Inequality and Extremist Voting: Evidence from Germany

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Abstract

This paper studies the impact of economic inequality on political polarization. Using a unique dataset covering different measures of regional income inequality as well as federal and state election outcomes at the county level in Germany, we investigate whether inequality influences the share of votes for right-wing and left-wing extremist parties using instrumental variable estimation. Our results suggest that an increase in income inequality has a sizeable influence on the support for extremist parties. The poorer a county is compared to the national average, the higher is the share of votes both nationalist and leftist parties receive. Our findings thus indicate that the rise in economic inequality may be a threat to political stability.

JEL:

Keywords: Inequality, political polarization, extremist voting, Germany.

1 Introduction

Over the past decades, many industrialized countries have experienced an increase in economic inequality. This trend has not only spurred research into the underlying causes and economic consequences, but also triggered heated public debates about its political and social implications. One of the major concerns is that the rise in inequality jeopardizes social cohesion and nourishes extremist and populist political movements, eventually leading to an increase in political polarization. The economic strains many groups in society experience are believed to have fueled resentments against mainstream political parties as well as the political order itself. Many pundits link the increase in inequality – alongside immigration and globalization, which are closely connected – to the surge in political public support for extreme parties at both ends of the political spectrum many countries in Europe (and other parts of the world) have witnessed: *Syriza* in Greece, *Podemos* in Spain, or *Die Linke* (the Left Party) in Germany on the political left, as well as the *Front National* in France, *Fidesz* in Hungary, or the *Alternative für Deutschland* (Alternative for Germany; AfD) in Germany on the political right are only a few examples of populist and extremist movements that capitalize on the widening of the gap between the rich on the one hand and the middle class and poor on the other hand. Moreover, the rise in inequality is believed to be a major source of what has been labelled neo-nationalism – a political leaning that promotes nativism, opposition to immigration, and protectionism. According to the current narrative, the more unequal economic resources are distributed, the greater the appeal of such extremist views.

The extant empirical evidence suggests that inequality and political polarization are indeed correlated. Evidence on the causal relationship between inequality and polarization is scarce, though. Utilizing unique regionally disaggregated data on election outcomes and different inequality measures from Germany, this paper aims at evaluating the causal influence inequality has on political polarization using instrumental variable estimation. Following Boustan et al. (2013), we construct instruments for region-specific inequality measures that are exogenous to asymmetric economic developments as well as endogenous sorting of individuals into regions. Our findings suggest that regional inequality indeed has a sizeable influence on the support for extremist parties. Both how a region compares to the national average as well as the level of income inequality within

a region affects the share of votes nationalist and leftist parties receive at federal elections. The poorer a region is as well as the larger the extent of inequality within a region, the larger the vote shares of both nationalist and leftist parties. Thus, our findings support the conjecture that economic inequality is an important driver of political polarization.

The remainder of the paper is organized as follows. In Section 2, we discuss the literature that relates to our analysis. Section 3 describes the data we use in our empirical analysis and Section 4 provides some descriptive evidence on regional inequality and election outcomes in Germany. In Section 5, we explain our estimation strategy. Section 6 shows the results of our empirical analysis. Section 7 concludes.

2 Related Literature

A large literature in economics and political science is concerned with the question why people vote for radical parties and support extremist movements. Among the various reasons scholars are discussing, economic circumstances are typically considered to be among the most important ones (see Lewis-Beck and Stegmaier, 2000). Existing empirical evidence suggests that macroeconomic shocks exert a large influence inter alia on voters' preferences for redistribution (Brunner et al., 2011; Giuliano and Spilimbergo, 2014), the re-election probability of the incumbent government (Lewis-Beck and Stegmeier, 2000), and the support for populist and extremist parties (see de Bromhead et al., 2013; Mian et al., 2014; Funke et al., 2016).

From an economics perspective, the link between political polarization and income inequality can be motivated by the median voter theorem (Romer, 1975; Meltzer and Richard, 1981). The traditional view is that a high level of economic inequality translates into greater support for leftist parties as they advocate redistributive policies and cater to the needs of those at the bottom of the income distribution. However, recent studies point out that economic strain can increase the popularity of right-wing parties as well. Aggeborn and Persson (2017) set up a theoretical model to explain why voters with low income are prone to support right-wing parties. They argue that low income voters are particularly vulnerable to economic insecurity and depend more heavily on basic public services. In contrast to left-wing parties, right-wing parties oppose spending on global goods such as a generous refugee support systems, foreign aid, and environmental protection in favor of basic public services that mainly benefit the domestic population.

Other scholars emphasize the role of economic globalization for the relationship between economic inequality and political polarization. For example, import shocks and trade integration with low-wage manufacturing countries are shown to have adverse effects on local labor markets which, in turn, gives rise to extremist voting (Autor et al., 2016; Malgouyres, 2017; Colantone and Stanig, 2018; Dippel et al., 2018). Since redistribution is costly and, in a highly globalized world, the welfare state is constrained in its ability to raise taxes due to the danger of capital flight, protectionist views and hostile attitudes toward globalization may become particularly popular (Sinn, 2003; Antràs et al., 2017). As Colatone and Stanig (2018: 3) put it: "As the losers (of globalization; authors' note) realize that effective redistribution policies are not feasible, the demand for protection emerges as an alternative. This breeds the success of economic nationalism." Consequently, in a country that is highly integrated into the world economy, populist and nationalist parties may have a particularly great appeal to voters suffering from economic strain.

Existing empirical evidence appears to support the conjecture that economic inequality and economic strain are positively related to political polarization. For the U.S., Garand (2010) shows that senators from states with higher levels of income inequality tend to be more polarized in roll-call voting. Based on time-series data, McCarty et al. (2006) as well as Duca and Saving (2016) document a positive correlation between income inequality and political polarization in the U.S. congress.

Empirical studies for Europe point into a similar direction. Lubbers and Scheepers (2001), for example, find that unemployed persons have been more likely to support extreme right-wing parties in Germany during the 1990s.[1] Unemployed people and less-educated manual workers are also found to be more likely voters of extremist right-wing parties in national elections across eighteen European countries in the 2000s (Werts et al., 2013). Using Swedish municipal data, Rydgren and Ruth (2011) show that the vote shares of the

[1] Moreover, Falk et al. (2011) find a positive relationship between extremist right-wing crimes and regional unemployment in Germany over the years 1996-1999. Krueger and Pischke (1997), however, suggest that neither unemployment nor wage structures can explain incidences of politically motivated crime against foreigners between 1991 to 1993 in East Germany.

far-right party Sweden Democrats (*Sverigedemokraterna)* are positively related to the municipal unemployment rate and negatively related to the educational level and the regional economic growth.

Guiso et al. (2017) also demonstrate a positive link between individual income insecurity and the popularity of populist parties on both the left and the right of the political spectrum using survey data from European countries. The authors argue that economic insecurity increases the support for populist policies both directly as well as in an indirect way through an erosion of trust toward immigrants. Becker et al. (2017) show that deprivation in terms of education, income and employment, as well as adverse effects of the austerity measures implemented by the government were key drivers of voting for Brexit.[2] The austerity measures implemented after 2010 included reductions in social services, tax credits, as well as child and housing benefits and had stronger adverse effects in poorer districts.

Using data on the outcomes of 14 national elections held in eight Western European countries between 1992 and 2000, Jesuit et al. (2009) apply tobit estimation and show that higher regional income inequality is associated with greater support for extreme right-wing parties, but higher regional unemployment with greater support for leftwing parties. The relationship between regional unemployment and vote shares of extreme right-wing parties, though, becomes significantly positive when immigration into a region increases.

To the best of our knowledge, the only study that uses a credible identification strategy to evaluate the causal effect of income inequality on political polarization is Voorheis et al. (2015). The authors adopt the instrumental variable approach proposed by Boustan et al. (2013) that is also used in the present paper. Voorheis et al. (2015) use data on political polarization in U.S. state legislatures and state level data on income inequality from the American Community Survey (ACS) covering the years from 2005 to 2011. The authors report a positive effect of income inequality on political polarization. Our paper not only

[2] According to Becker et al. (2017), demography, education, and economic structure at the district level explain a larger share of the variation in the Brexit vote than measures of local EU exposure in terms of immigration and trade.

provides a test for external validity of those findings using data from a different country, but also makes several novel contributions.

