and Norton, 2017).<sup>1</sup> Second, people also tend to misperceive their own income position (Guenther and Alicke, 2010).<sup>2</sup>

Such misperceptions can be (partially) explained by the discrepancy of what people deem to be tolerable and what they observe in the society (Sen, 2000). Individual perceptions of income inequality often originate from little to poor information; agents use heuristics or rely on particular rules of thumb to infer the level of income inequality (see the seminal contributions by Kahneman and Tversky, 1972; Tversky and Kahneman, 1974). Respondents use the information about the income distribution of their reference group as if it was representative of the entire population (Cruces et al., 2013, p. 102). Furthermore, inequality can be measured in various ways; this is important as people's perceptions of income distribution - and hence their pref-

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<sup>1</sup>There are however sizable cross-country differences. In the United States and the United Kingdom, underestimation of inequality is relatively common (Orton et al., 2007; Norton and Ariely, 2011). Conversely, overestimation occurs in most continental European countries, such as France, Germany and Italy (Niehues, 2014; Hauser and Norton, 2017). The degree of misperception is also not homogeneous. Even in countries where the income distribution is very similar - such as Germany and France - opinions differ widely as to how critically income differences are viewed (Niehues, 2014). The majority of Germans believe that half of the German population lives at the bottom of society. In France, respondents assume that 70 per cent of the population lives at the bottom.

<sup>2</sup>There appears to be a self-enhancement bias: individuals are inclined to see their own (income) position rosier than it actually is (Guenther and Alicke, 2010). Such bias is coupled with “[...]a pronounced tendency to see oneself as being in the middle of the social hierarchy [...]”, a tendency that holds for both, those at the top and at the bottom of the distribution and likewise across countries (Evans and Kelley, 2004, p. 3).

erences for income re-distribution - might differ depending on their own idea of how an equal society is supposed to look like. Therefore, not only factual data but also (mis)perceptions of inequality as well as subjective beliefs play a role in shaping preference for redistribution (Engelhardt and Wagener, 2014).

Scholars have so far approached these issue from various angles. A growing body of the literature focuses on the behavioural and cultural values that drive individual preferences for redistribution (Alesina and Giuliano, 2011). As an example, people prone to believe that income differentials are driven by merit, do not only tend to perceive the society as less unequal, but they are also less in favour of redistributive policies (Kuhn, 2015). Other research links the perceptions of inequality and the endorsement of redistributive policies to the notion of personal responsibility.<sup>3</sup>

Another strand of the literature focuses on experienced and expected social mobility. According to the seminal work by Lipset and Zetterberg (1959), attitudes towards redistributive policies may vary according to beliefs about social mobility - which, for example, are found to be different among Americans and Europeans (e.g. Piketty, 1995; Alesina and Giuliano, 2011). The Prospect of Upward Mobility (POUM) hypothesis argues that people may not support redistributive policies due to their hope that they (or their children) will step up on the social ladder (Benabou and Ok, 2001). Piketty (1995), however, shows that such beliefs about mobility are learned by past experiences and hence might not reflect true social mobility. Research documents that citizens frequently hold distorted expectations about their upward social mobility (e.g. Bjørnskov et al., 2013; Alesina et al., 2018).

In this study, we investigate whether inequality contributes to shape the demand for redistribution. In other words, does income inequality determine the preferences for redistribution? Thus, our paper adds to the body of literature in the following ways. First, we take advantage of the Special Eurobarometer on “Fairness, inequality and inter-generational mobility” (No. 471). This novel dataset uniquely comprises of dimensions related to attitudes, preferences and opinions with respect to key socioeconomic dimensions covering all EU-28 Member States. This helps us to understand how the demand for government action to reduce income inequality is correlated with actual income inequality.

Second, we calculate an enriched array of inequality measures based on micro data, originating from a number of European and national sources (EU-SILC, BHPS and GSOEP). Specifically, we compute the overall income distribution using the Gini coefficient; further, we adopt selected decile ratios, namely the ratio 90-10 and the ratio 90-50. Indeed, as individuals care about their status, they compare their own income to that of others, either in their workplace or in their social environment - see relative income hypothesis, introduced by Duesenberry et al. (1949). The ratios capture these relative distances, providing further insights into income distri-

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<sup>3</sup>Cappelen et al. finds that individuals are less likely to be inequality adverse once agents can make a choice regarding their outcome. This is true even when such choices are forced, “which arguably do not meet minimal conditions for a morally relevant choice” (Cappelen et al., 2016, p. 2).

butions across Europe. Finally, we do not only consider national aggregates, but we also compute the above measures at a deeper level of geographical disaggregation (NUTS regions). We argue that this framework of investigation is superior to national level analysis; as aforementioned, agents' (mis)perceptions originate from their immediate environment.

Our results indicate that individuals' perceptions of excess inequality are linked with the underlying level of income inequality. Specifically, we show that people correctly assess relatively high levels of income inequality in their society, while the literature emphasises the existence of common income misperceptions. We then find that the higher the income inequality is, the more people demand government interventions to reduce income disparities. We show that the Gini coefficient is a valid and appropriate predictor of the demand for government redistribution, as an increase in overall income distribution raises the demand for such policies. Similarly, this result also holds when using alternative measures of inequality. Both, the ratio 90-50 and the ratio 90-10, confirm the positive link between support for redistribution and inequality. Furthermore, we show that the coefficient associated with the ratio 90-50 is slightly larger than that of the ratio 90-10. This suggests that the distance between the median and the highest decile is marginally more influential on the demand for government interventions.

Further, we strengthen our findings by incorporating evidence on the individual's subjective positioning on a hypothetical social ladder and their subjective beliefs on fairness in the society. We argue that the higher this self-reported position is, the lower the support for government interventions becomes. Schooling and the income position also matter, albeit their importance decreases when the subjective social status is controlled for. We then find that respondents believing in the existence of equal opportunities and being more resilient to shocks during their life-cycle, show less support for income redistribution.

Our results are robust to the inclusion of additional control variables. The literature recently paid attention to the increasing between-region inequalities and how they contribute to shape political attitudes (Ballas et al., 2017; Iammarino et al., 2018). We show that, even after accounting for gaps between national and regional inequality and GDP, the demand for government intervention remains positively correlated with all of our inequality measures.

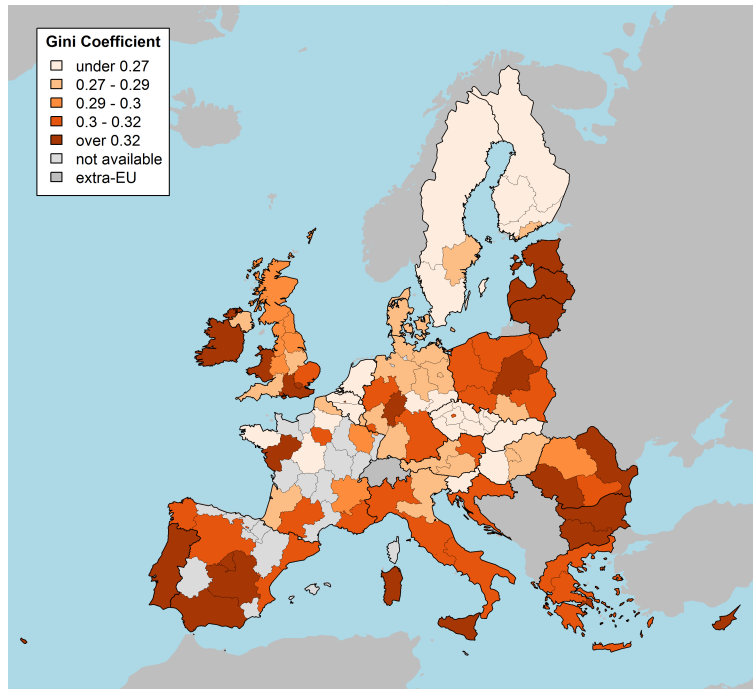
Finally, we cross-validate our results with the European Social Survey (ESS), which has been used to conduct several regional-level analyses (e.g. Aslam and Corrado, 2011; Markaki and Longhi, 2013; Doran and Fingleton, 2016) and has established quality (e.g. Koch et al., 2014; Koch, 2016). Importantly, the findings stemming from the Eurobarometer analysis are not statistically different from those obtained by deploying the ESS.

