The Effect of Economic Inequality on Demand for Redistribution

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Abstract

In this paper we have examined the relationship between economic inequality and demand for redistribution for 23 OECD countries and 17 European countries respectively. We depart from two different theories with contradictory predictions of the relationship between demand for redistribution and economic inequality: the median voter theorem predicting a positive correlation (Meltzer and Richard 1986), and the social distance model (MacRae 2006) predicting a negative correlation. We test the theories using two different measures of demand for redistribution: aggregate vote share of right wing parties and individual attitudes towards increased government redistribution. We also briefly examine the Prospect of Upwards Mobility hypothesis, which claims that it is not economic inequality as such but social mobility that determines demand for redistribution. We used election data from between 1975 and 2009, and survey data from 2002-2010. This enabled us to exploit the cross-sectional and time variation in economic inequality, to study the effect on demand for redistribution. The main contribution of this paper lies in the usage of new data, inequality data from 2005 and 2010, together with more robust econometric estimation techniques, e.g. fixed effects models. The results of the econometric estimation for both measures of demand for redistribution do not support any of the theories strongly, and are principally in line with most of the literature that does not find a statistically significant association between economic inequality and demand for redistribution. However, we do identify several important methodological caveats, e.g. limited variation in explanatory variables and reverse causality, and therefore stress that the empirical findings should be taken with a grain of salt.

Keywords: demand for redistribution, economic inequality, political economy

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1. Introduction, scientific problem and purpose of study

1.1 Introduction

Redistribution is one of the most salient features of the states in advanced industrial societies. Approximately 45 percent of GDP is collected and spent by governments in the OECD countries, and about half of this funds transfers, collectively financed services such as health care and public goods that we know as the welfare state.[1] This alone is an argument for the importance of studying the mechanism behind redistribution. But government redistribution is also perhaps the most central dividing line between the political right and the political left.

Closely linked to the phenomenon of redistribution is economic inequality. According to a series of reports published by the OECD, pre-tax economic inequality, i.e. measured before government redistribution and taxes, is on a rise, and has been, in all OECD member countries except France, Hungary, Belgium, Turkey and Greece since the beginning of the 1980s.[2] This trend does not seem to halt. In 2013 the OECD issued a new report, stating that the great recession of 2008 increased market inequality, on average, among the OECD members by 1.4 percentage points between 2007 and 2010.[3] For the 17 countries which data are available over a longer time period market income inequality increased more over the last three years than what was observed in the previous 12 years".[4]

In a series of classical papers in political economy by Romer, Roberts, and Meltzer and Richard, a formal model was chiseled out aiming to explain what the authors called the size of government i.e. redistribution. In a democracy with two vote-maximizing parties competing for the votes of the electorate, as the gap between the earnings of the median voter and the mean income rises, government redistribution will also increase. The logic behind this argument is that if the income distribution is skewed to the right, the income of the median voter will be lower than the mean income, hence the median voter would benefit from increased redistribution. This distance between the median voter income and the mean income can be thought of as a rough measure of economic inequality. Consequently, if the median voter is rational and acting in his or hers self-interest, the preferred level of redistribution of the median voter should increase when economic inequality increases. Thus, the model predicts that when economic inequality increases so will also government redistribution. This has been argued may have consequences for the economic performance of these countries as distortionary taxation is predicted to increase in countries with high inequality, which in turn is believed to produce lower growth.[5] But empirical support for the median voter-theorem has been mixed (see section 3.1.1) .This has lead researchers to develop alternative theories such as the social distance model,

[1] Moene & Wallerstein (2003) p. 485
[2] OECD (2009), OECD (2011)
[3] OECD (2013) p. 2
[4] OECD(2013) p. 2
[5] Alesina & Rodrik (1994)

which we also test empirically in this study, which claims that redistribution will decrease with increasing inequality. This logic behind the social distance model is that individuals generally are more likely to support redistribution if the welfare recipient is similar to themselves. When economic inequality increases, the social distance between the median voter and the welfare recipient increases and the similarities thus decrease, and so does the median voters willingness to support redistribution. We also briefly consider a third literature, the POUM hypothesis, which focuses on the effect of social mobility on demand for redistribution.

1.2 Scientific problem and purpose of study

In this study we aim to examine the relationship between economic inequality and the demand for redistribution for 23 affluent OECD countries and 17 European countries, respectively.[6] A number of studies have tried to empirically examine the median voter theorem focusing on government redistribution, but far fewer studies have examined the earlier step in the causal chain, i.e. how inequality affects the demand for redistribution (Finseraas 2008, Lübker 2007, Bowles & Gintis 2000, Kenworthy & McCall 2007, MacRae 2006). None of these studies is fully satisfactory from a methodological perspective and our contribution to the literature lies primarily in the usage of more robust econometric techniques by including a longer time-frame, and by using new data on both economic inequality and demand for redistribution.

We construct hypotheses from the social distance model and the median voter theorem about the relationship between inequality and demand for redistribution, which we use to test the theories empirically. We aim to examine the relationship by using two different measurements of demand for redistribution and make us of the cross-sectional and time variation in inequality. We measure demand for redistribution with two measures: a survey question and right wing party vote share the notion being that right parties are less associated with generous redistribution and social policies, and the support for right wing parties should thus be affected by changes in demand for redistribution. For both models, as we have variation over time, we can make use of country fixed effects, which should enable a more reliable estimate of the effect of economic inequality on demand for redistribution.

2. Determinants of inequality

2.1 A short trajectory of economic inequality

Before we examine the previous research on demand for redistribution and inequality, it is necessary to briefly summarize the trajectory of economic inequality and the literature on the factors driving on these changes in economic inequality.

Roine *et al* (2009) examine the development of the top percentile income shares and find that "[a]fter roughly the1980 top income shares have increased substantially in Anglo-Saxon [US, New Zealand, UK, Ireland,

[6] For a list of countries included in this study, see table A.1 in the appendix. The reason for us choosing these countries is that they are all since long consolidated, western-style, liberal democracies with welfare states. For reasons of comparability, we excluded e.g. post-soviet states.

Australia] countries but not in Continental European Countries [Germany, the Netherlands]".[7] However, it is also clear from the data that top income shares increased in Finland, Sweden, Japan, and, in a lesser extent, also Spain.

In an OECD report from 2008, including data until the mid-00s, focusing on the development of income inequality in the OECD countries, the authors claim that only four countries in the OECD have not experienced increasing inequality. Further, in an OECD report from 2011, the authors state that, in the OECD countries, in most cases the earnings of the richest 10 percent have increased rapidly compared with the 10 percent of the poorest. According to the report the post-tax Gini coefficient rose with approximately 10 percent from the mid-1980s to the late 2000s.[8]

It is difficult to state how large the observed increase in inequality is, since different measures of inequality differ in their sensitivity to changes in different parts of the income distribution.[9] Especially with Gini measures of economic inequality, it is important to note whether it is the Gini coefficient of gross income, disposable income or household income etc., since the different measures will provide different changes in inequality. Different measures might thus give different answers to the question if inequality has increased in the OECD countries. [10]

There seems to be no unified trajectory of inequality for the OECD countries. Whilst all countries included in our study, for which we have several observations on, except France, Belgium, the Netherlands and Greece, have experienced increasing pre-tax inequality as measured by the Gini coefficients provided by the OECD, some OECD countries may even have experienced decreasing inequality (Hungary and Turkey) since the 1980s. The variation over time and across countries in the development of inequality may enable the disentanglement of the effect of inequality on demand for redistribution, using panel data and pooled cross-section data.[11]

The lack of an overarching common story of the developments of inequality is reflected in the literature on the determinants of inequality. The relationship between rising income inequality, developments in domestic politics and economic globalisation is subject of widely varying interpretations among scholars, policy makers and political activists. A range of different factors are believed to play a role in rising inequality in the developed world in the last decades.[12] In this section we will briefly survey the most commonly though determinants of inequality and the different interpretations of their effects.

[7] Roine et al (2009) p. 980
[8] OECD(2011) p.22
[9] OECD (2008) p. 28
[10] OECD (2011) p. 26
[11] OECD (2011) p.22
[12] Mahler (2004) p. 1027

2. 2 International and external determinants of inequality

2.2.1 Globalization

With the increased integration of international commodity, capital and labour markets during the 20th century, it is reasonable to assume that international factors in addition to domestic factors play an ever growing part in the explanation of country specific income inequality.[13] However, opinions on how increased 'globalization' affects income inequality differ widely among scholars. The four different aspects of globalization discussed in this section are international trade, immigration, foreign direct investment and global financial flows.

Critics of global integration commonly point out the growth in international trade as one of the determinants behind rising inequality.[14] From the mid-1960s to 1990 the share of output exported grew from 12 to 20 percent in high-income countries.[15] This view is supported by extensions of the Heckscher-Ohlin model, notably the Stolper-Samuelson theorem and by the factor prize equalization theorem. According to the Heckscher-Ohlin model, countries will export products produced with the country's relatively abundant factors and import products produced with production factors that are relatively scarce in the country (Ohlin, 1935). A country which is relatively abundant in labour would, e.g., specialize in products with labour demanding production, since the greater supply of workers depresses wages and thus production costs.

Building on this argument, the Stolper-Samuelson theorem states that free trade will be detrimental for groups controlling relatively scarce factors of production, while it is beneficial for groups controlling relatively abundant factors of production.[16] Since skilled labour in the developed countries is relatively abundant in comparison with the rest of the world, while unskilled labour in the developed world is relatively scarce, increased trade would, according to the Stolper-Samuelson theorem, widen the wage gap between skilled and unskilled workers in the developed world. The step into a world market is thus said to have increase inequality as international competition have increased and unskilled labour, compared with skilled labour, in developed countries have drawn the short straw when demand for their services have decreased. [17]

In line with these predicted consequences of increased international trade, the factor prize equalization theorem states that when production shifts towards products in which the factors of production are abundant in a country factor prices between the trading partners will tend to equalize. This increased production will increase demand of the factors needed for production and thus equalizing the differences in factor prizes between the trading parts.[18] Trade with low-wage countries is thereby said by critics to undermine wage levels

[13] Baldwin, Martin (1999) p. 1
[14] Mahler (2004) p. 1028
[15] Richardson (1995) p.34
[16] Stolper. Samuelson (1941) p.73
[17] Wood (1994) p. 77
[18] Samuelson (1948) p. 165

in developed countries, since when for example differences in labour prices equalizes, the wages in the developed countries drop.[19]

On the other hand, a large of literature has only found a weak relationship between growing inequality and globalisation (e.g. Mahler, 2004; OECD 2011, Richardson 1995*).* Supporters of free trade argue that increased international trade has fuelled economic growth by stimulating national economies, which in turn have benefited every income group. Especially pressure on lower prices, created by international competition is said to be beneficial to low-income-earners, since high income groups consume a smaller proportion of their income than low income groups, the relative benefits of lower prices should benefit low income groups more.[20]

The second way in which globalization might influence income inequality is through migration. Since the 1960s the global migrant stock have increased from 92 million to 165 million in 2000 and similarly to international trade, rising immigration is argued to have a positive relationship with rising inequality.[21] Economist Gordon H. Hanson states in his book "*Why Does Immigration Divide America*" (2005) that one source of political opposition to immigration stems from that the benefits from immigration are not equally redistributed. The income of US residents are increased as a consequence of immigration allowing US firms to better utilize domestic resources, but these benefits are not shared equally among the citizens.[22] An increase in immigration would according to the supply and demand framework put downward pressure on wages for those who compete with immigrant over jobs. Those who employ immigrants would on the other hand enjoy benefits from cheaper labour, which could increase the gap in income distribution even further.[23] Since there is a predominance of low skilled workers among the migration flows from developing countries to developed countries, increasing immigration should thus be detrimental for low skilled workers in developed countries, as competition increases which might increase income inequality in the receiving country.[24]

The effect of increased immigration flows from low- to high income countries is similar to the effect of increased international trade, as international differences in factor prizes equalizes when the global labour is changed as a result of workers migrating from labour-abundant countries to labour-scarce countries.[25] The increased supply of unskilled workers in the developed countries thus depresses the domestic wage level for unskilled workers, widening the gap between skilled and unskilled workers.

[19] Krugman, Lawrence (1993) p.12
[20] Mahler (2004) p. 1027
[21] Özden, Parsons, Schiff & Walmsley (2012) p.35
[22] Hanson (2005) p.36
[23] Borjas (2006) p.2
[24] According to [Hanson (2005) p.3] 33 percent of all foreign-born adults in the United States had less than 12 years of education, compared to 13 percent of all native-born adults.
[25] Hanson (2010) p. 4364

However, in "*Why Does Immigration Divided America*?" economist Gordon H. Hanson raises some important differences between immigration and international trade.[26] The effect of migration is more complex than the effect of increased trade. In addition to the effect on labour markets, immigration may have an even larger effect on society since immigrants, use public services, pay taxes and sometimes vote. Immigrants thereby affect the income inequality in the receiving country both by influencing the labour market and by effecting government taxes and transfers, and thus may have an effect both on pre-tax and post-tax inequality.[27]

Contrary to the claim that immigration influences pre-tax and post-tax inequality, studies have found that immigration has a small economic impact on the wages, taxes and transfers for the native population and that immigration on average is beneficial for the native population.[28]

The third way in which increased economic globalisation can influence domestic income inequality is by the effects of foreign direct investment and creation of multinational enterprises. The traditional argument of the effect of FDI on economic inequality is that low skilled jobs in, e.g. the manufacturing sector are moved abroad to developing countries, resulting in increased economic inequality through declining domestic wages and unemployment.[29]

The Heckscher Ohlin-theorem of international trade states that increased foreign investment causes a decline in exports of domestic firms, as these exports might be replaced by products from foreign affiliates. Hence, the growing number of multinational enterprises could be argued to have a negative impact on a country's exports. At the same time the investments abroad uses capital that could be invested in the domestic economy. In addition to these effects, which are similar to those of increased international trade, multinationals enterprises access to labour overseas is predicted to make these companies more elastic in their demand for labour and thus their bargaining power towards unions increase.[30]

Taken together, increased FDI is thought to put downward pressure on wages and to increased unemployment, both by increased competition but also from companies gaining leverage in wage negotiations. However, the interpretation of these possibilities differ widely, as some economists claim that domestic workers can be compensated with requirements on firms to share their profits from expanded operations with the employees.[31] The true effect of increased foreign investment remains an unsettled issue as does the question if FDI increases exports and if investments abroad are substitutes for domestic investment.[32]

Increasing financial openness i.e. the increased ability to move capital across borders, is the final potential contributing factor of globalization to increasing income inequality. International financial flows are claimed

[26] Hanson (2005) p. 3
[27] Hanson (2005) p.4
[28] Card, Dustmann & Preston p.34
[29] Baldwin (1995) p. 1
[30] Caves (1996) p.132
[31] Mahler (2004) p. 1029
[32] Baldwin (1995) p.49

to reduce policymaker's possibilities to combat unemployment with traditional stimulative macroeconomic policies.[33] The increased financial openness is also argued to have made it-less complicated for corporations to evade domestic taxes, thereby causing a decline in government incomes, which thus reduces the ability of the government to redistribute. Similar to the 'race to the bottom' concept, Pierson (2001) states that when competition between countries is intensified governments will try to defend position on international markets by limiting domestic public expenditures and social benefits and lowering taxes. The logic behind the 'race to the bottom' argument is that when there is no restrictions for enterprises to relocate their business to countries where costs are lower, competition between countries increases. This forces governments to weaken regulations regarding safety, health and environmental issues to create more flexible labour markets, if governments wish to keep tax revenues from these enterprises.[34] Financial openness might have a negative impact on low-income groups, which when the government's ability to finance social benefits decline, as the increased financial openness may put downward pressure on the tax levels, but may also have a positive impact for those who succeed in profiting on the increased financial openness which may well widen the income distribution.[35] This might have an effect on pre-tax inequality, if it affects the reservation wage of workers.

