The Effect of Income Inequality on Political Polarization:

Evidence from European Regions, 2002–2014

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Abstract

This article investigates whether income inequality leads to political polarization and provides new evidence that an increase in the Gini coefficient at the local level increases the probability of supporting a political party at the extreme left or right of the ideological distribution. Using individual data for 25 European countries from 2002 to 2014, I find that increasing inequality leads on average to more support for left-wing parties. I also find that increasing inequality leads to more support for far-right parties among older individuals. Support for far-right parties seems to be driven by rising anti-European Union and anti-immigrant sentiments. These findings help to reconcile the predictions of two different branches of literature on the political-economy implications of rising inequality. The results are robust to a number of specifications, including an instrumental variable that addresses the endogeneity of income inequality.

Keywords: Income inequality, Political polarization, Europe

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1. Introduction

A large body of literature has examined the adverse consequences of rising political polarization. Political polarization could result in the implementation of short-sighted policies and make economies more inefficient. It could also make business cycles more volatile and contribute to economic stagnation.[2] At the same time, political polarization may help explain the slow process of recovery in the aftermath of financial crises, because it decreases the chances that governments will adopt economic reforms (Funke et al., 2016).

While the trend of rising political polarization in the United States and Europe have been substantially documented (see, for instance, McCarty et al., 2006; Wagner and Meyer, 2017), little is known about its causes. Recent empirical evidence has shown that trade shocks, which have reduced demand for local manufacturing (and have therefore led to job losses) have contributed to the increasing polarization observed in the United States (Autor et al., 2016). France's and Germany's greater exposure to trade with low-income countries has similarly been used to explain the rise of extreme-right political parties in France and Germany (Malgouyres, 2014; Dippel et al., 2015). Immigration has also been associated with polarization in Austria, where higher immigrant inflows have increased the share of the vote received by the far right-wing political party, because residents are concerned about the effects of immigrants on the labor market along with "compositional amenities" (Halla et al., 2012).

In this article, I examine the role of income inequality as a driver of political polarization. Political scientists have claimed that increasing inequality can have sizeable effects on the polarization of the political process. If personal income is an important determinant of policy preferences, it can be expected that changes in the distribution of income will affect voters'

[2] See, e.g., Azzimonti, 2011; Azzimonti and Talbert, 2014; Binswanger and Oechslin, 2015.

choices. For instance, if voters at the lower end of the income distribution spectrum are more likely to support redistribution policies, while richer voters are more likely to oppose them, an increasing income gap between these two groups may increase their disagreements regarding policy. Moreover, if income inequality increases and voters do, in fact, become more polarized, political parties need to compete for voters moving further away from the position of the median voter (Garand, 2010). Dixit and Weibull (2007) provide a theoretical model to explain how economic shocks may induce divergences of beliefs across groups, because individuals can become more ideologically extreme when new information reinforces their beliefs.

The relationship between inequality and polarization can also be analyzed in terms of the median voter and the demand for income redistribution. If inequality increases, the median voter model predicts a greater demand for redistribution (Meltzer and Richard, 1981), which would translate into more support for parties at the extreme left of the ideological scale. However, this period was also characterized by the rise of political parties considered to be on the far right on many key issues (i.e., expressing anti-Semitism, opposing same-sex marriage, etc.), but which at the same time support anti-globalization policies traditionally associated with the left. Higher levels of inequality could thus result in increasing support for far-right parties if individuals at the bottom of the income distribution believe that restricting trade or immigration would benefit them.

There is circumstantial evidence supporting a positive relationship between inequality and polarization. Garand (2010) finds that US senators from states with high levels of income inequality are more polarized than other senators. McCarty et al. (2003, 2006) have explored the long-term correlation between political polarization and income inequality in the United States. Duca and Saving (2017) use a time-series analysis to explore the long-term association between

these two variables, also in the United States. Finally, to our knowledge, there is only one study that attempts to identify the causal effect of income inequality on polarization (Voorheis et al., 2015). The authors use state-level data on polarization in state legislature and state-level income inequality for the United States and an instrumental variable approach to identify the main effect. They find that inequality has a positive and large effect on polarization.

This article focuses on the role of local income inequality on political polarization among European countries. In Europe, as in the United States, inequality and political polarization have increased since 1980.[3] This is the first study to try to establish a relationship between these two developments. Using household surveys covering 25 countries from 2002 to 2014, I exploit variations in income inequality and political polarization across 251 regions. This article has several advantages over the existing empirical work. First, the large number of observations allows me to control for unobserved heterogeneity at the local level as well as for country-year fixed effects that would absorb any economy-wide changes over time. Second, I use the European Social Survey (ESS), a rich dataset that allows the linking of information on individuals' self-reported voting choices with their socio-demographic characteristics, thereby enabling the researcher to control for a number of other of factors that can be correlated with both inequality and political views, such as individual income and age. At the same time, these data permit the researcher to investigate which individual socio-economic characteristics better predict polarization when inequality increases by allowing for the exploration of interaction effects between increasing inequality and individual-level variables. Moreover, the ESS also contains a host of variables regarding attitudes toward different policies which allows me to further investigate the mechanisms behind the link between inequality and political polarization,

[3] See, e.g., Wagner and Meyer (2017) for a description of the emergence of right-wing parties across Europe since 1980. See Piketty and Saez (2014) for inequality trends in Europe.

such as fear of the labor market effects of immigration, further European unification, and so on. Third, in order to uncover the causal effect of inequality, I use an instrumental variable for the Gini coefficient to address issues of endogeneity and reverse causality, as in Boustan et al. (2013). This instrument captures changes in the local income distribution that are only driven by aggregate changes at the European-wide level.