First, the data we use are collected at a highly disaggregated regional level. In Germany, there are currently more than 400 counties with, on average, roughly 170,000 inhabitants per county. Focusing on such a granular regional level is particularly informative because it allows us to assess the importance of the economic conditions in the local social environment on electoral outcomes.

Second, our measure of political polarization is based on electoral outcomes and, thus, captures the electorate's revealed political preferences. Third, the multi-party system in Germany covers the whole political spectrum, including parties at the far right and the far left. This facilitates the measurement of political polarization and makes Germany a particularly interesting place to study its determinants. Fourth, our sample period covers more than two decades, which is particularly important as the degree of economic inequality typically changes only slowly over time. Finally, in our empirical analysis, we employ different measures and account for different dimensions of economic inequality, that is, inequality within and between regions, which has not been done before.

3 Data Description

To study the influence of inequality on electoral outcomes, we construct a unique panel dataset covering more than 400 counties in Germany. Our dataset combines county-specific measures of income inequality and outcomes of federal and state elections that took place between 1990 and 2014. During this period, federal elections were held seven times and state elections 95 times.[3] Due to territorial reforms, the number of counties varies across our sample period. Thus, our panel dataset is slightly unbalanced.

To create our dataset, we mainly rely on two sources. Regional inequality measures are constructed based on microdata from the German Microcensus (*Mikrozensus*). Federal election outcomes at the county-level are provided by the Federal Returning Officer (*Bundeswahlleiter*), state election outcomes are provided by the respective state's returning officer (*Landeswahlleiter*).

[3] We employ only 80 of the state elections due to data limitations.

3.1. The German Microcensus

The Microcensus is a household survey that is carried out annually since 1957 by the statistical offices of the German states *(Statistische Landesämter)* and administered by the Federal Statistical Office *(Statistisches Bundesamt).* It comprises a representative 1%-sample of the German population, resulting in a sample size of more than 800,000 persons in almost 400,000 households per year. The Microcensus contains information about various demographic characteristics, including the county of residence, employment status, household size, the age of all household members, education levels and household income, among others. For our analysis, we use the waves from 1990 to 2014. However, the Microcensus carried out in 1990 only covers West-Germany.

Besides the large number of variables, one major advantage of the Microcensus is its large sample size, which allows us to construct measures of inequality at the regional level. Moreover, the Microcensus is administered by a federal agency and there is a legal obligation to answer the questions, which is why item-non-response is not an issue. Also, answers must be truthful and complete. This makes the Microcensus well-suited to study income inequality between and within counties in Germany.

To construct our inequality measures, we use information on monthly net household income. To account for differences in household size, we compute equivalized household incomes using the OECD equivalence scale. In addition, we adjust the income figures for changes in prices using the consumer price index for Germany. Note that the income variable in the Microcensus dataset is interval-censored, i.e., respondents are asked to indicate in which income class they are in. However, the width of the income classes is rather narrow and the number of income classes is large, varying between 18 and 24, depending on the survey year. To obtain continuous household income figures, we employ two different methods. First, we apply a multiple imputation approach. That is, we estimate a continuous income figure for each household based on information on a household's income class as well as various socio-demographic characteristics using interval regressions. This imputation technique ensures that the empirical distribution of the continuous income variable fits the shape of the distribution of the income classes. That way, we obtain a single income figure for each household that is consistent with the observed income limits (see for example Royston, 2007). Second, we follow Stauder and

Hüning (2004) and Gerhardt et al. (2009) and impute precise income values based on the assumption that incomes within income classes are uniformly distributed. For the main part of our analysis, we use income variables calculated based on the regression-based imputation approach, while the income variables calculated based on the assumption of a uniform distribution of incomes are only used as part of our robustness checks.

3.2. Indicators of Regional Inequality

A large literature suggests that concerns about personal economic well-being determine preferences for redistribution and protectionism and, that way, voting behavior (see section 2). When focusing on federal elections, we thus expect that an individual's position in the national income distribution should be decisive for her vote. This implies that at the aggregate level, it is important to look at how the residents residing in a county compare to the national average. In our empirical analysis, we employ three different indicators of inequality that account for the aggregate economic well-being of a county's citizens compared to the national average, thus capturing inequality *between* counties. Our first indicator is the median income in county i at year t. Since our regression equations contain time-fixed effects, the inclusion of county median income is equivalent to computing the difference between county median income and the (average) national median income. Our second indicator measures the average shortfall in income from the national median income to which we refer as 'median gap'. It is defined as follows:

$$Median\ gap_{it} = 100 \frac{1}{n_{it}} \sum_{j=1}^{q} \frac{z_{50,t}^{nat} - y_{ijt}}{z_{50,t}^{nat}}$$

Where n_{it} is the number of households in county i at year t, y_{ijt} is the income of household j, and $z_{50,t}^{nat}$ is the national median income. Our third indicator of inequality is constructed in a similar fashion, but measures the average shortfall from the national poverty line instead of the national median income. This indicator is widely known as the 'poverty gap' and looks as follows:

$$Poverty\ gap_{it} = 100 \frac{1}{n_{it}} \sum_{j=1}^{q} \frac{z_{pov,t}^{nat} - y_{ijt}}{z_{pov,t}^{nat}}$$

As it is common, we set the poverty line equal to 60% of median income, so that $z_{pov,t}^{nat} = 0.6 \times z_{50,t}^{nat}$.

Note that we use the same set of indicators for inequality when focusing on state election outcomes, implying that we believe that citizens take the national average as a reference point at the polls. Arguably, citizens compare the economic situation of the state they live in to the national economic conditions when making their vote and hold the state government accountable in case the state's economy performs weaker than the national average.

A very recent literature documents that subjective perceptions about inequality and actual inequality may not necessarily match as voters only have imperfect information about their relative standing in society income-wise (Kuhn, 2011; Cruces et al., 2013; Knell and Stix, 2017; Gimpelson and Treisman, 2018). Consequently, individuals' political preferences rather depend on the perceived level inequality than on actual inequality (Alesina and La Ferrara, 2005; Engelhardt and Wagener, 2014). Recent evidence suggests that people form expectations about their relative standing by comparing themselves to reference groups. In this regard, Clark and Senik (2010) show that people in Europe mainly compare themselves to others with whom they regularly interact in their nearby social environment. In a similar vein, Cruces et al. (2013) demonstrate that the decile of the national income distribution in which a person places herself is significantly related to her position in the local income distribution. In consideration of these results, we use different indicators of inequality *within* a county as proxies for inequality perceptions. The first indicator we use is the Gini coefficient of household equivalized incomes of residents in a county. The second and third indicator resemble the median gap and poverty gap introduced above, the only difference being that we replace the national median income and poverty line, respectively, with the county median income and poverty line.

3.3. Electoral System in Germany and Definition of Extremist Parties

The electoral system in Germany is based on proportional representation and multiple parties run for elections. To illustrate, our sample comprises 71 political parties running in at least one of the federal elections that took place between 1990 and 2013 alone, not including parties that only run in state elections. This multi-party system makes Germany a particularly interesting case to study in the given context, since it covers the whole political spectrum from the extreme left to the extreme right. At federal and state elections in Germany, voters have two votes: The first vote (*Erststimme*) is for a local candidate

voters would like to see in parliament, the second vote (*Zweitstimme*) is for one of the political parties running for election.[4] In our analysis, we focus on the second votes since they determine the number of seats parties receive in parliament, provided a party passes the five percent election threshold.[5]

We are interested in the vote shares of extreme nationalist and left-wing parties. We consider parties to be extremist in case the party or a subgroup of party members have been monitored by the German Federal Office for the Protection of the Constitution (*Bundesverfassungsschutz*), or its state-level equivalents (*Landesverfassungsschutz*). Key characteristics of extremist parties and party members are the rejection and negation of the democratic order or the federal constitution. In a next step, we label extremist parties as either extreme-right or extreme-left.[6]

On the extreme left of the political spectrum, there are six parties that ran in federal elections in Germany since 1990.[7] The Left Party (*Die Linke*), which was founded in 2007 when the Party of Democratic Socialism (*PDS*)[8] and the Electoral Alternative for Labour and Social Justice (*WASG*) merged, is the most popular leftist party in Germany. The party is regularly represented in the German national parliament (*Deutscher Bundestag*) and typically well above the five percent threshold.[9] Besides the Left Party, there is a number of several other small extreme left-wing parties, but they never passed the

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[4] The candidate who receives the majority of first votes in an election district is directly elected to the parliament. The distribution of seats in the parliament is, however, solely determined by the share of second votes a party receives.

