

**The Radicalization of the German Electorate:
Swinging to the Right and the Left in the Twilight of the Weimar Republic¹**

by

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Abstract

This article analyses the impact of the onset of the Great Depression on voting patterns at the local level in the final years of the Weimar Republic. A special pooled longitudinal/cross sectional, fixed-effects approach with spatial autocorrelation (EGLS) is used in order to simultaneously estimate the popularity determinants for the entire system of political parties for each of the 830 localities in our data set. By analysing the determinants for the vote shares of all major parties/party blocks we demonstrate unequivocally that the economic crisis was the crucial prerequisite for the political collapse of the Weimar Republic. In contrast to other empirical studies in this field, we use an essentially longitudinal approach by which we can completely avoid the problems associated with ecological inference and show that unemployment had a strong positive effect in favor of the National Socialists. Because of using aggregated data, we cannot, however, distinguish between egotropic and sociotropic voting behavior.

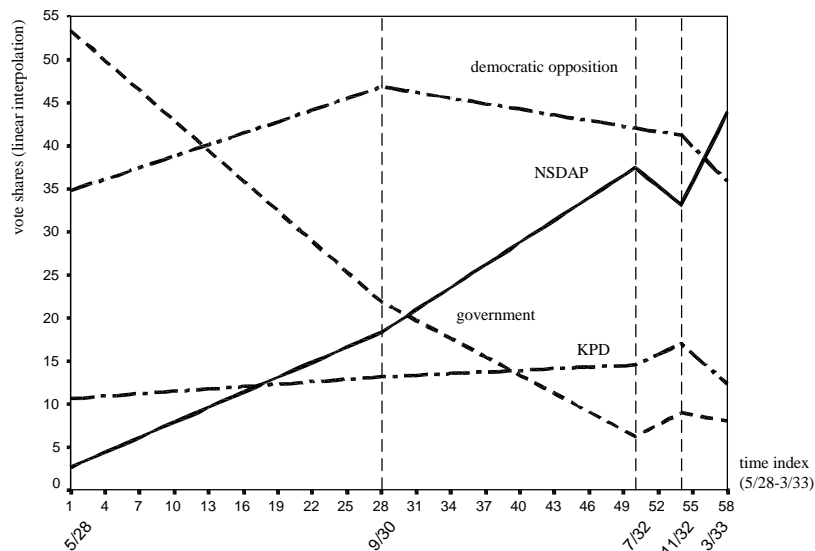
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¹ The generous support of the Volkswagen Foundation is gratefully acknowledged. I thank in addition, Jürgen Falter for making his painstakingly collected data set available in machine-readable format. I also thank John Komlos for encouragement and support in the course of this research project. Some results of this research project have been translated into an interactive internet project which extensively uses geographic maps. It can be downloaded from <http://www.weimar-voting.de>.

1. Introduction

After the fall of the Grand Coalition in March 1930, - the last democratic Weimar government to have a majority in the *Reichstag* - president Paul Hindenburg put in office a minority cabinet headed by chancellor Heinrich Brüning. Brüning ruled with emergency decrees, a constitutional device which was originally intended to enable the president to restore public safety and order in times of crisis without direct parliamentary control. With Hindenburg's support, Brüning carried out a rigorous policy which cut social expenses and reduced wages. The aim of this policy was to balance the heavily encumbered budget. This policy intensified the widespread pauperism in Germany.

Figure 1: Vote shares over time
(calculated from *Statistisches Jahrbuch des Deutschen Reiches* 57, 1937, p. 371)



In the following *Reichstag* election in September 1930, the National Socialist German Workers' Party (NSDAP) advanced from being a tiny splinter party to becoming the second largest party in Germany. The Communist Party (KPD) also registered gains, though on a considerably smaller scale than the NSDAP. The goal of both parties was to replace the Weimar government with their own ideal polity - respectively a *Volk*-based state community or a soviet-based proletarian dictatorship respectively - and consequently neither wanted to participate in a coalition government with the democratic parties. After the election in July 1932, the radical parties together constituted a majority in the *Reichstag*. The government parties, by contrast, suffered heavy losses, while the democratic opposition parties were able to keep their share of the vote approximately constant (see figure 1).