I find that increasing income inequality leads to an increase in the probability of an individual supporting a political party at the extremes of the political spectrum. My results show, in particular, that a five-point rise in the Gini coefficient increases the likelihood that an individual will support a far-right or far-left political party by about 4 percentage points. When analyzing support for far-right and far-left parties separately, I find that even though inequality is positively associated with increasing support for both groups, the results are statistically significant only for the latter. These results are robust to a number of different robustness checks.

Given that this period was characterized by the rise of far-right political parties across Europe, I estimate additional specifications to investigate whether inequality may have contributed to this change. In particular, I estimate interaction effects and find that inequality increases polarization towards the right only among older individuals. Using a different set of dependent variables, I find that inequality decreases support for further European unification, especially among college graduates. At the same time, inequality also leads to stronger anti-immigrant sentiment among older people. These results provide some support for the hypothesis that increasing inequality in certain regions contributed to the rise of the far right in Europe, as older people are at the same time more likely to participate in the electoral process than their younger peers (De Mello et al., 2016).

This article contributes to the growing body of literature on the rise of political polarization across the world. While most papers have argued that globalization may have contributed to this change through the potential—or *perceived*—negative effects of increasing trade and migration flows on natives' labor market outcomes, my findings show that inequality increases political polarization even after controlling for migration patterns and manufacturing jobs' destruction. This finding points out the importance of other changes associated with inequality such as, for instance, financial liberalization, the rise of information technologies and institutional changes in the labor market (Jaumotte et al., 2013; Acemoglu, 2002; Autor et al., 2016) to explain the positive effect of the former on political polarization. At the same time, the results of this article highlight the importance of non-economic factors at driving political polarization, showing that individuals who have been less exposed to the negative effects of globalization—such as older individuals and females (who have experienced an increased in labor force participation during this period)—have revealed more polarized political preferences as inequality has risen.

The results of this article also contribute to the literature on the effects of inequality on the economy. Income inequality has been associated with a number of adverse outcomes.[4] Rising income inequality could result in higher crime rates (Enamorado et al., 2016; Fajnzylber et al., 2002), poor health outcomes (Wilkinson and Pickett, 2006), and lower human capital accumulation (Chiu, 1998; Galor et al., 2009). Rising political polarization as a result of increasing inequality may help to explain some of the negative outcomes associated with inequality, as political polarization may increase the difficulty of agreeing on pro-growth structural reforms and redistribution policies. In fact, the findings of this article support models based on the median voter theorem as I find that more inequality leads to more support for left-

[4] See, for instance, Persson and Tabellini (1994); Banerjee and Duflo (2003); Barro (2000). See Benabou (1996) for a comprehensive review.

wing parties, but are also consistent with models of political economy where heterogeneous voters cannot agree on public policies (Benabou, 1996), as I find that increasing inequality leads at the same time to increasing support for far-right parties among certain socio-demographic groups.

The remainder of this article is organized as follows. Section 2 describes the data and provides some summary statistics. Section 3 outlines the identification strategy, including the construction of the instrumental variable for inequality. Section 4 describes the results and section 5 concludes.

2. Data on political polarization and income distribution

The European Social Survey (ESS) is a rich dataset aimed at collecting comparable information on the attitudes, beliefs and behavior patterns of the populations in more than thirty nations. In addition, the survey also collects information on individual socio-economic characteristics such as income, labor market status, region of residence, and so on. This survey has been extensively used by academics from different fields such as economics, sociology and political science.[5] I use seven bi-annual waves of the survey between 2002 and 2014. I restrict the sample to European countries as the data needed to measure political polarization and construct the instrumental variable are only available for this group of countries. Table 1 shows the number of countries and years covered.

To estimate the political stance of each individual I use the question "Which party did you vote for in that election"? I also use the question, "Is there a particular political party you feel closer to than all the other parties?" Following Ares et al. (2016), if individuals did not vote in the last

[5] See, for example, Card et al. (2012), Luttmer and Singhal (2011), Ares et al. (2016), Hainmueller and Hiscox (2007).

election, they are assigned the political party they feel closest to. Following the same paper, I merge the dataset with the Chapel Hill Expert Survey (CHES), which contains information on the ideological content of each party for every four years from 1999 to 2014. The CHES asks experts to place multiple political parties on an ideological scale from extreme left (0) to extreme right (10). This question is asked in every wave of the survey, so political parties are allowed to shift their ideological position over time. Hooghe et al. (2010) and Bakker et al. (2015) provide a detailed description of the CHES and show that its assessments are consistent with those of alternative datasets (such as the Manifesto Project).

