



Spoils of War: The Political Legacy of the German hyperinflation

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ABSTRACT

I study the link between monetary policy and electoral outcomes by linking new data on the 1923 German hyperinflation and the vote share of the main parties of Weimar Republic from 1924 to 1933. Exploiting cross-sectional variation in prices in over 280 cities, I find that inflation predicts the vote share of the *Volksrechtspartei*, an association-turned-party of inflation victims, and positively correlates with the Communists in the 1932 elections. Hyperinflation also leads to a decline in turnout, with a loss of confidence in the German institutions. However, contrary to received wisdom, areas more affected by inflation did not see a higher vote share for the Nazi party. Results are robust to a range of specifications, including models in differences, panel data with fixed effects, Coarsened Exact Matching estimation, Conley standard errors, and an instrumental variable strategy.

“Hyperinflations are the supernovas of the monetary firmament, exploding furiously only to collapse into the dark neutron stars of economic contraction.”

Charles S. Maier (1987: 194).

1. Introduction

The twentieth century has seen how monetary problems can translate into hyperinflations,¹ often associated with stress on the government budget, such as wars, ending of political regimes, a collapse in aggregate supply, or a fall in export prices. They not only knock down the economy with money becoming worthless but are held in our collective memory for decades. Germans have commonly used the word *Stabilitätspolitik* to advocate economic policy geared in support of price stability, a word that has been widely applied in light of Germany's supernova: the 1923 hyperinflation.² In January 1923, a US dollar was worth 17,000 Marks (24,000 Marks in April and 353,000 Marks in July). By November, a dollar was worth 2,193 trillion Marks, and, by December, 4,200 trillion Marks.

In this paper I provide new theory and evidence on how the 1923 hyperinflation, the defining episode of the 1920s, affected the broader German political order. While the origins and the economic consequences of the German hyperinflation have been well studied,³ its political legacy has often been claimed to have had broader political implications but with differing views. Could the memories of hyperinflation have paved Hitler's path to power? If so, could they have ended Weimar's inter-war democracy?

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¹ Throughout I employ the terms hyperinflation, inflation, rise in prices, and rise in the cost-of-living interchangeably. All of them refer to hyperinflation months (i.e., rise in prices) that took place in the fall of 1923.

² As Eichengreen (2015: 36) outlined, “The hyperinflation that reached its chaotic climax in Germany in 1923 came to be seared, seemingly forever, in the country's collective consciousness.”

³ Particularly, see Feldman's *opus magnum* (1997) and Holtfrerich's masterly study (1986). See also Balderston (1993), Bresciani-Turroni (1931), Childers (1982, 1983), Evans (2004), Ferguson (1995), Graham (1930) and James (1986).

Ferguson and Granville (2000: 1084), for example, argued that “the Weimar inflation proved the perfect seedbed for national(ist) socialism.” Likewise, Acemoglu et al. (2019: 656) also state that hyperinflation “set the stage for the ascent of the Nazi party.” However, other scholars suggest it played a much lesser role. Krugman (2013) wrote that “No, the 1923 hyperinflation didn’t bring Hitler to power; it was the Brüning deflation and depression” and Feldman (1997: 854) that “it was the Great Depression and not the inflation that was the driving force in making it possible for National Socialism to come to power in January 1933.”

Given the scant empirical evidence with which to systematically address the impact of the German hyperinflation on the political system and the demise of the Weimar Republic, I combine newly-collected granular data on prices in 280 localities (based on a cost-of-living index) with the share of the electoral vote for the main political party in the Reichstag in the seven federal elections held between 1924 and 1933⁴ while controlling for indicators of the performance of Germany’s industrial sector (strength, wages, and unemployment levels) and other local features of the cities (such as location, religion, occupational structure, and various fixed effects). Although hyperinflation was a national phenomena, it had a differential impact across regions (Bresciani-Turroni 1931).

Since the votes for each party can be identified in the data, I find four main results of the effect of hyperinflation on the German political system. The first is that hyperinflation strongly predicts the vote share of the People’s Right Party (*Volksrechtspartei* or VRP), an association-turned-party of inflation victims that stood in the 1928 election (Fritsch 2007, James 1986). This result dispels potential worries that in the price data there is not enough information in the variation (all noise) for its effects to be reflected in voting outcomes later on (i.e., cross-sectional variation in inflation is meaningful and has real effects in the later elections). Similarly, by looking at turnout in the different elections, I also find that the hyperinflation undermined the legitimacy of German institutions.

Secondly, using archival documentation from newspapers and mass pamphlets, I develop a historical narrative to show that hyperinflation was an important topic in the 1932 elections and though the Nazis had an anti-inflation rhetoric after the fall of 1931, given their program of job creation and expansionary policies, the KPD, the main party of protest for those workers disenchanted by the Weimar regime, and other parties of the Reichstag forcefully used, to various degrees, the fear of new inflation if the Nazis were elected as part of their political speech. These results show that the attacks against the Nazis on the inflation front had a sizeable effect, and that the KPD benefited from invoking hyperinflation in the 1932 elections. Still, at the margins, while the results are statistically significant, the total impact of the attacks is small and by July 1932 the Nazi party scored strongest (moving from 18.3% of the total votes to 37.3%).

Thirdly, the empirical evidence does not support the prediction of the Nazi vote share arising from the German hyperinflation. Contrary to what some have argued and to received wisdom, I find no connection between the traumatic experience of hyperinflation and the electoral success of the Nazis nearly a decade later. If anything, the sign tends to be negative (but mostly statistically insignificant) and small, with an estimated coefficient of determination of 0.054, meaning that variation in prices in 1923, at best, helps to explain 5 percent of the Nazi vote share in 1933.⁵ Finally, I also observe that in line with new research on the demise of the Weimar Republic (Galofré-Vilà et al. 2021a b), it was the Great Depression and deflation of the early 1930s (and not inflation) that poisoned and ended Germany’s inter-war democracy.

To identify causal effects, I use an instrumental variable strategy based on the distance from each city to the French border, controlling for industrial output and war-deaths. To overcome potential imbalances in covariates and reduce the potential for unobserved heterogeneity driving results towards zero, I show that results hold even when I use Coarsened Exact Matching (CEM) and a differences-in-differences analysis with fixed effects. To assess the significance of the findings and remove the worry of spatial autocorrelation in the residuals, I also employ a Conley correction of standard errors for spatial correlation. An additional battery of specifications available in the paper help to strengthen the validity of the analysis.

While there is a growing literature documenting the macroeconomic dynamics behind hyperinflations and their economic aftermath,⁶ their political consequences and underlying mechanisms are still poorly understood. This paper emphasizes the broader effects of perhaps the most remembered hyperinflation (the 1923 hyperinflation) on the inter-war German political order (i.e., on the different political parties). Naturally, the paper also contributes to the literature on the origins of populism (Gurieff and Papaioannou 2022) and the rise of Nazism (Evans 2004, Voigtländer and Voth 2012). While few scholars question that well-off Germans turned toward the Nazis after 1930, or deny a link between the economic distress arising from the Great Depression (Doerr et al. 2022, Galofré Vilà et al. 2021a, King et al. 2008), to date there is only limited evidence about the role played by the German hyperinflation, and, its contribution to the fall of the Weimar Republic is still, nearly a century later, a topic of considerable debate.

After a brief review of the origins and developments of the German hyperinflation (Section 2), I present the data (Section 3) and the local drivers of hyperinflation (Section 4). This is followed by the empirical results and robustness checks (Section 5) and an exploration of the effects of Brüning’s deflation in the early 1930s (Section 6). Section 7 concludes.

2. Background

2.1. The German hyperinflation

From the beginning of World War I to the end of hyperinflation in 1924, German inflation rose exponentially. Like most European countries, Germany had financed the war by increasing domestic debt and printing money, so when the war was over, inflation was

⁴ The elections within the period of study took place in May and December 1924, May 1928, September 1930, July and November 1932, and March 1933.

⁵ Statistical estimates are based on the results for Figure 2.

⁶ See for instance Cagan (1956), Dornbusch and Fischer (1986), Frankel (1977), Lopez and Mitchener (2021) and Salemi and Sargent (1979).

already an issue.⁷ Nonetheless, inflation problems further increased following the closure of the Great War. The Versailles Conference (which ended in the summer of 1919) greatly compromised Germany's future. The Allied Commission forced Germany to pay the bill for the war, treating Germany as a conquered enemy and surpassing its capacity to pay. This placed impossible financial demands on Germany and was dubbed as "cruel" by some (Keynes 1920). The following months were overshadowed by more inflation, the threat of depression, political turmoil, and a tax boycott that worsened uncertainties over payments.

Concerns were temporarily halted with a new constitution and Erzberger's fiscal reforms, which tried to strengthen the budget position by centralizing taxation and attempting to increase tax revenue by instituting a hefty income tax and a one-time capital levy (Hubbard 1990; Newcomer 1936). However, under the punitive reparations of Versailles, relying on tax hikes was not an option as, for the German taxpayers, money would have been used to repay Germany's debts. Because of uncertainties over payments, in May 1921, the London Ultimatum demanded a front-end payment of a thousand million Gold Marks by August in foreign exchange, and an additional 500 million Gold Marks by November (Eichengreen 1996). These demands amounted to about half of the total German tax revenue. If the conditions of the Ultimatum were not met, the Allies threatened Germany with the occupation of the Ruhr (Germany's western mining district). The immediate consequence of this threat was the fall of Chancellor Fehrenbach. Subsequently, since the Reichstag refused to hike taxes, by October 1921, the Allies annexed Upper Silesia to Poland. As a protest against these stiff terms, Germany suspended all payments in June 1922 and, by early 1923, it failed to make deliveries of coal, as payments in kind, to France, with France and Belgium occupying the Ruhr. Occupation was met by the Germans with passive resistance and inflation turned into hyperinflation.

