

The Demand for and Supply of Redistribution:  
The Association of Inequality Perceptions, Social Norms and  
Redistributive Preferences with the Effective Level of Inequality  
and Redistribution

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**Abstract**

This study uses internationally comparable survey data to study the empirical association between subjective and objective inequality measures. The analysis reveals substantial associations of subjective inequality measures and redistributive preferences with measures of objective inequality, redistribution and labor market regulation at the aggregate level. Specifically, I find that the effective level of redistribution (after tax and transfer inequality) is high (low) in those countries and years with high demand for redistribution. Moreover, there is a strong association between subjective inequality measures and individuals' political preferences, such as their support for progressive taxation. This suggests that the subjective and objective dimension of inequality are, at least in part, linked through individuals' voting behavior.

*JEL classification:* D31, D63, J31

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# 1 Introduction

The redistribution of income and wealth is an issue of substantial economic and political importance, and a substantial amount of resources is redistributed in all OECD member countries. In the mid-2000s, for example, overall public cash benefits amounted to about 15.8% while household taxes amounted to 31.1% of average household income among people in working age (OECD, 2008). Probably even more stunning are the differences in the extent of redistribution that one can observe across these countries. On the one hand, public cash benefits range from a low of about 6% in the United States to a high of about 30% in Poland, while household taxes in turn range from a low of about 21% in Ireland to a high of about 54% in Denmark and Iceland.<sup>1</sup> Looking at these simple numbers, the question arises of why countries differ so much regarding the amount of resources that is redistributed and, consequently, the level of after tax/transfer inequality.

Probably the most prominent and best-known hypothesis put forward to explain differences in the extent of redistribution links an individual's position in the income distribution with his or her (purely self-interested) support for redistribution by the state (Meltzer and Richard, 1981; Roberts, 1977; Romer, 1975). At the aggregate level, these models basically predict that we should observe more redistribution in less equal countries (with respect to the distribution of market income), a conclusion not clearly borne out by corresponding empirical evidence (e.g. Borge and Rattsø, 2004; Milanovic, 2000). On the other hand, however, this lack of evidence at the aggregate level that there is more redistribution in ex-ante more unequal societies is well in line with evidence from many studies using individual-level data showing that personal earnings or income is a surprisingly poor predictor of one's own level of support for redistribution (e.g. Alesina and La Ferrara, 2005; Corneo and Grüner, 2002; Fong, 2001).<sup>2</sup>

Even though it is clear that economic factors do play an important role in explaining ob-

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<sup>1</sup>Again, all numbers are percentages of disposable household income and refer to the population of individuals of working age only.

<sup>2</sup>One important explanation for the weak empirical association between income and preferences over redistribution relates to effective (or perceived) income mobility (Bénabou and Ok, 2001; Piketty, 1995; Ravallion and Lokshin, 2000). Other mechanisms that have been proposed to explain the muted association between individual income and preferences over redistribution are ethnic diversity and intra-group preferences (Alesina *et al.*, 1999; Luttmer, 2001), concerns about relative income and status instead of or on top of concerns about absolute income (Clark and Oswald, 1996; Ferrer-i Carbonell, 2005; Luttmer, 2005), as well as population aging (Galasso and Profeta, 2007; Razin *et al.*, 2002; Tabellini, 2000). Harms and Zink (2003) offer a comprehensive discussion of these and further mechanisms.

served differences in the level of inequality and redistribution across countries, most economists would presumably agree that additional explanations are needed to fully grasp the phenomenon (e.g. Alesina and Giuliano, 2009; Corneo and Grüner, 2000). For example, in an extensive review of the theoretical literature and the empirical evidence explaining the different social security systems of the US and Europe, Alesina and Glaeser (2004, p.3) conclude that “(...) economic considerations alone do not go very far in explaining American exceptionalism”. They argue that political institutions and ethnic diversity, rather than merely economic factors, are key to explain the difference between the US and Europe. The view that perceptions and attitudes play a key role in explaining the observed country differences in inequality and redistribution is shared by many researchers.<sup>3</sup> Consequently, several recent theoretical contributions to the literature have forcefully pushed the idea that individuals’ perceptions of inequality and their normative beliefs on distributional justice on the one hand and the effective amount of redistribution on the other hand should be viewed as simultaneously determined (Alesina and Angeletos, 2005; Bénabou and Tirole, 2006).<sup>4</sup> These models predict that there may be different equilibria, and that in equilibrium the effective inequality will be low in those countries where the demand for redistribution is high, and vice versa.

However, even though these arguments sound quite obvious, there is very limited empirical evidence in support of these arguments. In fact, there is only a handful of studies trying to give a comprehensive empirical description of differences in perceptions of inequality and beliefs about distributive justice across a wide range of different countries, and how perceptions and beliefs are associated with objective measures of inequality and redistribution.<sup>5</sup> One of the few available cross-country studies is the one by Corneo and Grüner (2002) who use survey data from the International Social Survey Program (ISSP) to explore different mechanisms

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<sup>3</sup>For example, Alesina and Angeletos (2005, p.960) argue that “the difference in political support for redistribution appears (...) to reflect a difference in social perceptions regarding the fairness of market outcomes and the underlying sources of income inequality”. Similarly, Bowles and Gintis (2002, p. 3) argue that “(...) by far the most important fault line is that people hold different beliefs about why the rich are rich and the poor are poor”.

<sup>4</sup>These arguments also line up well with the available micro-level evidence showing that individuals tend to favor an equal distribution of resources over an unequal distribution quite generally (e.g. Carlsson *et al.*, 2005; Fong *et al.*, 2005; Konow, 2003).

<sup>5</sup>Most of the available empirical studies focus on the determinants of preferences for redistribution in a single country. For example, Alesina and Fuchs-Schündeln (2007) compare redistributive preferences between West and East Germany. In fact, I am not aware of any empirical study that focuses on the association between objective and subjective measures of inequality and redistribution using as comprehensive and internationally comparable data as those from the ISSP.

explaining variation in preferences for redistribution.<sup>6</sup> Even though they do not mainly focus on differences across countries, they do present evidence showing large differences in redistributive preferences across different countries. Specifically, they find large differences in redistributive preferences between former socialist countries and Western democracies. They also find some interesting differences in the effect of key explanatory variables on redistributive preferences between the two groups of countries. Clearly the most comprehensive empirical study to date is the one by Osberg and Smeeding (2006), also relying on data from the ISSP. While they use a similar conceptual framework as I do in this paper, they do not try to relate country differences in redistributive preferences to differences in objective measures of inequality or redistribution, nor do they provide a formal analysis of the determinants of their measures of redistributive preferences. Finally, Isaksson and Lindskog (2009) also focus on cross-country evidence in preferences for redistribution, again using data from the ISSP. They find that the association between redistributive preferences and social norms differs widely across country, and that these differences explain part of the observed country differences in redistributive preferences.

This study adds to the existing empirical literature on two important dimensions. First, this study presents what is probably the most comprehensive evidence to date on the hypothesized association of individuals' subjective perceptions of inequality and their normative beliefs about distributional justice with the effective level of inequality and redistribution. Moreover, it also provides evidence on the association of subjective inequality measures and labor market institutions. Second, this paper also provides evidence on how these two dimensions are linked together at the individual level. Specifically, I estimate the association between individuals' subjective evaluations of inequality and their political preferences, such as their support for progressive taxation. The empirical analysis uses internationally comparable survey data covering many OECD member countries and three different points in time and uses a simple conceptual framework. The key feature of the framework is the (conceptual and empirical) distinction between individuals' perceptions of the actual level of wage inequality on the one hand and individuals' normative assessment of the ethical level of wage inequality on the other hand. The discrepancy between the perception of the actual level of inequality and the eth-

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<sup>6</sup>The ISSP has administered three surveys on social inequality to date (1987, 1992, and 1999), providing one of the few available cross-country data sets focusing on questions of social inequality and distributive justice. See section 2 below for additional information, as I use the same source of data.

ically tolerated level of inequality leads to a natural and intuitive measure of an individual's normative assessment of market justice. That is, a large discrepancy between actual and ethical wage inequality is viewed as a situation in which the perceived distribution of wages is not judged as fair (and vice versa).

The remainder of this paper is organized as follows. In the next section I discuss the main data source that contains individuals' subjective estimates of earnings for different occupations. Section 3 describes the conceptual framework and its empirical implementation. A substantial part of the empirical analysis is devoted to the description of the diversity of perceptions and normative beliefs across countries and over time. This evidence is presented and discussed in section 4. Section 5 provides a more stringent econometric analysis, again focusing association between subjective and objective inequality measures. Section 6 provides evidence on one potential channel linking the two dimensions of inequality at the individual level, studying the association between subjective inequality measures and individuals' more general political preferences. Section 7 concludes.

## 2 Data

### 2.1 Data Source

I primarily use the three available surveys focusing on the theme of social inequality from the International Social Survey Program (ISSP), which is a collaboration of various national survey organizations.<sup>7</sup> The first survey administered by the ISSP on the main theme of social inequality has been administered in 1987, the second in 1992, and the third in 1999. Another, fourth survey has been administered in 2009.<sup>8</sup> While only ten countries participated in the first survey on social inequality in 1987, the number of participating countries has steadily increased and already about thirty countries participated in the 1999 survey (see appendix table B.1 for details).

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<sup>7</sup>I also use some additional, aggregate-level data on various objective measures such as the effective level of inequality in disposable household income, the factual impact of redistribution, or the effective amount of overall social expenditure for some ancillary regressions. These data are taken from different sources: OECD (2008), the World Income Inequality Database (compiled by the United Nations University), the Penn World Tables (compiled by the Center for International Comparisons at the University of Pennsylvania), and the Labour Market Institutions Database (compiled by Stephen Nickell and Luca Nunziata). See appendix table B.2 for details.

<sup>8</sup>The data from this fourth survey are obviously of special interest as the survey has been administered amidst the financial crisis in 2009. Unfortunately, however, these data will not be available before the year 2011.

There have been some changes regarding the survey design over time. Some of these changes impose restrictions on the number of observations that can effectively be used in the empirical analysis because only quite few variables can be constructed in a consistent way for all three years and all countries. Thus I use a limited set of control variables in return for a large number of observations from all three survey years and from the maximum number of countries.

In the econometric analysis below (section 5) I will also use some additional aggregate-level variables from sources other than the ISSP, such as objective measures of inequality or different measures of labor market regulation and institutions. These variables and their sources, along with descriptive statistics, are listed in appendix table B.2.

## 2.2 Individuals' Subjective Wage Estimates

The most fascinating data available in all three ISSP surveys probably are individuals' subjective estimates of actual and ethical wages for people working in various specific occupations, such as a bus driver or a skilled worker in a factory. Individuals were asked to estimate what they thought to be the actual wage of people working in different occupations and what they thought people in these occupations ought to be paid from their point of view (denoted as actual and ethical wage estimates, for short).