[5] Note that the five percent threshold is not binding if a party wins at least three election districts directly by the first vote. In all federal elections in Germany that took place since 1990, this occurred only once in 1994, when four candidates of the Party of Democratic Socialism (PDS) received the majorities of first votes in their election districts. As result, the party got in total 30 seats in parliament, corresponding to its 4.4% vote share of second votes.

[6] Our sample includes 16 extremist parties that run the federal elections since 1990. At the state level, the sample of extremist parties range between five parties in Thuringia and thirteen parties in the state of Lower Saxony in our evaluation period 1990-2014.

[7] The full list of parties classified as either extreme left or right running in federal elections between 1990 and 2013 is provided in the Appendix, Table A3. Table A4a and A4b in the Appendix list all leftist and nationalist parties in our data set, including also parties that only ran in state elections.

[8] The PDS was founded in 1990 and is the successor of the Socialist Unity Party of Germany (*SED*), the communist party governing the German Democratic Republic (DDR) between 1949 and 1989.

[9] In the first unified German federal elections in 1990, the Left Party received only 2.4 percent of the second votes. However, the party was represented in the parliament with 17 seats because of a one-time exception that was made for parties that won at least five percent of all votes in the former German Democratic Republic.

required vote share for receiving seats in the federal parliament or state-level parliaments during our sample period. Small extremist parties on the left are communist parties such as the German Communist Party (*DKP*), the Communist Party of Germany (*KPD*), the Marxist-Leninist Party of Germany (*MLPD*); and Trotzkyist organizations such as the Party for Social Justice (*PSG*)[10], and the Spartakist Labour Party of Germany (*SpAD*).
On the extreme right, several parties ran in German federal and state elections since 1990. In the extant empirical literature, however, only three parties are regularly considered as far right-wing: The National Democratic Party of Germany (*NPD*), the German People's Union (*DVU;* merged with NPD in 2011), and the Republicans (*REP*). None of these parties was ever represented in the federal parliament, but they have regional strongholds and entered some state parliaments. Moreover, the NPD has won one seat in the European parliament in 2014, after the three percent hurdle was removed by the Federal Constitutional Court of Germany. Besides the NPD, DVU and REP, there are some other extreme right parties that ran for federal and state elections in our period of observation, such as the Union of Free Citizens (*BfB*), the Right Party (*Die Rechte*), Pro Germany (*Pro Deutschland*), Union for Germany/Popular Referendum (*Bündnis für Deutschland/Volksabstimmung*), and the German Party (*DP*). In contrast to other studies, we consider all those parties when computing the aggregate vote share of nationalist parties, although their vote shares are rather small at the national level. Some of these parties, however, are only eligible for vote in some states and do have local strongholds. We therefore believe that these parties are relevant for our analysis at the county level.

3.4. Control Variables

In our empirical analysis, we include several control variables depicting the demographic and economic situation in a county. We control for a county's age structure by including the share of people aged between 15 and 24, 25 and 34, 35 and 44, 45 and 54, 55 and 64, and above 65 years, as well as population density, unemployment rate, the share of transfer recipients, and the share of foreigners. Population densities are provided by the Federal Institute for Research on Building, Urban Affairs and Spatial Developments (*Bundesinstitut für Bau-, Stadt-, und Raumforschung, BBSR*). The share of foreigners is

[10] The PSG ran in the federal elections in 1990 and 1994 as Union of Socialist Workers (*BSA*).

taken from the German Regional Database (*Regionaldatenbank Deutschland*) as well as the statistical offices of the German states (*Statistische Landesämter*). The remaining control variables are calculated based on individual responses from the German Microcensus.

4 Descriptive Statistics

4.1. Regional Inequality

Between 1990 and 2014, inequality has increased in Germany. However, as Figure 1 and Figure **2** indicate, the extent of inequality varies considerably over time and across regions. Particularly pronounced are the differences across West and East German counties. The West/East divide is apparent regardless of whether one focuses on inequality between or within regions.

On average, median equivalized household income at the county level equals roughly €1,320 between 1990 and 2014.[11] In 1994, it was roughly €1,270 € per month and rose to almost €1,380 until 2013 (see Table 1), implying an increase of about 8.7%. Not all regions appear to have benefitted from the rise in national median income, though. While the average median income across West German counties increased by about 7.6% between 1994 and 2013, it grew by 12.3% in the East. Arguably, this finding indicates that East Germany caught up relative to the West after unification. However, a closer look at Tables A1 and A2 of the Appendix reveals that the 'catching up period' fell mostly into the 1990s. In 1994, the average median income across West and East German counties was roughly €1,320 € and €1,060, respectively, resulting in a difference of about €260. In 1998, this difference has reduced to €200, but started to increase again in the 2000s. In 2013, the difference in average median income across West and East German counties was €230. This development can also be seen in Figure 1, which graphically illustrates the regional variation in the ratio of the county median to the national median income in 1991, 2002 and 2014. The difference between West and East is clearly visible. The figure also shows how counties in West Germany have evolved differently since the early 1990s.

[11] Median household incomes of Table 1 are inflation-adjusted to the year 2010 (see section 3.1).

Southern German counties have, on average, performed better in median income levels than many counties in the Northern part of Germany.

Besides median income, the West/East divide also manifests in county-level Gini coefficients (Figure 2). While the average Gini coefficient across German counties between 1990 and 2014 is 26.1, it is 26.7 in the West and 23.5 in the East (see Table 1 as well as Tables A1 and A2 of the Appendix). On average, inequality has increased over time both in the West and in the East, but the increase was larger in East German counties. Figure 2 confirms that while inequality is still somewhat larger in the West, the difference between East and West German counties is becoming less pronounced. In 2013, the average Gini in West German counties is 28.0 and in the East 25.6. Similar results hold for alternative measures of inequality, such as median and poverty gaps (see Table 1, A1 and A2).

4.2. Extremist Voting

Even more striking are the differences regarding the vote shares of right and left-wing extremist parties across West and East Germany. For federal elections between 1990 and 2013, the average vote share of extreme parties was about 9.5% across all German counties (Table 1). However, whereas the average vote share was only 5.2% in West German counties, it was more than four times larger in the East, i.e. 21.3%. This difference is mainly due to the large share of votes the Left Party (Die Linke) receives in East Germany. The vote share of all leftist parties is 18.5% in East German counties, compared to 3.1% in the West. In general, the average vote share of nationalist parties has been higher in East German counties as well, the only exception being the federal elections held in 1994 (see Table A1 and A2 of the Appendix). One can thus conclude that the East generally tends to vote more extreme than the West.

In Germany as a whole, the average vote share of extremist parties at federal elections rose from 6.4% in 1990 to 14.9% in 2009, before decreasing again to 10.3% at the 2013 election (see Table 1 and Figure B1 in the Appendix). The largest rise in the average vote share of extremist parties fell between the federal elections of 2002 and 2005, where it rose by 6.7 percentage points. This enormous rise was mainly driven by the success of the leftist party PDS (the predecessor of Die Linke) after a series of socially unpopular

welfare and labor market reforms (Agenda 2010) were implemented by the Social Democratic/ Greens government between 2003 and the beginning of 2005.

Figure 1: Median income ratio of German counties relative to the national median between 1991 and 2014.