Monetary policy was out of control, and from September to November, prices changed more than once every day. This was the time when Germans carted worthless Marks in suitcases and wheelbarrows filled to the brim with cash, and millions of Germans lost their jobs, savings, and hopes. Unable to afford the most basic necessities, crowds soon began to riot. At that time, commentators noted that "plundering and riots were a daily occurrence" (Schacht 1927). These events included the *Beer Hall Putsch*, a failed *coup d'état* led by the Nazis in November 1923, in which Hitler was arrested and charged with treason.

Along with problems in the balance of payments (i.e., disturbances in the foreign exchange market, rising import prices, and money creation), hyperinflation also occurred because of budget deficits financed by printing money.⁸ Expectations over the Mark also mattered, and the events that took place after the middle of 1922, including Germany's unilateral end to payments, the occupation of the Ruhr, and the assassinations of Erzberger and Rathenau (the minister of finance and the minister of foreign affairs, respectively), further undermined confidence in the stability of the German Mark.

Stabilization started by the end of November 1923. Measures to stop hyperinflation had already begun in the summer of 1923 with the new government under Stresemann but were implemented by Marx after November 1923. These included a 500 million Gold Mark loan, with bonds widely accepted as hard currency. In November, a new temporary currency appeared, the Rentenmark, and, in August of the next year, the Reichsmark replaced both the Mark and the Rentenmark. Its exchange rate was at 10,000 trillion Marks and, since the Reichsmark was tied to the price of gold, it achieved general acceptance. Beyond monetary efforts, it was not until Stresemann's government agreed to call off the passive resistance in October 1923, and France signaled some willingness to reconsider the reparations bill, that prices began to stabilize. As Eichengreen (1996: 127) explained, "until the dispute over reparations subsided ... none of the prerequisites for monetary stability was present until 1924, and inflationary chaos was the result."

A critical element for stabilization arrived with the Dawes Plan in August 1924, which rescheduled Germany's obligations (although they were not significantly reduced), with the immediate debt service payments being scaled back to a fraction of what they had been in 1921/22, since payments were limited to some 1% of GNP. Central to the success of the Dawes Plan, was a foreign loan amounting to 800 million Gold Marks of foreign currency (with the U.S. floating half of the loan). What followed in the mid-1920s was an economic boost, frequently referred to as the 'Golden Twenties,' with a compound annual growth rate of 5.1% between 1924 and 1928.⁹

2.2. Distributional battles

During the hyperinflation months, financial chaos disrupted productive activity in all sectors, shrinking the size of the pie to be distributed. Arguably, the biggest economic losers from the inflation were people from outside Germany who held obligations payable in Marks. Then, German pensioners and wealthy Germans, such as bondholders and rentiers, also became largely impoverished; as Voth (1994) commented "the inflation had virtually wiped out the entire German 'rentier' class; a whole group of citizens had to work for a living rather than leading a pleasant life on the basis of income from capital."

Despite it being repeatedly stated that the middle class was severely hit by the hyperinflation, the effects on this group were very heterogeneous and, as Hubbard (1990: 562) maintained, "the persistent notion that the inflation 'destroyed the middle classes' must be substantially revised, if not completely discarded." Similarly, Evans (2004) also opined that "it used to be thought that it destroyed the economic prosperity of the middle class. But the middle class was a very diverse group in economic and financial terms" (see also

⁷ The annual inflation rate before and after World War I had grown by 84.6% in Austria, 71.1% in Hungary, 42.2% in Italy, 35.9% in France, 23.1% in Britain and 21.2% in Germany. Data are from Lopez and Mitchener (2021).

⁸ The fact that the directors of the Reichsbank were appointed directly by the Chancellor underlined the lack of independence of the institution. See Hubbard (1990), Eichengreen (1996) and Mee (2019).

⁹ For the compound annual growth rate, I used the data from the 2020 Maddison Project.

Feldman 1978). For those on a fixed income, the results were ruinous, but wages were generally protected by the unions and tended to preserve their value once nominal wages reflected the pace at which prices rose.¹⁰

Unemployment rates remained low, reaching a peak in January 1923 (26.5%) but declining thereafter (8.6% in May of the same year) (Evans and Geary 1987: 24). For most farmers, hyperinflation also meant that agricultural prices sharply increased, and that they could liquidate their indebtedness and redeem their mortgage debts at a fraction of their pre-war real value.¹¹ As Gómez León and de Jong (2019) have argued, during the hyperinflation all Germans lost and became impoverished, but those at the top of the income distribution lost more, making the income distribution more egalitarian. In a similar vein, Bartels (2019: 13) has also pointed out that the “hyperinflation likely contributed to reducing inequality.”

For the government, the hyperinflation did much to destroy what Robert Putnam calls social capital—the extent to which people implicitly trust each other—with the emergence of political disorder and the existence of very short-lived governments based on four unelected chancellors who led Germany between June 1920 and November 1923. As Eichengreen (2018: 73) opined, “inflation in the 1920s ... undermined confidence in the ability of mainstream politicians and governments to manage the economy.”

3. Data

This paper combines several data sources for interwar Germany at the city level, some of them hand-collected and digitized for the first time. A description of each variable is available below and for descriptive statistics see Table A1. More details on data sources are available in the *Data Appendix for Online Publication*.

3.1. Prices

As a way to monitor local inflation in the German economy, starting in December 1919, the Statistics of the Reich Office in coordination with the German Department of Labor (*Reichsarbeitsministerium*) issued the Inflation Statistics of the Reich (*Vierteljahrshefte zur Statistik des Deutschen Reichs*) capturing local inflation by a cost-of-living index (*Teuerungsraten*). This cost-of-living index was based on surveys carried out in 560 cities of varying population size (for those above 10,000 inhabitants) and after June 1923, in 280 cities (see more details below), balancing the prices of a basket of goods underlying the local prices and cost-of-living statistics for a family of five (two adults and three children aged eighteen months, seven, and twelve years respectively) on food, accommodation, heating, and lighting and, from April 1922, also clothing. It accounted for 87% of the expenditures detailed by the household surveys of 1907 and thus was aimed to capture the components of a conventional standard of living rather than the necessities of subsistence.

This new hand-collected data on the cost-of-living index make possible intertemporal comparisons within one and the same city, and allow for seasonal variations in consumption. At first, prices were indexed once a month, by the beginning of 1922, they were indexed twice, and after March 1923 nearly every week. Among other issues, it takes into account changes in the families’ consumption patterns due to the crisis. Indeed, the prices studied here are the same data as were used by the German government, trade unions and workers to settle collective wage agreements in the face of rising prices. Bresciani-Turroni (1931: 29) emphasized that “this index was considered by distinguished German statisticians as a sufficiently satisfactory measure of the variations in the cost of living” and Holtfrerich (1986: 29) that “Repeated checks have confirmed that... the estimates of price change yielded by this method are representative for all German towns with populations in excess of ten thousand.”¹²

As noted above, a downside of this source is that while the number of cities from January 1920 to June 1923 is balanced to over 560 cities, after June 1923 the number of cities drops to around 280 (see Fig. A1). To understand the causes behind this fall, in Table A2 I use a two-tailed comparison of means, comparing the background characteristics of the cities that did and did not report the cost-of-living data after June 1923, showing that smaller cities failed to report the cost-of-living data. There are no baseline differences in voting preferences or in religious beliefs and unemployment rates between the two groups, but differences are visible also for the cost-of-living data and occupational structure of the cities. Nonetheless, since I mostly measure hyperinflation at its height (from October to December 1923) I keep a balanced sample of 280 cities. The data in this study cover cities inhabited by a total of 22.1 million, a sizable fraction of the German population, which was 60.1 million according to the 1919 population census.

For a subsample of 71 cities (mostly cities above 100,000 inhabitants), I also hand-collected the same cost-of-living data from the bi-monthly statistical periodical of the *Reichsamt Wirtschaft und Statistik* with data going back to 1913. These periodicals provide the cost-of-living index and its components relative to the baseline year (1913=100), so I can compute prices for these cities back to 1913 when inflation was not an issue. Later on, these pre-World War I inflation rates are used in differenced models as a robustness check to the models in levels. Finally, from the *Wirtschaft und Statistik* I also collected the disaggregated price levels for nine commodities.

3.2. Voting data

Voting data for the above cities were obtained for the seven federal elections between 1924 and 1933. Details have been described elsewhere, and I use the voting data as organized by Voigtländer and Voth (2012), drawn from Official German Statistics (*Statistikdes*

¹⁰ Wages were set by the *Zentralarbeitsgemeinschaft* and both trade unions and employers were represented.

¹¹ As noted by Moeller (1982: 258) “the judgment that the agricultural sector gained from the inflation, at least relative to other social groups, particularly urban workers and those on fixed incomes, is justified.” See also Hubbard (1990) and Osmond (1982).

¹² For similar opinions see Hachtmann (1988) and Holtfrerich (1986).

