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Economic Deprivation and Radical Voting: Evidence from Germany*

Abstract

This paper studies the impact of economic deprivation on radical voting. Using a unique dataset covering different indicators of economic deprivation as well as federal election outcomes at the county-level in Germany for the period from 1998 to 2017, we examine whether economic deprivation affects the share of votes for radical right and left-wing parties using instrumental variable estimation. Our results suggest that an increase in economic deprivation has a sizeable effect on the support for radical parties at both ends of the political spectrum. The higher a county's rate of relative poverty, the average shortfall from the national median income, and the poverty line, the higher the vote share of radical right-wing and left-wing parties. We also provide evidence that regional variation in economic deprivation gave rise to the electoral success of the populist right-wing party AfD in the federal election of 2017. Our findings thus indicate that a rise in economic deprivation may undermine moderate political forces and be a threat to political stability.

JEL code: I32, D31, D73

Keywords: Economic deprivation, inequality, political polarization, radical voting, Germany

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1 Introduction

Over the past decades, economic inequality as well as the share of people suffering from (relative) economic deprivation has increased in many industrialized countries. 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 economic deprivation jeopardizes social cohesion and nourishes radical and populist political movements. The economic pressure experienced by certain groups in society is widely believed to fuel resentment against mainstream political parties as well as the political order itself. Many pundits link the increase in economic deprivation to the emergence of populist movements and the surge in public support for radical parties in Europe and other parts of the world: *Syriza* in Greece, *Podemos* in Spain, *MoVimento-5-Stelle* (5-Star-Movement) and *Lega* in Italy, *Front National* in France, *Fidesz* in Hungary, the *Sverigedemokraterna* (Sweden Democrats) in Sweden, or the *Alternative für Deutschland* (Alternative for Germany; AfD) in Germany are only a few examples of parties at the far left and far right of the political spectrum that capitalize on growing economic insecurity and deprivation. Moreover, the rise in economic deprivation is believed to be one of the major sources of what has been labelled neo-nationalism – a political leaning that promotes nativism, opposition to immigration, and protectionism.

The available empirical evidence suggests that, in general, economic deprivation and support for radical views and parties are indeed correlated. Evidence on the causal relationship is scarce, though. Our paper contributes to the literature by examining the causal effect of economic deprivation on support for radical parties in Germany. To this end, we exploit regional variation in election outcomes as well as the prevalence and intensity of economic deprivation. More precisely, we estimate regressions linking the share of radical left-wing and right-wing votes to regional indicators of economic deprivation. We measure economic deprivation of regions' citizens relative to the national average (not inequality or relative deprivation within regions). To identify causal effects, we follow Boustan *et al.* (2013) and construct instruments for region-specific measures of economic deprivation that are exogenous to asymmetric economic developments, endogenous political reactions to the rise in the support for radical parties, as well as endogenous sorting of individuals into regions.

Our analysis is conducted at the county-level, corresponding to NUTS-3. In the main part of our analysis, we use data for the period from 1998 to 2017. In an extension, we restrict our focus to the federal elections held in 2017 and the vote share of the AfD, which is interesting for at least two reasons. First, the AfD is the first nationalist party represented in the German federal parliament with significant size since World War II. Second, survey

evidence indicates that AfD supporters -- unlike supporters of other radical right-wing parties in Germany -- do not differ in their socioeconomic characteristics from supporters of parties at the center of the political spectrum, like the Christian Democratic Party (CDU) or the Social Democratic Party (SPD), in terms of income, education, or employment status Bergmann *et al.* (e.g. 2017); Hansen and Olsen (e.g. 2019).

Germany is particularly well-suited to study the effect of regional economic deprivation on the support for radical parties. The multi-party system in Germany covers parties from the entire political spectrum, including far left-wing and far right-wing parties. Arguably, this constitutes an important advantage over studies that focus on countries where only few parties compete in elections, like the U.S. or U.K., as it facilitates the measurement of political polarization. Moreover, by using data on election outcomes, we observe the electorate's revealed support for radical parties. This is an advantage over studies that rely on survey data, which only include stated preferences, not real voting behavior.

Our findings suggest that economic deprivation has a statistically and economically significant effect on the vote share of radical parties. The higher the intensity of economic deprivation in a county -- measured by the average shortfall from the national median income (median gap), the poverty line (poverty gap), as well as the poverty rate -- the more successful are radical parties at the polls. For instance, if the poverty gap (median gap) increases by one percentage point (pp), the share of radical right-wing party votes rises, on average, by 1.2 (0.7) pp. This effect is even more pronounced when focusing on the AfD votes at the 2017 federal election. Here, a one pp increase in the poverty gap (median gap) leads to a rise in the AfD vote share by 4.9 (1.9) pp. This effect is more pronounced in East Germany compared to West Germany. Our results thus indicate that economic deprivation is an important determinant of the electoral success of radical right-wing parties in Germany. In contrast, our results for radical left-wing parties are more ambiguous in that they are sensitive to the definition of radical parties, and whether East or West German counties are examined.

How can these results be reconciled with the observation from survey evidence that AfD voters are not poorer, on average, than other voters ((Bergmann *et al.*, 2017; Hansen and Olsen, 2019))? One explanation is that middle or even upper class voters in counties with a high degree of deprivation vote for AfD because they perceive higher economic threat and fear for their status, not because they are poor.

The rest of the paper is organized as follows. In Section 2, we review the related literature, motivate the connection between economic deprivation and the support for radical parties, and explain our contribution. Section 3 describes our data. Section 4 provides some descriptive evidence on regional variation in economic deprivation and election outcomes in Germany. In Section 5, we explain our estimation strategy. Our results are presented in

Section 6. In Section 7, we examine the effect of economic deprivation on election outcomes of the radical party AfD in the federal election of 2017. Section 8 concludes.

2 Related Literature, Hypotheses, and Contribution

2.1 The Economics of Radical Voting

Economic conditions matter at the polls. In fact, among the various determinants of voting behavior scholars have been analyzing, economic circumstances are typically considered to be among the most important ones Fair (e.g. 1978); Lewis-Beck (e.g. 1990); Lewis-Beck and Stegmaier (e.g. 2000, 2013). Consequently, in an attempt to explain the increase in political polarization as well as the rising support for radical parties – especially nationalist ones – various Western countries have been experiencing over the past few years, many scholars focus on economic factors. Recent empirical studies have linked the rise in political radicalism and nationalist (including anti-immigration) sentiments to major macroeconomic trends and events, particularly economic globalization and its adverse consequences (Autor *et al.*, 2020; Colantone and Stanig, 2018; Dippel *et al.*, 2018; Malgouyres, 2017), growing economic insecurity (Algan *et al.*, 2017; Dal Bó *et al.*, 2018; Guiso *et al.*, 2017), the economic strains resulting from the financial and economic crisis (Funke *et al.*, 2016; Mian *et al.*, 2014), as well as rising economic inequality (Duca and Saving, 2016; Garand, 2010; Jesuit *et al.*, 2009; McCarty *et al.*, 2016; Voorheis *et al.*, 2015; Winkler, 2019).¹

Most approaches linking radical voting to inequality and economic deprivation emphasize the importance of *relative deprivation*. The concept of relative deprivation suggests that individual support for radical (political) views results from an unfavorable comparison with other members of society (Runciman, 1966; Runciman and Bagley, 1969). Plainly speaking, people tend to be more concerned about their relative standing in a society's income distribution than their absolute level of income. An unfavorable social comparison or the fear of social decline are believed to trigger feelings of anxiety and frustration - people are convinced that they are not getting what they are entitled to. Those feelings, in turn, may foster resentments against the political mainstream as well as the political system itself (Algan *et al.*, 2017; Dal Bó *et al.*, 2018; Mutz, 2018). An inclination toward such sentiments seems to make the economically deprived particularly responsive to the messages of radical political parties and movements. Radical and populist politicians try to appeal to voters

¹ A related literature strand links economic strain to anti-immigrations sentiments as well as right-wing extremist crime. See, for example, Becker *et al.* (2017), Guiso *et al.* (2017), Davis and Deole (2015), Billiet *et al.* (2014), Falk *et al.* (2011), Facchini and Mayda (2009), and Mayda (2006).

experiencing relative economic deprivation by posing as their advocates and discrediting mainstream political parties and political institutions (Mudde, 2007).