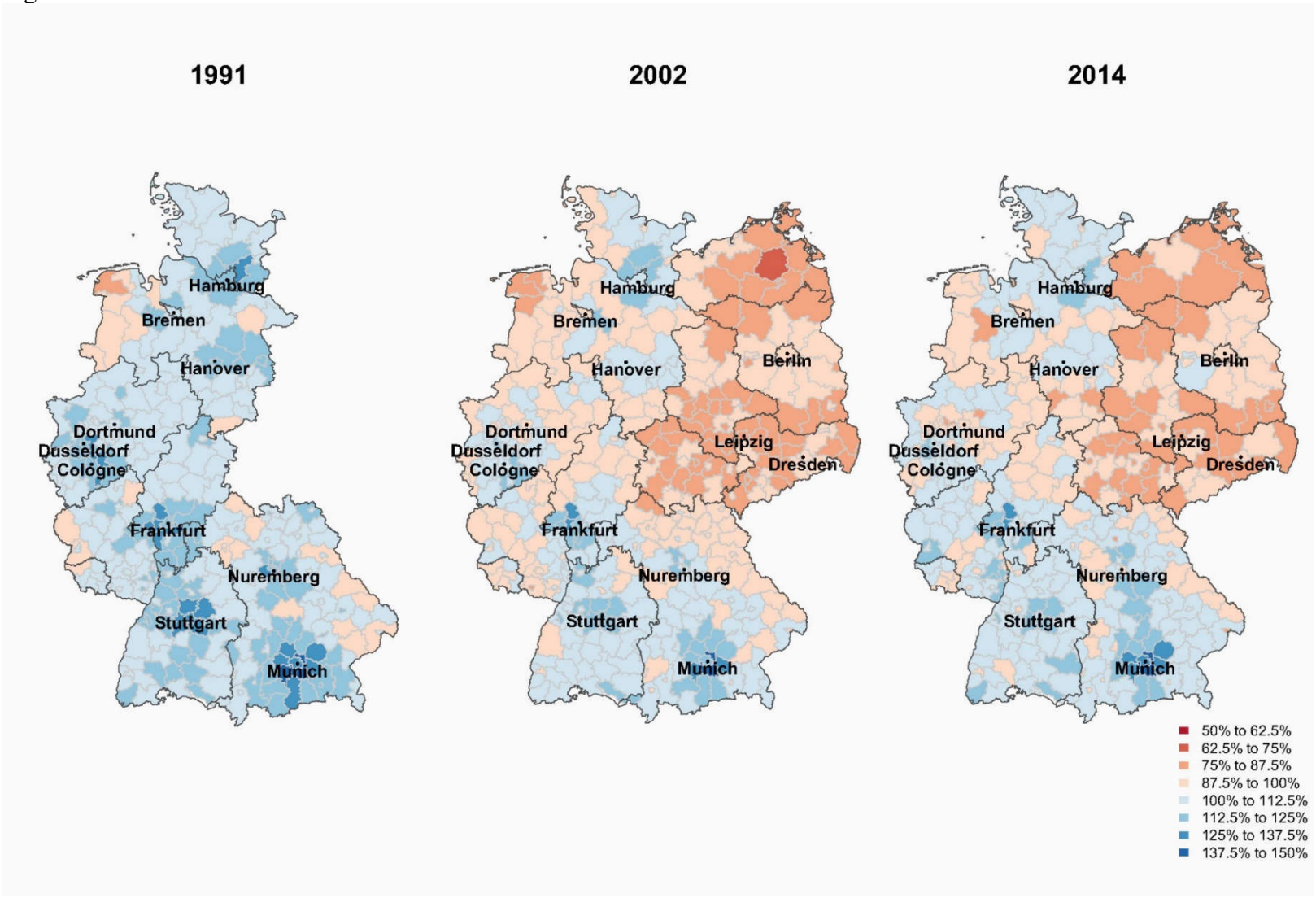

Figure 2: Gini coefficients in German counties between 1991 and 2014.

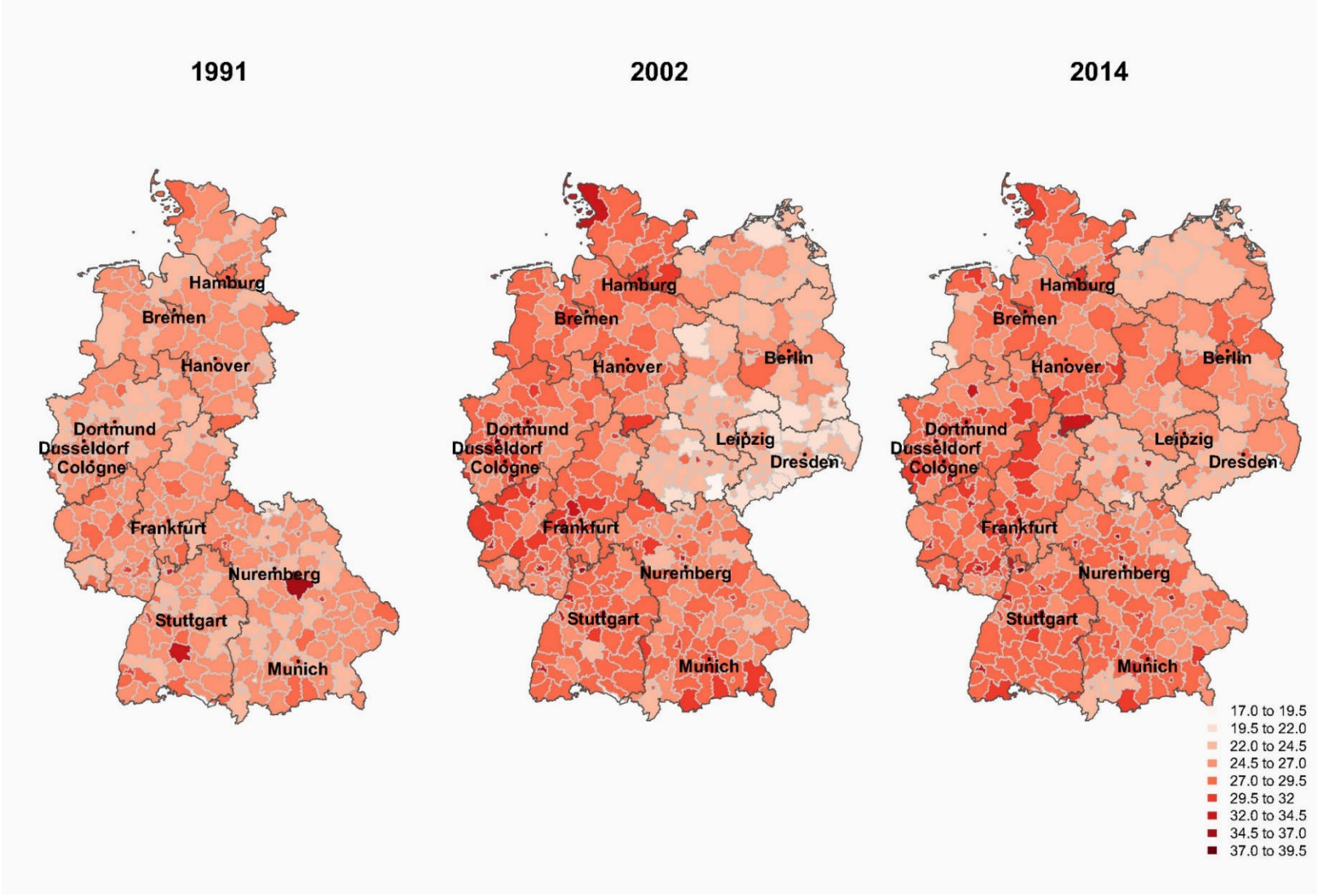

Table 1: Descriptive statistics

	All	**1990**	**1994**	**1998**	**2002**	**2005**	**2009**	**2013**
	mean	mean	mean	mean	mean	mean	mean	mean
Median Income	1.32	1.33	1.27	1.27	1.34	1.30	1.33	1.38
Poverty Gap (between)	3.99	3.98	3.78	3.78	4.03	4.31	3.98	4.01
Median Gap (between)	15.64	15.79	15.30	15.36	15.80	16.11	15.54	15.58
Gini Coefficient	26.05	24.31	24.54	24.72	26.90	26.90	27.05	27.54
Poverty Gap (within)	3.68	3.61	3.60	3.51	3.67	3.84	3.70	3.86
Median Gap (within)	14.76	14.72	14.51	14.29	14.66	15.01	14.94	15.23
Extreme Parties	9.46	6.39	7.17	9.84	6.00	12.69	14.92	10.33
Extreme Right	2.29	2.48	1.91	3.78	1.15	2.56	2.27	1.81
Extreme Left	7.16	3.91	5.26	6.06	4.85	10.13	12.65	8.52
Unemployment Rate	5.22	2.58	4.45	5.85	5.38	6.59	6.34	4.60
Share Transfer Recipients	5.63	3.16	4.99	6.24	5.73	6.83	6.36	5.45
Share Pop. 15-24	11.83	13.91	11.55	11.33	11.67	12.32	11.69	10.74
Share Pop. 25-34	13.24	16.14	16.17	14.57	12.02	11.56	11.33	11.58
Share Pop. 35-44	14.77	13.16	14.28	15.16	16.13	16.47	14.87	12.67
Share Pop. 55-64	12.68	11.36	12.55	13.89	13.08	11.76	12.16	13.64
Share Pop. 65+	18.72	15.72	16.35	16.96	18.45	19.83	21.30	21.90
Share Foreigners	7.56	8.63	10.29	6.87	6.95	6.89	7.07	7.09
Population Density	505.47	454.62	525.23	519.99	509.19	507.19	518.87	516.71
Observations	3121	544	444	440	439	439	413	402

Note: Median income is measured in 1000 Euros and inflation-adjusted to the year 2010.
Vote shares and population shares are measured in percent.