The remainder of the paper is structured as follow: Section 2 discusses the data; Section 3 outlines our empirical strategy; Section 4 presents the results; and Section 5 concludes.

## 2 Descriptive statistics

The empirical analysis is conducted using different novel data sources. We estimate income inequality measures using 2014 data and including originally 126 spatial units – a mixture of country, regional and sub-regional levels.<sup>4</sup> The sources exploited to compute such measures are the EU Survey of Income and Living Conditions (EU-SILC), the British Household Panel Survey (BHPS), and the German Socio-Economic Panel (GSOEP). In this study we will investigate three after-tax income inequality measures: the Gini coefficient, the ratio 90-10 and the ratio 90-50. The Gini coefficient (Figure 1), ranging from 0 to 1, measures to what extent a society falls short of an entirely equal income distribution. The 90-10 and 90-50 ratios describe income inequality between individuals whose income is at the 90th percentile and those whose income is at the 10th and at the 50th percentiles, respectively.<sup>5</sup>

Figure 1: The Gini coefficient



*Source:* EU Survey of Income and Living Conditions (EU-SILC), the British Household Panel Survey (BHPS), and the German Socio-Economic Panel (GSOEP), 2014. Authors' calculation.

The dependent variable(s) as well as the control variables originate mostly from the Special Eurobarometer 471 (EB 471), an EU-28 wide special module on the topic of “Fairness, inequality

<sup>4</sup>The countries for which no regional-level measures are available, and thus national inequality indicators are used, are the following: (i) Northern Europe: Denmark and Ireland; (ii) Western Europe: Luxembourg and the Netherlands; (iii) Southern Europe: Cyprus, Malta and Portugal; (iv) Eastern Europe: Estonia, Latvia, Lithuania, Slovakia, Slovenia and Croatia.

<sup>5</sup>The maps for the Ratio 90-10 and the Ratio 90-50 are available in Appendix A (Figures A.1a and A.1b respectively).



and inter-generational mobility”.<sup>6</sup> One of the novelties of this survey is to provide several items reporting citizens’ perceptions of fairness and inequality while being comprehensive of the entire EU. So far, it has not yet been utilised for questions pertaining to our object of investigation. Furthermore, observations feature the corresponding NUTS-2 level, which allows us to match the survey’s response with the aforementioned measures of inequality.

In order to address the potential non-representativeness at regional (NUTS-1 and NUTS-2) level of the EB 471, we employ three strategies. First, we exclude all those spatial units reporting 40 or less observations. Second, we create weights (using Eurostat census data) accounting for the share of the population in each of the 126 spatial units relative to the total EU population. This prevents us from assigning a disproportionate weight to the less-populated spatial units in our sample. Third, we cross-validate our analysis using the 2016 European Social Survey (ESS-8), a well-known cross-national survey that has been conducted since 2001 (see Appendix C for further details). The ESS has been used to conduct regional level analysis (e.g. Aslam and Corrado, 2011; Markaki and Longhi, 2013; Doran and Fingleton, 2016) and its quality has been assessed iteratively (see Koch et al., 2014; Koch, 2016).

Our sample excludes observations in which the respondent does not reply to (at least) one of the following items: household income, educational attainment and the dependent variable(s). The final work sample includes 21,879 respondents spreading over 101 spatial units.<sup>7</sup> The outcome variables, *perceived inequality* (Figure 2a) and *preferences for redistribution* (Figure 2b), capture respectively: (i) whether the level of inequality is higher than what the respondents deem to be tolerable (“Nowadays differences in people’s incomes are too great”) and (ii) whether the government should intervene to reduce people’s difference in income (“The government should take measures to reduce differences in income”). The latter is often used in the literature to proxy preferences for redistribution (e.g. Jæger, 2006, 2013; Finseraas, 2009; Luttmer and Singhal, 2011; Pittau et al., 2013; Rueda and Stegmueller, 2016).

*Perceived inequality* and *preferences for redistribution* are expressed on a 5 items Likert-scale, ranging from *strongly agree* to *strongly disagree*. We dichotomize both variables by assigning the value of 1 when respondents agreed or strongly agreed with the aforementioned statements, and 0 otherwise. To assess the robustness of the findings against a different cut-off point, we also create two dummy variables which take the value of one only when respondents show a *strong agreement*, and 0 otherwise.

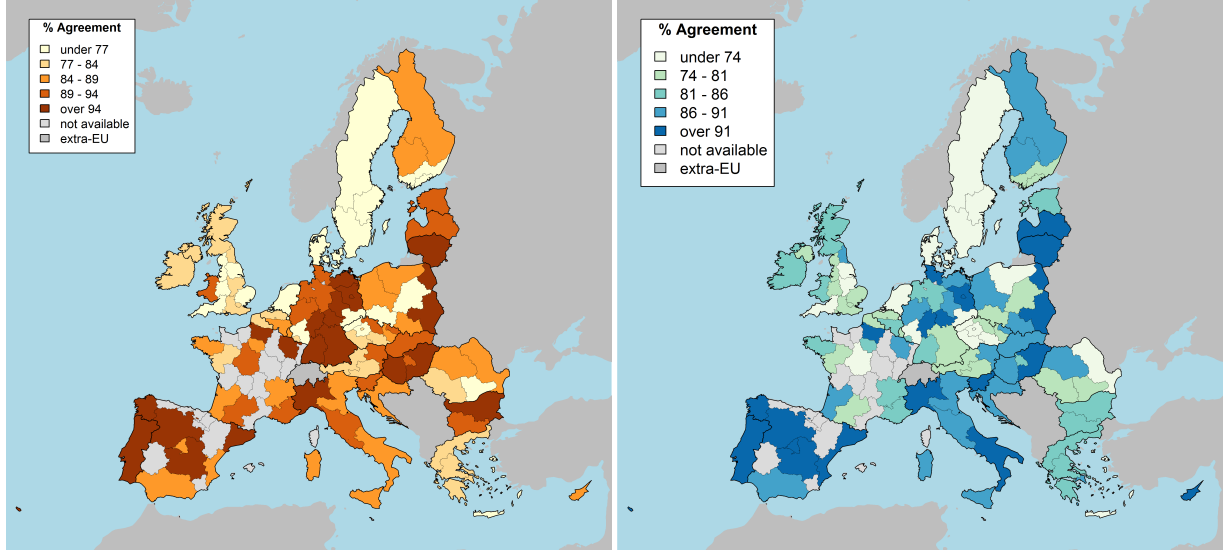
Overall, 85 percent of respondents agree or strongly agree that “nowadays differences in people’s incomes are too great”; 45 percent strongly agree. Similar figures can be seen with respect

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<sup>6</sup>It uses computer-assisted personal interviews, which have been conducted in December 2017, to investigate European citizens’ attitudes towards fairness and inequality. The universe represented is the population born between 1918 and 2002 and currently living in one of the 28 European Union countries. The sampling points are drawn after stratification by NUTS 2 regions and by degree of urbanisation. They thus represent the whole territory of the country surveyed and have been selected proportionally to the distribution of the population in terms of metropolitan, urban and rural areas.

<sup>7</sup>Detailed descriptive statistics are available in Appendix A, Table A.1.

Figure 2: Preference for redistribution and perceptions of excess inequality



(a) Perception of excess inequality

(b) Preference for redistribution

Source: Special Eurobarometer 471, “Fairness, inequality and inter-generational mobility”. Questions: (a) “The government should take measures to reduce differences in income”; (b) “Nowadays differences in people’s incomes are too great”.

to support for redistribution: 83 percent of respondents agree or strongly agree that government should intervene to reduce differences in income; the rate of strong agreement amounts to 45 percent. In both cases the standard deviation is relatively high, suggesting a strong degree of cross-spatial-unit variations, as depicted by Figures 2a and 2b.