The traditional view is that economic deprivation translates into greater support for left-wing parties as they advocate redistributive policies and cater to the needs of those at the bottom of the income distribution (Meltzer and Richard, 1981; Romer, 1975). However, recent studies point out that economic deprivation can increase the popularity of right-wing parties as well. Aggeborn and Persson (2017) develop a theoretical model to explain why low-income voters are prone to support right-wing (populist) 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 generous refugee support systems, foreign aid, and environmental protection in favor of basic public services that mainly benefit the domestic population.

Other scholars emphasize that in a highly globalized world, the welfare state is constrained in its ability to redistribute resources and to raise taxes due to the danger of capital flight (Antràs *et al.*, 2017; Sinn, 2003). When redistribution becomes prohibitively costly, protectionist views and hostile attitudes toward globalization may become particularly popular among voters suffering from economic deprivation. As Colantone and Stanig (2018, p.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, radical right-wing parties may have a particularly great appeal to voters suffering from economic deprivation.

2.2 Empirical Evidence on the Association between Deprivation and Polarization

Existing empirical evidence appears to support the conjecture that indicators related to economic deprivation such as unemployment, a low income level, and economic inequality are positively related to political polarization and the support for radical parties.² Duca and Saving (2016), Garand (2010), and McCarty *et al.* (2016) for the U.S., Guiso *et al.* (2017) and Jesuit *et al.* (2009) for samples of European countries, Lubbers and Scheepers (2001) for Germany, as well as Dal Bó *et al.* (2018) and Rydgren and Ruth (2011) for Sweden are just a few of the studies that document such an empirical relationship.

² Some scholars argue that unemployed people, lower skilled workers and the ‘old middle class’ are particularly affected by economic insecurity and perceptions of relative economic deprivation (Dal Bó *et al.*, 2018; Inglehart and Norris, 2017; Rydgren, 2007).

However, the bulk of the empirical literature analyses statistical correlations. Causal evidence on the effect of economic deprivation on political polarization or radical voting is scarce. To the best of our knowledge, the only studies that employ a credible identification strategy to estimate the causal impact of indicators of economic deprivation on the support for radical parties and political polarization are Voorheis *et al.* (2015), Algan *et al.* (2017), and Winkler (2019).

Voorheis *et al.* (2015) and Winkler (2019) adopt the instrumental variable approach proposed by Boustan *et al.* (2013) that is also used in the present paper and explained in detail below. Voorheis *et al.* (2015) use data on the degree of political polarization in U.S. state legislatures and state-level data on income inequality covering the years from 2005 to 2011. The authors report a positive effect of income inequality on political polarization. Winkler (2019) uses survey data from different European countries aggregated at different NUTS levels covering the period from 2002 and 2014. The evidence he provides suggests that an increase in inequality within a region increases the share of people supporting extreme left-wing parties. In contrast, an increase in inequality increases the support for extreme right-wing parties only among older voters. Algan *et al.* (2017) use data from European countries at the NUTS-2 level for the period from 2000 to 2016 and examine the effect of crises-driven increases in regional unemployment on vote shares for anti-establishment parties. The authors use regional variation in the pre-crisis share of real estate and housing construction as instrument for regional unemployment. Their estimates suggest that a crisis-induced rise in unemployment increases vote shares of anti-establishment parties, especially populist ones.

Our paper contributes to the literature in several ways. First, by focusing on German counties (corresponding to the NUTS-3 level), this paper uses data collected at a much more granular regional level than the literature cited above. In Germany, there are currently more than 400 counties with, on average, roughly 170,000 inhabitants. Exploiting variation at such a highly disaggregated regional level increases both our sample size as well as the variation in our measures of economic deprivation and, thus, the power of the statistical tests we perform. Second, most of the studies listed above use survey data to study the association between economic deprivation and political polarization. In contrast, we assess the support for radical parties using data on election outcomes and, thus, capture the electorate's revealed (and not stated) political preferences. Third, many studies utilize data from the U.S. Due to its two-party system, it is rather tedious to measure the degree of political polarization in the U.S. The multi-party system in Germany covers parties from the entire political spectrum, including parties at the far right and the far left. This facilitates the measurement of political polarization.³ Fourth, our sample period covers two decades and,

³ Studies with a focus on the U.S. typically rely on DW-nominate scores to measure the degree political polarization within U.S. politics. DW-nominate scores represent measures of the distance between

thus, a considerably larger time span than the studies discussed above. This is particularly important because the degree of economic deprivation typically changes only slowly over time. Finally, in our empirical analysis, we employ different measures of regional economic deprivation, that is, the poverty rate, the poverty gap, as well as the median gap, which has not been done before.

3 Data Description

To study the influence of economic deprivation on electoral outcomes, we construct a unique panel dataset covering more than 400 counties in Germany. Our dataset combines county-specific measures of economic deprivation and outcomes of federal elections that took place between 1998 and 2017. During this period, federal elections were held six times; in 1998, 2002, 2005, 2009, 2013, and 2017. Due to territorial reforms, the number of counties varies across our sample period. Therefore, our panel dataset is slightly unbalanced. To construct our variables of main interest, we mainly rely on two sources. Regional measures of economic deprivation 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*).

3.1 The German Microcensus

The Microcensus is a household survey 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 one percent-sample of the German population, resulting in a sample size of more than 800,000 persons in almost 400,000 households per year. The sample is representative at the regional level. The Microcensus contains information on various demographic characteristics, including the county of residence, employment status, household size, the age of all household members, and household income. For our analysis, we use the waves from 1991 to 2017.

Besides the large number of variables, one major advantage of the Microcensus is its large sample size, which allows us to construct indicators of economic deprivation at the regional level. Moreover, the Microcensus is administered by a federal agency and there is a legal obligation to answer the questions. Hence, item-non-response is not an issue. Also, answers

legislators. These scores indicate how similar or different, respectively, the voting records of legislators are. DW-nominate scores are not without criticism. Only recently, the political science journal *Studies in American Political Development* has devoted a special issue on the advantages and disadvantages of the DW-nominate scores. See *Studies in American Political Development*, Vol. 30, Issue 2, 2016.

must be truthful and complete. This makes the Microcensus well-suited to study economic deprivation at the county-level in Germany.

To construct our measures of economic deprivation, 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. However, the width of the income classes are 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 apply an imputation approach. 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 and that the income figure computed for each household lies within the borders of the income household's income class (see Royston, 2007).

3.2 Indicators of Economic Deprivation

A large literature suggests that concerns about personal economic well-being determine preferences for redistribution and protectionism and thereby voting behavior (cf. Section 2). When focusing on federal elections, we thus expect that an individual's position in the national income distribution is decisive for her vote. This implies that a regionally aggregated measure of economic deprivation should indicate how residents residing in a county compare to the national average.

In our empirical analysis, we employ three different indicators of economic deprivation that account for the relative economic well-being of a county's citizens compared to the national average. Our first indicator is the poverty rate, i.e., the share of households in a county with an income below the national poverty line $z_{pov,t}^{nat}$. As it is common, we set the poverty line equal to 60 percent of the national median income $z_{50,t}^{nat}$, so that $z_{pov,t}^{nat} = 0.6 \times z_{50,t}^{nat}$.

Our second indicator of economic deprivation is the poverty gap, which is defined as the average shortfall from the national poverty line:

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

Here, n_{it} is the number of households in county i and year t that are included in the Microcensus data, q is the number of households with an income below the poverty line, and y_{ijt} is the income of household j .

Our third measure of relative economic deprivation is constructed in a similar fashion, but measures the average shortfall from the national median income (instead of the poverty line). We refer to this measure as the median gap. It is constructed as follows:

$$\text{Median gap}_{it} = 100 \frac{1}{n_{it}} \sum_{j=1}^r \frac{z_{50,t}^{\text{nat}} - y_{ijt}}{z_{50,t}^{\text{nat}}} \quad (2)$$

r refers to the number of households in a county with an income below the national median income, while the other variables in equation (2) are defined as above.