Deutschen Reichs). To measure parties' electoral support at the city level, for each of the following six mainstream parties of the Weimar Republic, namely, the Center party, the DNVP, the DVP, the KPD, the Nazi party, and the SPD, I compute voting share for each election and city as a proportion of the votes going to each party out of the total valid vote (in percentages). I also use the data for the VRP in 1928. Since political participation increased over time, I also consider the political participation with turnout, taking into account how previous non-voters became radicalized or, alternatively, how Germans became disenchanting with the Republic. For each election and city I compute turnout as the share of votes cast on eligible votes and expressed in percentages (Voigtländer and Voth 2012).

3.3. Business structure

To control for the city's exposure to the business structure and local economy, I use two sources of evidence. Firstly, from the Handbook of German Stock Corporations (*Handbuch der Deutschen Aktiengesellschaften*) I hand-collected new data on the location of German joint stock firms across Germany in the fiscal year 1919/1920 and geocoded each firm by its position in the German territory. These are the headquarters of these joint-stock companies, not necessarily the location of their plants and amount to 6,157 corporations. I hand-collected the details of their names, location (city), and capital from their balance sheets. Since data on commuting zones or industrial clusters are unavailable for Germany's interwar geography, for each city I put together the number of firms that are within a radius of 50 km of the cities.¹³ Following the work of Dorn (2013), this would cluster the cities that are characterized by strong industrial ties capturing the economic notion of local labor markets. The analysis of proximity of local labor markets is further motivated by the notion that employers and workers interact within a space bounded by places of work and places of residence. For each city, I also compute the average capital of the joint stock firms within a 50 km distance.¹⁴ Secondly, to control for wage differentials as a measure of productivity, I use the Wage and Salary Survey (*Lohn- und Gehaltserhebung*) conducted by the German Department of Labor in 1920/21 (*Statistik des Deutschen Reichs* Volume 293). Here I hand-collected data on the nominal tariff-based wages (hourly wages in *Pfennigs*) for industrial workers in metallurgy, chemistry and construction.

3.4. Unemployment

To control for the labor market and economic insecurity, I also collected new city-level data from the German Statistical Office (*Statistischen Reichsamt*) and the German Employment Agency (*Reichsamt für Arbeitsvermittlung*) that in the periodical *Arbeitsmarkt-Anzeiger* reported the unemployment rates on a monthly basis. The unemployment figures are normalized by population in the German statistics. Data are available for around 410 cities between January 1920 and December 1921. Unfortunately, to the best of my knowledge, unemployment statistics after 1921 are only available for a few cities.

3.5. Background controls

To control for additional local characteristics of the cities, I use data for city population in 1919, the city's share of Protestants, Catholics, and Jews from the census of 1925 as in Voigtländer and Voth (2012). From the same census, I also use data on the occupational structure of the population, using data on the share of people working in agriculture, in industry, and manufactures, or who were self-employed along with blue and white collar workers. War-deaths in World War I normalized by population are from the German Statistical Yearbooks (*Statistik des Deutschen Reichs*) and radio exposure measured by strength of radio signal from Adena et al. (2015). To address some of the challenges of persistence and spatial autocorrelation,¹⁵ and the effect of long-term dependence on parameter estimates, I control for the city's location by its latitude and longitude (Voth 2021). Additionally, I also control for geography with distance from each city to the Ruhr (in km), Germany's mining district.

4. Drivers of inflation

A potential concern for identification is that cities in which prices climbed sharper may have already been more economically vulnerable before the crisis or had weaker governments. However, political outcomes in the June 1920 election were not systematically correlated with the cost-of-living index (Table A3). I also examine whether the background characteristics of the cities in terms of the local labor markets or religion played a role.¹⁶ Nonetheless, in saturated regressions, I can rule out this idea as the share of people working in agriculture or industry, or the unemployment rate, or the share of Catholics, or Jews fail to accurately predict the cost-of-living index.

¹³ The 50 km threshold is arbitrary, but the comparisons would be similar if other thresholds, like 30, 70, or 100 km were used (unreported here).

¹⁴ Since the companies' balance sheets were recorded at different points of the year, this data is only used as a robustness check as under a period of high inflation it becomes problematic.

¹⁵ The worry here is to not understate the size of standard errors because adjacent observations are not necessarily independent from each other, and can display dependence.

¹⁶ For instance, a strand of the literature claims that some Germans thought that the Jews manipulated local prices to get rich quickly in the throes of the hyperinflation. For a review, see Evans (2004), Ferguson (2010) and Voigtländer and Voth (2012).

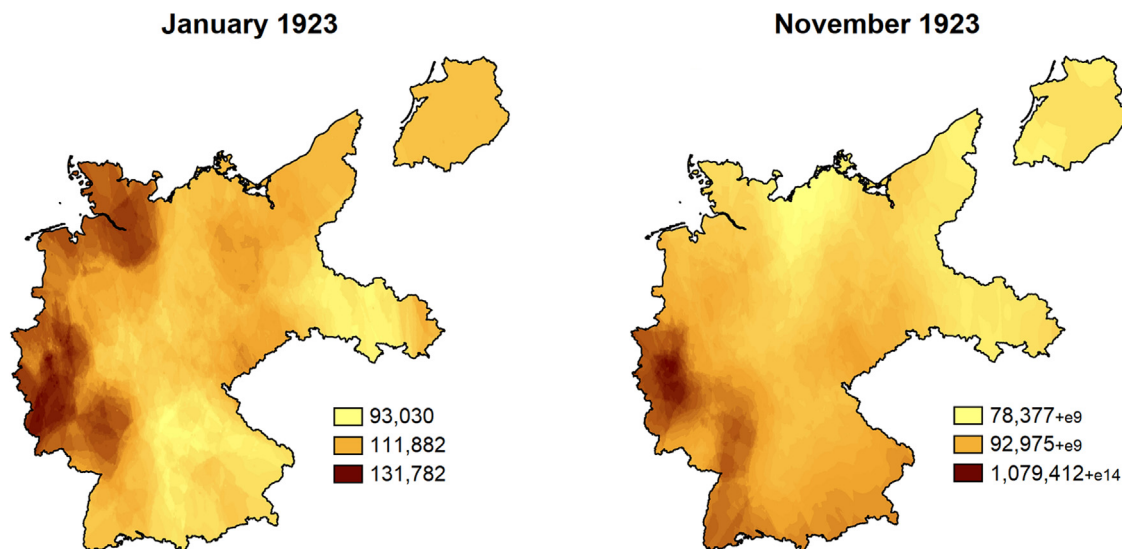


Fig. 1. The cost-of-living index across Germany.

These maps display the spatial distribution of the variable cost-of-living index across German cities. I use the coordinates of these cities to interpolate the outcomes of these variables across space using the Kriging method (also known as the *Wiener-Kolmogorov prediction*). Basically, I interpolate values using a Gaussian process of regression, giving the best linear unbiased prediction of the intermediate values. I use 30 natural breaks in the data by the different Jenks. Jenk classes are based on natural groupings inherent in the data, whose boundaries are set where there are relatively big differences in the data values.

Still, the cost-of-living index was correlated with geography. In Figure 1, I show the distribution of prices across the German territory. Prices were higher in West Prussia, and along the French border, and especially in states like the Rheinprovinz, Westfalen, and Oldenburg, and tended to decrease, from west to east. Closeness to the Ruhr matters not just for being Germany's industrial powerhouse but when the Allies occupied the Ruhr, in January 1923, they knocked the German productive machine, with national production sinking. The response to the occupation did not help to contain inflation either, as the German government sided with the Ruhr people and supported –that is, funded– an open-ended policy of passive resistance, assisting workers and firms alike causing more inflation in the economy.¹⁷

Exposure and mobilization to World War I also correlated with the cost-of-living index. Karl Helfferich, German Vice-Chancellor between 1916 and 1917, outlined how “directly after the outbreak of the war it was necessary to provide, by issues of paper money, the expenses of mobilization.”¹⁸ Due to the fall in production, inflation also skyrocketed where economic activity and denser industrial networks and white-collar workers were located. Foreign demand was not an option, as internal prices exceeded those of the outside world. Additionally, these were also likely urban places more dependent on food imports,¹⁹ which interacted with the black market and other makeshift solutions redoubling pressure on prices.²⁰

Overall, the importance of such drivers highlight that the cross-city variation in local inflation is not random but likely correlated with other local factors such as the local economy and geography. In what follows, I use a large number of identifications and battery of controls limiting the possibility that unobservables explain the findings of the paper.

5. Empirical analysis

5.1. Cross-city correlations

I begin by showing the basic relationships. Fig. 2 reveals that the associations between the cost-of-living index when hyperinflation was at its height (between October and December 1923) and the vote share going to each of the six mainstream parties in the 1933 elections are weak with a low explanatory power. Variation in prices at best explain around 5 percent of the variation in the voting

¹⁷ As noted by Straumann (2019: 27), “the German government induced the central bank to pay their wages by printing money. As the additional money entered the economy directly via private consumption, the inflation rate... accelerated and eventually led to full-blown hyperinflation.”

¹⁸ Seen in Bresciani-Turroni (1931: 49). Balderston (1993: 88) also pointed out that “the war left a legacy of supply constraints which were added to by inflation-period disturbances.”

¹⁹ For instance, in September 1923, Richard Lipinski, the Interior Ministry of the Saxony, denounced that “there are complaints about the shortage of milk, butter, and meat as well as all other foodstuffs. The working population of the cities and the larger industrial municipalities have thus been placed in a condition of great excitement and the result has been various outbursts and demonstrations.” Seen in Feldman (1997: 701).

