INCOME INEQUALITY AND MASS POLARIZATION

A Cross Country Analysis of the Relationship Between Income Inequality and Polarization in Attitudes to Economic Redistribution

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Abstract

More and more political attention has, in recent years, been directed towards the rise in income inequality that many western countries have experienced during the last decades. Among the questions asked by political scientists is what the possible political causes and consequences of this development are? One possible consequence that is sometimes referred to is that it threatens the unity and stability of a country: that it creates an "us and them". This could, as some have argued, manifest itself as increased political polarization. There is by now a number of studies done on the relationship between income inequality and political polarization. This study adds to these by analyzing the relationship between income inequality and how polarized the public's attitudes to redistribution are in 74 countries throughout the world. It finds that there is in fact a strong correlation between income inequality and polarization across countries. A multilevel analysis is then performed at the micro level to explore possible explanations for this correlation. The results from the analysis show that it cannot, as some previous research have argued, be explained by greater differences in attitudes between high and low income earners. Instead, it is differences within each income group, or throughout the income distribution, that is greater in more unequal countries. Finally, the study uses the longitudinal nature of the World Value Survey and European Value Study to perform an analysis over time, where it is shown that changes in income inequality has not lead to subsequent changes in polarization.

Key words: Income inequality, political polarization, economic redistribution, mass polarization

1. INTRODUCTION

Since the start of the 1980s almost all OECD countries have experienced a substantial rise in income inequality. An important factor behind this change has been the increasing share of the national income going to the top percentages of households (Atkinson, 2016; Atkinson, Piketty & Saez, 2011, p.5). Only looking at the top income earners is, however, not enough as many countries have experienced increased differences in other parts of the income distribution as well (Atkinson, 2016). One striking example of this is the rise in the number of people living beneath the relative poverty line in traditionally egalitarian countries like Sweden and Germany (Atkinson, 2016, p.29; OECD, 2011, p.5). This has impacted the public debate throughout the world: ranging from an economic book about income inequality that became an international best seller (Piketty, 2014), to the occupy Wall Street movement and Bernie Sanders election campaign in the US. In light of this there are more and more political scientists that have taken up studying political factors connected to the rise in income inequality. One example of this is research on the effect that income inequality may have on political polarization (Pontusson and Rueda, 2010; McCarty, Poole and Rosentahl, 2006; Voorheise, McCarty and Shor, 2015).

Political polarization occurs when the differences in ideology and policies of political parties and/or voters increases. It is described in the political science literature as problematic for a number of reasons: it makes political compromises harder, thus leading to legislative inefficiency and gridlock (Barber & McCarty, 2015, pp.38-44). Political polarization has also been connected to political instability, corruption, democratic breakdowns, inequality and lower trust for politicians (Svensson, 1998; Valenzuela, 1978; Voorheis, McCarty & Shor, 2015). On the other hand, there are positive aspects of having some degree of polarization: voters have a greater variety of political alternatives to choose from and opposing parties can work as a safe guard against corrupt practices and bad policies (Lupu, 2013; Brown, Touchton & Whithford, 2011).

There are, despite of this a priori logical connection, few empirical studies on the relationship between income inequality and political polarization. Those that have been done have mainly focused on polarization within the party system or on one specific country (mainly the US). The conclusions from these studies are mixed: with some arguing that inequality increases party system polarization and others that it actually decreases it (Pontusson & Rueda, 2008; Finseraas, Moene & Bath, 2015). There are several shortcomings in this body of literature: first, that there are too few of them in order to be able to draw any general conclusions; secondly, that the ones that have been done have been restricted to a smaller number of OECD-countries, and; lastly, that they mostly focus on polarization between political parties and thereby leave out the electorate.

The aim of this study is to fill some of these gaps by examining the relationship between income inequality and how polarized a country´s *electorate* is in their attitudes to economic redistribution. I choose to focus on attitudes to economic redistribution since this is a political issue that is highly related to income inequality. Insufficient redistributive policies are often viewed as an explanation for income inequality and as a way of remedying it. Attitudes towards redistribution and the welfare state have also been one of the main dividing lines in politics, between voters and parties that characterize themselves as either "left" or "right" (Alesina, Giuliano, 2009, p.2; Svallfors, 1997, p.290). Polarization in attitudes to redistribution might therefore have a substantial impact on the political system: for example, by making parties more polarized, heightening political tension and conflict, and hindering political compromises to improve redistributive policies.

The results from the study are based on three analyses: First, an OLS multiple regression analysis of 74 countries, where the relationship between income inequality and polarization is tested. The results show that income inequality correlates strongly with polarization in attitudes to economic redistribution, even when relevant control variables are added. Secondly, a multilevel regression analysis is performed in order to test if a country´s level of income inequality affects differences (polarization) in attitudes between people with a higher or lower income/education level. Interestingly, low income earners were not more "left" and

high income earners more "right" in more unequal countries. Instead, it is greater differences within all income groups, or throughout the entire income distribution, that explains why more unequal countries are more polarized.

The last part of the paper analyses if changes in income inequality over time has led to changes in polarization. This is done by studying countries whose residents have answered the survey questions three times or more between 1989 and 2013. The results indicate that there is no relationship between changes in income inequality and subsequent changes in polarization in attitudes to economic redistribution. The study thereby adds to the gaps in the previous research by: 1) analyzing the relationship between income inequality and polarization in the electorate across a wide range of countries; 2) by studying the relationship over time; 3) by illustrating that the relationship is driven by an increase in polarization throughout the income distribution and not by greater differences between those with a higher or lower income/education level, and; 4) by providing an outline for a theoretical framework that explains the relationship.

The research questions are the following:
- Is there are a cross-country correlation between income inequality and polarization?
- What factors can explain this correlation?
- Have changes in income inequality lead to changes in levels of polarization?

The aim of the paper is, in other words, to answer the following questions regarding the relationship between income inequality and polarization: if there is a correlation, how it can be explained and if it is a causal relationship. The paper proceeds as follows: first, a presentation of the main concepts and previous research is given. After that a theoretical framework is outlined as well as a discussion regarding methodology and operationalization of variables. Finally, the results from the analyses are presented, ending with a discussion and concluding remarks.

2. CONCEPTS AND PREVIOUS RESEARCH

2.1. The Rise in Income Inequality

Since the 1980s there has been a substantial increase in income inequality in most advanced democracies. This change constitutes a major reversal of the major reduction in income inequality that happened during the three decades following World War II (Piketty, 2014, pp.316-324; Atkinson, 2015, pp.214-215). The rise in inequality has, however, by no means followed a symmetrical trajectory across countries. First off, there are great differences between countries in how big the increase has been. Some countries, like the US, Britain and Australia, have witnessed increases in their gini coefficients of approximately 7, 9 and 6 points between 1980 and 2010 (on a 0-100 scale) (calculations based on Solt, 2014). France and Denmark, on the other hand, have had practically no increase in income inequality at all since the 80s (Atkinson, 2015, p.214). Other advanced democracies place themselves in-between these extremes. The same is true of developing countries: income inequality has, for example, decreased during the last decade in Brazil, whereas China is among the countries where it has increased the most (calculations based on Solt, 2014).

Another important aspect of the general rise in inequality is that countries differ significantly in the timing of changes in inequality. Practically the entire rise in inequality in Great Britain, for example, happened during the 1980s, Canada´s in the 1990s and the US have had a steadier increase during all three decades (Atkinson, 2015, p.213-214). The fact that the general rise in inequality is heterogeneous across countries makes it suited for the type of panel data analysis that I will perform in the last part of the paper, since there is a good deal of variation to be explained.

**Figure 1. Changes in gini coefficient net of taxes and transfers**
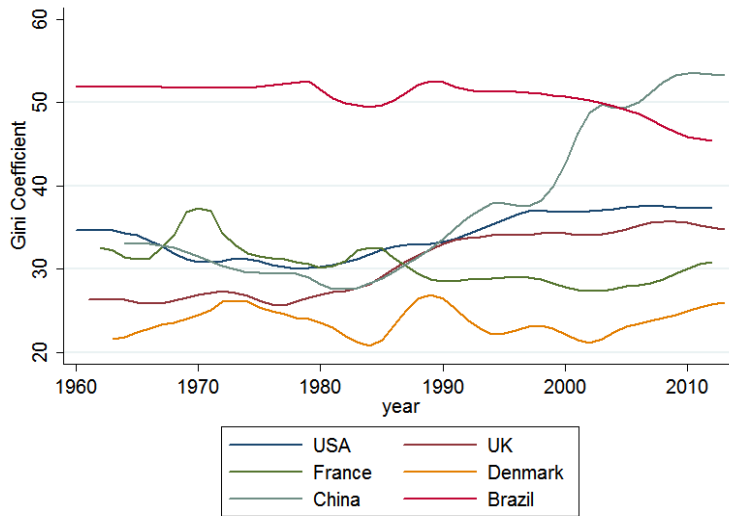
Note: Gini coefficient is measured as averages over three years; the year before, during and after the observation.
Source: Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

2.2. Political Polarization

Political polarization can mean a number of different things within the political science literature. One commonly used measurement is the standard deviation in ideological positioning of the parties in parliament or the electorate (Neusser & Johnstone, 2014, p.4). The standard deviation is measured as the average difference between every party's (voter´s) placement on an ideological left-right scale and the mean placement. Parties that are located further away from the mean therefore contribute to a higher standard deviation. Besides this, it is common to describe the degree to which parties or the electorate is sorted along some group affiliation as polarization (Hetherington, 2009, p.436; Abramovitz & Saunders, 2008, pp.546-547). A party system is more sorted if representatives from the left and right parties hold views that are closely in line with other representatives from their party, but sharply distinct from those belonging to other parties. An electorate is likewise described as sorted if people´s opinions on most policy issues are similar to others who support the same party, while being different from those supporting other parties (Hetherington, 2009, p.436).

Finally, it is important to make a distinction between polarization within the party system and the electorate. Scholars´ often describe what they are analyzing as political polarization, even though research has shown that it can be big differences between polarization of the party system and electorate (Fiorina, 2008). In this study I will focus on the standard deviation of the population´s attitudes to economic redistribution as my measure of polarization. The diagram below illustrates how I do this by showing the country whose population was the second most polarized in their views (Jordan) about whether incomes should be made more equal or not and the one whose population was the least polarized (Thailand). The graph to the left shows the most polarized country and the one to the right the least polarized one.

Figure 2. Dispersion of attitudes to economic redistribution in the country with the second highest average standard deviation (left) and lowest standard deviation (right)
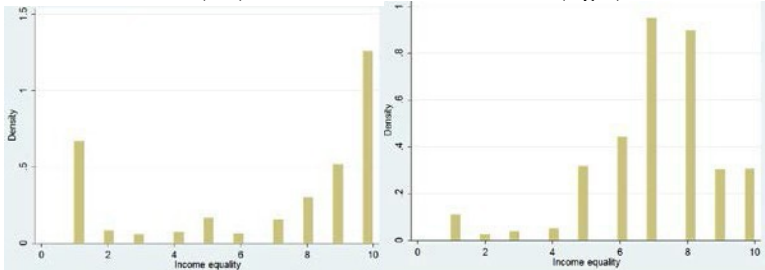
Source: WVS Longitudinal Data File; EVS Longitudinal Data file

The aim of this study is, in other words, to test if income inequality makes a countries population more polarized in line with the drastic dispersion of attitudes represented by the left graph of Jordan.