3.3 The German Electoral System and the Definition of Radical Parties

The electoral system in Germany is based on proportional representation and multiple parties run for elections. Since those parties cover the entire political spectrum from the far left to the far right, Germany is a particularly interesting country to study the association between economic deprivation and support for radical parties. At federal elections in Germany, voters have two votes: The first vote (*Erststimme*) is for a local candidate whom 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 mainly interested in the vote shares of radical left-wing and radical right-wing parties in the federal elections held between 1998 and 2017. We consider parties to be radical in case the party or a subgroup of party members have been under surveillance of the German Federal Office for the Protection of the Constitution (*Bundesverfassungsschutz*) or its state-level equivalents (*Landesverfassungsschutz*).⁶ Parties or party members are put under surveillance if they impose an imminent threat to the free democratic basic order. Table 1

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 since 1990, this occurred only once in 1994, when four candidates of the leftist 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 percent vote share of second votes.

⁶ We also define parties as radical if they cooperate in elections with other parties that are monitored by the German Federal Office for the Protection of the Constitution or its state-level equivalents.

provides a list of parties that we label radical right-wing and radical left-wing, respectively. The marks indicate in which federal elections the parties ran.

Table 1: Radical Parties at Federal Elections in Germany, 1998–2017

	Federal Elections in Germany					
	1998	2002	2005	2009	2013	2017
<i>Radical Right-Wing Parties</i>						
ADM				X		
AfD					X	X
BfB*	X					
Büso	X	X	X	X	X	X
Die RECHTE*					X	X
DM						X
DVU*	X			X		
NPD*	X	X	X	X	X	X
Pro Deutschland*					X	
REP (Republikaner)*	X	X	X	X	X	
Volksabstimmung*	X		X	X	X	X
50plus			X			
<i>Radical Left-Wing Parties</i>						
Die LINKE (PDS)	X	X	X	X	X	X
DKP*				X		X
KPD*		X				
MLPD*	X		X	X	X	X
SGP*	X		X	X	X	X

Notes: *indicates parties also included in the narrow definition.

Abbr.: ADM (Allianz der Mitte), AfD (Alternative für Deutschland), BfB (Bund freier Bürger), Büso (Bürgerrechtsbewegung Solidarität), DM (Deutsche Mitte), DVU (Deutsche Volkunion), NPD (Nationaldemokratische Partei Deutschlands), PDS (Partei des Demokratischen Sozialismus), DKP (Deutsche Kommunistische Partei), KPD (Kommunistische Partei Deutschlands), MLPD (Marxistisch-Leninistische Partei Deutschlands), SGP (Sozialistische Gleichheitspartei).

Our list of radical left-wing parties includes five parties. The Left Party (*Die Linke*), which was founded in 2007 when the Party of Democratic Socialism (PDS)⁷ and the Electoral Alternative for Labour and Social Justice (WASG) merged, is the most popular leftist party in Germany and regularly represented in the German federal parliament (*Deutscher Bundestag*).⁸ Besides the Left Party (*Die Linke*), there are several small radical left-wing

⁷ 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.

⁸ 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.

parties, but none of those has ever passed the five percent election threshold during our sample period. Small radical parties on the far 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 the Trotskyist oriented Party for Socialist Equality (SGP).

On the far right, twelve parties ran in German federal elections since 1998. The populist party Alternative for Germany (*Alternative für Deutschland*, AfD) is the most successful radical right-wing party in Germany since 1945. The AfD started to run for elections in 2013 and entered the European parliament one year later, i.e., in 2014. However, despite its Euro-skepticism, the AfD was not a radical right-wing party in its early years, but rather a conservative, market-liberal party (see Arzheimer, 2015; Schmitt-Beck, 2017). Since 2015, however, the AfD became more and more radical after several leading moderate politicians left the party. The nationalist and radical fraction took over power and clearly favored anti-immigration policies, emphasized German nationalism, and provoked distrust in the political order. This new radical right-wing party was successful in several state elections held in 2015 and 2016. In 2017, the AfD entered the German federal parliament for the first time. The AfD received a vote share of 12.6 percent and became the third largest party in parliament.

Besides the AfD, there are eleven other radical right-wing parties, the most prominent ones being the National Democratic Party of Germany (NPD), the German People's Union (DVU; merged with NPD in 2011), and the Republicans (REP). While none of these parties was ever represented in the federal parliament, they do have regional strongholds and entered some state parliaments in the past. Moreover, the NPD has won a seat in the European parliament in 2014, after the three percent threshold was removed by the Federal Constitutional Court of Germany. Besides AfD, NPD, DVU, and REP, there is a number of other radical right-wing parties that ran for federal elections during our sample period, such as the nationalist Union of Free Citizens (BfB), the Right Party (*Die Rechte*), Pro Germany (*Pro Deutschland*), the party Popular Referendum (*Volksabstimmung*), and the Civil Rights Movements Solidarity (BüSo).⁹

To test the sensitivity of our results with regard to the definition of radical parties, we also employ a narrow definition. In the narrow definition, we only label a party radical in case the party as a whole is under surveillance of the Office for the Protection of the Constitution. This reduces the number of radical right-wing parties from twelve to seven and the number of radical left-wing parties from five to four. Note that the two largest radical parties, i.e., the Left Party (*Die Linke*) and the AfD, are excluded from the narrow definition.

⁹ Note that many scholars studying right-wing extremism in Germany only include the AfD, NPD, DVU, and REP to their lists of radical right-wing parties, as they are the largest ones.

As a further robustness test, we also estimate the impact of relative economic deprivation on the vote shares of established parties. Our definition of established parties includes the Social Democratic Party (SPD), the Green Party (*Bündnis90/Die Grünen*), the Christian Democratic Party (CDU/CSU), and the Free Democratic Party (FDP). During our sample period, each of these four parties was a coalition member of the federal government for at least one legislative period.

3.4 Control Variables

In our empirical analysis, we include several control variables describing the demographic and economic situation in a county. We control for the population share of different age groups, population density, the unemployment rate, the share of recipients of social transfers, the shares of graduates from different schooling tracks (no degree (reference category), lower secondary degree (*Hauptschule*), intermediate secondary degree (*Realschule*), higher secondary degree (*Gymnasium*)), and the share of foreigners. Population density figures 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 taken from the German Regional Database (*Regionaldatenbank Deutschland*) as well as the statistical offices of the German states (*Statistische Landesämter*). Information on school graduates comes from the Federal Statistical Office (*Statistisches Bundesamt*). The remaining control variables are calculated based on individual responses from the German Microcensus (see Section 3.1).