Our socio-demographic control variables include: gender, age, educational attainment, and household income of the respondent. Specifically, *gender* is a dummy variable equal 1 when the respondent is a woman, and 0 when it is a man. *Age* is a continuous variable ranging from 15 to 99. Educational attainment is an ordinal variable (*education*) ranging from 1 to 4 referring to: (i) not completed primary studies or completed primary studies (ISCED 0-1); (ii) completed secondary studies (ISCED 2-3); (iii) completed post-secondary vocational studies, or higher education to bachelor level or equivalent (ISCED 4-5); and (iv) completed upper level of education to master, doctoral degree or equivalent (ISCED 6-8). Household income (*Income quintile: 4th and 5th*) is a dummy variable which equals one when the respondent self-reported to belong to one of the two highest income quintiles. Furthermore, our estimation strategy also takes into account the macro-region at the time of the interview.<sup>8</sup> This allows to

<sup>8</sup>Macro-regions are divided accordingly to the following categorization: (i) Western Europe: Belgium, France, Luxembourg, Netherlands, Austria, and Germany. (ii) Eastern Europe: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, and Croatia. (iii) Southern Europe: Greece, Spain, Italy, Portugal, Cyprus, and Malta. (iv) Northern Europe: Denmark, Finland, Sweden, Ireland, United Kingdom.

control for potentially omitted macro-regional effects driven by shared cultural, economical, and institutional factors.

As mentioned, the Eurobarometer 471 also includes a variety of Likert-like questions that, on a 1 to 5 scale, capture the perceptions of fairness of the respondent.<sup>9</sup> This provides the opportunity to investigate how individuals’ beliefs regarding fairness in the society affect redistributive preferences. Indeed, there exists an extensive theoretical, empirical and experimental literature showing that support for redistribution correlates with reciprocity and beliefs about opportunities and meritocracy (e.g. Fong, 2001; Alesina and Angeletos, 2005; Alesina and La Ferrara, 2005). We therefore exploit the following explanatory variables: (i) *life is fair*, which assesses the beliefs whether most of the things that happen in the respondent’s life are fair; (ii) *equal opportunities* expresses whether it enjoys equal opportunities for getting ahead in life; (iii) *opportunities (30y)* describes whether the respondent agrees that opportunities to get ahead in life have become more equal over the past 30 years; (iv) *merit* captures whether he or she believes that the society is meritocratic; (v) *justice prevails* explores whether the respondent is confident that justice in the society always prevails; and (vi) *resilience*, which measures the subjective ability to bounce-back after experiencing a negative personal shocks. Additionally, to control for the subjective position of the respondent in the society, we include a variable (*social ladder*) which records the self-reported position of the respondent on a hypothetical social ladder, with 1 being the lowest possible level and 10 the opposite.

We also test the robustness of our findings against an additional set of control variables. We create a dummy variable which equals 1 when, household sources of income include investments, savings, insurance or properties. This variable allows us to understand the preferences of those who are likely to be negatively affected by redistributive policies, particularly if such policies are financed through taxation on wealth. We then control for political orientation, exploiting a discrete 10-point scale question where 1 indicates the political *left* and 10 the political *right*. Indeed, the literature shows that redistributive preferences are among “the most important dividing line between the political left and political right” (Alesina and Giuliano, 2011, pp. 94-95); recent research unveils a strong polarization of such preference across the political spectrum (Alesina et al., 2018). Finally, we use between-regions within-country gaps, namely the *Gini gap* and the *GDP gap*. Such measures are computed using Eurostat data, subtracting the national weighted averages from the regional values. We also include population density (source Eurostat) as it might correlate with economic opportunities, living conditions and access to basic services.

### 3 Empirical strategy

Given the dichotomous nature of our dependent variables, we proceed our empirical strategy with the estimation of a non-linear model. Specifically, we estimate the following equation:

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<sup>9</sup>Detailed description of these variables is available in Appendix A. Table A.2.

$$p_i \equiv Pr(y_i = 1|INEQ) = F(\beta_{0i} + \beta_{1i}INEQ + \beta_{2i}x'_i) \quad (1)$$

where  $F(.)$  is the cumulative logistic distribution;  $y$  is either the individual preferences for redistribution or the perceptions of (excessive) inequality;  $INEQ$  refers to one of the three income inequality measures deployed throughout (Gini coefficient, ratio 90-50 and ratio 90-10); finally,  $x$  is a vector of control variables - e.g. individuals' sociodemographic characteristics and subjective beliefs (see Section 2 for further details).<sup>10</sup>

In the presence of the M-R theorem, a causal interpretation of Equation 1 is plausible, albeit caveats apply. The relation between preferences for government redistribution and inequality might suffer from endogeneity in the form of reverse causality. As the M-R theorem shows, an increase in inequality leads to a greater support for redistribution. However, support for redistribution might shape the income distribution itself. Governments aware of the electorate's demand for redistribution can enact policies that affect income inequality.

In this study we employ disposable income inequality measures. Using instead gross income inequality measures could in principle reduce reverse causality concerns. In fact, direct transfers from governments to individuals do not affect the pre-tax income inequality. Yet, our dependent variable captures generic preferences to reduce income differences. Therefore, redistributive policies affecting pre-tax income (i.e. embedded in the labour market) cannot be fully ruled out. Our inequality measures, which are taken from the latest household surveys, are lagged with respect to the interviews date, therefore favourably addressing the potential issue of reverse causality.

Yet, there might be room for another form of endogeneity: an omitted variable directly influencing both social preferences and inequality. For example, an increase in financial liberalization might increase income inequality and, through individuals' concerns unrelated with the changes in inequality itself, preferences for redistribution. Therefore, before testing the impact of inequality on redistribution, we evaluate whether actual income inequality and perceptions of excess inequality are associated. If concerns over inequality would be related to the observed disposable income inequality, a likely interpretation of our findings is that increases in inequality directly influence preferences for redistribution (see also Kerr, 2014, p. 69).

Finally, in order to validate the robustness of our estimates, we provide different specifications of Equation 1 and we cross-validate our estimates against an alternative dataset. Further, we address concerns of omitted country-specific effects by adding country fixed effects (Appendix B, Table B.1) in a restricted sample of countries for which 10 or more NUTS-level units were included in the original sample: France, Germany, Spain, and the UK.<sup>11</sup>

<sup>10</sup>To interpret the result, we report average marginal effects  $\delta y / \delta x$ . Average marginal effects indicate the average change in the predicted probability when the value of  $x$  changes by one unit. To overcome scaling issues, all income inequality measures have been standardized to have a zero mean and unit standard deviation.

<sup>11</sup>We would have been keen to include country dummies in all the countries having sub-national spatial units. However, some of this countries only have 4 or less NUTS-level regions and thus, little variability is available.

## 4 Findings

### 4.1 Main results: inequality and preferences for redistribution

As a point of departure of our investigation, we first consider whether individual perceptions of excess inequality are linked with the underlying level of disposable income inequality. In other words, do people correctly perceive income inequality? This is important for at least two reasons. First, if people’s perceptions of inequality is not concurrent with the true underlying inequality, their demand for redistribution could be biased. Second, as aforementioned, a positive link between the Gini coefficient and perceptions of inequality would support a causal connection from inequality to support for redistribution.

Table 1 shows that perception of excess inequality correlates with the level of disposable income inequality as measured by the Gini coefficient (column 1). A standard deviation increase of the Gini coefficient translates into a 4.4 percentage point increase of the probability to agree that “Nowadays differences in people’s incomes are too great”. Similar values are found when only respondents who strongly agree are considered (column 2). This result is relevant, given the large attention the literature paid to the misperceptions of income inequality (e.g. Orton et al., 2007; Norton and Ariely, 2011; Cruces et al., 2013). We show that people, on average, correctly assess whether inequality in their country is too high. This result holds even in a small sample of countries (France, Germany, Spain, and the UK) that have enough regional-level observations to allow for the addition of country fixed effects.<sup>12</sup> Against this background, we consider the interpretation that income inequality directly affects individual preferences for redistribution as plausible (as explained in Section 3).

The central result of our study suggests that preferences for redistribution are highly related to the overall inequality observed in the spatial units investigated. The baseline estimate in Table 1 (column 3) shows a positive and significant impact of income inequality on support for redistribution. As the Gini coefficient grows by one standard deviation, the probability of being in favour of government redistribution goes up by 3 percentage points. As income distributions becomes less equal, redistribution policies become more appealing to European citizens. This finding is significant at  $p < 0.01$ , even when accounting for strong agreement only (column 4).

Next, we complement the estimated positive relationship between inequality and support for redistribution (columns 3 and 4) by controlling for important socio-demographic characteristics. In particular, the level of education turns out to be significantly and negatively related to the dependent variable.<sup>13</sup> Respondents having tertiary education are twice as likely as those having post-secondary education to oppose redistributive policies. This compares favorably to the work by Fong (2001); Alesina and Giuliano (2011); Alesina and La Ferrara (2005) who establish education to be a strong predictor of support for redistribution. In addition, respondents in the

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<sup>12</sup>See Appendix B, Tables B.1.