Although it had already become impossible to form a majority based government before the upsurge in the radical parties' share of the vote, this development clearly narrowed even further the political alternatives of those willing to return to a regular parliamentary government.² Numerous observers linked this electoral development, together with the accompanying shift of power away from parliament to presidential power (Kolb, 1988, p. 124), to the widespread pauperism which had occurred in Germany during the early thirties. Despite this seemingly obvious relation between the Depression and the collapse of the entire political system of the Weimar Republic, electoral analyses for this period so far have concentrated on single parties or party blocks. In contrast, we will measure this connection for the entire party system. In addition, we introduce two further important refinements: we implement an essentially longitudinal research design and we consider the spatial dimension in the voting decision.³

The outline of the paper is as follows: Section 2 reports results from previous empirical analysis of the influence of the Depression on Weimar voting. Section 3 supplies some concise information about the economic background and party programs of that period. Section 4 describes the main economic theories used to explain election results. Section 5 gives a rationale for the longitudinal perspective used in this analysis. The data set and the model used are introduced in section 6. Spatial aspects of the estimation are discussed in section 7. Finally, in section 8, the estimation results are presented and discussed.

2. Previous empirical analysis of Weimar elections

The literature on Weimar election outcomes is extensive,⁴ but most of it focuses on the social composition of the Nazi electorate. Besides the issue of who voted for Hitler, the relationship between the economic depression and the political collapse of the Weimar Republic has attracted particular scholarly attention. In the years following the War, numerous such studies appeared, authored mainly by political scientists. The economic crises

² Bracher (1955) also emphasized that an important factor for the electoral successes of the opponents of the Weimar Republic (primarily the Nazis) was the *Machtvakuum* (~vacuum of political power) which resulted from the fact that the pro-republican parties were not able to form a majority based government. According to his argument hyperinflation and depression aggravated this political deadlock (for this interpretation see also van Riel and Schram, 1993, p. 80).

³ There exist already some spatial analyses of the Nazi vote, as well as NSDAP membership, e.g. O'Loughlin, Flint and Anselin (1994) or Ault and Brustein (1998). However, these analyses are primarily concerned with socio-structural determinants and do not model the impact of the economic crisis explicitly.

⁴ For an overview, see Küchler (1992).

was a key explanatory factor in almost all of them, although very few of them explicitly modeled its impact. Exceptions were Heberle (1934) and Kaltefleiter (1966) who emphasized the importance of the Depression for the the upsurge in the NSDAP vote and the radicalization of the Weimar electorate. In general, all the contributions were at the level of narrative evidence and did not explicitly test hypotheses.

However, in the early eighties, several studies appeared using statistical techniques to analyse the socio-structural composition of the Nazi vote (e.g. Hamilton, 1982; Childers, 1983). Frey and Weck (1981) were the first to test the relationship between the economic crisis and the Nazi vote with methodological rigor. They used a regression on a data set consisting of thirteen cross-sectional regions (*Landesarbeitsamtsbezirke*) pooled over four Reichstag elections⁵ to show a clear and significant positive impact of unemployment on the NSDAP share of the vote.⁶ A much more thorough effort was mounted by a research team headed by Jürgen Falter (e.g. Falter 1983, 1984, 1985). Falter (1985) reversed the main conclusion of the Frey and Weck study, using a newly compiled data set with a higher regional resolution for the same four elections at the level of administrative units townships (*Stadt- und Landkreise*), $n = 865$.⁷ In a multiple regression framework, he obtained a negative coefficient for the unemployment rate (-.16), yielding an elasticity of -.06.⁸ Another analysis dealing with the economic aspect of Weimar voting was van Riel's and Schram's (1993) paper in which they used a pooled data-set (76 cross-sectional regions pooled over seven elections) and a similar set of socio-structural control variables, like those in the studies mentioned above, to test the effect of the economic crisis on the government's share of the vote.⁹ In addition to the unemployment rate, the economic part of their vote function was augmented by a real wage proxy. By choosing the government's share as dependent variable they were

⁵ (09/30, 07/32, 11/32, 03/33)

⁶ Other variables included in the model were as follows: a constant, Catholics as share of total population, agricultural employment including helping family members as share of employed persons, blue-collar workers as share of labor force and turnout.