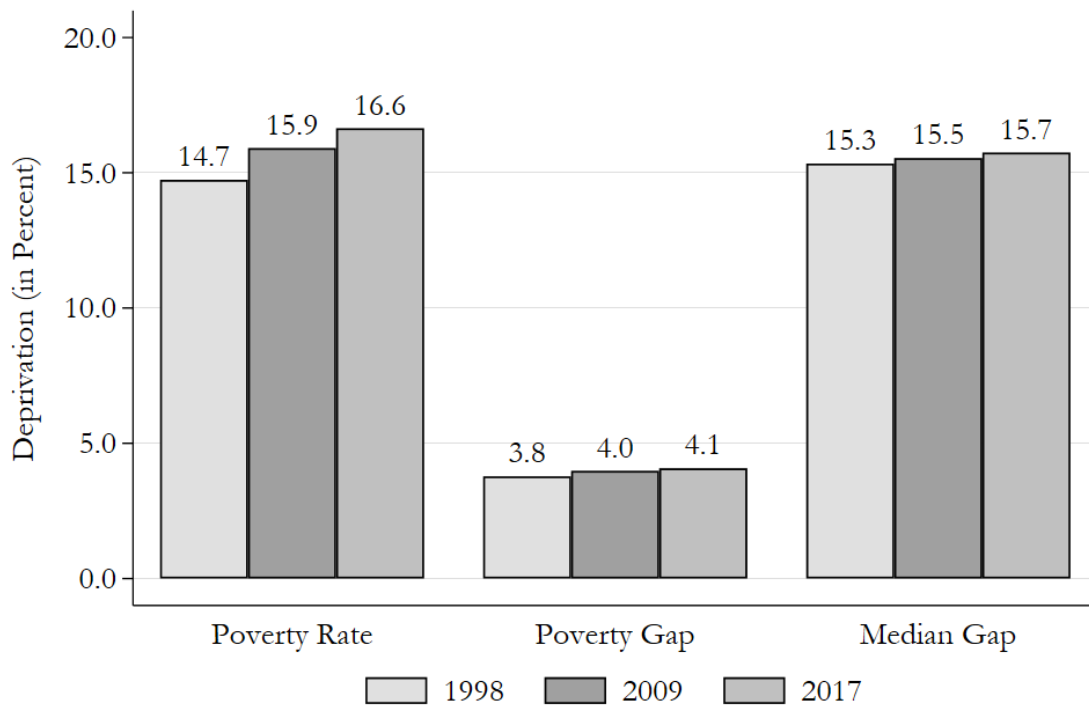
4 Descriptive Statistics

4.1 Regional Variation in Economic Deprivation

Figure 1 illustrates how the average realizations of the economic deprivation indicators developed over the past 20 years. Between 1998 and 2017, the average degree of relative economic deprivation at the county-level in Germany increased slightly. The share of households with an income below the poverty line grew from 14.7 percent in 1998 to 16.7 percent in 2017. Similarly, the average shortfall from the poverty line (median income), that is, the poverty gap (median gap), rose from 3.8 (15.3) percent to 4.1 (15.8) percent.

Figure 2 shows the realizations of the poverty rate in 1998, 2009, and 2017 at the county-level. The figure reveals that the extent of economic deprivation varies considerably across regions. Particularly pronounced are the differences between West and East German

Figure 1: Economic Deprivation over Time



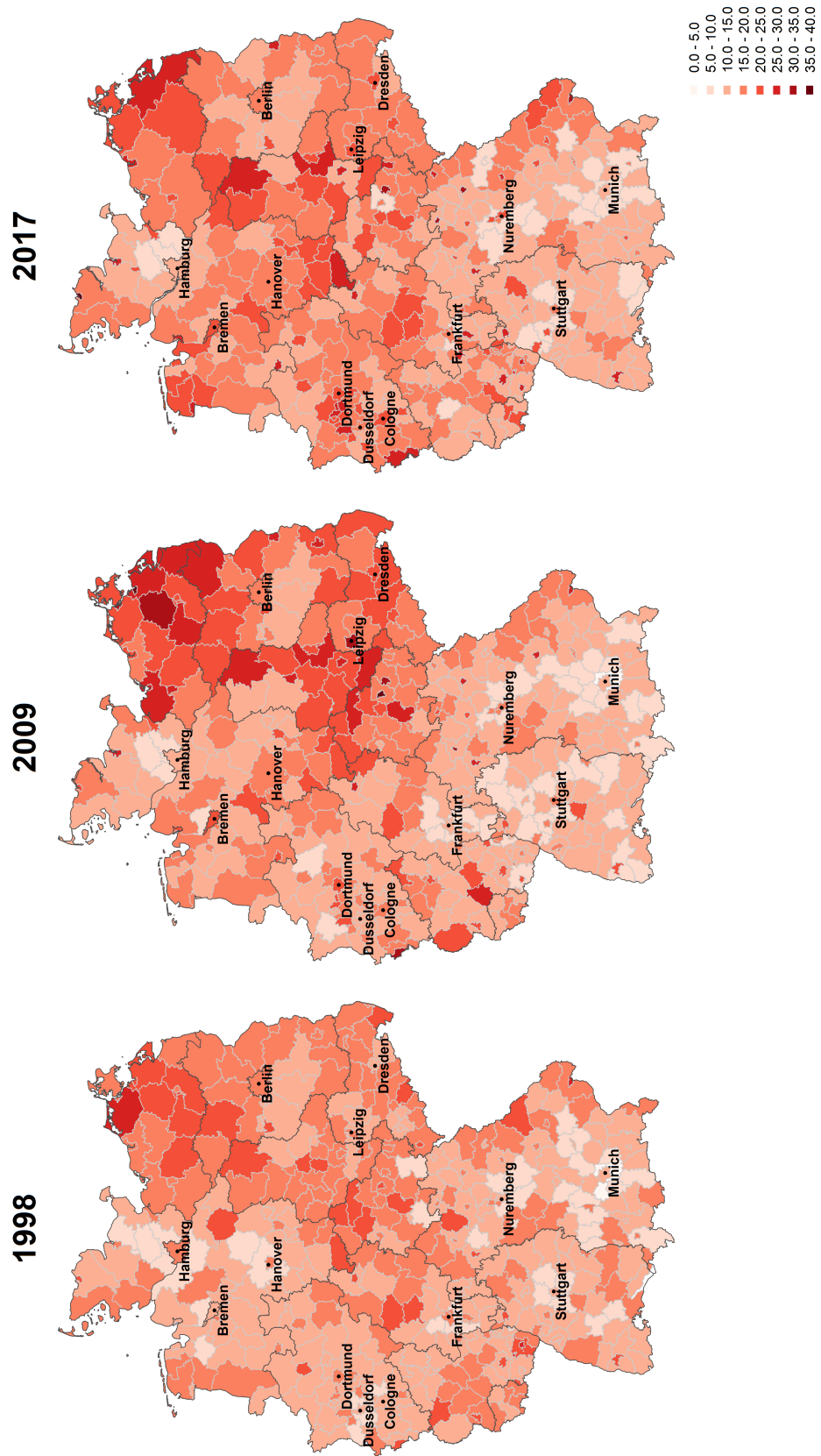
counties as well as between North and South. Interestingly, it appears that the differences between West and East Germany became smaller over time, while the North/South divide grew.

4.2 Support for Radical Parties

Figure 3 shows the average vote shares of radical right-wing and left-wing parties at the federal elections held between 1998 and 2017. Until 2017, radical left-wing parties have consistently been more successful at the polls than radical right-wing parties. This is mainly due to the popularity of the socialist Left Party and its predecessor, the PDS, in East Germany, where these parties have managed to always receive roughly one fifth of the votes. Many pundits link the noticeable jump in the average vote share of radical left-wing parties at the 2005 federal election to the so-called Hartz reforms, which led to a liberalization of the German labor market and were implemented by the left-wing coalition government consisting of the SPD and the Green Party. This resulted in many voters turning away from the SPD and Green Party and turning to the Left Party.

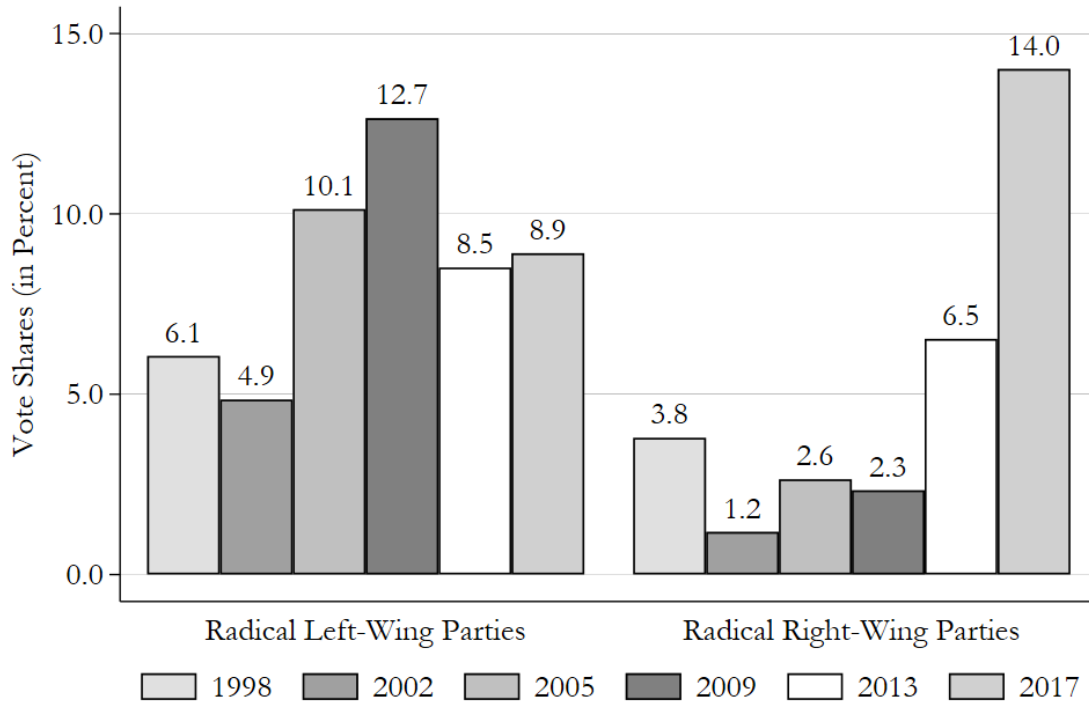
In 2013, however, there has been a notable rise in the share of votes for radical right-wing parties, which is entirely driven by the success of the newly founded right-wing populist party AfD. The AfD was founded in April 2013 to oppose German federal policies

