The Shadows of a Shattered Economy: How Persistent are Increases in Extremist Voting?

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Abstract

Economic shocks can trigger sharp increases in extremist voting (e.g., de Bromhead et al., 2013, Margalit, 2019). However, is the rise in extremist voting persistent over time or rather short-lived? I answer this question by exploiting geographic variation in the exposure to an economic crisis in interwar Germany while utilizing the exceptionally high number of Federal elections during this period. I show that having suffered from the economic collapse unfolding in the wake of the 1923 Ruhr Occupations caused a short-term six-percentage-point increase in left-wing extremist voting that vanished within half a year. I further document that repeated exposure to economic shocks leads to a anew overproportional increase in the support of extremist parties. To counteract endogeneity problems, I rely on Synthetic Control Groups for statistical inferencing.

JEL Classification: D72, N34
Keywords: Political Radicalization, Economic Crises, Political Extremism, Economic Voting, Economic History

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1 Introduction

Extremist and populist movements increasingly gain support in liberal democracies in Europe and around the World. Whereas the combined vote share of extremist and populist parties in Europe amounted to approximately 12 per cent in 1993, it increased up to about 32 per cent in 2022 (Rooduijn et al., 2023). This surge is observed predominantly at the right end of the political spectrum; however, instances of left-wing extremist parties experiencing significant growth are also documented. For instance and most recently, Geert Wilders and his right-wing populist *Party for Freedom* triumphed during the Dutch general elections in November 2023 when it more than doubled its vote share compared to 2021. Similarly, in Germany, preliminary polls conducted in October 2023 indicated a notable 14 percent vote share projection for a left-wing populist movement only days after it was founded.

This recent sharp rise in extremist voting has prompted a surge in academic studies investigating its casuses and consequences. Concerning the causes, the literature distinguishes between supply and demand-side factors. Supply side factors, for instance, encompass the electoral and party systems (e.g., Downs, 1957, Figueira, 2018, Guiso et al., 2017), and the political leaders' charisma (e.g., Alvares and Dahlgren, 2016, Hawkins, 2010). Demand side factors, on the other hand, can be divided into cultural attitudes, identities, and education (e.g., Norris and Inglehart, 2019, Bonomi et al., 2021, Gethin et al., 2021), terrorism (e.g., Sabet et al., 2023, Getmansky and Zeitzoff, 2014), globalization and migration shocks (e.g., Rodrik, 2018, Dustmann et al., 2019), overall economic conditions, including economic insecurity & marginalization (e.g., Fetzer, 2019, Guiso et al., 2020, Bo' et al., 2023), and exposure to economic shocks (e.g., de Bromhead et al., 2013, Funke et al., 2016, Verner and Gyöngyösi, 2020, Doerr et al., 2021, Algan et al., 2017, Braggion et al., 2020). Surprisingly, eventhough the rise of populist parties can have adverse effect on long-term economic growth (Funke et al., 2023), the time persistence of increased support for extremist parties resulting from economic shocks have received little scholarly attention thus far.[1]

This paper aims to fill this gap by researching changes in the vote shares of extremist parties across municipalities in response to a severe economic shock in Interwar Germany. The shock, triggered by the military occupation of the Ruhr area by French and Belgian forces and the subsequent implementation of a *Passive Resistance* strategy by the German government, led to an almost total halt in the local economy. Hardships among the affected population followed immediately, including starvation and misery. To identify time variations in the causal effect between exposure to the crises and increase in extremist

[1]There are a few papers that address the question of persistence. However, these papers use person-level survey data and primarily focus on preferences for redistribution as opposed to actual voting outcomes. Moreover, they tend to have a small number of records per unit of observation (Margalit, 2013, Martén, 2019) or lack a solid identification strategy (O'Grady, 2019).

voting, I rely on the high frequency of Federal elections in the *Weimar Republik*, and the generalized Difference-in-Differences *Synthetic Control Groups* (SCG) method. The SCG method enables to create a control group that is virtually indistinguishable along many dimensions from the municipalities that suffered from the economic turmoil, allowing for statistical inferencing (see Abadie and Gardeazabal, 2003, Abadie et al., 2010, 2015, Robbins and Davenport, 2021, for reference).

When comparing the effects on both left-wing and right-wing extremist parties' vote shares before and after the crisis, the baseline estimates indicate a six-percentage-point increase in the vote share of the communist party *Kommunistische Partei Deutschlands* (henceforth KPD) for muncipalities affected by the crisis relative to their unaffected peers. At the other end of the political spectrum, the analysis discovers smaller negative effect for two far-right parties. Upon extending the time frame to encompass additional elections both preceding and succeeding the economic shock, it becomes apparent that the increase in communist voting vanishes within only eight months. For the far-right DNVP (*Deutschnationale Volkspartei*), the effect seems more persistent, taking one additional election to disappear. Furthermore, considering additional upheavals linked to the onset of the *Great Depression* in the late 1920s and the *German Banking Crisis* of 1931, the findings suggest that the previously vanished increase in communist voting overproportionally re-surges upon a second encounter with an economic crisis. This finding suggests a long-lasting impact of economic crises on extremist voting behaviors. Such impacts, while not necessarily constantly visible, seem to be preserved in memory and re-surface when encountering a further crisis.

The paper makes contributions to three areas of economic literature. First, it enlarges the growing body of papers on the political consequences of economic shocks. De Bromhead et al. (2013) reveal a general link between the economic slump triggered by the *Great Depression* and political extremism across 28 countries. Whereas, on average, right-wing extremist parties gained from the crisis the strongest, notable exceptions existed where communist parties enjoyed surging popularity. Funke et al. (2016) expand the scope to 140 years of financial crises, finding similar patterns. On a sub-national level, Algan et al. (2017) exhibit a causal relationship between employment shocks following the Great Recession of the 21^{st} century and the subsequent surge in populism in Europe, stressing the importance of declining trust toward political institutions. Verner and Gyöngyösi (2020) show that the promise to relieve burdens to increasingly indebted private households as a reaction to a currency crisis positively impacted a far-right party's vote share in Hungary during the Great Recession. By exploiting variation in municipal pre-crisis exposure to a major German Bank, Doerr et al. (2021) find that the Bank's failure in the wake of the *German Banking Crisis* of 1931 was beneficial to Hitler's Nazi party. Results were more pronounced in regions marked by strong historical anti-semitism, highlighting the role of inherited cultural beliefs. Mian et al. (2014) investigate second-round

effects of financial crises. They suggest that increases in political polarization and fragmentation accompanied by a weakened position of ruling coalitions might hamper the realization of financial reforms. Moreover, they argue that electoral and institutional responses depend on the type of financial crisis.

The paper adds to a second strand of literature that emphasizes personal experiences in shaping individuals' beliefs, attitudes, and choices. Malmendier (2021) summarizes the corresponding literature and provides a link neuroscientific studies on the functioning of the brain. Along these lines, Giuliano and Spilimbergo (2014) find that experiencing a sizeable economic shock during early adulthood creates long-lasting enhanced support for government redistribution and a preference for left-wing parties. In accordance the underlying *impressionable years hypothesis* and contrary to my findings, Gavresi and Litina (2023) demonstrate that past exposures to economic shocks correspond to a reduced tendency to support populist attitudes when individuals face a new crisis. Concerning other economic attitudes, Malmendier and Nagel (2011) show that exposure to periods of low stock returns correlates with a reduction in stock market participation and stock holdings. Similar results are discovered concerning the bond market. In a further paper, Malmendier and Nagel (2016) highlight that individuals' inflation expectations are shaped by the inflation they had experiences before. Related literature argues that attitudes once shaped might even endure multiple of the following generations. For instance, Voigtländer and Voth (2012) exhibit that medieval anti-Semitism proxied by pogroms during the plague era predicts hostility and violence directed against the Jewish population in Germany of the 1920s and 30s. In a similar fashion, Cantoni et al. (2019) research the persistence of right-wing ideology. They demonstrate a correlation between past support for Hitler's Nazi Party in the 1930s and contemporary preferences for German's populist right-wing party, *Alternative für Deutschland (AfD)*.

The third contribution is of historic nature. While quantitative economic research studied German socio-economic and political dynamics in the late 1920s and early 1930s intensively (e.g., Stögbauer, 2001, Falter and Hänisch, 2013, Voigtländer and Voth, 2014, Satyanath et al., 2017), the years in the direct aftermath of WWI received less scholarly attention.

The remainder of this article is structured as follows. Section 2 sheds light on the institutional setting of the 1923 *Ruhr Occupation* and *Passive Resistance*. Section 3 provides the theoretical foundation, explaining why and how economic shocks might impact extremist voting. In Section 4, I discuss the data and provide information on the sources. Section 5 explains the construction and validity of the *Synthetic Control Group*. Sections 6 and 7 explore the baseline impact of the economic crisis on the electoral support for i) political camps (left versus right), and ii) individual parties, by accounting for the two the elections directly before and after the crisis. In Section 8, I then gradually extend the number of pre- and post-crisis elections and conduct event study analyses. This allows

the treatment effect to vary over time, thereby enabling the investigation of medium to long-term effects of the crisis. Section 9 concludes.

2 The Ruhr Occupation and Passive Resistance

After Germany failed to deliver coal and wood reparations to the Allies of WWI, the French Premier Minister Poincaré commanded the invasion into the previously demilitarized Ruhr area on January 11, 1923. Accordingly, six Belgian and French divisions, counting around 100,000 soldiers, entered the Ruhr area.[2] The German government considered the allied invasion into the country's most important heavy industry center to violate the *Treaty of Versailles*. As a reaction, it proclaimed the *Passive Resistance* on January 13, 1923, prompting the population living in the occupied areas not to follow orders by the occupiers (Schwabe, 1984). A "general strike-like situation" (Schwabe, 1984, p.4) emerged.[3]

As a result, the transportation system broke down, cutting companies off from input supply (Kleinschmidt, 2004). Moreover, the occupiers confiscated company property, additionally impeding production. Some companies had to cease their operations as a consequence. Others were actively shut down by the occupiers (Kolb and Schumann, 2013). The economic downturn's magnitude was immense. For instance, in the first six months of the *Passive Resistance*, coal firms in the Ruhr area produced less than during the ten days just before the occupation (Schwabe, 1984).[4] Even though the German government subsidized the workforce to partially compensate for the resulting drop in the demand for labor (Prion, 1926), misery spread around in the Ruhr area: Due to the Ruhr area's increasing isolation caused by tariff barriers and other restrictions established by the occupiers, the food supply collapsed, and a famine emerged (Fischer, 2004). Social unrest followed (Winkler, 1984).

While trying to keep the resistance alive, the German government suffered enormous financial losses. Financial support for the laid-off workforce and the private sector increased government spending, and the need to import foreign coal further weakened the German currency. Given this financial pressure, the old government resigned, and the newly elected government under Gustav Stresemann officially ended the *Passive Re-*

[2]Moreover, Italy participated by dispatching an engineering commission. Great Britain, on the other hand, remained neutral as it doubted any financial benefits and suspected France to pursue a separation of the Rhineland from Germany. The United States did not participate in the occupation. On the contrary, they began withdrawing troops from occupied territories west of the Rhine river on January 10, 1923 (Schwabe, 1984).

[3]The occupiers reacted to this by declaring a stage of siege. Public officials and business people were expelled and impeached at the military court. According to Schwabe (1984), by the end of the *Passive Resistance*, 100,000 people had been expelled.

[4]Although other parts of Germany likewise experienced declining production figures in 1923, the economic downturn was much more substantial in the occupied Ruhr area (see Table D.2 in the Appendix).

sistance after nine months on September 26, 1923.[5,6]

It is important to note that both left-wing and right-wing extremists viewed the occupiers as their common enemy. In the same vein, the occupation led to a temporary convergence and limited cooperation between radical forces (e.g., Ascher and Lewy, 1956, Berens, 2016). For instance, in May 1923, a French military court executed the German right-wing activist Albert Schlageter for sabotage and espionage. Karl Radek, a high-ranking official of the Communist International, paid tribute to Schlageter, trying to create a *national bolshevistic* momentum and a united front against the invaders (Winkler, 1984).

3 Theoretical Considerations

This section explores the theoretical foundations underlying the relationship between economic shocks and extremist voting. Initially, Section 3.1 generally sketches how experiencing an economic shock might be translated into extremist voting. Following this, Section 3.2 outlines the potential mechanisms that explain why, in some cases, parties on the extreme right gain an advantage, whereas in different circumstances, left-wing extremists see an increase in support. Subsequently, Section 3.3 shifts the discussion to hypothesizing about the durability of the increase in extremist voting following economic shocks.

3.1 Linking Economic Shocks to Extremist Voting

Drawing on Margalit (2019), an economic shock may affect an individual's political behavior such as voting patterns and preferences, in three distinct ways. Firstly, assuming voters are rational agents who aim to maximize their utility, economic shocks could temporarily modify an individual's budget constraint. This might occur through increased concerns over job security or (perceived) reductions in income. If we maintain that the utility function remains constant, this adjusted budget constraint could lead to a gravitation towards more extreme political positions.

Secondly, beyond influencing the budget constraint, an economic shock may also alter voting behaviors by directly changing a voter's utility function. This change in

[5]The Ruhr occupation itself lasted until August 1925 when France and Belgium withdrew the last troops.

[6]Aside from hyperinflation and the Ruhr Occupation, the year 1923 experienced more unrest. First, after the end of the *Passive Resistance*, separatist groups in the nation's western parts proclaimed autonomy from the Federal government. However, these attempts failed due to public opposition. Second, in the states of Thuringia and Saxony, the governing coalition between the SPD and KPD began to establish paramilitary chors. Armed forces sent by the central government resolved the situation. Thirdly, on November 8, 1923, right-wing extremists in Bavaria, co-headed by Adolf Hitler, attempted to overthrow the Federal government in Berlin. The attempted coup failed the next day when government troops intervened.

the utility function might arise as voters adapt their beliefs and preferences, *learning* to appreciate certain policies more and devalue others (e.g., Gerber and Green, 1999).

Third, building on the premise that political behavior largely rests on long-standing deeply held beliefs that are possibly acquired early in life (*Impressionable Years Hypothesis*, e.g., Mannheim, 1952, Newcomb, 1967, Krosnick and Alwin, 1989) or even inherited over family generations (e.g., Campbell et al., 1960), external events like an economic shock might not trigger behavioral changes. On the contrary, selective processing of information as a result of confirmation biases (Knobloch-Westerwick et al., 2020) or motivated reasoning (Redlawsk, 2002, Taber and Lodge, 2006) might even re-enforce the original perspective.

3.2 Differential Impacts on the Left versus Right?

Three theoretical frameworks might help explain which side of the political spectrum benefits in response to economic disturbances. The first one concerns political agendas of the extremist parties. On the one hand, left-wing parties have traditionally positioned themselves as advocates of the working class, championing social welfare, income redistribution, and government intervention in the economy to protect jobs and increase living standards (e.g., Piketty, 2020). In times of economic hardship, these policy positions may resonate more with voters who are directly affected by unemployment and poverty (e.g., Giuliano and Spilimbergo, 2014, Hibbs, 1977). Conversely, economic turmoil can breed distrust in the establishment and mainstream political institutions (Hobolt and Tilley, 2016), potentially benefiting right-wing parties that present themselves as alternatives to the conventional system.

Moreover, aside from party programs, also other party-specific supply-side factors such as the availability of charismatic leaders might prove crucial (e.g., Alvares and Dahlgren, 2016, Hawkins, 2010).

Furthermore political macro trends may also help explaining why we observe different political reactions to similar shocks at different points in time. The underlying assumption is that political movements exhibit different popularity dynamics both over time and across countries (Huntington, 1991, Gunitsky, 2014, 2018*a*,*b*). Thus, an economic shock hitting a society in which one political force or party *rides on a wave* of increasing popularity might have an re-enforcing effect.

3.3 Persistence of Increased Extremist Voting

The duration of the effects might depend on the channel through which they unfold. Assuming altered budget constraints that increase the demand for re-distributive policies push voters toward the extreme left, this shift is expected to vanish once the economy returns to its pre-shock state. On the other hand, if the shift towards more extreme voting

behavior stems from changes in individuals' utility functions, the surge in extremist voting is likely to persist. The underlying assumption is that changes to one's utility function are stable over time (Margalit, 2019).

4 Data Sources and Variable Definitions

To create a panel dataset encompassing the decade from 1920 to 1930, I combine various data sources and collapse the data onto the primary unit of the analysis, the German municipality. This section describes the main variables and data sources used in the study.

