

Article

Economic inequality and public demand for redistribution: combining cross-sectional and longitudinal evidence

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Abstract

One proposition of the popular median-voter hypothesis is a positive relationship between demand for redistribution and levels of inequality. However, empirical evidence of this relationship is scarce. A major shortcoming of previous research is that it is either cross-sectional, which casts general doubt on the causal nature of the estimates, or it is longitudinal and based on aggregated data, which makes it difficult to control for compositional effects or to analyze the individual-level implications of the hypothesis. This article estimates cross-sectional and longitudinal effects of inequality, while simultaneously controlling for the composition of data at the individual level. The article finds a positive within-country effect of inequality on demand for redistribution but no such relationship between countries. This finding points to an unobserved variable at the country level. Following the literature, the article considers welfare regimes as a possible factor capturing these unobserved country differences. However, none of the existing welfare regime typologies performs well in terms of capturing unobserved heterogeneity or in general explanatory power. All in all, the article finds robust support for the proposition that demand for redistribution is positively related to inequality, but it casts doubt on the utility of cross-sectional analysis and the welfare regime approach.

Key words: political economy, inequality, redistribution, income distribution, new growth theory, Europe

JEL Classification: D31, D63, O15

1. Introduction

The median-voter hypothesis (Meltzer and Richard, 1981) claims that high levels of income inequality are positively related to the amount of governmental income redistribution. If this hypothesis is true, a self-regulating mechanism preventing income inequality from rising too

high would exist. Research on the relationship between redistribution and income inequality, however, repeatedly finds a negative relationship between these variables (Moene and Wallerstein, 2001, 2003; Bradley *et al.*, 2003; Iversen and Soskice, 2006). Consequently, income inequality is rising in most OECD countries, a development that is regularly portrayed as problematic (OECD, 2011).

The mechanism linking economic inequality to redistribution proposed by the median-voter hypothesis is a multistage process that rests on a number of propositions: based on a rational-choice perspective the hypothesis argues that individuals support redistribution if their income is smaller than the mean income. The median is smaller than the mean if a distribution is right skewed. Right-skewed income distributions are found in all industrial societies. Consequently, the model expects the median voter in these countries to demand redistribution and increase this demand the higher the level of economic inequality (proposition 1). The median-voter hypothesis furthermore assumes that demand for redistribution is expressed in votes (proposition 2) and supplied by the governing parties (proposition 3).

This article tests the first of the three propositions of the median-voter hypothesis: that economic inequality affects the public demand for redistribution. Research into this relationship is still far from robust empirical evidence but might be vital to further evaluate the median-voter hypothesis: if proposition 1, the first step in the claimed causal process, is not true, the median-voter hypothesis as a whole can be rejected (Finseraas, 2009, p. 95). The major shortcoming of previous research into the relationship between inequality and demand for redistribution is that the analyses are either cross-sectional (for example, Lübker, 2007; Finseraas, 2009; Dallinger, 2010; Dion and Birchfield, 2010) or longitudinal but rely on aggregated data (for example, Aalberg, 2003; Kenworthy and McCall, 2008; Jæger, 2013). As I show in the literature review, both types of studies provide inconclusive results.

When comparing between countries, proposition 1 predicts higher demand for redistribution in countries with higher levels of inequality, everything else being equal (*ceteris paribus*). If countries differ in other respects than inequality, cross-sectional models are only unbiased if all relevant differences between countries can be controlled for. The relationship between inequality and demand for redistribution, as it is claimed by the median-voter hypothesis, might be effectively confounded by institutional differences that relate to both an inherent logic of solidarity adopted by the public and actual inequality (Lübker, 2007; Larsen, 2008; Dallinger, 2010). A challenge with these kinds of cross-sectional models, however, is that they are typically very sensitive to the choice of control variables because the number of potential controls is rather high, while the number of observed countries is usually rather small.

When comparing within countries over time, proposition 1 predicts that demand for redistribution increases (decreases) if inequality increases (decreases), again, everything else being equal (*ceteris paribus*). As many institutional factors and also other relevant variables are (nearly) constant within countries, longitudinal models should allow superior inference over cross-sectional models. However, a shortcoming of previously published longitudinal analyses is that they are based on aggregated data and therefore not able to test the individual-level implications of the median-voter hypothesis or adequately control for compositional effects from the individual level.

The following analysis contributes to the empirical literature by applying a multilevel hybrid model. This approach uses individual-level data and allows the decomposition of country-level effects into their between (cross-sectional) and within (longitudinal) components, while simultaneously controlling for compositional effects from the individual level

(Fairbrother, 2014). Applying the multilevel hybrid model allows me to make four contributions with this article. First, based on the longitudinal relationships in the data, I find a strong and robust positive effect of economic inequality on demand for redistribution, supporting proposition 1 of the median-voter hypothesis. Second, the simultaneous estimation of cross-sectional and longitudinal effects provides an opportunity for comparison, and I find that both types of effects differ substantially. In econometric terms, there must be systematic differences (unobserved heterogeneity) between countries that one needs to control for in cross-sectional models.¹ Third, following the literature, I consider welfare regimes the most popular candidate to control for such unobserved heterogeneity in ‘redistributive ethics’ (Bowles and Gintis, 2000, p. 33). To circumvent the problem of variable selection, I use numerous sets of control variables. The results show that none of the available welfare regime classifications, nor a mixture of them, are able to capture these between-country differences, a result that casts serious doubt on the welfare regime approach.

Fourth, because the model is based on individual-level data, it allows accounting for interaction effects between the country- and individual-levels. This provides an additional opportunity to test the median-voter hypothesis, which claims that differences between income groups decline if inequality is high. To that end, I account for an interaction between an individual’s income and the level of income inequality. I find that the individual income effect is strongly moderated by between-country differences, suggesting that polarization between income groups is smaller in countries with higher levels of inequality. This result also supports the median-voter hypothesis.

2. Theoretical considerations

Public support for redistribution has been the subject of research for more than half a century now. In general, one can distinguish between two sets of explanations. On the one hand, many studies are based on the idea of self-interest as one of the most important predictors of demand for redistribution. Within this framework, social scientists follow an economic argumentation and assume that individuals are *homines economici*. On the other hand, social beliefs are equally pronounced as determinants of demand for redistribution. These explanations rely on the idea of the *homo sociologicus*. Both sets of explanations are frequently used at the individual level and also at the contextual level and prove to be empirically relevant determinants of support for redistribution (Andress and Heien, 2001; Fong, 2001; Blekesaune and Quadagno, 2003; Linos and West, 2003; Blekesaune, 2007; Rehm, 2009; Breznau, 2010; Jæger, 2013).