²⁰ Reich legislation to prevent speculation and black-marketeering existed under the *Kriegsernährungsamt* (passed in 1916), but in the early 1920s it probably became insufficient to evade the regulations on supply and price. For how the black market operated see Osmond (1982) and Feldman (1997).

share of the KPD or the Nazi party and less than 4 percent for the SPD. Nonetheless, I next go beyond the graphical evidence and explore these correlations more rigorously and implement some empirical strategies to limit biases due to endogeneity and unobservables.

5.2. Cross-city models in levels

As benchmark, multivariate regression models are used to quantify the association between hyperinflation and the vote share going to the different parties:

$$VS_{p,c,t} = \alpha + \beta_1 \log \text{Cost-of-living}_{10-12/1923,c} + \Lambda'_{c,t} + e_{c,t} \tag{1}$$

where on the *left-hand side*, p denotes parties (p = Center party, DNVP, DVP, KPD, Nazi party, SPD, and the VRP), c denotes cities, t indexes elections (t = May and December 1924, 1928, 1930, July and November 1932 and 1933) and $VS_{p,c,t}$ is the vote share of each party in percentages in the different elections or turnout. On the *right-hand side*, *Cost-of-living* is the mean cost-of-living index (in logs) at the height of the hyperinflation (between October and December 1923) in the different cities c . In agreement with the results in Section 4, I also add a city-level vector of controls ($\Lambda'_{c,t}$) including the log of the population, the share of Protestants, the number

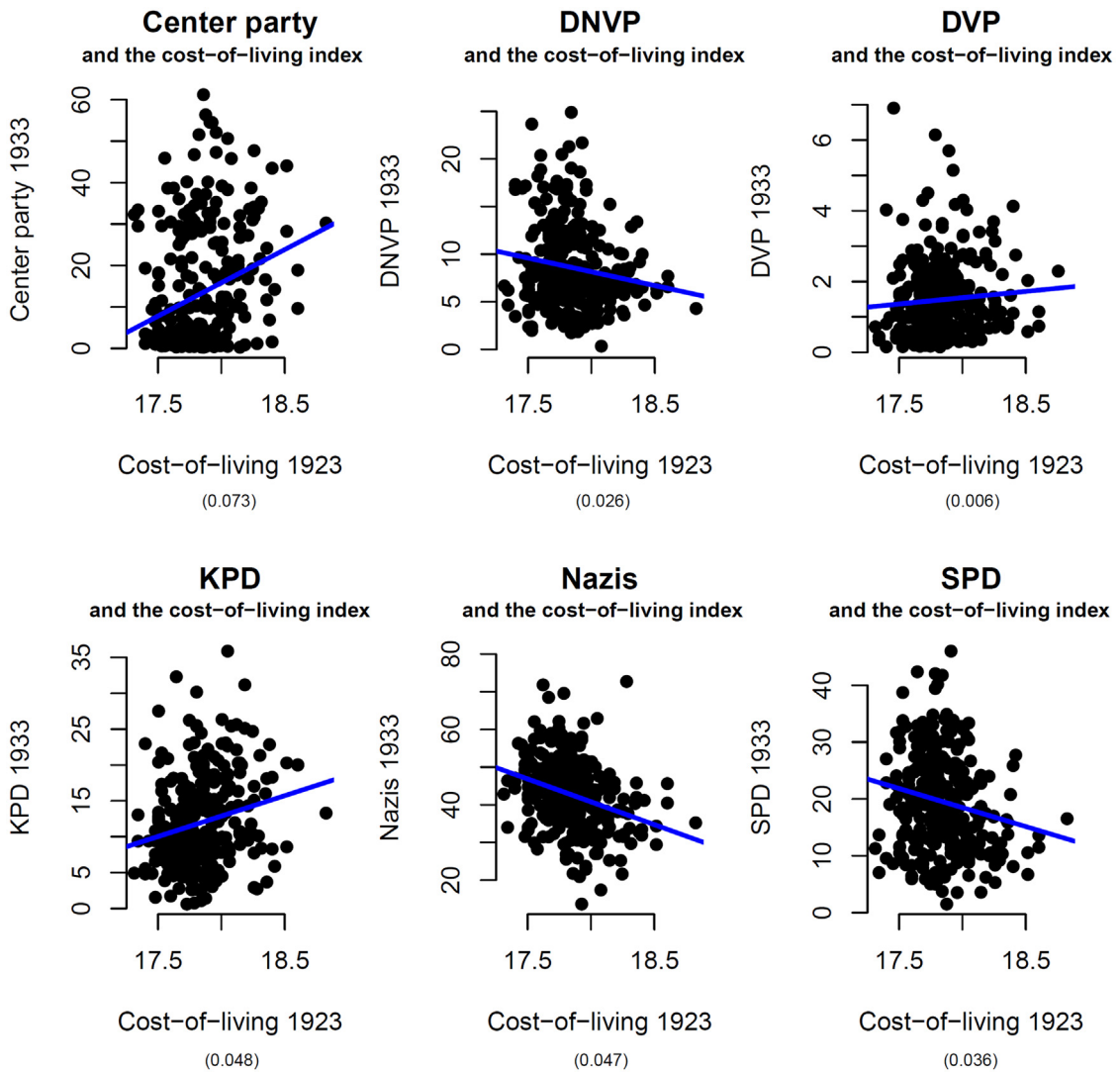


Fig. 2. Vote share in the 1933 election and the cost-of-living index between October and December 1923 (in logs). Data on the vertical axis are the vote share going to each party in the 1933 election. The horizontal axis shows the average cost-of-living index between October and December 1923 (in logs). Below each figure, in parentheses, I report the coefficient of determination. The *Center party*, was a conservative Catholic party, the *German National People’s Party* (DNVP), was a bourgeois and xenophobic party, the *German People’s Party* (DVP), was a center-right party, the *Communist Party* (KPD), was the main party of protest for those workers disenfranchised by the Weimar regime, the *National Socialist German Workers’ Party* (Nazis) was a far-right political party and the *Social Democrats* (SPD), was a working-class left-wing party. For data and sources see Section 3.

Table 1
Impact of city cost-of-living index on the vote share of the main political parties, turnout and the VRP.

	May 1924	Dec. 1924	May 1928	Sept. 1930	July 1932	Nov. 1932	March 1933
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Center party vote share	0.101* (0.055)	0.092 (0.054)	-0.001 (0.024)	-0.015 (0.027)	0.037 (0.034)	0.050 (0.033)	-0.002 (0.025)
N	281	281	281	281	246	251	281
DNVP vote share	0.049 (0.078)	0.014 (0.055)	0.066 (0.067)	0.114 (0.081)	0.101 (0.084)	0.043 (0.087)	0.007 (0.075)
N	281	281	281	281	246	251	281
DVP vote share	0.093 (0.063)	0.019 (0.084)	0.041 (0.074)	0.079 (0.071)	0.109 (0.079)	0.039 (0.065)	0.025 (0.067)
N	281	281	281	281	246	251	281
KPD vote share	0.103 (0.067)	0.086 (0.062)	0.058 (0.064)	0.099 (0.072)	0.117** (0.053)	0.105 (0.062)	0.107 (0.069)
N	281	281	281	281	246	251	281
Nazi party vote share	-	-	-0.136 (0.106)	-0.028 (0.063)	-0.097** (0.041)	-0.076 (0.066)	-0.003 (0.052)
N	-	-	281	281	246	251	281
SPD vote share	-0.028 (0.050)	-0.019 (0.049)	-0.044 (0.055)	-0.076 (0.052)	-0.095 (0.057)	-0.125* (0.070)	-0.066 (0.053)
N	281	281	281	281	246	251	281
VRP vote share	-	-	0.155** (0.073)	-	-	-	-
N	-	-	281	-	-	-	-
Turnout	0.007 (0.059)	-0.067 (0.065)	-0.123* (0.065)	-0.097 (0.063)	-0.071 (0.070)	-0.158* (0.083)	-0.065 (0.050)
N	281	281	281	281	246	251	281
Demographic controls	Y	Y	Y	Y	Y	Y	Y
Industrial controls	Y	Y	Y	Y	Y	Y	Y
Geographical controls	Y	Y	Y	Y	Y	Y	Y

The outcome variable is the percentage of valid votes cast going to each of the mainstream parties of the Reichstag in the different elections between 1924 and 1933. Each model has been estimated independently. The *Center party*, was a conservative Catholic party, the *German National People's Party* (DNVP), was a bourgeois and xenophobic party, the *German People's Party* (DVP), was a center-right party, the *Communist Party* (KPD), was the main party of protest for those workers disenchanted by the Weimar regime, the *National Socialist German Workers' Party* (Nazis) was a far-right political party, the *Social Democrats* (SPD), was a working-class left-wing party and the *People's Right Party* (VRP), was an association-turned-party of inflation victims. In the election of 1933, the DNVP presented as part of the *Kampffront Schwarz-Weiß-Rot*, which was an electoral alliance of three parties: the DNVP, the *Stahlhelm*, and the *Landbund*. The cost-of-living index for each city is the average cost-of-living between October and December 1923 (in logs). Demographic controls include the population in 1919 (in logs), the share of Protestants in 1925, and World War I participants as a share of the population. Industrial controls include the share of white-collar workers in 1925 and the number of joint stock companies within a distance of 50 km (measured in the fiscal year 1919/1920). Finally, geographical controls include the distance from each city to the Ruhr and the latitude and longitude of each city. All variables are measured at the city level and I standardize all variables with a mean of zero and a standard deviation of one. Robust standard errors in parentheses are clustered at the state-level, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

of joint stock firms within a radius of 50 km from each city, the distance from each city to the Ruhr, the World War I deaths (per thousand population), and the latitude and longitude of each city; the latter controlling for spatial autocorrelation. I cluster robust standard errors at the state-level. Robust standard errors are reported to address heteroscedasticity and by clustering at the state-level (above the city-level), I allow for arbitrary spatial correlations of the error term within the cluster. Throughout I also standardize data to have a mean of zero and a standard deviation of one, so all coefficients across models are directly comparable.