2.2.2 Technological Change

The technological progress during the last century is commonly considered to have favoured skilled workers in the developed world, while reducing the demand for unskilled manual workers.[36] The pattern of wages and returns to schooling in the United States indicates that technical changes during the past recent decades have been increasingly skill-biased.[37]

The skill-biased technical change hypothesis builds on the observation that income inequality has risen significantly since the 1980s, which coincides with the invention of the microchip and entry of computers on the labour market. This technological development resulted in an increase in relative demand for high-skilled workers on behalf of low-skilled workers, which caused rising income inequality in the US in the 1980s.[38] Contrary to economist Daron Acemoglu's findings, other studies have found little evidence about the effects of technological changes on income inequality. Economists David Card and John E. DiNardo found that even though computer technology has developed rapidly since the 1980s the rise in income inequality in the United States has not intensified but rather enfeebled. Card and DiNardo instead propose factors such as changes in minimum wages and deunionzation as explanatory variables for the 1980s rise in income inequality, which are discussed in section 2.2.1.[39]

[33] Mahler (2004) p. 1030
[34] Castles (2004) p.2
[35] Mahler (2004) p. 1030
[36] Acemoglu (2002) p. 7
[37] Acemoglu (2002) p. 11
[38] Card, DiNardo (2002) p.734
[39] Card, DiNardo (2002) p.776

In line with Acemoglu's observation, a recent report from the Organisation for Economic Co-operation and Development (OECD) have found that the earnings gap between high- and low-skilled workers has been growing over the past three decades.[40] During this period wage dispersion increased in a majority of the observed OECD countries, for example the earnings gap between the richest and poorest 10% of full time workers in the United States rose from 3.8 times in the beginning of the observations in 1980 to almost 5 times in 2008.[41] However the report points out that there is a problem with separating the effect of technological change from effect of the previously mentioned globalisation patterns, which are also considered to increase the value of skills.[42]

2.3 Domestic Explanations

2.3.1 Regulatory Reforms and deunionization

Among the domestic explanations for rising inequality, the concept of institutional change is perhaps the most prominent. Labour market institutions, such as unions, minimum wage laws etc. are considered to hinder rising inequality by increasing collective bargaining power. But unions do not only strive after a larger market income for their members but are also considered to influence social expenditures, and are thus thought to have a negative association with both pre-tax and post-tax inequality.[43] However, economists such as Daron Acemoglu argue that the timing and extent of deunionization suggest that even though it may be an important factor for determining the level and structure of wages, it is not the major driving force of increasing inequality.[44] The rapid increase in pre-tax inequality in both the United States and the United Kingdom predates the beginning of deunionization trends, while for example Canada, between the 1960s and 1980s experienced rising wage inequality while unions grew stronger. Pre-tax inequality has also, during the same time period, risen in occupations who have never to a large degree been affected by unions. Acemoglu instead suggests that technological change may be a possible explanation for the deunionization. If unions strive to compress wage differences between skilled and unskilled workers, the benefits of unions will decline for skilled workers as their wages increase. As unions become less attractive for skilled workers, their bargaining power decreases, thereby reinforcing the effect of skill-bias and resulting in a decline of wages for unskilled workers.[45]

The notion that the decisions of policymakers influence the level of inequality in society raises the issue of reversed causality. Policymakers' decisions on e.g. minimum wage laws, unionization laws or tax policy might definitely affect the level of pre-tax inequality in a country. Previous research has shown that e.g. marginal tax rates has a negative impact on pre-tax inequality, as the incentives for top earners to work more

[40] OECD (2011) p.86
[41] OECD (2011) p.86
[42] OECD (2011) p.28
[43] Mahler (2004) p. 1031, Acemoglu (2002) p.51
[44] Acemoglu (2002) p. 50
[45] Acemoglu (2002) p.51

are decreased.[46] Under the assumption that right wing parties are more associated with more lenient labour market regulations and lower tax rates, a higher right party vote share might thus have an effect on pre-tax inequality, which would make our measure of inequality of endogenous, i.e. inequality does not affect demand for redistribution, but rather demand for redistribution instead affects inequality. However, using pre-tax inequality as our explanatory variable should be methodologically sounder than using post-tax inequality, which is completely endogenous, when we want to study the effects of inequality on demand for redistribution. This problem of reversed causality is of course a serious methodological issue, which must be kept in mind. A more detailed discussion of using pre-tax or post-tax inequality is found in section 4.2 and on the determinants of post-tax inequality is available in A.2 in the appendix.

However, assuming that the problem of reversed causality is more critical for our first measure of demand for redistribution i.e. as right party vote share, this problem might be levitated somewhat by also including our other measure of demand for redistribution based on survey data, since the effect of demand for redistribution on pre-tax inequality measured with survey data might not be as direct as right party vote share.

3. Impacts of Inequality on Demand for Redistribution

The determinants of demand for redistribution have been subject to a fairly intense study within economics and other social sciences.[47] In this study we are not interested in the determinants of redistribution as such but primarily the effect of inequality which has been somewhat neglected in the literature.[48] Below two different theoretical arguments on the effect of inequality on demand for redistribution are presented. We also examine a literature that focus on a somewhat different issue that relates to inequality, but nevertheless is relevant to keep in mind. This literature is called POUM (Prospect of Upward Mobility) and focus on social mobility instead of economic inequality.

3.1 Channels of Impact

3.1.1 The Median voter theorem

In much of the work on the relationship between inequality and redistribution economists Meltzer and Richard's model building on Romer (1975) is the obvious point of departure. In the seminal article "A rational theory of the size of government" published in the Journal of Political Economy, Meltzer and Richard formulate a model attempting to provide theoretical basis for the size of government measured as the level of

[46] Roine et al (2009)
[47] There are of course a variety of explanations other than inequality important in trying to explain demand for redistribution.To name but a few examples, an individual history of misfortune affecting risk-aversion has been shown to have an effect (Piketty 1995), cultural norms emphasizing equality vs. individualism (Alesina & Glaeser 2004), the structure and organization of the family affects people's risk exposure and thus affect people's preferences for government intervention (Alesina & Guilianio 2009), income matters as people with higher income become more negative towards government redistribution and women seem to have a more positive inclination for government redistribution (Alesina & Giuliano 2009) and also perceptions of fairness i.e. if income is acquired by luck or by effort matters (Piketty 1995)
[48] Finseraas (2009) p. 98

social spending.[49] The main argument is that in a country with universal franchise and majority rule, "the voter with the median income is decisive in single issues election" i.e. in an election where the political debate focuses only on issues of redistribution, the equilibrium level of taxation and redistribution will be decided by the voter with the median income and thus will optimize the utility of the median voter, assuming universal turnout.[50] What then constitutes the equilibrium level of taxation and redistribution according to Meltzer and Richard? This is primarily dependent on the distance between the income of the median voter and the mean income in a given society (which we can think of as a rough measure of economic inequality) but also on that individuals are aware of the effect of the tax rate on disincentives (lowering the labour supply), assuring that redistribution will not be total.[51] Formally, the optimal tax rate for the decisive voter is equal to the ratio of mean to median income.[52] Richard and Meltzer state that income distributions generally are skewed to the right, i.e. that the mean income is higher than the median income, and that "the [equilibrium] tax rate rises as mean income rises relative to the income of the decisive voter, and taxes fall as [the mean income] falls".

The proposed explanation of the level of redistribution in society offered by Richard and Meltzer is beautiful in its simplicity and intuition. For the model to hold, the voters' must base their voting decision only on their economic self-interest i.e. if they would gain from increased redistribution.[53] However, the most critical assumption of the model is the assumption of full electoral turnout, which is necessary for the voter with the median income to be the decisive voter. If voting in democratic elections is less common amongst the poor and low-educated, the distribution of income in the electorate might not be identical to the income distribution in the population. If increasing inequality is a result of the poorest are getting even poorer, and this group vote to a lesser extent, this increased inequality may not translate into increased demand for redistribution in the electorate.

This process might be strengthened by factors such as migration, which might be associated with both higher levels of inequality, as discussed 2.1.1, and lower electoral turnout, if migrants vote to a lesser extent than natives. Most often immigrants are not allowed to vote at all (as they are not citizens), or might only vote in municipal elections which may be less relevant for redistribution issues.[54] However, immigrants are still agents in the economy, and therefore have an impact on the mean income but not on the wage of the decisive voter. If immigrants are, on average, poorer than the national citizens, this should have a negative impact on the mean income, which then decreases the distance between the income of the median voter and the mean income, which should reduce the median voter's demand for redistribution. Hence, as the assumption in the

[49] Meltzer & Richard (1981)
[50] Meltzer & Richard (1981) p. 923
[51] Meltzer & Richard (1981) p 920, Finseraas (2009) p. 97
Thus, it is obvious that the median voter theorem relates to the redistributive effects of the income distribution before taxes and transfers. However, that market inequality is preferable over net inequality, i.e. the actual inequality after taxes and transfers, as the basis of decision making of the voter will be discussed in the methodology section.
[52] Meltzer & Richard (1981) p. 923
[53] Meltzer & Richard (1981) p. 915
[54] The same is true for sentenced prisoners in some American states.

median voter theorem of universal franchise may not be fulfilled in any of our sample countries, we would expect this to weaken the relationship between pre-tax inequality and demand for redistribution in the electorate.

However, in this paper, we do not focus on whether increasing inequality actually leads to higher levels of redistribution, but on how demand for redistribution is affected by rising inequality. Important to note is that our survey measure of demand for redistribution also includes persons who are normally not allowed to vote such as immigrants, whilst these are excluded from our second measurement of demand for redistribution. Thus, if the political mechanism is the Achilles' heel of the median voter theorem, we might find a stronger relationship between inequality and demand for redistribution for our survey measure than for the right party vote share measure, as it comes closer to the assumption of universal suffrage.

From the median voter theorem, we can construct the following hypothesis of the effect of inequality on demand for redistribution:

H_1: As pre-tax inequality increases, demand for redistribution will also increase.

The median voter theorem, or Meltzer-Richard model, has been subject to some empirical testing and received mixed support. Milanovic (2001) conducted one of the earliest tests of the median voter theory using proper data (data on pre-tax inequality in a cross-country setting was first available with the Luxembourg Income Study Project). He examined redistribution and pre-tax inequality for 24 affluent democracies in the OECD between roughly 1970-2000, and did find that more unequal countries do redistribute, measured as the difference between the pre-tax and post-tax Gini, more. However, he found only weak support for the median voter theorem when in detail econometrically examining the effect of cash transfers, which hardly should benefit a gainfully employed median voter, and finds a strong positive statistical association. It seems like demand for redistribution increases even more than the median voter theorem suggest, which might be due to long-term gains of the middle class of increased transfers or other motives driving their behavior.[55] Also, Milanovic fails to control for the rate of unemployment, which may inflate the level of redistribution. Moene and Wallerstein (2001), on the other hand, find a negative correlation between inequality and a social insurance as a proxy for redistribution for 18 affluent OECD countries between 1980 and 1995. However, Moene and Wallersteins econometrical estimation is lacking and their results may be biased by unobservables, since they do not employ any fixed effect estimation. Kenworthy and Pontusson (2005), using LIS and OECD data and defining redistribution in line with Milanovic, find a strong positive relationship between inequality and redistribution. However, the econometric strategy is also lacking several important control variables such as the percentage elderly in the economy and does not use fixed effects estimation. Iversen and Soskice (2006) measures redistribution in the same way as the previous authors and examines 17 affluent OECD countries between roughly 1980-2000. They find no effect of pre-tax inequality on redistribution but also fail to control

[55] Milanovic (2000) p. 28

for time constant unobservables, which may well bias their findings. Finally, Kenworthy and McCall do not use any econometric estimation at all but instead study the effect of pre-tax inequality on spending on a number of different social policies descriptively, and find no obvious relationship between inequality and spending for 9 affluent democracies within the OECD. Kenworthy and McCall point out that there are considerable methodological problems in trying to distinguish the effects of voter preferences on the level of redistribution from the automatic compensatory effect of tax and transfers following changes in the business cycle, and also that social spending may increase because of a greater number of people receiving transfers and not because of increased generosity per se, which is why it is important to control for e.g. the unemployment rate in the economy.[56] However, as they do not perform any econometric estimations, their examinations are most probably subject to omitted variable bias.

Thus, the empirical findings are mixed, and also not one study seems fully satisfactory from a methodological perspective. They also differ in the choice of measures of redistribution and research design, which of course contributes to the mixed findings. Still, most studies on the median voter theorem have focused on whether greater market inequality leads to higher levels of social spending, thus ignoring the second step in the causality chain. It is possible that increasing inequality leads to higher levels of demand for redistribution, but that Richard and Meltzer's account of the political process/mechanism is too simplistic, and that increasing demand for redistribution does not translate into increased social spending because of, e.g., multidimensionality of democratic election or other unknown factors.[57] The possibly over-simplistic political mechanism is also a serious methodological issue for our study, as the measurement of demand for redistribution as right-party vote share relies heavily on the assumption that changes in demand for redistribution translates into changes in support for right-wing parties. However, as this is not our only measure and the survey measure is independent of the political mechanism, the research design of this study could provide some tentative answers on whether it is the failure of the political mechanism of the median voter theorem that is the cause of the mixed findings.

Even though issues of redistribution is a central dividing line between left and right in western democracies, it is not the only issue being handled in modern elections. Thus, if issues other than redistribution are more important to the voters (or if the elections are not single issue elections at all), it is possible that even if higher inequality produced a higher demand for redistribution, this would not show in government spending and transfers due to the fact that political parties prioritize other issues in election to win over voters.

Another limitation of the model is that it does not consider the possibility that the voters' base their preferences of the level of redistribution on ideas of fairness or other normative grounds, i.e. ideological

[56] Kenworthy & McCall (2007) p. 41
[57] Alesina and Giuliano (2009) p. 12

voting, instead of pure monetary self-interest.[58] It is also this notion of rationality in Richard and Meltzer's model that MacRae criticize in his development of the *social distance model* discussed in 3.1.2.

Still, most of this critique concerns why it is reasonable to doubt that the increased inequality must result in increased social spending. It might be that increased inequality produces an increased demand for redistribution, even though this increased demand may not be matched by the supply of redistribution offered by the political parties.

Only a handful of studies have explicitly empirically examined the association between inequality and demand for redistribution. Economists Bowles and Gintis (2000) do not find a positive relationship between market inequality and support for the welfare state (as a proxy for demand for redistribution) for eight developed countries in 1995, instead there seems to be a negative relationship. However, the authors only assess this relationship graphically and do not perform any econometrical modeling.