⁷ A slightly modified version of this data set ($n = 830$) is used in the present analysis.

⁸ In detail, Falter's results were (second figure gives elasticity): constant (-.25), Catholics as share of total population (-.18/-.19), agricultural employment including helping family members as share of employed persons (.14/.16), blue-collar workers as share of labor force (-.26/-.22) and turnout (.88/1.98) (Falter, e.a., 1985, p. 130; elasticities own calculation). We tried to replicate Falter's results with an OLS estimation and obtained the following regression coefficients: constant (-.48), Catholic share (-.18/-.23), agricultural employment (.08/.11), blue collar (-.25/-.26), turnout (1.13/3.21) and unemployment (-.38/-.17). When we took into consideration the residual correlation between the different *Reichstag*-elections by a SUR estimation the results were: constant (-.50), Catholic share (-.18/-.19), agricultural employment (.17/.16), blue-collar (-.22/-.22), turnout (1.04/1.98) and unemployment (-.01/.00). The variation among the regression coefficients pertaining to unemployment in the different examples demonstrates that especially the estimated influence of unemployment on the Nazi vote might crucially depend on model specification.

⁹ The composition of government varied in the period analysed. Therefore they constructed the incumbent's share by aggregating the voting share of the respective parties. They also accounted for the fact that in some

able to test the responsibility hypothesis of voting behavior which states that voters punish the incumbents for negative economic performance. With this approach, van Riel and Schram showed a very clear negative impact of unemployment (with a regression coefficient of $-.94$), and a positive impact of real wages ($.33$), on the popularity of the Weimar government, and thus confirmed the implications of the responsibility hypothesis.

For the NSDAP at least, the present empirical evidence concerning the impact of the depression is unsatisfactory: in spite of a clear positive longitudinal relationship between unemployment and the Nazi vote (see figure 2), there is a weak negative connection when a pooled longitudinal/cross-sectional level of analysis like Falter's (1985) is used. We will show in the following that, only with a longitudinal approach, is it possible to completely isolate the influence of economic factors from other electorally relevant determinants such as the socio-structural composition of the electorate, and thus to completely avoid the ecological inference problem.¹⁰ The results derived from our approach unequivocally confirm the intuitively plausible impression that the Depression and especially unemployment made voters defect from government parties and switch to a large extent to the NSDAP.

3. Background information

Economic development

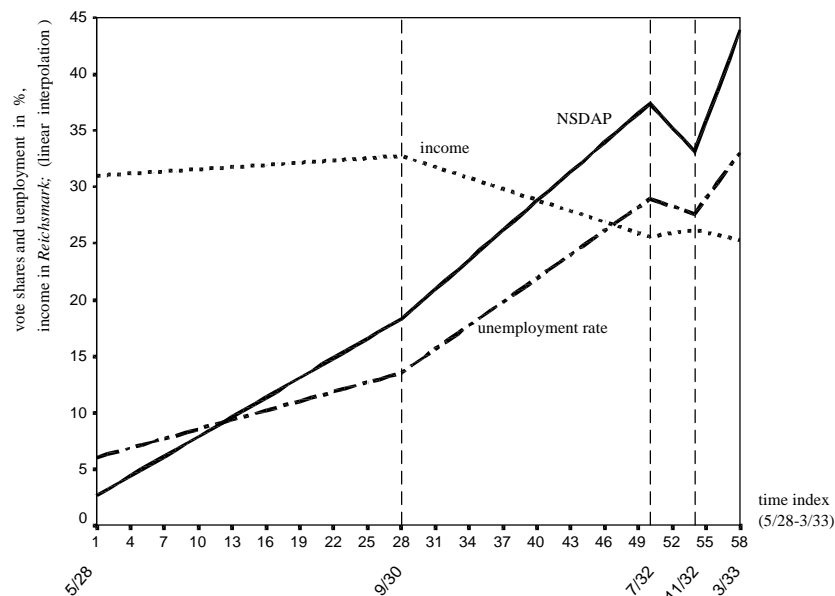
The most obvious evidence for the economic crisis in Germany was the increase of unemployment from about 1.1 million in May 1928 to about 6.1 million in February 1932. Unemployment decreased only slightly in 1932 and stayed at a very high level. In January 1933 the number of people on the dole again passed the 6 million threshold (Institut für Konjunkturforschung, 1933, p. 15). Over the same period, the percentage of unemployed people receiving insurance benefits fell from 83.2 % to 37.8 % (Adamy and Steffen, 1982). The unemployed (and their families), whose unemployment benefits had expired, had no choice other than to rely on public relief, which provided a bare minimum level of subsistence. Coincidentally with the increase in unemployment, wages were drastically cut