Specifically, respondents were asked the following two questions (in the original wording from the source questionnaire of the ISSP):

- *“We would like to know what you think people in these jobs actually earn. Please write how much you think they actually earn each month (before taxes, but after social security contributions). Many people are not exactly sure about this, but your best guess will be close enough.”*
- *“Next, what do you think people in these jobs ought to be paid. How much do you think they should earn each month (before taxes, but after social security contributions), regardless of what they actually earn.”*

The full list of occupations for which individuals gave wage estimates is given on the ordinate of figure 1 as well as in appendix table A.1.<sup>9</sup> Figure 1 gives an overall impression of

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<sup>9</sup>Table A.1 also contains the original description of the occupations in the survey and shows that the list of occupations has slightly changed over time.

how these subjective estimates differ across occupations. It shows median values of actual and ethical wage estimates for each of these occupation, using the data pooled across all available countries and years.<sup>10</sup> More specifically, the hollow triangles show median values of actual wage estimates for the different occupations, while the hollow circles show the corresponding median values for ethical wage estimates.

Figure 1

Several features of figure 1 are noteworthy. First, individuals' estimates of actual compensation do not necessarily reflect the real level of compensation for any occupation, since individuals may, or may not, be informed about wages paid in different occupations.<sup>11</sup> Second, there is a distinct ranking of occupations not only with respect to actual wages but also with respect to ethical wages.<sup>12</sup> Thus individuals not only perceive large wage differentials across occupations, but also that they accept quite large wage differentials across occupations. This in turn implies that absolute wage equality is usually not viewed as an ethical distribution of market wages. In fact it appears that individuals do not really disagree about whether there should be differences in pay across different occupations, but that they only disagree over how large these differences should ideally be. Another interesting observation is that actual and ethical wage estimates differ to a substantial degree for many occupations (though not for all). For example, the median estimate for actual earnings of a lawyer (relative to the earnings of a skilled worker) amounts to about 4.5, while the median ethical estimate amounts to about 3.9 only. Overall, differences between actual and ethical estimates tend to be lower for lower-skilled and middle-skilled occupations than for higher-skilled occupations. Moreover, the difference between actual and ethical wage varies substantially across occupations and has different signs for different occupations. Ethical wages tend to be higher than actual wages for those occupations with lower actual wages, such as a secretary or a skilled factory worker,

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<sup>10</sup>To get rid of different scaling across countries (due to, e.g., different currencies), I re-scale all wage estimates in a given year and country by the corresponding average actual wage estimate for an unskilled worker. However, note that this issue will be irrelevant later on because I will focus on inequality indices (i.e. inequality indices focus on wage shares and thus differences in the absolute level of wages across countries are irrelevant).

<sup>11</sup>Indeed, Osberg and Smeeding (2006, Table 6) show that individuals' estimates of the actual level of compensation of the chairman of a large national company are probably much lower than the effective level of executive pay. At the same time, people appear to have approximately correct perceptions about the wage of a skilled manufacturing worker.

<sup>12</sup>Moreover, note that the ranking of occupations with respect to ethical wages is almost the same as the ranking with respect to actual wages (this is true at least in the data pooled across all countries and years).

while ethical wages are on average lower than actual wages for occupations with a high level of perceived earnings, such as a lawyer or the chairman of a large national company.

### 3 Conceptual Framework

In this section I will explain how individuals' subjective estimates of actual and ethical wages for different occupation can be used to construct subjective measures of wage inequality as well as a measure of individuals' normative assessment of market justice using a simple conceptual framework proposed by Kuhn (2009), who initially applied the framework to Swiss survey data (also from the ISSP).

The framework essentially applies concepts that are routinely used for the measurement of objective inequality to subjective wage estimates such as those discussed in the preceding section. The main additional conceptual ingredient of the framework is the explicit distinction between individuals' perceptions of actual wages on the one hand and their normative beliefs about ethical or fair wages on the other hand.<sup>13</sup>

#### 3.1 Objective Wage Data

The starting point of the conceptual framework is the measurement of objective wage inequality. One of the most routinely used and best known measures of objective wage inequality is the Gini coefficient (e.g. Lambert, 2001). One feature of the Gini coefficient that will turn out to be important when applying it to subjective wage data is that, even though the computation of the Gini coefficient is usually done using individual-level wage data, it is easily possible to approximate the individual-level Gini coefficient using group-level data on wages only (e.g. Gastwirth and Glauberman, 1976).

Indeed, in the limit it is sufficient to observe wage information for two distinct groups of individuals only to roughly approximate the underlying overall wage inequality. Obviously, however, the approximation is less precise the fewer distinct groups there are. Formally, assume that there are only two distinct, mutually exclusive, and exhaustive groups of wage earners (bottom group and top group, for short) and that we observe the following information for

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<sup>13</sup>This conceptual distinction between individuals' perceptions on the one hand and their normative evaluations on the other hand is prevalent in the sociological literature, see Kelley and Evans (1993), Jasso (1978, 1980, 1999) or Osberg and Smeeding (2006), among many others. See also Sen (2000), who makes an analogous distinction between the perceived and the ethically tolerated level of inequality.

these two groups:

$$y \equiv (\bar{y}_{\text{bottom}}, \bar{y}_{\text{top}}, f_{\text{bottom}}), \quad (1)$$

with  $\bar{y}_{\text{bottom}}$  and  $\bar{y}_{\text{top}}$  denoting the average wage of the bottom group and the top group of wage earners, respectively, and with  $f_{\text{bottom}}$  denoting the fraction of individuals belonging to the bottom group.<sup>14</sup> It is easy to show that the Gini coefficient in this case is simply given by the difference between the population share of the bottom group and the wage share of the bottom group (see appendix C):<sup>15</sup>

$$G = f_{\text{bottom}} - q_{\text{bottom}} \quad (2)$$

Thus in the most simple case imaginable all that is needed to compute the Gini coefficient are the wage and population shares of the two distinct groups of wage earners.

### 3.2 Subjective Wage Data

The case of subjective wage estimates is similar to the discussion above, with two major modifications. First, as there are no objective wages any more, (group-specific) wage estimates become individual-specific and thus can potentially differ between any pair of individuals. Specifically, two different individuals may have very different estimates of the average wage within the bottom or the top group of wage earners. Formally, this means that  $\bar{y}_{\text{bottom}}$  and  $\bar{y}_{\text{top}}$  are not fixed parameters any more, but are now individual-specific quantities, i.e.  $\bar{y}(i)_{\text{bottom}}$  and  $\bar{y}(i)_{\text{top}}$ . Even though it is clearly imaginable that individuals also have different perceptions/beliefs about the population shares of the two groups, I treat the population shares as

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<sup>14</sup>Because there are only two groups of wage earners and because these two groups represent the population of workers, the two population shares must add up to one. This implies that the two population shares are simply given by  $f_{\text{bottom}}$  and  $(1 - f_{\text{bottom}}) = f_{\text{top}}$ , respectively.

<sup>15</sup>Note that the average wage is simply given by  $\bar{y} = \bar{y}_{\text{bottom}} \cdot f_{\text{bottom}} + \bar{y}_{\text{top}} \cdot f_{\text{top}}$ . This implies that the wage share of the bottom group is given by

$$q_{\text{bottom}} = \frac{f_{\text{bottom}} \bar{y}_{\text{bottom}}}{f_{\text{bottom}} \bar{y}_{\text{bottom}} + f_{\text{top}} \bar{y}_{\text{top}}},$$

and thus that the Gini coefficient can be computed based on the information contained in  $y$  only. Moreover, in the case of objective wage data it is always the case that  $\bar{y}_{\text{bottom}} \leq \bar{y}_{\text{top}}$ . Therefore  $q_{\text{bottom}}$  is always lower than or equal to  $f_{\text{bottom}}$  (in fact,  $G$  always lies between 0 and  $f_{\text{bottom}}$ ). As I will discuss below, the situation may be somewhat different in the case of subjective wage data (see footnote 22).

fixed parameters, implying that  $f_{\text{bottom}}$  does not vary across individuals.<sup>16</sup> Second, note that there are two different subjective wage estimates from an individual’s point of view: there are estimates of actual wages (i.e. perceptions) and estimates of ethical wages (i.e. normative valuations), which I will call actual and ethical wages in the following. While actual wage estimates refer to wages that people perceive to actually prevail, ethical wage estimates refer to wages that they view as ethically tolerable. Formally, assume that we observe the following information for each respondent:

$$y(i)^{\text{actual}} \equiv (\bar{y}(i)_{\text{bottom}}^{\text{actual}}, \bar{y}(i)_{\text{top}}^{\text{actual}}, f_{\text{bottom}}), \quad \text{and} \quad (3a)$$

$$y(i)^{\text{ethical}} \equiv (\bar{y}(i)_{\text{bottom}}^{\text{ethical}}, \bar{y}(i)_{\text{top}}^{\text{ethical}}, f_{\text{bottom}}) \quad (3b)$$

where  $y(i)^{\text{actual}}$  denotes the set of information that describes an individual’s perception of the actual wage distribution, while  $y(i)^{\text{ethical}}$  refers to those wages that he or she would judge as fair. In both cases, and analogously to the case of objective wages, all that is needed to get an empirical approximation to the underlying full distribution of wages are these three statistics each.

In practice, subjective estimates of the two average group wages as well as the fraction of individuals that belongs to the bottom group must be estimated in a first step.<sup>17</sup> To get the corresponding wage estimates I first assign each occupation for whom individuals estimated wages to either the bottom or the top group of wage earners.<sup>18</sup>

$$\begin{aligned} \text{bottom} = \{ & \text{unskilled worker, farm worker, shop assistant, secretary, bank clerk,} \\ & \text{bus driver, skilled worker, bricklayer, owner of a small shop} \} \end{aligned} \quad (4a)$$

$$\text{top} = \{ \text{doctor, lawyer, minister, judge, chairman, owner of a factory} \} \quad (4b)$$

Based on this simple classification of occupations, group-specific wages, either actual (in which

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<sup>16</sup>The main reason for doing so is that there is no adequate information in the survey to approximate individuals’ perceptions of population shares. Besides that, however, treating  $f_{\text{bottom}}$  as a fixed parameter also has the advantage that the framework thereby exclusively focuses on differences in wage estimates.

<sup>17</sup>Because there are only two different groups, it suffices to estimate  $f_{\text{bottom}}$  from the data as  $f_{\text{top}}$  is simply given by  $(1 - f_{\text{bottom}})$ . Note that the population weights are assumed to be fixed parameters, while wage estimates for the two groups are allowed to differ across individuals. The notation I use is therefore a bit sloppy because the population shares are not indexed, but should not cause any confusion.