2.3. Party system polarization

In this subsection I go through the most important insights from the previous research that has been done on party system polarization. The reason for doing so is that polarization within the electorate (which this study focuses on) is highly connected to polarization in the party system. Most of the theoretical underpinning in the research about party system polarization rests on the assumption that parties shift their positioning in response to the electorate (Lupu, 2015, pp.333-336; Ezrow et al., 2014, p.1559). That is, it is taken for granted that party system and electoral polarization go together. It is therefore relevant to analyze and understand the consequences of polarization within the party system since this could be the result of electoral polarization.

A majority of the studies of party polarization have focused on the American party system, where there is more or less a consensus that representatives from the two main parties have become more sorted along party lines (Barber & McCarty, 2015, p.23). This development started in the late 1970s and has since then steadily increased (ibid, pp.19-21). There is still no agreed upon explanatory variables for this. Studies have argued and found some support for factors like: gerrymandering; less contested primary elections; increased income inequality; the electoral system; institutional factors within parties and the parliament that make it harder to break party lines, and; a more polarized media landscape (ibid; McCarty & Shor, 2016).

The theoretical framework commonly used when studying party polarization is some form of elaboration of the spatial model of voting behavior first popularized by Anthony Downs (1957). Downs argued that the policies pursued by political parties are determined by the parties' perception of the preferences of the electorate and the policy position taken by competing parties. Voters, which lack perfect information about the parties' policies, place themselves on an ideological left-right scale in accordance with their perceived interest. They then support the party they think is located closest to them on the scale. A more polarized electorate should therefore lead to a more polarized party system (Downs, 1957). Downs also argued that parties, or coalitions of parties, gravitate towards the median voter in order to capture a majority of the electorate. This is a condition that subsequent analysis of party polarization has relaxed in different ways, which is why electoral polarization can lead to party system polarization (see for example: Grofman, 2004; Finseraas, Moene & Bath, 2015, pp.565-566).

In his seminal work on party systems Giovanni Sartori described polarization of party systems as a difficult challenge for multiparty electoral democracies (Sartori, 1976; Sani & Sartori, 1983). He argued that polarized pluralism systems can give rise to extreme "anti-system" parties and a stretching out of the parliamentary parties along the ideological spectrum (Sartori, 1976, p.132). There is therefore a risk that antagonism and mistrust towards politicians develop up to the point where it risks leading to internal strife and democratic breakdowns.

Examples of countries where scholars have described the trajectory of events leading up to a democratic break-down in this way are Chile under Salvador Allende´s government, the Weimar republic and the Austrian democracy during the 1930s (Dalton, 2008, p.900; Sartori, 1976, pp.131-145; Valenzuela, 1978).

The consequence of party polarization that has gotten the strongest empirical and theoretical support is that it leads to more inefficient governments and legislative gridlock (Barber & McCarty, 2015, pp.35-44). Research has, for example, tied polarization to fewer laws being passed and that it heightens the obstructionist tendencies of veto players, thus making it harder for governments to effectively respond to economic challenges (ibid, pp.38-39; Tsebelis, 1999, p.591). Others have argued that party polarization makes the electorate more sorted along partisan lines since they perceive the political system as more polarized (Lupu, 2013; Adams, Green and Milazzo, 2012).

Dettrey and Palmer (2015) argues that political partisanship in the US have contributed to the rise in income inequality there. The reason for this is, according to them, that increased legislative partisanship makes the parties cater to their core constituents to a larger degree. In the case of the US this has meant that Democratic governments have preferred expansionary fiscal policies aimed at reducing unemployment, whereas Republican governments have had more "stock-market friendly" policies. Low-income earners have loosed more from this than those with higher incomes, since they are more affected by unemployment than high income earners are by falls in the stock market. Dettrey and Palmer´s findings illustrate that the relationship between income inequality and political polarization might be bi-directional, meaning that they reinforce each other. This is a point that has been raised by other scholars as well (Pontusson & Rueda, 2008; Vorhouse, McCarty and Shor, 2015).

2.4. Voter polarization

As with the party system, there is a consensus among scholars that there has been a substantial increase in partisan sorting among the American electorate. A study from the PEW research center in 2014 of 10 000 Americans` answers to 10 value questions found that there is a considerable divide based upon which of the two parties one sympathizes with. The 10 questions make up a conservative-liberal index. The number of republican voters that were placed to the right (conservative side) of the median democrat on the value scale has gone from 64 % in 1994 to 92 % today and the change for democratic voters is from 70 to 94 %. The proportion of self-reported democrats and republicans who viewed the other party very unfavorably has more than doubled since 1994, and there are more who believe that the other party is a threat to the nation (Pew Research Center, 2014). This development has been reaffirmed by other studies as well (Abramowitz & Saunders, 2008, pp.546-548; Layman, Carsey & Horowitz, 2006, pp.98-90; Hetherington, 2009,pp.436-441)

Morris Fiorina, among others, has been critical of labeling this development as an increase in polarization of the American electorate (Fiorina & Abrams, 2008; Fiorina, 2014; Baker, 2005). They have given convincing evidence that Americans` views on policy issues have actually not become more extreme during this period. By investigating National Election Studies Fiorina (2008) finds that the standard deviation of American´s views on policy issues have not changed between 1984 and 2004. People in general had very similar ideological views as 20 years earlier and the same was true for the average standard deviation on questions about policy issues. These findings support those of DiMaggio, Evans and Bryson (1988) who studied the degree of polarization in American´s views on a wide range of policy issues between 1972 and 1994.

A common view among scholars has been that partisan sorting has declined in western democracies during recent decades. The argument behind this supposed decline is based on modernization theory and a decline in voting based on class cleavages. Voters are believed to have become more independent, mobile and less attached to any one social group; like a

political party (Jensen, 2011, pp.510-511; Poletti, 2015, p.245; Berglund et al., 2005, pp.123-125; Dalton, 1984). Others have questioned this by arguing that placement on the left/right ideological scale is still as good a predictor of party choice as before in western countries (van der Eijk & Schmitt, 2005, pp.180-187). Few studies have been done outside of America that measures electoral polarization as how disbursed or extreme voters` views on policy issues are (the standard deviation). Those that have been done have found a stable level of polarization, or depolarization, in the Netherlands, Britain and across European countries over time (Adams, De Vries & Leither, 2012; Adams, Green & Milazzo, 2012; Bartels, 2013; Neusser, Johnston & Bodet, 2014). Studies that analyses variables that can explain differences in polarization (standard deviation) across countries are even less common. Examples of these are: Lindqvist and Östling (2010) that found a significant relationship between polarization and the size of government; Grechyna (2016) who, in an exploratory analysis of the best determinants of attitudinal polarization at the country level, found these to be income inequality and social trust, and; studies by Adams De Vries and Leither (2012) and Adams, Green and Milazzo (2012) that found a connection between polarization in the party system and the electorate.

The body of research described above illustrates why more research on electoral polarization, as measured by the standard deviation, is needed. First, it is inaccurate to argue that polarization has increased or decreased solely based on the level of partisan sorting. As previous research has shown: the different measurements of political polarization do not always move in the same direction. Secondly, there is still a big vacuum to fill when it comes to explaining differences between countries in this particular form of polarization and why it changes over time.

2.5. Income Inequality and Political Polarization

Research about the relationship between income inequality and political polarization started gaining traction after it first was discovered how partisanship in the US congress had risen in tandem with income inequality since the 1970s (McCarty & Shor, 2015, p.5). Most of this research has been done in relation to the American case and have reached somewhat mixed conclusions. Voorheis, McCarthy and Shor (2015) have found that increased inequality has been associated with a substantial and statistical significant increase in polarization within state legislatures. Rising inequality was associated with a shift to the left for the median democratic legislature and to the right for the republican one. Dettrey and Campbell (2013), on the other hand, argue that income inequality has not lead to a more polarized electorate in the US. They show that high income earners are not more conservative than before and low income earners not more liberal. McCarty, Poole and Rosenthal (2006) found that income in the US has become a stronger predictor of voters party choice in the last decades, but that very little of this change can be explained by rising income inequality.

Cross sectional analysis of this relationship have also come to different conclusions: Pontusson and Rueda (2008) analyzes the effect of income inequality on party system polarization in 12 OECD countries. Their results indicate that rising wage inequality is associated with more leftist left parties at medium or high levels of low-income mobilization, whereas rising household income inequality is associated with more conservative right parties at low or medium levels of low income mobilization. Finseraas, Moene and Bath (2015) use the same measure of political polarization (party manifestos) as Pontusson and Rueda but reach the opposite conclusion. They find that rising income inequality leads to a rightward shift among left parties and thus a reduction in party system polarization.

Iversen and Soskice (2015) shed light on a previously overlooked relationship between income inequality and ideological polarization among the electorates in 21 advanced western democracies. They find that countries with a higher level of income inequality also had an electorate that placed themselves more to the middle ideologically. The explanation that they give for this is that more egalitarian countries have a higher level of unionization and low-income mobilization: factors that both increase ideological polarization and reduces income inequality.

Finally, Lindqvist and Östling (2010), and Grechyna (2016), point towards a correlation between income inequality and how polarized a country`s population is in their attitudes to different economic policy questions: among others, the same questions measuring attitudes to redistribution as the ones used in this study.

To conclude, the results from the relationship between income inequality and party polarization are mixed, but there seems to be a causal connection in the case of US state assemblies (Voorheis, McCarthy and Shor, 2015). There are, however, hardly any studies testing inequalities effect on *electoral* polarization in a cross-country setting. The limited numbers of studies that have done so have done it in a more indirect way and the results from these studies indicate that there is a connection between inequality and electoral polarization as measured by the standard deviation (Lindqvist & Östling, 2010; Grechyna, 2016).

3. Theoretical Framework

The focal relationship that I am interested in is the effect that income inequality has on attitudes to income redistribution and the role the government should have in redistributing incomes. Income inequality is hypothesized to cause increased voter polarization through two main causal mechanisms: by changing the relative distribution of income and by making education more unevenly distributed. It is also hypothesized that having a political left culture is associated with both lower income inequality and less polarization in attitudes to redistribution. Political left culture is therefore described as an antecedent variable in the theoretical model. It is important in explaining why there is a relationship, but not why income inequality leads to increased polarization. Below is a presentation of the three explanatory variables:

3.1. The income effect

This part of the theoretical model builds on other studies on income inequality, attitudes to redistribution and political polarization, and assumes that voters´ preferences for redistributive policies are mostly driven by rational pocket book concerns (Pontusson & Rueda, 2008, pp.312-313; Meltzer & Richards, 1981, p.914). A voter with an income well behind the mean income will have more to gain from having services like health care and education paid for through taxes. The same is true of public transfers like child benefits, unemployment insurance and paid sick leave. The reason for this is that taxes are progressive and the possible deadweight losses in income from these policies to a lower-income household will typically be outweighed by the gains they make from redistribution. The opposite is true the higher up in the income latter one goes, where those at the top have the most to lose from progressive taxation (Pontusson & Rueda, 2008, pp.314-319). The costs in taxes for a millionaire clearly outweigh the gains he makes from welfare services and transfers many times over. The data from voting records confirm this general pattern: higher income is associated with voting more conservative and having a less favorable view on redistribution (Barth, Finseraas & Moene, 2014, p.1; Svallfors, 1999, p.293). Indeed, this seems to be even truer for those at the absolute top of the income distribution (Page, Bartels & Seawright, 2013, p.51).

Based on this theory a more polarized income distribution should lead to a more polarized distribution of views on redistributive economic policies. The graph to the left below depicts an uneven distribution of income and the one to the right an even one. It shows that voters to the left and right have a greater incentive to hold more polarized views when incomes are distributed more unevenly. The main reason being, that they simply have more to gain/loose from a shift of the mean income towards the median one.