5 Empirical Approach

To evaluate the influence of economic inequality on the support for extremist parties, we estimate the following empirical panel data model by ordinary least squares (OLS):

$$(1)\ y_{it} = \alpha_i + \beta Ineq_{it} + \gamma x_{it} + \delta_t + \varepsilon_{it}$$

y_{it} is the share of votes nationalist or leftist parties received at the federal or state elections in county i and year t, α_i is a county-fixed effect that is included to account for time-invariant regional-specific factors that are related to economic conditions and might affect election outcomes, and δ_t is a year dummy to capture the effect of nation-wide events. We also include several demographic and economic control variables (x_{it}). Finally, $Ineq_{it}$ is a measure of regional inequality. In our empirical analysis, we consecutively employ different inequality measures to assess the importance of different dimensions of inequality, such as inequality between and within counties (see section 3.2.).

Identifying the causal effect of regional inequality on voting behavior is challenging since there are several confounding factors that are correlated with both election outcomes and regional economic conditions. First, households may sort into regions depending on their socio-demographic characteristics as well as political preferences. For example, households may prefer to live among people who are similar to them with regard to lifestyle and political views. Spatial segregation of households depending on their economic situation may also occur due to regional differences in labor market conditions, housing prices and costs of living. Second, there are a number of regional characteristics that are potentially correlated with both regional inequality and voting behavior such as, for example, factors related to labor supply in a county, household structure, geographic features, etc. While some important variables can be controlled for, we cannot exclude the possibility that there are other relevant variables we cannot observe, thus potentially leading to biased estimates.

In order to mitigate concerns regarding biased estimates due to the endogeneity of our covariates, we apply two-stage least squares (2SLS) estimation using instrumental variables for our inequality measures. Following Boustan et al. (2013), we first compute the average household income for each percentile of the national income distribution for all survey years. Then, we compute the annual national income growth rate for each percentile. Next, we focus on the initial survey year, determine the income percentile each

household belongs to based on the national income distribution, and multiply each household's income with the percentile-specific national income growth rate. That way, we obtain hypothetical incomes for each household we observe in the initial survey year for all subsequent sample years. Finally, we use these hypothetical incomes to compute counterfactual regional inequality measures as instruments. These inequality measures indicate how regional economic conditions would have developed in the absence of inward and outward migration and if each household's income would have changed over time in accordance with the percentile-specific national average. Consequently, our instruments only capture changes in the regional income distribution that are driven by national trends and cannot, by design, be influenced by county-specific trends such as mobility into and out of regions (Boustan et al., 2013).

An additional challenge specific to the use of county-level data in Germany is that the number of counties in East Germany has changed considerably after German unification due to various administrative-territorial reforms. For example, from 1990 to 1996, the number of counties in East Germany (excluding East-Berlin) dropped from 215 to 111. For this reason, we are forced to use the income distribution of 1997 to construct our instruments for East German counties, implying that we cannot use observations on East German counties prior to the federal election held in 1998 when using an instrumental variable approach.

6 Results

6.1. Inequality between Regions

OLS results for our measures of inequality between regions are presented in Table 2. Columns (1) to (3) show the effect of inequality on the vote share of leftist parties at federal elections, columns (4) to (6) show the results for nationalist parties.

According to our estimates, a county's *median income* is negatively related to the share of votes of extremist parties, while *median gap* and p*overty gap* are positively related. Consequently, the worse the households residing in a county are off compared to households in other counties, the higher the vote shares both leftist and nationalist parties receive at federal elections. However, although the coefficients turn out to be statistically significant, they are rather small in size and economically negligible. For instance, our

OLS estimates suggest that a one percentage point increase in the county's m*edian gap* would merely increase the vote share of leftist parties by 0.08 percentage points and that of nationalist parties by 0.04 percentage points.

Table 3 outlines the results based on 2SLS estimation. Our findings indicate that the OLS estimates are severely biased toward zero. According to the 2SLS estimates, inequality between regions does have a sizeable influence on extremist vote shares. Again, columns (1) to (3) in Table 3 present the results for leftist vote shares, while columns (4) to (6) present the results for nationalist parties. We find that a one percentage points increase in the *median gap* increases the vote share of leftist parties by 0.9 percentage points and the vote share of nationalist parties by 0.7 percentage points. The coefficient estimates for the *poverty gap* are even larger. Here, a one percentage point increase leads to an increase of 1.6 (1.2) percentage points in the vote shares of leftist (nationalist) parties. All estimates are statistically significant. *Median income*, on the other hand, is only statistically significant for the vote shares of nationalist parties. How a counties median income compares to the national median income only seems to matter for the vote shares nationalist parties receive at federal elections but not for the vote shares of leftist parties. The respective coefficients are -11.6. and – 1.3. This implies that a one standard deviation decrease in median income (which is roughly equal to 140 Euro) increases the vote share nationalist parties receive by 1.67 percentage points.

The F-statistics on the weak ID test in Table 3 reveals that counterfactual income inequality measures represent relevant and strong instruments (see also Figure B2 in the Appendix). In all cases, the value of the F-statistic is larger than 16.38 (10% critical value), the largest critical value proposed by Stock and Yogo (2005) to assess the suitability of an instrument.

Table 2: OLS - Inequality between Regions and Voting Outcomes for Extremist Parties

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Median income	-1.775**			-0.884***		
	(0.021)			(0.004)		
Median gap		0.081***			0.035***	
		(0.008)			(0.001)	
Poverty gap			0.089*			0.063***
			(0.081)			(0.000)
Share pop. 15-24	-0.081**	-0.083**	-0.089**	-0.088***	-0.090***	-0.093***
	(0.029)	(0.024)	(0.016)	(0.000)	(0.000)	(0.000)
Share pop. 25-34	-0.005	-0.008	-0.017	-0.055***	-0.057***	-0.062***
	(0.897)	(0.831)	(0.666)	(0.000)	(0.000)	(0.000)
Share pop. 35-44	-0.080	-0.078	-0.091*	-0.055***	-0.055***	-0.060***
	(0.109)	(0.118)	(0.060)	(0.002)	(0.002)	(0.001)
Share pop. 45-54	0.030	0.033	0.018	0.004	0.004	-0.001
	(0.414)	(0.363)	(0.599)	(0.743)	(0.717)	(0.935)
Share pop. 55-64	-0.070**	-0.064*	-0.076**	-0.053***	-0.051***	-0.055***
	(0.037)	(0.058)	(0.020)	(0.000)	(0.000)	(0.000)
Share pop. 65+	-0.046	-0.046	-0.050*	-0.029***	-0.029***	-0.032***
	(0.128)	(0.127)	(0.088)	(0.008)	(0.008)	(0.004)
Share foreigners	-0.065***	-0.065***	-0.064***	-0.001*	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.082)	(0.112)	(0.200)
Population density	-0.001	-0.001	-0.001	-0.002***	-0.002***	-0.002***
	(0.592)	(0.659)	(0.586)	(0.000)	(0.000)	(0.001)
Unemployment rate	0.081*	0.072	0.089*	0.009	0.006	0.011
	(0.097)	(0.146)	(0.069)	(0.611)	(0.730)	(0.535)
Share transfer recipients	-0.010	-0.019	-0.010	0.001	-0.003	-0.002
	(0.798)	(0.633)	(0.805)	(0.966)	(0.845)	(0.902)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. variable	7.385	7.385	7.385	2.298	2.298	2.298
R^2	0.818	0.818	0.818	0.709	0.710	0.710
N	2454	2454	2454	2454	2454	2454

Notes: OLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

Table 3: 2SLS - Effect of Inequality between Regions on Voting Outcomes for Extremists

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Median income	-1.324			-11.571***		
	(0.721)			(0.000)		
Median gap		0.940***			0.664***	
		(0.000)			(0.000)	
Poverty gap			1.587**			1.225***
			(0.023)			(0.003)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. variable	7.385	7.385	7.385	2.298	2.298	2.298
Weak ID test	53.43	41.78	21.18	53.43	41.78	21.18
N	2454	2454	2454	2454	2454	2454

Notes: 2SLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level. Weak ID test shows the Kleibergen-Paap F statistic for a weak identification test. The Stock-Yogo critical values are 16.38 (at 10%), 8.96 (at 15%), 6.66 (at 20%), and 5.53 (at 25%).