- 1 I consider two different explanations for the inconsistency of within- and between-country effects. One reason can be a missing variable that is (empirically and theoretically) related to the constructs of demand for redistribution and economic inequality, that is, an omitted variable confounding the investigated relationship. The theoretical section deals extensively with this issue. Another explanation could be that cross-country measurements of demand for redistribution are not directly comparable because respondents do not report their absolute demand for redistribution but their demand for redistribution relative to the actual amount of redistributive social policy measures in their countries. This might be conceptualized as a cross-country measurement error. Therefore, this issue is dealt with in the section on data and methods. However, both types of biases can potentially be corrected by controlling for an omitted variable.

The median-voter hypothesis, as proposed by [Meltzer and Richard \(1981\)](#), is an economic hypothesis based on the argument of pure self-interest. Individuals are expected to demand more redistribution if their (monetary) utility is maximized by higher redistribution (proposition 1). As a consequence of a right-skewed income distribution, which are found in all industrial societies, the median voter's income is smaller than the mean income. Under a basic tax assumption, those with an income above the mean redistribute to those with an income below the mean, leading the model to predict that the median-voter demands redistribution. The model furthermore predicts that the preferred amount of redistribution is dependent on the level of inequality: the higher the economic inequality, the greater the median voter's demand for redistribution.

Hence, the median-voter hypothesis predicts that one should observe high demand for redistribution in countries with high levels of economic inequality. In other words, when comparing two countries, which differ only in their levels of economic inequality, one should find that aggregated demand for redistribution is higher in the more unequal country ([Alesina and Rodrik, 1994](#)). Moreover, the median-voter hypothesis predicts that one should observe an increase in aggregated demand for redistribution if inequality increases over time.

However, despite a 'simple intuition' ([Perotti, 1993](#), p. 756) that speaks for the logic of the median-voter hypothesis, the literature offers a variety of competing arguments ([Lübker, 2007](#)). [Alesina and Angeletos \(2005\)](#) discuss the possibility that equality can be a term in an individual's utility function. Their argument is framed within economic theory but allows demand for redistribution to reflect more than a narrow self-interest. When moving further away from economic frameworks, the political sociology literature offers more general explanations based on the concepts of social justice beliefs or (dominant) ideologies ([Kluegel and Smith, 1986](#); [Kluegel and Wegener, 1995](#); [Andress and Heien, 2001](#); [Linos and West, 2003](#); [Jæger, 2006b](#)). The literature on social justice beliefs argues that there are distinct justice principles (equality, equity and need; [Deutsch, 1975](#)), each relating to a different logic of solidarity and, as a consequence, differences in the preferred level of redistribution ([Andress and Heien, 2001](#), pp. 340–341).

Large parts of the literature rely on the idea of deservingness and argue that support for redistribution may be a function of the perceived deservingness of the receivers ([Alesina et al., 2001](#); [Van Oorschot, 2006](#); [Larsen, 2008](#); [Schmidt and Spies, 2014](#)). This literature assumes that individuals accept redistribution to in-group members but disapprove of redistribution to out-group members. The social justice and the deservingness approach share an important feature which separates them from the theoretical perspective of the original median-voter hypothesis. They assume that preferences for redistribution are determined not only by economic self-interest but also by social forces.

Deservingness perceptions and justice beliefs ultimately operate at the individual level, but there are significant cultural differences between countries. In this sense, it has been argued that differences in justice beliefs and deservingness perceptions explain 'why [...] the United States [doesn't] have a European-style welfare state' ([Alesina et al., 2001](#)). One of the most prominent country-level approaches for the explanation of attitudes toward redistribution is the welfare regime theory by [Esping-Andersen \(1990\)](#), which incorporates the aforementioned explanations in a unified framework. This theory assumes that the institutional settings of distinct welfare regimes (re)produce and foster different logics of solidarity ([Svallfors, 1997](#); [Arts and Gelissen, 2001](#); [Mau, 2004](#); [Larsen, 2006, 2008](#)). In the original

theory, Esping-Andersen (1990) introduces a threefold typology of ideal type welfare states: liberal, social-democratic and conservative regimes.²

Liberal regimes are characterized by a market-based distribution of resources. Welfare benefits are strictly means tested and aim to reduce poverty only for those worst off. Consequently, the social security system draws a sharp line between the payers and the receivers of welfare. Receivers of welfare are often perceived as not deserving help, and the dominant justice principle is the need principle (Clasen and Van Oorschot, 2002, p. 94), which results in a minimum of actual and preferred redistribution. Consequently, the regime hypothesis claims that support for redistribution is lowest in liberal regimes.

The social-democratic regime is characterized by universal benefits, which aim to promote equality (Esping-Andersen, 1990, p. 28). There is no segmentation between the group of net receivers and net payers because in these systems most people are receivers and payers at the same time. The dominant justice principle in the social-democratic welfare regime is the equality principle (Clasen and Van Oorschot, 2002, p. 94), which results in strong actual and preferred redistribution.

Finally, the conservative regime type is characterized by welfare systems that are designed to preserve social status differences. The level of state intervention is high compared with liberal regimes, but welfare benefits are based on contributions and not universal as in the social-democratic regime. The dominant justice principle is the equity principle (Clasen and Van Oorschot, 2002, p. 94). The actual and preferred amount of redistribution is assumed to lie between the social-democratic and the liberal regime type.

To summarize, the original median-voter hypothesis accounts only for economic factors and predicts that demand for redistribution is high if inequality is high. The welfare regime theory, on the other hand, suggests that one should observe strong support for redistribution in countries where inequality is low because preferences for redistribution and inequality both express culturally determined ‘tastes for equality’ (Kenworthy and Pontusson, 2005, p. 459). Thus, from a narrow rational-choice perspective, inequality is expected to affect demand for redistribution positively (proposition 1 of the median-voter hypothesis). This relationship should be found within countries (within effects) but also between countries (between effects). Therefore, one can expect to find high levels of support for redistribution in countries with high levels of economic inequality and that demand for redistribution grows if inequality within a country increases. From a perspective based on ‘worlds of welfare (attitudes)’, one can hypothesize that levels of inequality and support for redistribution actually reflect institutionally embedded preferences. From this perspective, one should expect to find high support for redistribution in countries with low inequality and low support for redistribution in countries with high inequality.