cases a party left government before the next election date by splitting such a party's vote share between government and opposition (van Riel and Schram, 1993, p. 91).

¹⁰ The ecological inference problem (ecological fallacy) generally can emerge when empirical results from one level of analysis (e.g. cross-sectional) are transferred to another level of analysis (e.g. longitudinal). This topic is addressed in detail in section 5.

back and partial lay-offs also increased dramatically. As a result, weekly nominal per capita income diminished from about 31 *Reichsmarks* in 1928 to about 25 *Reichsmarks* in 1933. However, because of unmistakable deflation, real income increased by about 5%.¹¹ The agricultural sector, the single largest employer with 30.5 % of the labor force, faced drastically declining prices, especially for dairy products and livestock whose price decreased by over 50 % from 1928 to 1933. The result was a debt crisis and numerous foreclosures (Brustein, 1996, p. 66). Although unemployment figures were much lower in agriculture - especially in regions with small farms - hidden unemployment was substantial. Regional variations in the extent of indebtedness were also very high, partly because large grain farms with high wages bills and social security obligations were concentrated in the East. Figure 2 summarizes the development of the Nazi vote, the unemployment rate and weekly nominal per capita income. A parallel development of the series is evident, especially for NSDAP share and unemployment rate.

Figure 2: NSDAP vote share and economic indicators, Germany as a whole



The Weimar Political Landscape

The KPD directed its program to the concerns of the industrial proletariat by calling for increases in wages and for improving unemployment benefits. By advocating tariff

Ein ökologischer Fehlschluss ist eine Scheinkorrelation, die darauf zurückzuführen ist, dass empirische Ergebnisse, die auf einer bestimmten Aussageebenen abgeleitet wurden, unzulässigerweise auf eine andere Aussageebene übertragen werden.

¹¹ Wage levels according to own calculation (see footnote 24).

reductions on food imports so as to reduce prices for low-income families, the party appealed to the interests of the industrial proletariat over the rural proletariat. The Communists' argument that as dependent workers, white-collar employees and blue-collar workers shared common interests backfired, however. Instead of attracting the support of white-collar workers, this campaign strategy increased their fear of becoming proletarianized (Brustein, 1996, p. 11). The Communists' opposition to private property also put them at odds with small independent farmers, shopkeepers and artisans.

Until 1928 the NSDAP, the other radical party, also aimed its propaganda at blue-collar workers. However, their unexpected success in rural townships in the election of May 1928 led the party to adjust its program to the needs of middle class groups like small-holders and civil servants. Nevertheless, typical blue-collar concerns, such work creation programs, remained an important element in the Nazis' economic program. Realizing that the strong ties primarily between unskilled industrial workers and the KPD - especially in such highly unionized branches as mining, iron and steel - could not be broken, after 1928 the Nazis concentrated on skilled workers, who were concentrated in such industries as construction, woodworking and machine building. This lower middle class orientation was accompanied by an endorsement of private property. The Nazis' agrarian program included both tariffs on food imports and impartible inheritance; the latter was closely related to the proposal to resettle the disinherited in the eastern Germany. This policy was received enthusiastically in the northern and north eastern provinces where impartible inheritance was already practiced, but less enthusiastically in the predominantly Catholic southern and south western regions where partible inheritance was practiced. The Nazis' call for cheaper credit and lower taxes appealed not only to farmers but also to small shopkeepers and artisans. Another important middle class element of the Nazi strategy was the call for improvement of the social and economic standing of civil servants, which, compared to other groups of employees, had been relatively curtailed by Chancellor Brüning' s austerity measures (Brustein, 1996, pp. 95, 114).