I define political polarization as the percentage of individuals associated with parties at the extremes of the ideological scale. Using the pooled sample for all countries and years, I first calculate the cut-off scores that define the extremes (both left and right) of the distribution. Then, I create a dummy variable equal to one if the respondent is associated with a political party at the extremes of the distribution. Given that there is no particular reason to choose a specific cut-off value, I use three alternatives. More specifically, I use either the extreme 10, 20 or 50 percent (i.e., 5, 10 or 25 percent of each the extreme left and right) of the distribution.

I estimate the Gini coefficient at the regional level using the total household income reported in the survey. To collect this information, individuals are asked to report the income bracket the household belongs to. The number of income brackets is twelve from 2002 to 2006, and ten from 2008 to 2014. I assign the mid-point of the interval of each bracket to each household and, following Boustan et al. (2013), I use this income measure to estimate the Gini coefficient. Given that this variable may be affected by measurement error, as a robustness check I also re-estimate the main results using the Gini coefficients computed with the main household survey to collect income information in Europe, i.e., the European Survey of Income and Living Conditions

(EUSILC). While the Gini coefficients estimated using the EUSILC are more reliable, unfortunately many countries are not covered before 2007, and the regional variable is not as disaggregated as that of the ESS.

The level of regional aggregation to compute the Gini coefficient is defined using the NUTS (Nomenclature of Territorial Units for Statistics) classification. Eurostat divides each country into NUTS regions, going from the least (level 1) to the most (level 3) disaggregated level. The level of disaggregation used by country varies according to how the data is reported in the ESS (see Table 1 of a list of the number of regions per country). Data on inequality at the municipality or local labor market level would be ideal, but using the NUTS disaggregation still allows for significant cross-regional variation.

Table 2 shows some descriptive statistics for the variables under analysis, for the initial and latest survey year and for individuals older than 18 years. The first nine rows show the percentage of people who voted or feel closest to parties at the extremes of the ideological scale, using three different cut-offs. All six measures show an increase in political polarization during this period. The first row, for example, indicates that parties at the extreme quartiles of the distribution increased their share of voters by about 10 percent. At the same time, while both far-left and far-right parties experienced an increase in their share of supporters, the latter experienced larger gains. Regarding inequality, the subnational average Gini coefficient estimated using the ESS sample shows a decline of about 2 points during this period, but, as explained above, this variable might be affected by measurement error. In contrast, the average subnational Gini coefficient estimated using the EUSILC has been remarkably stable during this period. This average performance, however, hides substantial heterogeneity across regions, as 36 percent of the regions experienced an increase in inequality during this period, according to the Gini

coefficient estimated using the ESS. When using the EUSILC, about 55 percent of regions experienced an inequality increase. This article exploits this heterogeneity in the evolution of the Gini coefficient at the subnational level to investigate the impact of inequality on political polarization during this period.

The rest of the table reports the average values for the control variables. The ESS captures some important changes during this period, such as population aging: the share of people aged 55 or more increased by almost 6 percentage points during this period. Moreover, the data show an increase in the share of adults with tertiary education and of individuals who are retired and receiving social assistance.

3. Identification Strategy

I estimate the effect of inequality on political polarization using the following specification:

$$polarization_{i,r,c,t} = \alpha + \beta Gini_{r,c,t} + \Gamma X_{i,r,c,t} + \mu_r + \mu_{c,t} + \varepsilon_{i,r,c,t} \qquad (1)$$

where i indexes an individual, in region r, of country c in year t. $Gini$ is the Gini coefficient at the regional level, my measure of income inequality. The region-level fixed effects μ_r control for time-invariant regional characteristics that may affect the relationship between inequality and political polarization. The country-year pair fixed effects $\mu_{c,t}$ would absorb any economy-wide changes that may affect both inequality and political polarization. $X_{i,r,c,t}$ is a set of individual characteristics that may affect both income inequality and political views, including the logarithm of household income, age dummy variables, gender, employment status, education, a dummy variable for being retired, and a dummy variable for individuals receiving social assistance.

There are reasons to believe that reverse causality and omitted variables could bias the OLS estimate of β. If regions that become more politically polarized are less likely to implement redistributive policies, for example, this may lead to an increase in inequality, introducing an upward bias to the OLS estimation of β. Accordingly, if richer individuals are more likely to migrate to regions where redistribution policies are less prevalent, these regions would likely experience an increase in inequality, again introducing an upward bias to β. On the other hand, the estimation could also be affected by measurement error, as the number of observations to calculate the Gini coefficient for some regions is relatively low. This would tend to introduce a downward bias to the OLS estimate of β.