5.2.1. The VRP and turnout

The key finding of Table 1 is a strong positive correlation between the cost-of-living index and the vote share going to the VRP. A one-standard-deviation increase in the natural logarithm of the cost-of-living index is associated with an increase in the VRP vote share (in standard deviation terms) of 0.16 (95 percent confidence interval (CI): from 0.01 to 0.31). The VRP was an association-turned-party of inflation victims founded in the summer of 1926. It called for a better deal for those expropriated during the hyperinflation and also sought a reevaluation of (old) Marks. The party further articulated a nationalistic tone, calling for the restoration of Germany's colonial empire, and concentrated its own efforts upon small-scale investors, the renter, the pensioner, and the war veteran.²¹ To have a sense from where the voters were coming, Jones (1979: 167) argued that “of the established bourgeois parties, the DNVP seems to have been most severely affected by the VRP's performance at the polls.” This finding illustrates that cross-sectional variation in the cost-of-living index does explain political outcomes that can be sensibly linked to the event of hyperinflation.

A similar point can be made for the results looking at the variable turnout (negative and sometimes displaying a statistically negative coefficient) as there is a widespread view that the main effect of the German hyperinflation on politics was to destroy confidence in the Weimar Republic. For instance, Eichengreen (2018: 75) opined that “already in the early 1920s, inflation, by

²¹ See for instance Bauser (1927), Fritsch (2007), James (1986) and Jones (1979).

expropriating the middle class, undermined the legitimacy of the mainstream politicians who presided over it and weakened faith in the country's political institutions."²²

5.2.2. KPD, the Nazis, and SPD

Nearly a decade later after the hyperinflation months, in the midst of Brüning's belt-tightening and the financial crisis following Danat's failure, inflation was fervently debated on the political agenda and used as a political instrument to try to draw votes from the Nazis' electoral machine, that between 1928 and 1930 went from less than 3% of the votes to 18%. Here, using the Google Books Ngram Viewer it is possible to see that the mentions of "hyperinflation" and "inflation" in the corpus of German-language texts (i.e., books, newspapers, magazines, etc.) spiked in 1932 and 1933, and declined thereafter, meaning that in the early 1930s hyperinflation reached a peak of interest in Germany (Fig. A2).

Despite the Nazis not having a well-defined economic program and the uncertainty over the Nazis' future economic policy, they were often attacked by the other parties, and most vigorously by the KPD, on the grounds that, if elected, their programs would fuel new inflation in the economy. For instance, James (1986: 351) outlined that "the accusation frequently made against the Nazis in 1932 that their programme would mean a new inflation was particularly damaging and dangerous." Voth (1993: 284) also made the point that "inflation had become bitterly unpopular and was denounced in propaganda as right-wing exploitation of the workers." Similarly, Brustein and Falter (1994: 380) argued that "the NSDAP's suggestions to stimulate economic activity... was generally viewed as irresponsible and inflationary by the major political parties."²³

By looking at Nazi mass pamphlets, I also observe how, given the relevance of the accusations of driving new inflation, the Nazis tried to refute the accusations that their expansionary economic policy would lead to a new monetary collapse. James (1986: 351) also made the point that by the fall of 1931, "the rejection of inflation was far more than merely a public pose." For instance, in a pamphlet issued in July 1932 called *Stürzt Das System!* (Bring Down the System!), the Nazis stated that "the gutter press today accuses the National Socialists of wanting inflation. With this miserable lie that lacks any kind of proof, the Black-Red parties are attempting to divert the masses from the fact that they are the real culprits behind the inflation of 1923."²⁴ In another pamphlet issued in the spring of 1932, called the *Die Journaille Lügt!* (The Sensationalist Newspapers Lie!), they wrote that "the Red bigwig society found a new lie in fall 1931, the lie that the Nazis wanted inflation ... The only thing to say about this miserable lie is that the NSDAP has always said that it wants to create a stable currency." In mass rallies and speeches, Nazi leaders also channeled their efforts on the same front. For instance, in a speech that Hitler delivered in Dresden on 6 April 1932, he said very prominently that "some say today that we would produce inflation. We cannot do this, even if we wanted to, for the specialists in inflation are sitting in the parties which today rule the state."

Table 1 also shows that, contrary to what some have argued and to received wisdom, I find no connection between the traumatic experience of hyperinflation and the electoral success of the Nazis a decade later with models displaying a negative sign. While this can seem a controversial finding, in a recent paper, though using a different identification and data, Doerr et al. (2022: 29) also find no evidence that the memory of hyperinflation (as proxied by the vote share of the VRP) boosted Nazi popularity: "we find that areas that gave the VRP more votes did not support the Nazis more." Using the cost-of-living data, I also observe that in 1932, when the popularity of hyperinflation was at its height, memories of hyperinflation negatively affected the Nazi votes. In the July 1932 election, a one-standard-deviation increase in the natural logarithm of the cost-of-living index is associated with a decrease in the Nazi vote share (in standard deviation terms) of -0.10 (95% CI: from -0.18 to -0.01). Thus the attacks by the KPD and other parties appear to be damaging, and despite the Nazis trying to reject them, given their impact, they ultimately had a (statistically) significant effect.

Since the KPD and other parties were able to propagandize hyperinflation more meaningfully in some areas than in others, and the memory of hyperinflation can be triggered by propaganda, propaganda may have had a substantial impact on how strongly people remembered the 1923 hyperinflation at the polls. To explore this issue, I use data on city-specific radio signal strength from Adena et al. (2015) and interacted it with the cost-of-living index in 1923. By the 1920s, Germany had a highly developed, government-owned system of radio stations (Bausch 1956), and as Adena et al. (2015) showed, the Nazis did not have access to radio airtime before they were in power in early 1933, making it difficult in mid-1932 to defend themselves against the allegation that they would fuel new inflation. Results of the interaction between the cost-of-living index and radio signal in Table A4 show that the effect of hyperinflation on the Nazi vote share remains negative and statistically significant at the 5% level of confidence,²⁵ radio listenership is also negatively associated with Nazi support in July 1932 (at 5% level of confidence), while the interaction term with hyperinflation is positive (also at 5% level of confidence).

Results also reveal how in the July 1932 election, the KPD, which felt that exploiting hyperinflation was key in broadening its electoral appeal, profited from such campaigns channeling the discontent and misery of those who suffered in the grips of hyperinflation, and worried the masses about new inflation if the Nazis took power. James highlights (1986: 203) how "again and again in the depression labour politicians warned of the disastrous consequences of inflation" and Voth (1993: 284) how "the Communists also used this opportunity to spread the fear of inflation." Here a one-standard-deviation increase in the natural logarithm of the cost-of-living index is associated with an increase in the KPD vote share (in standard deviation terms) of 0.12 (95% CI: from 0.01 to 0.23). In

²² For similar arguments see also Bresciani-Turroni (1931), Straumann (2019), Temin and Vines (2013) and Voth (1995).

²³ Brustein and Falter (1994: 380) also add that "even the right-wing German Nationalist People's Party (DNVP)... joined in warning that the implementation of the NSDAP program would lead to a new harmful inflation." See also Barkai (1988), Ferguson (1995) and Holtfrerich (1990).

²⁴ The *red* stood for the left-parties like the KPD and the *black* referred to the Center Party.

²⁵ I would like to thank Referee 3 for the suggestion to do this interaction.

Fig. A3 I show the front page of a mass pamphlet issued by the KPD called *Faschismus = Inflation und Missehelend* (Fascism = Inflation and Misery) written by Theodor Neubauer and issued in the fall of 1931.

The results for the SPD in the delayed effects for the November 1932 election also add robustness to this narrative. Although the SPD, a working-class left-wing party, tried to attack the Nazis on the grounds of their inflationary policies due to Hitler's expansive economic policy, these attacks were not credible as, on the one hand, the Social Democrats were in power when inflation first appeared and then turned into hyperinflation (by contrast the KPD was in opposition),²⁶ while, on the other hand, despite some influential SPD leaders such as Rudolf Hilferding demanding that they should attack the Nazis on the inflation front, most of the SPD campaign was focused on other goals. Harsch (1993: 161) reviews how "the linking of capitalists with inflation was only one element in the radical rhetoric of the SPD in the fall of 1931... Dailies, pamphlets, and speakers now emphasized socialist solutions to the crisis." In part, they could not pick on Nazi expansionist programs in public, as this would directly clash with the interests of the unions. This point is effectively made by Gates (1974: 352) when saying that "the socialist labor movement was hopelessly split on the issue of unorthodox economic policy. The SPD executive accepted Hilferding's belief that large-scale public works would be inflationary, but it was afraid to oppose publicly any trade-union sponsored measures to create jobs."