Lübker (2007) finds no statistically significant correlation between inequality, measured as the Gini index post tax and transfers from the Luxembourg Income Study (LIS) and from Eurostat, and demand for redistribution, measured as the fraction of population agreeing with the statement "It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes" from the ISSP wave of 1999 for 21 developed countries.[59]

Finseraas (2008) finds support for the median voter theorem using cross-sectional data from the European Social Survey from 1999 data for 22 European countries and multilevel modeling in assessing the relationship. However, contradictory to the theorem, Finseraas uses the post-tax Gini as the measurement of inequality and also uses data from both the Luxembourg Income Study and the Deininger & Squire database, thus damaging the cross-sectional comparability between countries, especially as the accuracy of the inequality measurements provided by the Deininger and Squire data is questionable.[60] Using the post-tax measure of inequality obviously introduces the problem of reverse causality, i.e. that the post-tax Gini coefficient reflects increased demand for redistribution and not the other way around.[61] Finseraas does find that demand for redistribution increases with inequality and also that an interaction between personal income and inequality is statistically and economically significant.[62] However, using data from only one year is problematic, as the findings may be caused by unit heterogeneity. Widening the analysis time frame and thus incorporating the change in inequality within countries over time might provide a more convincing test of the formal model. Finseraas also includes three post-communist countries in his sample, which may not be

[58] Kenworthy & McCall (2007) p.36
[59] Lübker (2007) p. 133
[60] Atkinson & Brandolini (2001) See the section 5.2. Assesing the quality of inequality data for a more detailed argument.
[61] This issue will be discussed in greater detail in the section on methodological limitations.
[62] Finseraas (2009) p. 110

directly comparable with the other developed countries because of the communist regime, which has been shown to influence individual preferences for redistribution.[63]

Kenworthy & McCall (2007), on the other hand, find no support for the median voter theorem using survey data from the International Social Survey Program (ISSP). However, they do not carry out any econometrical testing. The relationship between inequality and demand for redistribution is studied by examining scatterplots. In addition, Kenworthy and McCall only examine this relationship for eight nations, for which they have longer time series available. They use both pre- and post-tax inequality in assessing the relationship. Kenworthy and McCall measures demand for redistribution with the aggregated mean response value to the question "It is the responsibility of the government to reduce the differences in income between people with high income and those with low income". They also state that they do not find much support for the model, i.e. demand for redistribution seems to be unresponsive to changes in both inequality measures. However, this may be due to the fact that they measure aggregated demand for redistribution as a mean (the response scale ranges only from 0 to 5). Thus, increased demand for redistribution in certain groups may be offset by decreased demand in other group – a polarization that is masked by using the mean value. Hence, the usage of demand for redistribution as an aggregated mean value may obscure relevant changes in the population and is therefore not an ideal measurement. In addition, the absence of econometrical modeling and also the limited sample renders the conclusions drawn by Kenworthy and McCall somewhat unconvincing.

Hence, in light of the conflicting findings of previous studies, there seem to be convincing reasons for further study of the median voter theorem. In addition, the latest data used in the cited articles is from 2000 and, as inequality has increased since then it seems reasonable to test the median voter theorem once again using new data and more reliable econometric techniques.

3.1.2 The Social Distance Model

In his doctoral thesis, political scientist Duncan MacRae claims that the median voter theorem fails to hold up in practice and instead proposes a modified version it: the social distance model.[64] The main idea of the social distance model is straightforward and focuses on a different kind of rationality of the decisive voter.[65] A large part of the cross-sectional redistribution targets a minority of the population such as the poor or the unemployed. Further, it is reasonable to assume the decisive voter will be gainfully employed and consequently differ from the median transfer recipient in several aspects and also not receive much direct benefit from these transfers. The key assumption of the theory is that "[p]eople generally […] support benefits for people like themselves; or for those who "deserve" support because they have fallen on hard times through no fault of their own".[66] In line with this, the main prediction of the theory is that the median voter's demand for redistribution will decrease with increasing pre-tax inequality. This since the "social distance", i.e., the

[63] Alesina & Fuchs-Schündeln (2005)
[64] MacRae (2004)
[65] MacRae (2004) p. 12f
[66] MacRae (2004) p. 1, see also Alesina and Giuliani (2009)

socioeconomic differences, between the median voter and the median welfare recipient will increase with increasing pre-tax inequality. Since people are assumed to support benefits for people like themselves and the similarities between the median voter and the median welfare recipient decrease with increasing inequality, the median voter is thought to identify even less with the median welfare recipient.[67] This increased social distance is then thought to translate into a decreased demand for redistribution of the median voter.[68] However, for this to hold, the identification of the median voter with the median welfare recipient must be understood as a continuous rather than a binary variable, which increases with decreasing economic inequality. If this is not the case, we would not expect increased market inequality to decrease demand for redistribution, as the median voter will still be gainfully employed and probably not gain a great deal economically from increased redistribution.

MacRae claims that economic inequality is a proxy for social distance and also uses summary measures of inequality to test the model. It is however clear that the social distance is not economic inequality in itself, but rather that the median voter's perception of the social distance to the median welfare recipient that is the key variable. Thus, an ideal proxy for this would not be an overall measurement of economic inequality but instead a measurement focusing on the distance between the median voter and the median welfare recipient. MacRae, however, does not propose such a measure. We know that e.g. the Gini coefficient places heavier weight on the changes in the middle of the income distribution (see section 4.1) and also that it does not focus particularly on how many individuals that have no market income i.e. are living on transfers which is important for the social distance model, and we would therefore not expect this measure of economic inequality to be particularly good at capturing the mechanism behind the model. Basically, all conventional measures of economic inequality focuses on inequality of income, but when examining the social distance model, it is clear that we would need a measure focusing more on the distance between median welfare recipient, who lacks market income, and the median voter.

According to MacRae, the proposition made of Alesina et al (2003) that ethnic fractionalization should decrease demand for redistribution, can thus be interpreted as a form of social distance, since ethnic fractionalization increases the differences between the median voter and the median welfare recipient if a certain ethnic group is overrepresented among the poor.

Even though we focus on the effects of economic inequality on demand for redistribution in this paper, the social distance model also makes predictions on the effect of changes in the rate of unemployment. We include this as this gives us yet another hypothesis of the social distance model, which may be helpful when testing the theory empirically. The rate of unemployment is thought to have an effect on demand for redistribution in the opposite direction of inequality. As the rate of unemployment rises in the economy,

[67] It is noteworthy that MacRae lack a more precise definition of social distance, and what concrete characteristics are included in the term.
[68] MacRae (2004) p. 1

MacRae argues, it should increase the likelihood of an unemployed individual to be perceived as a victim of unlucky circumstances rather than being lazy and undeserving. It should also increase the likelihood that the median voter itself will need government assistance.[69] However, contrary to MacRae's predictions, it is also possible that high levels of unemployment may lead to decreased demand for redistribution of the median voter because of the rising costs of transfers to the unemployed, especially as it is reasonable to assume that the median voter will still be employed.

MacRae also finds that increased pre-tax inequality has a negative effect on demand for redistribution in the US and that unemployment has a positive effect when assessing this relationship with survey data from the American National Election Studies between 1980 and 2005.[70] He also finds this for eight countries, all Anglophone except for Norway and Austria, using the ISSP survey and difference estimation between 1992 and 1999 measuring demand for redistribution with the question *"It is the responsibility of the government to reduce differences in income between people with high incomes and low incomes",* modeling the relationship at the individual level with the change in market inequality as the key explanatory variable.[71] However, for the cross-sectional regressions, inequality is measured as a Theil ratio, which is not strictly comparable between countries and only focuses on earnings inequality in the manufacturing industry which may very well differ from inequality in the whole population. It is thus not a satisfying measure of economic inequality and the sample selection also allows one to doubt the generality and external validity of the results for the whole population.

However, MacRae does not only suggest that increasing inequality should lead to decreased demand for redistribution, but also that increasing inequality produce a more conservative electorate, since left parties are generally associated with more generous benefits programs and social policy.[72] Hence, less demand for redistribution is thought to translate into less demand for the policies traditionally associated with left parties, which then is thought to advantage right parties. He tests this hypothesis on US data and finds that increasing inequality seems to drive the voters towards more conservative standpoints. As this argument is derived directly from the social distance model, there is no obvious reason to expect that this relationship would not hold for other affluent democracies besides the US. This has to our knowledge not been put to test empirically when measured as electoral support for right-wing parties in the literature. Instead, a few studies have examined the effect of increasing inequality on party rhetoric and reached conflicting conclusions on whether

[69] MacRae (2004) p. 15
[70] MacRae (2004) p. 43
[71] MacRae (2004) p. 67
[72] MacRae (2004) p. 52

parties become more conservative in the face of increasing inequality.[73] We instead aim to test if increasing inequality may increases the vote share for right-wing parties[74]

From the social distance model we can construct the following hypotheses:

H2a: As pre-tax inequality increases, demand for redistribution will decrease.
H2b: As unemployment increases, demand for redistribution will increase.

3.1.3 Social mobility and the POUM hypothesis

Finally, another exciting literature on demand for redistribution puts both of the models discussed above into question. This literature focusing on social mobility in general and the prospect of upwards mobility in particular, argues that it is not the level of inequality as such that is relevant when determining demand for redistribution, but instead the perception of economic inequality defined as how high or low social mobility is and expected future income. This theory is not the principal focus of our examination, but is nonetheless important to consider as it is a highly plausible alternative explanation of demand for redistribution and relates to the concept of inequality.

This literature focusing on the political economy of social mobility and future income first formalized by Benabou and Ok (2001).[75] Benabou and Ok propose yet another alternate take on the R-M model where individuals do not only care about their current income, as in the R-M model, but also about future income. Allowing for upwards and downwards social mobility and assuming that individuals are not too risk averse and that the mobility process is concave in expectations, Benabou and Ok argues that it is possible that "the poor do not support high levels of redistribution because of the hope that they, or their offspring, may make it up the income ladder."[76] Thus, if individuals believe that they or their offspring will move up the income ladder, it may be perfectly rational to demand less redistribution than the levels proposed by the R-M model. This is called the POUM (Prospect of Upward Mobility) hypothesis.

Thus, drawing on the POUM hypothesis framework, we can construct one final hypothesis.

H3: With increased (perceived) social mobility, demand for redistribution decreases.

The POUM hypothesis has also gained some empirical support in the literature. Alesina and La Ferrara (2002) find that support for redistributive policies decreases with increases in objective measures of future income using data from the General Social Survey in the USA between 1978 and 1994. [77] Alesina and Giuliano (2009)

[73] MacRae (2004) p. 31, Rueda & Pontusson (2008), Moene, Barth & Finseraas (2012)
[74] Especially as Alesina and Giuliano (2009) notes "that the question of whether or not a government should redistribute from the rich to the poor and how much is probably the most important dividing line between the political left and political right at least on economic issues" p. 2
[75] See also Alesina & La Ferrarra (2005), Alesina & Glaeser (2004) and Alesina & Giuliano (2009)
[76] Benabou & Ok (2001) P. 448
[77] This measure of expected future income is a function of the current income decile which the respondent belongs to, the mean income of all the deciles, weighted with the probabilities of the respondent transitioning to each respective decile. Alesina & La Ferrarra (2004) p. 907

also find support for the POUM hypothesis, however, only when social mobility is measured as a difference between the occupational prestige of the father and the respondent, also using data from the GSS but stretching until 2004.[78]

Ravallion and Lokshin (2000) study the effect of upward and downward mobility on demand for redistribution in Russia in the 1990s. They find that the prospect of downward mobility, measured through self-assessments, has a significant impact on demand for redistribution, even for the currently rich.[79] They also find the reversed to be true i.e. that increased belief in future upward mobility decreases demand for redistribution significantly. Widening the geographical sample, Corneo and Grüner (2002) use data from the ISSP from 1992 for a sample of 12 developed countries (notably, however, neither the UK nor the US is included in the sample) find that intergenerational upward mobility, measured with a question of if the respondent is better off than his/hers father, does have a negative effect on demand for redistribution.[80]

Checchi and Filippin (2003) also find support for the POUM hypothesis, i.e. that demand for redistribution decreases with increasing social mobility, using experimental design and varying the upward mobility of the transition matrices as experimental manipulation. The participants in the experiment were asked to specify their level of preferred taxation and Checchi and Filippin found that "preferred taxation declines when the transition matrices are characterized by the prospect of upward mobility".[81]

3.1.4 A note on right wing party vote share and the median voter theorem

In this study, we employ two measures of demand for redistribution: right wing party vote share and a survey question aimed to capture the respondents' attitude towards government redistribution. In the former case, we make the crucial assumption that, as right wing parties should be less identified with social insurance program and government redistribution, increased demand for redistribution should disadvantage them in the electoral competition. However, using this as a measure of government redistribution cannot strictly be derived from the formal argument of the median voter theorem made by Meltzer and Richard. The main prediction of the median voter theorem is that if the parties are vote-maximizing, they will both adjust their policies to the median voter. Hence, the median voter theorem predicts that there would be no great differences between the parties, at least in terms of the supply of government redistribution offered. In order for us to make the argument that right wing party vote share is a reasonable – indirect – measurement of demand for redistribution, we need to make the assumption that there in fact is differences between right and left wing parties in terms of redistribution and, if both right and left wing parties adjust themselves to the demand of the median voter, this does not happen instantly. If this assumption does not hold, we would expect to find no

[78] Alesina & Giuliano (2009) p. 15
[79] Ravallion & Lokshin (2000) p. 99
[80] Corneo & Grüner (2002) p. 100
[81] Checchi & Filippin (2003) p. 18

effect of inequality on right wing party vote share. However, the rationality of the individual voter is in no sense altered from the original model.

4. Measures of Economic Inequality

To examine the relationship between demand for redistribution and economic inequality econometrically we clearly are in need of a measurement of economic inequality. Even though the concept of economic inequality is strongly associated with the Gini coefficient, there are a variety of different measurements of inequality that could be used in the analysis. This section will contain a brief discussion of the most common measure of, the Gini coefficient, following the five desirable axioms Cowell (2001) stipulated for measurements of economic inequality. For a more detailed discussion of the possible alternative measures of inequality that we chose not to use, see section A.3 in the appendix.

4.1 The Gini coefficient as a measure of inequality

Although the Gini coefficient is the most well-known and widely used measurement of inequality there are a variety of possible different measurements to choose from. However, in practice, the usage of a certain measurement must be determined by the research question at hand.

The Gini coefficient fulfills the first three of the five desirability criteria Cowell stipulated for all measures of economic inequality: a Pigou-Dalton transfer always reduces inequality (weak principle of transfers), the level of inequality is independent of the scale or monetary measure (income scale dependence) and the level of inequality is independent of the number of individuals in the society (principle of population). However, it is not possible to express inequality in terms of inequality in and between subgroups in society[82] (decomposability) and a Pigou-Dalton transfer's reduction of inequality does not only depend on the distance between two individuals, but also on where in the income distribution this transfer takes place (strong principle of transfers). This is because the Gini, as a consequence of its construction, places more weight on changes in the center of the income distribution than at the extremes, which might be problematic for the social distance model as discussed in 3.2.1.[83] The main strength of the Gini is its comparability, which allows us to directly compare two different societies in terms of inequality. This is not true for other entropy measures of inequality such as the Theil index, which is not always comparable between countries.[84] It is also a full-information measure, i.e. it takes the whole distribution of income in society into account.[85] However, as the Gini is a relative measure standardized between 1 and 0, it can only be understood empirically in context. Neither does it tell us much about the structure of inequality which e.g. ratios do. With the aim of the paper in

[82] If it was, this would help us to effectively construct a measure of economic inequality more relevant for testing the social distance model.
[83] Atkinson (1970) p. 253
This is Atkinson's fundamental critique of the Gini coefficient and led him to construct the Atkinson inequality index, where the researcher can include an assumption of inequality aversion.
[84] Hale (2003) p. 16
[85] Hale (2003) p. 9

mind, i.e. examining the effect of increasing inequality on demand for redistribution, it may be that the key aspect is not the level of inequality but the structure, such as the distance between the median voter and the median welfare recipient, or that concentration of income among the upper-middle class and the rich may be particularly salient when individuals consider their preferences for redistribution.