This argument also builds the basic framework for the analysis of Lübker, who argues that a positive relationship between economic inequality and demand for redistribution, as claimed by the median-voter hypothesis, could only be identified after controlling for ‘social justice

2 An alternative approach to capture institutional and political context is offered by the varieties of capitalism literature, which would propose a different set of control variables. In this article I decided to use welfare regimes because they are theoretically explicitly assumed to influence individuals’ welfare attitudes. However, welfare regimes and varieties of capitalism are not unrelated, and one might argue that to some extent they describe the same substantive categories (Hicks and Kenworthy, 2003; Schröder, 2013).

norms [. . .] and typologies of different welfare state regimes' (2007, p. 130). However, within countries one can still expect changes in economic inequality to affect demand for redistribution positively because within-country effects are independent of systematic differences between countries.

From economic theory, I derive my first hypothesis:

H1: Levels and changes of economic inequality are positively related to individual's demand for redistribution.

From welfare regime theory, I derive the second hypothesis:

H2: Changes in economic inequality are positively related to demand for redistribution. Controlling for welfare regimes will attenuate country-level institutional bias, revealing a positive relationship also between countries.

These hypotheses are partly identical and partly competing. Both assume that within-country changes in levels of inequality positively affect demand for redistribution, following the median-voter logic (proposition 1). This is the primary interest of the following analysis. The first hypothesis assumes that the relationship between inequality and demand for redistribution is also observable between countries without a need to control for welfare regimes. The second hypothesis challenges this claim and assumes that inequality also reflects 'redistributive ethics' (Bowles and Gintis, 2000, p. 33). Therefore, the hypothesis claims that a positive relationship between inequality and demand for redistribution can only be observed after taking the welfare regime-related attitudes toward inequality into account (for similar arguments see, Lübker, 2007; Dallinger, 2010). Statistically speaking, within-country effects are independent of (unobserved) heterogeneity between countries. Between-country effects are biased, however, if important variables are omitted.

Finally, one can also hypothesize an interaction between an individual income position and economic inequality. From the Meltzer-Richard model it follows that the median voter demands more redistribution the higher the level of inequality (Dallinger, 2008; Finseraas, 2009). Additionally, the higher inequality is, the larger the group of individuals that benefit from redistribution. This is because the number of income groups that benefit from redistribution increases the larger the difference between the median and the mean income. In other words, the group that is likely to oppose redistribution becomes smaller the higher the level of inequality. Hence, income polarization should be weaker in countries with higher income inequality.

Dion and Birchfield (2010, p. 319) hypothesize the same moderation effect. They rely on similar economic arguments but additionally propose an explanation that goes beyond direct self-interest. If inequality is high, consensus between income groups might result because the rich are willing to redistribute to oppose social unrest (Alesina and Rodrik, 1994). This argument can also be framed in economic terms by accounting for the utility of social peace in an individual's utility function. It follows:

H3: Income has a negative effect on support for redistribution but differences between income groups are less pronounced if inequality is high.

The relationship hypothesized in H3 should be found within and between countries.³

3 Lupu and Pontusson (2011) discuss a similar mechanism. They consider the possibility that the 'structure of inequality' determines which income groups ally. They assume that low- and middle-income groups show similar preferences for redistribution if inequality between them is smaller than inequality

3. Empirical evidence from previous research

The theoretical section demonstrated that studies based on cross-sectional designs could lead to different conclusions than studies based on longitudinal designs. Although the results of both types should converge when cross-sectional analyses use an adequate set of control variables. The following review of previous empirical research takes these considerations further. I start with cross-sectional analysis of individual-level data.

[Dallinger \(2010\)](#) uses cross-sectional individual-level data (ISSP 1999) and finds a positive effect of economic inequality (measured via the Gini index) when controlling for economic prosperity and social expenditure. After including regime types, the effect increases, which leads her to conclude that demand for redistribution is not always high if inequality is high. In liberal regimes she found the opposite ([Dallinger, 2010](#), p. 346). [Finseraas \(2009\)](#) also finds a positive effect of economic inequality on demand for redistribution using European Social Survey (ESS) data from 2002. Neither social expenditure nor welfare regime dummies are used as controls in his analysis. The interaction effect between individual income and inequality is positive and confirms his hypothesis.

[Dion and Birchfield \(2010\)](#) use cross-sectional individual-level data from a variety of surveys. Their primary interest is in the interaction between individual income and education with economic inequality. The direct effect of economic inequality, however, is estimated to be negative or insignificant, depending on the model specification. The interaction effect between inequality and individual income is statistically not significant in a multilevel model but has the hypothesized positive sign (the higher inequality, the weaker the negative income effect).

To summarize, cross-sectional studies with individual-level data find positive as well as negative/insignificant effects of economic inequality on demand for redistribution. One positive effect is identified without controlling for welfare regime types. This evidence speaks against hypothesis H2. A mediating effect of inequality on the relationship between individual income and demand for redistribution is estimated as positive or insignificant.

Other studies use aggregated cross-sectional data. [Lübker \(2007\)](#) finds a positive but insignificant relationship between economic inequality and demand for redistribution. However, he notes that two particular groups of countries are responsible for this finding. First, transition countries (postcommunist countries) show high levels of demand for redistribution but often low levels of inequality. Second, the USA shows a low level of demand for redistribution although inequality is high. Nevertheless, a model accounting for these differences in welfare attitudes does not yield significant results either. This further speaks against hypothesis H2.

[Bowles and Gintis \(2000\)](#) also analyze aggregated cross-sectional data and find a negative relationship between inequality and an index of welfare support. Although they use Gini indexes based on pretax income (whereas other studies reported above used Gini indexes based on disposable household income), both indexes are usually closely related and regularly substituted ([Finseraas, 2009](#)). [Roller \(1995\)](#) uses aggregated data and finds a positive

between high- and middle-income groups. Hence, the more 'skewed' the distribution of incomes, the more likely it is that low- and middle-income groups demand redistribution. However, there is no definite relationship between the skewness of an income distribution and income inequality. Therefore, H3 cannot be directly derived from their model. In practice however, income inequality and skewness are highly correlated (0.71 in [Lupu and Pontusson, 2011](#), p. 326) and, therefore, the argument of Lupu and Pontusson might also be relevant for the relationship between inequality and demand for redistribution.

relationship between inequality and support for egalitarian policies. Similar to individual-level studies, aggregated cross-sectional research also tends to be inconclusive.