Figure 3. Examples of uneven (left) distribution of income and even (right)
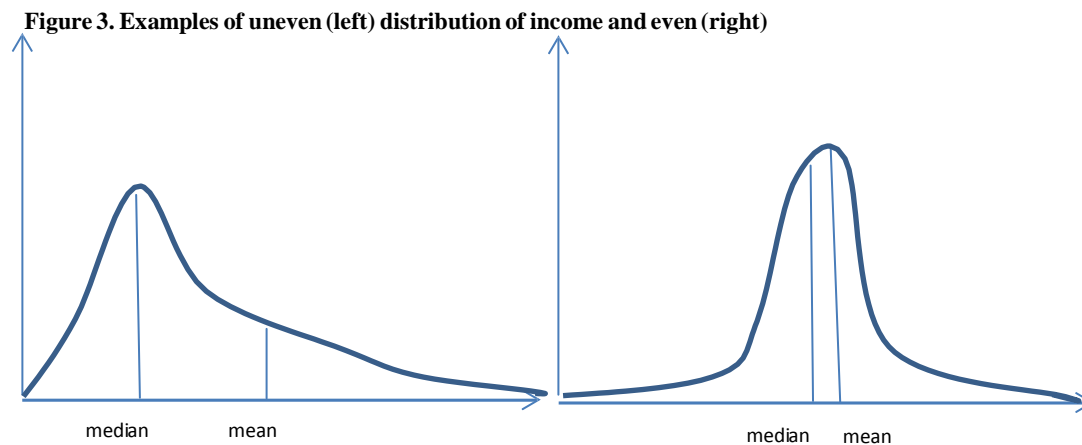
Given that inequality pushes the median income away from the mean one, one might expect that it should lead to a left skewed polarization where the population in general becomes more in favor of redistribution. This is indeed what the Meltzer-Richard (1981) model predicts. The theory I present, however, argues that it is difficult for people along the middle of the income distribution to know which level of redistribution they should prefer. Voters between the mean and median income is, for example, often net contributors to the public sectors. The degree to which they gain/loose from redistribution in the short run depends on how healthy they are, if they have kids, their age, and so forth. It is furthermore, difficult to have good knowledge of the level of income inequality in one´s country and the costs/benefits associated with redistributive policies. Increased income inequality is therefore assumed to heighten the ideological conflict (polarization) between those at the opposite ends of the income distribution, who will find it easier to know if they gain/loose more from redistribution, while those in the middle are more uncertain. The issue of redistribution might therefore become more salient, which could further increase polarization/sorting of voters since the differences between parties become clearer for voters (Adams, De Vries, & Leiter, 2012; Lupu, 2013).

3.2. The educational effect

The research on this topic is not conclusive, but overall it does seem as though higher income inequality entails greater differences in educational opportunities (Tselios, 2014, pp.221-222; 2008, pp.409-410; Perotti, 1996, p.82). Firstly, higher inequality means that children from lower income household are relatively more economically disadvantaged compared to those from middle or high-income households. Their parents might, for example, be less capable of helping them with schoolwork and to pay tuitions for higher education (Tselios, 2014, pp.221-222). Secondly, income inequality is correlated with having a smaller public sector at the country level (Elgin et al., 2010, p.18). This could mean that the public sector has fewer resources to invest in education and to make sure that everyone gets equal educational opportunities at all levels. Lastly, income inequality causes residential segregation, which in turn might lead to more unequal educational opportunities by making schools more segregated (Orfield & Lee, 2004; Lee, 2004).

Education, on the other hand, is an important predictor of people´s political attitudes and party choice (Rindermann, Flores-Mendoza & Woodley, 2011, p.1). Research at the micro level has found a connection between higher education and factors like: greater participation in the political process; better political knowledge; more democratic attitude towards politics, and; being more skeptical towards economic redistribution (Habibov, 2014, p.43; Lijphart, 1997, pp.1-2; Hillygus, 2005, p.25). It is, with this in mind, possible that greater educational differences also lead to more polarized views about economic redistribution. Most importantly, is the fact that education makes it more likely that people will participate in the political debate (passively or actively) (Lijphart, 1997, pp.1-2) and therefore assimilate their views to those of others; something that may reduce how extremely and randomly the average person deviates from the mean. Some of inequalities effect on polarization is therefore assumed to be caused (mediated) by differences in educational opportunities.

3.3. Political left culture

This part of the theoretical explanation builds on the institutional theory of welfare regimes (Svallfors, 1997; Esping-Andersen, 1990) and assumes that having a "left political culture" reduces inequality and leads to less polarization in attitudes to economic redistribution. What constitutes having a left political culture is here defined as having: a) a comparably high amount of government social expenditures and an ambitious welfare state, and; b) that welfare services are provided in a more universal manner. Scholars` have argued that having a more comprehensive and universal welfare state leads to broader support for ambitious welfare services (Boräng, 2015, pp.219-220; Rothstein, 1998). One reason for this is that discussions about welfare services and government transfers becomes less about the groups that benefits or loses from it, and instead more about solving common problems and what should be done from a general fairness perspective (Boräng, 2015, pp.219-220). The fact that welfare services and transfer systems cover more people means that more affluent groups will have had greater experience with them. They might therefore feel as if they too gain from them and therefore support them to a greater degree (Rothstein, 1998).

There are also studies that have connected a comprehensive welfare state with higher levels of generalized trust (Rothstein & Uslaner, 2005). Trusting others, as well as public institutions (institutional trust), makes it less likely that people will believe that others abuse the government sector for their own gains. Finally, it might simply be the case that people who live in welfare states have grown accustomed to a certain degree of government intervention and redistribution (Arts & Gelissen, 2001, p.296), and therefore the support for it is broader. It could be harder for people, living in countries with a less developed welfare state, to know what the appropriate level of redistribution ought to be. This might then explain why they deviate more in their attitudes from one another. All of these factors have been connected to greater overall support for the welfare sector (Rothstein, 1998; Boräng, 2015), but it is obvious that they might lead to smaller differences in opinion within countries as well (less polarization). In fact, much of the reasoning in the literature about institutional theory and welfare states, is centered on how support for welfare becomes broadened (less polarized) in countries with more comprehensive welfare regimes, and not just deepened within each societal group (Rothstein, 1998). Political left culture is therefore hypothesized to work as an

antecedent variable in the theoretical model: leading to both income inequality and polarization, i.e., as coming before (anteceding) them in the causal chain.

To sum up, it is hypothesized that these three explanatory variables are important in explaining why there is a correlation between income inequality and polarization in attitudes to redistribution across countries. Besides testing whether this relationship exists or not when relevant control variables are added, this study will also empirically examine how well these variables explain the correlation.

4. Methodology and Data

In this section I will go through the methodology used in the three different analyses, as well as how I have gathered the data and operationalized the variables.

4.1. Macro level OLS multiple regression analysis

An ordinary least squares (OLS) multiple regression analysis was performed in order to test the relationship between income inequality and polarization in attitudes to economic redistribution across countries. There are a number of core assumptions about the data that need to be accounted for when performing an OLS regression analysis. Violation of these assumptions can lead to biased estimations of the models predictive capacity (the R^2) or the size and significance of the coefficients (Field, 2009, pp.215-216, pp.220-221). It is therefore important to test for the occurrences of these problems in order to better understand ones results and to possibly adjust the data. The regular array of data diagnostic tests was therefore performed and they showed that it was not necessary to adjust the data in any way[1]. The only thing that was changed, was that Belarus, China and Kazakhstan was dropped from the model where parliamentary fractionalization was included. The reason for this being that one party dominated these countries` assemblies to such an extreme degree.

4.1.2. Variables

The dependent variables for polarization in attitudes to economic redistribution are operationalized from two questions that have been used in the World Value Survey (WVS) and European Value Study (EVS) since the second WVS wave in 1990-1994. Both the WVS and EVS uses elaborate sampling methods in order to make sure that the respondents answering the surveys make up a representative sample of the country`s population.

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[1]The Durbin Watson score for the full models in the regression analysis were 2.22 and 1.85 for the two dependent variables on a scale from 1-4. 2 indicate no serial autocorrelation, so the scores come sufficiently close to that (Fields, 2009: 220). The highest VIF-value and tolerance values were 2.55 and .91, which means that there should not be any problems with multicollinearity (ibid: 224). The highest leverage value was .39 and DF-beta values ranged from -0.18 to 0.16. DF-beta values above 1 are described as highly problematic by Field (2009) and mine are of course way below this: some countries were, however, removed in the model with fractionalization due to extreme values (as is discussed in the method section). Finally, the hettest command in stata was performed to test for heteroscedasticity. The results from this tests indicated that the null hypothesis of heteroscedasticity could be rejected.

The surveys are then conducted through interviews by trained personal or "professional organizations" and the sample size are at least 1000 respondents from each country (European Value Study, 2016; World Value Survey, 2016). Both of these surveys have regularly asked the same two identical questions about economic redistribution. I have therefore merged the data from both surveys in order to get more observations for the countries. Both questions consist of a scale from 1-10, with two statements on the opposite ends of the scales. The respondents are asked to pick a number on the scale in accordance with how much they agree with the statements (World Value Survey Longitudinal Data file, first released 2015-04-18; EVS Longitudinal Datafile, 2015-10-30). The statements that the respondents had to choose between are presented in the table:

Table 1. Wordings of the questions of the dependent variables

Economic redistribution	How would you place your views on this scale? 1 means that you completely agree with the statement "Incomes should be made more equal" and 10 mean that you completely agree with the statement "We need larger income differences as incentives".
The government´s role in economic redistribution	How would you place your views on this scale? 1 means that you completely agree with the statement "People should take more responsibility to provide for themselves" and 10 means that you completely agree with the statement "The government should take more responsibility ensure that everyone is provided for"

Note: The wordings of the questions have been abbreviated

The first question is clearly a valid measurement of the population's general attitude to future redistributive policies. A common criticism of using this type of questions when measuring differences in countries attitudes to redistribution is that all countries obviously have different current levels of redistribution to start with.

Being critical of "more equal incomes" in Sweden does not mean that one is less favorable of a certain level of redistribution than someone from a country with less government involvement that answers more positively (Alesina, Glaeser & Sacerdote, 2001).

This is, however, not a problem in this study since what I want to measure is the degree of polarization within the electorate and not the overall approval or disapproval of redistribution. The second question is also a valid measurement of peoples´ attitude to government involvement in redistributive policies. It is, however, important to note that the questions cover somewhat different features of economic redistribution. The first one is more abstract and general in that it asks about incomes being more equal without providing any description of how this is supposed to be achieved. It is possible that someone might be skeptical of the government taking care of people needs, while still thinking that equality in general is positive. They also differ from each other in that the first one implicitly departs from the present level of redistribution by asking if incomes should be made *more* equal. Whereas the other question asks what the ideal level of government involvement in redistributing incomes *should* be. Overall the questions do, however, capture attitudes to economic redistribution in a rather similar and general way, and I will therefore refer to them as simply "attitudes to economic redistribution" throughout the paper. In the result section I present the results from the models with the respective dependent variables separately. As it turns out, the dependent variables are highly correlated with one another and the regression models all point in the same direction.