<sup>18</sup>Note that those occupations assigned to the bottom (top) group on average have ethical wage estimates that are higher (lower) than the corresponding actual wage estimates (see figure 1 above).

case superscript  $w = \text{actual}$ ) or ethical ( $w = \text{ethical}$ ), can be estimated as simple averages of occupation-specific wage estimates:

$$\bar{y}(i)_{\text{bottom}}^w = \frac{\sum_{j=1}^{15} \mathbf{1}(j \in \text{bottom})y(i)_j^w}{\sum_{j=1}^{15} \mathbf{1}(j \in \text{bottom})\mathbf{1}(y(i)_j^w \neq *)}, \quad \text{and} \quad (5a)$$

$$\bar{y}(i)_{\text{top}}^w = \frac{\sum_{j=1}^{15} \mathbf{1}(j \in \text{top})y(i)_j^w}{\sum_{j=1}^{15} \mathbf{1}(j \in \text{top})\mathbf{1}(y(i)_j^w \neq *)}, \quad (5b)$$

where  $y(i)_j^w$  denotes an individual's actual or ethical wage estimate for people working in occupation  $j$ , and where  $*$  denotes a missing wage estimate.<sup>19</sup>

Finally, the fraction of individuals belonging to the bottom group is estimated from the observed distribution of individuals across occupations in the sample:

$$f_{\text{bottom}} = \frac{1}{n} \sum_{i=1}^n \mathbf{1}(\text{isco}_i \in [3, 9]), \quad (6)$$

where  $\text{isco}_i$  denotes an individual's major occupational code according to the International Standard Classification of Occupations (ISCO).<sup>20</sup> I estimate a different  $f_{\text{bottom}}$  for each country and year. As mentioned above, however, within any country $\times$ year-cell the size of the two groups is the same for all individuals and the same for both the distribution of actual and ethical wages.<sup>21</sup>

### 3.3 Subjective Inequality Indices and the Assessment of Market Justice

Assuming that estimates of the components of (3a) and (3b) are available, the corresponding individual-level Gini coefficients are again given by the following simple expressions (again, see

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<sup>19</sup>As indicated by the second indicator function in the denominator, group-specific wages can be computed for any single individual as long as he or she gives at least one wage estimate per group (i.e. at least one wage estimate for the top group and at least one estimate for the bottom group). This procedure can also easily take care of the fact that the list of occupations has changed somewhat over time and that wage estimates for all fifteen occupations are available only in 1992 and only for some few countries (see appendix table A.1).

<sup>20</sup>According to this classification, major group 1 consists of "legislators, senior officials and managers" and major group 2 of "professionals".

<sup>21</sup>The population shares actually do not change much over time within countries. The results would therefore hardly change if I would allow the population shares to vary only across countries only (but not over time).

appendix C):

$$G(i)^{\text{actual}} = f_{\text{bottom}} - q(i)_{\text{bottom}}^{\text{actual}}, \quad \text{and} \quad (7a)$$

$$G(i)^{\text{ethical}} = f_{\text{bottom}} - q(i)_{\text{bottom}}^{\text{ethical}}, \quad (7b)$$

where  $q(i)_{\text{bottom}}^w$  denotes the estimated wage share of the bottom group (i.e. the estimated share of total wages going to the bottom group) as estimated by individual  $i$ . Thus, as above in the case of objective wage data, the Gini coefficient is simply given by the difference between the population share of the bottom group and the wage share of the bottom group.<sup>22</sup>

Three points are especially noteworthy. First, and most importantly, subjective inequality measures can – and usually will – differ between individuals simply because individuals usually have different perceptions of actual and/or different normative assessments of ethical wages (that is, individuals will differ regarding the wage share of the bottom group,  $q(i)_{\text{bottom}}^w$ ). Moreover, since the population share is basically fixed across individuals, variation in perceptions and ethical valuations of inequality between individuals is almost entirely driven by different perceptions and valuations of the wage share accruing to the bottom group. Thus, in strong contrast to the objective measurement of inequality, inequality here is in the eye of the beholder and, as a consequence, there is a whole distribution of inequality measures and not just one summary measure (unless respondents do not differ regarding their wage estimates). Second, actual and ethical wage inequality can differ from each other for any given individual because actual and ethical wage shares of the bottom group may be different from each other (because the underlying wage estimates for different occupations may be different). This implies that actual and ethical inequality may differ, which in turn opens up an easy way of measuring individuals' assessment of market justice as the discrepancy between the two inequality measures (see below). Third and finally, note that the support of  $G(i)^w$  is in principle bounded by the population share of the bottom group. To circumvent the problem that the theoretical range of the inequality indices varies across countries and years because the population shares vary accordingly, I normalize them using the theoretical maximum of the corresponding Gini

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<sup>22</sup>In principle, the two subjective Gini coefficients can take on negative values (in contrast to the Gini coefficient describing objective wage data). This is possible because some individuals may think that the wage share of the bottom group is actually larger than their population share (i.e.  $q(i)_{\text{bottom}}^w$  can take on any value between zero and one). As shown in table 1 below, this is indeed true for a tiny fraction of individuals.

coefficient, which in the case of grouped data with two different groups only is simply given by the population share of the bottom group.<sup>23</sup>

Given that both subjective inequality measures for the same individual are actually observed, it's straightforward to define the potential demand for equalization of market wages as the desired relative reduction in wage inequality:

$$R(i) = \left( 1 - \frac{G(i)^{\text{ethical}}}{G(i)^{\text{actual}}} \right), \quad (8)$$

with  $G(i)^{\text{actual}}$  and  $G(i)^{\text{ethical}}$  as defined in equations (7a) and (7b). Note that a positive demand for equalization of market wages can only arise if the evaluation of ethical wages differs from the perceived distribution of wages. In other words, demand for equalization of wages is different from zero only if the wage shares of the two groups regarding the actual distribution differ from the corresponding wage shares with respect to the ethical distribution. Also note that the demand for equalization of market wages can be negative if the ethical inequality index is larger than the perceived inequality index.<sup>24</sup>  $R(i)$  measures only the potential demand for redistribution as the measure does not directly imply that individuals really desire that the distribution of market wages is adjusted according to their evaluations.

Thus, while  $R(i)$  says something about the discrepancy between individuals' perceptions of actual inequality and their normative views of the fair distribution of wages, it is not necessarily informative regarding individuals' beliefs that something should be done to eliminate this discrepancy, or even more specifically that the state should intervene correspondingly. It may thus be more correct to view  $R(i)$  as a measure of individuals' normative assessment of market justice, or rather the absence of market justice, with values of  $R(i)$  close to (far from) zero indicating a high (low) belief in market justice.

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<sup>23</sup>For  $k = 2$ , the maximum value of the Gini coefficient is attained in the case where all earnings are accruing to the top group and the bottom group has zero earnings. In this case we thus have that  $G^{\text{max}} = [(f_{\text{bottom}} + (f_{\text{bottom}} + f_{\text{top}})) \cdot 1] - 1 = f_{\text{bottom}}$  according to equation (C.2) in the appendix. Further note that  $F_1 = f_{\text{bottom}}$ ,  $F_2 = (f_{\text{bottom}} + f_{\text{top}}) = 1$  because there are only two groups and that  $q_1 = 0$  and  $q_2 = 1$  in the case of maximum inequality (i.e. all wages go to the top group).

<sup>24</sup>The demand for equalization of market wages can also be larger than one if either  $G(i)^{\text{actual}}$  or  $G(i)^{\text{ethical}}$  takes on a negative value (see also footnote 22).

## 4 The Diversity of Perceptions and Beliefs

This section documents that there is pronounced variation in all three subjective inequality measures across individuals, countries, and over time. I first focus on the key features within the pooled data and then move on to differences in perceptions and beliefs across countries and over time.

### 4.1 Subjective Inequality Measures: Key Features

Table 1 starts with some simple descriptives regarding the different measures of individuals' inequality perceptions and their normative beliefs about the just distribution of wages.

Table 1

First, panel (a) shows the estimated fraction of individuals that are classified as belonging to the bottom group of the overall population. This fraction is estimated to be 77% on average, and it varies between a low of about 57% (Canada in 1992) to a high of almost 92% (Poland in 1992). The actual wage share of the bottom (top) group amounts to 42% (58%), while the ethical wage share is about 54% (about 46%). Next, panel (b) shows descriptives regarding the two subjective inequality measures. Average inequality perception across all countries and years equals 0.451. Moreover, not one single individual perceives no pay differentials at all as the fraction of individuals who perceive the wages of the bottom group to be the same as the wages of the top group is zero. At the same time the average ethical inequality amounts to 0.301 only, i.e. the ethical level of inequality is about a third lower than the perceived level. Also note that only few individuals (actually less than one percent of the overall sample), would judge absolute equality as fair, as can be seen from the fraction of individuals with an ethical inequality of zero. Regarding individuals' assessment of market justice, panel (c) shows that people favor a more equal distribution of wages across occupations than the distribution they perceive to actually exist (on average by about one third). Indeed, the overwhelming majority (about 90%) of individuals has a positive demand for equalization of wages, while only a small fraction of the sample has no or even a negative demand (about 8.2% and 1.6%, respectively).<sup>25</sup> At the same time, only few individuals would like to eliminate all differences

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<sup>25</sup>Literally, a negative demand for equalization of market wages implies that an individual wants to increase the level of wage inequality. While this is suggestive of a regressive transfer, in most cases this is simply driven

in pay across individuals (i.e. have either a demand for equalization of wages of exactly one or larger than one).

Figure 2

Figure 2 underlines some key features graphically. First, panel (a) shows a simple scatterplot of ethical versus actual inequality estimates. Clearly, ethical inequality is lower than actual inequality for most individuals (most observations are located below the 45° line, indicated by the dashed line). Consequently, the overwhelming majority of individuals has a demand for equalization of market wages that is larger than zero, as shown by panel (b) of figure 2. However, the figure also clearly shows that only very few individuals would like to reduce all perceived wage differentials (meaning that they would like equal wages for all occupations). This general pattern notwithstanding, however, it is also evident that people have widely different perceptions of the actual level of inequality and beliefs about the ethical level of inequality.

## 4.2 Country Differences

One of the most recurrent themes in the existing literature is the marked difference between Europe and the United States regarding preferences over redistribution and perceptions of the causes of inequality (e.g. Alesina and Glaeser, 2004). I thus start with a comparison between the Anglo-American countries on the one side and the European countries (Eastern and Western European countries separated) on the other side.

The upper three panels of figure 3 show density estimates for the whole distribution of the three subjective inequality measures for each the the three regions. The densities differ markedly from each other, and they do so in the expected direction. First, individuals in the Anglo-American countries perceive much higher wage inequality than Europeans, as shown in panel (a). At the same time, panel (b) shows that Europeans are much less tolerant towards inequality than individuals from Anglo-American countries.

Figure 3

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by an individual's desire to increase both the wage of the bottom and the top group but with a larger desired relative increase regarding the wage of the top group (reflecting the fact that overall perceived wages may differ from overall ethical wages).

However, as shown by Osberg and Smeeding (2006), there is also considerable heterogeneity among European and Anglo-American countries as well. The remaining three panels of figure 3 illustrate the heterogeneity in perceptions and beliefs across countries within broader cultural/historical regions. Each panel shows country-specific density estimates of the demand for equalization of market wages. For readability, only two specific countries in each region are particularly marked.