In contrast to cross-sectional studies, longitudinal designs controlling for country fixed effects should yield more reliable results because they are less likely confounded by (unobserved) differences between countries, that is, regime-specific welfare attitudes. [Aalberg \(2003\)](#) uses longitudinal aggregated data for 12 countries and finds that support for egalitarian policies grows when inequality increases. However, [Kenworthy and McCall \(2008\)](#), who base their study on aggregated longitudinal data from eight countries, are not able to replicate the results from Aalberg; they find no relationship between income inequality and support for redistribution. [Kelly and Enns \(2010\)](#) analyze data from the USA and find support for welfare policies to be negatively related to inequality.

[Jæger \(2013\)](#) uses an innovative design to estimate longitudinal effects of economic inequality on public support for redistribution. He builds a pseudo-panel from the ESS data. His observations are socio-economic groups observed over time. Thus, his analysis is also based on aggregated data, but the level of aggregation is much closer to the individual level. He finds a positive effect of economic inequality on support for redistribution.

To summarize, only a few comparative studies based on longitudinal data are available. These studies have not been able to give a robust answer to the question of how economic inequality relates to individuals' demands for redistribution.

4. Data and methods

4.1 Data

To test my hypotheses I use data from five rounds of the European Social Survey (ESS 2002 to 2010). I chose this data set for three reasons. First, compared with other international surveys, the ESS is of exceptionally high quality (in 2005 the ESS won the Descartes Price of the European Union for its advancements in survey research). Second, when building country time-series, the ESS provides the best chance to come close to an unbalanced panel. Third, reliable inequality data are available for the time period and countries covered by the ESS, whereas it is less possible to collect reliable time series on inequality for the periods and countries represented in other international surveys.

The dependent variable in my analysis is demand for redistribution, measured with the item: 'The government should take measures to reduce differences in income levels'. Respondents can state their opinion on a five-point Likert scale. Despite criticisms of single-item measures, this survey item has been used in a variety of studies to measure support for redistribution ([Jæger, 2006a, 2013](#); [Finseraas, 2008, 2009](#); [Luttmer and Singhal, 2011](#); [Schmidt and Spies, 2014](#)) and I follow this approach. Table A2 in the Appendix gives the distribution of the dependent variable between and within countries (also see Supplementary material Figure OA1).

A particular concern about the item on redistribution could be raised with regard to the comparability between countries. The item is designed to measure demand for income redistribution in an international survey and, thus, should be comparable across countries. Actually, most of the published studies using this item are cross-sectional. However, respondents might understand the item as if it was asking whether the government should take more measures than it currently does. If this is true, one has to control for the sum of redistributive policy measures to identify an unbiased between-country effect. As I control for welfare

regimes, I assume that such an effect is covered. Nevertheless, as a robustness check, all models presented in the following analysis have also been estimated with social spending (in percentage of GDP) as an additional control variable. Social spending did not have any effect and all other estimates were substantially identical (results are not reported but available on request).

In my analysis, I am confronted with a change of the income measure between the ESS rounds three and four. All income measures provided by the ESS are based on household incomes. As resources are assumed to be reallocated within households, this measure is suitable for the analysis. However, in the first three rounds, income was measured in absolute terms, using income categories. Beginning with round four, income was measured using country-specific decile categories. The relative measure that is available for rounds four and five is well suited for my analysis as individuals' demands for redistribution are theoretically assumed to depend on their relative positions within a country's income distribution. I recoded the 10-category variable into a variable that distinguishes between five quintiles. To harmonize the income measures, I recoded the income variables from the first three rounds into quintile categories, relying on the distribution of the income variable within each country-year. This approach is not without assumptions. While the decile-categories used in rounds four and five are obtained from an external source, the income measure for the first three rounds is based on the income distribution in the ESS sample. By using the ESS design weights I aim to account for possible sampling bias. I choose to use only five categories (quintiles) because it is more likely that the income measures for rounds three to five will be comparable. This is due to the fact that recoding the income measures from rounds one to three into deciles is not possible in some countries. I test the robustness of my results using a model accounting for the possibility that the two income measures cause different effects and thus are not comparable.

Economic inequality is measured by the Gini index,⁴ an inequality measure that varies between 0 and 100, with 0 indicating perfect equality and 100 indicating perfect inequality (i.e., all income given to one person). The data are based on disposable (post-tax and post-transfer) household income distributions. The median-voter hypothesis claims that the market (pretax and pretransfer) income is relevant for an individual's redistributive preferences. However, several arguments are in favor of using inequality data based on disposable incomes. First, individuals perceive the income distribution as it is, not as it would be if there was no redistribution (Finseraas, 2009). Second, reliable inequality data for market incomes are not available for most of the countries in the ESS sample. As the empirical analysis is particularly aimed at estimating within-country effects, the reliability of the time series is of outstanding importance. The problem of data availability also appears in economic research that

4 When collecting the inequality data, particular attention was paid to create reliable time series. When working with inequality data this is particularly important (Shamon and Andreß, 2012). Wherever possible, Gini indexes are taken from Eurostat. Some data are taken from the OECD. For some years data are substituted with data from the previous or following year. This approach should give a more reliable time series than mixing different sources to have data from the right years. For three countries I had to rely on other data sources. For Switzerland, I estimated the Gini index by linear interpolation as only two reliable data points were available (2002 World Income Inequality Database and 2010 OECD). For Turkey I had to take data from the CIA World Fact Book (2008). Finally, for Israel, I use also data from the World Income Inequality Database (2002) and interpolate the value for 2008. In the empirical analysis, I test my results for their robustness in a model that excludes these three problematic cases. A detailed documentation of the country-level data is included in Supplementary material Table OA1.

claims to test the full median-voter hypothesis. Therefore, it is common to substitute inequality measures of market income with disposable income, even in economics (see the discussion by Milanović, 2000). Third, post-tax inequality is highly correlated with the pretax inequality (Milanović, 2000, p. 390; Finseraas, 2009, p. 101). Table A2 in the Appendix presents the distribution of the Gini index between countries and also the variance within countries (also compare Supplementary material Figure OA2).