Election data & municipality characteristics: I obtain data on Federal election outcomes from Falter and Hänisch (1990). The data is provided on a municipality level for cities and villages counting more than 2,000 inhabitants. Towns with less than 2,000 inhabitants are grouped per county. This data structure allows for circa 4,500 - 5,000 observational units per election.[7] The source provides election data for the major political parties, spanning all eight German Federal elections from 1920 to 1933. Moreover, I use manually extracted outcomes for the 1920 Prussian' state election from Preußisches Statistisches Landesamt (1921).

Falter and Hänisch (1990) also offer municipality characteristics, comprising aggregate employment and religious confession numbers. Unfortunately, this census data is only available for the years 1925 and 1933. Thus, pre-treatment municipality characteristics are unknown. However, under the assumption of a relatively low degree of domestic geographic mobility in the 1920s and the resulting stability in religious patterns over the country, I use 1925 religious information for the Syntethic Control Group's validation.

Geospatial vector data: The Max Planck Institute for Demographic Research (2011) provides geographic information (centroids and polygons) for urban districts (*Kreisfreie Städte*), counties (*Landkreise*), provinces (*Preußische Provinzen*), governorates (*Regierungsbezirke*), and Federal states. In addition, I obtain centroids for not self-administered cities and villages from the OpenStreetMap contributors (2022). For the grouped villages that have less than 2,000 citizens, I proxy each groups's geographic location with its county's centroid. I generate digital geospatial polygons of the occupied territories by manually digitizing a historical map provided by Statistisches Reichsamt (1924) (see Figure Figure A.1 in the Appendix).

Economic data: I extract data for the entirety of German joint-stock companies from a annually published handbook, the *Handbuch der Deutschen Aktiengesellschaften*. The extraction and digitization process is described by Gram et al. (2022). To change the unit of observation and create a proxy for industry-specific exposure to economic activity

[7] The variation over time results from local government reorganizations.

(EEA) per municipality, I follow Equation 1. Let F_{it} be the set of firms from industry i in year t. Assume further that I represents the set of available industries. Moreover, r (with $r > 0$) indicates the magnitude to which geographically distant companies impact a given municipality's EEA. The higher r is, the smaller is the impact of a distant company on a municipality's EEA score (see Figure A.2 in the Appendix for an example). For each industry i in year t, I define municipality m's EEA as the sum of all firm's $(1+r)$ to the power of the negative geographic distance to municipality m $(-d_{m,it})$.[8] The sum of the industry-specific EEAs gives a municipality's general exposure to economic activities, as indicated by Equation 2.

$$EEA_{m,i,t} = \sum_{f \in F_{it}} (1+r)^{-d_{m,it}} \tag{1}$$

$$EEA_{m,t} = \sum_{i \in I} EEA_{m,i,t} \tag{2}$$

Deaths figures: To carve out the severity of the economic crisis triggered by the *Passive Resistance* and explore heterogeneous treatment effects, I calculate and compare excess mortality rates between affected and unaffected municipalities for the crisis year 1923 (see Appendix 5). The annual death figures utilized in this analysis are sourced from Landesarchiv Nordrhein-Westfalen (2022), which provides the information at the level of individual registry offices.[9] Following Karlinsky and Kobak (2021), I define excess mortality as the difference between actual and expected deaths. To adjust for differences in the sizes of the geographic areas, I normalize this difference by dividing it by the death figures reported by the registry offices for 1922. (see Equation 3).

$$Excess\ Mortality_{r,1923} = \frac{Actual\ Deaths_{1923} - Expected\ Deaths_{1923}}{Actual\ Deaths_{1922}} \tag{3}$$

I predict expected number of deaths for each registry office r in 1923 in two ways. First, I fit a 2^{nd} degree polynomial regression model to death numbers from 1919 to 1924, excluding observations from 1923. Second, I repeat that task by fitting a linear regression model. Moreover, as one municipality can have multiple registry offices, I calculate excess mortality also on the municipality level, following a similar logic.

[8] Note that the range of $EEA_{m,i,t}$ is $]0, F_{it}]$.

[9] The Landesarchiv Nordrhein-Westfalen (2022) is currently uploading scans of historical registers of births, deaths, and marriages for registry offices from within the state of North Rhine-Westphalia in its current borders. Because this is an ongoing process, I could only digitize a subset of existing registers. However, I assume the selection of uploaded records to be random and, therefore, not to bias my estimates.

5 Constructing a Synthetic Control Group

Due to the area's economic importance, the French decision to occupy the Ruhr area is not random. To deal with the non-randomness, I construct an artificial Control group that is essentially indistinguishable from the occupied municipalities, using the *Synthetic Control Group* (SCG) method. The SCG's original implementation assumes that only one treated unit exists that needs to be imitated. However, as the unit of observation of this study is the German municipality, I follow Robbins et al. (2017)'s extension, allowing for the construction of a control group for multiple treated units.

To do so, I first define the treatment variable $CRISIS_m$ that equals one if municipality m suffered from the economic shock triggered by the Ruhr occupation in 1923 ($N = 117$) and zero otherwise.[10] The municipalities for which the treatment variable equals zero are the untreated units that represent the pool of potential control units. Thus, I construct a weight for each untreated unit in the next step.[11] Most untreated units' weights are zero, which de facto excludes them from the subsequent analysis. Only a subset of 96 out of 2442 untreated units receives weights larger than zero, ranging between 0.055 and 7.368 (see Table B.1 in the Appendix). These 96 weighted municipalities constitute the synthetic control group. The constructed weights need to fulfill three conditions. First, the sum of the control units' weights must equal the number of treated units; ii) the weighted sum of the control units' covariates must equal these covariates' sum for the treated units; iii) the second condition also holds for the outcome variables. Importantly, when constructing the weights, I exclude municipalities from German territories already under occupation before the 1920 Federal election from the pool of potential control units. This exclusion is necessary because imitating the - at that time unoccupied - Ruhr area in 1920 with already occupied municipalities is impossible. Aside from this, I likewise exclude the grouped villages with less than 2,000 inhabitants since a distinct classification of whether they are within the occupied territory is not feasible.

I then regress 1920 municipality covariates (X) and outcome variables (Y) on the treatment dummy to validate the untreated units' weights (see Equations 4 and 5). The selection of weights is validated if $\hat{\beta}_1$ is not differentiable from zero.

$$X_{m,1920} = \beta_0 + \beta_1 CRISIS + \epsilon_m \tag{4}$$

$$Y_{m,1920} = \beta_0 + \beta_1 CRISIS + \epsilon_m \tag{5}$$

[10] Note that French and Belgian troops already occupied a small part of the Ruhr area in 1921 (see Panel (a) in Figure A.1). Because this occupation likewise took place between the 1920 and the 1924 Federal elections, and because the *Passive Resistance* with its economic consequences also unfolded, I also define the area occupied in 1921 as treated.

[11] For construction, I rely on Robbins and Davenport (2021)'s `microsynth` package for **R**.

To highlight the advantage of the synthetic control method, I repeat this exercise, using the unweighted sample of all available untreated municipalities (see Equations 6 and 7). Using synthetic controls is beneficial when the null hypothesis for $\hat{\gamma}_1$ is rejected while $\hat{\beta}_1$ is indistinguishable from zero.

$$X_{m,1920} = \gamma_0 + \gamma_1 CRISIS + \eta_m \tag{6}$$

$$Y_{m,1920} = \gamma_0 + \gamma_1 CRISIS + \eta_m \tag{7}$$

Table I presents the results. As observable in Columns 1 and 2 of Panel A, synthetic controls lead to a perfect balance for election results (*Political Variables*) in 1920, the year of the pre-crisis election. Moreover, no statistically significant differences exist for population size ($\hat{\beta} = 0.00$ with a p-value of 1) and religious affiliations when using synthetic controls. When shifting attention to economic characteristics, the treatment and control groups do not differ concerning whether the municipalities are located within economic centers. What is different, however, is the degree of economic activity and the types of predominant industries. The Synthetic Control Group (SCG) method cannot entirely adjust for differences due to the Ruhr area's dominant economic role in particular sectors. Therefore, regardless of the manner in which other municipalities are combined, their weighted averages fail to equal the Ruhr area's concerning specific variables.

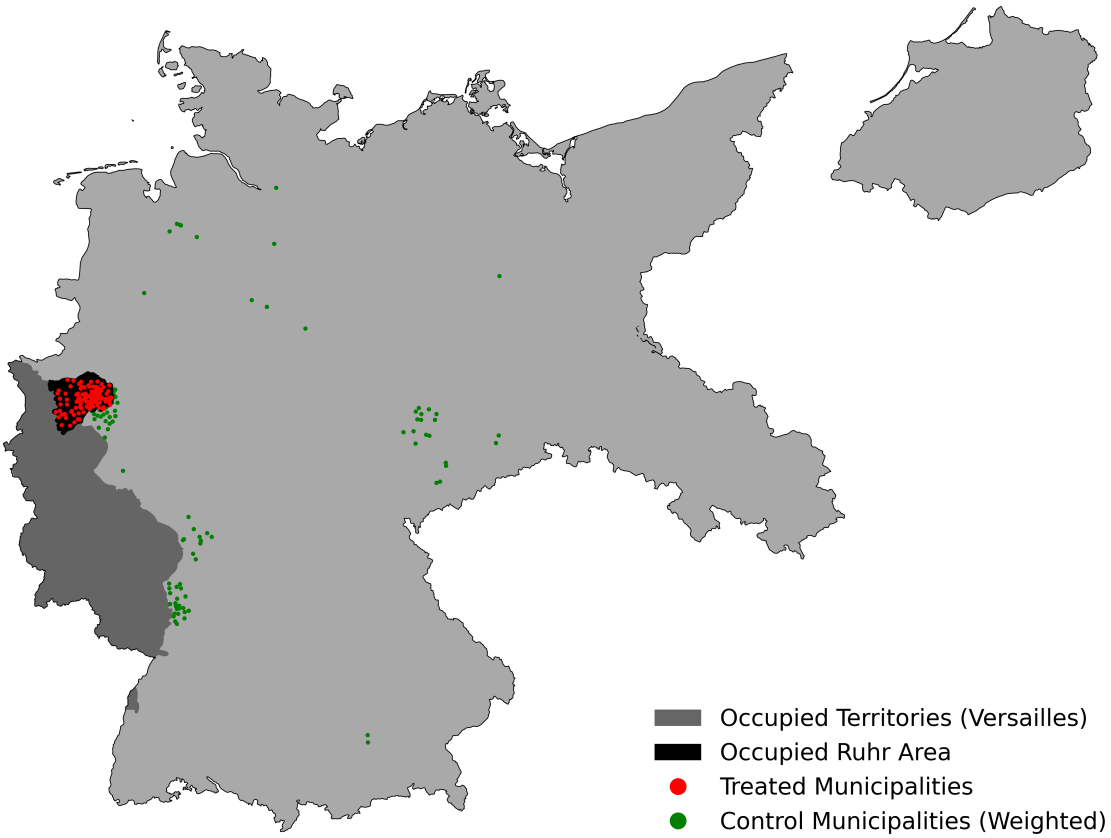
Figure I illustrates the geographic distribution of municipalities from the treatment (red markers) and control (green markers) groups with a weight greater than zero. As shown, most of the synthetic control group's municipalities are from within the economic centers in Saxonia, Berlin, Hamburg, Bremen, Frankfurt, Mannheim, Munich, and the unoccupied part of the Ruhr area.

Comparing Panel A to B from Table I reveals that using synthetic controls is beneficial. Without synthetic controls, treated municipalities would have significantly higher vote shares for left-wing and centrist parties in 1920 ($\hat{\beta} = 0.06$ with a p-value of 0.00). Conversely, vote shares for right-wing parties would be significantly lower by about nine percentage points. Additionally, the treatment and control groups would differ widely concerning most other municipality characteristics. For instance, muncipalities affected by the crisis would be a quarter of a standard deviation larger compared to unaffected cities and municipalities.

Table I: Differences in Municipality Characteristics

	Synthetic Control		No Synthetic Control	
	(1) $\hat{\beta}$	p-value H_0 $\beta = 0$	(3) $\hat{\gamma}$	p-value H_0 $\gamma = 0$
Social Variable				
Population (Std.)	0.00	1.00	0.25	0.00
Eligible Voters' Share	-0.00	1.00	-0.07	0.00
Share of Catholic Citizens	0.07	0.44	0.21	0.01
Share of Protestant Citizens	-0.09	0.29	-0.23	0.00
Share of Jewish Citizens	-0.00	0.16	-0.00	0.39
Political Variable				
Share of Left-wing Votes	-0.00	1.00	0.06	0.00
KPD Share	-0.00	1.00	0.00	0.30
USPD Share	-0.00	1.00	0.07	0.00
SPD Share	0.00	1.00	-0.01	0.29
Share of Right-wing Votes	0.00	1.00	-0.09	0.00
DNVP Share	0.00	1.00	-0.09	0.00
Share of Centrist Votes	-0.00	1.00	0.03	0.15
Voter Turnout	-0.00	1.00	0.05	0.00
Share of Valid Votes	0.00	1.00	-0.01	0.00
Economic Variable				
Economic Center	-0.00	1.00	0.80	0.00
Economic Activity	0.22	0.00	0.74	0.00
Exposure to Mining and Quarrying	1.49	0.00	2.23	0.00
Exposure to Manufacturing	0.19	0.00	0.71	0.00
Exposure to Finance	-0.07	0.34	0.45	0.00
Exposure to Construction	0.06	0.07	0.19	0.00

Note: This table indicates how well the Synthetic Control Method eliminates differences between treated and untreated municipalities. While Columns 1 and 2 refer to differences when using SCG, Columns 3 and 4 correspond to a comparison between the treated area with the unweighted set of all available untreated municipalities. Columns 1 and 3 show the estimated $\hat{\beta}$ and $\hat{\gamma}$ coefficients resulting from fitting the regression models in Equations 4 to 7. Columns 2 and 4 exhibits the estimates' statistical significance by providing p-values.



Note: This figure illustrates the geographical distribution of German municipalities included in the treatment and control groups. Treated municipalities (red markers) suffered from the economic shock triggered by the invasion of the Ruhr area in January 1923. (Weighted) control municipalities (green markers) determined by the synthetic control method are outside the occupied territories. The region highlighted in dark gray represents areas already occupied by the Allies of WWI in accordance with the Versailles Treaty and such regions that the Allies had temporarily occupied at the beginning of the 1920s.

Figure I: SCG - Municipalities Included in the Treatment and Control Group

6 The Economic Crisis and Election Outcomes

To assess the political consequences of the economic crisis triggered by the *Ruhr Occupation* and *Passive Resistance*, I first investigate voting patterns at the level of political camps (left, center, right). Once these general patterns are revealed, the focus shifts to individual parties.

To analyze the effects for each political camp, I fit the regression model

$$Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t} \tag{8}$$

using the municipality weights determined above. $Vote\ Share_{p,m,t}$ describes the vote share of a political camp p in municipality m at election date t. $POST_t$ is a binary indicator that is zero for the pre-occupation Federal election in 1920 and one for the first Federal election in 1924 when the *Passive Resistance* had already ended. I control for the exposure to economic activity as this variables could not be balanced out by the SCG method. Moreover, I include election date (η_t) and municipality dummies (μ_m) to absorb factors common to all municipalities in a given year and those constant over time for each municipality. Aside from this, the baseline specification includes electoral district by election date fixed effects (λ_{td}) and standard errors clustered at the municipality level. The coefficient of interest is β. It captures the differential effect of the economic crisis triggered by the Ruhr occupation on the occupied municipalities. Importantly, I argue that the effect of the occupation itself does not dilute β. This is because the occupation triggered a country-wide "unanimous outcry of national outrage" (Kolb and Schumann, 2013, p.51), and thus should be captured by the election date fixed effects.

Table II shows that the combined vote share of the major left-wing parties increases by approximately 5.6 percentage points in response to the economic crisis (Column 1).[12] The aggregate vote share of the political right, on the other hand, reduces by about 4.8 percentage points. Moreover, the centrist political camp's vote share seems unaffected by the shock. The results are robust to different specifications (Columns 2 to 6). For instance, they remain virtually unchanged when the model does not include control variables (Column 2). Additionally, the choice of the administrative level (governorate, province, or Federal state) for absorbing region by election date fixed effects does not influence the results either (Columns 3-5). One concern might be that the borders of the

[12]Note that Appendix 4.3 illustrates the party landscape of post-WWI Germany in detail, providing information on the composition of the political camps as well as the the dynamics within the major left- and right-wing parties.