A variety of differing distributions of income could be represented by the same Gini coefficient, although the structure of inequality in these societies may very well differ substantially when closely examined.[86] Consequently, a constant Gini coefficient does not necessarily mean that inequality is constant, but rather that the "overall" inequality in society is constant. This may also suppress the amount of variation in the variable compared to other measures, but this might also be compensated by the fact that the Gini is a full-information measure.

Hence, even though the Gini coefficient does not satisfy all five of Cowell's desirable properties, it should be a better summary measure of economic inequality than ratios or share, since it considers the whole income distribution. A consequence might therefore be that the Gini is better suited for testing the median voter theorem than the social distance model. Still, its property of comparability renders it extremely useful in cross-country research. However, alternative measures such as ratios and shares can be important in telling us something about the structure of inequality, as described in A.3.2.

4.2 Pre-tax or post-tax inequality?

A final aspect when determining which measure of inequality is the most suitable concerns if the measure should be post- or pre-tax. The median voter theorem clearly departs from pre-tax inequality and this is also suggested by MacRae to be the relevant measure for the social distance model. The pre-tax inequality measure seems to have quite a few advantages compared to the post-tax measure: (i) it is more clearly rooted in the median voter theorem, (ii) it makes it easier to disentangle the effect of inequality on redistribution, as pre-tax inequality obviously precedes redistribution and (iii) logically, individuals ought to make a decision on their preferred level of redistribution based on their gross income. It is, however, harder to find data on pre-tax inequality than post-tax inequality. Post-tax inequality, in turn, is (i) methodologically more complicated to use and is reasonably more highly at risk of being endogenous but (ii) post-tax inequality is nevertheless the level of inequality that individuals face in their daily life and (iii) there is more data available.

It is also not obvious why social distance, as argued by MacRae, should have a stronger relationship with pre-tax inequality than post-tax inequality. If social distance is to be understood as a socioeconomic distance between individuals, why is pre-tax and not post-tax inequality the best proxy for social distance? Still, the pre-tax measure is more reliable to use when we contemplate our research questions: the effect of economic inequality on redistribution, and reduces the methodological problems considerably. Disentangling the effect of post-tax inequality on demand for redistribution seems to be a very difficult from an econometric point of

[86] Jenkins & Van Kerm (2009) p. 52

view and might well be endogenous. However, as it is possible that post-tax inequality really does matter for the demand for redistribution, we provide the econometric results with post-tax inequality as explanatory variable in section A.8 in the appendix.

5. Data quality and descriptive statistics

5.1 Inequality data

The inequality data provided by the Luxembourg Income Study project (LIS) are often considered to be the most reliable measure of inequality available today.[87] This is because the LIS key figures (e.g. Gini coefficients) are all constructed from micro data provided by the national statistic agencies with the aim of enabling cross-country comparisons. This enables the construction of standardized measurements of inequality constructed according to a common definition, greatly improving the possibility to compare inequality over time and between countries.[88] Unfortunately, the LIS has not yearly observations of Gini coefficients but collects data in waves. Thus, the number of time points are quite few and more importantly, it has not observations for all countries in our sample. As we would like an inequality measure that covers our whole sample and ideally with regular observations for the entire time period, we need to consider using measures of inequality provided by other sources.

Three possible sources of inequality data, from the OECD, the World Bank and the University of Texas Inequality Project (UTIP) were considered. However, Brandolini and Atkinson (2001) have already concluded that the Deringer and Squire dataset provided by the World Bank is unreliable. Still, the quality of the OECD and UTIP data was uncertain, and we assessed the quality of our different measures of inequality by using the LIS Gini as a benchmark. Our assessment, presented in table 5.1, show that the OECD measure of inequality has a much stronger correlation with the LIS data than the UTIP data. We therefore only present the results for the OECD data here, whilst a detailed description of the World Bank and UTIP data and the results from the assessment of the UTIP data is available in section A.3.4 in the appendix.

5.1.1 Assessing the quality of inequality data

The OECD provide data on income inequality both based on disposable household income (i.e. post-tax and transfers) and household earnings (i.e. pre-tax and transfers) The OECD Gini figures also come from a variety of micro sources, just as the LIS, but has also produced its variables according to a common definition aiming to enable cross-country comparisons between the OECD countries.[89] Thus, we have reasons to believe that the cross-country comparability of this data is high and we would also expect it to be quite strongly correlated with the LIS data, as it is often constructed from the same raw data.

[87] Atkinson (2004) p. 166
[88] Atkinson (2004) p. 173
Still, as the national statistic agencies do not always collect micro data with the aim of constructing cross-country comparable measures of inequality, differences in methodology may also of course affect the LIS measurements.
[89] http://www.oecd.org/social/soc/_README_Income_Surveys&Years.pdf

The data quality of these measurements of income inequality is assessed by examining the correlation of these variables with the LIS Gini coefficient and by regressing the LIS Gini on the OECD Gini coefficients. As the LIS Gini works as our benchmark, we interpret a stronger correlation with the LIS as higher data quality. Ideally, we would like the beta coefficient to be as close to 1 as possible. The pooled regression of the OECD data on the LIS data has an R-squared of .75 and a beta coefficient of .95, indicating that the OECD and LIS data seem have a strong statistical association.

Let us now turn to the correlations between the LIS Gini and the OECD. Table 5.1 below contains the correlations for two distinctive years and for all years pooled together.

Table 5.1 Correlation matrix between the OECD and the LIS Gini coefficients

		OECD (post)
2000	LIS	.8671
	n	15
1995	LIS	.8772
	n	11
All years	LIS	.8668
	n	34

Comment: The sample was restricted in the following manner: the inequality measurements had to overlap for individual years (i.e. we did not use time windows). The following countries were included: AUS, AUT, BEL, CAN, DEN, FIN, FRA, DEU, GRC, IRE, ITA, LUX, NET, NOR, SPA, SWE, CHE, UK and US.

The picture that emerges is much the same as for the pooled regressions examined above. For both samples, the OECD Gini is the measurement that is strongly correlated with the LIS Gini. Hence, the Gini data provided by the OECD seems to be a credible measurement of economic inequality to use instead of the LIS data.

5.2 Constructing the data sets

The data sets used to test the theories was constructed in the following manner. We used the Comparative Political Data Set I (CPDS) provided by the University of Bern which includes election data for the 23 OECD countries included in our sample. The CPDS, however, does not include any data on economic inequality and we therefore had to merge the data with the post- and pre-tax Gini coefficients provided by the OECD. Unfortunately, the OECD only provide measures approximately every five years on economic inequality, and we therefore needed to impute values of economic inequality as they only rarely match the year of an election. There are several different ways to impute the data e.g. by moving averages, by filling all previous missing values with the most recent value etc. However, as economic inequality is rather sluggish in its evolution, and as the inequality data provided by the OECD is not for a certain year such as 2005 but instead described as "around mid-00's", we chose to impute the inequality data ± 2 years of the actual observation year.

For the survey data on demand for redistribution from the ESS, we departed from the cumulative ESS file containing all respondents, variables and waves included in the ESS. We then merged our macro level

variables and used the same strategy when interpolating, e.g., the inequality data as described above. More information on the construction of the data set can be found in the appendix under A.4.

5.3 Descriptive statistics

In this section we present the first look at the descriptive statistics of the data used to test our hypotheses. This overview can provide some insight to tendencies and changes that have occurred over the time period of interest. However, it is important to keep in mind that the data presented here are summary statistics at an aggregated level, and that caution should be taken before drawing any conclusions of the developments of the observed variables since these bivariate associations could suffer from omitted variable bias. Also, the failure to observe any changes in the mean values of the variables should not be taken as evidence of no change, as a stable mean may well incorporate two trends moving in the opposite direction and cancelling each other out.

The data on right-wing vote shares originate from the "Comparative Political Data Set 1960-2010", and consist of annual observations for 23 democratic countries during this time period. The variable *right_vote* is the vote share for conservative parties, as defined in the "Comparative Political Data Set 1960-2010", which is one of the most widely used data sets on comparative political data. In cases were there did not exist any parties classified as conservative in a country, we chose to include the parties in the country which were classified as liberal. The idea behind this is that liberal and conservative parties traditionally both are classified as right-wing parties, and thus liberal parties should constitute the mainstream right party alternative in countries that are lacking parties classified as conservative.[90] They key assumption is that liberal and conservative parties are less associated with generous social policies and redistribution than left parties, and that their support therefore is affected by the demand for redistribution. The party family classifications in the data set were made using expert surveys and building on extensive research within political science on party families. The descriptive statistics for right party vote share are found in table 5.2.

[90] Budge & Fairlie (1983)

Table 5.2 Descriptive statistics right-wing party vote share over time

Year	Obs	Mean	Std. Dev.	Min	Max
1975	22	28.34091	15.59691	5.4	54.3
1976	22	27.90909	15.65956	3.1	54.3
1977	23	28.68261	14.59566	3.1	50.6
1978	23	28.28261	14.22388	3.1	50.6
1979	23	28.37826	15.12872	0	50.6
1980	23	28.59565	15.23693	0	50.6
1981	23	28.84783	14.27563	0	47.9
1982	23	27.35652	14.1982	0	47.9
1983	23	28.35217	12.74633	5	45.8
1984	23	29.46522	13.34707	5	50
1985	23	30.42174	14.15181	5	50
1986	23	30.47391	13.96744	7	50
1987	23	30.51739	14.59712	8.4	56.3
1988	23	29.96087	14.34921	8.4	56.3
1989	23	30.72609	14.13208	8.4	56.3
1990	23	31.06957	13.82282	8.4	56.3
1991	23	31.13478	13.50393	8.4	50.4
1992	23	30.82609	13.36706	7.3	50.4
1993	23	29.52826	13.98324	7.3	57.35
1994	23	31.3913	13.50932	6.9	57.4
1995	23	30.5	12.87694	6.9	57.4
1996	23	30.68696	13.33251	6.9	64.3
1997	23	29.86522	12.84954	6.9	64.3
1998	23	29.6913	13.39949	6.2	64.3
1999	23	30.12348	13.22324	6.2	64.3
2000	23	29.16696	11.93866	6.2	47
2001	23	29.84522	11.42873	6.2	47
2002	23	28.89348	13.25788	7.4	50.6
2003	23	28.35696	13.07251	7.4	50.6
2004	23	28.56565	12.51531	7.4	49.3
2005	23	28.76087	12.80184	9.8	49.3
2006	23	28.87826	12.41952	9.8	45.4
2007	23	29.16957	12.76777	9.8	51.6
2008	23	30.34783	12.52637	9.8	51.6
2009	23	29.3913	11.37301	10.4	51.6

The changes in right-wing party vote share are observed annually over 35 years, from 1975 to 2009. During this period the vote share seem to have remained at a relatively steady level, with a minimum of 27.36 % in 1982 and maximum of 30.69 % in 1996.

The data on demand for redistribution are collected from the European Social Survey, which have been conducted in five waves from the start in 2002 to 2010. The participants in the surveys were presented with the statement, "Government should reduce differences in income", and were asked to answer to which degree they supported the statement. The possible answers range from 1 (strongly disagree) to 5 (strongly agree), where a higher number implies a stronger demand for redistribution. This is a fairly common operationalization of demand for redistribution when measured through surveys (similar measures are employed in the International Social Survey Program and the World Values Survey). However it is not free of problems, particularly with respect to the comparability across time and space. To answer the question the respondents must assess the current level of government redistribution and then determine whether more or less of government redistribution is desirable. The obvious problem is that the level of distribution changes over time and thus the respondents partly answer these questions with different levels of redistribution in mind. The second problem relates to cultural differences when interpreting the phenomena of government redistribution. In countries with higher levels of corruption e.g. south European countries, even though a respondent may be poor, she may oppose government redistribution because she would not receive any benefits from this increased redistribution, as they would be eaten up by the bureaucratic apparatus. In

countries with lower levels of corruption e.g. the Nordic countries, this may not be a problem. These societal differences may not only produce different average values, but may also distort the correlation between demand for redistribution and inequality, even though the mechanisms of the social distance model or the median voter theorem may be true. Summary statistics for this variable are presented in table 5.3

Table. 5.3 Descriptive statistics demand for redistribution over time

Year	Obs	Mean	Std. Dev.	Min	Max
2002	32234	3.745176	1.053068	1	5
2004	32628	3.773017	1.044728	1	5
2006	27630	3.749294	1.051436	1	5
2008	28151	3.79887	1.025002	1	5
2010	27658	3.823487	1.05516	1	5

The means displayed in table 5.3 indicates that on an aggregated level, demand for redistribution have increased slightly since the first wave of the European Social Survey.

The developments in inequality, measured by the changes in the aggregated Gini coefficient, pre-tax and transfers, provided by the OECD for the countries in our sample, are found in table 5.4. One should also note that we have no pre-tax inequality data on Ireland, but only post-tax inequality data. Thus, Ireland will not be included in the regression with pre-tax inequality as an explanatory variable. Note that we multiplied the Gini coefficients by a factor of 100 to create a Gini index to facilitate the interpretation of the coefficients. The Gini index spans from 0 to 100 whilst the Gini coefficient spans from 0 to 1.

Table 5.4 Descriptive statistics over Gini coefficient developments over time, pre transfers

Year	Obs (aggregated)	Mean (original)	Mean (additional)	Mean (aggregated)	Std. Dev. (aggregated)	Min (aggregated)	Max (aggregated)
1975	8	39.9	-	39.9	4.42331	33.8	45.7
1985	15	42	39.6	40.72	3.57815	34.5	47.3
1990	11	43.5	43.25	43.4	2.61534	39.6	47.4
1995	18	46.2125	45.18	45.63889	3.09594	40.3	50.8
2000	18	46.5125	45.95	46.2	3.06709	41.5	51.6
2005	20	46.9875	46.1	46.455	4.39311	36.5	55.7
2010	22	46.3375	45.76429	45.97273	3.88222	38.2	53.4

At a first look at the data it seems as inequality has increased since the start of the measurements in 1975, it has however stayed on a relatively stable level since the start of the 2000s. The means in table 5.4 are divided into three columns. The first column consist of data for Canada, Finland, Greece, Netherlands, Portugal, Sweden, United Kingdom and United States who have been included throughout the whole time period, with the exception of Portugal in 1985 and Finland and Greece in 1990. The second column shows the mean for the additional countries that have been included as more data became available and the third column displays the aggregated mean for all countries in a given year. During the observed time period the trend in inequality seem to be consistent between the various compositions of countries and tell basically the same story of growing inequality.

The descriptive statistics over developments in aggregated Gini coefficient indicates a similar story as the one portrayed by the OECD. Relative to the aggregated Gini of 39.9 in 1975, the absolute change of 6.0723 points

increase to 45.9 in 2010, constitute a 15.2 percent increase in inequality pre transfers and tax in the OECD countries during the observed time period.[91]

The development of the pre-tax Gini coefficients over time in 11 of the countries included in our data has been examined by Kenworthy and Pontusson (2005) using LIS data. The time period they examine stretches roughly from the beginning of the 1980s up until the year 2000, with an average absolute change of 5.29 of the mean values, which constitute a 16.5 percent increase for all the countries included in their data, which is very much in line with our findings. The larger increase in the data from Kenworthy and Pontusson may well be due to the smaller sample of countries.