Figure 2: Poverty Rate of German Counties between 1998 and 2017



Notes: This figure shows the poverty rate across counties for 1998, 2009, and 2017. The poverty rate is measured in percent.

Figure 3: Average Vote Shares in German Counties



concerning the eurozone crisis and just missed the five percent election threshold in 2013. In 2017, the AfD received 12.6 percent of the votes and became the third-largest party in the federal parliament, having completed the turn from a Eurosceptical conservative party to a radical right-wing party favoring anti-immigration policies.

Thus, whereas in 1998 the combined county vote shares of radical right- und left-wing parties was on average 9.9 percent, it more than doubled to 22.9 percent in 2017. However, these averages conceal substantial differences in voting outcomes between East and West Germany. East German counties exhibit considerably larger vote shares for radical parties. This is not only due to the success of the Left Party (*Die Linke*), but also the AfD enjoys greater popularity in the East than in the West. In 2017, the average vote share of radical left-wing (right-wing) parties was 17.2 (23.4) percent in East German counties and 7.0 (11.8) percent in West German counties (see Figure A1 in the appendix).

5 Empirical Approach

To study the association between economic deprivation and support for radical parties, we estimate the following empirical panel data model:

$$Y_{it} = \alpha_i + \beta Deprivation_{it} + \gamma X_{it} + \delta_t + \varepsilon_{it} \quad (3)$$

Index i refers to the county and index t to the year of the federal election. Our sample covers six federal elections: 1998, 2002, 2005, 2009, 2013, and 2017. We use two dependent variables in our empirical model (see Section 3.3): the vote share of radical right-wing parties and the vote share of radical left-wing parties. $Deprivation_{it}$ is a measure of regional economic deprivation. We consecutively employ three deprivation measures: (i) the poverty rate, (ii) the poverty gap and (iii) the median gap (see Section 3.2). The vector X_{it} includes the control variables described in Section 3.4. Finally, α_i is a county-fixed effect that is included to account for time-invariant regional-specific factors related to economic conditions and δ_t is a year-fixed effect included to capture the effect of nation-wide events.

Identifying the causal effect of economic deprivation 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 based on their economic situation may also occur due to regional differences in labor market conditions, housing prices, and costs of living. All those factors could also be related to election outcomes, implying that omitting them from the regression would lead to biased estimates when using OLS to identify the parameters of Equation (3). Unfortunately, the data we would need to control for those factors are typically not available at the county-level, and neither are suitable proxy variables. Furthermore, there are a number of regional characteristics that are potentially correlated with both regional economic deprivation 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.

To address concerns regarding biased OLS estimates due to the endogeneity of our covariates, we construct instrument variables for our deprivation measures that are similar to the instrument proposed by Boustan *et al.* (2013). The construction proceeds in four steps. In step one, we compute the average household income for each income percentile of the national income distribution and for all survey years (i.e., 1991-2017). In the second step, we compute percentile-specific annual national income growth rates for each survey year. In step three, we focus on household incomes in a base year, determine to which percentile of the national income distribution each household in that base year belongs, and multiply each household's income with the percentile-specific annual national income growth rates. That way, we obtain a time-series of hypothetical incomes for each household

that we observe in the base year. In the final step, we use these hypothetical incomes to compute counterfactual economic deprivation measures which we then use as instruments for the actual realizations of the regional deprivation measures.

The counterfactual deprivation measures indicate how regional economic deprivation 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 or asymmetric economic and political developments (Boustan *et al.*, 2013). The cross-sectional variation in our instruments stems entirely from the variation in the base year's income distribution, whereas the time-variation comes from the percentile-specific income growth rate at the national level.

The results of our first-stage IV regressions demonstrate that the instruments are highly relevant. The coefficients of all instrumental variables are highly significant with coefficient estimates that are close to unity.¹⁰ The relevance of our instruments is further indicated by the Cragg-Donald F statistics for exclusion restriction tests, which are far larger than the critical values proposed by Stock and Yogo (2005) (cf. Section 6.2).

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) decreased from 215 to 111. For this reason, we are forced to use 1997 as our base year for the construction of our instruments for East German counties. For West Germany, our base year for the constructions of the instrumental variables is 1991.

6 Results

6.1 Baseline Specification

We start with the results of OLS estimation, which are presented in Table 2. The left panel shows the results for radical left-wing parties, the right panel for radical right-wing parties.

The estimates reveal a statistically significant relationship between the level of economic deprivation in a county and the vote share of radical left-wing parties. The estimated effects

¹⁰ Results available on request.

Table 2: Support for Radical Parties - OLS Estimates

	Radical Left-Wing Parties			Radical Right-Wing Parties		
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rate	0.062*** [0.007]			0.013 [0.455]		
Poverty Gap		0.152** [0.016]			-0.008 [0.849]	
Median Gap			0.123*** [0.001]			-0.022 [0.428]
Unemployment	0.317*** [0.000]	0.325*** [0.000]	0.303*** [0.000]	-0.429*** [0.000]	-0.423*** [0.000]	-0.417*** [0.000]
Transfer Recipients	-0.002 [0.975]	0.007 [0.876]	-0.005 [0.909]	0.003 [0.935]	0.009 [0.781]	0.014 [0.678]
Population Density	7.242*** [0.000]	7.118*** [0.000]	7.180*** [0.000]	-7.336*** [0.000]	-7.435*** [0.000]	-7.482*** [0.000]
Age 15 - 24	0.237*** [0.000]	0.232*** [0.000]	0.236*** [0.000]	-0.420*** [0.000]	-0.417*** [0.000]	-0.416*** [0.000]
Age 25 - 34	0.202*** [0.000]	0.197*** [0.000]	0.206*** [0.000]	-0.271*** [0.000]	-0.268*** [0.000]	-0.268*** [0.000]
Age 35 - 44	0.178*** [0.006]	0.169*** [0.008]	0.183*** [0.005]	-0.257*** [0.000]	-0.259*** [0.000]	-0.262*** [0.000]
Age 45 - 54	0.167*** [0.001]	0.160*** [0.001]	0.179*** [0.001]	-0.228*** [0.000]	-0.230*** [0.000]	-0.234*** [0.000]
Age 55 - 64	0.077* [0.068]	0.069* [0.096]	0.085** [0.047]	-0.161*** [0.000]	-0.164*** [0.000]	-0.168*** [0.000]
Age 65+	0.110*** [0.007]	0.107*** [0.009]	0.111*** [0.007]	-0.207*** [0.000]	-0.207*** [0.000]	-0.207*** [0.000]
Schooling Lowest Track	0.049 [0.206]	0.053 [0.172]	0.051 [0.188]	0.104*** [0.000]	0.105*** [0.000]	0.105*** [0.000]
Schooling Interm. Track	-0.005 [0.892]	-0.004 [0.912]	-0.002 [0.946]	0.066** [0.016]	0.065** [0.017]	0.065** [0.018]
Schooling Highest Track	0.151*** [0.000]	0.151*** [0.000]	0.152*** [0.000]	0.033 [0.266]	0.033 [0.261]	0.033 [0.261]
Foreigners	0.185*** [0.010]	0.184** [0.010]	0.185*** [0.009]	0.028 [0.739]	0.030 [0.720]	0.031 [0.711]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	8.51	8.51	8.51	4.95	4.95	4.95
R ²	0.958	0.958	0.958	0.911	0.911	0.911
N	2510	2510	2510	2510	2510	2510