Table II: Effects on Political Camps

	(1) Baseline Effect	(2) No Controls	(3) Governorate × Election Date	(4) Province × Election Date	(5) State × Election Date	(6) Excl. Border Regions
Left-Wing Parties						
POST × CRISIS	0.0558***	0.0456***	0.0556***	0.0532***	0.0489***	0.0753***
	(0.0111)	(0.0110)	(0.0109)	(0.0091)	(0.0083)	(0.0149)
Center Parties						
POST × CRISIS	-0.0077	0.0024	-0.0110	-0.0145	0.0030	0.0217
	(0.0160)	(0.0157)	(0.0169)	(0.0150)	(0.0126)	(0.0209)
Right-Wing Parties						
POST × CRISIS	-0.0482***	-0.0481***	-0.0447***	-0.0387**	-0.0519***	-0.0970***
	(0.0156)	(0.0159)	(0.0169)	(0.0153)	(0.0128)	(0.0224)
Fixed-effects						
Municipality	✓	✓	✓	✓	✓	✓
Election Date	✓	✓	✓	✓	✓	✓
Electoral District × Election Date	✓	✓				✓
Governorate × Election Date			✓			
Province × Election Date				✓		
State × Election Date					✓	
Controls	✓		✓	✓	✓	✓
Observations	426	426	426	426	426	316
Clusters	213	213	213	213	213	158

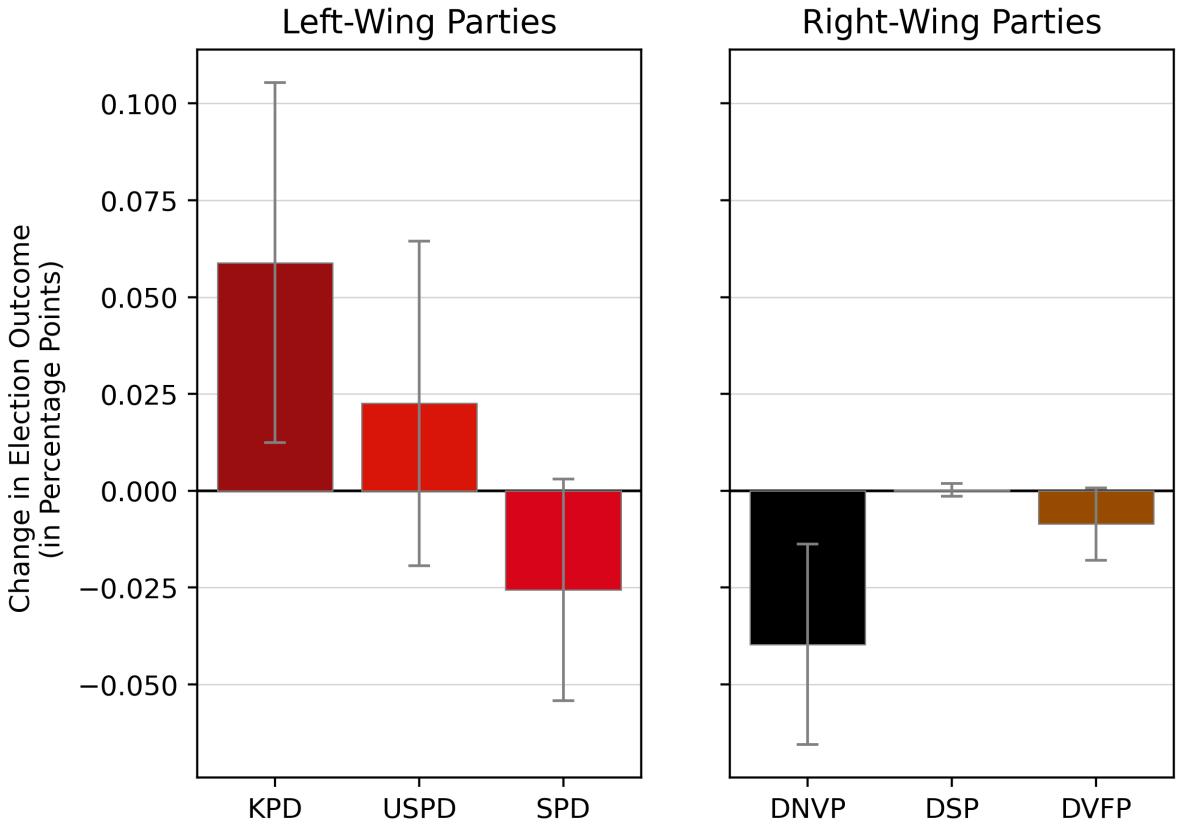
Note: This table shows estimated regression coefficients for political camps using the baseline model $Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$ and its variations. p refers to a political camp, m to municipalities, t to election dates, and d to electoral districts. Standard Errors are clustered at the municipality level for all models. Column 1 represents the estimators for the baseline model. Column 2 excludes control variables from the regression. Columns 3 to 5 vary in the selection of the administrative level used to absorb region by election date fixed effects. Column 6 is similar to the baseline specification, except that municipalities closer or equal to five kilometers to the assumed border of the occupied Ruhr area are excluded from the regressions. * p < 0.1, ** p < 0.05, *** p < 0.01 indicate statistical significance.

occupied territory cannot be precisely determined or extracted from maps, potentially leading to biases. When I exclude municipalities closer or equal to five kilometers to the digitized border in Column 6, the results' sign and significance do not change. However, the effects become larger in size, potentially suggesting that municipalities classified as untreated might indeed have been occupied or affected in some sense (see discussion below). In that case, the baseline specification would underestimate the economic shock's effect.

When turning to the effects on individual parties, heterogenous effects within the left political camp become visible. Figure II plots the β estimates for individual parties following the baseline specification while controlling for the exposure to economic activity of the regression model from Equation 8.[13] The left panel shows that the SPD, a center-left political party not extremist in nature, loses about 2.5 percentage points in vote share in response to the crisis (p-value = 0.081). The radical left KPD's vote share increase of about six percentage points (p-value of 0.0139) overcompensates the SPD's losses, leading to the aggregate increase in leftist voting described above. I find no significant effects of the shock on the moderate left-wing USPD.

On the right end of the political spectrum, results are more homogenous. The

[13]In these regressions, p in Equation 8 represents a political party.



Note: This figure shows estimated β regression coefficient for individual political parties using the model $Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$. p refers to a political party, m to municipalities, t to election dates, and d to electoral districts. Standard Errors are clustered at the municipality level for all regressions. Municipality, election date, and electoral district by election date fixed effects are absorbed. Whiskers indicate statistical significance at the five percent level.

Figure II: Effects on Party Vote Shares of the 1923 Economic Crisis

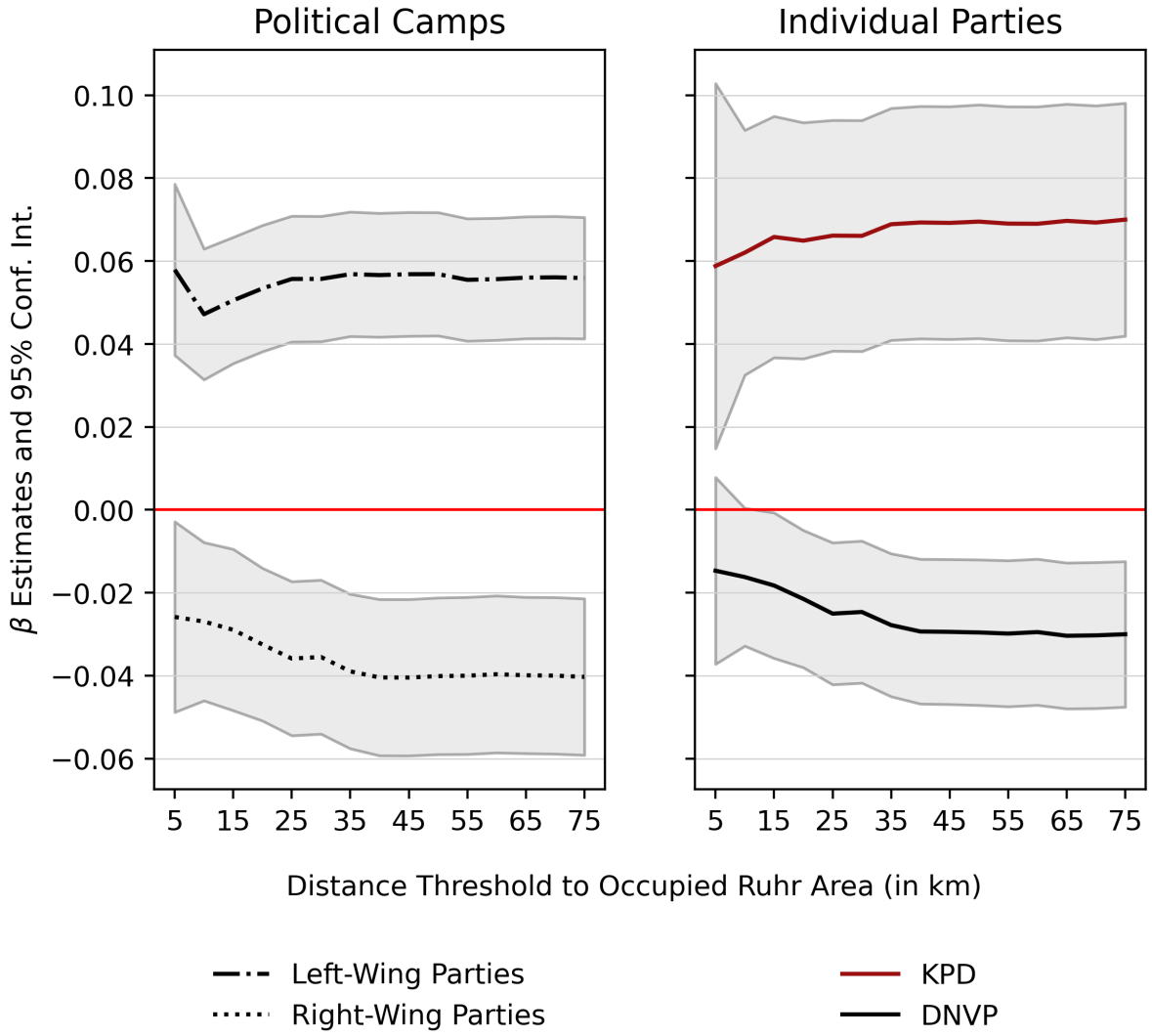
economic crisis leads to a decrease in the far-right DNVP's vote share of about four percentage points (p-value = 0.003). Concerning the other two extremist right-wing parties (that did not participate in any Federal election prior to 1923), the results suggest that the DVFP collects fewer votes ($\sim$ one percentage point with a p-value of 0.072) in the area hit by the economic crisis. On the other hand, vote shares of the DSP are indistinguishable between the control and treatment groups.[14]

Next, I review the result's robustness. To do so, I compare the municipalities hit by the crisis from within the occupied territory to their untreated neighboring towns and cities. If the results are robust, I expect the effect revealed in Table II and Figure II to unfold directly at the geographic boundaries of the occupied territories.

Moreover, I account for varying definitions of the term "neighboring". At first, the control group consists of unoccupied municipalities whose geographic distance to the

[14]Firstly established in 1921 (DVFP) and 1922 (DSP), these two extremist right-wing parties did not participate in the 1920 Federal elections. Thus, I set their vote shares to zero for this election when running the regressions.

occupation border is five kilometers or less. Then, while repeating the regression specified in Equation 8, the maximum distance threshold gradually increases to 75 kilometers, each time including more unoccupied municipalities in the control group. In other words, I assess the effects of the economic shock as a function of distance to the border of the occupied Ruhr territory. Importantly, I do not rely on the SCG method for this exercise as I use an unweighted set of control units. This is because, otherwise, there would be insufficient variation in the number of control units when raising the distance threshold.



Note: The figure illustrates treatment effects using different control groups whose selection depends on the municipalities' distances to the occupied Ruhr area. The fitted regression model is $Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$, where p stands for a political camp or party, m refers to a municipality, and t to the election date. d represents electoral districts. The variable $CRISIS$ equals one for municipalities affected by the economic shock triggered by the Allied Ruhr occupation in 1923 and zero otherwise. $POST$ is zero for the Federal election in June 1920. It is one for the election in May 1924. The model includes municipality, election date, and electoral district by election date fixed effects. Standard Errors are clustered at the municipality level for all models. The figure's left panel illustrates the estimated β for the aggregated vote shares of left and right-wing parties. The right panel shows the β estimators for the KPD and the DNVP. The gray shaded areas represent statistical significance at the 5 percent level.

Figure III: Effects as a Function to Distance to the Occupied Ruhr Area

As can be seen in the left panel of Figure III, the increase in the aggregate vote

share for left-wing parties exists instantaneously when the treated municipalities are compared to their neighboring and unoccupied municipalities from within a radius of only five kilometers to the occupation border (the x-axis indicates geographic distance thresholds). This effect remains stable once the distance threshold rises. The estimated effect on the aggregate vote share of right-wing parties is negative when the distance threshold is small, also supporting results presented in Table II.[15]

The right panel of Figure III shows the effects on the vote shares of the individual parties that were affected the strongest when using the SCG method. The illustrated statistically significant increase of the communist KPD's vote share amounts to about 5.8 percentage points when applying a distance threshold of five kilometers for unoccupied municipalities. It increases further to up to seven percentage points when raising the distance threshold. For the far-right DNVP, the estimated coefficient is negative when the municipalities included in control group are geographically close to the occupation zone's border. However, it firstly becomes statistically significant when increasing the distance threshold to 10 kilometers (p-value = 0.058). A potential explanation for the slightly less pronounced effects when setting a small distance threshold refers to people that live in unoccupied municipalities but work in the occupied area. Such people would also be affected by the economic downturn and, thus, potentially react similarly to citizens in the occupied part of the Ruhr area.

7 Differential Capture of Mobilized Voters as Channel

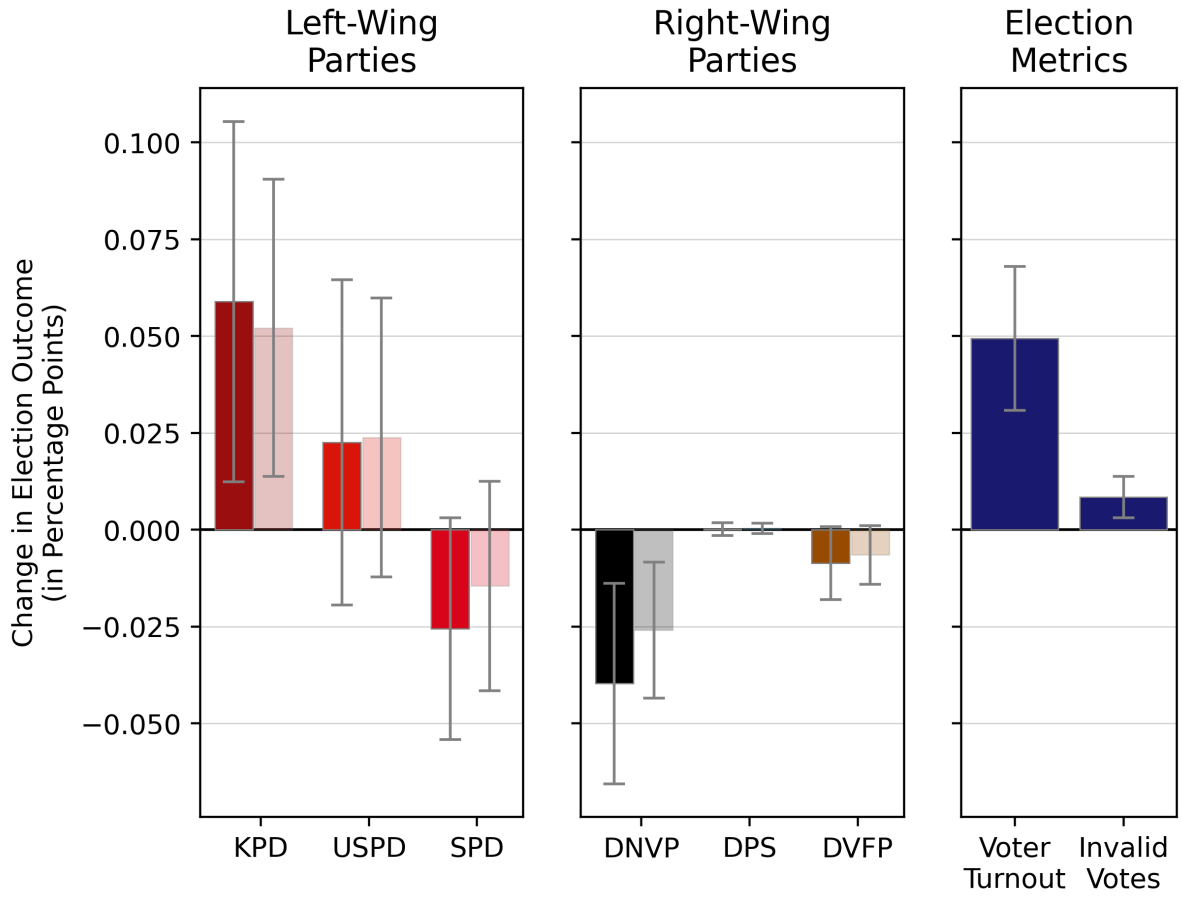
The economic crisis following the Allied invasion of the Ruhr area mobilized voters, increasing voter turnout by about five percentage points (see right panel of Figure IV).[16] The question arises of whether it was the mobilized voters leading to the increase in the communist KPD's vote share. Or in other words, the question is if the KPD captured the majority of newly mobilized voters. To answer this question, I compare the estimated increases of the parties' vote shares when measured as the percentage of vote cast (left bars in Figure IV; the plotted coefficients equal the ones in Figure II) and percentage of eligible voters (right bars in Figure IV). The intuition is as follows: Suppose one party disproportionately captures newly mobilized voters in response to the shock. In that case, its estimated β coefficient in a generalized Difference-in-Differences setup should be higher when the vote share is measured as the percentage of eligible voters as opposed to when it's measured as the fraction of votes cast. Vice versa, parties that do not benefit from the increase in turnout should exhibit significantly smaller β estimates. Since neither

[15]Figure C.3 in the Appendix provides the corresponding graphs for the parties not covered by Figure III.