First, panel (d) shows that Sweden and Switzerland mark the two extreme distributions within Western Europe, and thus the remaining countries fall somewhere between these two countries. Correspondingly, Latvia and Slovakia represent the two extremes among the Eastern European countries (see panel (e)), and so do Northern Ireland and the United States for the group of Anglo-American countries (as shown in panel (f)). It is also interesting to note that it appears that there is more heterogeneity across countries within the group of Western and Eastern European countries than within the group of Anglo-American countries.

### 4.3 Changes Over Time

Because three are different years of survey focusing on questions of social inequality (1987, 1992, and 1999), I can also study whether individuals' perceptions and normative beliefs have changed over time. Figure 4 shows density estimates of the demand for equalization of market wages and the two inequality indices, respectively, separately for each year of survey.<sup>26</sup>

Figure 4

The first two panels show that there were substantial shifts over time regarding the two inequality indices. More specifically, perceptions of actual inequality have unambiguously gone up over time, as shown in panel (a). Also note that a bimodal distribution existed in 1987 which vanishes over time.<sup>27</sup> At the same time, panel (b) shows that the ethical level of inequality has also gone up, countervailing the upward trend in the perceived level of wage inequality. Again, there is some bimodality in the distribution in 1987, but not in later years. Because the two subjective inequality indices tend to trend into the same direction over time, they partially

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<sup>26</sup>For this figure I restrict the sample to observations from those countries/regions that participated in all three surveys (Australia, former West Germany, Great Britain, Hungary, and the United States).

<sup>27</sup>The bimodality is driven by Hungary, the only Eastern European country that has participated in the 1987 survey. This in turn implies that subjective evaluations in Hungary have converged towards the distribution of the other countries over time.

cancel each other. As a result, there is not much change to the demand for equalization of market wages over time as shown in panel (c).

## 5 The Association of Subjective with Objective Measures of Inequality and Redistribution

The next step of the analysis is to see whether these differences in perceptions and beliefs across countries (and over time) are related to corresponding differences in objective measures of inequality and redistribution. To start exploring this issue, figure 5 thus shows some simple scatterplots at the country  $\times$  year level.

Figure 5

Panel (a) shows that there is only a weak association between the effective amount of inequality regarding the distribution of market income and average perceptions of inequality.<sup>28</sup> This is true even though there is substantial variation in both the effective inequality before taxes and transfers as well as in the perceived level of inequality at the aggregate level. In contrast, however, there is a strong positive correlation between the effective after-tax/transfer inequality and the ethical level of inequality; as shown in panel (b). Observations with a high level of ethical inequality, such as the US, indeed have a substantially higher after tax/transfer inequality than countries with a low level of ethical inequality, such as Germany or Sweden. Finally, panel (c) shows that there is a strong empirical association of the difference in the effective inequality after and before taxes and transfers with the demand for equalization of market wages as well. Indeed, this figure clearly shows that the reduction in income inequality through taxes and transfer payments is larger among countries with a high level of demand for equalization of market wages, such as Sweden and Austria, than among countries with a low demand, such as the United States or Switzerland.

### 5.1 Econometric Analysis

However, it remains to be shown that there still is an associations between subjective and objective inequality measures once observable differences in the sample composition across

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<sup>28</sup>The correlation becomes somewhat stronger, but remains weak, if the Eastern European countries are excluded.

countries and over time are taken into account. This is the goal of the following econometric analysis.<sup>29</sup> Because objective measures of inequality and redistribution are obviously only available at the aggregate level, it is necessary to implement the analysis at the aggregate level as well. It is therefore necessary to aggregate the two subjective inequality indices and the redistribution measure correspondingly.

For this reason I first run a simple two-way fixed effects regression model to get empirical estimates of country fixed effects relating to the demand for equalization of market wages as well as regarding the two subjective inequality measures. To model the variation in subjective inequality measures at the individual level, I use a simple regression model with unobservables at the country- and year-level of the following form:

$$y_{ijt} = \beta_0 + x_{ijt}\beta + \theta_j + \lambda_t + \varepsilon_{ijt}, \quad (9)$$

where  $y_{ijt}$  denotes the outcome of interest, e.g. the perceived level of wage inequality, of individual  $i$  from country  $j$  and year  $t$ . Individual-level control variables are denoted by  $x_{ijt}$ , and  $\theta_j$  and  $\lambda_t$  denote unobserved country and calendar-year fixed effects, respectively. Note that differences in  $\hat{\theta}_j$  represent systematic differences in any given outcome across countries, net of differences in observed characteristics and of common changes over time. The main estimation results regarding actual and ethical wage inequality as well as the normative assessment of market justice are shown in appendix table B.3. I will not discuss these estimates in detail because I am primarily interested in getting empirical estimates of  $\theta_j$ .<sup>30</sup>

In the second step I estimate a series of simple regression models that describe the sign and strength of the empirical association between subjective and objective inequality measures:<sup>31</sup>

$$\omega_{jt} = \alpha_0 + \alpha_1\hat{\theta}_j + x_j\beta + \lambda_t + \varepsilon_{jt}, \quad (10)$$

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<sup>29</sup>See Di Tella and MacCulloch (2002) for an analysis of the determinants of unemployment benefits in a similar spirit as the analysis in this section.

<sup>30</sup>Nonetheless, it is important to note that these estimates are line with the results from previous micro-level studies on the determinants of redistributive preferences. For example personal income rank has a strong and statistically significant effect on all three measures. Specifically, individuals with higher income tend to have a higher perceived and also a higher tolerated level of inequality. Overall, people with higher income tend to have a lower demand for equalization of market wages, however.

<sup>31</sup>Appendix table 2 reports results for analogous regression models where the key regressor  $\hat{\theta}$ (demand) is replaced with  $\hat{\theta}$ (actual inequality) and  $\hat{\theta}$ (ethical inequality).

Here,  $\omega_{jt}$  denotes some aggregate-level outcome of interest for country  $j$  and year  $t$ , such as the Gini coefficient of disposable household income after taxes and transfer payments or some measure of labor market institutions (e.g. the degree of employment protection).<sup>32</sup> The Gini coefficient of disposable household income before taxes and transfer payments, the unemployment rate, and the log of per-capita GDP, and the share of the population in working age (% of total population aged between 15 and 64) are included as control variables  $x_j$ . The regressions also include calendar-year fixed effects, denoted by  $\lambda_t$ . Finally, note that these regressions take into account that both the dependent variable and the control variables vary only at the aggregate level.

Table 2

Table 2 first discusses results when country fixed effects regarding the two subjective inequality measures are used as main regressors. Specifically, the first four columns show results for outcomes that relate to the effective level of inequality and redistribution, while the remaining four columns describe different aspects of labor market regulation. The first two rows show point estimates of the two key regressors along with their standard errors, while the two bottom rows show approximate elasticities of each outcome variable with respect to these two variables.<sup>33</sup>

The outcome variable in the first column is the effective inequality in disposable household income, after taxes and transfer payments.<sup>34</sup> As shown by the corresponding elasticities at the bottom of the table, the association between the effective level of inequality and the two subjective inequality measures is very pronounced (-0.321 in the case of actual, 0.274 in the case of ethical inequality), even though only the ethical level of inequality turns out to be statistically significant. In the case of overall social expenditure and public cash transfers, both actual and ethical inequality turn out to be statistically significant predictors. The quantitative effects are again large, as the approximate elasticities vary between 0.560 and 1.1.93 (in absolute size). Household taxes are also significantly associated with the ethical,

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<sup>32</sup>See appendix table B.2 for details on and descriptives of the aggregate level variables.

<sup>33</sup>Because the sample mean of  $\hat{\theta}_j$  is zero, I report the predicted change in the outcome variable resulting from an increase by  $\hat{\theta}$  of one standard deviation, divided by the sample mean of the corresponding outcome.

<sup>34</sup>Note that the same estimates (but with sign reversed) would result for the difference between the Gini before and the Gini coefficient after taxes and transfers because the Gini before taxes and transfers is also included as a regressor.

but not the perceived level of wage inequality. Also note the large R-squared in each of these regressions, varying between 0.41 and 0.82.

The next four columns look at outcomes that describe labor market institutions. The dependent variable in the fourth column is an index of employment protection, with higher values denoting stricter regulation in this respect. Again, the ethical but not the perceived level of inequality turns out to be significantly associated with the outcome. The elasticity of employment protection with respect to the ethical level of inequality is as high as -1.118. The next two columns look at the two key parameters of the unemployment insurance system: the potential benefit duration and the replacement rate. In contrast to the outcomes considered thus far, neither the actual nor the ethical level of inequality is significantly associated with either of the two outcomes. Finally, the outcome in the last column is the tax wedge. As in the case of unemployment insurance, the two subjective inequality measures have no significant relation to the outcome.

Table 3

Table 3 shows analogous results for regressions where the demand for equalization of market wages is used a main regressor (instead of the two subjective inequality measures). The last row of table 3 again shows an estimate of the elasticity of the dependent variable with respect to the key regressor (see footnote 33).

First, the estimated association of the redistribution measure and the after tax/transfer Gini coefficient is huge. The approximate elasticity of the effective Gini after taxes and transfers with respect to the demand for market equalization at the country level is -0.155. Consistent with the unconditional correlation from figure 5, therefore, there remains a large and significant association between the level of redistributive preferences, measured by  $R(i)$ , and the effective level of after tax/transfer inequality in income after netting out differences in sample composition across countries and over time.

The second column shows results for total social expenditure (as percentage of real per-capita GDP). Consistent with the result from the first column, countries with a higher demand for equalization of market wages tend to have larger overall social expenditure. Again, the estimated association is large in quantitative terms, as the implied elasticity is 0.312. The outcome in the third (fourth) column are overall public cash transfers (household taxes) as a

fraction of disposable household income for an individual of working age. In countries with a higher demand for wage equalization, both public cash transfers and taxes are a larger fraction of disposable household income, *ceteris paribus*. The corresponding approximate elasticities with respect to redistributive preferences are, respectively, 0.487 and 0.140.

The remaining four columns again show results for the four outcomes of labor market regulation, and these additional results suggest that the demand for wage equalization is also substantially associated with these institutional variables. The first measure is an index of employment protection. Countries with a higher demand for the equalization of market wages tend to have much stricter employment protection (the estimated elasticity is 0.618). The dependent variables in columns (6) and (7) are, respectively, the maximum unemployment benefit duration and the benefit replacement rate. The corresponding elasticities are -0.214 and 0.368, respectively. Finally, the last column of table 3 shows results for the tax wedge.

## 6 Subjective Inequality Measures and Political Preferences

One can think of various channels linking objective and subjective measures of inequality and redistribution. However, the channel probably stressed most by economists runs from individuals' preferences through their more general political preferences and their voting behavior to effective political-economic outcomes (see Borck, 2007, for a detailed discussion).