6.2. Inequality within Regions

The results for the OLS regressions using indicators of inequality within regions are presented in Table 4. Columns (1) to (3) show the effect of our inequality measures on leftist party vote shares, columns (4) to (6) show the results for nationalist parties.

Based on our OLS estimation, it appears that income inequality within counties is also only modestly related to the support for extremist parties. The coefficient estimate of the county-specific *Gini* index turns out to be statistically significant, but economically negligible. Estimates for the *median gap* and *poverty gap* are also rather small in size and only statistically significant for the vote shares of nationalist parties.

However, a glance at the 2SLS estimates in Table 5 reveals that yet again, the OLS estimates are severely biased toward zero. The results indicate that a one-point increase (on a scale from 0 to 100) in the *Gini* coefficient is associated with an increase in the share of votes nationalist parties receive by 1.6 percentage points. For leftist parties, the coefficient estimate is 7.3. Nevertheless, neither estimate is statistically significant when

using 2SLS estimation. Regarding the p*overty gap*, our findings suggest that the higher the average shortfall from the county's poverty line, the higher the vote shares extremist parties receive. A one-percentage-point increase leads to a 5.3 percentage points increase in vote shares leftist parties receive and a 2.9 percentage points increase in vote shares of nationalist parties. Both estimates are statistically significant at the 10% level. Similarly, a one percentage point increase in m*edian gap* increases the vote share of nationalist parties by 1.5 percentage points. The coefficient estimate on leftist vote shares is not statistically significant, however. We thus conclude that, in general, inequality within counties also appears to influence extremist voting, especially right-wing extremist / nationalist extremist voting.

Note, however, that the F-statistics of the weak ID tests indicate that the instruments for our indicators of inequality within counties are not particularly strong. The value of the F-statistic is below 5.53 (that is the 25% critical value as suggested by Stock and Yogo, 2005) when we predict the county *Gini* coefficient and the county p*overty gap*, and only slightly above 5.53 when we instrument the county *median gap*. We therefore cannot exclude a weak instrument bias based on our within county estimates.

Table 4: OLS - Inequality within Regions and Voting Outcomes for Extremist Parties

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	0.088***			0.034***		
	(0.004)			(0.002)		
Median gap		0.052			0.049***	
		(0.231)			(0.002)	
Poverty gap			0.013			0.055***
			(0.815)			(0.004)
Share pop. 15-24	-0.084**	-0.087**	-0.085**	-0.090***	-0.092***	-0.093***
	(0.022)	(0.018)	(0.021)	(0.000)	(0.000)	(0.000)
Share pop. 25-34	-0.018	-0.014	-0.011	-0.060***	-0.061***	-0.061***
	(0.649)	(0.712)	(0.766)	(0.000)	(0.000)	(0.000)
Share pop. 35-44	-0.091*	-0.094*	-0.094*	-0.061***	-0.062***	-0.063***
	(0.059)	(0.050)	(0.050)	(0.000)	(0.000)	(0.000)
Share pop. 45-54	0.016	0.014	0.015	-0.003	-0.004	-0.004
	(0.651)	(0.678)	(0.662)	(0.807)	(0.741)	(0.748)
Share pop. 55-64	-0.079**	-0.079**	-0.081**	-0.057***	-0.057***	-0.058***
	(0.015)	(0.015)	(0.013)	(0.000)	(0.000)	(0.000)
Share pop. 65+	-0.047	-0.049	-0.048	-0.030***	-0.031***	-0.032***
	(0.115)	(0.100)	(0.102)	(0.006)	(0.005)	(0.004)
Share foreigners	-0.065***	-0.064***	-0.064***	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.227)	(0.548)	(0.380)
Population density	-0.001	-0.001	-0.001	-0.002***	-0.002***	-0.002***
	(0.533)	(0.509)	(0.477)	(0.000)	(0.000)	(0.000)
Unemployment rate	0.099**	0.097*	0.099**	0.017	0.015	0.016
	(0.044)	(0.050)	(0.044)	(0.302)	(0.372)	(0.338)
Share transfer recipients	-0.010	-0.003	0.000	0.001	0.002	0.003
	(0.785)	(0.938)	(0.995)	(0.910)	(0.858)	(0.793)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. variable	7.385	7.385	7.385	2.298	2.298	2.298
R^2	0.818	0.817	0.817	0.709	0.709	0.709
N	2454	2454	2454	2454	2454	2454

Notes: OLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

Table 5: 2SLS - Effect of Inequality within Regions on Voting Outcomes for Extremists

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	7.335			1.584		
	(0.193)			(0.216)		
Median gap		1.678			1.451*	
		(0.112)			(0.054)	
Poverty gap			5.302*			2.941*
			(0.067)			(0.052)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. var.	7.385	7.385	7.385	2.298	2.298	2.298
Weak ID test	1.74	6.02	4.61	1.74	6.02	4.61
N	2454	2454	2454	2454	2454	2454

Notes: 2SLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level. Weak ID test shows the Kleibergen-Paap F statistic for a weak identification test. The Stock-Yogo critical values are 16.38 (at 10%), 8.96 (at 15%), 6.66 (at 20%), and 5.53 (at 25%).

6.3. Robustness tests

We test the sensitivity of our results in several ways. First, we include additional control variables depicting the level of education of the county population. Since these variables are only available from 1995 onwards, including them results in a smaller sample. Second, we estimate Equation (1) in first differences rather than including county-fixed effects. Note that using the first differences estimator implies computing the absolute change in our variables between two consecutive federal election years. Third, we impute continuous household income figures assuming a uniform distribution of incomes within each income bin instead of applying a regression-based imputation approach. All our results turn out to be robust to these modifications so that our conclusions remain unaffected.

Finally, we test whether inequality affects state election outcomes as well. To this end, we use data on the electoral outcomes of 80 state elections held in all 16 German states between 1990 and 2014 and re-estimate Equation (1). The results are presented in Tables A5 to A8 of the Appendix. Our findings suggest the effect of inequality on extreme vote

shares is less pronounced than for federal elections. We thus conclude that voters tend to hold the federal government rather than the state governments accountable for their poor economic situation.

7 Conclusion

Arguably, two of the major challenges many industrialized countries are currently facing are the persistent increase in economic inequality and growing political polarization. Many pundits believe that these two phenomena are closely linked, blaming the relative deprivation many people face for the increasing popularity of nationalist and leftist parties and movements many countries in the world experience. The aim of this paper is to investigate whether economic inequality has a causal influence on political polarization. To this end, we utilize data on income inequality and outcomes of federal and state elections on the county level in Germany. Our analysis covers seven federal elections that took place between 1990 and 2013. Applying instrumental variable estimation, we evaluate the importance of how a county compares income-wise to the national average as well as the level of income inequality within a county on the share of votes nationalist and leftist parties receive.

Our results indicate that economic conditions have a sizeable impact on the support for extremist parties. The lower the regional median income as well as the higher the inequality and poverty intensity within a region, the larger the share of votes nationalist and leftist parties receive. Our findings suggest that the impact of inequality in median incomes between regions is larger on vote shares for nationalist parties than extreme left-wing parties. Yet, inequality in terms of the average shortfall from the (national and county) median income as well as the (national and county) poverty line have slightly larger voting outcome effects for leftist parties. Thus, our findings support the notion that the different dimensions of economic inequality, both within and between regions, can be important drivers of political polarization. Moreover, using state election outcomes as a robustness test shows that the effect of inequality on extreme vote shares is less pronounced in state elections than in federal elections. We therefore conclude that voters assign the responsibility for economic inequality more to economic policies of federal governments than policies of state governments. This raises the question of how economic

policies can address these issues and which types of policies are best suited. We intend to investigate this in future work.