[16]Voter turnout refers to an election's participation rate, defined as votes cast over eligible voters.

applies, and it appears that all parties were equally affected by the voter mobilization, I can rule out this potential channel for explaining the surge in KPD vote shares.

A second potential channel relates to varying intensities of treatment. The idea is that the electoral response of the populace to the crisis at the ballot box is contingent on the severity of the economic downturn. In Appendix 5, I employ excess death figures as a proxy to gauge the intensity of the shock. However, employing this proxy, I find no correlation between the intensity of the crisis left- or right-wing voting.



Note: This table shows estimated regression coefficients for political camps using the baseline model $Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$ and its variations. p refers to a political party or election metric. m refers to municipalities, t to election dates, and d to electoral districts. Standard Errors are clustered at the municipality level for all models. The left panel presents estimators for individual left-wing parties, the center panel for right-wing parties, and the right panel for election metrics, including voter turnout and the share of invalid votes. For each party, two bars exist. The left bars indicate the estimated coefficients when defining a party's vote share as votes over votes cast. In the right bars, a party's vote share is defined as the party's votes over eligible voters. Whiskers indicate statistical significance at the five percent level.

Figure IV: Votes per Vote Cast vs. per Eligible Voters

Aside from the increase in voter turnout, the economic downturn increased the share of invalid votes.[17] One potential interpretation of this increase is that people suffering from the consequences of the crisis protested the democratic system.

[17]The share of invalid votes is the number of incorrectly filled ballots over all collected ballot papers.

8 Rapid Convergence and Medium-Term Resurgence

This sections investigates how long the effects discussed in Section 6 survive before they vanish. It additionally researchers the effects of a repeated exposures to economic shocks. The high number of (Federal) elections during the politically unstable 1920s in Germany enable such analyses.

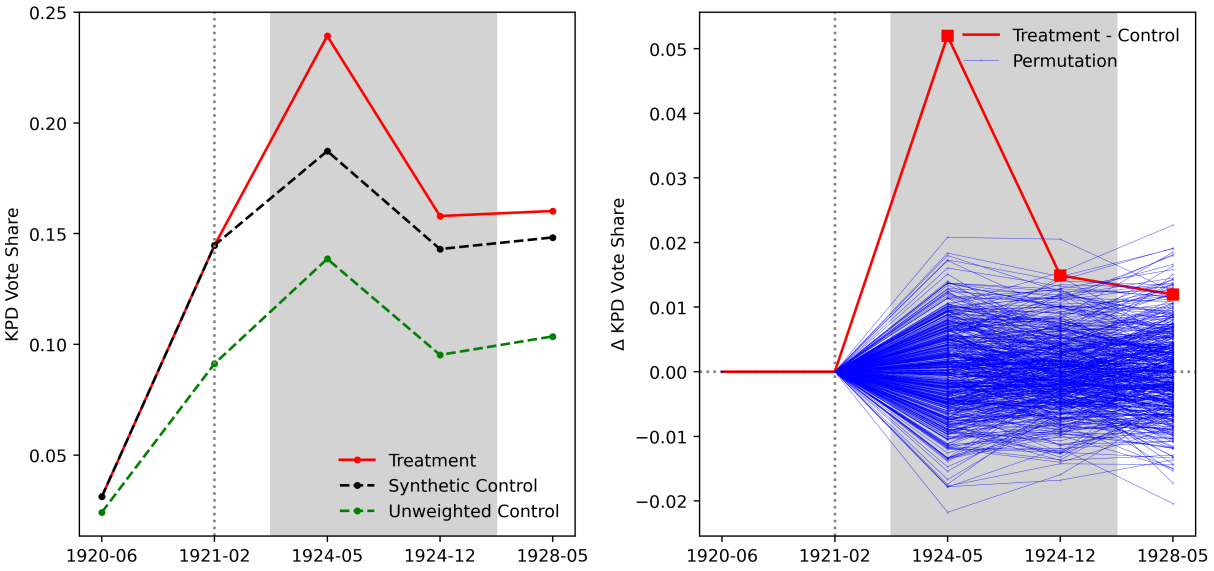
The Federal elections in May 1924 have served as only post-treatment elections in Section 6. Expanding the analysis to include the second 1924 Federal election, which took place just eight months later in December, and the 1928 Federal elections, allows for an investigation of short-term dynamics. Moreover, I additionally add a second pre-treatment election by accounting the 1921 Prussian state election results. Doing so allows to assure the satisfaction of the key identifying assumption of generalized Difference-in-Differences methods that describes the existence of parallel trends prior to the treatment. Some of the municipalities included in the *synthetic control group* established in Section 6 were in states other than Prussia. Excluding them from the regressions because of missing values would introduce a bias, as the control group would be no longer indistinguishable from the treatment group. Thus, I create a second *synthetic control group*, which only consists of Prussian Municipalities. Table F.6 of Appendix 6 highlights that also this control group almost perfectly resembles the set of municipalities that suffered from the economic crisis related to the Ruhr occupation and *Passive Resistance*. The most notable divergence from the balance table in Section 6 relates to religious differences. This divergence arises from the unique characteristics of the Ruhr area and its adjacent territories, most of which are excluded from the pool of control municipalities due to their occupation in accordance with the Versailles Treaty. These regions demonstrated a high concentration of Catholics, contrasting with the predominantly Protestant composition of the rest of Prussia. Given the focus on Prussia, municipalities from other Catholic-dominated regions, such as Bavaria, could not be used to offset these religious disparities.

To investigate the treatment effects' short-term dynamics between the May and December 1924, I follow the standard approach in the SCG literature (e.g., Robbins and Davenport, 2021) and fit the following weighted regression model for the two 1924 and the 1928 Federal elections:[18]

$$Vote\ Share_{p,m,t} = \alpha_t + \beta_{p,t}[CRISIS_m \times POST_t] + \epsilon_{p,m,t} \tag{9}$$

I perform this regression for the vote shares of the communist KPD and the far-

[18]The variables' definition is equal to Section 6. $Vote\ Share_{p,m,t}$ corresponds to the vote share of party p in municipality m at election t. $POST_t$ is a binary variable indicating whether the election t took place before or after the economic crisis associated with the *Passive Resistance*. Moreover, $CRISIS_m$ is a binary indicator corresponding to whether a municipality was affected by this economic crisis or not.

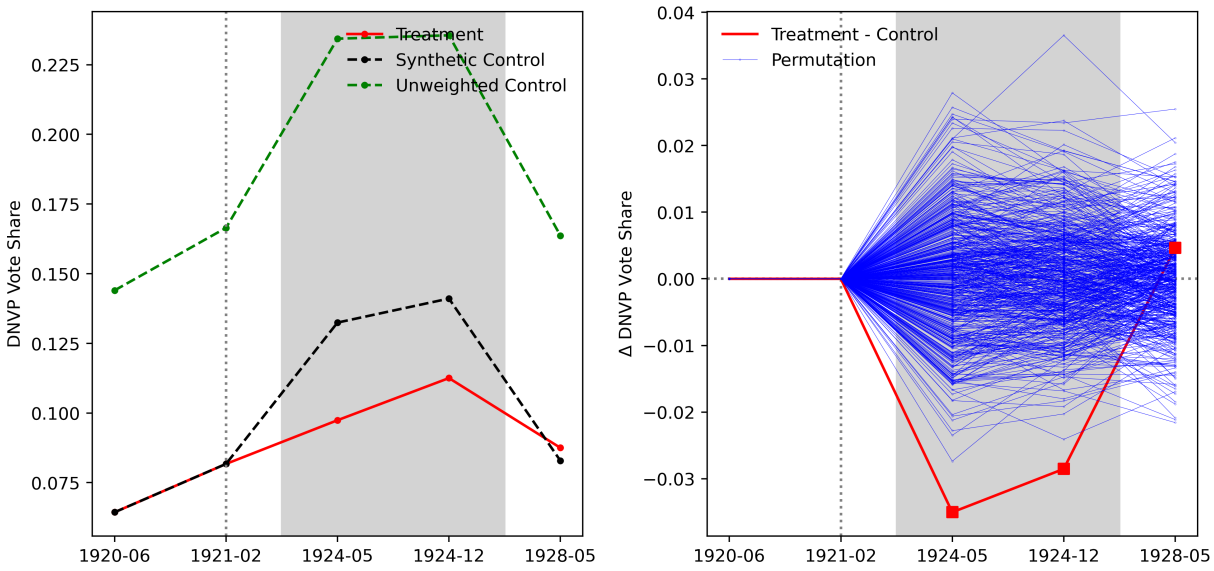


Note: The left panel presents mean values in communist KPD vote shares, showcasing the unweighted control group (green dashed line), the weighted control group (black dashed line), and the treatment group (red solid line). A vertical line demarcates the 1921 Prussian state elections, providing the last pre-treatment observations. The gray shaded area represents the duration of the *Ruhr Occupation* by the Allied troops. On the right panel, β coefficients derived from fitting the regression model $Vote; Share_{p,m,t} = \alpha_t + \beta_{p,t}[CRISIS_m \times POST_t] + \epsilon_{p,m,t}$ are plotted for the Federal elections in May and December 1924, and May 1928 (depicted by red squares). The blue lines denote effects estimated with 500 treatment permutations.

Figure V: Short-Term Differences in Treatment Effects for the communist KPD

right DNVP, as these were the two parties for which we found the strongest statistically significant results in Section 6. Figure V represents the results for the KPD. The right squares in the right panel illustrate the β_{KPD} coefficients for the two Federal elections in May and December 1924. Whereas the crisis led to an significant increase of about 5 percentage points ($\hat{\beta} \approx 0.052$) in May (P-value < 0.001), its effect had vanished by December ($\hat{\beta} \approx 0.015$ and P-value ≈ 0.22). Importantly, although using a different set and weights of control municipalities, the reported increase for the election in 1924 is almost identical to the one discussed in Section 6. This provides additional robustness to the baseline estimations.

I conduct a permutation test to provide an alternative method for assessing the effects' statistical significance. It randomly assigns the treatment indicator to municipalities from the overall samples of German municipalities and creates synthetic control group weights accordingly. I set the number of permutations to 500 and re-calculate treatment effects each time (blue lines in the right panel of Figure V). By comparing the treatment effect observed when using the original synthetic control group with the distribution of treatment effects obtained through permutation, I find evidence supporting the statistical significance of the original treatment effect as discovered for the May 1924 elections (P-value < 0.001). However, contrary to the previous analysis, when performing this permutation for the December 1924 election, the permutation-based P-value (0.012) suggests a statistically significant increase in the KPD vote share.



Note: The left panel presents mean values in far-right DNVP vote shares, highlighting the unweighted control group (green dashed line), the weighted control group (black dashed line), and the treatment group (red solid line). A vertical line represents the 1921 Prussian state elections, providing the last pre-treatment observations. The gray shaded area illustrates the duration of the *Ruhr Occupation* by the Allied troops. On the right panel, β coefficients derived from fitting the regression model $Vote; Share_{p,m,t} = \alpha_t + \beta_{p,t}[CRISIS_m \times POST_t] + \epsilon_{p,m,t}$ are plotted for the Federal elections in May and December 1924, and May 1928 (depicted by red squares). The blue lines denote effects estimated with 500 treatment permutations.

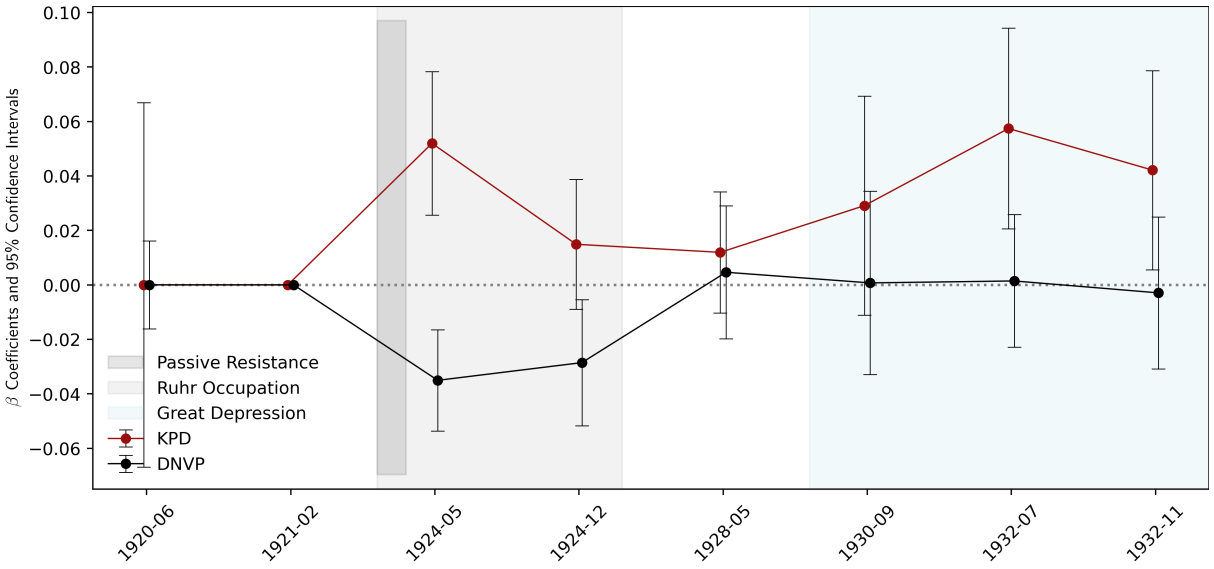
Figure VI: Short-Term Differences in Treatment Effects for the far-right DNVP

The left panel of Figure V graphically illustrates the benefit of using *Synthetic Control Groups*. First, comparing the unweighted average in the KPD vote share of all available untreated municipalities (green dashed line) with the treatment group (red solid line), a pre-trend becomes apparent: While the difference was about 1 percentage point in June 1920, it amounted to approximately 5 percentage points in February 1921. Second, the weighted municipalities from the *Synthetic Control Group* (black dashed line) perfectly match the treatment group.

Repeating the regression from Equation 9 for the far-right DNVP reveals different dynamics. As illustrated in Figure VI, the negative effect of the economic crisis on the DNVP's vote share that becomes apparent in May 1924 ($\hat{\beta} \approx -0.035$ and P-value < 0.001) survives the December 1924 elections ($\hat{\beta} \approx -0.028$ and P-value ≈ 0.018). By 1928, the effect has disappeared. The permutation tests underpin the significance of these findings.

In a next step, I expand the post treatment period until the last free Federal elections of the Weimar Republic in November 1932.[19] Expanding the observation period suggests that the 1923 economic crisis' effects resurfaced once the electorate had been exposed to further economic shocks. These further shocks include the *Great Depression* that started to adversely affect the Weimar Republic's economy in 1929 and the *German*

[19]We exclude the elections in March 1933 as Hitler had already unleashed acts of violent suppression of his political opponents after he was appointed Chancellor on January 30, 1933.