To mitigate the above concerns, I use an instrumental variable for $Gini$. The instrument is based on Boustan et al. (2013) and combines the initial income distribution at the regional level with more aggregate trends in the distribution of income. More specifically, I first estimate the percentile of the European level income distribution each household belongs to in the initial survey year. Then, I assign to each household the income growth of such percentile at the European level for the rest of the period. This allows me to construct a "predicted" income distribution, which I use to calculate a predicted Gini. Changes in this predicted Gini over time are then only driven by aggregate patterns and not affected by any changes at the region level. More specifically, I estimate the following equations:

$$polarization_{i,r,c,t} = \alpha + \beta \widehat{Gini_{r,c,t}} + \Gamma X_{i,r,c,t} + \mu_r + \mu_{c,t} + \varepsilon_{i,r,c,t} \qquad (2)$$

$$Gini_{r,c,t} = \gamma + \delta Predicted\ Gini_{r,c,t} + \Omega X_{i,r,c,t} + \rho_r + \rho_{c,t} + \xi_{i,r,c,t} \qquad (3)$$

The $Predicted\ Gini$ variable is constructed using the percentiles of the joint income distribution of 15 European countries covered continuously in the EUSILC from 2004 to 2014 (income

reference years 2003 to 2013).[6] Since the EUSILC income reference years do not match those of the ESS for 2002 and 2014, I pair the EUSILC income reference year of 2003 with that of the ESS 2002, as well as, accordingly, the EUSILC income reference year of 2013 with the ESS 2014.

I further address concerns about measurement error bias by carrying out two robustness checks. First, instead of using the Gini coefficients estimated using the ESS, I merge the ESS data with the region-level Gini coefficients estimated using the EUSILC, the main survey to measure income statistics in Europe. Second, I estimate equations (2) and (3) using a restricted sample, i.e., dropping regions with a number of observations low enough that may lead to imprecise estimates of the Gini coefficient. More specifically, I drop regions with less than 100 observations.

4. Results

4.1 Main results

Table 3 shows the OLS estimates equation (1), where the dependent variable is a dummy variable equal to one if the individual voted or feels closest to a political party at the extreme left or right, using three alternative cut-offs. Standard errors are clustered at the regional level. Column (1) shows no significant association between the Gini coefficient and the probability of voting or feeling closest to a political party at the extreme 5 percent, right or left. On the other hand, columns (2) and (3) show a positive and statistically significant association between the Gini coefficient and support for political parties at the extreme 10 or 25 percentages of the

[6] The countries used to calculate the percentiles of the income distribution at the European level are: Austria, Belgium, Denmark, Spain, Estonia, Finland, France, Greece, Ireland, Iceland, Italy, Luxembourg, Norway, Portugal, and Sweden.

ideological distribution. The coefficients are not very large in magnitude. For instance, according to column (2), a five-point increase in the Gini coefficient in the region is associated with an increase of almost one percent in the probability of supporting an extreme party. The coefficients associated with the control variables show some interesting patterns. Older people, women, college graduates and employed individuals are less likely to support extreme parties.

OLS estimates of β, however, might be biased because of omitted variables and measurement error issues. Table 4 shows the IV estimates of equation (2). Column (10) displays the first stage regression, which shows a high and positive correlation between the estimated regional Gini coefficient using the ESS and the predicted Gini. The table also shows that the Kleibergen-Paap F-statistic is higher than 10, alleviating concerns of weak instruments. Columns (1), (4) and (7) show that the coefficients for overall left and right polarization are positive and statistically significant. According to column (4), a 5-point increase in the Gini coefficient leads to an increase of almost 4 percentage points in the probability of supporting an extreme party. When comparing the IV and OLS results, the IV estimates tend to be larger in magnitude. This suggests that the IV procedure is correcting for measurement error, which would bias the OLS estimate of β toward zero. When disaggregating by left or right polarization, all the coefficients are positive, although only the ones for polarization to the left are statistically significant. This is somewhat surprising as the period under analysis was characterized by a much higher level of polarization toward the right. Section 4.4 further analyzes this point.

Table 5 shows the estimates of β using two alternative measures of political polarization. Columns (1) through (3) uses the economic ideology scale of the political party from the Chapel Hill Expert Survey, where experts are asked to rank each party in terms of their proposed degree of involvement of the government in the economy. Column (1) shows that increasing inequality

leads to increasing support for parties at the extremes of the spectrum on economic issues, with a 5-point increase in the Gini coefficient leading to an increase of 1.4 percentage points in the probability of supporting a political party at the extremes. Columns (4) to (5) show estimates of β using a question in the ESS in which individuals are asked to report their own position in the ideological scale from 0 (extreme left) to 10 (extreme right). The coefficients are positive, but only statistically significant for the top and bottom 25th quartile cut-off, indicating that increasing regional inequality leads to an increase in the probability of an individual being registered at the extremes left or right quartiles of the ideological scale.

4.2 Robustness Checks

I estimate three additional specifications to check the robustness of the results. The first two robustness checks are aimed at further addressing the concern that the Gini coefficient estimated using the ESS might not be measured accurately. Table 6 shows the estimates restricting the sample to regions with more than 100 observations used to estimate the Gini coefficient. The coefficients are basically similar to the baseline results in Table 4, suggesting that the small number of observations in some regions is not affecting the main findings.