<sup>13</sup>The base category is people with no or primary education.

Table 1: Perceptions of inequality, preferences for redistribution, and income inequality

	Perceptions of Inequality		Preferences for Redistribution	
	Agreement	Strong agreement	Agreement	Strong agreement
	(1)	(2)	(3)	(4)
Gini	0.0443*** (11.38)	0.0471*** (9.51)	0.0300*** (7.70)	0.0384*** (7.75)
<i>Education:</i>				
Secondary	-0.00505 (-0.51)	-0.0223* (-1.77)	-0.00335 (-0.32)	-0.0161 (-1.28)
Post-secondary	-0.0293*** (-2.81)	-0.0477*** (-3.49)	-0.0246** (-2.24)	-0.0311** (-2.28)
Tertiary	-0.0620*** (-4.63)	-0.0968*** (-6.00)	-0.0639*** (-4.65)	-0.0670*** (-4.04)
<i>Income quintile:</i>				
4th and 5th	-0.0629*** (-7.68)	-0.0631*** (-6.22)	-0.0890*** (-10.59)	-0.0843*** (-8.30)
<i>Gender:</i>				
Woman	0.0292*** (4.33)	0.0170** (2.02)	0.0317*** (4.66)	0.0197** (2.33)
Age	0.00142*** (7.35)	0.00234*** (9.74)	0.00112*** (5.58)	0.00125*** (5.12)
<i>Macro-region:</i>				
East EU	0.0655*** (8.26)	0.0962*** (8.15)	0.0372*** (4.27)	0.0927*** (7.89)
South EU	0.0684*** (6.33)	-0.0503*** (-3.16)	0.104*** (10.10)	0.0517*** (3.16)
North EU	-0.0465*** (-4.84)	-0.0844*** (-7.14)	-0.0672*** (-6.68)	-0.0717*** (-6.07)
Observations	21879	21879	21879	21879

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: column (1) and (2) “Nowadays differences in people’s incomes are too great”. Column (1) accounts for *agree* and *strongly agree*. Column (2) accounts for *strongly agree* only. Specifications (3) and (4) “The government should take measures to reduce differences in income”. Column (3) accounts for *agree* and *strongly agree*. Column (4) accounts for *strongly agree* only.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

two highest income quintiles are strongly against government actions (by almost 9 percentage points) when compared to respondents in the lowest income class. Overall, we can infer that dimensions of socio-economic status matter in the formation of preferences for redistribution.

Besides, gender is another important predictor, as women show *ceteris paribus* stronger support for redistribution than men. In the general agreement specification, women are found (with  $p < 0.01$ ) to be 3.2 percentage points more likely to agree than men. This effect is slightly lower in the strong agreement specification (2 percentage points). The reason behind the gender-effect may be explained by gender-wise psychological traits (Alesina and Giuliano, 2011). Alike for gender, a positive relation can also be found with respect to the age of the respondent. A one-year increase in age rises the propensity for government redistribution by 0.1 percentage points. This confirms the estimates of Fong (2001); Alesina and Giuliano (2011); Guillaud (2013) and Barnes (2014), while Alesina and La Ferrara (2005) find the opposite effect.

Due to the existence of socio-economic disparities across the EU, we believe there is need to include a proxy for this spatial dimension in the estimates. With respect to EU macro regions, we find that in both, Eastern and Southern Europe, people have on average stronger preferences for redistribution than their Western European counterparts. On the other hand, people in the North of Europe show less support for re-distribution. This might reflect the differentials in terms of the current levels of welfare state and living standards across the continent. In Northern Europe, where the welfare state is well established and the GDP per capita is among the highest, the demand for redistribution is low. Conversely, in Mediterranean countries, where real income has yet to fully recover from the Great Recession and redistributive actions are frozen, the demand for reshuffling incomes is higher.

An alternative way to measure income inequality is to consider particular moments of the income distribution, in other words, to compute ratios of income levels at two different percentiles. While the Gini coefficient captures the overall income distribution within a society, the ratios provide information about the relative distance of any two income classes. This sheds additional light on the relative income distribution, which is likely to impact individual perceptions of inequality as well as preferences for redistribution. Therefore, we now deploy the *Ratio 90-10* as well as the *Ratio 90-50* as the main explanatory variables of interest (Table 2). Intuitively, we might think of the first ratio as a measure describing the difference between the “richest” and the “poorest” deciles (ratio of income levels at the 90th and the 10th percentile). Analogously, the *Ratio 90-50* might be interpreted as a measure of the distance of the “richest” versus the “middle class” (ratio of 90th and 50th percentile income levels). Equivalently, we refer to these ratios as “inter-decile gaps”.

In column 1, our estimate for the Ratio 90-10 is positive and significant: a standard deviation increase in the gap between the highest and the lowest decile (column 1) leads to an increase in the demand for redistribution by 2.2 percentage points. When we investigate the same specification using the Ratio 90-50 (see column 2) we find a stronger, positive and significant

Table 2: Preference for redistribution: inter-decile gaps

	Agreement		Strong agreement	
	(1)	(2)	(3)	(4)
Ratio 90-10	0.0223*** (5.22)		0.0244*** (4.84)	
Ratio 90-50		0.0331*** (8.28)		0.0271*** (5.60)
<i>Education:</i>				
Secondary	-0.00428 (-0.41)	-0.00324 (-0.31)	-0.0177 (-1.41)	-0.0175 (-1.39)
Post-secondary	-0.0243** (-2.22)	-0.0249** (-2.27)	-0.0307** (-2.25)	-0.0321** (-2.34)
Tertiary	-0.0628*** (-4.58)	-0.0646*** (-4.69)	-0.0656*** (-3.95)	-0.0679*** (-4.08)
<i>Income Quintile:</i>				
4th and 5th	-0.0901*** (-10.69)	-0.0890*** (-10.56)	-0.0858*** (-8.43)	-0.0849*** (-8.32)
<i>Gender:</i>				
Woman	0.0321*** (4.71)	0.0315*** (4.62)	0.0205** (2.41)	0.0197** (2.32)
Age	0.00109*** (5.44)	0.00108*** (5.38)	0.00123*** (5.00)	0.00118*** (4.83)
<i>Macro-region:</i>				
East EU	0.0377*** (4.22)	0.0361*** (4.06)	0.0975*** (7.96)	0.101*** (8.58)
South EU	0.107*** (10.00)	0.109*** (10.93)	0.0609*** (3.49)	0.0731*** (4.65)
North EU	-0.0612*** (-6.09)	-0.0588*** (-5.84)	-0.0654*** (-5.56)	-0.0631*** (-5.39)
Observations	21879	21879	21879	21879

*Notes:* the Ratio 90-10 and the Ratio 90-50 have been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree* are considered in columns (1) and (2), *strongly agree* only in columns (3) and (4).

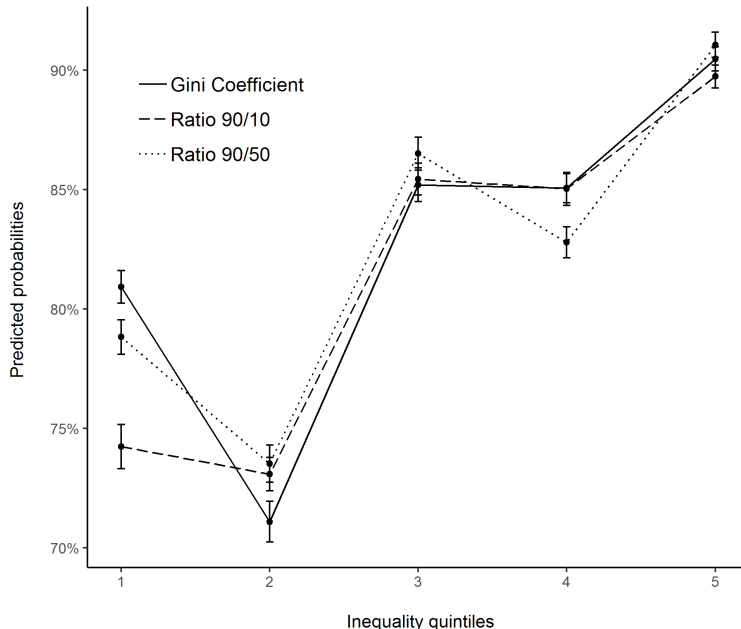
\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$



effect, in fact, 1.5 times larger (3.3 percentage points) compared to using the Ratio 90-10. When changing the cut-off point of the dependent variable to *strong agreement* only (columns 3 and 4), the estimates preserve their direction and statistical significance, albeit there is not more sizable difference between the two ratios. Results for the covariates remain unchanged compared to our main specifications (see Table 1).