Note: The figure illustrates estimated β coefficients from the fitted model $Vote\ Share_{p,m,t} = \alpha + \sum_{t \neq 1921} \beta_{p,t}[CRISIS_m \times Election\ Date_t] + \left(\sum_{t \in E} \zeta_t Election\ Date_t \times Unemployment_{m,t}\right) + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$, in which time dummies that are interacted with the treatment variable $CRISIS$ allow for time-varying treatment effects. To avoid biases from the regional differences in the exposure to the *Great Depression* and the *German Banking Crisis*, the model includes interactions of time dummies with municipality-level unemployment shares for the elections occurring in 1930 and 1932 (these elections constitute the set E). The dependent variables are the municipality-level vote shares of the communist KPD and the far-right DNVP parties, and the 1921 Prussian state election is the omitted period. The variable $CRISIS$ equals one for municipalities affected by the economic shock triggered by the Allied Ruhr occupation in 1923 and zero otherwise. p stands for either the right or left political camp, m refers to a municipality, and t to the election date. d represents electoral districts. Standard Errors are clustered at the municipality level for all models. Whiskers indicate statistical significance at the five percent level.

Figure VII: Eventstudy Graph

Banking crisis that began to unfold in 1931 (see James, 1984, for details on the historic and institutional background). To account for regional differences in the severity of these shocks, the event study regression specification in Equation 10 incorporates interaction effects between the time dummies for the three 1930 and 1932 elections ($Election\ Date_t$) and municipality-level unemployment figures ($Unemployment_{m,t}$). Moreover, interacting election date dummies with the treatment variable $CRISIS$ allows for time-varying treatment effects. Similar to above, I use the municipality weights constructed using the SCG method when fitting the model, in which the 1921 Prussian state election serve as reference period.

$$Vote\ Share_{p,m,t} = \alpha + \sum_{t \neq 1921} \beta_{p,t}[CRISIS_m \times Election\ Date_t] + \left(\sum_{t \in E} \zeta_t Election\ Date_t \times Unemployment_{m,t}\right) + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t} \tag{10}$$

Importantly, in line with the results presented above, the regression results illus-

trated in Figure VII support the notion of direct but short-term fluctuations in the vote share of the communist KPD and far-right DNVP parties. What is more, the results suggests an reoccurring increase in the KPD vote share after the onset of the economic consequences of the *Great Depression*. While this increase becomes already apparent in the 1930 elections, it takes until July 1932 to become statistically significant. In terms of effect size, it is comparable to the first 1924 federal elections. In summary, these results indicate a lasting effect of shocks experiences at an earlier point in individuals' lives. They correspond to a strand of economic literature focused on the importance experience-based learning for shaping economic and political bahavior (e.g., Malmendier, 2021, Malmendier and Nagel, 2016, 2011, Gavresi and Litina, 2023). Due to the lack of municipality-level information on population movements, I cannot dismiss geographic sorting as a potential source of biases. Nevertheless, considering the relatively low geographic mobility in the mid-1920s (e.g., Hochstadt, 1981), I assume that population movements are not the primary driver of the results.

The regression results for the right-wing DNVP do not indicate similar patterns. Once the effect had vanished by 1928, the estimated coefficients remain close to zero and highly insignificant for the remaining elections. However, if one shifts the attention to the aggregated effect of all right-wing parties a similar *Memory Effect* becomes apparent as shown by Figure F.6 in Appendix 6. This suggests, the decrease in right-wing voting from which the DNVP mainly suffered in 1924 had shifted to affect other right-wing parties by the early 1930s. One interpretation of this finding assumes the people in the weighted control municipalities that voted for the DNVP in the May 1924 Federal elections migrated to other, more extreme right-wing parties later.

9 Conclusion

This paper contributes to our understanding of the complex interplay between economic shocks and the political landscape, particularly in the context of extremism and populism within democracies. Through an in-depth analysis of the changes in extremist party vote shares in response to the severe economic shock triggered by the *Ruhr Occupation* and the subsequent *Passive Resistance* strategy in Interwar Germany, this study bridges a crucial gap in the existing literature. It sheds light on the nuanced and temporal nature of political responses to economic crises, demonstrating that while the immediate aftermath of an economic shock can bolster support for extremist parties, the persistence of such support is not guaranteed and can be influenced by subsequent economic events and shocks.

Furthermore, by leveraging the high-frequency electoral data of the *Weimar Republic* and employing the *Synthetic Control Groups* method, this paper not only confirms the short-lived nature of changes in extremist voting in the face of economic turmoil

but also illustrates the importance of considering both historical context and the varying impacts on different camps within the political spectrum. The baseline estimates and extended analysis underscore the transient increase in support for a communist party, while highlighting the decrease in far-right voting following economic distress.

This research also underscores the value of historical analysis in informing contemporary political and economic discourse. By drawing parallels between past and present instances of economic shocks and their political repercussions, it provides a valuable perspective on the challenges and opportunities faced by liberal democracies in managing the rise of extremism and populism.

In addition, this paper also opens new avenues for future research. It calls for a more nuanced understanding of the conditions under which economic crises can lead to a sustained increase in support for extremist parties, and the potential for economic recovery and stability to mitigate these effects. As liberal democracies continue to grapple with the rise of extremism and populism, the insights provided by this study offer a timely and critical resource for policymakers, scholars, and citizens alike.

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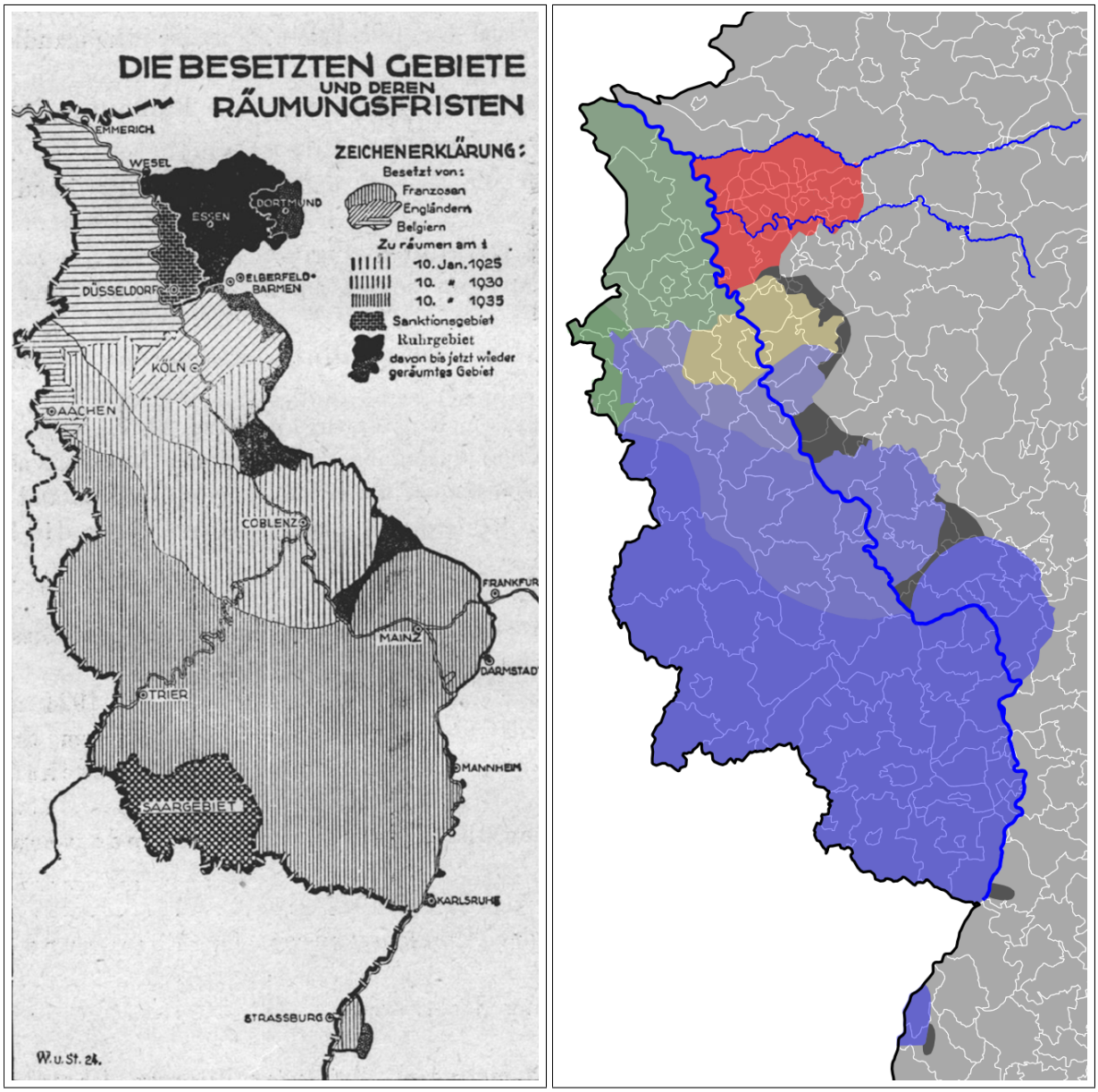
Online Appendix for Paper:

The Shadows of a Shattered Economy: How Persistent are Increases in Extremist Voting?

Table of Contents

1 Additional Information on the Data Generation Process



(a)

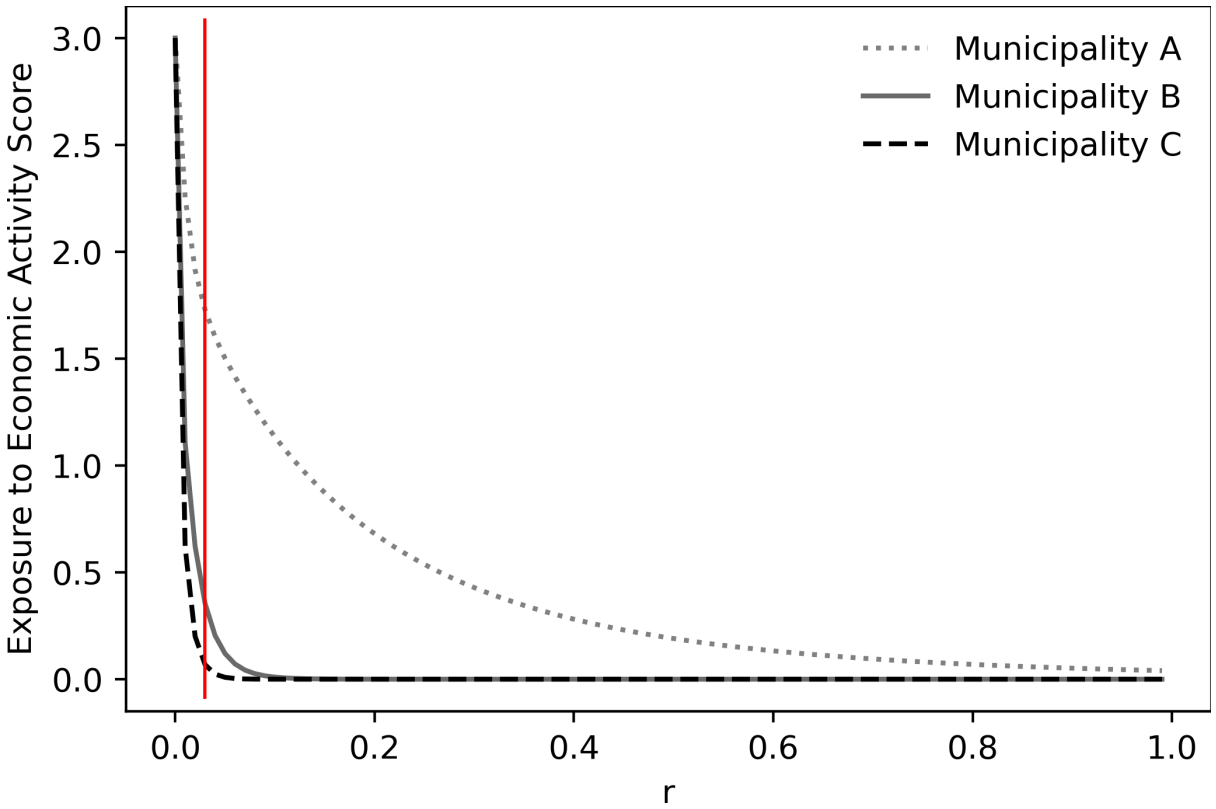
Note: The figure shows German areas occupied by the Allies of WWI in 1924. Patterns vary depending on the occupiers' nation and the withdrawal date as stated in the Versailles Treaty. The Ruhr area occupied starting from January 11, 1923, is highlighted in black. The image is a scaled screenshot taken from Statistisches Reichsamt (1924, p.788)

.

(b)

Note: The figure illustrates different layers of digital geospatial vector data. The gray area represents counties and urban districts of the Weimar Republic taken from Max Planck Institute for Demographic Research (2011). The borders of administrative regions are white. The blue lines are the visual representation of geographic objects corresponding to the Rhine (vertical), Ruhr (lower horizontal), and Lippe (upper horizontal) rivers (OpenStreetMap contributors, 2022). The colored areas represent the occupied territories from Panel **(a)**. The red patch illustrates the occupied Ruhr area. The coordinate reference system (CRS) used for the illustration of the geographic objects is EPSG:4230

Figure A.1: Graphical Representation of Geospatial Vector Data Created from Historical Maps of Occupied Territories in 1924 Germany.



Note: The figure shows *Economic Activity Scores* (*EEA*) as defined by Equation 1 for three hypothetical municipalities and varying r. In the example, three firms are assumed to exist that all belong to the same industry. Municipality A's distances to these firms are (5 km, 7 km, and 100 km). Municipality B's distance vector is (50 km, 70 km, and 1000 km). Municipality C is assumed to be (100 km, 170 km, and 2000 km) away from the firms. If $r = 0$, each municipality has an *Economic Activity Scores* of 3, equalling the total number of firms. In this case, the *EEA* would incorrectly not indicate differences in geographic exposure to economic activity. Thus, r needs to be larger than 0. On the other hand, if r approaches 1, scores for all municipalities converge to 0. Ideally, r should reflect differences in the average distance to economic centers. Thus, for the baseline specification, I define r as 0.03, as illustrated by the red vertical line.