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APPENDIX

A. Additional Tables

Table A1: Descriptive Statistics – West Germany

	All mean	1990 mean	1994 mean	1998 mean	2002 mean	2005 mean	2009 mean	2013 mean
Median Income	1.36	1.33	1.32	1.32	1.40	1.36	1.37	1.42
Poverty Gap (between)	3.73	3.98	3.61	3.67	3.75	3.78	3.55	3.76
Median Gap (between)	14.51	15.79	13.98	14.16	14.46	14.41	14.24	14.54
Gini Coefficient	26.68	24.31	25.37	25.90	28.01	27.68	27.52	27.99
Poverty Gap (within)	3.84	3.61	3.87	3.81	3.88	3.95	3.74	4.03
Median Gap (within)	15.01	14.72	14.93	14.74	15.00	15.18	15.04	15.48
Extreme Parties	5.18	3.36	2.95	4.29	1.97	6.83	10.25	6.66
Extreme Right	2.12	3.04	2.14	3.26	0.97	2.01	1.93	1.48
Extreme Left	3.06	0.32	0.82	1.03	1.00	4.83	8.31	5.18
Unemployment Rate	3.88	2.58	3.51	3.85	3.44	4.90	5.08	3.81
Share Transfer Recipients	4.54	3.16	4.29	4.75	4.15	5.23	5.37	4.84
Share Pop. 15-24	11.76	13.91	11.49	10.88	10.99	11.83	11.86	11.39
Share Pop. 25-34	13.57	16.14	16.50	15.10	12.49	11.81	11.35	11.56
Share Pop. 35-44	14.68	13.16	14.07	14.90	16.11	16.60	15.05	12.84
Share Pop. 55-64	12.40	11.36	12.31	13.58	12.85	11.59	11.90	13.22
Share Pop. 65+	18.44	15.72	16.62	17.02	18.22	19.42	20.77	21.33
Share Foreigners	8.75	8.63	10.29	8.64	8.62	8.52	8.34	8.24
Population Density	574.01	551.72	582.23	580.31	578.37	579.15	574.88	571.39
Observations	2292	329	328	328	327	327	327	326

Note: Median income is measured in 1000 Euros and inflation-adjusted to the year 2010.
Vote shares and population shares are measured in percent.

Table A2: Descriptive Statistics – East Germany

	All	**1994**	**1998**	**2002**	**2005**	**2009**	**2013**
	mean	mean	mean	mean	mean	mean	mean
Median Income	1.14	1.06	1.12	1.18	1.13	1.15	1.19
Poverty Gap (between)	5.01	4.52	4.11	4.87	5.87	5.64	5.08
Median Gap (between)	20.16	21.09	18.86	19.73	21.08	20.48	20.05
Gini Coefficient	23.51	20.89	21.28	23.64	24.61	25.25	25.61
Poverty Gap (within)	3.06	2.40	2.61	3.06	3.54	3.52	3.12
Median Gap (within)	13.75	12.64	12.96	13.68	14.49	14.53	14.15
Extreme Parties	21.27	19.10	26.08	17.79	29.79	32.69	26.06
Extreme Right	2.77	1.29	5.28	1.69	4.16	3.54	3.23
Extreme Left	18.49	17.81	20.81	16.09	25.63	29.15	22.83
Unemployment Rate	10.55	8.56	11.69	11.06	11.53	11.13	8.00
Share Transfer Recipients	9.99	8.07	10.61	10.35	11.50	10.13	8.07
Share Pop. 15-24	12.08	11.79	12.64	13.64	13.75	11.04	7.97
Share Pop. 25-34	11.90	14.71	13.01	10.65	10.82	11.26	11.65
Share Pop. 35-44	15.12	15.23	15.91	16.16	16.10	14.20	11.91
Share Pop. 55-64	13.78	13.57	14.81	13.75	12.27	13.13	15.45
Share Pop. 65+	19.85	15.18	16.82	19.11	21.04	23.32	24.33
Share Foreigners	2.06	.	1.75	2.08	2.13	2.27	2.15
Population Density	316.31	364.06	343.35	307.20	297.09	307.18	282.16
Observations	829	116	112	112	112	86	76

Note: Median income is measured in 1000 Euros and inflation-adjusted to the year 2010.
Vote shares and population shares are measured in percent.

Table A3: Extremist parties at federal elections in Germany, 1990-2013

	Federal elections in Germany						
	1990	1994	1998	2002	2005	2009	2013
Extreme nationalist parties							
BfB			X				
DDD	X						
Die RECHTE							X
DVU			X			X	
NPD	X		X	X	X	X	X
Patrioten	X						
Pro Deutschland							X
REP (Republikaner)	X	X	X	X	X	X	X
Volksabstimmung / Deutschland			X		X	X	X
Extreme leftist parties							
Die LINKE / PDS	X	X	X	X	X	X	X
DKP						X	
KPD	X			X			
MLPD		X	X		X	X	X
PSG / BSA	X	X	X		X	X	X
SpAD	X						

Table A4a: Leftist parties in Germany, 1990-2014

Extreme leftist parties
Arbeit & Soziale Gerechtigkeit - Die Wahlalternative (WASG)
Autonome
B - Bergpartei, die Überpartei (BergP)
Bund Westdeutscher Kommunisten (BWK)
Demokratische Sozialisten (DS)
Deutsche Kommunistische Partei (DKP)
Die LINKE / Partei des Demokratischen Sozialismus (PDS)
Kommunistische Partei Deutschlands (KPD)
Linke Alternative - Wehrt Euch (cooperation of PDS, BWK, DKP, MLPD)
Linke Liste Niedersachsen (LLN)
Marxistisch-Leninistische Partei Deutschlands (MLPD)
Ökologische Linke (ÖkoLi)
Partei für Soziale Gleichheit, Sektion der Vierten Internationale (PSG) / Bund Sozialistischer Arbeiter (BSA)
Regenbogen - für eine neue Linke (REGENBOGEN)
Revolutionär Sozialistischer Bund, Vierte Internationale (RSB)
Spartakistische Arbeiterpartei Deutschlands (SpAD)
Sozialistische Alternative (SAV)
Vereinigte Sozialistische Partei (VSP)
Vereinigung der Arbeitskreise für Arbeitnehmerpolitik und Demokratie (VAA) / Plattform Europa der ArbeitnehmerInnen und Demokratie (PEAD)

Table A4b: Nationalist parties in Germany, 1990-2014

Extreme nationalist parties
Ab jetzt … Demokratie durch Volksabstimmung – Politik für die Menschen (Volksabstimmung / Deutschland)
ARMINIUS - Bund des deutschen Volkes
Bund der Deutschen Demokraten, Die Deutschen Demokraten (DDD)
Bund freier Bürger - Offensive für Deutschland (BfB)
Bund für Gesamtdeutschland (BGD)
Bürgerbewegung pro Deutschland (pro Deutschland)
Bürgerbewegung pro Nordrhein-Westfalen (pro NRW)
Demokratische Republikaner Deutschlands (DRD)
Der Dritte Weg (III. Weg)
Deutsche Gemeinschaft für Gerechtigkeit (DGG)
Deutsche Heimat Partei (DHP)
Deutsche Liga für Volk und Heimat (DLVH)
Deutsche Partei (DP)
Demokratische Soziale Offensive (DSO)
Deutsche Volksunion (DVU)
Die Freiheit - Bürgerrechtspartei für mehr Freiheit und Demokratie (Die FREIHEIT)
Die Deutschen Konservativen (Die Konservativen)
Die RECHTE
Die Republikaner (REP)
Freiheitliche Deutsche Arbeiterpartei (FAP)
Freiheitliche Deutsche Volkspartei (FDVP)
Freiheitliche Volkspartei (FVP)
Hamburger Liste für Ausländerstopp (HLA)
Interim Partei Deutschland - Das Reicht! (IPD)
JA (zu Brandenburg) / Bewegung Neue Ordnung (BNO)
Nationaldemokratische Partei Deutschlands (NPD)
Nationale Front (NF)
Nationale Liste (NL)
Nationale Offensive (NO)
Patrioten für Deutschland (Patrioten)
Protest der Bürger (PdB)
Sächsische Volkspartei (SVP)
Unabhängige Arbeiter-Partei, Deutsche Sozialisten (UAP)

Table A5: OLS - Inequality between Regions and Voting Outcomes for Extremist Parties at State Elections, 1990-2014