At the individual level I control for a series of variables that have been found to affect welfare support of individuals: gender (dummy variable, 1 = male, 0 = female), age, subjective health (dummy variable, 1 = fair, bad or very bad, 0 = good or very good), family status (dummy variable, 1 = married/civil partnership, 0 = all other states), formal education (five categories, ISCED 0–1 [Ref.], ISCED 2, ISCED 3, ISCED 4 and ISCED 5–6), labor market status (three categories, paid work, unemployed, not in labor force [Ref.]) and left-right orientation measured on a scale from 0 (most left) to 11 (most right).

At the country level, it is necessary to include economic prosperity (real GDP/capita in \$1000, PPP) in the regression function to ensure that the estimated effect of inequality is not spurious (Finseraas, 2009, p. 103). The country-level data are documented in Supplementary material Table OA1. Supplementary material Table OA2 reports the bivariate correlations of all variables used in the analysis.

Finally, I use different classifications of welfare regimes. Assigning welfare states to static categories can be problematic and, as I argued, might seriously affect the results. I use the ‘State of the Art Report’ by Arts and Gelissen (2002) as a basic source and add information from other sources where necessary (Daatland and Herlofson, 2003; Zambon *et al.*, 2006; Gal, 2010). Postcommunist countries are coded as a separate category. The data are documented in Supplementary material Table OA1. To test Hypothesis H2, I estimate a model that controls for welfare regimes. This model is estimated multiple times. For those countries where multiple classifications are available, the classification applied in each estimation is taken from a random draw. When this procedure is repeated enough, it covers all possible constellations of welfare state classifications. This approach allows determination of the range in which the between effect of inequality lies after controlling for all possible welfare state classifications. Remember that the primary interest here is in the effect of economic inequality. Welfare regimes serve as a variable controlling for country heterogeneity.

The sample consists of 27 countries that are reported in Table A1 in the Appendix. I treat East and West Germany as separate quasi-countries to account for the historically determined differences in welfare attitudes as well as the differences in economic conditions (compare also Wegener and Liebig, 1995; Lübker, 2007). The data contain 105 country-year observations and a total of 133 001 individual observations. The analysis is based on a data set obtained by listwise deletion. The average sample size for each country-year is 1267 with a minimum of 532 and a maximum of 1939. I do not weight the data as weighting can cause biased standard errors but is unnecessary if the control variables account for sampling selectivity (DuMouchel and Duncan, 1983). As I have a large set of control variables, I assume that the statistical model controls for selectivity in the sample.

4.2 Methods

Hierarchical mixed models are employed to estimate the effect of country-level variables on demand for redistribution. The dependent variable is treated as continuous. The model is a special form of a hybrid model which allows estimating within and between effects at the

level of countries but simultaneously controls for individual-level compositional effects. The model has the following form:

$$y_{jti} = \beta_0(t) + \beta_1 X_{jti} + \gamma_{WE}(Z_{jt} - \bar{Z}_j) + \gamma_{BE}\bar{Z}_j + v_j + u_{jt} + e_{jti}$$

The model has three levels: countries (j), country-years (t), and individuals (i). Individuals are nested in country-years (or samples) and these are nested in countries. The individual-level variables are captured by the vector X_{jti} and β_1 contains the corresponding coefficients. Country-level variables are notated using the vector Z_{jt} . In principle, country-level indicators can vary between survey years (thus the index jt). By building the cross-time mean of all country-level variables (\bar{Z}_j) and subtracting this term from the original vector ($Z_{jt} - \bar{Z}_j$) one obtains two orthogonal terms (\bar{Z}_j and $(Z_{jt} - \bar{Z}_j)$). Including both terms in the regression function gives a hybrid model. A hybrid model estimates within- and between-unit effects simultaneously. The coefficient vector γ_{WE} gives the within-country effects of the variables in Z and the coefficient-vector γ_{BE} gives the between-country estimates (see Fairbrother, 2014, for a detailed discussion of the modeling approach).

The within estimates of a hybrid model are identical to fixed effects estimates from panel models (note that the transformation $Z_{jt} - \bar{Z}_j$ is equivalent to the so-called fixed effects transformation). The within effects are exactly identical with fixed effects if the operation shown above is performed with all of the time-varying variables in the model and the panel is balanced. If these assumptions are not fulfilled, the estimates only approximate the fixed effects (Andress *et al.*, 2013, p. 165). I tested each of the estimated within effects for equality to a fixed effects estimate to make sure that the estimates are identical. No significant differences were found.

As already noted, the model has the advantage that it simultaneously estimates between-country effects, based on cross-sectional variation, and within-country effects, as usually done in the analysis of pooled times-series cross-section data, but also controls for compositional effects at the individual-level. The model also controls for a time trend (indicated via the constant $\beta_0(t)$). This is necessary to guarantee that the within-country estimates are not spurious to a common time trend in the data.

5. Results

Table 1 reports the results of a series of random effects models. The ICC of the empty model (M_0) is 0.097 for the country level and 0.007 for the country-year level (ICC according to Hox, 2002, p. 32, equation 2.16). Hence, the variance observed at the country-year level is very small in relation to the total variance. It is important to note that the small variance component does not mean that there are no changes of the dependent variable between survey years (compare Table A2 in the Appendix).

Moreover, the fact that the variance at the country-year level is very small is not per se a negative characteristic of the data. The purpose of estimating within-country effects is to eliminate the variance that is due to unobserved heterogeneity. To frame it differently, about 10% of the variance in the sample is not located at the individual level. This is the variance that most studies seek to explain. The design of my analysis relies on only 6.5% of this variance to estimate the within effects. However, the variance component at the country-year level is significant and, thus, there is variation that can be explained.