Figure A.2: Exemplified *Exposure to Economic Activity Scores* in Dependence on the Parameter r

2 Synthetic Control Group

Table B.1: SCG - Municipalities and Weights from the Treatment and Control Groups

	Name	Federal State	Prussian Province	*CRISIS*	Weight
1	Bruehl	Baden	-	0	3.065
2	Dossenheim	Baden	-	0	0.853
3	Edingen	Baden	-	0	0.743
4	Friedrichsfeld	Baden	-	0	0.684
5	Heidelberg	Baden	-	0	0.330
6	Hockenheim	Baden	-	0	1.642
7	Ketsch	Baden	-	0	2.888
8	Ladenburg	Baden	-	0	0.095
9	Leimen	Baden	-	0	0.278
10	Mannheim	Baden	-	0	0.816
11	Neckarhausen	Baden	-	0	1.837
12	Plankstadt	Baden	-	0	1.760
13	Reilingen	Baden	-	0	0.295
14	Seckenheim	Baden	-	0	1.143
15	Wallstadt	Baden	-	0	0.157
16	Ziegelhausen	Baden	-	0	1.095
17	Feldmoching	Bayern	-	0	0.546
18	Muenchen S	Bayern	-	0	1.407
19	Wolfenbuettel	Braunschweig	-	0	0.114
20	Hamburg Mit Hafen S	Hansestadt Hamburg	-	0	0.209
21	Bensheim	Hessen	-	0	1.395
22	Biblis	Hessen	-	0	1.200
23	Birkenau	Hessen	-	0	0.639
24	Buedesheim	Hessen	-	0	0.547
25	Buerstadt	Hessen	-	0	1.320
26	Friedberg	Hessen	-	0	0.345
27	Hainstadt	Hessen	-	0	1.591
28	Heppenheim	Hessen	-	0	1.243
29	Lampertheim	Hessen	-	0	0.820
30	Lorsch	Hessen	-	0	1.259
31	Muenster	Hessen	-	0	1.639
32	Ober-Roden	Hessen	-	0	0.794
33	Viernheim	Hessen	-	0	2.656
34	Hude	Oldenburg	-	0	1.072
35	Neuenkirchen	Oldenburg	-	0	0.121
36	Bernau Bei Berlin	Preußen	Brandenburg	0	7.368
37	Aumund	Preußen	Hannover	0	0.394
38	Blumenthal	Preußen	Hannover	0	1.992
39	Grohn	Preußen	Hannover	0	1.359
40	Hemelingen	Preußen	Hannover	0	1.853

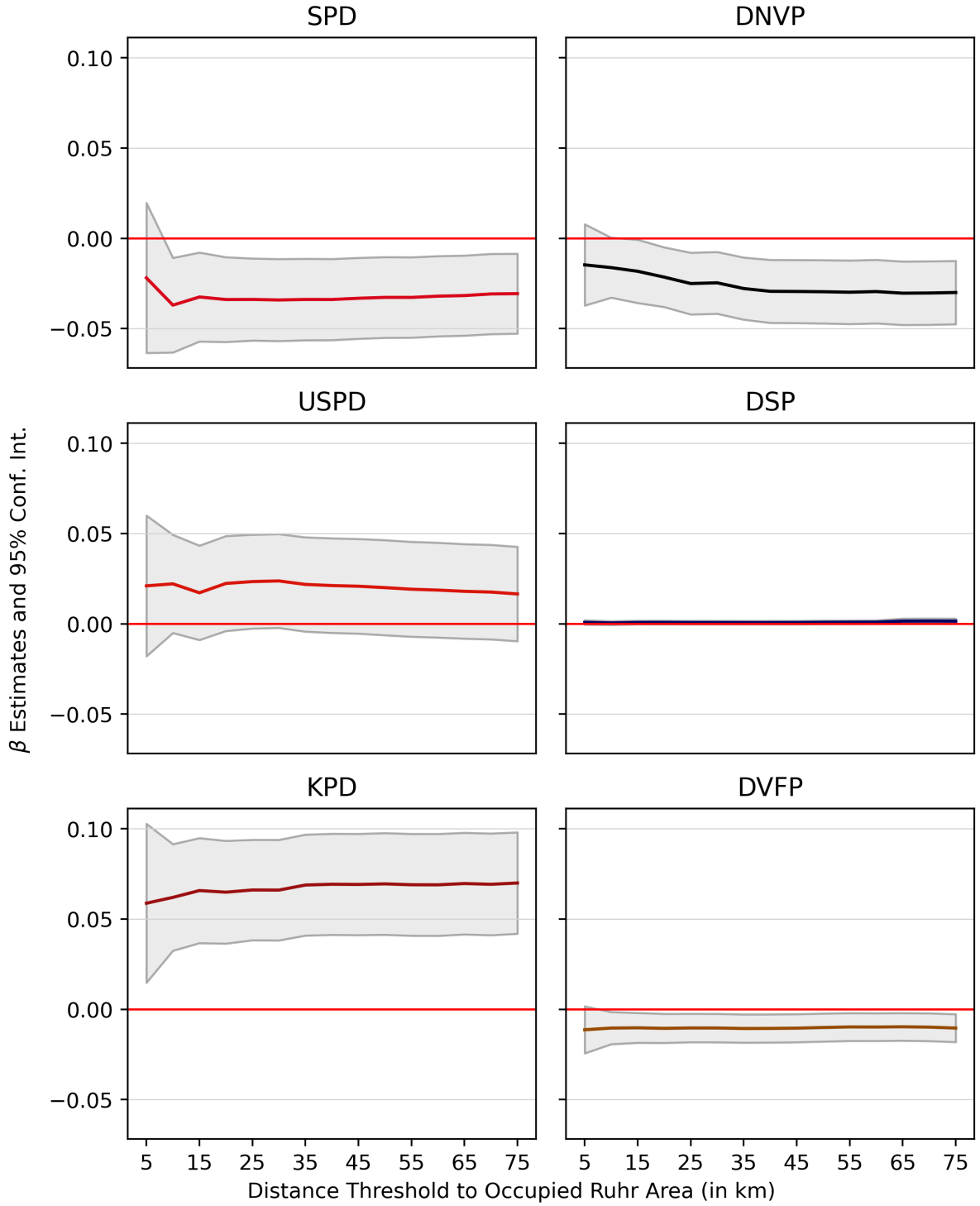
41	Langenhagen	Preußen	Hannover	0	2.611
42	Lehrte	Preußen	Hannover	0	0.724
43	Munster	Preußen	Hannover	0	1.318
44	Floersheim	Preußen	Hessen-Nassau	0	0.842
45	Frankfurt S	Preußen	Hessen-Nassau	0	0.216
46	Grossauheim	Preußen	Hessen-Nassau	0	0.330
47	Hanau S	Preußen	Hessen-Nassau	0	0.787
48	Langenselbold	Preußen	Hessen-Nassau	0	0.760
49	Somborn	Preußen	Hessen-Nassau	0	3.704
50	Angermund	Preußen	Rheinprovinz	1	1.000
51	Dinslaken	Preußen	Rheinprovinz	1	1.000
52	Duesseldorf S	Preußen	Rheinprovinz	1	1.000
53	Duisburg (-31.7.29) S	Preußen	Rheinprovinz	1	1.000
54	Erkrath	Preußen	Rheinprovinz	1	1.000
55	Essen S	Preußen	Rheinprovinz	1	1.000
56	Frillendorf	Preußen	Rheinprovinz	1	1.000
57	Gahlen	Preußen	Rheinprovinz	1	1.000
58	Hamborn S (-31.7.29)	Preußen	Rheinprovinz	1	1.000
59	Hardenberg	Preußen	Rheinprovinz	1	1.000
60	Heiligenhaus	Preußen	Rheinprovinz	1	1.000
61	Heisingen	Preußen	Rheinprovinz	1	1.000
62	Huckingen	Preußen	Rheinprovinz	1	1.000
63	Kaiserswerth	Preußen	Rheinprovinz	1	1.000
64	Karnap	Preußen	Rheinprovinz	1	1.000
65	Katernberg	Preußen	Rheinprovinz	1	1.000
66	Kettwig	Preußen	Rheinprovinz	1	1.000
67	Klueppelberg	Preußen	Rheinprovinz	0	2.192
68	Kray	Preußen	Rheinprovinz	1	1.000
69	Kupferdreh	Preußen	Rheinprovinz	1	1.000
70	Langenberg	Preußen	Rheinprovinz	1	1.000
71	Laupendahl	Preußen	Rheinprovinz	1	1.000
72	Lintorf	Preußen	Rheinprovinz	1	1.000
73	Mettmann	Preußen	Rheinprovinz	1	1.000
74	Muelheim (Ruhr) S	Preußen	Rheinprovinz	1	1.000
75	Muendelheim	Preußen	Rheinprovinz	1	1.000
76	Oberhausen S	Preußen	Rheinprovinz	1	1.000
77	Radevormwald	Preußen	Rheinprovinz	0	0.239
78	Ratingen	Preußen	Rheinprovinz	1	1.000
79	Schonnebeck	Preußen	Rheinprovinz	1	1.000
80	Steele	Preußen	Rheinprovinz	1	1.000
81	Sterkrade S	Preußen	Rheinprovinz	1	1.000
82	Stoppenberg	Preußen	Rheinprovinz	1	1.000
83	Ueberruhr	Preußen	Rheinprovinz	1	1.000
84	Velbert	Preußen	Rheinprovinz	1	1.000
85	Walsum	Preußen	Rheinprovinz	1	1.000
86	Werden A. Ruhr	Preußen	Rheinprovinz	1	1.000
87	Wissen, L. D. Sieg	Preußen	Rheinprovinz	0	0.561

88	Wuelfrath	Preußen	Rheinprovinz	1	1.000
89	Hohenmoelsen	Preußen	Sachsen	0	0.236
90	Zipsendorf	Preußen	Sachsen	0	1.306
91	Altenbochum	Preußen	Westfahlen	1	1.000
92	Altendorf	Preußen	Westfahlen	1	1.000
93	Annen	Preußen	Westfahlen	1	1.000
94	Aplerbeck	Preußen	Westfahlen	1	1.000
95	Asseln	Preußen	Westfahlen	0	1.917
96	Baak	Preußen	Westfahlen	1	1.000
97	Barop	Preußen	Westfahlen	1	1.000
98	Berghofen	Preußen	Westfahlen	1	1.000
99	Bochum S	Preußen	Westfahlen	1	1.000
100	Boele	Preußen	Westfahlen	0	4.360
101	Boernig	Preußen	Westfahlen	1	1.000
102	Boevinghausen Bei Luetge	Preußen	Westfahlen	1	1.000
103	Bommern	Preußen	Westfahlen	1	1.000
104	Brambauer	Preußen	Westfahlen	1	1.000
105	Breckerfeld (=1928 Boeckerfeld)	Preußen	Westfahlen	0	1.640
106	Buer S (-31.3.28)	Preußen	Westfahlen	1	1.000
107	Castrop	Preußen	Westfahlen	1	1.000
108	Dahl	Preußen	Westfahlen	0	1.963
109	Datteln	Preußen	Westfahlen	1	1.000
110	Dorsten	Preußen	Westfahlen	1	1.000
111	Dortmund S	Preußen	Westfahlen	1	1.000
112	Eickel	Preußen	Westfahlen	1	1.000
113	Ende	Preußen	Westfahlen	1	1.000
114	Eppendorf	Preußen	Westfahlen	1	1.000
115	Gelsenkirchen S (-31.3.2	Preußen	Westfahlen	1	1.000
116	Gerthe	Preußen	Westfahlen	1	1.000
117	Gevelsberg	Preußen	Westfahlen	0	0.732
118	Grundschoettel	Preußen	Westfahlen	0	0.900
119	Guennigfeld	Preußen	Westfahlen	1	1.000
120	Habingshorst	Preußen	Westfahlen	1	1.000
121	Hagen S	Preußen	Westfahlen	0	1.238
122	Halver	Preußen	Westfahlen	0	0.581
123	Harpen	Preußen	Westfahlen	1	1.000
124	Haspe	Preußen	Westfahlen	0	0.976
125	Hasslinghausen	Preußen	Westfahlen	0	0.055
126	Hattingen	Preußen	Westfahlen	1	1.000
127	Hennen	Preußen	Westfahlen	0	0.903
128	Henrichenburg	Preußen	Westfahlen	1	1.000
129	Herdecke	Preußen	Westfahlen	1	1.000
130	Herne S	Preußen	Westfahlen	1	1.000
131	Herten	Preußen	Westfahlen	1	1.000
132	Hoentrop	Preußen	Westfahlen	1	1.000

133	Hoerde S (-31.3.28)	Preußen	Westfahlen	1	1.000
134	Holthausen B. Castrop	Preußen	Westfahlen	1	1.000
135	Holzen	Preußen	Westfahlen	1	1.000
136	Holzwickede	Preußen	Westfahlen	0	2.900
137	Hordel	Preußen	Westfahlen	1	1.000
138	Horst (Horst-Emscher)	Preußen	Westfahlen	1	1.000
139	Huelscheid	Preußen	Westfahlen	0	1.340
140	Husen	Preußen	Westfahlen	0	4.694
141	Ickern	Preußen	Westfahlen	1	1.000
142	Kirchderne	Preußen	Westfahlen	1	1.000
143	Kirchhellen	Preußen	Westfahlen	1	1.000
144	Kirchhoerde	Preußen	Westfahlen	1	1.000
145	Kirchlinde	Preußen	Westfahlen	1	1.000
146	Koenigssteele	Preußen	Westfahlen	1	1.000
147	Laer	Preußen	Westfahlen	1	1.000
148	Langendreer	Preußen	Westfahlen	1	1.000
149	Leithe	Preußen	Westfahlen	1	1.000
150	Letmathe	Preußen	Westfahlen	0	3.263
151	Luenen	Preußen	Westfahlen	1	1.000
152	Luetgendortmund	Preußen	Westfahlen	1	1.000
153	Marl	Preußen	Westfahlen	1	1.000
154	Marten	Preußen	Westfahlen	1	1.000
155	Mengede	Preußen	Westfahlen	1	1.000
156	Methler	Preußen	Westfahlen	0	0.497
157	Nachrodt-Wiblingwerde	Preußen	Westfahlen	0	1.361
158	Nette	Preußen	Westfahlen	1	1.000
159	Nieder Bonsfeld	Preußen	Westfahlen	1	1.000
160	Niedersprockhoevel	Preußen	Westfahlen	0	0.641
161	Oer	Preußen	Westfahlen	1	1.000
162	Oespel	Preußen	Westfahlen	1	1.000
163	Oestrich	Preußen	Westfahlen	1	1.000
164	Polsum	Preußen	Westfahlen	1	1.000
165	Querenburg	Preußen	Westfahlen	1	1.000
166	Rauxel	Preußen	Westfahlen	1	1.000
167	Recklinghausen Lg.	Preußen	Westfahlen	1	1.000
168	Recklinghausen S	Preußen	Westfahlen	1	1.000
169	Riemke	Preußen	Westfahlen	1	1.000
170	Roehlinghausen	Preußen	Westfahlen	1	1.000
171	Schalksmuehle	Preußen	Westfahlen	0	0.944
172	Schueren	Preußen	Westfahlen	1	1.000
173	Schwelm	Preußen	Westfahlen	0	0.616
174	Schwerte	Preußen	Westfahlen	0	0.390
175	Sodingen	Preußen	Westfahlen	1	1.000
176	Soelde	Preußen	Westfahlen	0	1.155
177	Somborn	Preußen	Westfahlen	1	1.000
178	Stiepel	Preußen	Westfahlen	1	1.000
179	Suderwich	Preußen	Westfahlen	1	1.000

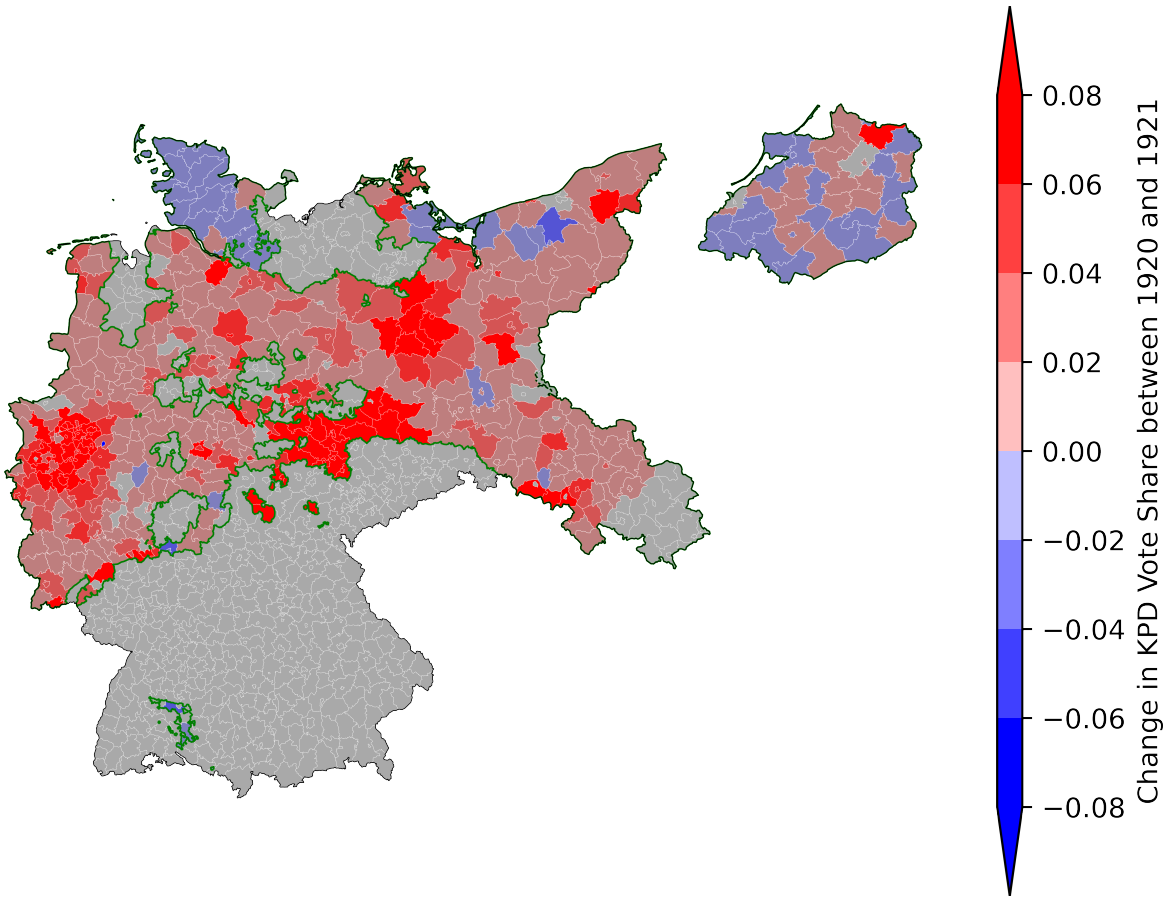
180	Voerde	Preußen	Westfahlen	0	0.841
181	Volmarstein	Preußen	Westfahlen	0	0.914
182	Vorhalle	Preußen	Westfahlen	1	1.000
183	Waltrop	Preußen	Westfahlen	1	1.000
184	Wanne	Preußen	Westfahlen	1	1.000
185	Wattenscheid	Preußen	Westfahlen	1	1.000
186	Weitmar	Preußen	Westfahlen	1	1.000
187	Welper	Preußen	Westfahlen	1	1.000
188	Wengern	Preußen	Westfahlen	0	0.387
189	Werne	Preußen	Westfahlen	1	1.000
190	Westenfeld	Preußen	Westfahlen	1	1.000
191	Westerfilde	Preußen	Westfahlen	1	1.000
192	Westerholt	Preußen	Westfahlen	1	1.000
193	Westherbede	Preußen	Westfahlen	1	1.000
194	Westhofen	Preußen	Westfahlen	1	1.000
195	Wetter A. D. Ruhr	Preußen	Westfahlen	1	1.000
196	Witten S	Preußen	Westfahlen	1	1.000
197	Boehlitz-Ehrenberg	Sachsen	-	0	0.916
198	Borna	Sachsen	-	0	0.829
199	Brandis	Sachsen	-	0	0.602
200	Coswig	Sachsen	-	0	3.528
201	Knautkleeberg	Sachsen	-	0	0.694
202	Leipzig S	Sachsen	-	0	2.041
203	Lindenthal	Sachsen	-	0	0.222
204	Lobstaedt	Sachsen	-	0	2.155
205	Markranstaedt	Sachsen	-	0	1.134
206	Naunhof	Sachsen	-	0	0.250
207	Oberfrohna	Sachsen	-	0	0.273
208	Pegau	Sachsen	-	0	0.364
209	Pleissa	Sachsen	-	0	0.352
210	Taucha	Sachsen	-	0	0.610
211	Wildenfels	Sachsen	-	0	0.971
212	Wilsdruff	Sachsen	-	0	0.791
213	Zschocken	Sachsen	-	0	0.668