For the cross sectional regression analysis I took the last year that the countries had been included in the surveys within the time span 2006-2013. Countries that had not answered the survey within this time span were omitted, which meant a sample size of 74 different countries (for a list of the countries and the year they answered the survey see Appendix 3). There were a few countries for which there were no data for gini coefficients the last year they answered the survey. I then included the year these countries had answered the surveys prior to this, given that it was within the 2006-2013 time frame. There was quite a bit of variation in how disbursed (polarized) the countries` answers were which makes it more plausible to identify independent variables that can explain these differences:

Table 2. Countries with lowest and highest polarization on question about whether incomes should be made more equal or not

Rank	Lowest	Std.	Rank	Highest	Std.
1	Thailand	1.88	67	Vietnam	3.12
2	Slovenia	2.15	68	Philippines	3.12
3	Japan	2.16	69	South Africa	3.14
4	Austria	2.24	70	Moldova	3.17
5	Ethiopia	2.24	71	Montenegro	3.17
6	Estonia	2.26	72	Armenia	3.20
7	Norway	2.26	73	Mexico	3.32
8	Netherlands	2.28	74	Romania	3.43
9	Indonesia	2.29	75	Jordan	3.54
10	Hungary	2.30	76	India	3.72

Note: The idea for this and the previous descriptive table comes from Östling & Lindqvist (2010, p.547). Sources: European Value Study, Longitudinal Data File; World Value Survey, Longitudinal Data File

The main independent variable in the analysis is the countries level of income inequality as measured by their gini coefficient net of taxes and transfers. The data for the countries gini coefficients are taken from the Standardized World Income Inequality Database (SWIID). It is measured on a scale from 0-100, where 0 indicates perfect equality and 100 perfect inequality. SWIID is widely used in academic research since it provides the fullest comparable coverage of countries over time. SWIID uses data from most of the existing data sources on income inequality and then performs multiple imputation models in order to produce measurements for gini coefficients for "174 countries for as many years as possible from 1960 to present" (Solt, 2014). The gini coefficient from the Luxembourg Income Study is used as the main benchmark to which it strives to compare itself to.

The SWIID database consists of numerous imputed models for the gini coefficient net of taxes and transfers that can be summarized into one measure (gini_net), which is the one I have used in this study (Solt, 2014; Jenkins, 2014). The reason for using the gini coefficient net of taxes and transfers is because it is the amount of money that people actually dispose of which matters the most to them. Another reason is that it includes people who do not get a wage (market) income, which makes it a better description of the level of income inequality in a country. Finally, the variable for income inequality is the average gini coefficient for three years: the year before the country answered the WVS or EVS, the same year as they did so and the year following that. This is a way of adjusting for possible differences in how the measures for the gini coefficients are computed in the countries, as well as fluctuations caused by temporary macroeconomic events.

My measure for educational opportunity comes from the United Nations Development Program's (UNDP) Human Development Reports and measures the average year of schooling within the countries. That is, how many years of education the average citizen has had (United Nations Development Program, 2015). I consider this to be the best way of operationalizing the educational opportunities that a country`s citizens` has had[2].

Political left culture is operationalized through three variables. First, the countries level of public expenditures as measured by the International Monetary Fund (IMF). The data for this variable was retrieved from the University of Gothenburg`s Quality of Government (QoG) Standard Time-Series Dataset (Teorell et al., 2016). It is made up of the average level of government expenditure during a three-year period: one year before the survey, the same year as it and the year following it. Three year averages were chosen because public expenditures tend to go up as a percentage of GDP during economic downturns and down during upturns. It is therefore appropriate to take an average in order to smooth out yearly fluctuations.

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[2] Besides this, a variable for differences in educational opportunities was constructed. This was done by taking the countries` average standard deviation to a question about respondents' education level in the WVS and EVS. This variable did, however, turn out to correlate very weakly with both income inequality and the dependent variables, which is why it is not included in the analysis.

There are obvious validity problems with this measure of "political left culture": countries with big public expenditures devoted to other things than welfare services and social transfers receive too high figures; having a lower GDP leads to a higher public expenditure to GDP ratio, without this having anything to do with welfare, and; it does not capture the universality of welfare services and transfer systems. Despite this, it is still the most accurate way of operationalizing the variable in order to get data for all of the countries.

The other two variables used to operationalize left political culture were the government`s level of social expenditures as a percentage of GDP and the proportion of workers belonging to a trade union. These variables capture left culture in a more precise way, but are, on the other hand, only available for mostly OECD-countries. These variables are therefore only included in one of the models in the regression analysis[3]. The level of social expenditures were received from the QoG Standard Tim-Series Dataset, and union density from Hayter and Stoevska (2011) and the OECD`s (2016) trade union density data.

The most important control variable in the analysis that is not part of the theoretical framework is the countries level of economic development. This is measured by taking the logarithm of the countries per capita GDP adjusted for purchasing power parity. The data for GDP was taken from the QoG Standard Time-Series Dataset (Teorell et al., 2016). Finally, a variable for the fractionalization of the country`s parliaments is included. This measures the odds of two random legislators being from different parties on a scale from 0-1. The argument that the number of parties in a country´s parliament is important for the degree of political polarization has always been an established part of the literature on the subject (Sartori, 1976: 131-145; Pontusson & Rueda, 2008: 332). This variable was also retrieved from the QoG Standard Time-Series Dataset (Teorell et al., 2016).

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[3] Besides this, variables were constructed for the average ideological positioning of the countries` parliamentary parties and the citizens average self-placement on the left/right scale. None of these variables correlated in any meaningful way with the dependent variables, which is why they were not include in the analysis.

The table below shows some descriptive statistics of the variables used:

Table. 3. Descriptive statistics

Variables	N	Mean	Std.	Min	Max
Gini	73	35.17	7.96	23.78	59.11
GDP	74	24 106	18 402	858	94 169
Gov. expenditure	74	36.53	10.51	14.13	54.22
Soc. expenditure	34	20.71	5.93	7.80	29.81
Fractionalization	67	.65	0.16	0.13	0.91
Schooling	74	9.69	2.74	1.3	13.42
Std.Gov. redistribution	74	2.67	0.35	2.12	3.52
Std. redistribution	74	2.70	0.34	1.88	2.70

4.2. Micro level multilevel analysis

Multilevel models are a way of analyzing data that is nested in multiple levels. In this case whether individual`s (level 1) responses to the questions about economic redistribution varies based on the level of income inequality in the country where they live (level 2). The hypothesis, laid out in the theory section, is that low income earners will be more in favor of economic redistribution in countries where the level of income inequality is higher. High income earners, on the other hand, are hypothesized to be less in favor of redistribution in those countries. The same is true for people with lower and higher education levels. A multi-level OLS linear regression analysis is performed in order to test this[4].

4.2.1. Variables

The dependent variables are the same as in the macro level regression analysis: 1) if incomes should be redistributed more equally, or if we need larger income differences as incentives, and; 2) if everyone should make sure they can provide for themselves, or if the government should make sure everyone is provided for.

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[4] It was not necessary to perform the same data diagnostic tests as in relation to the macro analysis, since only one independent variable is included at the individual level (income/education level) and one at the country level (gini coefficient) in the regression models. These are furthermore included in an interaction term in all models in the analysis.

Instead of using the average standard deviation on these questions, as I did in the macro analysis, I now use the standard version of the questions. That is, the degree to which my independent variables can predict the respondents´ answers to the questions.

The EVS and WVS have regularly asked respondents to place themselves on an income scale from 1-10 in relation to the country that they live in. I have recoded this scale into three dummy variables, and in the presentation of the results I use the "middle income group" as my reference group. I have, however, also tested the results with the other two income groups as my reference groups, as well as with only two dummy variables, without getting any significant change in the results. Finally, the surveys asked the respondents´ about their education level. Those responsible for the WVS and EVS have recoded this variable into three values: low education, middle education and high education. These were then recoded into three dummy variables and middle education level is used as the reference category (WVS Longitudinal Data File, first released 2015-04-18; EVS Longitudinal Data file, 2015-10-30).

Education and income level are the only individual level independent variables included in the analysis. A separate analysis was, however, conducted that included a number of control variables that, according to previous research, are important in predicting people´s attitudes to welfare and economic redistribution. These were: gender, age, trust, and if the respondent was employed in the public or private sector (Svallfors, 2013, p.375). Education and income was also included as control variables for each other in this analysis. The effects were in the same direction as the one without the controls, which is why they are not presented in the result section. One major difference in the analysis with the controls was that the interaction effects for income level and inequality was stronger for one of the dependent variables. If anything this strengthens the conclusions that will be presented in the result section: that there is not a greater differences between high and low income earners in more unequal countries. The results from the analysis with controls, together with a brief discussion on interpretation and coding of variables, can be found in Appendix 2.

Lastly, the only independent variable at the country level is the countries level of income inequality that is measured in the same was as in the macro analysis: the gini coefficient net of taxes and transfers.

4.3. Cross-country analysis over time

The longitudinal nature of the WVS and EVS data allows me to analyze the relationship in a dynamic framework over time. This is very useful, since it makes it possible to draw inferences about causality. It is also, if causality exists, possible to test the causal direction of the relationship. Causality might actually run from polarization towards income inequality and not only the other way around, which is something that other studies have alluded to. The data I have is heavily tilted towards cross country observations in comparison with time observations, i.e., T is much smaller than N. It is therefore necessary to use another analysis technique than cross-sectional-time-series analysis, which is otherwise the most commonly used one.

I will therefore perform an OLS regression analysis based on the principles of granger causality. The principle of granger causality states that a variable X_1 can be said to have a causal impact on another variable Y if the lagged change in X_1 leads to a change in Y, even after controlling for the lagged change in Y itself (Granger, 1969; Bartels, 2013). I will modify this principle somewhat and test if changes in Y can be predicted by lagged changes in X_1, even after controlling for lagged changes in Y and other relevant control variables X_n.[5] The reason for using changes in Y is that it is a more accurate test of the causality of the relationship than only testing how well the independent variables predict the current value of Y. The data for my analysis covers 43 countries over a time span from 1989 to 2013, and the number of time observations per country various from 3-5 (see Appendix 3 for a list of the countries included in the analysis).

[5] See Bartels (2013) for a similar modification of the concept of Granger causality in his analysis of changes in political polarization in Europe.

A problem with my panel data is that it is very unbalanced. The reason for this is that I have tried to strike a balance between including as many observations as possible at the same time as I keep it reasonably balanced. First, the time gaps between the observations for each panel vary from 5-12 years. Most of the gaps lay in a more narrow range between these two extremes, but it is nonetheless a problematic amount of variation. Differences in time gaps can bias the results if it impacts it in a systematic way. It could, for example, be that countries where the effect of inequality is larger happen to have bigger time gaps. This might then inflate the results of the overall effect of income inequality. There are also variations when it comes to the number of time observations per panel (country): 3 countries have 5 time observations, 11 have 4 observations and 29 only 3 ones. The countries with more observation might therefore bias the results, since they have a bigger impact. There is also a risk of cross sectional chocks, like an international economic crisis, impacting the results in certain time periods. I try to correct for these problems by performing the same regression analysis as the one described above, but with a strongly balanced panel set instead. I do this as a form of robustness control to check if the results are approximately the same. In the strongly balances set all countries have only three same time observations: 1990/91, 1999/2000 and 2008/2009. The number of countries then drops to 22, compared with 43 in the original analysis. The results from this "balanced" analysis reaffirm the ones from the standard one, thus strengthening the credibility of the results. I will only report the results from the original analysis in the result section below, but the regression table from the strongly balanced panel set, as well as a list of the countries included, can be found in the Appendix1and3.

Given these shortcomings, the results from the analysis should be interpreted with caution. Especially, the lack of time observations means that a more complete dataset over time could produce different results that would be more credible. The test conducted is also a tough one, since it can be hard to get significant results when one test how changes in a variable predict changes in another one: especially with so few time observations. There is a large degree of random variable in the observations that it is hard to capture with predictor variables. The results should therefore be viewed as indicators, rather than firm evidence.