Table 1 Multilevel hybrid regression of support for redistribution

	M0 b/SE	M1 b/SE	M2 b/SE	M3 b/SE	M4 b/SE	M5 b/SE
<i>Individual-level variables</i>						
Household income		−0.0838*** 0.0023	−0.0838*** 0.0023	−0.0838*** 0.0023	−0.0745*** 0.0091	−0.2275*** 0.0539
<i>Employment status (ref. not in labor force)</i>						
Employed		0.0014 0.0064	0.0014 0.0064	0.0014 0.0064	0.0022 0.0064	0.0023 0.0064
Unemployed		0.0877*** 0.0128	0.0879*** 0.0128	0.0879*** 0.0128	0.0942*** 0.0128	0.0945*** 0.0128
<i>Education (ref. ISCED 0–1)</i>						
ISCED 2		0.0658*** 0.0105	0.0661*** 0.0105	0.0659*** 0.0105	0.0445*** 0.0106	0.0441*** 0.0106
ISCED 3		0.0178* 0.0101	0.0180* 0.0101	0.0177* 0.0101	−0.0059 0.0102	−0.0063 0.0102
ISCED 4		−0.0580** 0.0216	−0.0575** 0.0216	−0.0576** 0.0216	−0.0747*** 0.0217	−0.0751*** 0.0217
ISCED 5–6		−0.1779*** 0.0106	−0.1778*** 0.0106	−0.1779*** 0.0106	−0.1956*** 0.0107	−0.1960*** 0.0107
Age		0.0027*** 0.0002	0.0027*** 0.0002	0.0027*** 0.0002	0.0026*** 0.0002	0.0026*** 0.0002
Married (ref. not married)		0.0163** 0.0058	0.0162** 0.0058	0.0162** 0.0058	0.0220*** 0.0058	0.0221*** 0.0058
Bad health (ref. good health)		0.0712*** 0.0063	0.0713*** 0.0063	0.0712*** 0.0063	0.0713*** 0.0063	0.0712*** 0.0063
Left-right scale		−0.0861*** 0.0012	−0.0862*** 0.0012	−0.0862*** 0.0012	−0.0858*** 0.0012	−0.0858*** 0.0012
<i>Country-level variables</i>						
Gini index [WE]			0.0221*** 0.0071	0.0221*** 0.0071	0.0207** 0.0073	0.0222* 0.0097
Gini index [BE]			0.0293** 0.0123	0.0143 0.0115	0.0018 0.0097	0.0049 0.0098

GDP/C [WE]				0.0010	0.0013	0.0013
				0.0051	0.0052	0.0052
GDP/C [BE]				−0.0145***	−0.0106**	−0.0107**
				0.0045	0.0038	0.0038
<i>Cross-level interactions</i>						
Gini [WE]* income						−0.0006
						0.0026
Gini [BE]* income						0.0052**
						0.0018
<i>Time trend (ref. 2002)</i>						
2004		0.0414	0.0242	0.0205	0.0220	0.0220
2006		0.0611*	0.0471	0.0383	0.0388	0.0391
2008		0.0762**	0.0636*	0.0524	0.0511	0.0514
2010		0.1269***	0.1131***	0.1010*	0.1092*	0.1096*
Constant	3.8828***	4.3426***	3.4963***	4.3740***	4.6186***	4.5301***
	0.064	0.0652	0.3672	0.4168	0.3549	0.3567
<i>Variance components</i>						
Var (Country)	0.1083***	0.0962***	0.0799***	0.0573***	0.0365***	0.0365***
Var (Country-years)	0.0075***	0.0075***	0.0066***	0.0065***	0.0098***	0.0098***
Var (Individual)	1.0056***	0.9342***	0.9342***	0.9342***	0.9299***	0.9299***
Level-3 Var (Income)					0.0019***	0.0014***
Level-3 Cov (Cons., Income)					0.0020	0.0016
Level-2 Var (Income)					0.0006***	0.0006***
Level-2 Cov (Cons., income)					−0.0014***	−0.0013***
AIC	378 534	368 771	368 761	368 756	368 303	368 300
BIC	378 573	368 957	368 966	368 981	368 568	368 584

Source: Author's calculations, ESS 2002–2010 (unweighted data).

Notes: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ (one-sided tests). All models are based on 27 countries, 105 country-years and 133 001 individual observations. Standard errors of the year dummies and random effects are omitted from the output but are available in the Supplementary material.

In Model M_1 all individual-level variables and dummy variables accounting for a time trend are included. Income has a significant negative effect, confirming the basic assumption underlying Hypothesis H3.⁵ The model reduces the variance components at the country level by 11% and at the individual level by about 7%. The year dummies indicate an upward trend in demand for redistribution.

Model M_1 adds the Gini index. The between effect of economic inequality is 0.029 and significant at the 1% level (all between-country effects are notated with [BE]). The within effect is estimated to be 0.022 and also significant at the 1% level. Model M_2 leads to a highly significant model improvement compared to Model M_1 (LR test: $P < 0.001$). Hypotheses H1 and H2 expected the within effect to be positive, but H2 claimed that the between effect should be positive only after controlling for welfare regimes. Therefore, Model M_2 favors Hypothesis H1 over H2.⁶

Model M_3 tests whether the effects hold if economic wealth is controlled for. As it turns out, the within effect of economic inequality remains positive (0.022) and significant (1% level). The effect should be considered substantial. As an example, a change in the Gini index by four units has an equally strong effect (0.088) as a change in the income position by one quintile (-0.084).⁷ This result provides strong support for the tested proposition of the median-voter hypothesis. The between effect of economic inequality is no longer significant after including the control variable GDP/capita. The evidence for the median-voter hypothesis from Model M_3 has been intensively tested for its robustness. First, all countries with questionable Gini data were excluded (Israel, Switzerland and Turkey; compare note 4). The within effect of the Gini index remains almost unchanged (0.022) and highly significant (1% level). Second, I reestimated the model 27 times and excluded each country at a time (delete-one jackknife). The average estimated within effect is 0.022 and is significantly positive at the 5% level (jackknife standard error, $P = 0.028$). Third, I estimated the model with cluster robust standard errors. The within effect remains highly significant ($P = 0.007$). Hence, all robustness tests support the strong evidence for the median-voter hypothesis.

Hypothesis H2 stated that a positive between effect of economic inequality should be found only after controlling for welfare regimes. This hypothesis is tested using the basic setup of Model M_3 . As explained, different welfare state classifications are employed. I reestimated Model M_3 100 times including welfare-regime-dummies. Each model uses a different set of welfare regime classifications because every country for which multiple classifications are available is randomly assigned to one of the available categories.