A third important element in the context of 1930–1932 for the SPD was Brüning's deflation and voter dissatisfaction. Brüning's minority coalition that ruled from March 1930 to May 1932 was possible thanks to tacit parliamentary toleration of the SPD. Here, among other historians, Harsch (1993: 156) highlighted the point that the "ideological approval of fiscal conservatism was compounded by the fear that the opposite course would rekindle the hyperinflation of 1923. The SPD, then, did not dispute the principles behind Brüning's plan to accelerate deflationary tendencies with budget cuts." James (1986: 33) further views how "this toleration policy' helped to erode further the SPD's electoral support" and also did King et al. (2008: 960): "the SPD was punished for its tacit collusion with the Brüning government in 1932." The issue of Brüning's deflation and its connection to the German hyperinflation and political outcomes is further explored in Section 6 with a broader overview on Brüning's spending cuts and tax hikes available in Galofré-Vilà et al. (2021a).

5.2.3. Center party, the DNVP, and the DVP

Finally, Table 1 shows no connection between the hyperinflation and the votes for two far-right parties, the DNVP, a bourgeois and xenophobic party, and DVP, a center-right party. If anything, they display a positive sign through the different elections but with a low predictive value. Still, in some robustness checks that I pursue in the following Subsections, the results for the DNVP become statistically significant for the 1932 elections which fits within the narrative described above. As for the Center party, a conservative Catholic party, it seems that they got some rewards for stabilizing the economy in 1924, but the effects were short-lived and vanish in the following elections. Although it was Stresemann's Great Coalition that started the stabilization plan in the summer of 1923, the government fell before it could stabilize the economy and was replaced by a minority cabinet under Marx (of the Center party) supported by the German Democratic Party (DDP), a center-left liberal party, and DVP that governed between November 1923 and January 1925 and again from May 1926 to June 1928. Nonetheless, Jones (1979) reviews how these parties that stabilized the economy at some point also failed to live up the promises which they made during the stabilization like a full and equitable revaluation of those paper mark debts.

5.3. Coarsened exact matching

Next, in Table A5, I use CEM to rule out that results are driven by imbalance in observable characteristics across treated and controls. The CEM estimator picks control observations for each treated unit, ensuring (approximate) covariate balance. I match cities with either below or above the median cost-of-living index between October and December 1923 based on the share of white-collars, World War I participation (per thousand population), and distance to the Ruhr. With these parameters, the CEM algorithm creates 87 combinations of different strata, of which 30 can be matched.²⁷ Since not all treated cities can be matched to an untreated city, the number of observations compared with Table 1 declines (i.e., there is no match). Overall, CEM matching results dispels concerns regarding causal inference and show the same story as the one above: the cost-of-living index strongly predicts the vote share of the VRP in 1928, the declines in turnout, and the positive correlation with the KPD in July 1932.

5.4. Conley standard errors

Since all the results rely on spatial variation, throughout I included the city's latitude and longitude clustering robust standard errors at the state level.²⁸ Yet, to further assess the significance of the findings, I use a recent implementation of the Conley correction of standard errors for spatial correlation correction to allow for spatial dependence of errors across observations (Conley 1999, Conley et al. 2012, Colella et al. 2019). In short, Conley standard errors allow for spatial autocorrelation within a certain radius around a city. Table A6 shows the standard errors for Table 1 for different cut-offs of spatial dependence, where the distance used

²⁶ Hill et al. (1977: 310) review how "the extreme hardship and suffering the inflation created ... tended to discredit the Social Democratic Party" and Ferguson (1995: 463) that "NSDAP election propaganda repeatedly cited the inflation as evidence of the Weimar Republic's economic incompetence."

²⁷ Results are robust to the addition of less controls and offering more combinations (unreported here).

²⁸ Moreover, clustering at lower units (i.e., district/*bezirke*) does not change the significance of the coefficients, just somewhat lower the standard errors (unreported here).

to calculate these standard errors is the Euclidian distance between any two cities and I allow for standard errors to be correlated within a radius of that distance at 100, 200, and 300 km. Again, these corrections and using alternative distances (unreported here) does not materially affect the results.

5.5. Instrumental variable

To further address potential issues of omitted variable bias and measurement error in the cost-of-living data, in a spirit similar to [Becker and Woessmann \(2008\)](#) and [Rubin \(2014\)](#), I present instrumental variable estimates using the Euclidean distance from each location to the French border as an IV. In Table A7, I only report results for the VRP party in 1928, as this is the only party that, *ex-ante*, one could expect to be sensitive to inflation. It is a useful instrument because inflation was intense in the French border, yet a city's distance from the French border should have no direct effect on later voting for the VRP.²⁹ In other words, the instrument relates to hyperinflation but not directly to later voting with the possibility to directly control for exposure to WWI (i.e., war-deaths) and industrial output.

I present estimates with the standard controls (war-deaths, population in logs, share of Protestants, share of white-collars, and number of firms within a distance of 50 km, but omitting distance to the Ruhr and latitude and longitude for being orthogonal to distance to France) and a saturated regression controlling further for industrial output (share of people working in industry and the capital—not just the number—of the firms within a radius of 50 km). Overall, the instrument—distance to France as the crow flies—is a strong and significant predictor of the cost-of-living index in the fall of 1923. The *F*-test for excluded instruments is also above the rule-of-thumb threshold of 16 ([Stock and Yogo 2005](#)) and the Anderson-Rubin test of statistical significance also reports very low *p*-values.

Nonetheless, the IV coefficients are much larger than their OLS counterparts (i.e., five times larger). While unobservables and omitted variable bias are unlikely to drive the difference—adding more industrial controls barely changes the size of the coefficients—measurement error in the cost-of-living data for small places can be an issue. Compliers may also be systematically different from the rest of the sample ([Marbach and Hangartner 2020](#)) and IV and OLS weights may be also different ([Ishimaru 2022](#)). While the IV certainly does not preclude the possibility that there were other reasons for voting for a party like the VRP, the instrument is relevant (i.e., highly correlated with the treatment) and, as described above, plausibly satisfies the exclusion restriction confirming the causal link between the cost-of-living index and the vote share of the VRP later on.

5.6. Additional robustness

I next add a battery of other robustness checks to highlight that the effects described above have a causal relationship.³⁰

5.6.1. Sample characteristics

I begin exploring potential heterogeneity in the impact of hyperinflation on the voting patterns. For the July 1932 election, when inflation was intensely debated, I split the sample for values above and below the median value of the main controls listed in [Eq. \(1\)](#) (Panel A in Table A8). When I stratify the sample, I find that for the Catholic Center party, a bourgeois and anti-Marxist party, hyperinflation had a stronger impact in its strongholds: in more urban places, with a higher share of joint stock firms and white-collar workers. Among KPD voters, hyperinflation also had a stronger effect in more populated and Protestant areas, which is consistent with the notion of an urban working class electorate and the fact that Catholics were perceived as more conservative than Protestants.³¹ The Ruhr's frontier is also where labor demands were greater on the inflation front, and where the KPD grew faster.

For the Nazis, only these places below the median value of joint stock companies predict hyperinflation. It is indeed a well-established fact that despite the Nazis gained votes from all walks of life, they were somewhat 'underrepresented' among the working classes and in industrial cities, where firms were located. Finally, as the political home of the worker movement, the impact of hyperinflation for the SPD was mostly felt in crowded places with a larger number of firms and a lower exposure to the war; the latter explained by its initial anti-war stance, despite later on, in 1914, supporting the war as a "defensive war." I also continue exploring potential heterogeneity in the cost-of-living data and interacted the baseline characteristics of the cities with the cost-of-living data (Panel B in Table A8). Consistent with the previous results, I find that for the KPD, inflation increased near to where firms were located, which are in principle more crowded places and closer to the Ruhr valley and for the SPD I also find that prices increased with war-deaths.

I also saturate a city-level regression with more city-level time-varying controls that reflect industrial sector strength (output), industrial-sector wages, and unemployment levels (Table A9). Specifically, I add new controls for unemployment rate in June 1921, the average hourly nominal wage paid in the industrial sector to men and women in *Reichspfennigs*, and the capital of the joint stock firms that are within a radius of 50 km from each city in the fiscal year 1919/1920. Despite the decline in sample size due to the lack of data for unemployment or wages in some cities, these regressions are intended to reduce concerns around region-characteristics confounding the findings, as results conform to those in [Table 1](#). If anything, the baseline results remain and the vote share of the DVP comes to display some predictive power at the 10% level of confidence for the July 1932 election, which nevertheless fits within

²⁹ I would like to thank Referee 3 for the suggestion to implement this instrument.

³⁰ I pursued other baseline checks such as the inclusion of state-level fixed effects and different levels of clustering (unreported here).

³¹ [Spenkuch and Tillmann \(2018\)](#) also noted that Catholics shunned the KPD election after election. Indeed, while the Catholic Church tended to vote for the Center Party, the Protestant Church remained largely apolitical.

the narrative of fears around Nazis' new inflation presented in Section 5.2. Finally, in Fig. A4, I also control for potential outliers and remove one city at a time for the VRP, showing that the results are very stable across samples. Although unreported here, the same result holds for the other parties.

5.6.2. Cost-of-living data

A potential concern is that one may also expect the local variation in prices to be connected with local consumption baskets, which in turn will be dependent on local preferences and income. While the cost-of-living index at hand already takes into account local consumption preferences, in Table A10, I disaggregated price levels for nine commodities for the period October-December 1923. Variation in food prices too predicts the vote share of the VRP for some food items such as bacon, barley, lard, and potatoes and, also in line with Table 1, the prices for potatoes also predict the decline in turnout.³² These prices moved flexibly with the market, as by the fall of 1920, food prices were released from governmental control. Potatoes were decontrolled in September 1920, beef and pork in October 1920, butter and milk not until May/June 1921, and sugar in October 1921. Eggs, vegetables, fruit, and rice had already been traded freely in 1919 (Holtfrerich 1986: 92). Nonetheless, these results need to be taken with a grain of salt, as they are unadjusted correlations (only controlling for latitude and longitude and robust standard clustered at the state-level) as here spatial coverage is compromised due to data availability (less than 20 cities).