Thus, the link between inequality and redistribution in the entire EU is robust to different disposable income inequality measures. Furthermore, preferences for redistribution are somehow stronger when the distance between the median voter and the high earners increases (Ratio 90-50) in comparison to the Ratio 90-10. It appears that the relative income allocated to the middle class is relatively important to understand the demand for redistributive policies.

Figure 3: Predicted propensities for government redistribution



Finally, we explore predicted probabilities of support for redistribution at different income inequality quintiles - see Figure 3. We show that for very low levels of the Gini coefficient, individuals exhibit more support for redistribution than for slightly higher values <sup>14</sup> A further increase in income inequality leads to a spike in the support for redistribution, while moving from the median to the 4<sup>th</sup> quintile does not have any sizable effect. Finally, an additional increase is observed at the highest levels of income inequality, albeit the marginal increment is lower than at other moments of the distribution. Robustness analysis, using the two decile-ratios confirm these patterns, albeit the Ratio 90-10 shows a non-significant difference for the lowest two quintiles.

<sup>14</sup>Regression results are available in Table B.2, Appendix B.

## 4.2 Beliefs in fairness of life and preferences for redistribution

A related strand of the research shows that there exists a link between support for redistribution and beliefs about fairness in a society (e.g. Fong, 2001; Alesina and Angeletos, 2005; Alesina and La Ferrara, 2005). Individual perceptions of income distribution, and thus their demand for re-distribution, might in fact correlate not only with the underlying income inequality (as discussed in Section 4.1), but also with their opinion about the society and their role in it. To accommodate such a possibility, Table 3 describes a rich set of questions on fairness.

In addition, we investigate the self-reported positioning on a hypothetical social ladder. In fact, while education and income might describe some of the socio-economic characteristics relevant, we consider that they might fail to capture the entire dimension of the respondent's social status, which might feedback to its redistribution preferences. Therefore, column 1 adds the respondent's subjective position on a hypothetical social ladder. *Ceteris paribus*, we robustly estimate a negative and significant average marginal effect: a unit increase in the 10-point *social ladder* reduces support for income redistribution by 2.4 percentage points. Once accounting for the subjective social status the link between support for redistribution on one hand and income and education on the other hand becomes weaker.

The dimension of redistributive preferences also relates to variables expressing attitudes or preferences towards fairness, equality and justice. We test a specification including the marginal effects of these three dimensions (see column 2). Those believing that what happens in their life is fair do not show any statistically significant support for redistribution compared to those who perceive their life as unfair. Conversely, having *equal opportunities* has a significant and negative effect (-1.5 percentage points). Therefore, people do not see the need to further redistribute when they have the aprioristic beliefs that everybody enjoys the same chances to get ahead in life. Regarding the dimension of *living in a society where justice prevails*, we also observe a negative and significant association (-1 percentage point) with redistribution preferences.

Column 3 provides further insights by exploring other fairness-related dimensions. These include beliefs about meritocracy, whether opportunities compared to 30 years ago have improved or not and individual resilience. It shows that people who tend to believe that individuals get what they deserve (*merit*), exhibit a lower support for redistribution (-3.4 percentage points). A similar, albeit weaker, result emerges for those who think that their opportunities have improved compared to those of their parents (-1 percentage point). Finally, less resilient individuals tend to show a higher degree of support for government's intervention (2.5 percentage points). Overall, people believing that they could get ahead in life based on their own effort and merit are less likely to demand government intervention.<sup>15</sup> Importantly, even after accounting for individuals' beliefs about fairness in the society as well as including a subjective measure of social status,

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<sup>15</sup>In the appendix we show that these findings are robust to the adoption of different inequality measures (see Table B.3). Further, similar results can be found with respect to perceptions of inequality being too high (Table B.4).

Table 3: Preference for redistribution: subjective beliefs

	(1)	(2)	(3)
Gini	0.0252*** (6.18)	0.0255*** (6.26)	0.0242*** (5.97)
<i>Education:</i>			
Secondary	0.000484 (0.04)	-0.000707 (-0.06)	0.00127 (0.11)
Post-secondary	-0.0137 (-1.15)	-0.0141 (-1.19)	-0.00838 (-0.70)
Tertiary	-0.0356** (-2.46)	-0.0376*** (-2.60)	-0.0296** (-2.05)
<i>Income quintile:</i>			
4th and 5th	-0.0670*** (-7.73)	-0.0638*** (-7.39)	-0.0589*** (-6.88)
<i>Gender:</i>			
Woman	0.0301*** (4.23)	0.0291*** (4.10)	0.0215*** (3.05)
Age	0.00117*** (5.50)	0.00111*** (5.23)	0.00103*** (4.93)
<i>Macro-region:</i>			
East EU	0.0182** (1.99)	0.00900 (0.97)	0.00996 (1.09)
South EU	0.0920*** (8.54)	0.0847*** (7.75)	0.0833*** (7.49)
North EU	-0.0721*** (-7.06)	-0.0669*** (-6.55)	-0.0500*** (-5.05)
Social ladder	-0.0242*** (-10.29)	-0.0210*** (-8.52)	-0.0176*** (-7.21)
Life is fair		0.00135 (0.32)	
Equal opportunities		-0.0151*** (-3.87)	
Justice prevails		-0.00992*** (-2.93)	
Merit			-0.0335*** (-9.75)
opportunities (30y)			-0.00901*** (-2.59)
Resilience			0.0247*** (7.87)
Observations	19833	19833	19833

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree*. This table exclude from the sample all the respondents refusing to reply (or did not know how to) to at least one of the following items: social ladder, life is fair, equal opportunities, justice prevails, merit, opportunities (30y), resilience. In total, 2046 are exclude with respect to our basic specifications (i.e. Tables 1).

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

income inequality remains an important predictor of support for redistribution.

### 4.3 Robustness analysis

#### 4.3.1 Additional controls

In order to establish the robustness of the estimates discussed so far, we deploy a set of complementary modelling features. Initially, we consider the hypothesis that not only sub-national inequality measures matter for explaining individual preferences, but also the differences between national and regional inequality dimensions. Recent research demonstrates that while the EU-wide inequality has decreased (Benczur et al., 2017), sizeable regional disparities exist (Iammarino et al., 2018). Therefore, we add to our main model Gini and GDP gaps measuring the distances between regional and national averages (Table 4). To do so, we restrict our sample to those countries for which regional income inequality data are available (NUTS-1 and NUTS-2).

Our estimates - see column (1) - show that neither the GDP gap nor the Gini gap affect support for redistribution. Even if on average inequalities between regions are on the rise across Europe, they do not appear to have an impact on redistributive preferences. Importantly, in a rather restricted sample of countries, the level of income inequality remains an important predictor of support for redistribution.

We then enhance our specification by including the observed population density to capture relative agglomeration effects. Such an effect does turn out. Further, we replace our proxy of the respondents' income positions with a dummy variable capturing whether the respondents have income originating from capital gains - e.g. income from investment, saving, insurance or property. Our results show that people receiving capital income are less in favour of government redistribution (column 4). Both, the magnitude and the size of the effect are comparable with those found with respect to the income quintile position. This further confirms that individuals are less supportive of income redistribution when they believe that they might have to contribute to it.

Finally, a simple notion of political orientation is included, measuring self-reported political preferences on a scale from extreme left (1) to extreme right (10). As voters shift by one unit towards the political right, support for redistribution decreases by almost three percentage points. This findings are in line with those by Olivera (2015) and Alesina and Giuliano (2011). Further, Alesina and Giuliano (2011) show that once controlling for political ideology, beliefs about fairness in the society lose their role as predictors for preferences for redistribution. However, we document that such idiosyncratic beliefs remain significant and retain their magnitude even after including a political orientation scale - See Table B.5.