Data on the pre-tax Gini coefficient developments is also provided by the OECD in the report "Divided we stand". For the time period between the 1980s up until 2005 the average Gini coefficient for 8 of the countries included in our data increased by 6.87 points or 20.9 percent.[92] Data over the developments in the pre-tax Gini coefficient starting from circa 1985 also indicates similar developments in Denmark and Finland, which both experienced growing inequality from the mid-1980s to the mid-2000s, while inequality during this time period declined in the Netherlands.[93]

Despite of some difference in the numbers, the different data sources all indicate a similar pattern in the development of the Gini coefficient pre-tax, with rising inequality in all countries included in the sample for which we have several observations, except for the Belgium, the Netherlands, Greece and France, comparing the first and the last observations.

After the first examination of the descriptive statistics of our data some preliminary observations can be noted. Since the measure of inequality has increased, while the share of right-wing party vote share has decreased, there might be a negative statistical association between the two. On the other hand, a positive statistical association seems to exist between demand for redistribution and increased inequality. Still, as these are aggregated statistics, we cannot draw anything but tentative and preliminary conclusions from these descriptive statistics.

6. Econometric strategy, methodological issues and results

In this section we test the theories proposed in section 2, the median voter theorem and the social distance model, empirically. We do this by examining the relationship between two different dependent variables thought to capture demand for redistribution – indirectly as right party vote share and directly through a survey question – and pre-tax economic inequality. The median voter theorem predicts a positive correlation

[91] The percent increase in inequality is calculated by dividing the change in aggregated mean between 1975 and 2010 with the aggregated mean in the start of the time period, in 1975. *([0.459 - 0.399] / 0.399)*
[92] Countries included are: Australia, Canada, Germany, Norway, Sweden, Switzerland, United Kingdom (GB only) and the United States.
[93] OECD (2011) Table 7.3

between demand for redistribution and economic inequality, whilst the social distance model predicts a negative correlation between economic inequality and demand for redistribution. Summary statistics for all control variables can be found in table A.3 in the appendix. We have also estimated all models using a post-tax measure of economic inequality. However, as this measure is methodologically inferior, we only include them in section A.8 in the appendix.

6.1 Right-wing party vote share

6.1.1 Econometric strategy

The first model concerns the relationship between right-wing party vote share and economic inequality and uses data on the national level. Since we have repeated measurements for all analytical units, the data used in estimating this relationship can be conceptualized as a small T, large N (N > T) panel. However, it is obvious that with N = 23 countries our N is notably smaller than panels with small T and N = 500 or more, which is more common in economics, which may lead to problems of statistical inference due to small sample issues, as much of the econometrics today relies on asymptotic theory.

The variables of main theoretical interest are the measurements of economic inequality and also the unemployment rate. The unemployment rate data comes from OECD; and is harmonized to enable comparisons between countries and time. In order to strengthen the validity of our claims on the structural relationship between inequality and demand for redistribution, measured as right-wing party vote share, it is necessary to control for other variables that may be correlated with both party vote share and inequality. If we do not control for these variables, our model may well suffer from omitted variable bias, and the results of our econometrical estimation would not be credible. However, it is important only to include controls that we suspect would bias the results if not included. If one included every variable that we suspect may correlate with the dependent variable, we might actually bias our estimator further without being aware of it.[94] The control variables included in the regression can broadly be defined as either relating to political institutions and demographics or economic variables. We control for plurality voting systems such as first-past-the-post voting systems used in the US and the UK, in contrast to proportional and semi-proportional systems, as we know that these systems produce fewer political parties compared to proportional systems, thus generating higher vote shares for each effective party. Since this voting system is common in the Anglophone world where inequality is on average higher than in the non-Anglophone world, not controlling for this would certainly bias our estimations.[95] Voting in elections is known to be more common among well-educated and wealthier individuals, even though it is one of the most equal forms of political participation, and it is therefore reasonable to suspect that lower voter turnout is associated with less demand for redistribution and

[94] This happens if we have two opposing directions of bias, i.e. if our explanatory variable is correlated with two unobservables, biasing the explanatory variable in different directions, thus basically cancelling each other out. If one of these variables is included but not the other our estimator would suffer from greater bias than before, even though we tried to correct for omitted variable bias. Of course, this argument is only valid if we do not have strong reasons to believe that our explanatory variable is biased, but we decide to control for other variables that we do not have reason to believe is biasing the estimator.

[95] Huber, Ragin & Stephens (1993), Iversen & Soskice (2009)

thus stronger support for right-wing parties, especially if higher economic inequality produces lower voter turnout and we therefore control for electoral turnout.[96] Two dummy variables indicating federalist and presidential political systems are also included, since previous research has shown that they seem to correlate with right party vote share.[97] We include the share of population over 65 years of age, as an increased share of the population living on pensions, all else equal, ought to increase the demand for redistribution, if we think of pensions as a form of redistribution. We also include controls for two other factors on the aggregate level that, however, may be problematic from an econometric point of view: globalization by the proxy variable logarithm of trade openness, defined as the share of imports and exports of GDP and union density defined as union membership as a proportion of wage and salary earners in employment. Globalization is often seen to be associated with increasing inequality (see section 2.2.1), and may also be associated with higher perceived risk of the electorate of becoming unemployed et cetera which may lead to increased demand for redistribution.[98] Thus, trade openness may be correlated both with inequality and demand for redistribution. Union density has been identified as a determinant of inequality and may well be positively associated with weaker support for right-wing parties, if the unions mobilize their members politically and the interest of the union lies closer to left parties than right parties.[99] However, these variables might be "bad controls", as they may not only correlate with inequality statistically but might actually cause it. Therefore, controlling for these variables might actually cause us to "over-control", which may lead to an increased risk of committing type II errors. We do include them, however, as they have been proposed as important control variables by previous research.

To account for the fact that trends in right party vote share and inequality may share a positive or a negative time trend that is structurally unrelated, we also include time dummies (i.e. a dummy for every year except the first). This allows the intercept in the regression equation to vary over time, which is aimed to capture a general time trend in right party vote share that is structurally unrelated to changes in inequality. Finally, demand for redistribution measured as right-wing party vote share, might be caused by time-constant and unobserved factors, α_i, in each country such as political culture. Fortunately, as we are working with panel data, we can, using a fixed effects model, eliminate all time constant factors, observed or unobserved, that have an effect on the dependent variable. However, using fixed effects models compared to pooled cross-sections are only strictly necessary if the time-constant factor α_i is correlated with some or all explanatory variables, $\boldsymbol{X}_{it}$. If the assumption $Cov(\alpha_i , X_{it}) = 0$ does not hold and $Cov(Y_{it} , \alpha_i) \neq 0$ using pooled cross-sections would lead to omitted variable bias.

There are different ways to deal with the problem of unit heterogeneity: one can either estimate the model using first differences (FD), fixed (FE) or random effects (RE) estimation. RE estimation has the advantage

[96] Mahler (2008)
[97] Moene & Wallerstein (2003)
[98] This is the most common proxy for globalization and trade openness in the literature.
[99] Moene & Wallerstein (2003). p. 501

that it allows for the estimation of the effect of time-constant variables, e.g. political institutions that do not exhibit any variation in the sample, which is not possible when using FE or FD estimation.[100] However, for the RE model to be consistent it requires (in addition to the assumptions that must be fulfilled for the FE model to be unbiased and consistent) that $E(\alpha_i , \boldsymbol{X}_{it}) = 0$, i.e. that the expected value of α_i given all other explanatory variables is constant, which means that the time-constant factors and the other explanatory variables must not be correlated.[101] This is a strong assumption, as time-constant factors affecting the conservative party vote share may well be correlated with explanatory variables affecting vote share, such as a corporatist political culture producing strong unions which is often found in countries with strong Social Democratic or Christian Democratic parties. Thus, there are reasons to believe that the α_i is correlated with $\boldsymbol{X}_{it}$. First differencing and fixed effects estimation, on the other hand, allows for arbitrary correlation between α_i and $\boldsymbol{X}_{it}$, and are therefore more suitable to use in examining the research question at hand.[102] One could ask what the point is of using simple pooled OLS if we risk producing a biased estimator in the presence of time constant unobservables, but when the time constant unobservables are eliminated either through first differencing or fixed effects transformation (i.e. time demeaning), we also reduce the variation in our variables greatly, which makes the estimation of the standard errors, and thus the whole model, less efficient and precise.

The difference between FE and FD is often not considered very important in the literature and largely comes down to if our idiosyncratic errors are serially correlated or not. However, due to technical limitations in our data, i.e. that we have observations at irregular time intervals which renders the differencing strategy complex to implement, we use the FE estimator instead of the FD estimator. A detailed discussion on the advantages and disadvantages of the FE and the FD is found in the appendix under A.5.

Hence, two full models will be estimated, one using pooled OLS and one using time demeaned data:

$$y_{it} = \beta_0 + \beta_1 Ineq_{it} + \boldsymbol{\delta_k X_{kt}} + u_{it} \quad t = 1,2 \dots T$$

$$\ddot{y}_{it} = \beta_1 \ddot{Ineq}_{it} + \boldsymbol{\delta_k \ddot{X}_{kt}} + \ddot{u}_{it} \quad t = 1,2 \dots T$$

Where the accents signifies time demeaned data produced by the within transformation, β_1 is the coefficient of principal theoretical interest, $\boldsymbol{\delta_k}$ is a 1×N vector of parameters and $\boldsymbol{X_{it}}$ is a K×N matrix of control variables including time dummies and u_{it} and $\ddot{u}_{it}$ represents the idiosyncratic error terms.

6.1.2 Methodological issues

When we examine the relationship between right party vote share and inequality, it is apparent that the presumed statistical association may reflect that increased inequality does not increase or decrease right party

[100] Wooldridge (2002) p. 251
[101] Wooldridge (2009) p. 504
[102] Wooldridge (2009) p. 504

vote share, but instead that increased/decreased inequality is on the contrary to the theory caused by the right party vote share, e.g., through tax policy changes, as discussed in section 2.2.1. In other words, we have an endogeneity problem in the form of *reverse causality*, which would lead to us violating the strict exogeneity assumption. This problem is not easily dealt with, especially as we have so few observations of economic inequality. A possible solution would be to use an instrument instead of economic inequality, i.e. a variable correlated with economic inequality, uncorrelated with u_{it} and structurally uncorrelated with right party vote share, but this is very hard to find. Another solution would be to lag the economic inequality variable; however, as we have such infrequent measures of economic inequality, this is perhaps not a satisfying solution. However, as the measure of economic inequality that we include is pre-tax, it should be less affected by changes in government policy than the post-tax Gini. Still, we know that the marginal tax rate (which is obviously affected by which parties form government) on high incomes have a depressing effect on top incomes, thus, not even the pre-tax Gini can be considered completely exogenous. Still, it is certainly more reliable than the post-tax.

Another endogeneity issue, which was discussed in 3.1.4, was that the political parties may adjust and tweak their policies to match the demand for redistribution. If these adjustments are made very close in time to the changes in demand for redistribution, it is possible that the voters do not perceive any substantial differences in the supply of redistribution, which is necessary for right party vote share to be a satisfying dependent variable.

A third methodological issue is attenuation bias due to measurement error in the explanatory variables. This attenuation bias can be derived from the assumption that the measurement error in the explanatory variables is uncorrelated with the unobserved, true value of the explanatory variable, i.e., the measurement error is noise of some sort, and then the measurement error must be correlated with the observed value of the explanatory variable.[103] This particular form of bias attenuates the findings, i.e. bias the coefficients towards zero, which may have consequences for both the statistical and economic significance. The effective size of the bias depends on the covariance between the measurement error and the observed value and the variance of the explanatory variable.[104] The bias is smaller the greater the variation in the explanatory variable, however, as the Gini coefficient is a rather sluggish moving variable which thus limits the variation in the variable, the attenuation bias is a cause for concern. Also, attenuation bias particularly attenuates positive estimates and it is known that bias in one of the explanatory variables most often bias the whole estimator.[105]

In light of the quality and quantity of the data we have at our hands when assessing the relationship between demand for redistribution and economic inequality, it is worth stressing that the results perhaps are not strong

[103] Wooldridge (2009) p. 319

[104] If x^*_1 is the unobserved explanatory variable and e_1 the measurement error, the bias is equal to $\beta_1 \left(\frac{\sigma^2_{x*1}}{\sigma^2_{x*1}+ \sigma^2_{e1}}\right)$ which is always $< \beta_1$ hence the attenuation bias

[105] Wooldridge (2009) p. 320

enough to once and for all put the median voter theorem or the social distance model to the test, we should be able to draw some tentative conclusions on the relationship between demand for redistribution and pre-tax economic inequality.

Finally, in the social sciences, when we do not employ experimental or quasi-experimental design, one should be aware that we most often cannot establish causality, but we can (hopefully) falsify hypotheses. The causality is in a sense "black boxed". Hence, in this study we cannot claim that, depending on the results, increased demand for redistribution is caused by increased inequality as proposed by the median voter-theorem, as we cannot observe the causal mechanism. Still, we can refute the hypothesis proposed by the median voter-theorem if increased inequality produces less demand for redistribution, as this goes contrary to the predictions of the median voter-theorem. This limitation of the design and method of the study must of course be kept in mind when conclusions are drawn.

6.1.3 Empirical findings

In table 6.1 are the results of our econometric analysis of economic inequality on right party vote share. Five models are estimated with increasing complexity, adding controls, year dummies and fixed effects step by step.

Table 6.1 Determinants of right party vote share (OLS, unst. beta coefficients, cluster-robust SE within brackets)

	I	II	III	IV	V
Gini pre-tax	0.338	0.365	0.331	0.0529	0.0359
	(0.494)	(0.435)	(0.525)	(0.477)	(0.542)
Single member		4.839	4.559	4.192*	8.430*
		(4.644)	(4.974)	(2.084)	(4.761)
Federalism		-3.158	-3.728	4.293***	6.365***
		(2.684)	(2.498)	(1.498)	(2.213)
Presidentialism		1.321	1.086	1.206	-1.056
		(6.774)	(5.449)	(2.717)	(4.262)
Voter turnout		-0.369	-0.408	-0.219	-0.244
		(0.252)	(0.238)	(0.184)	(0.182)
Perc. Elderly		-1.245*	-1.200	0.0577	-0.194
		(0.629)	(0.836)	(0.921)	(0.963)
Unemp. Rate			0.179	0.236	0.404
			(0.785)	(0.416)	(0.561)
Log open					1.694
					(12.92)
Union density					-0.224
					(0.236)
Constant	15.00	60.33	60.40*	36.67	42.40
	(22.37)	(35.29)	(29.56)	(26.16)	(60.77)
Fixed Effects	No	No	No	Yes	Yes
Year Dummies	No	No	Yes	Yes	Yes
N	146	146	144	144	138
R-squared	0.010	0.333	0.460	0.356	0.363

Comment: * p < .10, ** p < .05, *** p < .01

In column I the bivariate statistical association between inequality and right party vote share is not statistically significant at conventional levels. If the Gini index increases by one unit right party vote share increases by 0.338 percentage points. When controls for political institutions are included in column II, the coefficient is still statistically insignificant and the magnitude of the coefficient barely budges. In column III we also add year dummies and the rate of unemployment, which also in this case fails to reach statistical significance at conventional levels. Finally, in the full model, IV, we include country fixed effects, which drastically reduce the magnitude of the coefficient of pre-tax inequality, but only marginally reduce the size of the standard error. Lastly, in column V, we also include the possible bad controls which reduces the coefficient of the Gini somewhat and it is still not statistically significant.