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level. Broad definition of radical parties.

are of modest size, though. The coefficient estimates suggest that a one pp increase in the poverty rate is associated with an increase in the share of votes for radical left-wing parties of 0.06 pp. In relation to the sample mean, this is equivalent to an increase in the vote share of 0.7 percent. For the poverty gap (median gap), the estimated effect of a one pp increase is 0.15 (0.12) pp, implying a 1.8 (1.5) percent increase in votes compared to the sample mean. In contrast, for radical right-wing parties, we do not detect any significant association between the share of votes these parties receive and our deprivation measures.

A glance at the coefficient estimates of the control variables reveals some interesting findings. An increase in the unemployment rate as well as population density is associated with an increase in the vote share of radical left-wing parties, but a decrease in the vote share of radical right-wing parties. The latter result suggests that right-wing parties are more popular in rural areas, which is well in line with anecdotal evidence. Older people appear to be less likely to vote for radical left-wing and radical right-wing parties, as suggested by the decrease in the magnitudes of the corresponding coefficient estimates. People with a low level of education show stronger support for radical right-wing parties, whereas highly educated people appear to be more likely to support radical left-wing parties. Interestingly, the share of foreigners is significantly positively related to the vote share of radical left-wing parties, but not significantly related to the share of votes for radical right-wing parties.

The OLS estimates should be interpreted with caution, though, as we cannot rule out that they are affected by confounding factors. Table 3 reports the results of the IV estimation where we instrument the actual realizations of our deprivation measures by measures that are computed based on counterfactual incomes. Again, the left panel shows the results for the share of votes for left-wing parties, the right panel for right-wing parties.

Comparing the IV estimates to the OLS estimates suggests that the OLS estimates are indeed severely biased. With regard to the vote share of radical left-wing parties, the results we obtain based on IV estimation are very different to the OLS results. We detect a significantly negative effect of the poverty rate on the vote share of radical left-wing parties. The effect is not huge, but not negligible either. I.e., a rise in the share of households with an income below the poverty line decreases the vote share of radical left-wing parties by 0.26 pp or about three percent of the sample mean, respectively. However, the coefficient estimates of the other two deprivation measures, that is, the poverty gap and the median gap, are not statistically different from zero at reasonable levels of significance. Note that it is unlikely that the insignificance of these deprivation measures is due to inefficient estimation, as the Cragg-Donald F statistics are far above the critical values of the weak instrument test by Stock and Yogo (2005).¹¹

¹¹ The critical values for the Stock-Yogo weak IV F-test are 16.38 (10 percent maximal IV size), 8.96 (15 percent), 6.66 (20 percent), and 5.53 (25 percent).

Table 3: Support for Radical Parties - IV Estimates

	Radical Left-Wing Parties			Radical Right-Wing Parties		
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rate	-0.261** [0.039]			0.496*** [0.000]		
Poverty Gap		0.213 [0.329]			1.243*** [0.000]	
Median Gap			0.050 [0.775]			0.683*** [0.003]
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	8.51	8.51	8.51	4.95	4.95	4.95
N	2510	2510	2510	2510	2510	2510
Cragg-Donald	56.37	98.48	44.98	56.37	98.48	44.48
Kleibergen-Paap	42.25	54.33	5.64	42.25	54.33	5.64

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level. Broad definition of radical parties.

In contrast, the IV estimates indicate that economic deprivation has a positive impact on the vote share of radical right-wing parties. The estimated effects are statistically significant even at the one percent level of significance and of relevant magnitude. According to the estimates, a one pp increase in the poverty rate leads to a rise in the vote share of radical right-wing parties by 0.5 pp. In relation to the sample mean, this implies an increase in the vote share by ten percent. The effects of an increase in the poverty gap and median gap are even larger. Here, a one pp increase leads to 1.24 and 0.68 pp higher vote shares, implying a 25 percent and 14 percent increase in votes, respectively. The fact that a change in the average shortfall from the poverty line has a larger effect on the share of radical right-wing votes than a change in the average shortfall from the median income suggests that people are more prone to support radical right-wing parties the more deprived they are.

6.2 Extensions and Robustness Checks

To test the robustness of our results, we modify our empirical specification in several ways. In a first robustness test, we apply a narrow definition of radical parties that includes only those parties that are entirely under the Office for the Protection of the Constitution's surveillance (cf. Section 3.3). With regard to radical left-wing parties, the only party included

in the broad definition, but excluded from the narrow definition, is the Left Party. Of the radical right-wing parties, five out of twelve do not meet the narrow definition, among them the AfD. The results of the IV approach are presented in Table A1 in the appendix.

For left-wing radical parties, we detect a positive effect of all three economic deprivation measures that is significant at every reasonable level of significance. It thus appears that in the baseline specification, the significant negative coefficient estimate for the poverty rate and the insignificant estimates for the poverty gap and median gap are entirely driven by the Left Party. The coefficient estimates indicate that a one pp increase in the poverty rate/poverty gap/median gap increases the share of radical left-wing votes by 0.03/0.12/0.06 pp, which implies an increase in the vote share by 50/200/100 percent. However, in light of the small vote share radical left-wing parties other than the Left Party received in federal elections, the effects are still far too small to have a meaningful impact. In contrast, the results we obtain for radical right-wing parties remain qualitatively unchanged when changing the definition of radical parties. The fact that the coefficient estimates become notably smaller compared to the baseline results is most likely due to the exclusion of five out of twelve parties when moving from the broad to the narrow definition, among them the AfD, the most popular right-wing party in recent years.

Second, we investigate how changes in economic deprivation affect the share of votes of established parties. The results are presented in Table A2 in the appendix. We detect a significantly negative effect of the poverty gap on the share of votes for established parties. The coefficient estimate of the median gap is negative as well, but just above the ten percent level of significance. It thus appears that the gain in votes for radical parties in response to an increase in economic deprivation comes to the expense of established parties.¹²

Third, we examine whether the effect of economic deprivation differs across West and East Germany. In Section 4, we highlighted that economic deprivation is much more prevalent in East Germany, although the West-East divide appears to have decreased over the past decades. At the same time, radical parties at both ends of the political spectrum enjoy greater popularity in East Germany than in West Germany. It is thus interesting to check whether the effect economic deprivation has on the vote share of radical parties varies across the two regions. To this end, we estimate separate coefficients for our deprivation measures across West and East German counties by including two dummy variables, i.e., one dummy that is equal to one for West German counties and one dummy that is equal to one for East German counties, and interacting these dummies with the deprivation measures. The results of the IV estimation are presented in Table 4.

¹² Further analyses suggest that the reduction in the combined vote share of established parties is primarily due to a reduction in the votes for the Social Democratic Party (SPD) and the Green Party, which both lean to the left. The results are available on request.

Table 4: Support for Radical Parties in West and East Germany - IV Estimates

	Radical Left-Wing Parties			Radical Right-Wing Parties		
	(1)	(2)	(3)	(4)	(5)	(6)
East × Poverty Rate	-0.556*			0.708***		
	[0.055]			[0.000]		
West × Poverty Rate	1.269			-0.605		
	[0.598]			[0.688]		
East × Poverty Gap		-0.113			1.084***	
		[0.660]			[0.000]	
West × Poverty Gap		0.920			1.590**	
		[0.225]			[0.040]	
East × Median Gap			-2.373			0.912*
			[0.123]			[0.060]
West × Median Gap			3.689			0.339
			[0.278]			[0.791]
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	8.51	8.51	8.51	4.95	4.95	4.95
N	2510	2510	2510	2510	2510	2510
Cragg-Donald	0.36	5.15	0.93	0.36	5.15	0.93
Kleibergen-Paap	0.20	3.21	0.49	0.20	3.21	0.49

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level. Broad definition of radical parties.