Table 4: Preference for redistribution: additional controls

	(1)	(2)	(3)	(4)
Gini	0.0118** (2.18)	0.0298*** (7.57)	0.0301*** (7.70)	0.0303*** (6.83)
<i>Education:</i>				
Secondary	-0.0164 (-1.35)	-0.00339 (-0.33)	-0.00868 (-0.88)	0.00298 (0.24)
Post-secondary	-0.00824 (-0.65)	-0.0246** (-2.25)	-0.0394*** (-3.73)	-0.0255** (-2.01)
Tertiary	-0.0679*** (-4.11)	-0.0640*** (-4.66)	-0.0963*** (-7.23)	-0.0722*** (-4.64)
<i>Gender:</i>				
Woman	0.0348*** (4.45)	0.0318*** (4.66)	0.0352*** (5.15)	0.0291*** (3.85)
Age	0.00112*** (4.84)	0.00112*** (5.58)	0.00148*** (7.55)	0.00141*** (6.21)
<i>Macro-region:</i>				
East EU	-0.0324*** (-2.87)	0.0379*** (4.24)	0.0326*** (3.72)	0.0517*** (5.36)
South EU	0.0683*** (5.62)	0.105*** (10.08)	0.103*** (10.04)	0.106*** (8.75)
North EU	-0.0689*** (-5.78)	-0.0668*** (-6.59)	-0.0676*** (-6.70)	-0.0621*** (-5.96)
<i>Income Quintile:</i>				
4th and 5th	-0.0542*** (-5.72)	-0.0889*** (-10.58)		-0.0860*** (-9.50)
GDPgap	$-2.83 \times 10^{-7}$ (-0.41)			
GINIgap	0.312 (1.35)			
Population density		$1.63 \times 10^{-6}$ (0.32)		
<i>Source of income:</i>				
Capital			-0.0847*** (-6.66)	
Right-wing				-0.0296*** (-17.27)
Observations	12247	21879	21879	17904

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree*. Column (5) only has 17904 observations since the items regarding the placement on the political scale has 1405 *refusal* and 2570 *don't know* with respect to our full sample.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

### 4.3.2 Cross-validation: EB-ESS comparison

In order to strengthen our findings, we use an established dataset, the European Social Survey (ESS) to cross-validate our estimates. For making the appropriate comparisons, we drop all the countries/regions in Eurobarometer not included in the ESS. Further, we re-code the control variables included in the ESS to correspond to those of the Eurobarometer used in this analysis. Summary statistics of the key variables in both data sets are reasonably close to each other.<sup>16</sup>

The estimates referring to the Gini coefficient (Table 5, column 1 and 4) show that the ESS estimates are very similar to those of the Eurobarometer. They both report a positive and significant link between redistribution preferences and income inequality. In the same manner, both, the Ratio 90-50 (columns 2 and 5) and the Ratio 90-10 (columns 3 and 6) receive close results in terms of their magnitudes and significance. Overall, the estimates conducted with the ESS and the Eurobarometer barely report statistically different results. This benchmarking exercise reassures us that our estimates are robust and valid throughout.

## 5 Conclusions

In this paper, we investigate the link between perceptions of excessive inequality, preferences for redistribution and actual income inequality. To this end, we take advantage of a novel survey as well as of different measures of income inequality for all EU-28 Member States. Our key findings indicates that the probability of demanding government actions to reduce income disparities is strongly correlated with regional or small state income inequality. The same is found with respect to individual perceptions of excessive inequality. Importantly, this supports our claim of a causal interpretation of the effect of income inequality on support for redistribution.

As we have noted, socio-demographic characterises, such as gender, education, income positions and subjective social class bear important consequences for the perceptions of excess inequality and the demand for government-led redistribution. Turning to the under-researched notion of fairness, we argue that people considering equal opportunities to be in place and who are more resilient to life shocks, are less in favour of government intervention to reduce inequalities. These results hold even after controlling for political orientation, suggesting that beliefs about fairness in the society are key to understand such policy-relevant demand.

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<sup>16</sup>See Descriptive Statistics in Table C.6, Appendix C.

Table 5: EB-ESS comparison

	Eurobarometer			European Social Survey		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	0.0381*** (7.93)			0.0322*** (7.82)		
Ratio 90/10		0.0428*** (7.48)			0.0438*** (9.28)	
Ratio 90/50			0.0329*** (6.40)			0.0353*** (8.50)
<i>Education:</i>						
Secondary	-0.00747 (-0.57)	-0.00654 (-0.50)	-0.00839 (-0.64)	0.00445 (0.35)	0.00747 (0.58)	0.00602 (0.47)
Post-secondary	-0.0178 (-1.32)	-0.0163 (-1.21)	-0.0190 (-1.41)	-0.0171 (-1.18)	-0.0166 (-1.14)	-0.0162 (-1.11)
Tertiary	-0.0688*** (-4.05)	-0.0675*** (-3.97)	-0.0688*** (-4.06)	-0.0638*** (-4.10)	-0.0622*** (-3.98)	-0.0625*** (-4.00)
<i>Income Quintile:</i>						
4th and 5th	-0.0949*** (-9.07)	-0.0941*** (-8.99)	-0.0975*** (-9.26)	-0.0840*** (-10.92)	-0.0841*** (-10.95)	-0.0845*** (-10.97)
<i>Gender:</i>						
Woman	0.0309*** (3.74)	0.0310*** (3.75)	0.0310*** (3.74)	0.0297*** (4.31)	0.0301*** (4.36)	0.0297*** (4.30)
Age	0.00134*** (5.59)	0.00132*** (5.50)	0.00127*** (5.29)	0.00111*** (5.43)	0.00113*** (5.54)	0.00110*** (5.38)
<i>Macro-region:</i>						
East EU	0.0429*** (4.37)	0.0339*** (3.43)	0.0412*** (3.98)	0.0436*** (4.96)	0.0297*** (3.33)	0.0352*** (3.83)
South EU	0.109*** (9.58)	0.0936*** (7.51)	0.121*** (11.24)	0.0948*** (8.69)	0.0669*** (5.36)	0.101*** (9.78)
North EU	-0.0173* (-1.66)	-0.0183* (-1.81)	-0.00719 (-0.69)	-0.0206** (-2.30)	-0.0224** (-2.56)	-0.0149* (-1.69)
Observations	14674	14674	14674	27660	27660	27660

*Notes:* the Gini coefficient, the ratio 90-10, and the ratio 90-50 have been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree*.

*Sources:* columns (1) to (3): Special Eurobarometer 471; columns (4) to (6) European Social Survey, Round 8, version 2.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

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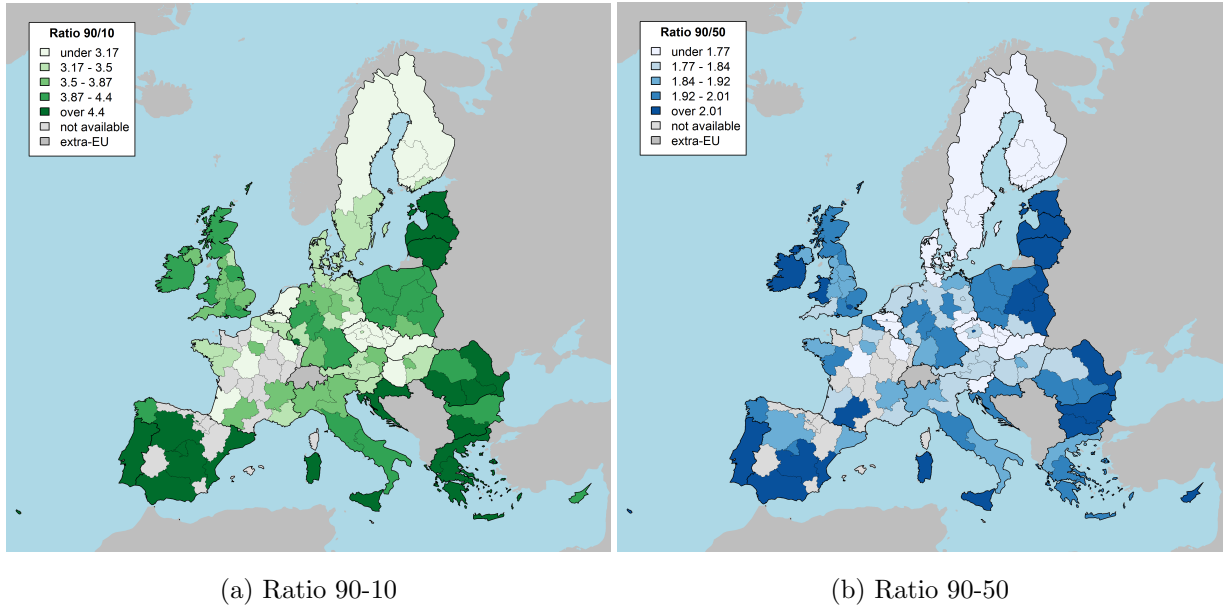
## Appendix A Descriptive statistics