Panel B of Table 6 shows the results using the regional Gini coefficients based on the EUSILC. Since this household survey starts in 2003, I assigned the Gini coefficients for that year to the 2002 ESS sample. The number of observations in the regression is substantially lower, as the EUSILC did not cover many countries in the sample before 2007. Also, the cross-regional variation is also lower, as the regional identifier is more aggregated in the EUSILC than in the ESS. This may explain why the coefficient in the first-stage regression is less precisely estimated, not passing the Kleibergen-Paap test for weak instruments. However, columns (1) to (3) do show that the association between inequality and polarization remains positive.

Panel C of Table 6 shows the estimates of equation (2) adding regional variables as controls. Since they are not available for all regions and years, the number of observations declines. The regional control variables include factors that may affect both political attitudes and the income distribution, such as migration, economic growth and the level and growth of manufacturing jobs. I control for manufacturing jobs as there is empirical evidence that increasing regional exposure to trade with lower income countries during this period led to the destruction of manufacturing jobs and stronger support for extreme political parties (see Malgouyres, 2014; Dippel et al., 2015). The estimates of β are positive and very similar to the baseline results in Table 4, implying that inequality had an impact on political polarization beyond any contemporaneous changes on immigration flows, economic growth and manufacturing jobs. The coefficient in column (3) for the polarization at the top and bottom 25^{th} percent of the ideological scale is no longer statistically significant, however.

4.3 Attitudes toward immigration and the European Union

This section explores the policy issues that could be driving the relationship between inequality and polarization. The ESS contains a host of questions regarding attitudes towards various policies. I examine two that are related to important changes experienced during the period under analysis: attitudes toward immigration and the European Union. I measure attitudes toward immigration using two questions. One of them asks individuals whether the government should allow more people to immigrate into the country who are from the same race or ethnic group as the majority of people already in the country. The second question is similar, but asks about allowing people from a different race or ethnic group to immigrate. Table 7 shows that increasing inequality does not lead to more or less anti-immigrant sentiment, regardless of which variable is used.

The ESS also contains a question about attitudes towards the European Union. In particular, it asks individuals whether European unification has gone too far or whether it should go further, on a scale from 0 to 10. Table 7 shows that increasing inequality at the regional level led to more anti-European Union sentiment. In particular, row (5) shows that an increase of 5 points in the Gini coefficient led to a reduction of 3.5 percent in the likelihood of responding that the EU should go further. Given that anti-EU sentiment has been a common thread across far-right parties in Europe, this provides some support for the hypothesis that increasing inequality has, in fact, led to more polarization toward the right. The next section attempts to shed more light on this issue.

4.4 Inequality and the rise of the far right in Europe

The baseline results of this article are in line with the predictions of the median voter theorem, in which more inequality leads to more demand for redistribution and therefore more support for parties away from the center and toward the left. This may suggest that increasing inequality in certain districts did not contribute to the rise of support for far-right parties observed during the period under analysis. However, the data allows me to analyze how different individuals' characteristics could explain different responses to the increase in inequality.

Table 8 shows the estimates of the main equation, which interacts the Gini coefficient with individuals' arguably exogenous characteristics. Column (1) shows that the positive effect of increasing inequality on polarization toward the left is driven by the average individual, with women actually becoming less pro-left as inequality increases. Column (2), in contrast, shows that even though the main effect of inequality on polarization toward the right is not statistically significant, older individuals and women become more supportive of far-right parties as inequality increases. Given that older individuals in Europe are significantly more likely to vote

than younger people (De Mello et al., 2016), these results suggest that increasing inequality may have been a driver of polarization toward the right in regions with a larger share of older people.

Table 9 shows interaction effects using attitudes toward immigrants and the European Union as dependent variables. It shows that increasing inequality led to more anti-immigrant sentiment among older individuals in Europe. In contrast, skilled individuals were more likely to be pro-immigration as inequality increased in the region. Column (4) shows that, surprisingly, increasing inequality led to more anti-EU sentiment for the average individual and even to a larger extent among college graduates. These results are consistent with the hypothesis that increasing income inequality played an important role in driving support for far-right political parties in districts with older populations (by increasing anti-immigrant sentiment) or with more skilled people (by raising anti-EU sentiment).

5. Conclusion

Using individual and regional variation on political attitudes and income inequality, respectively, this article finds that increasing inequality in certain European regions has led to increasing political polarization. More specifically, I find that increasing inequality has led to increasing support for far-left parties, with more inequality increasing the demand for redistribution. I also find, however, that increasing inequality leads to more support for far-right political parties among older voters, who are at the same time more likely to vote than their younger counterparts. Inequality seems to increase support for the far right through increased anti-immigrant and anti-European Union sentiment.

The results of this article contribute to the reconciliation of two sets of political economy models that attempt to link inequality with policy attitudes. On the one hand, the finding that increasing

inequality leads to increasing support for far-left political parties is consistent with the median voter model, whereby increasing inequality leads to more demand for redistribution, a platform typically associated with the left. On the other hand, the fact that increasing inequality simultaneously increases support for *far-right* political parties among certain demographic groups (such as women and old people) is consistent with political economy models predicting that inequality may increase disagreements about policies between individuals at different points of the income distribution.