To move beyond the maximum level of inflation (i.e., what matters a decade later might also be how people still feel about the event) I also show robustness using different functional forms of the cost-of-living data, using dummies for above-below median and above-below a certain high percentile of the distribution (i.e., quintiles and deciles of the distribution). As shown in Table A11, none of the main results differed and the effects of the inflation described above on the main political parties (VRP, KPD, SPD and the Nazis) are still visible.

Another concern is bounding selection on unobservables. To assess whether results are driven by correlated unobservables, Table A12 provides bounds along the lines of Altonji et al. (2005) showing that the amount of selection on unobservables needs to be (implausibly) large in order to explain away the results for the VRP. Specifically, I follow the suggested approach in Oster (2019) by assuming equal selection on observables and unobservables ($\delta=1$) and a $\Pi=1.3$ and using this parametrization, one would require that the amount of selection on unobservables to be up to 3.5 times as high in order to explain away the results. Methodologically, while in Table 1 I have presented results on semi-elasticities taking logs in the cost-of-living data, I also obtain very consistent results using the inverse hyperbolic sine transformation (unreported here).

5.6.3. Voting behavior

Although the results so far are based on independent estimations, since supporting one party inherently means not supporting another (i.e., election results of individual parties are not independent), I show results for each party while controlling for the vote share of the other parties (Table A13). Again, these models show that this leads to no material change in the baseline findings. In addition, in line with the narrative presented in Section 5.2. and the association between victims of inflation and the KPD, the positive results for the KPD in the 1924 elections (both), 1928, and 1930 tend to display statistically significant p-values at the 5% or 10% level of confidence. The same appears to hold for the DNVP.

Next, since there was a great deal of heterogeneity in the degree of hyperinflation experienced by the different cities, it is also possible to look at the extremes of the cost-of-living data by different percentiles of the distribution (Table A14). An interesting result is that those at the top of the distribution (those exposed to more inflation) turned their backs on the Nazis. The same holds for the SPD and turnout, where those above the median, also voted less in the different elections. As for the Center party and the KPD, all parts of the distribution of the cost-of-living index seem to have favored these parties (and not just the extremes).

Nonetheless, despite the fact that all these robustness checks yield very consistent results with the baseline findings of Table 1, arguably, the analysis has one important limitation. Since the effects of inflation were very heterogeneous among different groups, I cannot identify who benefited and who suffered from the hyperinflation experience (i.e., I cannot identify debtors and savers in the data), with the possibility to average out two opposing forces, leading to a non-result. While this is something I cannot test with the available data,³³ this is probably unlikely for the case at hand, as the results for the Nazis, the KPD, the SPD and turnout display statistically significant p-values in the 1932 elections. Throughout I also showed that differences in local inflation rates were not merely academic and once the currency collapsed, these differences are meaningful enough to affect voting patterns a decade later (i.e., the cost-of-living data closely predicting the vote share of the VRP).

5.7. Cross-city models in differences

I also use a model in differences that helps to absorb much of the unobservable characteristics at the city-level. Specifically, I use the following equation:

$$\Delta VS_{c,t,p} = \alpha + \beta_1 \Delta \text{Cost-of-living}_{c,m} + \Lambda'_{c,t} + \mathbf{e}_{c,t} \quad (2)$$

where c denotes cities, t indexes elections, and $\Delta VS_{c,t,p}$ is the vote share of the party p (p = Center party, DNVP, DVP, KPD, Nazi party and the SPD) between two contiguous pairs of elections t (t = the difference between May 1924 and December 1924, December

³² Given the small sample size, only robust standard errors clustered at the state level are used. Yet, for the VRP if I add other controls, such as latitude and longitude, the statistical significance for lard and potatoes holds.

³³ For instance, the share of white-collar workers who are more likely to be savers are probably too rough a proxy to be meaningful.

1924 and 1928, 1928 and 1930, etc.). The main explanatory variable is the highest level of hyperinflation experienced by taking the average prices between the months m , ($m =$ October, November and December 1923), relative to a pre-hyperinflation year with the baseline of prices in 1913. Thus, I use deviations from undisturbed levels of prices, taking differences from some reasonable pre-WWI benchmark year (before prices started to soar). I also add a city-level vector of controls ($\Lambda'_{c,t}$) as in Eq. (1) and cluster robust standard errors at the state-level and standardize data to have a mean of zero and a standard deviation of one.

As Table 2 shows, using models in differences reports the same overall findings as the one in levels: the hyperinflation had a momentum in the 1932 elections, with a positive effect for the KPD and an adverse one for the Nazi party and the SPD. Turnout also tends to display a negative sign, being statistically significant when involving the 1932 elections. Since support for extremist parties at a certain election can be level-shifted due to hyperinflation, as a robustness check in Table A15, I also explore the change in a party's vote share with different deltas taking differences from May 1924 (i.e., May 1924 and December 1924, May 1924 and 1928, May 1924 and 1930, etc.) and also from 1930 (i.e., 1930 and July 1932, 1930 and November 1932 and 1930 and March 1933). Again results are robust to the ones presented in Table 2.

Unfortunately, the results for the VRP cannot be reported as the party only participated in 1928. As for the Nazi party, while the literature places most importance on the cumulative effects of hyperinflation and its deep memories, I do not think that hyperinflation was strongly connected to either the Nazi sentiment or ideology back in 1924. Despite the German Nazi Party being banned after the *Beer Hall Putsch* in 1923, and not taking part in the 1924 elections, the *German Völkisch Freedom Party* (DVFP) and the National Socialist Freedom Movement (NSFP), two parties that shared many of the Nazis' ideas and even had overlapping candidates with them, only achieved together 6% of the votes in May, and 3% in December. Feldman (1997: 855) notes that "their campaign deliberately targeted pensioners, small investors, and other inflation victims by characterizing the inflation as 'finance Bolshevism' and history's most shamelessly and ruthlessly executed expropriation." Even when looking at the effects of the hyperinflation on the DVFP and NSFP votes in the May and December 1924 elections, the so-called 'inflation' elections, the effects are not statistically significant, displaying a consistent negative sign. The effect (in terms of standard deviations) for the difference between the March and December 1924 is -0.01 (95% CI from -0.22 to 0.19) and -0.21 (95% CI from -0.62 to 0.20) for December 1924 and 1928.

5.8. Panel data with fixed effects

I finalize the analysis by exploring the effects of hyperinflation on electoral outcomes using panel regressions in a difference-in-differences framework at the city-election level. The regressions cluster standard errors at the city-level and include city and election fixed effects. This setup helps to address concerns of omitted variable bias that is constant by city or time. Naturally, the panel analysis can only be applied for parties which ran in all the elections (missing the Nazi and VRP results). As reported in Table A16, while in all cases the size of the coefficients are somewhat reduced, the results are consistent with those using the cross-sectional analysis, displaying statistically significant coefficients (at the 5 or 10 percent level of confidence) for the KPD and turnout. Here a one-standard-deviation increase in the natural logarithm of hyperinflation is associated with a decrease in the KPD (in standard deviation terms) of 0.09 (95% CI from 0.01, 0.19) and turnout of -0.08 (95% CI from -0.15 to -0.04).

6. Brüning's deflation

A final point in the paper is that, as noted in the introduction, while the literature about the role of hyperinflation and Nazification is extensive, another literature on monetary policy during the inter-war era contends that Brüning's deflation between 1930 and 1932 did matter for the Nazi boost.³⁴ As Fig. A5 shows, prices fell by more than 50% from peak to trough, and since technically Germany suspended gold convertibility in the summer of 1931, being unable to devalue directly, it chose to let prices fall sufficiently to be competitive on the markets, acting as a 'surrogate devaluation'.

While Brüning argued that he drove Germany towards deflation because he was adamant that any inflationary move had to be avoided ("Germany has already experienced an inflation. It would be unthinkable to inflict another inflation on the German people"³⁵), many believe that there was more 'room for manoeuvre' on what he believed. In fact, Brüning's deflation formed part of a broader plan to end the agreements reached at Versailles, as he held that the consequent suffering brought by budget cuts and deflation would be highly visible, thereby eliciting international sympathy for the Germans and helping put an end to the unpopular reparations imposed at Versailles. Nonetheless, this strategy was never a clear political winner and soon lacked an economic rationale as by June 1931, the Hoover Moratorium had suspended Germany's WWI debts for one year, and a year later, in July 1932, reparations were permanently postponed at the Lausanne Conference.

Brüning's orthodoxy helped to accelerate Germany's descent into depression, deflation aggravated mass unemployment in the economy and radicalized the German electorate in the twilight years of the Weimar Republic. Yet, while the political effects of Brüning's policies analyzed by Galofré-Vilà et al. (2021a) mostly focus on cost-cutting policies (budget cuts and tax hikes) and the Nazi party, the impact of prices (i.e. 1930-1932 deflation) on the political agenda has not yet been tested to the best of my knowledge. To fill this gap, I use the following model to estimate the effect of deflation on Weimar's ruling parties:

$$VS_{p,c,t} = \alpha + \beta_1 \Delta \text{prices}_{1928/1932,c} + e_{c,t} \quad (3)$$

³⁴ For an overview see Voth (1993).

³⁵ *Akten der Reichskanzlei* (AdR), Nr. 502, 2 October 1931, 1782–1783.