Table A.1: Descriptive statistics

	Mean	Std.Dev.	Min	Max	N
<b>Dependent variables:</b>					
Perceived inequality	0.85	0.36	0	1	21879
Perceived inequality (strong agree)	0.45	0.5	0	1	21879
Preferences for Redistribution	0.83	0.38	0	1	21879
Preferences for Redistribution (strong agree)	0.45	0.5	0	1	21879
<b>Inequality measures:</b>					
Gini coefficient	0.30	0.04	0.23	0.37	21879
Ratio 90-10	3.88	0.76	2.58	5.93	21879
Ratio 90-50	1.95	0.22	1.64	2.46	21879
<b>Control Variables:</b>					
Education	2.39	0.91	1	4	21879
Income quintile: 4th and 5th	0.26	0.44	0	1	21879
Gender	0.54	0.5	0	1	21879
Age	52.23	17.79	15	99	21879
Macro-region	2.32	1.03	1	4	21879
Pop. density	260.43	680.46	6	7393.4	21879
Income: capital	0.09	0.28	0	1	21879
Gini gap <sup>(i)</sup>	0.01	0.02	-0.1	0.07	13158
GDP gap <sup>(i)</sup>	810.53	6220.73	-25396.98	12213.77	13158
Political orientation <sup>(ii)</sup>	5.24	2.14	1	10	17904
<b>Subjective Beliefs<sup>(iii)</sup></b>					
Social ladder	5.54	1.63	1	10	19833
Fair life	3.38	1.04	1	5	19833
Equal opportunities	3.38	1.17	1	5	19833
Justice prevails	2.85	1.15	1	5	19833
Merit	2.96	1.11	1	5	19833
Opportunities (30y)	3.21	1.16	1	5	19833

*Notes:* (i) regional gaps are computed only for those countries in which NUTS-1 and NUTS-2 levels are available; (ii) the item regarding political orientation presents 1405 *refusal* and 2570 *don't know*; (iii) when considering subjective beliefs we exclude from the sample all the respondents refusing to reply (or did not know how to) to at least one of the following items: social ladder, life is fair, equal opportunities, justice prevails, merit, opportunities (30y), resilience.

Figure A.1: Inter-decile gaps maps



Source: EU Survey of Income and Living Conditions (EU-SILC), the British Household Panel Survey (BHPS), and the German Socio-Economic Panel (GSOEP), 2014. Authors' calculation.

Table A.2: Perceptions of fairness: EB 471 questions

Variable	Question
Social ladder	Think of the following ladder as representing where people stand in [NATIONALITY] society. The higher up you are on this ladder, the closer you are to the people at the very top in terms of social status; the lower you are, the closer you are to the people at the very bottom in terms of social status. Where would you place [...] on this ladder relative to other people in [OUR COUNTRY]?
Life is fair	I believe that most of the things that happen in my life are fair
Equal opportunities	Nowadays in [OUR COUNTRY] I have equal opportunities for getting ahead in life, like everyone else
Merit	I believe that, by and large, people get what they deserve in [OUR COUNTRY]
Justice Prevails	I am confident that justice always prevails over injustice in [OUR COUNTRY]
Opportunities (30y)	Compared with 30 years ago, opportunities for getting ahead in life have become more equal in [OUR COUNTRY]
Resilience	When things go wrong in my life, it generally takes me a long time to get back to normal

## Appendix B Robustness analysis

Table B.1: Inclusion of country fixed effects

	Perceptions of Inequality			Preferences for Redistribution		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	0.0151** (2.03)	0.0150** (1.96)	0.0156** (2.08)	0.0178** (2.20)	0.0185** (2.24)	0.0188** (2.29)
<i>Education:</i>						
Secondary	0.0215 (0.94)	0.0236 (1.01)	0.0251 (1.08)	0.0129 (0.51)	0.0140 (0.54)	0.0149 (0.57)
Post-secondary	0.0248 (1.05)	0.0284 (1.18)	0.0275 (1.13)	0.0242 (0.92)	0.0266 (0.99)	0.0247 (0.92)
Tertiary	-0.0184 (-0.58)	-0.00630 (-0.20)	-0.00556 (-0.17)	-0.0568* (-1.65)	-0.0452 (-1.34)	-0.0440 (-1.29)
<i>Income quintile:</i>						
4th and 5th	-0.0107 (-0.63)	0.000206 (0.01)	0.000814 (0.05)	-0.0676*** (-3.36)	-0.0533*** (-2.70)	-0.0526*** (-2.64)
<i>Gender:</i>						
Woman	0.0121 (0.92)	0.0110 (0.84)	0.00831 (0.63)	-0.00345 (-0.22)	-0.00456 (-0.30)	-0.00891 (-0.58)
Age	0.00146*** (4.00)	0.00148*** (4.13)	0.00153*** (4.30)	0.00125*** (2.76)	0.00130*** (2.89)	0.00139*** (3.10)
Social ladder		-0.00586 (-1.20)	-0.00480 (-0.97)		-0.00694 (-1.32)	-0.00378 (-0.74)
Life is fair		-0.0160** (-2.25)			-0.0135* (-1.77)	
Equal opportunities		-0.0155** (-2.44)			-0.0152* (-1.80)	
Justice prevails		0.00237 (0.41)			0.00148 (0.20)	
Merit			-0.0250*** (-3.79)			-0.0405*** (-5.39)
opportunities (30y)			-0.00321 (-0.51)			-0.00232 (-0.29)
Resilience			0.0130** (2.26)			0.0138* (1.95)
Observations	2932	2932	2932	2932	2932	2932

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: specifications (1) to (3) “Nowadays differences in people’s incomes are too great”, *agree* and *strongly agree*. Specifications (4) to (6) “The government should take measures to reduce differences in income”, *agree* and *strongly agree*. Countries fixed effects are included but not reported. The sample includes only respondents from France, Germany, Spain and the United Kingdom.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table B.2: Predicted propensities for government redistribution

	Gini	Ratio 90/50	Ratio 90/10
	(1)	(2)	(3)
<i>Inequality:</i>			
2 <sup>nd</sup> quintile	-0.0426*** (-3.78)	-0.0421*** (-4.24)	0.00763 (0.73)
3 <sup>rd</sup> quintile	-0.0148* (-1.65)	0.0393*** (3.83)	0.0922*** (8.72)
4 <sup>th</sup> quintile	0.0226** (2.45)	0.0153 (1.63)	0.0653*** (6.17)
5 <sup>th</sup> quintile	0.0360*** (3.45)	0.0759*** (7.31)	0.0696*** (6.01)
<i>Education:</i>			
Secondary	-0.00372 (-0.36)	-0.00585 (-0.56)	-0.00750 (-0.72)
Post-secondary	-0.0199* (-1.82)	-0.0217** (-1.99)	-0.0224** (-2.06)
Tertiary	-0.0600*** (-4.37)	-0.0636*** (-4.63)	-0.0646*** (-4.73)
<i>Income Quintile:</i>			
4th and 5th	-0.0861*** (-10.29)	-0.0832*** (-9.99)	-0.0848*** (-10.15)
<i>Gender:</i>			
Woman	0.0316*** (4.64)	0.0298*** (4.39)	0.0315*** (4.65)
Age	0.00117*** (5.83)	0.00116*** (5.81)	0.00120*** (5.94)
<i>Macro-region:</i>			
East EU	0.0309*** (3.53)	0.0298*** (3.30)	0.0381*** (4.15)
South EU	0.102*** (10.04)	0.0935*** (9.07)	0.102*** (9.22)
North EU	-0.0753*** (-7.61)	-0.0631*** (-6.14)	-0.0598*** (-5.97)
Observations	21879	21879	21879

*Notes:* the Gini coefficient, the Ratio 90-10, and the Ratio 90-50 have been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree*.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table B.3: Preference for redistribution: inter-deciles gaps subjective beliefs