According to our estimates, an increase in the poverty gap has a somewhat stronger effect on the support for radical right-wing parties in West Germany than in East Germany. In West German counties, a one pp increase in the poverty gap leads to a 1.6 pp increase in the vote share for radical right-wing parties, compared to 1.1 pp in East German counties. However, for the poverty rate and the median gap, we only find significant coefficient estimates for East Germany.

Finally, we investigate whether the effect of deprivation on the support for radical parties varies across urban and rural areas. It is often argued that people living in rural areas are more prone to support radical parties, especially nationalistic ones. As before, we estimate separate coefficients by interacting the deprivation measures with two dummy variables, taking the value of one for urban or rural counties, respectively.¹³ Our results do not support

¹³ The classification of urban counties and rural counties is taken from the Federal Institute for Research on Building, Urban Affairs and Spatial Developments. Basis for the classification is the population density.

the conjecture that the effect economic deprivation has on the support for radical parties varies across urban and rural areas (see Table 5).

Table 5: Support for Radical Parties in Urban and Rural Counties - IV Estimates

	Radical Left-Wing Parties			Radical Right-Wing Parties		
	(1)	(2)	(3)	(4)	(5)	(6)
Rural × Poverty Rate	-0.282** [0.028]			0.504*** [0.000]		
Urban × Poverty Rate	-0.220* [0.095]			0.479*** [0.000]		
Rural × Poverty Gap		0.119 [0.583]			1.287*** [0.000]	
Urban × Poverty Gap		0.342 [0.138]			1.184*** [0.000]	
Rural × Median Gap			0.024 [0.894]			0.693*** [0.003]
Urban × Median Gap			0.084 [0.639]			0.670*** [0.005]
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	8.51	8.51	8.51	4.95	4.95	4.95
N	2510	2510	2510	2510	2510	2510
Cragg-Donald	28.16	49.33	22.50	28.16	49.33	22.50
Kleibergen-Paap	21.19	27.06	2.81	21.19	27.06	2.81

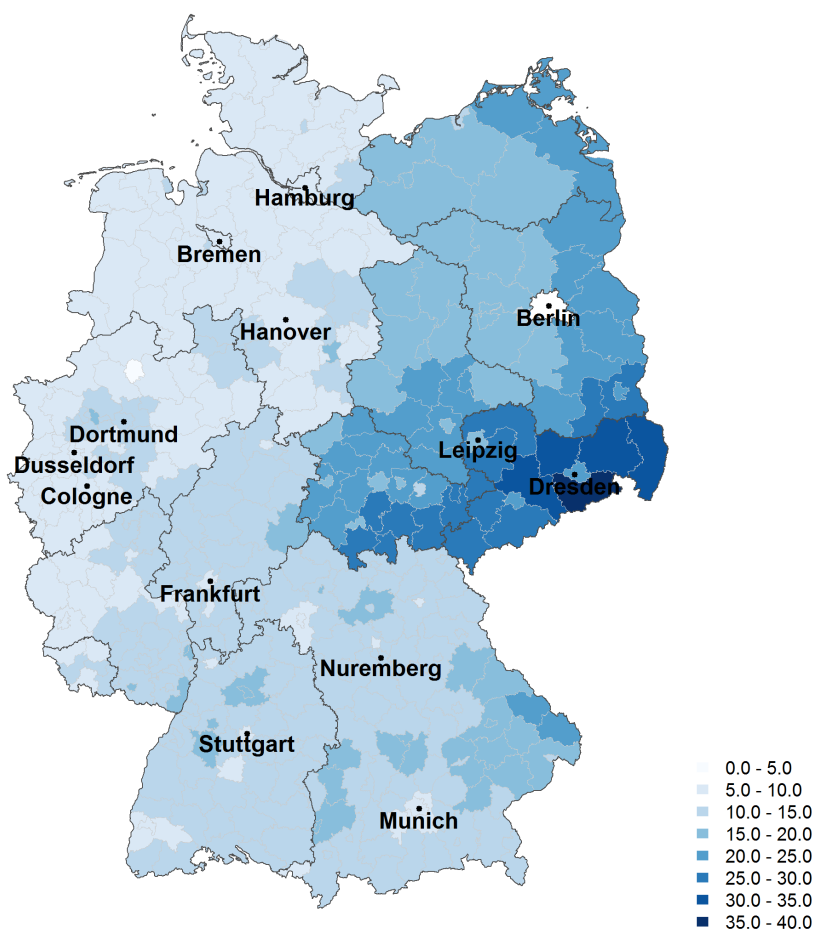
Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level. Broad definition of radical parties.

7 The 2017 Election and the Rise of the AfD

The federal election of 2017 marked a new era for the Federal Republic of Germany. For the first time since its foundation in 1949, a radical right-wing party with a nationalistic and xenophobic platform entered the federal parliament. Yet, the vote shares of the AfD were not distributed evenly across German regions. Figure 4 illustrates the regional distribution of AfD vote shares at the 2017 federal election.

The differences across German counties are quite remarkable: vote shares range from 4.9 percent in Münster (Northrhine-Westphalia) to 35.5 percent in Sächsische Schweiz -

Figure 4: AfD Vote Shares in 2017



Osterzgebirge (Saxony). Most striking are the differences in vote shares between East and West German counties. Whereas the population weighted county average in West Germany is 10.7 percent, it is 22.5 percent, i.e. about twice as high, in East Germany. Additionally, one can also discern regional discrepancies within East and West. In East Germany, vote shares are particularly high along the Polish and Czech border. In West Germany, vote shares are somewhat higher in the South than in the North; but, again, largest in economically weaker regions.

We examine whether and to what extent economic deprivation can explain the observed regional differences in AfD vote shares. For this purpose, we re-estimate our baseline empirical model, but employ the AfD vote share as the dependent variable and only utilize data from the federal election of 2017:

$$Y_{i2017} = \alpha_i + \beta \text{Deprivation}_{i2017} + \gamma X_{i2017} + \varepsilon_{i2017} \quad (4)$$

Table 6 shows the IV estimates. The results indicate that regional variation in economic deprivation influences the electoral success of the AfD in a statistically significant and sizeable way.

Table 6: AfD Vote Shares in German Counties - IV Estimates

	AfD Vote Shares		
	(1)	(2)	(3)
Poverty Rate	1.974*** [0.000]		
Poverty Gap		4.868*** [0.003]	
Median Gap			1.943*** [0.000]
Economic Controls	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes
Education	Yes	Yes	Yes
Mean Dep. Variable	13.41	13.41	13.41
N	396	396	396
Cragg-Donald	25.63	13.98	70.31
Kleibergen-Paap	21.43	12.18	54.33

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level.

According to our estimates, a one pp increase in the poverty rate leads, on average, to an increase in the AfD vote share by about 2.0 pp, which is equivalent to a 15 percent increase in votes in relation to the sample mean. An increase in the poverty gap has an even larger effect. If the poverty gap increases by one pp, the AfD vote share increases by almost 5.0 pp, which implies a 37 percent increase in votes. Thus, the effect of economic deprivation on the vote share of the AfD in the 2017 election is three to four times higher than the general effect of economic deprivation on voting for radical right-wing parties in all federal elections between 1998 and 2017 (see Section 6).

As before, we also estimate separate effects for West vs. East Germany and for urban vs. rural areas. The results suggest that the average effect conceals important regional differences. I.e., we find that the effect of economic deprivation on the AfD vote share is about three times larger in East German counties than in West German counties (cf. Table A3 in the appendix). In contrast, the effect of economic deprivation on vote shares of all radical right-wing parties is more similar between East and West German counties (see Section 6). However, we again do not detect any heterogenous effects between rural and urban counties (cf. Table A4 in the appendix).