Our findings do not support any of the theories discussed in the 3.1.1 strongly. However, even though the coefficients associated with our measurement of economic inequality are not statistically significant, the signs

are positive, indicating that a higher degree of economic inequality increases the right wing party vote share, which is in line with the social distance model and goes against the argument we constructed from the median voter theorem. This statistical insignificance might be caused by low variation in the measures of economic inequality. This has only previously only been tested empirically by MacRae (2006), who found a significant positive association, but as we noted in 3.1.2, his econometric strategy is hardly convincing. Still, we must keep in mind that these findings might also reflect reverse causality and may also suffer from attenuation bias. On the other hand, the social distance model also predicted that we would find a negative relationship between unemployment rate, which does not have low variation, and right party vote share, which was found but nowhere near conventional levels of statistical significance. However, we want to be very careful in interpreting between unemployment and right party vote share on the aggregate level as we do not want to commit an ecological fallacy: the negative coefficient may indicate that the unemployed vote for right parties to a lesser extent as they have higher demand for redistribution, and perhaps is unrelated to the behavior of the median voter.

Nonetheless, the econometric strategy rested on the assumption that the demand for redistribution manifests itself indirectly in the support for right and left wing parties. If one favors higher levels of redistribution, one ought to vote for left wing parties and vice versa. This may of course not be true due to e.g. multidimensionality of elections and that matters of redistribution may not be very salient compared to other electoral issues. It may also be that all parties adjust themselves to changes in demand for redistribution, thereby offsetting any structural advantage that have arisen due to changes in demand for redistribution.

Another issue that relates to the measure of inequality is that it may be the structure of economic inequality and not the level that is important for the voting decision, as it could tell us more of the social proximity between the median voter and the other groups, as we discuss in section 3.1.2. It could also be that it is not the *de facto* inequality that matters, but individual's perception of inequality, as proposed by the POUM literature or is driven by norms of inequality, which we do not control for. Still, if these are sluggish moving, they might have been differentiated away with the country fixed effects. Finally, we have the problem of the assumption of universal turn out. For the median voter theorem to work, i.e. for the median voter to be the decisive voter, we must have perfect electoral turnout. However, we do not have perfect electoral turnout in any of the countries included in the sample, and we also know that individuals working in these countries are not always allowed to vote (e.g. immigrants and sentenced prisoners in certain states in the US). Thus, it is highly likely that the median income in the franchise is higher than the median income in the population. Also, as we do not have data on the structure of inequality, we do not know if the median voter has been negatively affected by the changes in inequality at all (this could be true if increases in inequality are concentrated among e.g. the poorest decile).

Hence, several important methodological issues remain to be solved before we can consider this a satisfactory test of the median voter theorem and the social distance model. Therefore, the results found here should be

interpreted with a grain of salt, especially when coupled with the very weak findings. Our full model using fixed effects does however suggest that we have no strong relationship between demand for redistribution and economic inequality, as suggested with other measures of demand for redistribution by Bowles and Gintis (2000), Lübker (2007) and Kenworthy and McCall (2007) contrary to Finseraas (2008).

6.2 Demand for redistribution

6.2.1 Econometric strategy

Our second dependent variable concerns demand for redistribution as measured by the survey question included in the European Social Survey every other year since 2002. We have chosen to estimate this relationship at the micro level instead of aggregating the micro data to the country level for a number of reasons: Firstly, aggregating micro level data ignores a lot of information on the micro level. Secondly, one of the theoretical interesting variables is constituted by an interaction between micro level data and macro level data. Thus, we would like to use as much of the variation on the micro level when assessing this interaction with a macro level variable. Thirdly, estimating this relationship at the micro level also enables us to identify what parts of the variation that is cross-sectional and which part of the variation that is due to within country effects and also enables us to separate the effects of the macro level variables from their micro level counterparts which might be theoretically important (e.g. the unemployment rate compared to an individual being unemployed). Lastly, and most importantly, by estimating this relationship about the behavior of individuals on a micro level, we do not face the risk of committing an ecological fallacy, i.e. assuming that a possible correlation at the aggregate level also holds for the individuals at the micro level.

A consequence of estimating this relationship at the micro level, is that we will mix micro and macro level variables in the model. It is therefore important that we use clustered standard errors in estimating this relationship, which takes into account that our data has a hierarchical structure (i.e. that the respondents are nested within countries and time).[106] This means that the standard errors are corrected to take into account that we only have one observation of inequality per year and country, and not as many independent observations of inequality as we have respondents in our data set. However, one should be aware that we only have 17 countries in the ESS data, which is probably below, the minimum amounts of clusters required for the standard errors to be "well behaved".[107] Thus, we should once again note that the standard errors in our estimation may not be conservative enough, which is crucial to remember when interpreting the results.

The data we are working with is pooled micro level cross-sections with a dependent variable with an ordinal scale. Assuming that the scale of the dependent variable is to be considered continuous is a far too heroic assumption, and we therefore recode our dependent variable to a Bernoulli variable, where "agree strongly" and "agree" are coded as 1 and "neither agree or disagree", "disagree" and "disagree strongly" are coded as 0. When estimating the relationship between demand for redistribution and inequality our main alternatives are

[106] Angrist & Pischke (2009) p. 231
[107] Nichols & Schaffer (2007)

either to estimate with a linear probability model (OLS) or using binary logistic regression. The standard approach would in this case be to use binary logistic or probit regression, since our dependent variable is discrete. However, in recent years the linear probability model has increased in popularity, perhaps due to the strong advocacy by economists Angrist and Pischke in their textbook "Mostly Harmless Econometrics". The advantage of using the LPM compared to logistic or probit regression is the straightforwardness when interpreting the regression coefficients: the magnitude the effect of an explanatory variable (which should be interpreted as a marginal change in probability of "success" i.e. a respondent agreeing with the statement above) variable can be directly read from the beta coefficients in contrast to logistic or probit regression due to the non-linearity of these models.[108] There are of course a few disadvantages. Since the probability model is linear, the marginal effects of the explanatory variables will be constant; the effect of a one unit increase in the explanatory variable changes the probability by the same amount regardless of initial value of the explanatory variable.[109] This is not reasonable as probability is bounded between 0 and 1. Relating to this problem is the phenomenon of ridiculous predictions of cumulative probability i.e. that a respondent may have a negative predicted probability or a probability greater than 1. Also, unless all slope coefficients are equal to zero, the variance of the estimator is heteroscedastic, but this is easily corrected for by using robust standard errors. Still, despite these complications, if our main interest lays in the partial effects of our explanatory variables this should be reliable. According to Wooldridge "the LPM often seems to give good estimates of the partial effects on the response probability near the center of the distribution of **x**".[110] However, as a robustness check we will compare the estimates of our LPM with the average partial effects estimates of a binary logistic regression. If these do not deviate notably, we will present the estimates of the LPM.

As before, the variables of theoretical interests are the measurements of inequality and unemployment, which we have already defined, but also the interaction between household income and inequality, as we would expect the effect of increasing inequality on demand for redistribution to be greater for individuals in the lower deciles, according to the median voter theorem. To account for the POUM hypothesis we add a variable aiming to capture social mobility. Alesina and Giuiliano (2005) employ to two different measures of social mobility: one concerning the occupational status of the respondent compared to his/her father, and one concerning the level of education. In the ESS we have no information on the occupational status of the respondent and his/her father, but we have information on the level of education of the father. We therefore construct a dummy indicating that the respondent has a higher level of education than his/her father, even though Alesina and Giuliano found that the effect of status of occupation is stronger.

It is necessary to include control variables in our regression to strengthen the validity of our findings. We include a control for gender (coded 1 for female), as previous research have shown women to be more

[108] Wooldridge (2002) p. 455 Thus, if the coefficients of the logistic or probit regression are not presented as odds ratios, we cannot tell the economic significance of the variables by simply looking at the beta coefficients, as the effect of an explanatory variable depends on the values of the other variables in the regression equation.
[109] Wooldridge (2002) p. 455
[110] Wooldridge (2002) p. 455

supportive of redistribution than men.[111] Age and its square term are included, as one might suspect that one has a higher demand for redistribution in the parts of life when one is more dependent on the welfare state e.g. as a pensioner or as a university student attending publicly financed education. We include household income since individuals with higher incomes are known to be less favorable of redistribution as their economic gain is relatively smaller. Using income as an explanatory variable in a cross-country setting can indeed be problematic due to differences in wage levels. We address this problem by instead creating country specific household income deciles, which we use as a relative measure of income.[112] As most of the redistribution takes place within the country, we believe that this is a reliable and relevant measure of relative income that allows for cross-country comparisons, even though it contains less information than a monetary measure of household income. Education, measured as years of education, is included as highly educated individuals probably suffers a lower risk exposure of e.g. becoming unemployed, or if they become unemployed have a greater probability of finding new work, due to their relatively greater human capital, and ought to have less need for redistribution. Previous research has also shown that higher education is related to less demand for redistribution.[113] Number of household members is included as a larger household, assuming that not all of these household members are gainfully employed, ought to put a greater strain on the economy of the household. We control for if the respondent is a union member, as union members may be more politically organized and aware of their economic self-interest, and as greater redistribution logically should increase the reservation wage of individuals it should be in their interest to raise levels of redistribution. A dummy variable for gainfully employed is included and also one for if the respondent is married, as both are thought to affect the risk exposure of the individual. We add these individual level controls not because we think excluding them would bias the estimation of the effect inequality on demand for redistribution to a great extent. However, not controlling for these respondent characteristics would probably bias the estimation of the interaction effect between inequality and household income. We include both a dummy for employed and the national unemployment rate as the social distance model explicitly states that it is the rate of unemployment affects the likelihood of an individual becoming unemployed or getting a job, but being employed as such should also have an effect on demand for redistribution. However, by doing this we risk to over control for the effect of unemployment and thereby rendering both coefficients statistically insignificant due to multicollinearity. We include a dummy variable indicating of the respondent attends religious ceremonies at least on a monthly basis. Finally, on the individual level, we include a dummy variable for belonging to a minority in the country the respondent lives in.

[111] Alesina & Giuliano (2009)
[112] This is the most convenient way to solve this issue, as the ESS in the second wave only distribute data on which national household income decile the household belongs to, and not the monetary value as such. If this was not the case, we could have interacted the deviation of the household income from the national mean interacted with the country dummies.
[113] Cusack et al (2006), Iversen & Soskice (2001)

Ideally, we would like to control for if the respondent has immigrated to the country, but the ESS does not provide any data on this. Alesina has previously shown that redistribution is affected negatively by ethnic fractionalization.[114] In the section determinants of inequality, migration was also discussed as a possible driving factor behind the increasing inequality, and as it is hard to find data on migrant flows we proxy it with by ethnic fractionalization. Finseraas argues that one should not include left-right ideology as a control due to the possible endogeneity problem of demand for redistribution determining ideology and not the other way around and we do therefore not control for left-right ideology. We also include dummy variables for countries and year to allow for different intercepts between countries and waves of the ESS. We also control for three variables on the macro level, namely openness of the economy as a measure of openness of the economy, union density, percentage of the population over 65 years of age. However, both union density and openness of economy might be bad controls, as we discuss in 6.1.2, and might lead us to "over-control" as they might not only correlate with inequality but actually cause it.

Thus, the full model estimated will be:

$$y_i = \beta_0 + \beta_1 Ineq_i + \beta_2 Ineq_i \times Household\ income_i + \boldsymbol{\delta_k X_k} + u_i$$

Where β_1 and β_2 are the coefficient of principal theoretical interest, $\boldsymbol{\delta_k}$ is a 1×N vector of parameters and $\boldsymbol{X_k}$ is a K×N matrix of control variables including time and country dummies and u_i is the error term.

6.2.2 Methodological issues

The most apparent methodological drawback is that we do not have data on all the 23 countries in our sample. Fortunately, we have a variety of different types of welfare state regimes, linguistic and cultural areas in our ESS data, which levitates this problem somewhat and increases the external validity. Still, we are convinced that it is better to use reliable data with enough observations to produce reasonably reliable estimates than to use data with only a handful of countries such as provided by the International Social Survey Program, although including countries from outside of Europe, which would make it impossible to produce well-behave clustered standard errors, and where we have a maximum of two survey waves per country, rendering it extremely difficult to estimate the effect of the sluggish moving inequality variable on demand for redistribution. In addition to this, our model might suffer from omitted variable bias as we do not control for norms regarding acceptance of inequality. If, e.g., poverty is seen as self-caused, this might of course lead to people accepting higher levels of economic inequality and accepting lower levels of government redistribution. However, if these norms are sluggish, they will hopefully be captured by country dummy variables.

We still face the issues of attenuation bias, structure vs level of inequality and low variation in the economic inequality. However, as these issues are basically the same as for right party vote share, we do not discuss this

[114] Alesina et al (2003)

in further detail here. The problem of reverse causality is not as straight-forward for this dependent variable as for right-party vote share. The idea is that demand for redistribution is not driven by inequality, but that the level of inequality is instead caused by the demand for redistribution, i.e. the demand for redistribution, e.g., forces the politicians to enact policies that affect inequality. Still, using pre-tax inequality should be more exogenous than post-tax inequality.

Finally, we have the problems of comparability through space and time, which we touched upon in 5.4. It is possible that individuals in different countries and years interpret the question asked by the ESS differently, which renders the comparison useless. It might also be that, considering that we are just studying an eight year period, the variation in inequality is too small to leave a substantial mark on the demand for redistribution.

6.2.3 Empirical findings

In table 6.2 below are the results of the linear probability model regression. Like in section 6.1.3, five models are estimated with increasing complexity. First we present the bivariate relationship. We then add control variables on the individual level. The next column contains the rate of unemployment and, finally, the full model contains the interaction term. The last column also includes the potentially bad controls. All estimations include a full set of country and year dummies. Note that this model is a linear probability mode which means that we interpret the coefficients as, in this case, the increased probability to believe that government redistribution should increase.