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Table 1. European Social Survey Sample

Country	First sample year	Latest sample year	Number of regions
Austria	2002	2014	9
Belgium	2002	2014	3
Bulgaria	2006	2012	28
Cyprus	2006	2012	1
Czech Republic	2002	2014	9
Denmark	2002	2014	5
Estonia	2008	2012	5
Finland	2002	2014	5
France	2004	2014	8
Germany	2002	2014	16
Greece	2002	2010	13
Hungary	2004	2014	7
Ireland	2002	2014	3
Italy	2010	2012	20
Lithuania	2002	2014	10
Netherlands	2002	2014	12
Norway	2002	2014	7
Poland	2002	2014	16
Portugal	2002	2014	5
Slovakia	2001	2012	9
Slovenia	2002	2014	12
Spain	2002	2014	20
Sweden	2002	2014	8
Switzerland	2002	2014	7
United Kingdom	2002	2014	13

Note: Table shows the initial and latest survey year per country in the ESS. The last column shows the number of regions within each country.

Table 2. Summary statistics: Political polarization and inequality, 2002–2014

	Initial Year	Final year	Change
	Mean	Mean	
Individual Variables			
Extreme 50	39.5%	49.7%	10.2%
Extreme Right 25	21.1%	28.1%	7.0%
Extreme Left 25	18.4%	21.5%	3.2%
Extreme 20	15.9%	21.2%	5.3%
Extreme Right 10	7.2%	12.1%	5.0%
Extreme Left 10	8.8%	9.1%	0.3%
Extreme 10	8.0%	14.2%	6.2%
Extreme Right 5	3.7%	7.5%	3.8%
Extreme Left 5	4.3%	6.7%	2.4%
Log(household income)	9.748	9.976	0.228
Age 18-24	11.4%	9.7%	-1.7%
Age 25-34	15.9%	14.6%	-1.4%
Age 35-44	19.8%	17.5%	-2.3%
Age 45-54	19.1%	18.9%	-0.2%
Age 55-64	15.8%	17.3%	1.5%
Age 65+	18.0%	22.0%	4.0%
Female	53.3%	53.5%	0.2%
Secondary	15.9%	17.3%	1.4%
Tertiary	40.4%	49.7%	9.3%
Employed	52.0%	51.6%	-0.4%
Retired	20.7%	24.1%	3.4%
Married	55.1%	54.8%	-0.3%
Social Assistant Recipient	10.1%	27.9%	17.8%
Regional Variables			
Gini (ESS)	0.339	0.316	-0.023
Gini (EUSILC)	0.314	0.318	0.004
Predicted Gini	0.339	0.341	0.002

Note: Estimated using the ESS. The initial and final sample year for each country can be found in Table 1. Sample includes individuals aged 18 years or more and has 44,683 and 45,040 individual observations in the initial and final year, respectively. Extreme 50, 20 and 10 are the percentages of supporters of political parties at the extreme 25^{th}, 10^{th} and 5^{th} percentiles left and right of the ideological spectrum. The Gini coefficients vary at the regional level only. The number of regions used to calculate the Gini (ESS) is 251. The number of regions to calculate the Gini (EUSILC) is 83.

Table 3. OLS estimates, income inequality and political polarization, 2002–2014

	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)
	(1)	(2)	(3)
Gini	-0.0213	0.156***	0.146**
	(0.0505)	(0.0576)	(0.0601)
ln(household Income)	-0.0160***	-0.0147***	0.0113***
	(0.00210)	(0.00269)	(0.00423)
age 25-34	-0.0167***	-0.0203***	-0.0175***
	(0.00500)	(0.00562)	(0.00599)
age 35-44	-0.0160***	-0.0193***	-0.0103
	(0.00515)	(0.00553)	(0.00670)
age 45-54	-0.0178***	-0.0167***	-0.00292
	(0.00532)	(0.00640)	(0.00679)
age 54-64	-0.0329***	-0.0421***	-0.0168*
	(0.00649)	(0.00762)	(0.00866)
age 65+	-0.0565***	-0.0730***	-0.0258*
	(0.00873)	(0.0107)	(0.0132)
Female	-0.0146***	-0.0129***	-0.0151***
	(0.00221)	(0.00220)	(0.00305)
High School Graduate	-0.00565	-0.00444	0.00627*
	(0.00426)	(0.00469)	(0.00362)
College Graduate	-0.0207***	-0.00716*	0.00682
	(0.00437)	(0.00429)	(0.00464)
Employed	-0.0119***	-0.0161***	-0.00589
	(0.00323)	(0.00413)	(0.00448)
Retired	-0.00278	-0.00785	0.00128
	(0.00357)	(0.00476)	(0.00521)
Married	-0.0132***	-0.0226***	-0.0171***
	(0.00233)	(0.00320)	(0.00298)
Social Assistance Receipient	0.000546	-0.000108	0.00372
	(0.00324)	(0.00389)	(0.00454)
Region Fixed Effects	YES	YES	YES
Country x Year Fixed Effects	YES	YES	YES
Observations	129,327	129,327	129,327
R-squared	0.181	0.224	0.348