I performed the same data diagnostic tests as has been described in relation to the other analysis. A typical problem with panel level data is that it adds another dimension of possible autocorrelation within panels over time. It is common that error terms in one time period are correlated with error terms in future time periods. This might then lead to over or underestimation of the variance in the regression model (R^2), thus leading one to falsely accept or reject the null hypothesis (Durbin & Watson, 1950, pp.409-411). I test for autocorrelation by performing the Durbin Watson test and the regression models for both of my dependent variables are fairly close to a score of 2, which indicates no autocorrelation. It is problematic to perform a Durbin-Watson test when one has a lagged dependent variable in the model. The fact that I control for the lagged change in my dependent variable is, however, also a way of correcting for any possible estimation bias caused by autocorrelation (Keele & Kelly, 2005). It should therefore not be any serious problem caused by autocorrelation in the analysis. The other diagnostic tests also show that the data do not seem to be in violation of any of the core assumptions[6].

4.3.1. Variables

The dependent variables are the same in the panel data analysis as the ones previously described in relation to the macro and micro analysis. That is, the countries average standard deviation to the two questions about economic redistribution. The difference is that I here use changes in the standard deviations between two waves. It needs to be noted that a number of countries did not answer the question about whether income inequality should be made more equal in the EVS wave 1999. This altered which waves I choose to include for these countries, which normally was done by randomly taking the years they were included in the surveys in a 5-12 year interval. I choose to include observations within this interval since income inequality tends to change slowly and it would therefore be misleading to use shorter time periods.

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[6] The Breusch-Pagan test for heteroscedasticy both showed that this firmly could be rejected with chi2 values of 2.62 and 0.63 for the dependent variables. The VIF-values were 1.04 and tolarence values .96, which show that there clearly were no problems with multicollinearity. The Durbin-Watson scores were 1.84 and 2.26. That is, close to 2 indicating no serial auto-correlation. It is not surprising that all of these values were low, given how low the correlation between changes in income inequality and changes in polarization turned out to be. The range for DF-beta values were between 0.18-and -.03, and the highest leverage value was 0.11, so there were clearly not any problems with outliers.

The choice of countries was otherwise completely random, since I include all countries that took part of the surveys at least three times and that had gaps in their observations of 5-12 years.

The main independent variable is the change in the gini coefficient for a country between the two waves preceding the waves making up the dependent variable. The data comes from the Standardized World Income Inequality Database and measures the gini coefficient after taxes and transfers (Solt, 2014). The control variables I tested for were: changes in GDP per capita adjusted for purchasing power parity; changes in average year of schooling; changes in ideology; changes in party system ideology, and; party system polarization. The data and measurement techniques for all of these were the same as has been described in relation to the macro and micro level analysis. The only difference is that I measure the lagged changes of theses variables as well. Party system polarization was constructed by taking the average standard deviation for the parties placement on the Comparative Party Manifesto`s left/right ideological scale, for each country.

The UNDP only provides data for average years of schooling in 1980, 85, 90, 2000, 2005, and annually after that. Countries who did not answer the survey in these years got the UNDP measure that was closest to the year they answered the survey. They got the average of two UNDP schooling scores if they answered the survey in a year that lay between two of these time periods: for example, 1995. A few of the variables for GDP per capita in purchasing power parity, which were not available via the QoG dataset, was retrieved from the website tradingeconomics.com (2016). As it turned out none of the control variables altered the effect of income inequality, which was highly insignificant in all cases. I will therefore not include the models with these control variables in the presentation of the results. The regression analysis with all the control variables included is presented in Appendix1.

5. Results

5.1. Macro level OLS multiple regression analysis

The graphs below depict the correlation between income inequality and polarization in attitudes to economic redistribution. The graph to the left shows the relationship for all of the 74 countries that are part of the regression analysis and the one to the right for only 21 "traditional western democracies". The data are for the last year the countries were part of the EVS or WVS during the period 2006-2013. The dependent variable in the graphs is the average standard deviation for both of the questions about economic redistribution averaged up together.

Figure 4. Correlation between income inequality and average standard deviation (polarization)
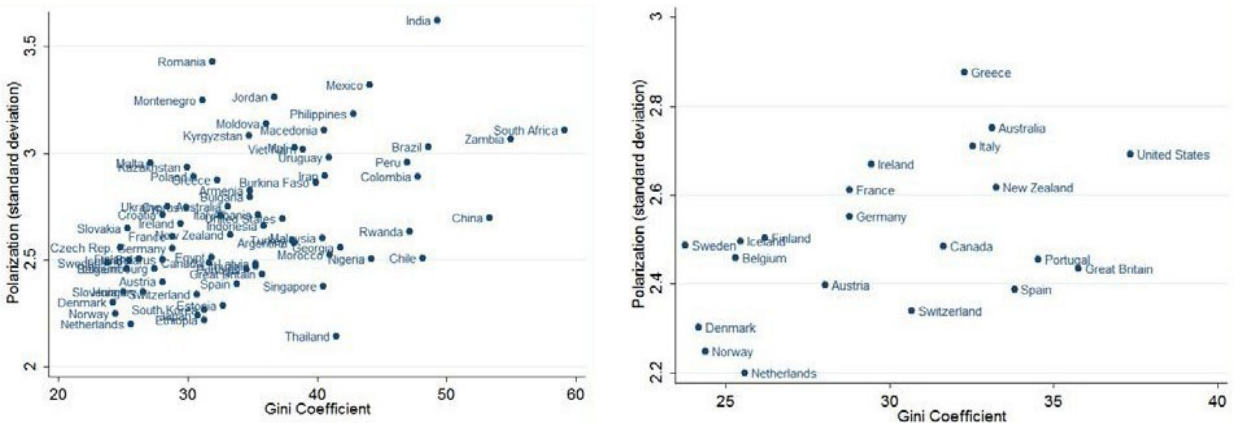
Sources: EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October2014.

I choose to include the graph for western democracies to show that the relationship is strong both for the sample at large and for this relevant subgroup. Western democracies have the best and most reliable data on the variables used in the study, and have been better studied by previous research on political polarization and income inequality. They also share a common history, culture and socio-economic structure that make it interesting to zoom in on them. The correlations are very strong for both the entire sample (r = .45) and for only western democracies (r = .49). The fact that income inequality and polarization in attitudes to economic redistribution correlate to such a degree is interesting

and something that has not been studied in any deeper detail before.[7] It runs contrary to research on ideological sorting, which has shown that there is a negative correlation between ideological polarization and income inequality among western democracies, i.e. more equal countries have populations that are more ideologically polarized (Iversen and Soskice, 2015).

The graphs below show the same relationship, but for a period of 17 years instead: 1996-2013. The variable for polarization is calculated by taking the average standard deviation to the two questions about redistribution for every year the countries were included in the surveys. The mean of these two values taken together is then correlated against the average gini coefficient for the years the countries were part of the survey. The graph to the left shows the relationship for the entire sample (74 countries) and the one to the right for 21 "traditional western democracies":

Figure 5. Correlation between income inequality and standard deviation (polarization) 1996-2013

Note: The values for the average standard deviation and gini coefficient are taken by averaging the values from all the years the countries were included in the surveys 1996-2013. The dependent variable (polarization) is the average standard deviation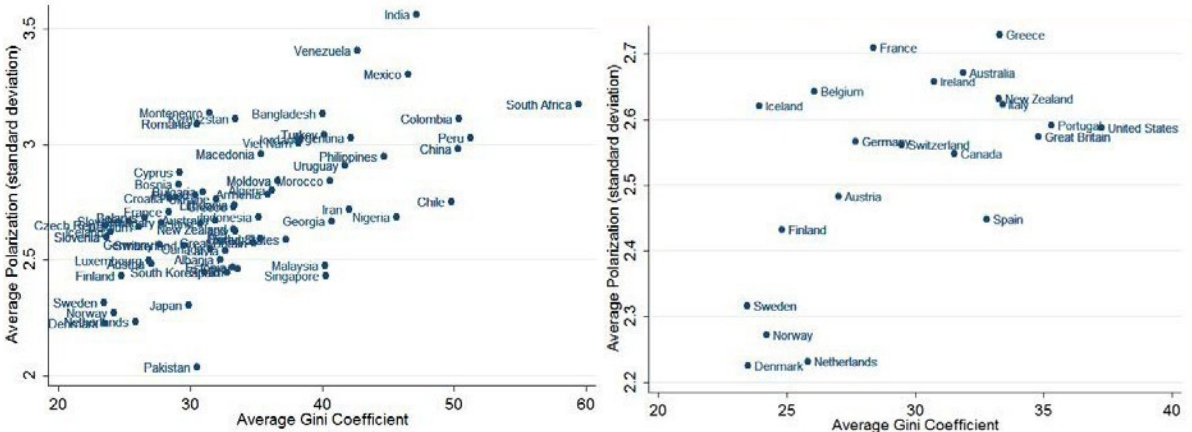 to both questions about redistribution taken together. Sources: EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

The correlation when one takes the averages of the standard deviation to the questions 1996-2013 is extremely high: 0.66 for the entire sample and 0.64 for traditional western

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   The exceptions I have found to this are Graechner (2016) that found a connection between income inequality and polarization in attitudes to economic redistribution, using the same survey questions as I do. Another one is Östling and Lindqvist (2010) who found a correlation between income inequality and polarization in attitudes to redistribution in their study of relationship between polarization and the size of governments.

democracies. This shows that the relationship is not due to some statistical coincident, since it is robust throughout the time that the questions have been asked in the surveys. The reason as to why this relationship is stronger than the one for only the last year is probably because polarization tends to fluctuate quite a bit from year to year. Bartels (2013) finds that increases in how polarized voters are on policy issues tend to be followed by subsequent decreases during the next survey waves. This could, for example, be due to regression towards the mean or some other unexplained factor (Kahneman, 2012). That being said, there is still a rather strong and statistically significant relationship, when only the last year is included. The regression analysis is therefore performed with data from the countries last survey year only.