In this final part of the empirical analysis I will therefore focus on the association between subjective inequality measures and individuals' more general political preferences such as their support for progressive taxation. As before, I use simple two-way fixed-effects regression specification to estimate the strength of the association between political preferences and subjective inequality evaluations:

$$p_{ijt} = \alpha y_{ijt} + \beta_0 + x_{ijt}\beta + \theta_j + \lambda_t + \varepsilon_{ijt}, \quad (11)$$

where the dependent variable  $p_{ijt}$  is one of three measures of political preferences. The regressor of key interest is some subjective inequality measure, denoted by  $y_{ijt}$ . The regression models either include the two subjective inequality measures or individuals' assessment of market justice. The remaining control variables are the same as before (see equation (9) above). As above, results with and without country and calendar year fixed-effects are shown and standard

errors are clustered by country×calendar-year. All standard errors in these regressions are clustered by country×calendar-year and thus take potential correlation of error terms within countries into account (e.g. Moulton, 1986).

Table 4

Table 4 shows results for different measures of political preferences. The first two columns show results for individuals' general support for redistribution by the state.<sup>35</sup> The first column clearly shows that those individuals with a high demand for equalization of market wages tend to be in support of redistribution by the state. The corresponding point estimate is statistically significant and moreover large in substantial terms. Evaluated at sample means, the elasticity of the support for redistribution by the state with respect to the demand for equalization of market wages amounts to about 12.5% ( $= (0.319 \cdot 0.255)/0.65$ ), as shown at the bottom of the table. Relative effects have about the same size if the two inequality indices are included as regressors instead of the demand for equalization of market wages, as can be seen from column (2). The corresponding elasticities are 0.258 and -0.256, respectively.

The next two columns show estimates of the association between subjective inequality measures and people's support for progressive taxation. Again, column (3) shows a strong and statistically significant association between the demand for equalizing market wages and the support for progressive taxation. Thus thus individuals with a higher demand for equalizing market wages are clearly much more in favor of progressive taxation than those with a low demand. Again, the size of the estimated coefficients is remarkable, even though much smaller than in the case of general support for redistribution by the state (the elasticity of support for progressive taxation with respect to redistributive preferences amounts to 0.047). The two subjective inequality measures are also significantly associated with the support for progressive taxation, as shown in the fourth column.

Finally, the last two columns report results for individuals' general political self-assessment on a simple left-right scale. The underlying scale runs from 0 to 10, with higher values denoting orientation to the right. As expected, individuals with a higher demand for equalizing market wages think of themselves as more left-wing voters than those with a low demand. Again, besides being of statistical significance, the estimated coefficient turns out to be large

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<sup>35</sup>Again, see appendix A for variable definitions.

in substantive terms. The elasticity of political orientation regarding the demand for equalization of market wages is -0.156; the elasticities with respect to actual and ethical inequality, respectively, are -0.328 and 0.323.

## 7 Conclusions

There is considerable variation in individuals' perceptions of the effective level of wage inequality as well as in their assessments of the ethical level of inequality. Not surprisingly, there is huge heterogeneity in perceptions and beliefs not only within, but also across countries. As expected, individuals from European countries tend to demand more redistribution than people from Anglo-American countries. Further scrutiny of the data shows that there is considerable heterogeneity across different countries from the same cultural/historical region as well. Indeed, differences in subjective inequality measures across countries are so large that there is considerable overlap in perceptions and beliefs for countries from different regions. There is also some evidence of substantial shifts in perceptions and norms over time. Specifically, both the perceived and the ethical level of wage inequality have increased over time.

The key result of this study is that there remain large country differences in both the perception of inequality and the ethical level of inequality, and thus also in the demand for redistribution, after controlling for observable differences in individual-level determinants of these measures. These remaining differences in subjective inequality indices and redistributive preferences are in many cases strongly and significantly associated with objective measures of inequality and redistribution, such as the effective level of after tax/transfer inequality, as well as with measures of labor market regulation, such as employment protection.

This paper also provides evidence that the subjective and objective dimension of inequality and redistribution are, at least in part, linked through individuals' more general political preferences at the micro level. Indeed, and in line with the evidence of strong associations between subjective and objective inequality measures, individuals with stronger redistributive preferences tend to be more in favor of state intervention regarding distributional issues in general. Moreover, these individuals are also more often supportive of progressive taxation and they also tend to position themselves on the left rather than on the right of the political spectrum.

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Table 1: Subjective inequality measures, descriptive statistics

	Mean	Standard deviation
<i>(a) Subjective wage distributions</i>		
Population share, bottom group	0.774	0.080
Population share, top group	0.226	0.080
Actual wage share, bottom group	0.420	0.174
Actual wage share, top group	0.580	0.174
Ethical wage share, bottom group	0.539	0.165
Ethical wage share, top group	0.461	0.165
<i>(b) Subjective inequality measures</i>		
Gini coefficient, actual wage distribution	0.463	0.200
$\mathbf{1}(\text{Actual Gini} = 0)$	0.000	0.000
$\mathbf{1}(\text{Actual Gini} < 0)$	0.001	0.038
Gini coefficient, ethical wage distribution	0.310	0.180
$\mathbf{1}(\text{Ethical Gini} = 0)$	0.005	0.073
$\mathbf{1}(\text{Ethical Gini} < 0)$	0.005	0.068
<i>(c) The assessment of market (in)justice</i>		
Demand for equalization of wages	0.319	0.278
$\mathbf{1}(\text{Equalization} < 0)$	0.082	0.274
$\mathbf{1}(\text{Equalization} = 0)$	0.016	0.127
$\mathbf{1}(\text{Equalization} > 0)$	0.902	0.298
$\mathbf{1}(\text{Equalization} = 1)$	0.005	0.073
$\mathbf{1}(\text{Equalization} > 1)$	0.004	0.061

Notes: All numbers refer to the data pooled across all countries and years.  $\mathbf{1}(\cdot)$  denotes the indicator function. Variable definitions are given in the main text.

Table 2: Aggregate regressions, specifications using subjective inequality indices

	Inequality and redistribution				Labor market institutions			
	Gini(a)	SocExp	PCB	HT	EP	BD	BRR	TW
Mean	0.301	21.643	20.867	29.897	0.945	0.549	0.406	0.538
Standard deviation	0.046	5.006	8.778	5.941	0.593	0.321	0.172	0.098
$\hat{\theta}$ (actual inequality)	-0.487 (0.374)	126.312*** (26.920)	185.719** (73.819)	48.908 (31.539)	6.049 (5.069)	-2.241 (3.270)	0.767 (1.506)	0.956 (1.645)
$\hat{\theta}$ (ethical inequality)	1.007**	-201.594*** (33.207)	-303.570*** (97.344)	-94.855** (40.016)	-12.879* (6.238)	3.315 (3.970)	-2.387 (1.900)	-2.152 (2.089)
Gini(b)	0.511*	-6.035 (20.972)	6.702 (27.347)	-71.181*** (24.130)	1.246 (1.951)	6.354** (2.265)	-4.181*** (0.865)	-0.088 (0.915)
Unemployment rate	-0.003 (0.003)	0.195 (0.237)	-0.268 (0.788)	-1.021** (0.365)	-0.032 (0.037)	-0.036 (0.023)	0.040*** (0.013)	0.017 (0.012)
ln(real GDP/capita)	-0.057 (0.083)	1.007 (8.359)	0.610 (5.934)	-15.411*** (4.801)	-0.497 (0.422)	-0.417 (0.553)	-0.094 (0.195)	0.247 (0.245)
Population aged 15 to 64	-0.010** (0.004)	0.841** (0.316)	1.615 (0.956)	0.263 (0.451)	0.154*** (0.033)	-0.025 (0.036)	0.028* (0.015)	0.006 (0.012)
Year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of observations	30	30	30	29	30	30	30	25
p-value (F-statistic)	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.005
R-Squared	0.631	0.762	0.711	0.735	0.821	0.410	0.667	0.576
Elasticity w.r.t.								
$\hat{\theta}$ (actual inequality)	-0.321	0.560	0.854	0.157	0.615	-0.392	0.181	0.171
$\hat{\theta}$ (ethical inequality)	0.274	-0.764	-1.193	-0.260	-1.118	0.495	-0.482	-0.328

Notes: \*, \*\*, \*\*\* denotes statistical significance on the 10%, 5%, and 1% level, respectively. Robust standard errors in parentheses.  $\hat{\theta}$ (demand) denotes the estimated country fixed effect for the demand for wage equalization, derived from equation (9). Variable abbreviations are as follows: Gini(b) = Gini before taxes and transfers; Gini(a) = Gini after taxes and transfers; SocExp = total social expenditure (% of GDP); PCB = public cash transfer (% of disposable household income); HT = household taxes (% of disposable household income); EP = employment protection; BD = benefit duration (unemployment insurance); BRR = benefit replacement rate (unemployment insurance); TW = tax wedge. Aggregate-level variables are taken from various sources (see footnote 7 and table B.2). Elasticity w.r.t.  $\hat{\theta}$ (inequality) shows the hypothetical relative change in the dependent variable resulting from an increase of  $\hat{\theta}$ (inequality) by one standard deviation.

Table 3: Subjective inequality, objective inequality, and labor market institutions

	Inequality and redistribution				Labor market institutions			
	Gini(a)	SocExp	PCB	HT	EP	BD	BRR	TW
Mean	0.301	21.643	20.867	29.897	0.945	0.549	0.406	0.538
Standard deviation	0.046	5.006	8.778	5.941	0.593	0.321	0.172	0.098
$\hat{\theta}(\text{demand})$	-0.790*** (0.162)	114.600*** (10.015)	172.086*** (42.954)	71.095*** (22.782)	9.892*** (1.509)	-1.992 (1.336)	2.530*** (0.779)	2.228*** (0.672)
Gini(b)	0.540* (0.275)	-0.403 (18.415)	29.774 (32.449)	-71.519*** (24.700)	0.810 (2.842)	6.206*** (2.049)	-4.408*** (0.824)	-0.602 (0.867)
Unemployment rate	-0.002 (0.003)	0.087 (0.191)	-0.494 (0.769)	-1.096*** (0.335)	-0.051* (0.026)	-0.037* (0.020)	0.037*** (0.012)	0.018 (0.010)
ln(real GDP/capita)	-0.017 (0.081)	-2.149 (7.656)	-2.078 (5.680)	-17.835*** (4.558)	-1.080** (0.424)	-0.422 (0.542)	-0.249 (0.192)	0.157 (0.210)
Population aged 15 to 64	-0.009** (0.004)	0.854*** (0.295)	1.426 (0.988)	0.226 (0.470)	0.143*** (0.045)	-0.028 (0.035)	0.025 (0.019)	0.009 (0.011)
Year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of observations	30	30	30	29	30	30	30	25
p-value (F-statistic)	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.006
R-Squared	0.567	0.793	0.677	0.719	0.715	0.427	0.577	0.502
Elasticity w.r.t. $\hat{\theta}(\text{demand})$	-0.155	0.312	0.487	0.140	0.618	-0.214	0.368	0.244