Table 6.2 Determinants of demand for redistribution (LPM, beta coeff., cluster-robust SE within brackets)

	I	II	III	IV	V
Gini pre-tax	0.00997	0.00963	0.00401	0.000909	-0.00717
	(0.00637)	(0.00680)	(0.00239)	(0.00589)	(0.00434)
Houseinc*Pre				0.000604	0.000620
				(0.000759)	(0.000752)
Age		0.00517***	0.00514***	0.00517***	0.00516***
		(0.00131)	(0.00132)	(0.00132)	(0.00132)
Age^2		-0.0000434***	-0.0000430***	-0.0000433***	-0.0000432***
		(0.0000126)	(0.0000128)	(0.0000127)	(0.0000127)
Female		0.0543***	0.0546***	0.0547***	0.0548***
		(0.00572)	(0.00569)	(0.00570)	(0.00571)
Edu (years)		-0.00787***	-0.00787***	-0.00792***	-0.00789***
		(0.00122)	(0.00123)	(0.00121)	(0.00122)
Househ inc		-0.0223***	-0.0223***	-0.0504	-0.0513
		(0.00275)	(0.00280)	(0.0345)	(0.0341)
Househ. memb		0.00591**	0.00593**	0.00610**	0.00606**
		(0.00273)	(0.00271)	(0.00261)	(0.00263)
Employed		-0.00927	-0.00890	-0.00861	-0.00755
		(0.00584)	(0.00586)	(0.00598)	(0.00594)
Rel attend		-0.0220**	-0.0223**	-0.0225**	-0.0226**
		(0.0100)	(0.0100)	(0.0100)	(0.0101)
Minority		0.0261	0.0266	0.0259	0.0263
		(0.0177)	(0.0174)	(0.0176)	(0.0177)
Union memb		0.0722***	0.0725***	0.0727***	0.0723***
		(0.00912)	(0.00912)	(0.00914)	(0.00922)
Soc mob (edu)		-0.00207	-0.00205	-0.00182	-0.00206
		(0.00600)	(0.00599)	(0.00606)	(0.00595)
Unemp rate			-0.00308	-0.00289	0.000962
			(0.00483)	(0.00486)	(0.00337)
Ethnic fract			-0.0721***	-0.0720***	0.176**
			(0.0150)	(0.0147)	(0.0687)
Perc. Elderly			0.0445**	0.0446**	0.0336***
			(0.0162)	(0.0159)	(0.00925)
Union density					0.00320
					(0.00421)
Log open econ					0.497***
					(0.106)
Constant	0.295	0.335	0.654*	0.794**	-3.739**
	(0.273)	(0.275)	(0.332)	(0.346)	(1.275)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	124599	92089	92089	92089	92089
R-squared	0.073	0.102	0.103	0.103	0.104

Comment: * p < .10, ** p < .05, *** p < .01

Column I contains the relationship between pre-tax Gini and demand for redistribution, including year and country dummies. The magnitude of the coefficient is small, although positive, and is not statistically significant at conventional levels: a one point increase in the pre-tax Gini index would lead to an increased probability of a respondent stating that increased government redistribution is good by approximately 1 percentage point.[115] In column II we add individual level characteristics, as described above, which all have the expected sign on the coefficients, although some are not statistically significant. The coefficient and standard error of the pre-tax Gini barely nudges. We then add three macro level variables in column III, which reduces the magnitude of the pre-tax Gini to 0.00401 and it is still not significant at conventional levels. The rate of unemployment is not statistically significant and has a negative coefficient, contrary to the prediction of the social distance model. Finally, the full model is found in column IV, where we also include an interaction effect; however, the coefficient of pre-tax Gini is drastically reduced to 0.000909, which is hardly economically significant, with the coefficient of the interaction effect being even smaller but also positive, as predicted by the median voter theorem. Even an increase with inequality by two standard deviations would only increase the probability of a respondent agreeing with the statement by less than one percentage point. Neither is statistically significant. The rate of unemployment is still not statistically significant and is also negative. Finally, in the last model we include the bad controls mentioned previously. The coefficient of pre-tax inequality changes sign and becomes negative, in line with the social distance model, but fails to reach statistical significance, whilst the coefficient and standard error of the interaction term changes only marginally. Thus, neither the median voter theorem nor the social distance model is supported by our findings. However, judging from the signs of the coefficients, these are in line with the predictions of the median voter theorem.

As a robustness check we also estimated models IV with an alternative specification of the dependent variable with its original five-step ordinal scale. The findings were in all important aspects the same as for the estimations in column IV.

Consistent for models I-V is that our measure of social mobility is not statistically significant, and the magnitude of the coefficient, although negative as predicted by the POUM hypothesis, is also constantly near zero. This speaks against the POUM-hypothesis as put forward by Benabou and Ok, but one should also question if this measurement of social mobility may not be too crude and blunt.

All in all, we find very little support for the two theories tested in this paper. This is in line with the majority of the previous studies of the determinants of demand for redistribution (Bowles & Gintis 2000; Lübker 2007; Kenworthy & McCall 2007) who find no significant statistical association between inequality (measured as both pre-tax and post-tax inequality) and demand for redistribution, but contrary to the findings of Finseraas (2008) and MacRae (2006). As we pointed out in section

[115] As this is LPM we interpret the coefficients as marginal changes in probability.

3.1.1, however, most of the studies where methodologically unsatisfactory and it is possible that the findings of Finseraas and MacRae would be refuted with the usage of more reliable econometric strategies and particularly the inclusion of more data, in terms of a longer time frame, which would enable capturing the temporal dynamics, and the inclusion of more countries, respectively. Finseraas also uses the post-tax Gini, and thus reverse causality might be a serious issue.

However, a number of important caveats must be kept in mind when interpreting these results, some of which we have already discussed in 6.13. Measurement error is still a possible source of bias, which may attenuate the findings, and reverse causality is still an issue. Also, it may well be that it is the structure of inequality that is relevant, and not the level of inequality as measured by the Gini coefficient. It is furthermore possible that the 8 year time-frame contains too little variation in inequality to enable a precise estimate of the effect, especially as the large changes in inequality seemed to have taken place in the late 1980s. However, in contrast to the findings in 6.1.3, this data should not be by the possibly problematic assumption of universal turnout, as the ESS includes e.g. migrant workers who are not allowed to vote. Also, multidimensionality should neither be a problem for this dependent variable, indicating that it is not the failure of the political mechanism of the median voter theorem that is the problem. The socioeconomic bias in partaking in public opinion surveys, i.e., that the well-educated and well-off vote to a higher degree than individuals in a lower socioeconomic positions, may not be as severe for survey participation as for voting. Thus, with the survey data from the ESS we probably come closer to the median voter theorems assumption of universal suffrage, than with the voting data. Finally, we must also be aware of the possible problems of comparability through space and time mentioned in 5.4.

7. Conclusions

In this paper we have examined the relationship between economic inequality and demand for redistribution for 23 OECD countries and 17 European countries respectively. It is important to study redistribution, or the size of government, in itself, since approximately 45% of GDP among the OECD countries is collected and spent by governments, but it is also important as, e.g. large redistribution have been said to hinder economic growth. Most of the previous literature has focused on the effect of economic inequality on redistribution as such, but we instead focus on the earlier step in the causal chain, arguing that if economic inequality should have an effect on redistribution this must be mediated through changes in demand for redistribution. We depart from two different theories with contradictory predictions of the relationship between demand for redistribution and economic inequality: the median voter theorem predicting a positive correlation (Meltzer and Richard 1986), and the social distance model (MacRae 2006) predicting a negative correlation. We tested the theories using two different measures of demand for redistribution: aggregate vote share of right wing parties and individual attitudes towards increased government redistribution. We used election data from

between 1975 and 2009, and survey data from 2002-2010. This enabled us to exploit the cross-sectional and time variation in economic inequality, in studying the effect on demand for redistribution. The data used to test the theories enabled us to use a panel data approach, i.e., fixed effects estimation, when studying the right party vote share and to control for country fixed effects in examining the survey data. The main contribution of this paper lies in the usage of new data, inequality data from 2005 and 2010 and the latest round of the ESS, together with more robust and reliable econometric estimation techniques.

The results of the econometric estimation for both measures of demand for redistribution does not support any of the theories strongly, and are principally in line with a number of other studies (Bowles & Gintis 2000; Lübker 2007; Kenworthy & McCall 2007) who do not find a statistically significant association between economic inequality and demand for redistribution. However, as we do not find strong results with neither of the two data types, this might indicate that it is not (only) the political mechanism of the median voter theorem that is the problem, which has been framed as key explanation for the mixed empirical evidence. The absence of strong results also for the survey data indicate that the causal mechanism fails earlier in the causal chain.

Still, when interpreting the results a few important methodological caveats must be kept in mind. It could be that we did not have enough variation in our measures of economic inequality, or that our measure of inequality (the Gini coefficient) did not tap into an interesting dimension of inequality when considering demand for redistribution. One should be aware that a stable Gini coefficient does not imply that the structure of inequality does not change: changes in towards more inequality for some could be offset by changes towards more equality for others, thus keeping the level of the Gini constant.

Hence, the issue of the effect of economic inequality is far from settled. Perhaps the best way forward, in face of the methodological issues discussed in this paper, is an empirical approach more in line with the experimental paradigm in economics, i.e., to try and find a pseudo-natural experiment where inequality has drastically risen due to e.g. austerity reforms. Another way forward would be to try to study the effect of the structure of inequality rather than the level of inequality. Still, judging from this and previous studies, there does not seem to be a strong effect of inequality on demand for redistribution.

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Appendix

A.1 List of countries included in the study

Right-wing party vote share
Australia
Austria
Belgium
Canada
Denmark
Finland
France
Germany
Greece
Iceland
Ireland
Italy
Japan
Luxembourg
Netherlands
New Zealand
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom
United States

Demand for redistribution (ESS)
Austria
Belgium
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Netherlands
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom

A.2 Determinants of post-tax inequality

As mentioned with the quote from Stolper and Samuelson it is always possible to bribe the suffering factor by subsidies or other redistributive devices so as to leave all factors better off as a result of trade. Even if pre transfers and tax inequality, is rising, a more equal income distribution can be achieved through social security systems redistributing income through transfer payments, benefiting those with low labour market income[116]. In addition to transfers, tax systems who have a proportionately higher income tax for those with higher wages than those with lower, also help to decrease inequality by levelling out the household disposable income. This is supported by Gini index data from the OECD, stating that income inequality after taxes and transfers in the OECD countries was about 25 % lower than inequality in income before taxes and transfers in the late 2000s.[117]

However, the OECD state in their report "Divided we stand" that tax benefit systems in the OECD-countries have grown less efficient in reducing inequality.[118] In the OECD-countries the extent of redistribution grew from the mid-1980s to the mid-2000s. Across the 29 countries the OECD observed

[116] Labour market income inequality is constituted of differences in wage rates, hours worked and by employment rates (OECD, 2012).
[117] OECD (2012) p. 5
[118] OECD (2011) p. 292

over this time period, average social expenditure grew from 17.0 percent of GDP in the mid-1980s to 20.1 percent of GDP by the year 2005.[119] But this increase in redistribution did not match the growth in market income inequality, which grew by twice as much, causing the overall level of inequality to incline. The average Gini coefficient for the OECD countries stood at 0.29 in the 1980s but have since then increased to an average of 0.316, an increase of almost 10 percent.[120] Redistribution systems have been generally effective at decreasing the effects of widening income gaps, which have been driven by falling income at the bottom of the income scale. However, these systems have been less effective at reducing the effect of growing inequality caused by rising top incomes.[121]

Traditional right wing policies, such as decreasing the overall tax burden are said by the OECD to have benefited those with high or very high income, and thereby increased income gaps in the OECD-countries during the last decade.[122]

A.3 Measures of Inequality

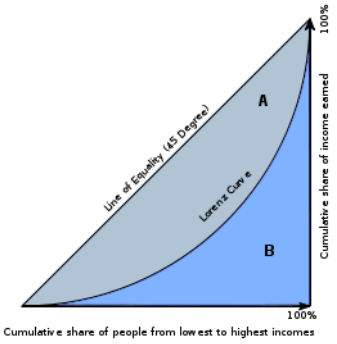
A.3.1 The Gini coefficient

The Gini coefficient is a measure of relative wealth and is derived from the Lorenz curve. The Lorenz curve is depicted in figure 4.2 below, and shows the cumulative share observations from the lowest to the highest of a resource and then plots the cumulative proportion of the population on the X-axis and the cumulative proportion of the variable of interest on the Y-axis.[123] The 45 degree line in the figure represents a state of perfect or absolute inequality. The Gini coefficient then is equal to twice the area between the Lorenz curve and the diagonal.[124] For an illustration of the Lorentz curve, see figure A.1 below.

The minimum value of the Gini coefficient is 0, which corresponds to a state where all resources in the country are distributed equally between all individuals and the Lorentz curve and the diagonal collapse and the maximum value is 1, corresponds to the hypothetical state where one individual receives all earnings in society.

[119] OECD (2011) p. 264
[120] OECD (2011) p. 22
[121] OECD (2011) p.292
[122] OECD(2011) p.292
[123] Hale (2003)
[124] There are several different ways to calculate the Gini, however, the details will not be discussed here.

Figure A.1 The Lorenz Curve



A.3.2 Alternative measures of inequality

A possible alternative to the Gini coefficient would be using ratios such as the 90/10 and 80/20 ratios, indicating how much larger the 90th percentile's share of the total national earnings are compared to the 10th percentile.[125] Closely related to the ratio measures is income share data, found in, e.g., the world top income database, showing how large share of the total earnings in the economy that belongs to the 10th decile. An obvious drawback of the percentile ratio and the share measurements is that they are not full-information measures, i.e. do not use all the information on the income distributions provided by the data. The ratio measure only uses the information on the two relevant deciles or percentiles and the share measure only uses the information of e.g. top decile earnings as a share of total earnings in the population. Thus, they do not necessarily satisfy the fundamental first principle of inequality measures, the weak principle of transfers, because transfers might take place outside of the relevant percentiles/deciles. As ranking measures, they do however satisfy the scale invariance and population properties. However, they do not satisfy the fourth and fifth criteria. Still, the ratios and shares have one key advantage compared to the Gini coefficient: even though they do not provide us with a summary measure of the level of inequality, they tell us something about the structure of inequality. Also, the ratios and shares are often more easily computed which has enabled the construction of longer time series (e.g. for the world top income database we have time-series for certain countries stretching as far back as the 1880s, and we also have more frequent measures and thus more detailed knowledge about the development of inequality).

A.3.3 UTIP data description and quality

Before LIS data was available, a widely used data set was the Deiringer and Squire data set (DS) assembled for and provided by the World Bank.[126] However, in an article published in the Journal of Economic Literature, Atkinson and Brandolini convincingly put forward the caveats and problems of using second order data sets (assembled data sets of ready-made data, i.e. inequality measurements that the researcher does not have to calculate themselves) such as this.[127] As a consequence of the

[125] Jenkins & Van Kerm (2009) p.50
[126] Atkinson & Brandoloni (2001) p. 782
[127] Atkinson & Brandolini (2001) p. 782

ready-made character of this data set different kinds of data, variable definitions and sampling techniques are used for constructing Gini coefficients, rendering the comparability over time and between countries dubious, so that "differences in methodology may affect not just the level but also the trend in inequality".[128] An illustration of this problem is that, according to the *DS* dataset, both Spain and the United Kingdom are said to be more equal than Norway, Denmark and Sweden, which is quite contrary to common belief and the LIS data.[129] The correlation between the LIS key figures and the DS data is also a mere 0.48, according to Atkinson and Brandolini.[130] The problems associated with *DS* data are highly important for this study, as this data set is used to construct the University of Texas Inequality Project's (UTIP) measure of household inequality.[131] The UTIP measure of household inequality is estimated through regressing the UTIP-UNIDO measures of manufacturing inequality – the dispersion of earnings across industrial categories in the manufacturing sector - on the DS data.[132] Even though we have no reason for questioning the quality of the UTIP-UNIDO measurement of earnings inequality in manufacturing industries, the combination of this data with the DS data to econometrically estimate household inequality seems to be a project of high uncertainty and a careful examination of the data against a benchmark is indeed necessary. However, if the relationship between the LIS data and the UTIP measurement of household inequality was strong, we could use UTIP's long time-series with annual observations within the time period of 1963-2003 for most countries in our sample. Below we assess the quality of the UTIP data using the LIS data as our benchmark, first by performing a pooled regression and then by examining pure correlations.

The UTIP measure of household inequality generally estimates inequality to be higher compared to the LIS Gini. The regression line notably falls below the 45 degrees line, and the observations are fairly loosely scattered around the regression line. The R-squared of the regression is .3947 and the beta coefficient is equal to .72. This implies that the UTIP household inequality measure can account for approximately 39% of the variation in the LIS Gini and that for every one unit increase in UTIP inequality we would expect the LIS to increase by .72.