	(1)	(2)	(3)	(4)	(5)	(6)
Ratio 90/10	0.0165*** (3.69)	0.0160*** (3.58)	0.0151*** (3.41)			
Ratio 90/50				0.0294*** (7.11)	0.0297*** (7.21)	0.0294*** (7.18)
<i>Education:</i>						
Secondary	-0.000164 (-0.01)	-0.00141 (-0.12)	0.000718 (0.06)	0.000956 (0.08)	-0.000215 (-0.02)	0.00174 (0.15)
Post-secondary	-0.0131 (-1.11)	-0.0136 (-1.15)	-0.00767 (-0.64)	-0.0138 (-1.16)	-0.0141 (-1.19)	-0.00846 (-0.71)
Tertiary	-0.0338** (-2.34)	-0.0358** (-2.48)	-0.0276* (-1.91)	-0.0362** (-2.49)	-0.0382*** (-2.63)	-0.0304** (-2.09)
<i>Income quintile:</i>						
4th and 5th	-0.0672*** (-7.74)	-0.0640*** (-7.42)	-0.0590*** (-6.89)	-0.0666*** (-7.69)	-0.0633*** (-7.35)	-0.0584*** (-6.83)
<i>Gender:</i>						
Woman	0.0304*** (4.27)	0.0295*** (4.15)	0.0219*** (3.10)	0.0298*** (4.19)	0.0289*** (4.07)	0.0213*** (3.02)
Age	0.00114*** (5.36)	0.00108*** (5.09)	0.00101*** (4.80)	0.00114*** (5.37)	0.00108*** (5.10)	0.00101*** (4.81)
<i>Macro-region:</i>						
East EU	0.0203** (2.17)	0.0120 (1.27)	0.0127 (1.35)	0.0159* (1.72)	0.00663 (0.70)	0.00672 (0.72)
South EU	0.0965*** (8.70)	0.0901*** (8.05)	0.0885*** (7.72)	0.0953*** (9.11)	0.0879*** (8.28)	0.0854*** (7.89)
North EU	-0.0669*** (-6.52)	-0.0618*** (-6.02)	-0.0451*** (-4.53)	-0.0649*** (-6.35)	-0.0596*** (-5.84)	-0.0432*** (-4.38)
Social ladder	-0.0250*** (-10.59)	-0.0219*** (-8.88)	-0.0184*** (-7.51)	-0.0243*** (-10.31)	-0.0211*** (-8.55)	-0.0176*** (-7.19)
Life is fair		0.00157 (0.38)			0.00121 (0.29)	
Equal opportunities		-0.0151*** (-3.89)			-0.0155*** (-3.97)	
Justice prevails		-0.00949*** (-2.81)			-0.00940*** (-2.78)	
Merit			-0.0333*** (-9.69)			-0.0333*** (-9.68)
opportunities (30y)			-0.00888** (-2.56)			-0.00962*** (-2.77)
Resilience			0.0251*** (8.03)			0.0249*** (7.95)
Observations	19833	19833	19833	19833	19833	19833

Notes: the Ratio 90-10 and the Ratio 90-50 have been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: "The government should take measures to reduce differences in income", *agree* and *strongly agree*.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$



Table B.4: Perceptions of inequality: subjective beliefs

	(1)	(2)	(3)
Gini	0.0375*** (9.28)	0.0380*** (9.44)	0.0365*** (9.09)
<i>Education:</i>			
Secondary	0.00125 (0.11)	-0.000403 (-0.04)	0.00329 (0.29)
Post-secondary	-0.0167 (-1.45)	-0.0174 (-1.53)	-0.00971 (-0.84)
Tertiary	-0.0343** (-2.42)	-0.0371*** (-2.63)	-0.0264* (-1.87)
<i>Income quintile:</i>			
4th and 5th	-0.0457*** (-5.48)	-0.0416*** (-5.02)	-0.0360*** (-4.40)
<i>Gender:</i>			
Woman	0.0302*** (4.30)	0.0287*** (4.11)	0.0226*** (3.25)
Age	0.00160*** (7.87)	0.00152*** (7.51)	0.00147*** (7.34)
<i>Macro-region:</i>			
East EU	0.0517*** (6.23)	0.0413*** (4.91)	0.0431*** (5.17)
South EU	0.0659*** (5.96)	0.0563*** (5.01)	0.0542*** (4.74)
North EU	-0.0520*** (-5.29)	-0.0471*** (-4.83)	-0.0299*** (-3.14)
Social ladder	-0.0231*** (-9.73)	-0.0192*** (-7.82)	-0.0167*** (-6.79)
Life is fair		-0.000381 (-0.09)	
Equal opportunities		-0.0145*** (-3.83)	
Justice prevails		-0.0155*** (-4.69)	
Merit			-0.0260*** (-7.66)
opportunities (30y)			-0.0131*** (-3.93)
Resilience			0.0286*** (9.46)
Observations	19833	19833	19833

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “Nowadays differences in people’s incomes are too great”, *agree* and *strongly agree*.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table B.5: Preferences for redistribution, subjective beliefs and political orientation

	(1)	(2)	(3)
Gini	0.0245*** (5.33)	0.0249*** (5.43)	0.0237*** (5.18)
<i>Education:</i>			
Secondary	0.00783 (0.60)	0.00652 (0.50)	0.00765 (0.58)
Post-secondary	-0.0127 (-0.94)	-0.0135 (-1.00)	-0.00781 (-0.57)
Tertiary	-0.0404** (-2.46)	-0.0425*** (-2.60)	-0.0342** (-2.08)
<i>Gender:</i>			
Woman	0.0269*** (3.43)	0.0261*** (3.33)	0.0192** (2.47)
Age	0.00143*** (6.03)	0.00139*** (5.87)	0.00132*** (5.62)
<i>Macro-region:</i>			
East EU	0.0351*** (3.47)	0.0271*** (2.63)	0.0260** (2.56)
South EU	0.0955*** (7.62)	0.0887*** (6.93)	0.0860*** (6.65)
North EU	-0.0635*** (-5.99)	-0.0592*** (-5.55)	-0.0451*** (-4.33)
<i>Income quintile:</i>			
4th and 5th	-0.0653*** (-6.99)	-0.0625*** (-6.71)	-0.0582*** (-6.28)
Social ladder	-0.0235*** (-8.78)	-0.0206*** (-7.37)	-0.0175*** (-6.29)
Right-wing	-0.0287*** (-16.25)	-0.0280*** (-15.77)	-0.0261*** (-14.87)
Life is fair		0.00169 (0.36)	
Equal opportunities		-0.0141*** (-3.27)	
Justice prevails		-0.00915** (-2.48)	
Merit			-0.0301*** (-7.92)
opportunities (30y)			-0.00814** (-2.12)
Resilience			0.0234*** (6.64)
Observations	16608	16608	16608

*Notes:* the Gini coefficient has been transformed to have mean 0 and unit standard deviation. Average marginal effects are reported; z-statistics in parentheses. Dependent variable: “The government should take measures to reduce differences in income”, *agree* and *strongly agree*.

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## Appendix C EB-ESS comparison

Table C.6: Descriptive statistics, EB-ESS comparison

	EB			ESS		
	Mean	Std. Dev.	N	Mean	Std. Dev.	N
Redistribution (agree)	0.83	0.37	14674	0.74	0.44	27660
Gini (regional)	0.29	0.04	14674	0.30	0.04	27660
Ratio 90/10	3.72	0.70	14674	3.77	0.70	27660
Ratio 90/50	1.92	0.23	14674	1.94	0.23	27660
Education	2.42	0.91	14674	2.35	0.82	27660
Income quintile: 4 <sup>th</sup> and 5 <sup>th</sup>	0.25	0.43	14674	0.36	0.48	27660
Gender	0.53	0.5	14674	0.53	0.5	27660
Age	52.83	17.89	14674	50.2	18.04	27660
Macro-region	2.26	1.13	14674	2.32	1.15	27660

*Notes:* Mean, Std. Dev., and N are, respectively, the average value taken by the corresponding variables, its standard deviation, and the number of observations. Variables are defined as Section 2.

*Sources:* The inequality measures (Gini coefficient, Ratio 90/10 and Ratio 90/50) have been computed using the EU Survey of Income and Living Conditions (EU-SILC), the British Household Panel Survey (BHPS), and the German Socio-Economic Panel (GSOEP). The remaining questions have been retrieved from the Eurobarometer 471 (columns 1 to 3) and the ESS, Round 8, Version 2 (columns 4 to 6)

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