3 Additional Robustness Checks



Note: The figure illustrates treatment effects using different control groups whose selection depends on the municipalities' distances to the occupied Ruhr area. The fitted regression model is $Vote\ Share_{p,m,t} = \alpha + \beta[CRISIS_m \times POST_t] + \zeta Controls_{m,t} + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$, where p stands for a political party, m refers to a municipality, and t to the election date. d represents electoral districts. The variable $CRISIS$ equals one for municipalities affected by the economic shock triggered by the Allied Ruhr occupation in 1923 and zero otherwise. $POST$ is zero for the Federal election in June 1920. It is one for the election in May 1924. The model includes municipality, election date, and electoral district by election date fixed effects. Standard Errors are clustered at the municipality level for all models. The gray shaded areas represent statistical significance at the 5 percent level. Each subfigure corresponds to a party from either the right or left political camp.

Figure C.3: Effects as a Function to Distance to the Occupied Ruhr Area for Individual Parties



Note: This figure illustrates county-level changes in the vote shares of the communist KPD between the Federal election of 1920 and the Prussian state elections of 1921. The green lines represent the borders of Prussia. Gray patches highlight counties from either other German states or Prussia, for which the data sources provide insufficient observations.

Figure C.4: Changes in KPD Vote Shares between the 1920 Federal and 1921 Prussian State Elections

4 Historical Background

4.1 The End of War and the November Revolution

The 1923 Ruhr Occupation, the economic crisis it triggered, and the election outcomes in 1924 have to be explained in the context of the political eruptions starting in the late summer of 1918.[20] The following paragraphs summarize the main events, suggesting that both left and right-wing extremist movements had established a widely recognized anti-system reputation before the Ruhr occupation and the economic crisis it set off in 1923.

After Germany's allies Austria-Hungary (September 14, 1918) and Bulgaria (September 30, 1918) resigned from war and ceased fire, the German Supreme Army Command admitted its defeat to representatives of the monarchy later the same month. In consequence, a new government was formed on October 3, 1918.[21] Reaching out to the American President, Woodrow Wilson, asking for a ceasefire and offering peace was the new government's first action on the day of its inauguration.

Two further developments in October triggered a public uprise, ultimately leading to the Emperor's abdication and the *November Revolution*. First, the public perception interpreted Wilson's willingness to negotiate the terms of a peace treaty as conditional on Germany turning into a democracy. Second, on October 28, 1918, marines refused the order to set sails for a last and, in their eyes, "pointless" and "irresponsible" (Kolb and Schumann, 2013, p.6) battle. Navi officials ordered mass arrests of marines in response, provoking armed and violent riots. News about the mutiny spread over the country. Marxist workers' and soldiers' councils emerged and carried the uprise. On November 9, 1918, Max von Baden ousted the Emperor and installed a provisional government led by center-left politicians. In parallel, on November 11, 1918, a German delegation signed the armistice, ending the war.

In the following months, the provisional government prepared the election of a constituent national assembly under constant threats from extremist forces (see below). The election was held on January 19, 1919. On February 11, 1919, the elected assembly appointed Friedrich Ebert as the first head of state (*Reichspräsident*). The assembly took place in the city of Weimar, giving the new country its name, the *Weimar Republic*. On July 31, 1919, the assembly approved the new constitution, effectively finalizing the foundation of the new republic. Moreover, in the sequel of the armistice, Germany signed the Peace Treaty of Versailles on June 28, 1919. Large parts of the German population considered the treaty unjust (Kolb and Schu-

[20] If not stated otherwise, information in the chapter stem from Kolb and Schumann (2013).

[21] For the first time in imperial Germany, the parliament had a say when appointing government members. At that point, Germany de facto turned from a constitutional into a parliamentarian monarchy.

mann, 2013), providing "fertile soil for [...] extremism" (Ascher and Lewy, 1956, p.479).[22]

4.2 The Crisis Years of the Young Republic

Ever since the end of WWI, the young republic was under heavy attack. Radical forces from either side of the political spectrum not only imposed a threat to the republic's existence, they also attempted to eliminate their opposing counterparts. Starting in December 2018 and lasting until summer 1919, a series of increasingly radical left-wing revolts occurred, including the *Weihnachtskämpfe* of 1918, the *Spartacist Uprising* of January 1919, general strikes, and several proclamations of Soviet-style republics (*Räterepubliken*). The center-left government ordered the military, police forces, and paramilitary militias (*Freikorps*), dominated by right-wing war veterans, to violently shut down the riots. The political right likewise attempted to overthrow the government. In March 1920, parts of the military ousted the government from Berlin and took over power (*Kapp-Lüttwitz-Putsch*). As a reaction, labor unions called out for a general strike, and ministry officials refused to follow the orders of the military junta, causing the coup d'état to fail. Newly armed left-wing groups emerged and joined the fight against the junta. However, in the weeks following the coup's defeat, some of these left-wing groups reached out for power themselves.[23] Relying on the military that had proven to be (at least partly) hostile to the republic only weeks before, the government crushed the revolts.[24]

Economically, high production levels characterized the early post-war years. High growth rates were partly enabled by a continuing depreciation of the German currency that proved favorable for exports. At the same time, rising inflation rates accompanied the currency's depreciation.[25] Whereas inflation did not hamper production initially,

[22]The most important terms of the peace treaty were i) the cession of approximately 12.5 percent of German territory, accounting for about ten percent of the population, circa 20 percent of the heavy industry's, 15 percent of the agricultural sector's, and six to seven percent of the manufacturing industry's production capacities, ii) the acknowledgement of sole war guilt of Germany and her allies, iii) the loss of all colonies, and iv) demilitarization regulations. Moreover, the treaty sentences Germany to vast reparation obligations whose exact volumes were tied to the German economic performance in subsequent years.

[23]Severe counterattacks took place in Saxonia, Thuringia, and the Ruhr area, where "the Red Army" (Kolb and Schumann, 2013, p.41) ruled for several weeks.

[24]Moreover, in addition to casualties from combats, the republic witnessed at least 376 political murders until 1922 Gumbel (1922). Whereas right-wing extremists murdered 354 persons, left-wing radicals committed 22 assassinations. Besides activists from opposing political camps, assassins also targeted centrist politicians. Prominent victims include Matthias Erzberger (centrist politician and signer of the armistice, 1921), Walter Rathenau (minister of foreign affairs, 1922), Rosa Luxemburg and Karl Liebknecht (the *Spartacist* leaders, 1919)

[25]The inflation period consists of four phases (Prion, 1926). The first phase resulted from the re-opening of foreign trade. As the German demand for foreign products was high after years of isolation, the value of the German currency diminished. The *London Ultimatum* from May 1921 forced Germany to accept her reparation obligations and triggered the inflation period's second phase. Initial to the third phase was the announcement of the de facto refusal of long-term foreign lending to Germany at the Paris Banking Conference by international banks in early June 1922. When the German Minister

the economy increasingly suffered from the enhancing inflationary pressure toward 1923. However, the thriving industrial activity contrasted with the relatively low standard of living that large parts of the population had been facing (Bresciani-Turroni, 1937).

4.3 Political Parties from the Left and Right until the 1924 Elections

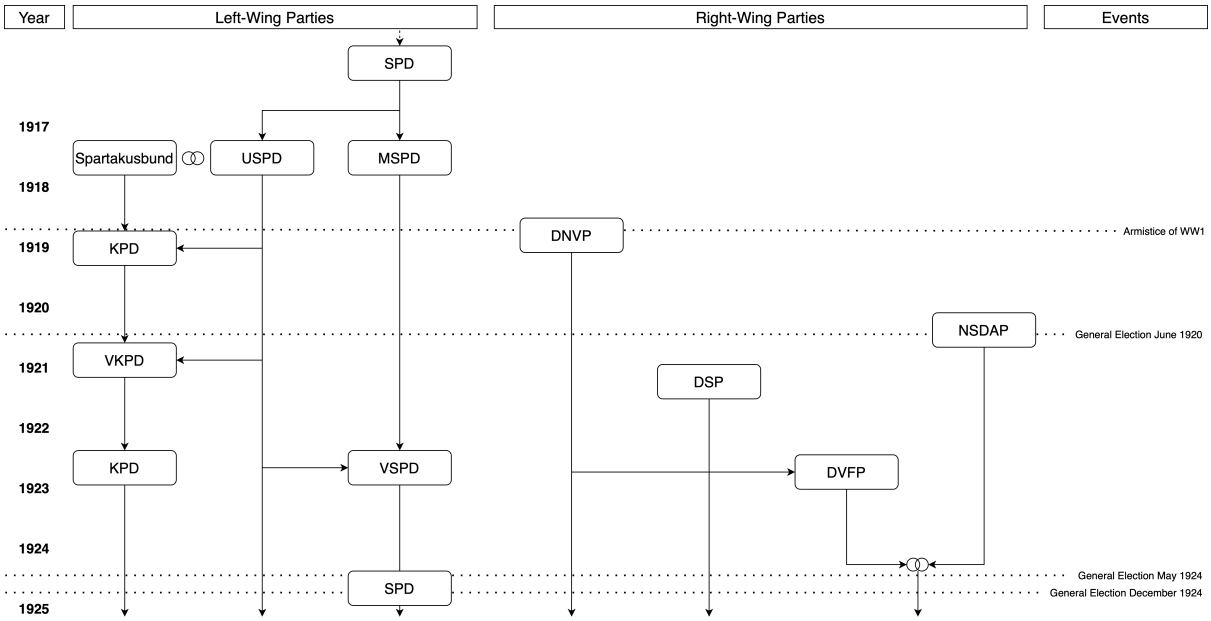
Three major left-wing political parties existed in the early years of the Weimar Republic: The center-left *(Mehrheits-) Sozialdemokratische Partei Deutschlands* (SPD, MSPD, or VSPD), the extremist and "anti-democratic" (Debus and Hansen, 2010, p.20) *Kommunistische Partei Deutschlands* (KPD), and the *Unabhängige Sozialdemokratische Partei Deutschlands* (USPD), which positions between the SPD and the KPD in terms of political extremism. The following paragraph sketches the parties' and their relations' developments.

In 1917, when the German Parliament voted on the expansion of credits to finance the war, the SPD split into parts (see Figure D.5). The fraction supporting ongoing war efforts now called itself MSPD. In the aftermath of the war, the MSPD (1,000,000 members in March 1919) became the strongest party in Germany. During its time in government, the MSPD relied on the old military elite and bourgeoisie parties, trying to prohibit a further escalation of the revolutionary situation. On the contrary, opponents of the proliferation of financial means enabling the war's continuation formed the USPD. The USPD (100,000 members in October 1918, 300,000 members in January 1919, and 750,000 members in late 1919) covered a wide range of the leftist political spectrum. The USPD's right wing collaborated with the MSPD as it favored the formation of a constituent national assembly through elections. More radical voices in the USPD were reluctant toward or even rejected establishing a parliamentarian democracy. Among the most radical ones, the *Spartakusbund* argued for the establishment of a soviet system, following the example of the *Union of Soviet Socialist Republics* (USSR). On January 1, 1919, this group separated from the USPD and formed in alliance with other left-wing extremists a new political party, the communist KPD.[26] In December 1920, the USPD experienced another breakup. Fighting over the issue of whether to join the *Communist*

for Foreign Affairs, Walther Rathenau, was assassinated in Berlin by domestic extremist forces later the same month, the resulting fear of financial and political instability caused investors to flee from the German currency. The inflation entered its final phase and turned into a hyperinflationary period when the German central bank dismissed its stabilization invervention in April 1923. At that time, the central bank issued vast amounts of money needed by the government to finance the resistance in the Ruhr area and support affected companies.

[26] At its formation, the KPD counted approximately 100,000 members. This number reduced to approximately 80,000 in 1920, after the party expelled many of its members. The KPD counted about 360,000 members in 1921, 225,000 in 1922, and 295,000 in 1923 (Weber, 1969, pp.362).

International under Russia's guidance, parts of its members abandoned the USPD to join the KPD. Finally, in September 1922, many of the USPD's remaining members left the party and merged with the MSPD.[27] Even though the USPD officially existed until 1931, it lost its political importance after 1922. Relations, especially between the KPD, which was heavily involved in public uprisings, and the SPD, which aimed at defending the democratic republic by relying on force, were hostile. The new expression "war among brothers" was coined, summarizing the atmosphere among leftist parties.



Note: The figure illustrates party dynamics within the left and right camps of the political spectrum in post-WWI Germany until 1925. Three major left-wing (SPD, USPD, and KPD) and four main right-wing (DNVP, DSP, DVFP, and NSDAP) parties existed. A gray background indicates the extremist nature of a party. The non-extremist center-left SPD is the only listed party that already existed before the outbreak of WWI. It split in 1917, fighting over war credit expansions. The newly emerged USPD experienced multiple waves of member losses. In general, USPD members either returned to the more centrist MSPD (that changed its name back to SPD later on) or the more radical KPD, founded in 1919. On the right side of the political spectrum, the DNVP was the first party to be established in 1918. Varying views on the *Kapp-Lüttwitz-Putsch* and Rathenau's assassination caused a group of DNVP members to form a new and more radical party, the DVFP. The DVFP would later temporarily join forces with Hitler's NSDAP.

Figure D.5: Overview of German Left and Right-Wing Parties after WWI

On the other side of the political spectrum, the *Deutschnationale Volkspartei* (DNVP) stood as the sole significant right-wing party with (partly) extremist ideologies to participate in the Federal election of 1920.[28] In addition to the DNVP, two new and more radical right-wing parties emerged in the subsequent years. Varying views on the attempted *Kapp-Lüttwitz-Putsch* and Rathenau's assassination caused a group of DNVP delegates to form a new party extremist in nature, the *Deutschvölkische Freiheitspartei* (DVFP) (Wulff, 1968). After the party was temporarily outlawed in the aftermath of

[27]The MSPD subsequently changed its name into *United Social Democratic Party of Germany* (VSPD). From 1924 onwards, the "V" was cancelled from the label the party operated under SPD again.