But how can these findings be reconciled with survey evidence suggesting that AfD supporters do not differ from supporters of established parties in terms of income and other socio-demographic characteristics (Bergmann *et al.*, 2017; Hansen and Olsen, 2019)? One possible explanation is that the extent of economic deprivation in a region does not only strengthen the AfD's popularity among the economically deprived, but also among voters from other income groups. There are at least two potential reasons for such a relationship. First, a high level of economic deprivation in close regional proximity may increase economic anxiety among middle and high-income earners, as well as the perceived risk of social decline. Economic anxiety, in turn, is found to be an important determinant of the popularity of populist parties (Algan *et al.*, 2017; Guiso *et al.*, 2017). Second, middle and high-income earners may not only care about their own economic situation, but also about the economic conditions in the region in which they are living. A high level of economic deprivation may thus increase dissatisfaction with the political mainstream and make middle and high-income earner more prone to support the populist platform on which the AfD runs.

8 Conclusion

Arguably, two of the major challenges many industrialized countries have been facing over the past few years are the increase in relative economic deprivation and growing political polarization. Many observers argue that these two phenomena are closely linked, blaming the relative economic deprivation many people experience to be a main factor driving the increasing popularity of radical parties and movements around the world. This paper explores whether economic deprivation influences the support for radical parties in a causal way. Using data from Germany, we employ instrumental variable estimation to study the effect of economic deprivation on the share of votes radical left-wing and right-wing parties received in federal elections. Our analysis is conducted at the county-level (NUTS-3) and covers six federal elections held between 1998 and 2017.

The empirical results suggest that regional economic deprivation has a causal and sizeable effect on vote shares of radical parties. This effect is particularly pronounced for radical right-wing parties. I.e., the greater the prevalence of (relative) poverty, the greater the success of nationalistic parties at the polls. Moreover, our results suggest that relative economic deprivation was an important determinant of the electoral success of the AfD (Alternative for Germany), the new nationalist party in Germany, in the federal election of 2017. All in all, our findings provide evidence that the prevalence of relative economic deprivation is an important driver of political polarization, the rise of radical parties and

populist movements, and may thus undermine moderate political forces and ultimately threaten political stability.

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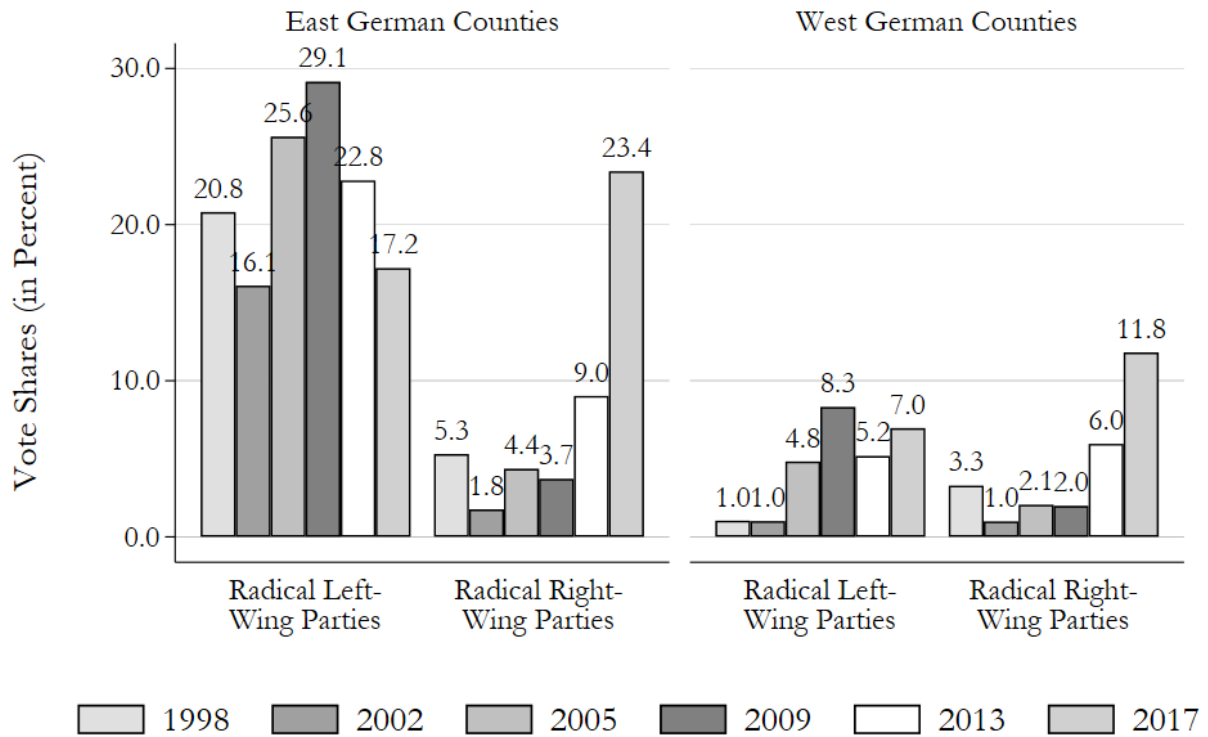
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Appendix

Figure A1: Radical Vote Shares in East and West German Counties



Notes: Vote shares are measures in percent

Table A1: Support for Radical Parties (Narrow Definition) - IV Estimates

	Radical Left-Wing Parties			Radical Right-Wing Parties		
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rate	0.032*** [0.000]			0.039 [0.321]		
Poverty Gap		0.116*** [0.000]			0.178** [0.019]	
Median Gap			0.064*** [0.000]			0.189*** [0.001]
Economic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	0.06	0.06	0.06	2.02	2.02	2.02
N	2510	2510	2510	2510	2510	2510
Cragg-Donald	56.37	98.48	44.98	56.37	98.48	44.98
Kleibergen-Paap	42.25	54.33	5.64	42.25	54.33	5.64

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level. Narrow definition of radical parties.

Table A2: Established Parties - IV Estimates

	Established Parties		
	(1)	(2)	(3)
Poverty Rate	0.076 [0.567]		
Poverty Gap		-0.810*** [0.001]	
Median Gap			-0.234 [0.110]
Economic Controls	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes
Education	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Mean Dep. Variable	83.45	83.45	83.45
N	2510	2510	2510
Cragg-Donald	56.37	98.48	44.98
Kleibergen-Paap	42.25	54.33	5.64

Notes: p-values in brackets; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; standard errors are clustered at the county-level. Broad definition of radical parties.

Table A3: AfD Vote Shares in East and West German Counties - IV Estimates

	AfD Vote Shares		
	(1)	(2)	(3)
East × Poverty Rate	1.030*** [0.000]		
West × Poverty Rate	0.390* [0.051]		
East × Poverty Gap		3.811*** [0.000]	
West × Poverty Gap		1.238 [0.182]	
East × Median Gap			0.946*** [0.000]
West × Median Gap			0.291 [0.139]
Economic Controls	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes
Education	Yes	Yes	Yes
Mean Dep. Variable	13.41	13.41	13.41
N	396	396	396
Cragg-Donald	17.75	7.36	37.35
Kleibergen-Paap	14.03	5.47	26.91

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level.

Table A4: AfD Vote Shares in Urban and Rural German Counties - IV Estimates

	AfD Vote Shares		
	(1)	(2)	(3)
Rural \times Poverty Rate	2.025*** [0.000]		
Urban \times Poverty Rate	2.104*** [0.000]		
Rural \times Poverty Gap		4.875*** [0.003]	
Urban \times Poverty Gap		4.922*** [0.005]	
Rural \times Median Gap			1.987*** [0.000]
Urban \times Median Gap			2.050*** [0.000]
Economic Controls	Yes	Yes	Yes
Demogr. Controls	Yes	Yes	Yes
Foreigners	Yes	Yes	Yes
Education	Yes	Yes	Yes
Mean Dep. Variable	13.41	13.41	13.41
N	396	396	396

Notes: p-values in brackets; * p < 0.1, ** p < 0.05, *** p < 0.01; standard errors are clustered at the county-level.