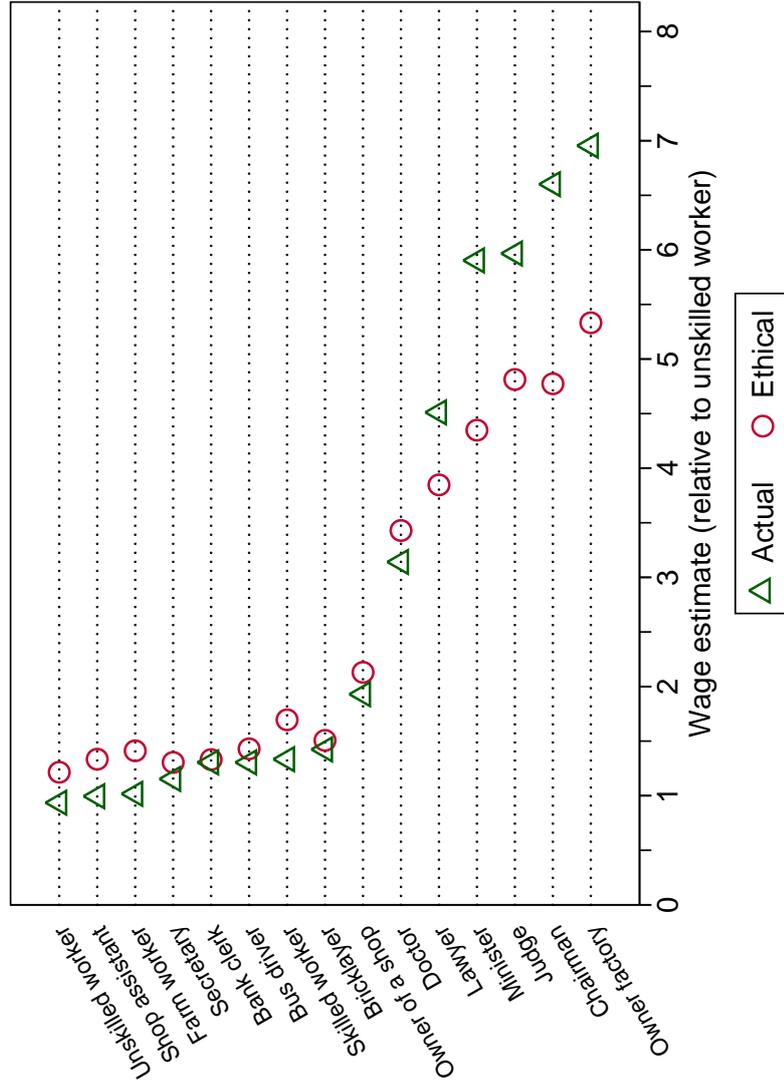
Notes: \*, \*\*, \*\*\* denotes statistical significance on the 10%, 5%, and 1% level, respectively. Robust standard errors in parentheses.  $\hat{\theta}(\text{demand})$  denotes the estimated country fixed effect for the demand for wage equalization, derived from equation (9). Variable abbreviations are as follows: Gini(b) = Gini before taxes and transfers; Gini(a) = Gini after taxes and transfers; SocExp = total social expenditure (% of GDP); PCB = public cash transfer (% of disposable household income); HT = household taxes (% of disposable household income); EP = employment protection; BD = benefit duration (unemployment insurance); BRR = benefit replacement rate (unemployment insurance); TW = tax wedge. Aggregate-level variables are taken from various sources (see footnote 7 and table B.2). Elasticity w.r.t.  $\hat{\theta}(\text{demand})$  shows the hypothetical relative change in the dependent variable resulting from an increase of  $\hat{\theta}(\text{demand})$  by one standard deviation.

Table 4: Subjective inequality measures and political preferences

	Redistribution by the state		Progressive taxation		Conservative orientation	
Mean	0.650	0.650	0.776	0.776	0.340	0.340
Standard deviation	0.477	0.477	0.417	0.417	0.474	0.474
Demand for equalization	0.255*** (0.030)		0.114*** (0.017)		-0.171*** (0.026)	
Actual inequality		0.361*** (0.049)		0.257*** (0.031)		-0.226*** (0.042)
Ethical inequality		-0.535*** (0.072)		-0.243*** (0.033)		0.326*** (0.063)
Individual-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	50,863	50,863	49,306	49,306	28,011	28,011
R-Squared	0.184	0.182	0.059	0.061	0.088	0.088
Elasticity w.r.t.						
Demand for equalization	0.125		0.047		-0.156	
Actual inequality		0.258		0.153		-0.328
Ethical inequality		-0.256		-0.098		0.323

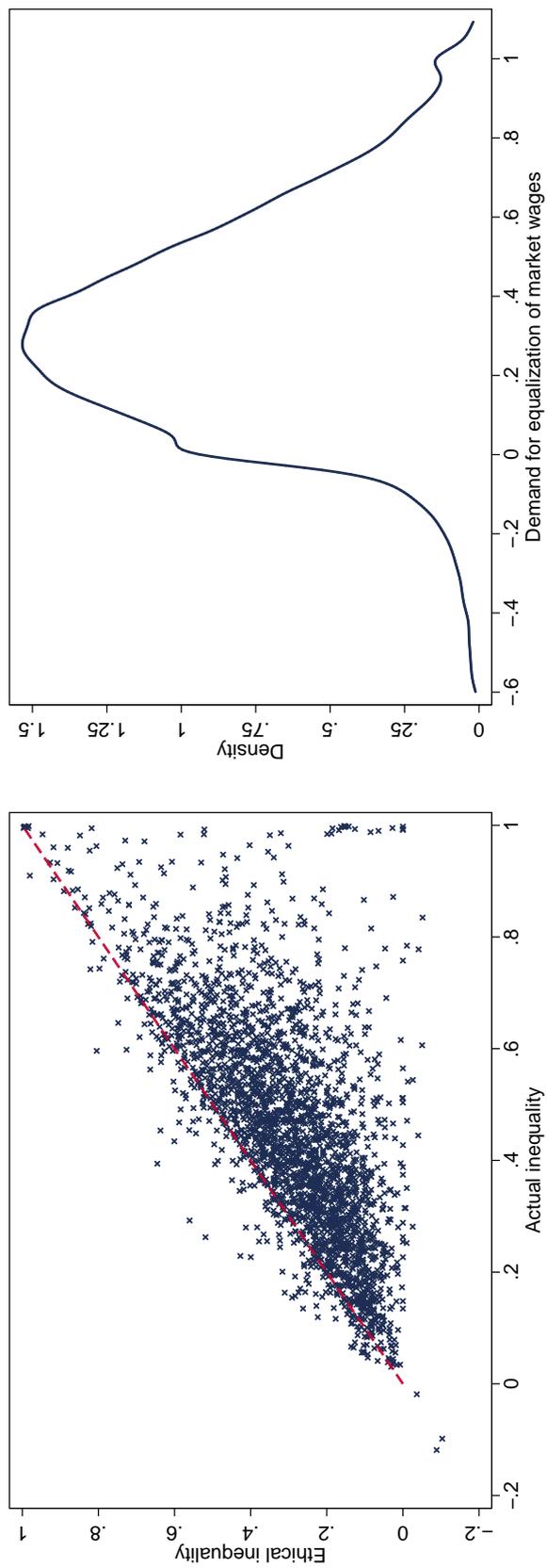
Notes: \*, \*\*, \*\*\* denotes statistical significance on the 10%, 5%, and 1% level, respectively. Robust standard errors are given in parentheses and are clustered by country×year. Variable definitions are given in the main text.

Figure 1: Subjective wage estimates, by occupation



Notes: The figure shows median estimates for wages in different occupations, pooled over all countries and years. The hollow triangles (circles) refer to actual (ethical) wage estimates. Individual wage estimates have been re-scaled with the average actual wage estimate of an unskilled worker in a given country and year of survey. See also table A.1 in the appendix.

Figure 2: Subjective inequality measures, pooled data

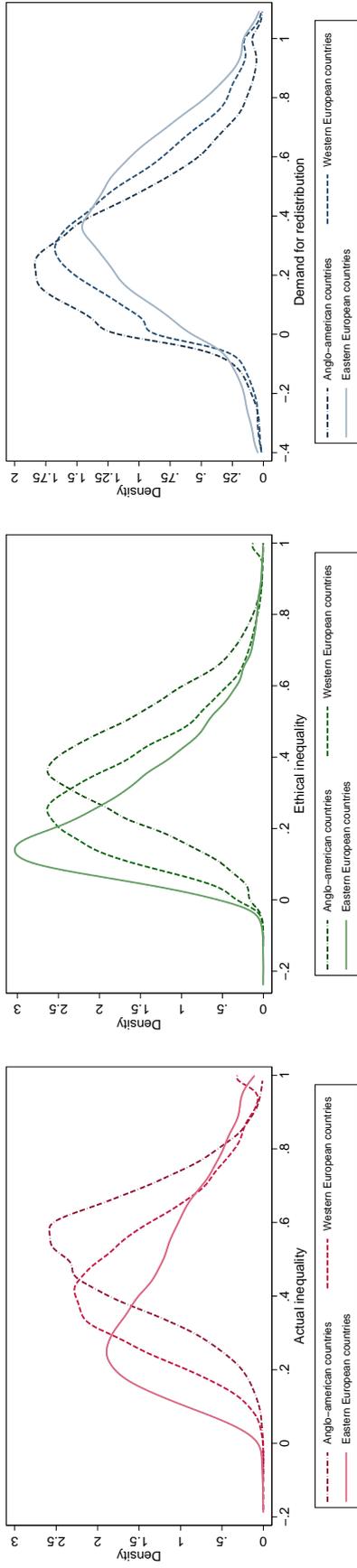


(a) Actual versus ethical inequality

(b) Demand for equalization of market wages

Notes: Both figures are based on data pooled across all available countries and years. Panel (a) is based on a 5% random sample from the overall sample. Variable definitions are given in the main text. Density estimate in panel (b) uses the Gaussian kernel.