Table 4. OLS cross country regression analysis of the relationship between income inequality and polarization (average standard deviation) in attitudes to economic redistribution

Variables	Std. Incomes more equal				Std. Government make sure everyone is provided for					
	1	2	3	4	5	6	7	8	9	10
Gini	.016***	.012	.019**	.022**	.015	.019***	.013*	.018**	.024***	.015
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Log GDP		-.066	-.139*	-.111	-.11		-.094*	-.167**	-.146*	.153
		(0.04)	(0.06)	(0.06)	(0.14)		(0.04)	(0.06)	(0.06)	(0.13)
Years of Schooling			.029	.021				.035	.039	
			(0.02)	(0.02)				(0.02)	(0.02)	
Gov. Exp.			.008					.004	.004	
			(0.00)							
Fractionalization of Parliament				.020					.238	
				(0.23)					(0.23)	
Unionization					.001					.000
					(0.00)					(0.00)
Gov. Social Expenditures					-.001					-.002
					(0.01)					(0.01)
Adjusted R^2	.14	.16	.19	.22	.04	.18	.23	.24	.28	.12
Intercept	2.12	2.92	2.81	2.59	3.20	1.20	3.13	3.17	2.57	3.59
	(0.16)	(0.53)	(0.55)	(0.58)	(1.56)	(0.17)	(0.53)	(0.56)	(0.59)	(1.44)
N	74	73	73	67	33	74	73	73	67	33

Note: significance values: * $p < 0.05$; ** $p < 0.01$. *** $p \leq 0.001$; Standard errors in parenthesis: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014; QoG Standard Time-Series Database (Teorell, et al., 2016); UNDP (2015); OECD union density statistics; Hayter & Stoevska (2011); Tradingeconomics.com

Model 1 and 6 shows that inequality, on its own, has a significant predictive capacity for both variables of polarization. The unstandardized regression coefficients are .016 and .019 and are both statistically significant at the highest level. An increase in the gini coefficient (which is measured on a scale from 1-100) of 10 is associated with having a .16 and .19 higher standard deviation on the questions. Another way of illustrating this is through an example: Sweden had a gini coefficient of 23.91 in 2011, which is the lowest of all the countries in the sample. South Africa, on the other hand, had the highest gini coefficient of all countries at 60.29. Moving from Sweden´s level of inequality to South Africa´s is associated with a 0.58 or 0.69 increase in standard deviation according to the results from the analysis. This would move Sweden from being part of the one third of countries with the lowest level of polarization to the one third with the highest. Another example of the difference in dispersion of views that this change entails can be given by the two histograms shown below. They show the distribution of answers to one of the question about economic redistribution in South Africa and Sweden. The difference in average standard deviation between the respondents from the countries was 0.66:

Figure. 6. Histogram of the frequencies of responses in Sweden to the right and South Africa to the left to the statement about "whether incomes should be made more equal or not?"
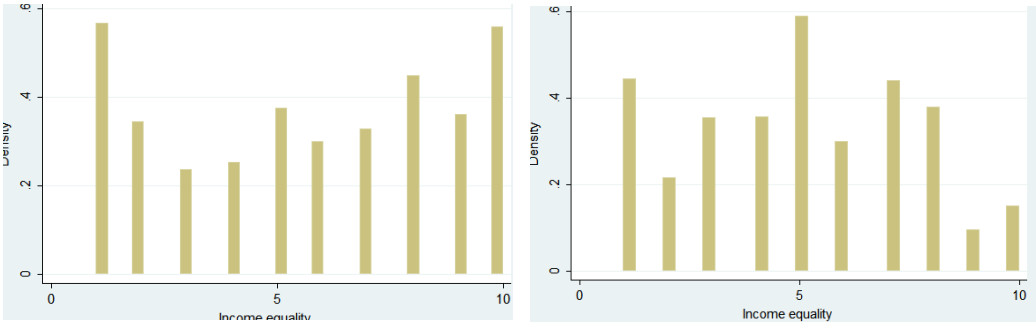
Source: WVS Longitudinal Data File; EVS Longitudinal Data File

The graphs clearly show that a difference of .66 in standard deviation constitutes a more polarized distribution of views. The graph over South Africa's frequencies to the left have many more people answering at the extremes and much fewer close to the mean.

In model 2 and 8 GDP per capita in purchasing power is included alongside the gini coefficient. It shows that a higher level of economic development is associated with lower polarization. This is also evident from the graphs of the scatter plots, but it is true even when one holds the level of income inequality constant. The effect of income inequality is reduced by including the country`s level of GDP, but only marginally and it stays significant. That richer countries are considerably less polarized in their attitudes to these policy issues is an interesting finding and it begs the question of whether this is true of other policy issues as well? It must, however, be noted that the effect of GDP in model 2 does not reach statistically significance, but the general conclusion from all models taken together is that GDP is associated with lower polarization.

The other control variables have no significant impact on polarization and do not impact the coefficient for income inequality in any significant manner. This actually contradicts the theoretical framework laid out in the theory section. I had expected that the variables measuring left/right political culture (government expenditures, social expenditures and union density) and average years of schooling should have an effect on polarization. That is, that they would both impact polarization in a significant way and reduce (mediate) the effect of income inequality.

The effect of income inequality loses significance in model 5 and 10 when government social expenditures and union density is included. The only countries included in the analysis of this model were OECD-countries, since those were the only ones with reliable data on social expenditures (33 countries). The reason for this drop in significance is, however, most likely due to the fact that the number of observations is lower. I control for this by conducting the same step-wise analysis as above, but with only OECD-countries instead of the entire sample. This showed that unionization and social expenditures did not alter the size of the regression coefficient for inequality, which only became insignificant after the inclusion of GDP. The results form models 5 and 10 does, however, provide reasons for caution about the degree to which the results can be generalized to subsets of countries, as well as the general strength of the relationship.

In sum, the cross country analysis provides strong support for a relationship between income inequality and polarization in attitudes to redistribution across countries. Somewhat surprisingly, it does not provide support for two of the proposed explanatory variables in the theory section: educational opportunities and left political culture. The next part of the paper examines another one of the explanatory variables laid out in the theoretical framework: that people with higher/lower income level will hold more divergent views in more unequal countries (the income effect). The same test is also performed for people with higher/lower education level.

5.2. Micro Analysis

The table below presents the results from the multilevel analysis, which tests if income inequality at the country level impacts the answers of people with a high or low income/education level.

Table. 5. Multilevel regression analysis. Dependent variable: attitudes to redistribution.

Variables	Incomes more equal				Government make sure everyone is provided for			
	1	2	3	4	5	6	7	8
Fixed Intercept	5.53***	4.87***	4.81**	5.02***	5.78***	4.77***	4.40***	4.22***
	(0.12)	(0.53)	(0.54)	(0.53)	(0.12)	(0.51)	(0.53)	(0.53)
Country level varible								
Gini		.017	.020			043**	.038*	044**
		(0.01)	(0.01)			(0.01)	(0.01)	(0.01)
Individual level variables								
Middle income								
Low income		-.317***		-.565***		.391***		.660***
		(0.01)		(0.08)		(0.02)		(0.08)
High income		.666***		.409***		-.231***		-.371***
		(0.08)		(0.02)		(0.08)		(0.02)
High income*gini		-.007				-.004		
		(0.00)				(0.00)		
Low income*gini				.007***				-.007***
				(0.00)				(0.00)
Middle education								
Low education			-.291***				.287***	
			(0.02)				(0.02)	
High education			.423***				-.337***	
			(0.09)				(0.02)	
High education*gini			-.004				.003	
			(0.00)				(0.00)	
Std. countrylevel	1.01	1.01	1.02	1.00	1.07	1.01	1.03	1.03
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)
Std. individual level	2.72	2.70	2.69	2.70	2.69	2.68	2.68	2.68
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
-Log likelihood	-267846	-267306	-251707	267306	-268835	-268226	-253014	-268222
Observations	110 675	110 675	104 356	110 675	111 449	111 499	105 142	111 4999
Countries	75	75	75	75	75	75	75	75

Note: significance values: * p < 0.05; ** P < 0.01. *** p ≤ 0.001; Standard errors in parenthesis: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

First off, the empty column in model 1 and 5 shows that the data is suitable for a multi-level analysis since a substantial share of the variance in in people´s responses can be explained at the (second) country level.[1]

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[1] Hong Kong was included in this multilevel analysis (making the sample 75), but not in the macro analysis presented before. The country answered the survey in 2005, which was below the cut-off for the macro analysis. The answering options to the questions about redistribution also appear to have been fewer than in the other countries, which could affect Hong Kong´s average deviation compared to the others.

The intra class correlation is a measure for the share of the variance in respondents´ answers that can be explained at the country (second) level (Fields, 2009, pp.728-729). This was calculated through the estat icc command in stata and were 0.12 and 0.14 for the two dependent variables. This means that 12 and 14 percent of the differences between respondents' answers can be explained at the country level (ibid).

The results reported in model 2 and 3 shows the effect of self-reported income and education level on respondents´ answer to the two questions. As expected high income earners were considerably more likely to agree with statement 10 that "we need greater differences as an incentive" than with statement 1 that "incomes should be made more equal". The effect is strong with an unstandardized regression coefficient of 0.666, which means that they were predicted to answer 0.666 scale steps (on a 1-10 scale) higher than those belonging to the middle-income group, which works as the reference category. Respondents from the low-income group, on the other hand, were predicted to answer 0.229 scale steps closer to option 1 "that incomes should be made more equal" than the middle-income group. The effect of education, presented in model 3, is also strong and in the same direction as that of income. Those who had a higher education answered 0.423 scale-steps higher than those with a lower education.

The question about the government´s role in redistribution incomes is ordered in the opposite direction as the first one about whether incomes should be made more equal or not. That is, a higher value indicates answering closer to option 10 "that the government should make sure that everyone is provided for" than 1 that "it is everyone's personal responsibility to make sure that he is provided for". The results are in the same direction as the ones for the other dependent variable: respondents with lower education/income were more positive towards redistribution and those with higher education/income saw it more as a personal responsibility (model 6, 7 and 8). All of these regression coefficients, except for the gini coefficient at the country level, were strong and statistically significant at the highest level.

The results are in line with hypothesized effect of income and educational differences laid out in the theoretical framework. Having a higher income and education level should indicate that one has more to lose from redistribution and that it is therefore rational to be more critical of redistribution. The surprising part of the multilevel analysis is, however, that the level of inequality at the country level does not moderate the effect of income and education level in the theorized direction. Respondents with a higher education or income, living in more unequal countries, were not more against redistribution than their counterparts from more egalitarian countries: the interaction effects presented in models 2, 3, 6 and 7. The same was true for those with a low income, whose answers did not differ depending on the level of inequality: models 4 and 8. The interaction terms, although sometimes significant, all have a very small effect and they are in the opposite direction than what was hypothesized by the "*income effect*" in the theory section, i.e., different income groups are less polarized in more unequal countries.

This goes against both the explanation given by the theory (the income effect) and most of the previous literature (Meltzer & Richard, 1981). That is, that a higher level of income inequality implies that the mean income is further away from the income of lower income earners, which should lead them to favor redistribution more. The opposite should also be true for high income earners. The question is therefore why more unequal countries are more polarized, if it is not due to greater attitudinal differences between those with high/low income/education levels? One possible explanation for this is that people in countries with higher inequality have more varying opinions throughout the income scale. This is indeed what I find, as is illustrated by the table below. The table depicts the results from a regression analysis where the average standard deviation for the three different income groups works as the dependent variable and the gini coefficient as the independent one. It is the same analysis as the one presented previously in the macro analysis section, but with the three income groups analyzed separately instead of together as one. The results show that higher income inequality is associated with greater differences within each income group. This is illustrated both with the positive regression coefficients and the relatively high correlations.

Table 6. Regression coefficients and correlations for income inequality (independent variable) and the average standard deviation (dependent variable) for specific income groups

	Incomes more equal	Government make sure everyone is provided for
Regression coefficients		
Low income earners	.020*** (0.00)	.017** (0.01)
Middle income earners	.016*** (0.00)	.017** (0.00)
High income earners	0.016** (0.00)	.023*** (0.02)
Correlations		
Low income earners	.44	.20
Middle income earners	.37	.21
High income earners	.36	.42

Note: significance values: * p < 0.05; ** P < 0.01. *** p ≤ 0.001; Standard errors in parenthesis: Sources; World Value Survey – Longitudinal Data File; European Value Study – Longitudinal Data file; Standardized World Income Inequality Database: Standard errors in prentices.

One possible explanation for this general dispersion of polarization throughout the income scales is the political culture explanation described in the theory section. A country where a certain level of government intervention and redistribution is an integrated part of the country might also have more of common understanding on these issues. One example of this is the Scandinavian countries where a strong universal welfare state is typically accepted as part of the economic "model" of the country. This is more or less true of most European countries, which probably is part of the explanation for their lower level of polarization. People from countries where government redistribution is less advanced will find it harder to know what the appropriate level of redistribution ought to be. They might therefore give answers that deviate more to the extremes than in countries where people are more used to a certain level of redistribution.