The results of this exercise provide two important findings. First, the between effect of economic inequality has not been estimated as positive. The average estimate of the between effect is 0.010 and has a standard deviation of 0.005 (minimum = 0.002, maximum = 0.021). None

- 5 As already indicated, the income measure might not be comparable between rounds one to three and rounds four to five. I reestimated Model M_1 with an additional interaction term that allowed the effect of income to vary between rounds one to three and rounds four to five. The difference between the two effects was not significant. I concluded that one can safely assume that the two income measures are comparable.
- 6 Supplementary material Figures OA3 and OA4 present the aggregate-level relationship of the Gini index and demand for redistribution.
- 7 Standardized effects are: 0.0237 for the Gini index and 0.110 for individual income. Thus, with regard to standardized effects, the income effect is about 4.5 times larger than the effect of the Gini index.

of the estimated effects have been significant. Hence, Hypothesis H2 cannot be confirmed: welfare regimes do not seem to capture the unobserved variables that confound the relationship between inequality and demand for redistribution. A second interesting finding relates to the general explanatory power of welfare regimes. Out of the 100 estimated models, only 4 lead to a significant improvement of the model fit (LR test $P < 0.05$), which is less than one could expect by chance. This casts general doubt on the value of welfare regimes for the explanation of attitudes toward redistribution.

Finally, Hypothesis H3 claimed that differences between income groups are less pronounced when inequality is high. Models M₄ and M₅ (Table 1) test this claim.⁸ In Model M₄ random slopes for income are introduced. The model allows the income effect to vary between countries and between country-years. Both random effects are significant. Model M₅ introduces cross-level interaction effects between the Gini index and individual income. It leads to a significant improvement of the model fit compared with Model M₄ (LR test: $P < 0.05$). The interaction of income and within-country changes in inequality is not significant. The interaction of income and between-country inequality is significantly positive (1% level).⁹ Due to the interaction term the variance of the random slope of the income effect is reduced by 25.16%.

The model suggests that differences between income groups are smaller in countries with high levels of inequality. Figure 1 shows the marginal effect of income. The effect is significantly negative if the Gini index is lower than about 37. Values above 37 are only observed in two countries. Thus, the model predicts a significantly negative income effect for 25 out of 27 countries. I also tested the interaction effect using a categorical income measure. The results were substantially similar and are graphically presented in Figure 2. The full regression table is available in Supplementary material Table OA3. The figure shows that differences between income groups are more pronounced when inequality is at its minimum. If inequality is at its maximum, the model predicts that only the richest quintile is less supportive of redistribution, whereas the first four income quintiles show no significant difference in support for redistribution. This is exactly the hypothesized relationship and in line with the results based on a continuous income measure. Hence, as expected in Hypothesis H3, the differences between income groups decrease when inequality levels are high. However, this effect cannot be found within countries. The model, therefore, provides only mixed support for Hypothesis H3.

6. Summary and conclusion

This article investigated the relationship between economic inequality and demand for redistribution. The analysis identified a positive within-country effect of inequality on demand for redistribution. This positive effect appears to be very robust and provides strong support for

- 8 As with Model M₁, I tested the comparability of the income measure between rounds one to three and rounds four to five. I introduced interaction terms that allow the income effect and the interaction effects of inequality and income to vary between these rounds. None of the interaction terms was significant, indicating that the effects do not vary between the different income measures.
- 9 As a robustness check, I estimated Models M₄ and M₅ also without the individual-level control variables. These models (M_{4.1} and M_{5.1}) are presented in Supplementary material Table OA4. The estimated income effect and the interaction effect between income and Gini index are substantially identical to the estimates from the full model.

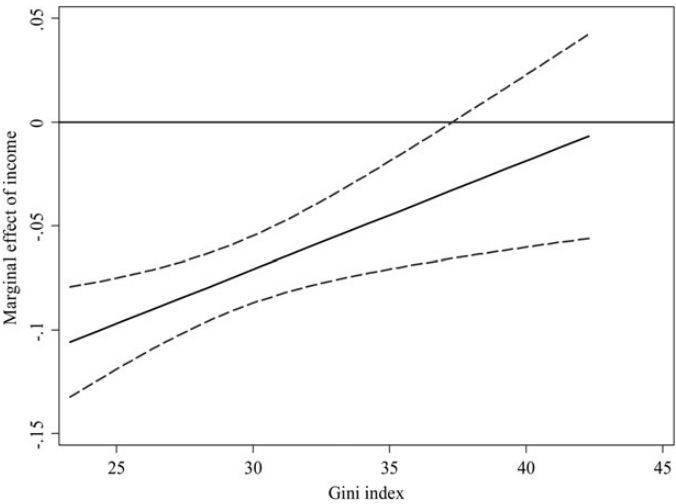


Figure 1 Marginal effect of continuous income (Model M_5).
Notes: Marginal effect based on Model M_5 . The dashed lines give the 95% confidence interval.

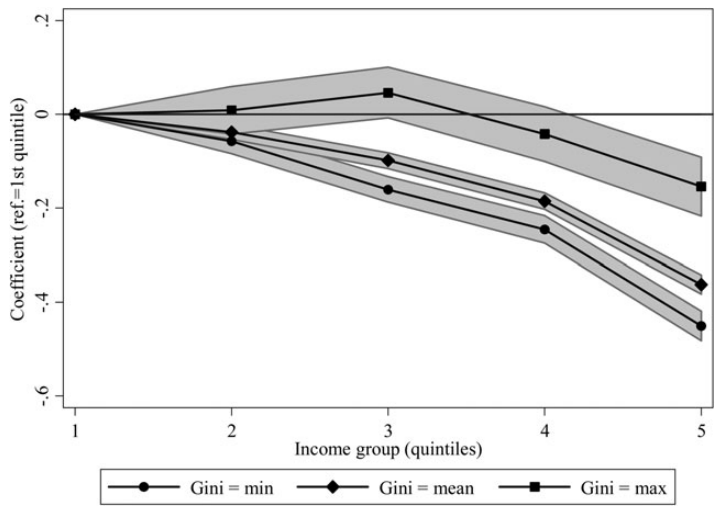


Figure 2 Marginal effects of income categories (Model M_7).
Notes: The model on which these conditional effects are based is not presented in the article (see Supplementary material Table OA3). The model is identical to Model M_5 but uses four dummy variables to model the income effect and its interaction with economic inequality. The data points indicate the size of the coefficient for the income category on the x-axis. The shaded areas give the 95% confidence intervals for the estimates. Note that the income measure used is categorical and not continuous. Thus, the lines connecting the points are only for illustrational purposes.

the first proposition of the median-voter hypothesis. Although the empirical analysis revealed a positive within-country effect of inequality on demand for redistribution, I did not find such a relationship between countries. It was argued that from a pure economic perspective within

and between effects should be equal, because basic economic theory does not account for justice beliefs or distributional ethics. Based on the welfare regime theory, it was hypothesized that a positive between-country effect should be found only after controlling for 'worlds of welfare attitudes'. This hypothesis could not be confirmed. In econometric terms, there seem to be unobserved country-level characteristics, but welfare regimes are not able to capture these. Another explanation for the inconsistency of within and between effects might be a lack of measurement equivalence between countries that cannot easily be controlled for. Finally, the analysis tested whether inequality moderates the effect of income. It was assumed that differences between income groups decline when inequality is high. This hypothesis gained mixed support from the empirical analysis. No interaction was found for within-country changes of inequality and income. Between countries, the hypothesized relationship could be identified.