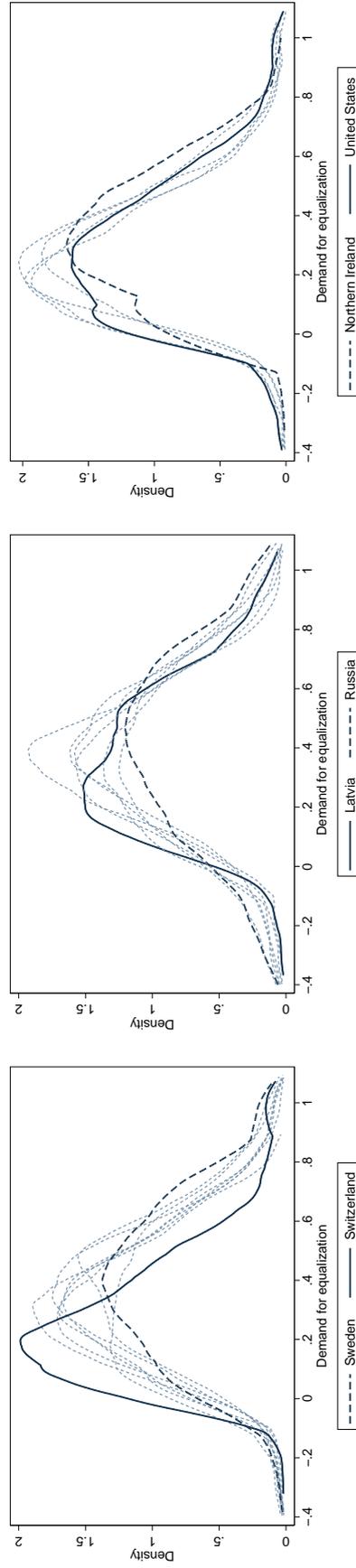
Figure 3: Subjective inequality measures, by region



(a) Actual inequality

(b) Ethical inequality

(c) Demand for equalization of market wages



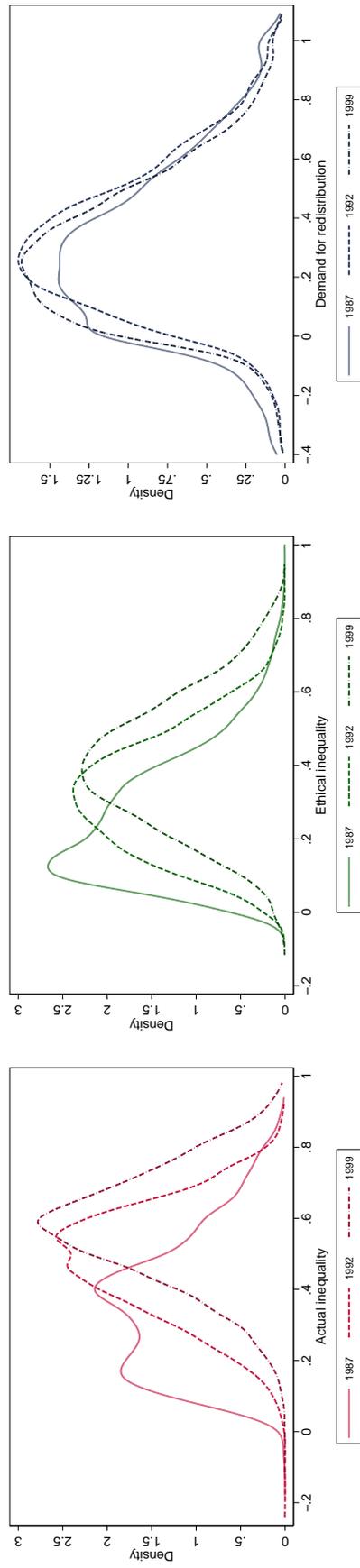
(d) Western European countries

(e) Eastern European countries

(f) Anglo-American countries

Notes: The Anglo-American region includes the following countries: Australia, Canada, Great Britain and Northern Ireland, New Zealand, and the United States. Western Europe includes: Austria, Cyprus, France, (West) Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. Eastern Europe includes: Bulgaria, Czech Republic, (East) Germany, Hungary, Latvia, Poland, Russia, Slovakia and Slovenia. Variable definitions are given in the main text. Density estimates use the Gaussian kernel.

Figure 4: Subjective inequality measures, by year of survey (selected countries only)



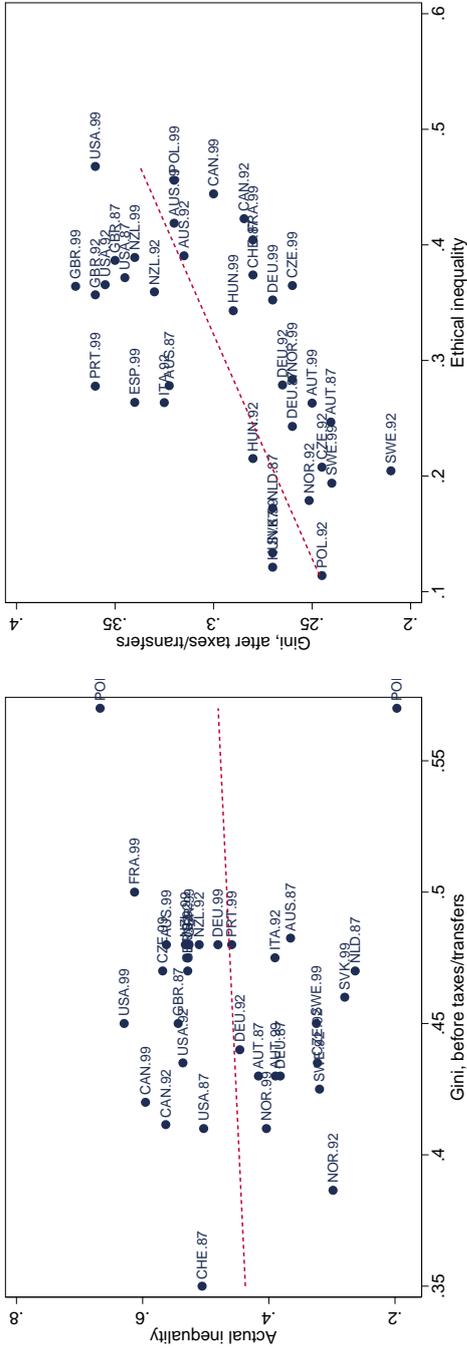
(a) Actual inequality, by year

(b) Ethical inequality, by year

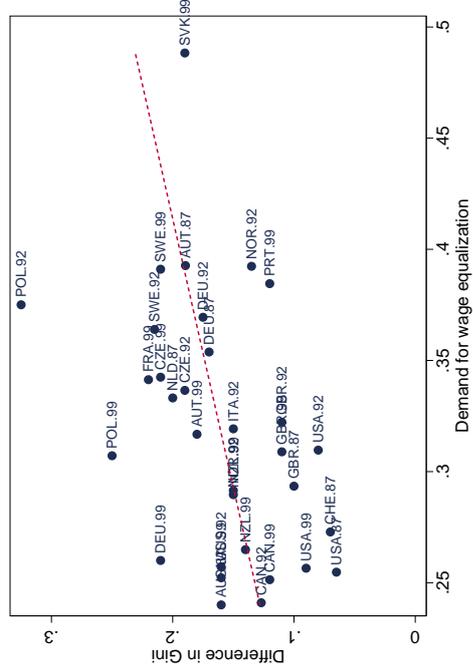
(c) Demand for redistribution, by year

Notes: Figures are based on observations from those countries from those countries that participated in all three years only (Australia, former West Germany, Great Britain, Hungary, and the United States). Variable definitions are given in the main text. Density estimates use the Gaussian kernel.

Figure 5: Subjective and objective inequality measures, country  $\times$  year averages



(a) Gini of disposable household income (before taxes and transfers) versus perceived inequality (b) Gini of disposable household income (after taxes and transfer payments) versus ethical inequality



(c) Difference in Gini before and Gini after taxes and transfers versus demand for equalization of market wages

Notes: The figure shows sample means for country  $\times$  year-cells. The dashed line shows the estimated regression function. Variable definitions are given in the main text and in appendix table B.2.

## A Variable Definitions

### A.1 Dependent Variables

**Subjective Wage Estimates** Table A.1 shows the complete list of occupations, by year of survey, for which individuals were asked to give subjective wage estimates. There have been several changes to the list of occupations over time, but that the majority of occupations in 1999 is still the same as in 1987.

**Support for redistribution by the state:** Individuals' support for redistribution by the state is measured by a simple item from the survey: *“Do you agree or disagree? It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes.”* The possible answers range from 1 (*“strongly disagree”*) to 5 (*“strongly agree”*). In the empirical analysis I will simply use a dichotomized variable taking on the value 1 if an individual (strongly) agrees with the statement and 0 otherwise.

**Support for progressive taxation:** Individuals' support for progressive taxation is measured by a single survey item: *“Do you think people with high incomes should pay a larger share of their income in taxes than those with low incomes, the same share, or a smaller share?”* Possible answers range from 1 (*“much smaller share”*) to 5 (*“much larger share”*). In the analysis I use a dichotomized variable taking on the value 1 only if an individual strongly agrees with the statement and 0 otherwise.

**Conservative orientation:** Individuals' stated political orientation on a simple left-right scale. *“Based on your current voting intention, would you call yourself left-wing or right-wing?”* Possible answer categories range from 1 (*“far left”*) to 5 (*“far right”*).

### A.2 Individual-level Regressors

I use three sets of regressors to model the variation in the three subjective inequality measures (see table B.3 for full regression results): (i) variables which describe the factors that do or ought to determine actual pay from the individuals' point of view, (ii) variables describing individuals' self-interest in redistribution or economic variables mediating self-interest in redistribution, and (iii) additional control variables which potentially correlate with unobserved determinants of subjective inequality measures (like risk aversion, for example).

**Belief that needs should be important:** This variable is meant to capture the extent to which an individual thinks that one's needs should be important in determining their income (need principle). This variable is constructed from the following two questions about the factors that should be important in determining one's pay: *“In deciding how much people ought to earn, how important should each of these things be, in your opinion? (i) What is needed to support your family. (ii) Whether the person has children to support.”*

**Belief that effort should be important:** This variable is meant to capture the equity principle and is constructed from five questions about which factors should be important in determining pay: *“In deciding how much people ought to earn, how important should each of these things be, in your opinion? (i) How much responsibility goes with the job. (ii) The number of years spent in education and training. (iii) Whether the job requires supervising others. (iv) How well he or she does the job. (v) How hard he or she works at the job.”*

**Perception that ascribed skills are important:** This variable measures the extent to which a person believes in ascribed factors as being important in determining the amount of compensation. This question relates to the perception of individuals of which factors actually are important for getting ahead. “*We have some questions about opportunities for getting ahead: (i) How important is coming from a wealthy family? (ii) Knowing the right people?*”

**Perception that acquired skills are important:** This variable measures if an individual thinks that acquired skills are actually important in determining one’s pay. The variable is the sum of over two different questions: “*We have some questions about opportunities for getting ahead: (i) Do you agree or disagree? In [country], people get rewarded for their effort. (ii) In [country], people get rewarded for their intelligence and skills.*”

**Income:** An individual’s personal net monthly income, expressed as the rank of an individual within the income distribution in a given country and year.

**Social mobility:** The only information about individuals’ mobility available in the data is given by two simple questions about individuals’ self-perception of the position today and ten years ago: “*(i) In our society, there are groups which tend to be towards the top and groups which tend to be toward the bottom. Below is a scale that runs from top to bottom. Where would you put yourself on this scale? (ii) And ten years ago, where did you fit then?*” Both are measured on a scale from 1 (bottom) to 10 (top). The mobility scale used simply is defined as the difference between the two scores (i.e. position today minus position ten years ago).