The results from the macro level analysis, however, contradict this "left political culture" explanation. The effect of income inequality was not reduced (mediated) by bringing in variables for government expenditure, social expenditures and union density into the analysis. This could, however, be due to the difficulty of measuring left/right political culture and welfare generosity: especially for the entire sample, where the operationalization used was total public expenditures. Future studies that analysis the left political culture explanation in a more detailed and advanced way is needed in order to better test this explanation.

Another possible explanation in line with the "educational effect" part of the theory is that more unequal countries have greater differences in education level and that this accounts for some of the differences in polarization. Educational differences, as measured by the average standard deviation to the question about education level, do correlate positively with income inequality and polarization. The effect is, however, too small to be part of the explanation for the correlation between inequality and polarization.

In sum, the results do not provide support for the theory that inequality leads to greater polarization by increasing differences in attitudes between people with high and low income/education levels. Instead, inequality seems to be associated with greater differences throughout the income distribution (within each income group).

5.3. Time series analysis

This table below presents the results from an OLS linear regression analysis, with lagged changes in income inequality as the independent variable and changes in polarization as the dependent one. Also included are lagged changes in polarization as a control variable and a model that illustrates how changes in inequality and polarization correlate with each other during the same time periods.

Table 7. OLS linear cross country regression analysis of lagged changes in income inequality and changes in polarization (average standard deviation)

| Variables | Std. Incomes more equal Δ t-1 | | | Std. Government make sure everyone is provided for Δ t-1 | | | | |
	1	2	3	4	5	6	7	8
Gini Δ t-2	-.001		.007		-.002		-.005	
	(0.01)		(0.01)		(0.01)		(0.01)	
Y Δ t-2		-.379**	-.393**			-.251	-.260*	
		(0.13)	(0.14)			(0.13)	(0.13)	
Gini Δ t-1				.022*				.006
				(0.01)				(0.01)
Adjusted R^2	-.02	.11	.10	.03	-.02	.05	.03	-.00
Intercept	-.064	-.050	-.063	-.054	-.066	-.083*	-.074	-.081
	(0.05)	(0.04)	(0.05)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
N	56	56	56	95	60	60	60	103

Note: significance values: * p < 0.05; ** P < 0.01. *** p ≤ 0.001; Standard errors in parenthesis: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

The analysis show that changes in income inequality has not had any effect on subsequent changes in polarization. An increase in income inequality between two waves is associated with a small and statistically insignificant decrease in polarization. The coefficient of -.001 in model 1 and -.002 in model 5 indicates that an increase in the gini coefficient of 1 is associated with a .001 and .002 decrease in standard deviation between the following two waves. Model 2 and 6 show that lagged changes in standard deviation has a strong and significant effect on change in the standard deviation between the following two waves. An increase in the average standard deviation of 1 is associated with a subsequent decrease of 0.392 and 0.251 between the following two waves. This is in line with the findings from Bartels (2013) that polarization in mass attitudes fluctuates up and down over time. Model 3 and 7 are the main models where I include the lagged value of changes in Y as a control variable. The results are in the same direction as the previous ones with no significant effect of changes in income inequality and a strong and significant effect from lagged changes in Y.

The last two models (4 and 8) show the correlation between changes in income inequality and polarization during the same time periods. They correlate positively with one another and model 4 has a significant effect for the correlation. This, however, does not say anything about causality and an increase in inequality is, as has just been mentioned, associated with a decrease in polarization between the next two waves (model 1 and 5). The correlation between income inequality and polarization is, furthermore, very weak and significant for only one of the dependent variables (model4).

Figure. 7. Average changes for all countries in gini coefficient and standard deviation to the question about whether incomes should be made more equal
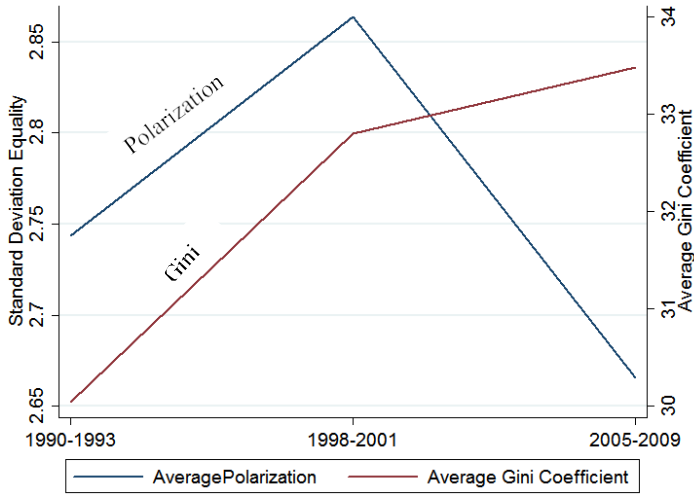
Fig. 8. Average changes for all countries in gini coefficient and standard deviation to the question about whether the government should make sure everyone is provided for
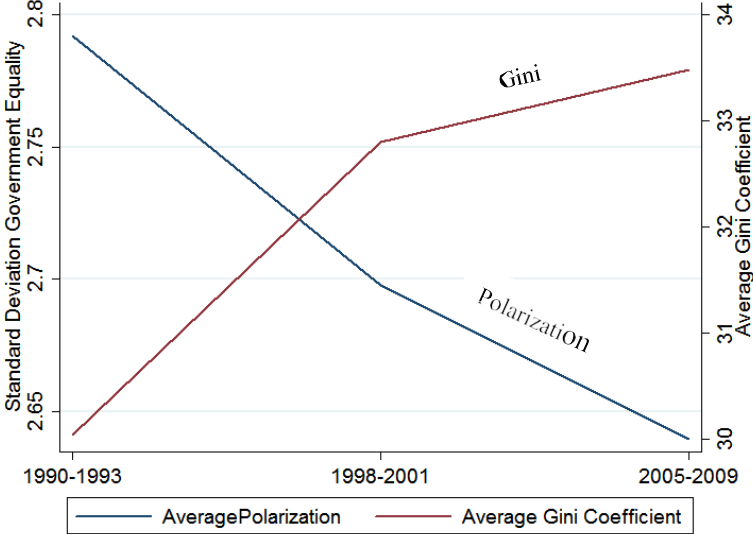
The graphs above depict the average change in gini coefficient and polarization for all of the countries that were included in the WVS or EVS in three different time periods: 1989-1994, 1999-2004 and 2005-2009. It is in other words the average polarization and income inequality for all countries during these three ways. Income inequality has increased steadily and significantly (the red lines) whereas polarization was lower in the last time period than the first one for both of the questions (blue lines). There is, in other words, no correlation between changes in income inequality and polarization for all of the countries taken together.

In conclusion, the results from the analysis over time provides rather compelling evidence that changes income inequality does not seem to have had an impact on polarization in attitudes about economic redistribution. Analysis with only the first and last year the countries responded to the survey, as well as with the more balanced dataset, was in the same direction, further strengthening the credibility of the results.

6. Discussion and concluding remarks

An important contribution with this study is that it provides convincing empirical evidence for a positive correlation between income inequality and polarization in attitudes to economic redistribution at the country level. This relationship stays significant, even with the inclusion of relevant control variables. Furthermore, the results indicate that the relationship holds for a large sample of countries (74) as well as for relevant subgroups within this sample: although it is less significant for some subgroups (for example, OECD-countries). This runs contrary to some of the previous research, which has argued that countries with lower income inequality tend to have population`s that are more ideologically polarized (Iversen & Soskice, 2015). It reaffirms the arguments made by Fiorina (2008) in relation to the American case: that a country's level of polarization depends on how one measures it.

The results go against the theorized explanations given by this study, as well as previous research (Meltzer & Richards, 1987; Pontusson & Rueda, 2010, Finseraas, Barth & Moene, 2015). These studies have focused on party system polarization, but an important part of their theoretical motivation for a positive relationship between inequality and polarization is greater differences in attitudes to redistribution between low and high income earners. The multilevel analysis performed in this study showed that this was in fact not the case: there were not greater differences between income groups in more unequal countries. Instead, the results indicate that attitudinal differences are greater within all income/education groups in more unequal countries. Future studies might therefore need to nuance their description of how different population groups react to increased income inequality.

An interesting task for future studies would be to try to find an explanation as to why attitudinal differences are greater within each income group and not between them. The political left culture explanation, given in the theory section, does seem to fit with this type of dispersion of views. Being accustomed to a more comprehensive welfare state could lead people throughout the income distribution to develop more of a common understanding of the appropriate level of distribution.

Countries with a "left culture" also tend to have stronger left (worker) and right (bourgeoisie) parties, which could contribute to more similar attitudes within the income groups. The reason for this is that the parties provide information ques to their supporters about how to think on issues like economic redistribution. Part of a future study could therefore be to test the "political left" culture theory in a more systematic way and with a better operationalization of the variables than public sectors expenditures as a share of GDP.

Finally, changes in income inequality do not seem to lead to changes in polarization in attitudes to economic redistribution. These results are in line with other studies on mass polarization (as measured by standard deviation) in attitudes to policy issues, which have shown a pattern of stability or depolarization over time (Adams, De Vries & Leither, 2012; Adams, Green & Milazzo, 2012; Bartels, 2013; Neusser, Johnston & Bodet, 2014). It is, however, important to caution against any strong conclusions on this point. To test whether changes in income inequality leads to changes in polarization is definitely a hard test. It is also problematic that the data set is unbalanced and, most of all, that it only covers a very limited number of time periods. Future studies could remedy many of these problems by using panel data that covers more time periods. One way of doing this may be to scale down on the number of countries in the sample, in order to get more time observations for each country.

Another interesting avenue for future research is to test the effect that income inequality has on other economic policy issues than economic redistribution. The results from a study by Grechina (2016), for example, indicate that inequality does correlate with other economic policy questions as well. The possible political implications could obviously be greater if the correlation stretched to a broader set of questions, and there might also be a stronger case for a causal relationship.

The results from this study point towards a number of possible political implications. The most obvious of these is that the relationship between income inequality and polarization could make it harder to push through effective redistributive policies. Previous research has shown that political polarization hinders forceful political initiatives since compromises become harder.

Having greater differences of opinion within the various income groups might therefore make it less likely that effective popular movements get created that otherwise could push for redistributive reforms. It will also be more difficult for popular opinion to affect decision makers if it is divided in various camps. Popular opinions tend to have a big effect on actual policies when there is broad understanding on an issue, thus facilitating compromise between political parties. Scholars have also argued that mass polarization can lead to increased polarization within the part system, as the parties adjust their policies to their core constituents. All of this, taken together, could help explain why some countries have been less effective in implementing reforms that reduces income inequality. On the other hand, it does not seem as though an increase in income inequality exacerbates this problem, since I find no effect of changes over time.

Besides this, it is important to reflect on how polarization in attitudes to redistribution is connected with other policy issues. Questions about redistribution and welfare is, as has been mentioned, an important question in politics. It lies at the heart of how a lot of parties and people characterize themselves politically: as "left" or "right". A connection between income inequality and polarization in attitudes to redistribution might therefore help explain differences in how polarized countries are in general. This could then be part of the explanation for greater tensions and conflicts in some countries. There are, in fact, numerous examples of countries that have broken down into heavy internal conflicts over questions about redistribution and the appropriate level of government involvement in the economy (Valenzuela, 1978; Dalton, 2008, p.900). It is important to point out that the result from this study does not provide any evidence of this relationship between inequality and polarization on the one hand, and polarization and internal conflict on the other hand. It is just worth reflecting over, since previous research has argued for this connection between polarization and conflict. There are also some uncertainties regarding just how substantial the results found in these studies are and especially how, and if, they impact other socio-political factors.