Table A.3.4 Correlation matrix between three different measurements of inequality

		UTIP
2000	LIS	.5278
	n	12
1995	LIS	.8217
	n	12
All years	LIS	0.6282

[128] Atkinson & Brandolini (2001) p. 780
[129] Atikonson & Brandolini (2001) p. 776
[130] See Gottschalk & Smeeding (1997) p. 687 The countries included in in this comparison are Spain, Finland, Belgium, Luxembourg, Canada, Netherlands, Italy, West Germany, United Kingdom, Sweden, Denmark, Norway, Ireland, France, Australia and the United States between the years 1970 and 1993.
[131] Galbraith & Kumh (2004)
[132] Galbraith & Kumh (2004) p. 9

n	99

Comment: The sample was restricted in the following manner: the inequality measurements had to overlap for individual years (i.e. we did not use time windows). The following countries were included: AUS, AUT, BEL, CAN, DEN, FIN, FRA, DEU, GRC, IRE, ITA, LUX, NET, NOR, SPA, SWE, CHE, UK and US.

A.4 Construction of data sets

The data set was constructed in the following manner. We used the Comparative Political Data Set I (CPDS) provided by the University of Bern which includes election data for the 23 OECD countries included in our sample. The data set also includes other politically and economically relevant data on electoral systems, number of parties in election etc. The electoral data we make use of include the vote shares of all electorally relevant parties in an election, categorized by party families, using expert surveys, such as liberal, social democratic, religious and conservative parties. The election data in the CPDS is imputed for every year with the most recent observation, thus it contains no missing values except for years when some countries were not democracies (e.g. some time periods for Greece, Spain and Portugal). Therefore, a dummy was created to indicate the year when the election took place to make sure that an election was not counted as several observations in the regression analysis.

The data set, however, does not include any data on economic inequality and we therefore had to merge the data with the post- and pre-tax Gini coefficients provided by the OECD. Unfortunately, the OECD only provide measures approximately every five years on economic inequality, and we therefore needed to impute values of economic inequality as they only rarely match the year of an election. If we were not to do this, we would have very few observations which would give us less statistical power. There are several different ways to impute the data e.g. by interpolating moving averages, by filling all previous missing values with the most recent value etc. However, as economic inequality is rather sluggish in its evolution, and as the inequality data provided by the OECD is not for a certain year such as 2005 but instead described as "around mid-00's", we chose to impute the inequality data ± 2 years of the actual observation year. Thus, if we have an observation for 2005 but have missing values for the years 2003, 2004, 2006 and 2007 we replace the missing values with the 2005 values. This is of course not without drawbacks, as even though inequality in 2004 probably is reasonably proxied by the inequality for the same country in 2005, it inevitably introduces more noise in the data, which may cause attenuation bias. It is thus important to note that every election is only counted as one observation, but that two elections, theoretically, may share the same value for the Gini coefficients.

For the survey data on demand for redistribution from the ESS, we departed from the cumulative ESS file containing all respondents, variables and waves included in the ESS. We then merged our macro level variables and used the same strategy when interpolating, e.g., the inequality data as described above.

For all other variables used in this study we have annual observations with a few seemingly random missing values, except for the ethnic fractionalization index. For this index, calculated by Alesina et al (2003), we only have a few observations per country from around the year 2000 or earlier. We have therefore chosen not to include it in the econometrical testing for the right-party vote share data which stretches all the way back to 1975, but include for the testing on the ESS data. We interpolate the years with missing values with the most recent value. Even though this is hardly satisfactorily, it may be an important variable to control for. Thus the significance of this variable in the econometrical model should be taken with a grain of salt, especially when combined with country fixed effects.

For the sources of the other variables, please see table A.3with descriptive statistics for control variables.

A.5 Fixed effects vs first differencing

Since both FD and FE are unbiased under the assumptions of linear in parameters, random sampling, some variation in all of the explanatory variables and that the expected value of the idiosyncratic error conditioned on all the explanatory variables in all time periods and unobserved effect equals zero, we cannot use unbiasedness as a criterion for choosing between these estimators.[133] They key assumption is the strict exogeneity assumption, which states that "the expected value of the idiosyncratic error given the explanatory variables in *all* time periods and the unobserved effect is zero: $E(u_{it}|X_i, a_i) = 0$", i.e. there can be no feedback of the error term on the explanatory variables.[134] If this assumption does not hold, it does not matter whether we estimate our model with and FD or FE estimator as it will be biased no matter what.

A technical advantage of the FE estimator is that it is more easily implemented when we have an unbalanced panel, as we have in this case.[135]In fact, as we have irregular observations of right party vote share due to the fact that the countries in our sample have elections at irregular intervals both within and between countries FD estimation is very difficult to implement, as it requires us to define an interval at which to difference the data (1 year, 2 years etc.). The within transformation is far more easily implemented, as the time demeaning of the individual observations do not require us to define a time interval for differencing.

FE is more efficient (produces smaller standard errors) than FD if $Cov(u_{i1}, u_{is}) = 0\ t \neq s$, i.e. if the idiosyncratic error term is serially uncorrelated.[136] It is, however, hard to make this decision on the

[133] Wooldridge (2009) p. 487 These assumptions are assumption FE.1-4 on page 503
[134] Wooldridge (2009) p. 503 This also rules out including a lagged dependent variable as an explanatory variable.
[135] This is due to the way a_i is eliminated through differencing compared to the time demeaning procedure of the fixed effects transformation.
[136] Wooldridge (2009) p. 487

grounds of efficiency as we can estimate only the time demeaned errors ($\ddot{u}_{it}$) and not u_{it}.[137] Because of the technical problems of the irregularity of the observations and the unbalanced panel, it is also in this case complicated to estimate Δu_{it}, needed to perform Wooldridge test for serial correlation in panel data.[138] First differencing might also be more appropriate if we have unit root in our data as it turns a stationary process into a weakly dependent process.[139]

Still, the technical problems of implementing FD force us to choose FE as our econometric strategy. In general, the FE estimator seems to be more "sensitive to nonnormality, heteroskedasticity and serial correlation in the idiosyncratic errors".[140] All these problems have in common that they affect the inference of the econometric modeling and not the estimated coefficients as such. Thus, we must be aware that even though we try to correct for these problems of serial correlation and heteroscedasticity using clustered standard errors, our estimate of the standard errors might not be conservative enough due to the limited number of our clusters and we might face a higher risk of committing type I errors. Fortunately, the biasedness of the FE estimator tends to zero at the rate 1/T, which is not the case for the FD estimator.

A.6 Descriptive statistics

A.6.1 List of observations of pre-tax inequality per country and year

1975	1985	1990	1995	2000	2005	2010
			Australia	Australia	Australia	Australia
					Austria	Austria
	Belgium		Belgium	Belgium	Belgium	Belgium
Canada	Canada	Canada	Canada	Canada	Canada	Canada
	Denmark	Denmark	Denmark	Denmark	Denmark	Denmark
Finland	Finland	Finland	Finland	Finland	Finland	Finland
			France	France	France	France
	Germany	Germany	Germany	Germany	Germany	Germany
Greece	Greece		Greece	Greece	Greece	Greece
					Iceland	Iceland
	Italy	Italy	Italy	Italy	Italy	Italy
	Japan		Japan	Japan	Japan	Japan
	Luxembourg		Luxembourg	Luxembourg	Luxembourg	Luxembourg
Netherlands	Netherlands	Netherlands	Netherlands	Netherlands	Netherlands	Netherlands
	New Zealand	New Zealand	New Zealand	New Zealand	New Zealand	New Zealand
	Norway		Norway	Norway	Norway	Norway
Portugal		Portugal	Portugal	Portugal	Portugal	Portugal
						Spain
Sweden	Sweden	Sweden	Sweden	Sweden	Sweden	Sweden
						Switzerland
United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom
United States	United States	United States	United States	United States	United States	United States

A.6.2 Post-tax inequality

Table A.6.2 Descriptive statistics over developments in aggregated post-tax Gini over time

[137] Wooldridge (2002) p. 284
[138] Drukker (2003)
[139] Wooldridge (2009) p. 487 Unfortunately the tests for unit root also relies on being able to estimate the differenced equation
[140] Wooldridge (2009) p. 487

Year	Obs	Mean	Std. Dev.	Min	Max
1975	8	.295625	.0656461	.212	.413
1985	19	.2784737	.0487093	.198	.371
1990	12	.29525	.0462388	.209	.354
1995	21	.294	.049107	.211	.361
2000	22	.3005	.0420948	.226	.357
2005	23	.2986957	.0420934	.232	.385
2010	23	.3024348	.0356254	.248	.378

Inequality post transfers seem to have remained on a stable level during the 2000s, despite claims of less redistributive policies and of reduced overall tax burdens.[141] This also hold true with the addition of the most recent years after the economic crisis of 2008.

[141] OECD (2011) p.270

A.6.3 Control variables

Table A.6.3 Descriptive statistics for control variables

	Source	Obs	Mean	Std. Dev.	Min	Max
Single Member	Until 2000: Huber et al. (2004).	1133	.4757282	.7615904	0	2
Federalism	Huber et al. (2004)	1133	.5419241	.8371132	0	2
Presidentialism	Huber et al. (2004)	1133	.1703442	.3761009	0	1
Voter Turnout	European Journal of Political Research (Political Data Yearbook, various issues);	1134	78.5223	13.16538	35	95.8
Elderly	OECD (2010), "Labour Force Statistics: Summary tables", OECD Employment and Labour Market Statistics (database)	1168	12.9601	2.872648	5.726886	22.74724
Unemployment rate	OECD (2010), "Key short-term indicators", Main Economic Indica-tors (database)	845	6.188033	3.544297	0	20.06667
Social expenditure	OECD (2012), "Social Expenditure: Aggregated data", OECD So-cial Expenditure Statistics (database)	689	21.55341	5.238764	10.1	36.2
Open economy	Heston, Alan, Robert Summers and Bettina Aten (2012), Penn World Table Version 7.1	1163	66.5672	42.76719	9.269115	319.5532
Union density	Visser (2011)	1065	41.27976	19.39849	7.575857	96.35514
Age	ESS	150645	47.65677	18.43769	13	97
Age2	ESS	150645	2611.114	1848.564	169	9409
Female	ESS	150606	.5293215	.4991412	0	1
Education (years)	ESS	149550	12.06325	4.319311	0	56
Househ Inc	ESS	114252	5.030949	2.833313	1	10
Open economy (log)	OECD (2010), "Key short-term indicators", Main Economic Indica-tors (database)	1163	4.031366	.578004	2.226688	5.766924
Househ Members	ESS	151164	2.659489	1.374339	1	22
Employed	ESS	150645	.088984	.2847216	0	1
Relig Attendence	ESS	150770	5.460198	1.524712	1	7
Minority	ESS	149689	1.96164	.1920633	1	2
Union Member	ESS	150525	2.362823	.8331587	1	3
Social Mobility	ESS	146376	.1952779	.3964158	0	1
Ethnic Fractionalization	Alesina et al (2003)	23	.2258099	.2083365	.011928	.71242

A.7 Empirical findings for post-tax inequality

A.7.1 Right party vote share

Table 7.1 Determinants of right party vote share
(OLS, unst. beta coefficients, cluster-robust SE within brackets)

	I	II	III	IV	V
Gini post-tax	1.753***	1.506***	1.687***	0.155	0.512
	(0.279)	(0.343)	(0.456)	(0.535)	(0.482)
Single member		3.757	2.687	4.406*	-0.121
		(3.214)	(3.576)	(2.351)	(5.692)
Federalism		-3.227*	-3.481**	2.446	2.393
		(1.731)	(1.644)	(1.797)	(2.649)
Presidentialism		6.399	5.917	-0.181	1.528
		(5.264)	(5.340)	(3.605)	(4.273)
Voter turnout		-0.0673	-0.0771	-0.0918	-0.120
		(0.208)	(0.200)	(0.210)	(0.220)
Perc. Elderly		-0.651	-0.500	0.529	0.605
		(0.452)	(0.518)	(1.214)	(1.239)
Unemp. Rate			-0.285	-0.330	-0.481
			(0.508)	(0.321)	(0.402)
Log open					-0.554
					(11.79)
Union density					0.267
					(0.262)
Constant	-21.90**	0.193	-3.357	21.91	6.727
	(8.023)	(26.38)	(27.00)	(31.57)	(56.60)
Fixed Effects	No	No	No	Yes	Yes
Year Dummies	No	No	Yes	Yes	Yes
N	167	167	163	163	157
R-squared	0.380	0.486	0.571	0.292	0.295

Comment: * p < .10, ** p < .05, *** p < .01

A.7.2 Demand for redistribution

Table 7.2 Determinants of demand for redistribution (LPM, beta coeff., cluster-robust SE within brackets)

	I	II	III	IV	V
Gini post-tax	0.00351	0.00778	-0.00105	-0.00578	-0.0112**
	(0.00576)	(0.00468)	(0.00311)	(0.00508)	(0.00476)
Houseinc*Post				0.000975	0.00101
				(0.000741)	(0.000748)
Age		0.00474***	0.00472***	0.00479***	0.00478***
		(0.00123)	(0.00124)	(0.00124)	(0.00124)
Age^2		-0.0000401***	-0.0000398***	-0.0000402***	-0.0000402***
		(0.0000115)	(0.0000116)	(0.0000117)	(0.0000116)
Female		0.0542***	0.0546***	0.0546***	0.0547***
		(0.00569)	(0.00569)	(0.00570)	(0.00569)
Edu (years)		-0.00765***	-0.00768***	-0.00781***	-0.00781***
		(0.00112)	(0.00114)	(0.00107)	(0.00107)
Househ inc		-0.0221***	-0.0220***	-0.0502**	-0.0511**
		(0.00267)	(0.00267)	(0.0201)	(0.0203)
Househ. memb		0.00642**	0.00638**	0.00691***	0.00695***
		(0.00258)	(0.00252)	(0.00235)	(0.00234)
Employed		-0.00768	-0.00848	-0.00764	-0.00637
		(0.00542)	(0.00560)	(0.00568)	(0.00549)
Rel attend		-0.0164*	-0.0166*	-0.0164*	-0.0162*
		(0.00892)	(0.00898)	(0.00886)	(0.00890)
Minority		0.0181	0.0185	0.0180	0.0181
		(0.0164)	(0.0162)	(0.0162)	(0.0164)
Union memb		0.0706***	0.0707***	0.0714***	0.0713***
		(0.00901)	(0.00899)	(0.00893)	(0.00893)
Soc mob (edu)		-0.00237	-0.00230	-0.00223	-0.00220
		(0.00566)	(0.00566)	(0.00573)	(0.00562)
Unemp rate			-0.00113	-0.00118	-0.00187
			(0.00268)	(0.00267)	(0.00322)
Ethnic fract			-0.0370**	-0.0379**	0.109*
			(0.0173)	(0.0174)	(0.0518)
Perc. Elderly			0.0465***	0.0462***	0.0279**
			(0.0148)	(0.0147)	(0.00989)
Union density					-0.00425
					(0.00319)
Log open econ					0.339***
					(0.102)
Constant	0.603***	0.518***	0.420	0.569*	-1.963*
	(0.153)	(0.113)	(0.311)	(0.296)	(1.001)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	147695	107009	107009	107009	107009
R-squared	0.065	0.095	0.096	0.096	0.097