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable is a dummy variable equal to 1 if the individual voted or feels closest to a political party at either extreme of the ideological scale. Each column shows different cut-offs at the highest/lowest 25th, 10th and 5th percentiles of the distribution. The ideological score of each party comes from the Chapel Hill Expert Survey. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 4. IV estimates, income inequality and political polarization, 2002–2014

	Pr(Extreme 10)	Pr(Extreme Left 5)	Pr(Extreme Right 5)	Pr(Extreme 20)	Pr(Extreme Left 10)	Pr(Extreme Right 10)	Pr(Extreme 50)	Pr(Extreme Left 25)	Pr(Extreme Right 25)	Gini (First-stage regression)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Gini	0.354**	0.126	0.229	0.764***	0.398***	0.366	0.682**	0.503**	0.179	
	(0.177)	(0.114)	(0.153)	(0.292)	(0.145)	(0.239)	(0.314)	(0.239)	(0.255)	
Predicted Gini										0.573***
										(0.0987)
Region Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country x Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Kleibergen-Paap rk Wald F statistic										40.1
Cragg-Donald Wald F statistic										8680.9
Observations	129,327	129,327	129,327	129,327	129,327	129,327	129,327	129,327	129,327	129,327
R-squared	0.180	0.092	0.272	0.223	0.153	0.237	0.347	0.209	0.181	0.794

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable is a dummy variable equal to 1 if the individual voted or feels closest to a political party at either extreme of the ideological scale and zero otherwise. Each column shows different cut-offs at the highest/lowest 25th, 10th and 5th percentiles of the distribution. The ideological score of each party comes from the Chapel Hill Expert Survey. Column (10) reports the first-stage coefficient and tests for weak instrumental variables. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 5. IV estimates, income inequality, economic and individual ideology

	Economic Ideology of Political Party			Own Individual Ideological Position		
	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	0.293*	0.640	-0.0721	-0.0377	0.206	0.562**
	(0.159)	(0.410)	(0.242)	(0.261)	(0.259)	(0.245)
Region Fixed Effects	YES	YES	YES	YES	YES	YES
Country x Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	129,327	129,327	129,327	188,482	188,482	188,482
R-squared	0.231	0.245	0.288	0.037	0.032	0.038

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable in columns (1) through (3) is a dummy variable equal to 1 if the individual voted or feels closest to a political party at either extreme of the economic ideological scale. The dependent variable in columns (4) through (6) is a dummy variable equal to one if the individual reports to be at the extremes of the ideological distribution, where the ideological scale goes from 0 (extreme left) to 10 (extreme right). Each column shows different cut-offs at the highest/lowest 25^{th}, 10^{th} and 5^{th} percentiles of the distribution. The ideological score of each party comes from the Chapel Hill Expert Survey. Column (10) reports the first-stage coefficient and tests for weak instrumental variables. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 6. IV estimates, robustness checks

(A) Excluding regions with less than 100 observations

	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)	Gini (First-stage regression)
	(1)	(2)	(3)	(4)
Gini	0.386**	0.698***	0.535*	
	(0.153)	(0.269)	(0.282)	
Predicted Gini				0.634***
				(0.109)
Observations	112,472	112,472	112,472	112,472
R-squared	0.179	0.225	0.334	0.869

(B) Using Gini coefficient from EUSILC

	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)	Gini (First-stage regression)
	(1)	(2)	(3)	(4)
Gini	6.989*	6.378*	2.291	
	(3.764)	(3.714)	(1.592)	
Predicted Gini				0.733**
				(0.309)
Kleibergen-Paap rk Wald F statistic				5.618
Cragg-Donald Wald F statistic				1277.672
Observations	85,661	85,661	85,661	85,661
R-squared	0.177	0.210	0.339	0.952

(B) Controlling for immigration, manufacturing jobs, economic growth and population

	Pr(Extreme 10)	Pr(Extreme 20)	Pr(Extreme 50)	Gini (First-stage regression)
	(1)	(2)	(3)	(4)
Gini	0.431**	0.691**	0.451	
	(0.214)	(0.307)	(0.313)	
Predicted Gini				0.534***
				(0.113)
Region Fixed Effects	YES	YES	YES	YES
Country x Year Fixed Effects	YES	YES	YES	YES
Observations	117,389	117,389	117,389	117,389
R-squared	0.186	0.215	0.354	0.778

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable is a dummy variable equal to 1 if the individual voted or feels closest to a political party at either extreme of the ideological scale. Each column shows different cut-offs at the highest/lowest 25th, 10th and 5th percentiles of the distribution. The ideological score of each party comes from the Chapel Hill Expert Survey. Column (3) reports the first-stage coefficient and tests for weak instrumental variables. Panel (A) excludes regions with less than 100 observations in the ESS. Panel (B) uses the Gini coefficient estimated using the EUSILC instead of the ESS. Panel (C) controls for region-level variables, including log(GDP per capita), log(population), crude migration rate flows, level and growth of manufacturing jobs. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 7. Inequality and attitudes toward immigration and the European Union