Table 2

Impact of city cost-of-living index on the vote share of the main political parties and turnout using first differences.

	Δ May 1924 -Dec. 1294	Δ Dec. 1924 -May 1928	Δ May 1928 - Sept. 1930	Δ Sept. 1930 - July 1932	Δ July 1932 -Nov. 1992	Δ Nov. 1932 – March 1993
	(1)	(2)	(3)	(4)	(5)	(6)
Center	-0.073 (0.078)	0.119 (0.084)	0.001 (0.092)	0.178 (0.169)	0.025 (0.057)	0.046 (0.035)
N	70	70	70	66	65	66
DNVP	0.086 (0.087)	-0.003 (0.110)	0.104 (0.098)	-0.062 (0.124)	0.099 (0.095)	-0.120 (0.080)
N	70	70	70	66	65	66
DVP	-0.105 (0.095)	-0.078 (0.095)	-0.004 (0.145)	0.156 (0.122)	0.166 (0.205)	0.010 (0.154)
N	70	70	70	66	65	66
KPD	0.138 (0.121)	-0.115 (0.115)	-0.170 (0.099)	0.277** (0.134)	0.110 (0.124)	-0.141 (0.090)
N	70	70	70	66	65	66
Nazis	-	-	-0.332 (0.612)	-0.292 (0.661)	-0.560* (0.322)	0.027 (0.708)
N	-	-	70	66	65	66
SPD	-0.031 (0.118)	-0.004 (0.128)	0.010 (0.123)	-0.332** (0.148)	0.012 (0.105)	0.168 (0.135)
N	70	70	70	66	65	66
Turnout	0.119 (0.084)	0.083 (0.117)	-0.127 (0.115)	-0.309** (0.126)	0.054 (0.094)	0.099 (0.100)
N	70	70	70	66	65	66
Demography	Y	Y	Y	Y	Y	Y
Industry	Y	Y	Y	Y	Y	Y
Geography	Y	Y	Y	Y	Y	Y

The outcome variable is the difference in the vote share going to each of the mainstream parties of the Reichstag in two contiguous pairs of elections between 1924 and 1933. Each model has been estimated independently. The *Center party*, was a conservative Catholic party, the *German National People's Party* (DNVP), was a bourgeois and xenophobic party, the *German People's Party* (DVP), was a center-right party, the *Communist Party* (KPD), was the main party of protest for those workers disenchanted by the Weimar regime, the *National Socialist German Workers' Party* (Nazis) was a far-right political party, the *Social Democrats* (SPD), was a working-class left-wing party and the *People's Right Party* (VRP), was an association-turned-party of inflation victims. In the election of 1933, the DNVP presented as part of the *Kampffront Schwarz-Weiß-Rot*, which was an electoral alliance of three parties: the DNVP, the *Stahlhelm*, and the *Landbund*. The cost-of-living index for each city is the average cost-of-living between October and December 1923 relative to 1913 (in percentages). Demographic controls include the population in 1919 (in logs), the share of Protestants in 1925, and World War I participants as a share of the population. Industrial controls include the share of white-collar workers in 1925 and the number of joint stock companies within a distance of 50 km (measured in the fiscal year 1919/1920). Finally, geographical controls include the distance from each city to the Ruhr and the latitude and longitude of each city. All variables are measured at the city level and I standardize all variables with a mean of zero and a standard deviation of one. Robust standard errors in parentheses are clustered at the state-level, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3
Impact of city prices on the vote share of the main political parties and turnout.

	May 1928 (1)	September 1930 (2)	July 1932 (3)	November 1932 (4)	March 1933 (5)
Center party vote share	0.24 (0.126)	0.266* (0.143)	0.300* (0.143)	0.268* (0.132)	0.247* (0.124)
<i>N</i>	19	19	18	19	19
DNVP vote share	0.004 (0.108)	0.031 (0.163)	0.013 (0.112)	0.007 (0.100)	0.071 (0.115)
<i>N</i>	19	19	18	19	19
DVP vote share	-0.637*** (0.156)	-0.387 (0.233)	-0.263 (0.180)	-0.348* (0.175)	-0.314 (0.192)
<i>N</i>	19	19	18	19	19
KPD vote share	-0.081 (0.269)	0.022 (0.252)	0.059 (0.243)	0.119 (0.250)	0.031 (0.253)
<i>N</i>	19	19	18	19	19
Nazi party vote share	0.377 (0.212)	-0.173 (0.107)	-0.335*** (0.091)	-0.292*** (0.079)	-0.279** (0.099)
<i>N</i>	19	19	18	19	19
SPD vote share	0.022 (0.134)	-0.017 (0.132)	-0.069 (0.135)	-0.077 (0.139)	-0.069 (0.166)
<i>N</i>	19	19	18	19	19
Turnout	0.147 (0.172)	0.058 (0.219)	-0.171 (0.222)	-0.322 (0.245)	0.096 (0.255)
<i>N</i>	19	19	18	19	19

The outcome variable is the percentage of valid votes cast going to each of the mainstream parties of the Reichstag in the different elections between 1928 and 1933. Each model has been estimated independently. The *Center party*, was a conservative Catholic party, the *German National People's Party* (DNVP), was a bourgeois and xenophobic party, the *German People's Party* (DVP), was a center-right party, the *Communist Party* (KPD), was the main party of protest for those workers disenchanted by the Weimar regime, the *National Socialist German Workers' Party* (Nazis) was a far-right political party and the *Social Democrats* (SPD), was a working-class left-wing party. In the election of 1933, the DNVP presented as part of the *Kampffront Schwarz-Weiß-Rot*, which was an electoral alliance of three parties: the DNVP, the *Stahlhelm*, and the *Landbund*. Δ prices takes the percentage change between 1928 and 1932 based on an unbalanced basket of food prices for 12 items. All variables are measured at the city level and I standardize all variables with a mean of zero and a standard deviation of one. Robust standard errors in parentheses are clustered at the state-level, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

where p denotes parties ($p =$ Center party, DNVP, DVP, KPD, Nazi party and SPD), c denotes cities, t indexes elections ($t = 1928, 1930, \text{July and November } 1932 \text{ and } 1933$), and $VS_{p,c,t}$ is the vote share of each party in percentages of the total vote in the different elections or turnout. The variable Δ prices takes the percentage change between the local prices in city c between the years 1928 and 1932 based on an unbalanced basket of food prices for 12 items.³⁶ I cluster robust standard errors at the state-level and standardize data to have a mean of zero and a standard deviation of one so all coefficients across models are directly comparable.

Although the data on prices are only available for less than 20 cities (data are collected from the *Wirtschaft und Statistik*),³⁷ a look at deflation on the political spectrum of the Weimar Republic in Table 3 shows that those more affected by Brüning's deflation were lured by the siren calls of the Nazis. For the July 1932 election, a one-standard-deviation increase in prices is associated with a decrease in Nazi vote share (in standard deviation terms) of -0.34 (95% CI: from -0.53 to -0.14). By contrast, for the Center party (Brüning's party), a one-standard-deviation increase in prices is associated with an increase of 0.30 standard deviations of the vote share of the Center party (95% CI: from -0.01 to 0.61). These results show how people were fed up with Brüning's deflation and how monetary policy can fuel the flames of radical parties, so that it was deflation, not inflation, that ended inter-war democracy.³⁸ As for the lack of association for deflation with the other parties (beyond the Nazis and the Center party), this shows how the Nazis were the only party that successfully transformed German suffering into more votes.

7. Discussion

While there is an enormous and rich narrative in the academia and a widespread established opinion around the political impact of the German hyperinflation, opening the door to the demise of the Weimar Republic and the Nazi electoral success, this paper has endeavored to validate this hypothesis empirically, to show that there is no straight line between the hyperinflation and the end of democracy nor the Nazi electoral success a decade later. This result does not mean that hyperinflation was not on the table as an important matter in the 1930s elections, nor that the hyperinflation did not have a tremendous negative effect on German society, spreading mass immiseration and losing faith in their politicians, but, simply, that the Weimar Republic survived the hyperinflation months but succumbed to the economic slump of the 1930s. So, if we aim to understand history, very different lessons from those

³⁶ These items are rye, wheat, barley, oat, peas, beans, beef, pork, veal, mutton, bacon, and eggs.

³⁷ Data for the different items are in *Reichspfennigs* per kilogram with the exception of eggs that are in *Reichspfennigs* per dozen.

³⁸ Low p-values are maintained even after controlling for the location of the cities (unreported here).

taken for granted in the past should be paid heed: neither the political impact of the German hyperinflation was nearly as perverse as previously thought on the political side, nor its economic and social impact was as dire and uniform.

While counterfactual history is always treacherous ground on which to tread, there is still the open question of whether the traditional parties (even for their own survival) could have done more to preserve democracy. For instance, historians stress the animosity between the two major parties of the left and difficulties in building lasting coalitions and bridges to avoid the worse. In a clear attempt to broaden its electoral appeal and draw votes from the Nazi pocket-book, the elections of 1932 seem a good opportunity to visualize how, as part of their political speech, fear of new inflation to come was propagandized if the Nazis were elected. Yet, a coordinated effort might have had a stronger effect, as the attacks of the KPD only had a sizeable effect (by July 1932 the Nazis became the biggest party in the Reichstag), while the SPD had its hands tied by the unions, its past, and Brüning's austerity. Nonetheless, even if we can imagine that these efforts were possible, it seems clear that after the Great Depression the German Republic was doomed.

Data Availability

Data will be made available on request.

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Supplementary materials

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