Future studies should be directed towards testing what the possible effects from a more polarized distribution of views on policy issues could be. Very few previous studies have done on this, which means that there is a big gap in the literature.[8]

Finally, this study provides methodological insights for studies about mass attitudinal polarization more broadly and not just in relation to income inequality. It has become increasingly common with statements about how the population in countries like Sweden is becoming more polarized. Annual surveys from countries like Sweden provide interesting data to study attitudinal polarization over time and the individual and contextual factors that are important in explaining differences between people.

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[8] An exception is Lindqvist & Östling (2010).

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Appendix 1

The table below presents the results from the strongly balanced time series analysis. That is, for 22 countries who answered the survey 1990/91, 1999/2000 and 2008/2009. These countries were: Austria, Belgium, Bulgaria, Belarus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden and Great Britain.

Table 8. OLS regression analysis with strongly balanced time series dataset. Dependent variable: average standard deviation (polarization)

Variables	Incomes more equal Δ t-1				Government make sure everyone is provided for Δ t-1			
	1	2	3	4	5	6	7	8
Gini Δ t-2	-.007 (0.01)		-.008 (0.02)		-.006 (0.01)		-.008 (0.01)	
Y Δ t-2		-.290* (0.14)	-.274 (0.15)			-.182 (0.13)	-186 (0.13)	
Gini Δ t-1				.026* (0.01)				-001 (0.01)
Intercept	-.064 (0.06)	-.059 (0.04)	-.054 (0.05)	-.068 (0.04)	-.039 (0.04)	-.063 (0.04)	-.042 (0.04)	-.073 (0.03)
Adjusted R^2	-.02	.08	.06	.06	-.02	.02	.01	-.01
N	38	37	37	75	40	39	39	79

Notes: significance values: * p < 0.05; ** P < 0.01. *** p ≤ 0.001; Standard errors in parenthesis: Sources: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

The next table presents the results from the standard time series analysis presented in the result section, but with all the control variables included. These were all discussed in the methods section and include changes between the two waves preceding the dependent variables in: log GDP, average years of schooling, party system ideology and party system polarization.

Table 9. Time series OLS regression analysis, with full set of control variables

Variables	Incomes more equal Δ t-1				Government make sure everyone is provided for Δ t-1			
	1	2	3	4	5	6	7	8
Gini Δ t-2	.002 (0.02)	-.005 (0.02)	.005 (0.02)	.004 (0.01)	-.018 (0.02)	-.018 (0.02)	-.008 (0.01)	-.005 (0.01)
Y Δ t-2	-.514** (0.18)	-.539** (0.17)	-.395** (0.14)	-.399** (0.14)	-.354 (0.17)	-.350 (0.18)	-.246 (0.13)	-.275* (0.13)
Party System Polarization Δ t-2	.033 (0.03)				-.010 (0.02)			
Ideology Δ t-2		-.044 (0.02)				-.017 (0.02)		
Log GDP Δ t-2			.249 (0.24)				.095 (0.20)	
Average Years of Schooling				.005 (0.07)				-.020 (0.05)
Intercept	.001 (0.06)	.005 (0.06)	(0.07)	-.045 (0.07)	-.030 (0.05)	-.018 (0.05)	-.087 (0.05)	-.046 (0.06)
Adjusted R^2	.16	.21	.10	.09	.05	.06	.02	.02
N	35	35	55	53	39	39	59	57

Notes: significance values: * $p < 0.05$; ** $P < 0.01$. *** $p \leq 0.001$; Standard errors in parenthesis: Sources: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014; Volkens, Andrea / Lehmann, Pola / Matthie, Theres / Merz, Nicolas / regeln, Sven med Werner, Annika (2016): Manifestet Datainsamling. Manifesto Project (MRG / CMP / MARPOR). Version2016a. Berlin: Berlin Science Centrum för socialvetenskaplig (WZB)

The table illustrates what was stated in the paper: including control variables did not change the effect that changes in income inequality had on changes in polarization. Income inequality remains highly insignificant when control variables that have been described as relevant in the theory section and previous research are included. The table shows the results when the variables are included separately together with the main dependent and independent variables. The same is true when multiple control variables are added together with the main variables, although this is not illustrated here.

Appendix 2

A separate multilevel OLS linear regression analysis was conducted, which included 4 control variables that have been described as important predictors for peoples` attitudes to economic redistribution. These were: social trust, age, gender and if the respondent was employed in the private or public sector. All of the variables were retrieved from the EVS and WVS. The question that measured social trust consisted of two answering options: if the respondent felt that people in general could be trusted, or that you can never be too careful. This was recoded into two dummy variables, where those with low trust were the reference category. Age was measured on an 8-point scale, which was kept in its original form. Gender was of course dummy coded into two dummy variables for male and female (male = reference category). Finally, the variable for employment status was dummy coded into two dummy variables for those employed in the private and public sector respectively (private sector = reference category). The table on the next page depicts the results from the analysis. The results reaffirm the ones from the multilevel analysis without controls: unequal countries do not have greater differences in attitudes amongst the income/education groups. If anything, the interaction effects between income and the gini coefficient in model 1 and 2 show the opposite effects: high income earners are more favorable towards redistribution when inequality is higher and the opposite for low income earners. The effect in this interaction term are slightly higher than without the controls, but overall they are very similar and definitely in the same direction, i.e., reaffirming each other.

Table 10. Multilevel OLS regression analysis with full set of controls and interactions. Dependent variable: attitudes to redistribution

Variables	Income more equal				Government make sure everyone is provided for			
	1	2	3	4	5	6	7	8
Gini	.023	.016	.021	.018	.044**	.045**	.044**	.042**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Middle income								
Low income	-.244***	-649***	-242***	-.241***	.351***	.644***	.351***	.351***
	(0.02)	(0.09)	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)	(0.02)
High income	.736***	.345***	.342***	.342***	-.208*	-.305***	-.302***	-.302***
	(0.09)	(0.02)	(0.02)	(0.02)	(0.09)	(0.02)	(0.02)	(0.02)
Age	-.009	-.009	-.010	-.010	-.014*	-.015**	-.015**	-.014*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Middle education								
Low education	-.195	-.195***	-.195***	-.350***	.198***	.199***	.309***	.199***
	(0.02)	(0.02)	(0.02)	(0.10)	(0.02)	(0.02)	(0.10)	(0.02)
High education	.197***	.199***	.445***	.199***	-.126***	-.124***	-.124***	-.252**
	(0.02)	(0.02)	(0.10)	(0.02)	(0.02)	(0.02)	(0.02)	(0.10)
High income*gini	-.011***				-.003			
	(0.00)				(0.00)			
Low income*gini		.012***				-.008***		
		(0.00)				(0.00)		
High education*gini			-.007*					.004
			(0.00)					(0.00)
Low education*gini				.004			-.003	
				(0.00)			(0.00)	
Female	-.099***	-.099***	.101***	-.100***	.161***	.160***	.161***	.161***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
High trust	-.060**	-.059**	-.060**	-.059**	-.103***	-.101***	-.102***	-.101***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Intercept	4.82***	5.05***	4.88***	4.98***	4.20***	4.15***	4.19***	4.25***
	(0.57)	(0.57)	(0.57)	(0.57)	(0.56)	(0.56)	(0.56)	(0.56)
Log Likelihood	-235714	-235718	-235720	-235722	-236687	-236682	-.236687	
Country Variance	1.02	1.02	1.02	1.02	1.01	1.01	1.01	
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	
Individual Variance	2.68	2.68	2.68	2.68	2.66	2.66	2.66	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Observations	97 988	97 988	97 988	97 988	98 713	98 713	98 713	
Countries	74	74	74	74	74	74	74	

Notes: significance values: * p < 0.05; ** P < 0.01. *** p ≤ 0.001; Standard errors in parenthesis: Sources: Sources; EVS Longitudinal Data File; WVS Longitudinal Data File; Solt Frederick, Standardized World Income Inequality Database, version 5.0, October 2014.

Appendix 3

The tables below lists the countries included in the three analyses: the macro level cross country analysis, multilevel analysis and time series analysis overtime.

Table 11. List of countries included in the OLS time series regression analysis presented in results section 5.3

Country	Year	Year	Year	Year		Country	Year	Year	Year	Year	Year
Argentina	1991	1999	2006	2013		Italy	1990	1999	2009		
Australia	1995	2005	2012			Japan	1990	1995	2000	2005	2010
Austria	1990	1999	2008			South Korea	1990	1996	2001	2010	
Belgium	1990	1999	2008			Latvia	1990	1996	2008		
Bulgaria	1991	1999	2008			Lithuania	1990	1999	2008		
Belarus	1990	2000	2008			Mexico	1990	1995	2000	2005	2012
Canada	1990	2000	2006			Moldova	1996	2002	2008		
Chile	1990	1996	2006	2011		Netherlands	1990	1999	2006	2012	
China	1990	1995	2001	2007	2012	New Zeeland	1998	2004	2011		
Colombia	1998	2005	2012			Nigeria	1990	1995	2000	2011	
Czech. Rep.	1991	1999	2008			Norway	1990	1996	2007		
Denmark	1990	1999	2008			Peru	1996	2001	2012		
Estonia	1990	1999	2008			Philippines	1996	2001	2012		
Finland	1990	2000	2009			Poland	1989	1997	2005	2012	
France	1990	1999	2008			Portugal	1990	1999	2008		
Germany	1990	1999	2008			Romania	1993	1999	2005	2012	
Hungary	1991	1999	2008			Slovakia	1990	1998	2008		
India	1990	1995	2001	2006		Slovenia	1992	1999	2005	2011	
Ireland	1990	1999	2008			South Africa	1990	1996	2006		
Spain	1990	1995	2000	2008		Turkey	1990	1996	2007		
Sweden	1990	1996	2006	2011		Great Britain	1990	1999	2009		
USA	1990	1999	2006								

Sources: World value Survey Longitudinal Data file; European Value Study Longitudinal Data File

Table 12. List of countries included in the macro level OLS regression analysis (section 5.1) and the multilevel analysis (section 5.2). Hong Kong was included in the multilevel analysis, but not in the macro regression analysis (5.1)

Country	Year	Country	Year	Country	Year	Country	Year
Albania	2008	Canada	2006	Estonia	2011	Indonesia	2006
Argentina	2013	Chile	2011	Finland	2009	Iran	2007
Australia	2012	China	2012	France	2008	Ireland	2008
Austria	2008	Colombia	2012	Georgia	2009	Italy	2009
Armenia	2011	Croatia	2008	Germany	2008	Japan	2010
Belgium	2009	Cyprus	2011	Greece	2008	Kazakhstan	2011
Brazil	2006	Czech Rep.	2008	Hungary	2009	Jordan	2007
Bulgaria	2008	Denmark	2008	Iceland	2009	South Korea	2010
Belarus	2011	Ethiopia	2007	India	2006	Kyrgyzstan	2011
Latvia	2008	Malaysia	2012	Mexico	2012	Morocco	2007
Lithuania	2008	Mali	2007	Moldova	2008	Netherlands	2012
Luxembourg	2008	Malta	2008	Montenegro	2008	New Zeeland	2011
Nigeria	2011	Philippines	2012	Romania	2012	Slovakia	2008
Norway	2008	Poland	2012	Rwanda	2007	Vietnam	2006
Peru	2012	Portugal	2008	Singapore	2012	Slovenia	2011
South Africa	2011	Thailand	2008	Egypt	2008	Uruguay	2011
Spain	2006	Turkey	2007	Great Britain	2009	Zambia	2007
Sweden	2011	Ukraine	2011	USA	2011		
Switzerland	2011	Macedonia	2006	Burkina Faso	2007		

Sources: World value Survey Longitudinal Data file; European value Study Longitudinal Data File