	Should the country allow people of the same race or ethnic group to come an live here?	
	Agree-Strongly Agree	Disagree-Strongly Disagree
(1)	-0.205	-0.191
	(0.169)	(0.196)
	Strongly Agree	Strongly Disagree
(2)	0.145	-0.145
	(0.230)	(0.230)
	Should the country allow people of a different race or ethnic group to come an live here?	
	Agree-Strongly Agree	Disagree-Strongly Disagree
(3)	-0.242	-0.233
	(0.201)	(0.155)
	Strongly Agree	Strongly Disagree
(4)	-0.0493	0.0493
	(0.226)	(0.226)
	Has European Unification gone too far (0) or should it go further (10)? (0-10 scale)	
	Has gone too far (0-2)	Should go further (8-10)
(5)	-0.291	-0.708***
	(0.315)	(0.239)
	Has gone too far (0-1)	Should go further (9-10)
(6)	-0.556	-0.542***
	(0.352)	(0.208)

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable in rows (1) through (4) is a dummy variable equal to one if the individual agrees/disagrees with allowing more immigrants into the country. The dependent variable in rows (5) and (6) is a dummy variable equal to 1 if the individual reports that European unification has gone too far (first column) or if it should go further (column 2). This question is not available in the 2002 and 2010 ESS. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 8. Income inequality and political polarization: interaction effects.

	Pr(Extreme Left 10)	Pr(Extreme Right 10)
	(1)	(2)
Gini	0.482***	0.0374
	(0.158)	(0.235)
Gini X age 25-34	0.00722	0.117
	(0.0861)	(0.0880)
Gini X age 35-44	0.0442	0.116
	(0.0929)	(0.0892)
Gini X age 45-54	-0.0743	0.225**
	(0.0828)	(0.0984)
Gini X age 55-64	-0.138	0.508***
	(0.105)	(0.101)
Gini X age 65+	-0.202	0.609***
	(0.128)	(0.0982)
Gini x Female	-0.0959**	0.125***
	(0.0380)	(0.0372)
Gini x Secondary	-0.0255	0.0550
	(0.0596)	(0.0575)
Gini x Tertiary	0.0541	-0.0567
	(0.0685)	(0.0778)
Region Fixed Effects	YES	YES
Country x Year Fixed Effects	YES	YES
	0	0
Observations	129,327	129,327
R-squared	0.154	0.239

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country, according to Table 1). The dependent variable is a dummy variable equal to 1 if the individual voted or feels closest to a political party at either extreme of the ideological scale. Each column shows different cut-offs: highest/lowest 25th, 10th and 5th percentiles of the distribution. The ideological score of each party comes from the Chapel Hill Expert Survey. Column (10) reports the first-stage coefficient and tests for weak instrumental variables. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.

Table 9. Income inequality and attitudes toward immigrants and the EU: interaction effects.

	Should the country allow people of the same race or ethnic group to come an live here?	Should the country allow people of a different race or ethnic group to come an live here?	Has European Unification gone too far (0) or should it go further (10)? (0-10 scale)
	Strongly Disagree	Strongly Disagree	Should go further (9-10)
	(1)	(2)	(3)
Gini	-0.231	-0.417*	-0.465*
	(0.249)	(0.251)	(0.274)
Gini X age 25-34	0.228**	0.286***	0.00143
	(0.104)	(0.0959)	(0.103)
Gini X age 35-44	0.263***	0.272***	0.0301
	(0.0965)	(0.0976)	(0.105)
Gini X age 45-54	0.314***	0.381***	-0.0442
	(0.0981)	(0.112)	(0.102)
Gini X age 55-64	0.435***	0.539***	0.0658
	(0.111)	(0.116)	(0.0929)
Gini X age 65+	0.444***	0.554***	0.0435
	(0.132)	(0.138)	(0.0975)
Gini x Female	0.0993	0.0818	-0.0358
	(0.0611)	(0.0657)	(0.0480)
Gini x Secondary	-0.0531	-0.116	-0.0692
	(0.0694)	(0.0768)	(0.0508)
Gini x Tertiary	-0.136*	-0.264***	-0.186***
	(0.0771)	(0.0793)	(0.0567)
Region Fixed Effects	YES	YES	YES
Country x Year Fixed Effects	YES	YES	YES
Observations	202,683	202,543	139,349
R-squared	0.123	0.150	0.060

Note: Sample includes all individuals in the ESS from 2002 to 2014 (coverage varies by country according to Table 1). The dependent variable in columns (1) through (4) is a dummy variable equal to one if the individual agrees/disagrees with allowing more immigrants into the country. The dependent variable in columns (5) and (6) is a dummy variable equal to 1 if the individual reports that European unification has gone too far (first column) or if it should go further (column 2). The number of observations in columns (5) and (6) is lower because the variable used to construct the dependent variable was not available in 2004 and 2010. Standard errors are clustered at the regional level. Coefficient statistically significant at ***1%, **5%, and *10%.