**Perception of social conflicts:** This variable measures individuals’ perceptions of conflicts within society. Included items are questions about the existence of conflicts between: “*In all countries, there are differences or even conflicts between different social groups. In your opinion, In [country] how much conflict is there between...: (i) Poor people and rich people? (ii) The working class and the middle class? (iii) Management and workers? (iv) People at the top of society and people at the bottom? (v) Young people and older people?*”

**Socio-demographic controls:** The remaining controls that are used in the analysis are self-explanatory: Age (in years), highest attained education (in years), gender, occupation (dummy variables denoting major occupational group according to the International Standard Classification of Occupations), and employment status (dummy variables indicating employment, unemployment and nonemployment, respectively).

Table A.1: Subjective Wage Estimates for Specific Occupations

Occupation	Abbreviation	1987	1992	1999
"An unskilled worker in a factory"	Unskilled worker	✓	✓	✓
"A bricklayer "	Bricklayer	✓	(✓)	✓
"A shop assistant in a department store"	Shop assistant		✓	
"A farm worker"	Farm worker	✓	✓	
"A secretary"	Secretary	✓	(✓)	
"A bus driver"	Bus driver	✓	(✓)	
"A skilled worker in a factory"	Skilled worker	✓	✓	✓
"A bank clerk"	Bank clerk	✓	(✓)	
"The owner of a small shop "	Shop owner	✓	✓	
"A lawyer"	Lawyer		✓	✓
"A doctor in general practice"	Doctor	✓	✓	✓
"The owner-manager of a large factory"	Owner of a factory		✓	✓
"A cabinet minister in the national government"	Minister	✓	✓	✓
"A judge in [country's highest court]"	Judge		✓	✓
"The chairman of a large national company"	Chairman	✓	✓	✓
"Your own occupation"	Own occupation			✓

Notes: The first columns contains the original wording from the ISSP source questionnaire. The second column lists the corresponding abbreviations used in the figures and tables. (✓) denotes that wage estimates in 1992 are available for Australia, Sweden, and Slovenia only.

## B Additional Tables and Figures

Table B.1: Number of observations with valid information on the key dependent variable, by country and year

Country	Year of survey			Total	
	1987	1992	1999	Absolute	Fraction
Australia	1,387	1,956	1,477	4,820	0.87
Austria	891		872	1,763	0.89
Bulgaria		928	737	1,665	0.72
Canada		871	896	1,767	0.89
Chile			1,034	1,034	0.69
Cyprus			983	983	0.98
Czech Republic		867	1,665	2,532	0.86
France			1,701	1,701	0.90
East Germany		861	432	1,293	0.81
West Germany	1,153	1,477	737	3,367	0.73
Great Britain	1,009	912	621	2,542	0.82
Hungary	2,083	1,096	1,000	4,179	0.83
Israel			960	960	0.79
Italy		940		940	0.94
Latvia			877	877	0.80
Netherlands	1,405			1,405	0.86
New Zealand		1,091	965	2,056	0.88
Northern Ireland			514	514	0.62
Norway		987	1,153	2,140	0.76
Philippines		563	1,066	1,629	0.68
Poland		1,112	895	2,007	0.83
Portugal			745	745	0.65
Russia		1,423	1,200	2,623	0.71
Slovakia			1,059	1,059	0.98
Slovenia		950	754	1,704	0.83
Spain			720	720	0.59
Sweden		574	983	1,557	0.82
Switzerland	829			829	0.84
United States	1,184	843	991	3,018	0.73
Total	9,941	17,451	25,037	52,429	0.75

Notes: The last column shows the fraction of valid observations to overall sample size. Valid observations are those with non-missing values on all three measures of subjective inequality.

Table B.2: Aggregate level variables, descriptives and sources

Variable	Mean	Standard deviation	N×T	Source
Gini(b)	0.457	0.043	35	World Income Inequality Database
Gini(a)	0.296	0.044	39	World Income Inequality Database
SocExp	21.195	4.621	37	OECD
PCB	23.046	9.109	39	OECD
HT	28.988	6.044	34	OECD
EP	0.966	0.595	31	Labor Market Institutions Database
BD	0.541	0.319	31	Labor Market Institutions Database
BRR	0.414	0.175	31	Labor Market Institutions Database
TW	0.535	0.098	26	Labor Market Institutions Database
UR	7.855	3.704	31	Labor Market Institutions Database
ln(rGDP)	9.681	0.539	51	Penn World Table
POP1564	66.888	1.597	39	OECD

Table B.3: Full regression results

	Inequality		Demand
	Actual	Ethical	for equalization
Mean	0.463	0.310	0.319
Standard deviation	0.200	0.180	0.278
Income (rank)	0.034*** (0.008)	0.035*** (0.007)	-0.036*** (0.012)
Social mobility	-0.008*** (0.002)	0.001 (0.001)	-0.010*** (0.002)
Perception: ascribed features are important	0.007*** (0.001)		0.003 (0.002)
Perception: acquired features are important	-0.026*** (0.006)		-0.037*** (0.005)
Belief: needs should be important		-0.017*** (0.002)	0.025*** (0.003)
Belief: effort should be important		0.027*** (0.003)	-0.040*** (0.007)
Age (years)	0.001*** (0.000)	0.001*** (0.000)	-0.001*** (0.000)
Perception of social conflicts	0.001 (0.003)	-0.010*** (0.002)	0.025*** (0.004)
Education (years)	0.001* (0.001)	0.002*** (0.000)	-0.005*** (0.001)
Female	-0.015*** (0.002)	-0.026*** (0.002)	0.032*** (0.004)
Unemployed	0.015*** (0.005)	0.013*** (0.004)	-0.007 (0.007)
Not in labor force	-0.000 (0.003)	0.009*** (0.003)	-0.019*** (0.005)
Occupation			
Professional	-0.003 (0.004)	-0.015*** (0.005)	0.019** (0.008)
Technician or associated professional	-0.012** (0.005)	-0.022*** (0.005)	0.025*** (0.007)
Clerk	-0.007* (0.004)	-0.017*** (0.005)	0.020*** (0.006)
Service worker	-0.019*** (0.005)	-0.031*** (0.004)	0.040*** (0.006)
Skilled worker	-0.023*** (0.008)	-0.042*** (0.008)	0.060*** (0.011)
Craft worker	-0.012** (0.005)	-0.036*** (0.005)	0.058*** (0.006)
Plant/machine operator	-0.018*** (0.006)	-0.043*** (0.006)	0.075*** (0.007)
Elementary occupation	-0.022*** (0.007)	-0.033*** (0.007)	0.044*** (0.008)
Constant	0.394*** (0.036)	0.213*** (0.023)	0.441*** (0.022)
Country fixed effects	Yes	Yes	Yes
Calendar-year fixed effects	Yes	Yes	Yes
Number of observations	52,429	52,429	52,429
R-Squared	0.371	0.316	0.104

Notes: \*, \*\*, \*\*\* denotes statistical significance on the 10%, 5%, and 1% level, respectively. Robust standard errors are given in parentheses and are clustered by country×year. Variable definitions are given in the main text.

## C The Gini Coefficient With Two Groups Only

Assume that group-level data on wages, along with corresponding population weights, are observed

$$\{(\bar{y}_1, f_1), \dots, (\bar{y}_j, f_j), \dots, (\bar{y}_k, f_k)\}, \quad (\text{C.1})$$

where  $j = 1, \dots, k$  indexes groups of wage earners (assumed to be ordered according to their within-group average wage  $\bar{y}_j$ ).

For example,  $j$  may index the universe of occupations. Further, let  $f_j$  denote the population weight of group  $j$  (with  $\sum_j f_j = 1$  because  $j$  indexes the universe of groups of wage earners) and let  $\bar{y}_j$  denote the average wage of group  $j$ . For such grouped data, the Gini coefficient  $G$  can be computed as follows:<sup>36</sup>

$$G = \left( \left[ \sum_{j=1}^k 0.5 \cdot (F_{j-1} + F_j) q_j \right] - 0.5 \right) / 0.5 = \left[ \sum_{j=1}^k (F_{j-1} + F_j) q_j \right] - 1, \quad (\text{C.2})$$

$F_j$  denotes to the accumulated population share up to and including group  $j$ , and  $q_j$  represents the wage share of group  $j$ , i.e.  $q_j = (f_j \cdot \bar{y}_j) / \sum_{j=1}^k (f_j \cdot \bar{y}_j)$ .

In the case of two distinct groups only, the wage distribution can be fully described by the following three quantities only:

$$\{(\bar{y}_1, f_1), (\bar{y}_2, f_2)\} = \{(\bar{y}_1, f_1), (\bar{y}_2, (1 - f_1))\}, \quad (\text{C.3})$$

because  $f_1 + f_2 = 1$ . Moreover, it is easy to show that the computation of  $G$  simplifies considerably in this case. Multiplying out equation (C.2) and using the notation that  $j = 1 = \text{bottom}$  and  $j = 2 = \text{top}$  yields:

$$\begin{aligned} G &= [(0 + F_{\text{bottom}})q_{\text{bottom}} + (F_{\text{bottom}} + F_{\text{top}})q_{\text{top}}] - 1 \\ &= [(0 + f_{\text{bottom}})q_{\text{bottom}} + (f_{\text{bottom}} + 1)q_{\text{top}}] - 1 \\ &= f_{\text{bottom}}(q_{\text{bottom}} + q_{\text{top}}) + q_{\text{top}} - 1 \\ &= f_{\text{bottom}} - q_{\text{bottom}} \end{aligned} \quad (\text{C.4})$$

The first equality in equation (C.4) follows from the fact that  $F_0 = 0$  and  $F_1 = F_{\text{bottom}} = f_{\text{bottom}}$  (because  $F$  is a cumulative density function) and that  $F_2 = F_{\text{top}} = f_{\text{bottom}} + f_{\text{top}} = 1$  (because there are only two groups of wage earners). The last equality follows from the fact that  $(q_{\text{bottom}} + q_{\text{top}}) = 1$  by construction and that, therefore,  $(q_{\text{top}} - 1) = -q_{\text{bottom}}$ .

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<sup>36</sup>This formula in turn reflects the geometric interpretation of the Gini coefficient: the Gini coefficient equals the ratio of the area between the curve representing equal distribution of wages and the Lorenz curve to the area under the curve representing equal distribution (which is equal to 0.5 by construction). In the case of grouped wage data, the area above the Lorenz curve can be computed as the sum of trapezoids:

$$G = \sum_{j=1}^k 0.5 \cdot (F_{j-1} + F_j) q_j$$

Subtracting 0.5 (which equals the area above the diagonal) and dividing by 0.5 (which equals the area below the diagonal) therefore yields the formula for the Gini coefficient as given by equation (C.2).