[28]A dissens concerning the degree of extremity of the DNVP exists among historians. While Kruppa (1988, p.138) asserts that the party already had a significant number of *völkisch*-radicals and ultra-nationalists among its members at the time of its founding, Capoccia (2001) argues that the party became radicalized in 1928.

a failed coup d'état in November 1923 (*Hitler-Ludendorff-Putsch*), it joined forces with Hitler's *Nationalsozialistische Deutsche Arbeiterpartei* (NSDAP) to compete in both 1924 Federal elections.[29] Founded in 1921, the *Deutschsoziale Partei* (DSP) was a further ultra-nationalistic right-wing party that emerged after WWI. With antisemitism and revisionism on its agenda, the party had similar political goals as the NSDAP (Kruppa, 1988).

Moreover, not only did extremist parties emerge in the years following WWI. The case of the KPD - the only extremist party that participated in the elections prior to 1924 - shows that people also increasingly supported extremist views (see Table D.3 and Figure C.4 in the Appendix).

Table D.2: Shipped Freight Volumes between the Ruhr area and Other German Regions

	(1) Ruhr area	(2) Control area	(3) t-Test
	Mean	Mean	Diff
1921	-0.00	-0.22	-0.22
1922	0.29	1.16	0.87
1923	-0.77	-0.32	0.45***
1924	3.82	2.32	-1.51
1925	0.23	0.17	-0.06

Note: This table shows differences in the growth rates of shipped goods between the occupied Ruhr area and other regions of Germany. Data on freight volumes stems from *Wirtschaft und Statistik*. Column 1 gives the annual average growth rates of shipped goods at ports located the Ruhr area. Column 2 provides these values for inland ports from outside the Ruhr area. Column 3 shows the differences in means and their statistical significance, where * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

[29]The names under which the DVFP and the NSDAP jointly competed were *Nationalsozialistische Freiheitspartei* and *Nationalsozialistische Freiheitsbewegung*. The parties ended their collaboration in February 1925.

Table D.3: Election Results for Left and Right-Wing parties after WWI

	Panel A. Left-Wing Parties					
	KPD		USPD		SPD	
Election	(1)	(2)	(1)	(2)	(1)	(2)
6 Jun, 1920	1.94	4.23	16.58	23.62	22.14	16.15
4 May, 1924	11.84	26.83	0.87	1.40	21.08	13.96
7 Dec, 1924	8.51	17.47	0.31	0.66	26.55	21.03
	Panel B. Right-Wing Parties					
	DNVP		DSP		DVFP	
Election	(1)	(2)	(1)	(2)	(1)	(2)
6 Jun, 1920	15.37	6.10	-	-	-	-
4 May, 1924	20.34	10.10	1.21	0.37	6.74	2.78
7 Dec, 1924	21.08	11.44	0.57	0.05	3.10	1.27

Note: This table illustrates election outcomes for the first three Federal elections in post-WWI Germany. Values are reported as percentages. Panel A exhibits results for the three left-wing parties (KPD, USPD, and (M)SPD). Panel B shows election results for the right-wing parties. Note that the election results for the DVFP include NSDAP votes, as the two parties joined forces before the 1924 elections. Column 1 reports results for municipalities not occupied in the wake of the 1923 Ruhr occupation. On the contrary, Column 2 shows election outcomes for the municipalities occupied in January 1923.

5 Crisis Intensity as potential Channel for Heterogenous Treatment Effects

Why did people in the occupied territories support more radical political views? In the following paragraphs, I first suggest that excess mortality in the occupied Ruhr area differs from unoccupied regions, making it a valid proxy to measure the severity of the economic crisis. Next, I use geographic variations in excess mortality within the area hit by the shock to assess heterogeneous treatment effects. My results suggest that excess mortality correlates with increases in extremist voting on both sides of the political spectrum.

Concerning the first step, the unit of observation for mortality figures is the civil registry office. Thus I specify the regression model

$$Excess\ Mortality_{r,1923} = \alpha + \gamma CRISIS_{rm} + \rho Population_{rm} + \epsilon_{r,1923} \tag{11}$$

in which I regress excess mortality at registry office r located in municipality m at the year of the crisis 1923 on the treatment dummy $CRISIS$. I control for population size and use heteroskedasticity-consistent standard errors. Table E.4 presents the estimated coefficient of the treatment dummy. Columns 1 and 2 rely on predicted death figures when using a 2^{nd} degree polynomial regression. The death counts underlying to the re-

gressions illustrated in Columns 3 and 4 stem from a linear prediction. Interestingly, all specifications suggest that facing the economic crisis leads to lower excess mortality. This finding might appear counterintuitive at first sight. However, the following factors potentially explain the sign of the effect. First, the shutdown of the Ruhr economy increased the living conditions to some extent. The lack of hard physical work led to an "significant improvement" (Fischer, 2004, p.150) of the blue-collar workers' health conditions.[30] Second, occupational accidents with fatalities were common in industrialized Germany in the early 20^{th} century (Knoll-Jung, 2021).[31] I assume the closure of production plants in the heart of the German heavy industry must have massively decreased the number of work-related accidents and thus prohibited fatalities. But not only did blue-collar workers' health benefit from the work: Rapidly improving air quality in response to the shutdown (Fischer, 2004) increased living conditions of the wider population.

Table E.4: The Economic Crisis and Excess Mortality

	Dependent Variable: Excess Mortality			
	Polynomial Prediction		Linear Prediction	
	(1) Basis	(2) Controls	(3) Basis	(4) Controls
CRISIS	-0.0572***	-0.0586***	-0.0456***	-0.0485***
	(0.0186)	(0.0191)	(0.0169)	(0.0174)
Controls		✓		✓
Observations	376	375	376	375

Note: The table illustrates estimates for the treatment variable *CRISIS* following the regression model $Excess\ Mortality_{r,1923} = \alpha + \gamma CRISIS_{rm} + \rho Population_{rm} + \epsilon_{r,1923}$. The unit of observation is the registry office. The dependent variable is excess mortality at registry office r in 1923. In Columns 1 and 2, excess mortality for 1923 is estimated using a 2^{nd} degree polynomial regression model fitted to annual observations from 1919 to 1924. In Columns 2 and 3, the same data is fitted to a linear model. Columns 2 and 4 control for the population of the municipality in which the registry office is located. * p < 0.1, ** p < 0.05, *** p < 0.01 indicate statistical significance.

At the same time, people have been starving. Nonetheless, they did not have to starve to death if they overcame their patriot pride and went to soup kitchens the French established across the occupied territory to break the *Passive Resistance* (Fischer, 2004). Moreover, the Red Cross organized a support program enabling parents to evacuate hundreds of thousands of their starving children to other regions in Germany.[32] Another concern is people killed in violent confrontations with the occupiers, potentially driving

[30]Fischer (2004) refers to an official report issued by the district government in 1925 when making the statement. The document, which I cannot access personally at this point, is stored in the *Staatsarchiv Münster* under *Reg. Arnsberg 6, Nr. 512, Bericht des Oberregierungs und Gewerberates, T.Nr. 88 R G., Arnsberg, Februar 1925, II B. Gesundheitsschädliche Einflüsse.*

[31]For instance, for the years 1917 to 1920, the annual average number of deadly work accidents exceeds 7,000.

[32]Note that other sources report increased incidences of diseases (Fischer, 2004).

death figures up in the Ruhr area. However, as Jeannesson (2004) estimates the total number of such fatalities to vary between 85 and 111, this factor seems irrelevant for mortality rates in a region populated by millions. To summarize, while the entire country experienced positive excess mortality rates in 1923 (the mean for registry office in unoccupied territories in my sample is 9.7 percent), it was lower in the occupied area (mean of 5.9 percent).

Next, I use excess mortality as a (reverse) proxy for the economic downturn's severity. To assess heterogeneous effects on the support for political camps and parties, I regress their changes in vote shares on excess mortality in 1923.[33] For this purpose, I collapse excess mortality rates to the municipality level as this is the observation unit for electoral data.

$$\Delta Vote\ Share_{p,m,1924} = \alpha + \gamma Excess\ Mortality_{m,1923} + \rho_k Population_m + \epsilon_{p,m,1924} \quad (12)$$

I follow the model in Equation E.5, in which $\Delta Vote\ Share_{p,m,1924}$ describes the change in the vote share of the political camp or party p in municipality m between the Federal elections of June 1920 and May 1924. I use robust standard errors and control for population size. Table E.5 shows that excess mortality has no predictive power for changes in vote shares of political camps (Columns 1 and 2). This is different concerning vote shares of the extremist parties. A one standard deviation increase in excess mortality correlates with decreases of about four and one percentage points for the vote shares of the ultra-left KPD (Column 3) and ultra-nationalistic DVFP (Column 5), respectively. Although the sample size is only 27, these estimates are significant at the ten percent level. The interpretation is as follows: The stronger a municipality gets hit by the crisis (i.e., the lower the excess mortality rate is), the higher the increase in voting for the KPD and DVFP. When combining the vote shares of extremist parties, the estimated effect is about 4.2 percentage points and is significant at the five percent level. Interestingly, although the estimated average impact on the DVFP's vore share is negative (see Figure II), the party seems to benefit from the economic crisis when the downturn is sufficiently large. The results support the view that both extremes of the political spectrum benefited from the economic shock following the occupation of the Ruhr area. On a larger scale, they provide support for the hypothesis that pre-treatment perceptions of political movements matter for political radicalization in response to an economic shock.

[33]Similar to Section 6, I assume the two right-wing extremist parties' vote shares to be zero in the 1920 Federal elections, in which they did not participate.

Table E.5: Excess Mortality and Extremist Voting within the Occupied Territories

	Dependent Variable: Changes in Vote Shares					
	Political Camps		Extremist Parties			
	(1) Left-Wing Parties	(2) Right-Wing Parties	(3) KPD	(4) DSP	(5) DVFP	(6) All Extremist Parties
Excess Mortality (Std.)	-0.004	0.003	-0.008	-0.000	-0.001	-0.009
	(0.006)	(0.004)	(0.011)	(0.000)	(0.002)	(0.011)
Controls	✓	✓	✓	✓	✓	✓
Observations	74	74	74	74	74	74

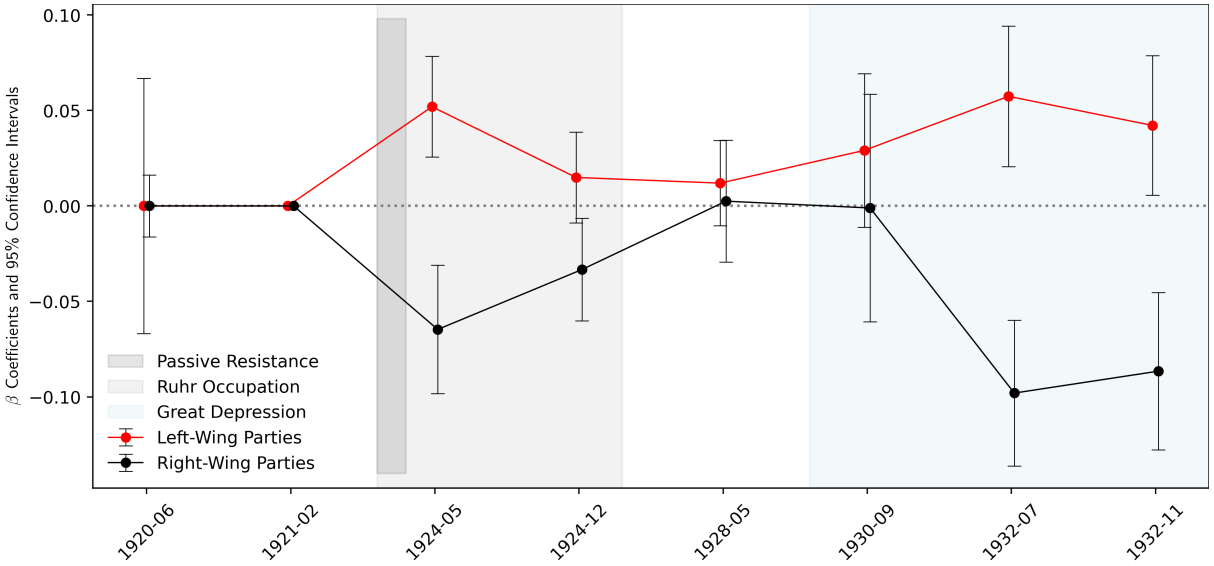
Note: This table shows the estimated coefficients from the regression model $\Delta Vote\ Share_{p,m,1924} = \alpha + \gamma Excess\ Mortality_{m,1923} + \rho_k Population_m + \epsilon_{p,m,1924}$. The explanatory variable of interest is the excess mortality of municipality t in 1923. The dependent variable is the change in vote share for political camp or party p between the 1920 and the first 1924 Federal elections. The model controls for municipality population. Standard errors are robust to heteroskedasticity across all specifications. The total number of observations is 27. Whereas Columns 1 and 2 indicate estimated coefficients when aggregated vote shares of political camps are the dependent variable, Columns 3 to 6 refer to changes in vote shares of individual extremist parties. Statistical significance is indicated by * p < 0.1, ** p < 0.05, *** p < 0.01.

6 The *Prussian* Synthetic Control Group

Table F.6: Differences in Municipality Characteristics (Prussia Only)

	Synthetic Control		No Synthetic Control	
	(1) $\hat{\beta}$	p-value H_0 $\beta = 0$	(3) $\hat{\gamma}$	p-value H_0 $\gamma = 0$
Social Variable				
Population (Std.)	0.00	1.00	0.24	0.00
Eligible Voters' Share	-0.06	0.00	-0.06	0.00
Share of Catholic Citizens	0.23	0.00	0.25	0.00
Share of Protestant Citizens	-0.24	0.00	-0.27	0.00
Share of Jewish Citizens	-0.01	0.01	-0.00	0.24
Political Variable				
Share of Left-wing Votes	-0.00	1.00	0.07	0.00
KPD Share	-0.00	1.00	0.05	0.00
USPD Share	0.01	0.51	0.03	0.00
SPD Share	-0.01	0.58	-0.01	0.37
Share of Right-wing Votes	-0.00	1.00	-0.10	0.00
DNVP Share	-0.00	1.00	-0.10	0.00
Share of Centrist Votes	0.03	0.31	0.04	0.00
Voter Turnout	-0.00	1.00	0.03	0.00
Share of Valid Votes	-0.00	1.00	0.00	0.90
Economic Variable				
Economic Center	-0.00	1.00	0.82	0.00
Economic Activity	0.30	0.00	0.78	0.00
Exposure to Mining and Quarrying	1.43	0.00	2.25	0.00
Exposure to Manufacturing	0.33	0.00	0.77	0.00
Exposure to Finance	0.11	0.19	0.51	0.00
Exposure to Construction	0.00	0.99	0.17	0.00

Note: This table indicates how well the Synthetic Control Method eliminates differences between treated and untreated municipalities. While Columns 1 and 2 refer to differences when using SCG, Columns 3 and 4 correspond to a comparison between the treated area with the unweighted set of all available untreated municipalities. Columns 1 and 3 show the estimated $\hat{\beta}$ and $\hat{\gamma}$ coefficients resulting from fitting the regression models in Equations 4 to 7. Columns 2 and 4 exhibits the estimates' statistical significance by providing p-values. As opposed to Table I, the regressions underlying this table refer to municipalities from the federal state of Prussia only.



Note: The figure illustrates estimated β coefficients from the fitted model $Vote\ Share_{p,m,t} = \alpha + \sum_{t \neq 1921} \beta_{p,t}[CRISIS_m \times Election\ Date_t] + \left(\sum_{t \in E} \zeta_t Election\ Date_t \times Unemployment_{m,t}\right) + \mu_m + \eta_t + \lambda_{td} + \epsilon_{p,m,t}$, in which time dummies that are interacted with the treatment variable $CRISIS$ allow for time-varying treatment effects. To avoid biases from the regional differences in the exposure to the *Great Depression* and the *German Banking Crisis*, the model includes interactions of time dummies with municipality-level unemployment shares for the elections occurring in 1930 and 1932 (these elections constitute the set E). The dependent variables are the aggregated municipality-level vote shares of all left-wing and right-wing parties, and the 1921 Prussian state election is the omitted period. The variable $CRISIS$ equals one for municipalities affected by the economic shock triggered by the Allied Ruhr occupation in 1923 and zero otherwise. p stands for either the right or left political camp, m refers to a municipality, and t to the election date. d represents electoral districts. Standard Errors are clustered at the municipality level for all models. Whiskers indicate statistical significance at the five percent level.

Figure F.6: Eventstudy Graph