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Median income	0.255			-0.292		
	(0.800)			(0.696)		
Median gap		-0.028			0.001	
		(0.441)			(0.965)	
Poverty gap			-0.089			0.015
			(0.129)			(0.752)
Share pop. 15-24	0.107*	0.108*	0.112*	-0.021	-0.021	-0.022
	(0.095)	(0.092)	(0.083)	(0.582)	(0.586)	(0.574)
Share pop. 25-34	-0.064	-0.065	-0.059	0.088**	0.086**	0.086**
	(0.207)	(0.199)	(0.240)	(0.030)	(0.031)	(0.034)
Share pop. 35-44	-0.031	-0.036	-0.036	0.028	0.025	0.026
	(0.588)	(0.526)	(0.538)	(0.547)	(0.582)	(0.567)
Share pop. 45-54	-0.145***	-0.149***	-0.148***	0.094**	0.092**	0.092**
	(0.001)	(0.000)	(0.000)	(0.016)	(0.019)	(0.016)
Share pop. 55-64	0.001	-0.003	-0.001	-0.030	-0.032	-0.032
	(0.978)	(0.951)	(0.977)	(0.418)	(0.384)	(0.382)
Share pop. 65+	-0.080**	-0.082**	-0.081**	0.047	0.046	0.047
	(0.038)	(0.034)	(0.037)	(0.114)	(0.117)	(0.116)
Share foreigners	-0.091***	-0.091***	-0.091***	-0.003	-0.003	-0.003
	(0.000)	(0.000)	(0.000)	(0.283)	(0.308)	(0.294)
Population density	0.002	0.002	0.002	-0.002	-0.002	-0.002
	(0.319)	(0.327)	(0.343)	(0.401)	(0.392)	(0.398)
Unemployment rate	0.319***	0.325***	0.326***	0.046	0.048	0.047
	(0.000)	(0.000)	(0.000)	(0.370)	(0.347)	(0.353)
Share transfer recipients	-0.100*	-0.093*	-0.088	0.005	0.007	0.005
	(0.077)	(0.094)	(0.110)	(0.884)	(0.835)	(0.876)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. variable	6.128	6.128	6.128	6.136	6.136	6.136
R^2	0.657	0.657	0.657	0.691	0.691	0.691
N	1888	1888	1888	1888	1888	1888

Notes: OLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

Table A6: 2SLS - Effect of Inequality between Regions on Voting Outcomes for Extremists at State Elections, 1990-2014

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Median income	-23.410**			-34.652***		
	(0.013)			(0.001)		
Median gap		1.337			2.663*	
		(0.171)			(0.064)	
Poverty gap			-0.384			1.242*
			(0.484)			(0.092)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	Yes	Yes	Yes	Yes	Yes	Yes
Weak ID test	19.34	3.69	7.99	19.34	3.69	7.99
N	1888	1888	1888	1888	1888	1888

Notes: 2SLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level. Weak ID test shows the Kleibergen-Paap F statistic for a weak identification test. The Stock-Yogo critical values are 16.38 (at 10%), 8.96 (at 15%), 6.66 (at 20%), and 5.53 (at 25%).

Table A7: OLS - Inequality within Regions and Voting Outcomes for Extremist Parties at State Elections, 1990-2014

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	-0.060*			0.007		
	(0.099)			(0.825)		
Median gap		-0.063			0.026	
		(0.198)			(0.563)	
Poverty gap			-0.095			-0.021
			(0.121)			(0.694)
Share pop. 15-24	0.111*	0.108*	0.109*	-0.022	-0.022	-0.021
	(0.085)	(0.090)	(0.088)	(0.578)	(0.574)	(0.597)
Share pop. 25-34	-0.059	-0.059	-0.058	0.086**	0.085**	0.087**
	(0.242)	(0.240)	(0.253)	(0.032)	(0.035)	(0.031)
Share pop. 35-44	-0.032	-0.030	-0.029	0.025	0.026	0.025
	(0.585)	(0.606)	(0.612)	(0.580)	(0.576)	(0.585)
Share pop. 45-54	-0.145***	-0.142***	-0.142***	0.092**	0.092**	0.091**
	(0.001)	(0.001)	(0.001)	(0.018)	(0.017)	(0.017)
Share pop. 55-64	0.003	0.004	0.004	-0.032	-0.032	-0.032
	(0.937)	(0.933)	(0.931)	(0.370)	(0.368)	(0.374)
Share pop. 65+	-0.083**	-0.081**	-0.080**	0.047	0.047	0.046
	(0.033)	(0.037)	(0.040)	(0.118)	(0.115)	(0.118)
Share foreigners	-0.091***	-0.091***	-0.091***	-0.003	-0.003	-0.003
	(0.000)	(0.000)	(0.000)	(0.298)	(0.323)	(0.296)
Population density	0.002	0.002	0.002	-0.002	-0.002	-0.002
	(0.302)	(0.300)	(0.298)	(0.390)	(0.386)	(0.390)
Unemployment rate	0.319***	0.319***	0.319***	0.048	0.048	0.049
	(0.000)	(0.000)	(0.000)	(0.338)	(0.346)	(0.330)
Share transfer recipients	-0.091*	-0.096*	-0.096*	0.006	0.005	0.009
	(0.096)	(0.083)	(0.086)	(0.846)	(0.872)	(0.785)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. variable	6.128	6.128	6.128	6.136	6.136	6.136
R^2	0.657	0.657	0.657	0.691	0.691	0.691
N	1888	1888	1888	1888	1888	1888

Notes: OLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

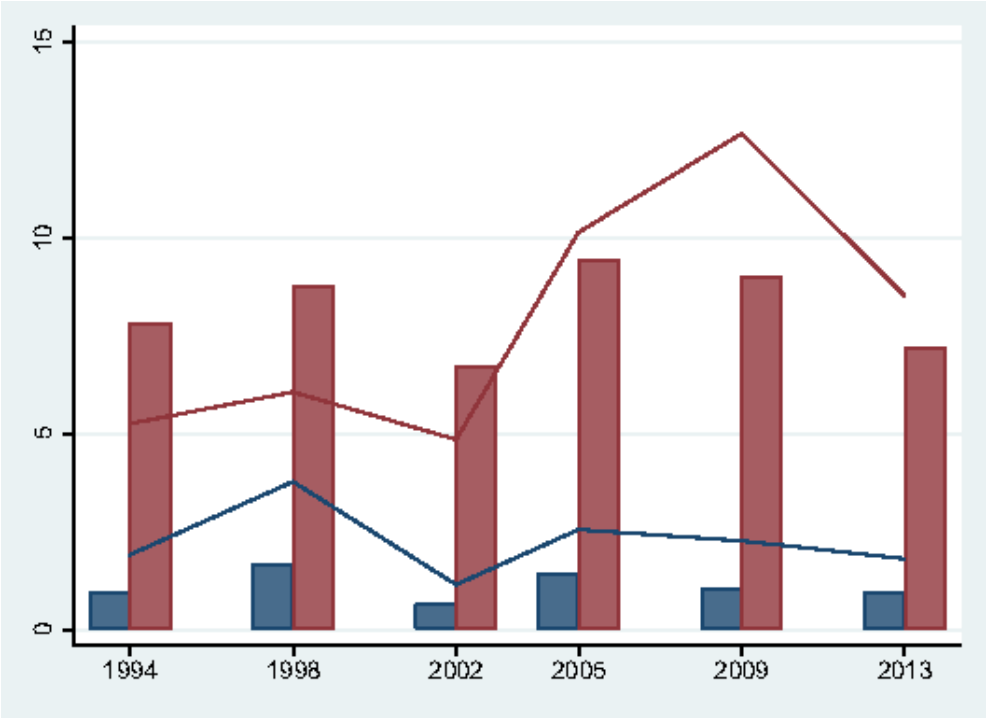
Table A8: 2SLS - Effect of Inequality within Regions on Voting Outcomes for Extremists at State Elections, 1990-2014

Dep. variable	**Vote share of leftist parties**			**Vote share of nationalist parties**		
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	-10.748			-10.548		
	(0.704)			(0.705)		
Median gap		10.467			10.039	
		(0.660)			(0.650)	
Poverty gap			19.974			19.609
			(0.720)			(0.717)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	Yes	Yes	Yes	Yes	Yes	Yes
Weak ID test	0.16	0.28	0.16	0.16	0.28	0.16
N	1888	1888	1888	1888	1888	1888

Notes: 2SLS estimation. Standard errors clustered at the county level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level. Weak ID test shows the Kleibergen-Paap F statistic for a weak identification test. The Stock-Yogo critical values are 16.38 (at 10%), 8.96 (at 15%), 6.66 (at 20%), and 5.53 (at 25%).

B. Additional Figures

Figure B1: Average Support of Extremist Parties at Federal Elections, 1994-2013



Note: Average vote shares of extremist parties at federal elections in German counties. Bottom-blue (upper-red) line indicates average vote shares of nationalist (leftist) parties, bottom-blue (upper-red) bars indicate standard deviations.

Figure B2: Instrument Strength (First Stage Regression)