To conclude, the analysis casts general doubt on the validity of cross-sectional research into country-level effects. These models are likely to suffer from unobserved heterogeneity. It is also conceivable that the item used to measure demand for redistribution is not comparable between countries. Research into the cross-country comparability of this item should therefore be encouraged. The article demonstrated the limited value of the welfare regime approach in explaining attitudes toward redistribution. Based on the longitudinal effect of inequality, the article provides robust evidence for a true relationship between economic inequality and demand for redistribution, supporting proposition 1 of the median-voter hypothesis.¹⁰

Of course, it does not follow that my analysis supports the median-voter hypothesis as a whole. This hypothesis claims that inequality is positively related to *actual* redistribution but research on this relationship continuously finds a negative relationship (Moene and Wallerstein, 2001, 2003; Bradley *et al.*, 2003; Iversen and Soskice, 2006). Hence, although my analysis supports the view that inequality is positively related to demand for redistribution, empirical evidence shows that this demand is not translated into actual redistribution.

Following the logic of the median-voter hypothesis, my results suggest that the remaining propositions are not true. The median-voter hypothesis assumes that demand for redistribution is expressed in votes (proposition 2) and supplied by the governing parties (proposition 3). Obviously, these assumptions are critical. Redistributive matters might play a role for individuals' voting decisions, but there are a number of other issues that are relevant for the party choice of individuals. Following Inglehart (1984), one general trend in the salience of issues should be a shift from materialistic to postmaterialistic ones (see Inglehart, 1990). It has also been shown that the group which benefits most from redistribution is the group that is least likely to vote (Schäfer, 2012). Consequently, there must not be a majority voting for redistribution, even if the majority of the population would benefit from it. Furthermore, it has been argued that social-democratic parties, which historically have been the parties that established redistributive politics (Bradley *et al.*, 2003, pp. 224–225), might not always promote these policies (Rueda, 2005).

10 Nevertheless, the analysis is obviously not based on a random sample of countries, and the time period under investigation is quite short. Therefore, it might be critical to infer from these results to a larger population of countries.

Supplementary material

Supplementary material is available at *SOCECO* online.

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Appendix

Table A1 Individual- and country-level sample size

Country	Year					Total
	2002	2004	2006	2008	2010	
Austria	1270	1114	1223			3607
Belgium	1235	1259	1512	1493	1411	6910
Bulgaria			771		1570	2341
Cyprus			693		576	1269
Czech Republic	791	1585		1301	1532	5209
Denmark	1174	1188	1263	1332	1304	6261
Finland	1706	1773	1653	1925		7057
France		1440	1651	1785	1517	6393
West Germany	1314	1212	1190	1367	1402	6485
East Germany	879	779	789	753	848	4048
Great Britain	1599	1264	1661	1795	1577	7896
Greece	1453	1289		1022	1358	5122
Hungary		1084		946	1066	3096
Ireland		1477	1008	1426	1509	5420
Israel	1703			1555		3258
Italy	532	878				1410
Luxembourg	681	804				1485
Netherlands	1939	1555	1574	1511	1409	7988
Norway	1898	1662	1634	1453	1437	8084
Poland	1465	1160	1149	1116	1139	6029
Portugal	836	881	917	708		3342
Slovakia		723	908		1054	2685
Slovenia	901	802	872	814	738	4127
Spain	832	897	1029	1358	1338	5454
Sweden	1758	1711	1680	1664	1331	8144
Switzerland	1429	1536	1370	1303	1165	6803
Turkey		1389		1689		3078
Total	25 395	29 462	24 547	28 316	25 281	133 001

Source: ESS 2002–2010.

Table A2 Within- and between-country distribution of dependent and independent variables

Country	Demand for redistribution			Gini index	
	Mean	SD total	SD years	Mean	SD years
Austria	3.781	1.080	0.071	25.000	1.000
Belgium	3.749	1.068	0.053	27.200	1.095
Bulgaria	4.371	0.954	0.002	32.000	1.414
Cyprus	4.160	0.793	0.073	25.000	0.000
Czech Republic	3.557	1.241	0.189	27.403	1.446
Denmark	3.030	1.152	0.059	24.556	0.515
Finland	3.943	1.020	0.087	26.000	0.000
France	4.127	1.024	0.078	28.325	1.044
West Germany	3.391	1.083	0.176	27.509	2.190
East Germany	3.989	0.930	0.113	27.509	2.190
Great Britain	3.513	1.048	0.052	34.092	0.737
Greece	4.353	0.789	0.098	32.435	1.130
Hungary	4.345	0.842	0.062	26.403	1.220
Ireland	3.808	0.967	0.078	30.832	1.377
Israel	4.074	0.943	0.125	37.000	0.000
Italy	4.058	0.902	0.027	31.000	2.828
Luxembourg	3.612	1.177	0.016	27.000	0.000
Netherlands	3.443	1.082	0.039	27.475	1.276
Norway	3.580	1.007	0.112	26.402	2.189
Poland	3.924	0.992	0.102	32.489	2.242
Portugal	4.203	0.768	0.056	37.250	0.957
Slovakia	3.998	0.948	0.096	26.554	1.263
Slovenia	4.154	0.869	0.077	23.318	0.843
Spain	4.056	0.871	0.046	31.140	0.314
Sweden	3.702	0.939	0.020	23.987	1.197
Switzerland	3.639	1.061	0.098	30.881	0.490
Turkey	4.307	0.790	0.070	42.600	3.394
Total	3.804	1.058		28.957	1.207

Source: ESS 2002–2010 (unweighted data); sources of Gini index documented in Supplementary Material Table OA1.

Notes: SD total gives the standard deviation of the dependent variable observed within countries. This is the total variation observed at the individual level. SD years gives the standard deviation of country-year averages, that is, the standard deviation in a data set that is aggregated to the level of country-years. This is the change in the mean levels observed between survey years.