The block of democratic parties included the *Zentrum* and the Bavarian People' s Party (BVP) which was basically the regional branch of the *Zentrum* in Bavaria. These participated in fifteen of the eighteen Weimar governments and therefore can be seen as the backbone of the Weimar democracy. These parties represented the political interests of Catholics, who accounted for about a third of the population and were concentrated in the south and west of Germany. Among other demands, they advocated their right to attend parochial schools, which had been prohibited by Bismarck as part of the *Kulturkampf*.

Both major liberal parties - the German Democratic Party (DDP), which in 1930 was renamed the German State Party (DStP), and the German People's Party (DVP) - originated in the pre-war National Liberals. The former was more progressive and had a stronger social focus, while the DVP was perceived as the advocate of the competitive, export oriented industries (Brustein, 1996, p. 35). Both parties advocated classical liberal free trade policies and argued for a clear separation between church and state. The DDP participated in thirteen of eighteen Weimar governments and the DVP participated in eleven.

The Social Democratic Party (SPD) played an ambiguous role in supporting the Weimar governments. In the early twenties it participated in several governments, and it also took the leading role in the Grand Coalition of 1928. However, after the collapse of this coalition in March 1930, the SPD resigned from the government due to both a fundamental disagreement about the future of the unemployment insurance program and the looming financial crises with the onset of the Depression. Subsequently, the party tolerated the minority cabinet under chancellor Brüning which ruled by emergency decree, thereby preventing emergence of a parliamentary majority opposed to the government. The SPD's main aim was to replace the market oriented economy by a full employment welfare state, to be achieved by comprehensive labor legislation which would be financed by taxes on high incomes and which would guarantee a high labor income. Like the Liberals, the SPD also advocated a secularized society and opposed tariffs on food imports (Brustein, 1996, p. 43ff).

The German National People's Party (DNVP) did not have a consistent policy towards Weimar. After a period of dominance by a liberal wing, which favored involvement in, and support of, the government, the radical nationalist block took over leadership in 1928. From then on the party followed a strictly anti-republican course, even though it formed the government after the *Reichstag* election in July 1932. Following the election of March 1933 in which the NSDAP received the most mandates of all parties (43.9 %)- its best result ever - the DNVP (8 %) formed a coalition with the Nazis and ultimately, brought Adolf Hitler to power (Brustein, 1996, p. 33). In other words, though small, the DNVP played a pivotal role in the demise of the Weimar Republic.

4. Theories of voting behavior

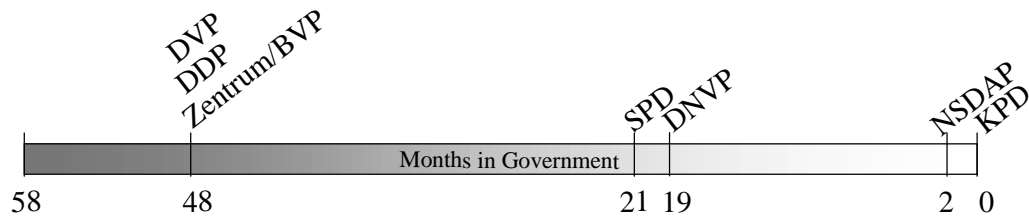
In the politico-economic literature the major theory concerning the determinants of voting results is the responsibility hypothesis. It is based on the Downsian notion of a voter

choosing the party which maximizes his/her expected utility. The responsibility hypothesis says that voters punish the government for economic decline and this in turn benefits the opposition (Nannestad and Paldam, 1994a, p. 215). The variables used as determinants for party popularity are mostly economic indicators which can be influenced by the government and which are relevant to the welfare of the electorate. Normally, these are the unemployment rate, income, and inflation. When there are several opposition parties however, the responsibility hypothesis only has implications concerning the general direction of the flow of the vote and not its exact distribution among the opposition parties (Rattinger, 1991, p. 51). This theory implies for an empirical analysis of the determinants of the voting shares of more than one party, that the sign of variables which lower the utility of a voter (like unemployment) should be negative with respect to the government share and positive for the opposition parties' share.

The partisan theory is another theory about the direction of the vote in reaction to economic changes. It holds that parties are permanently committed to pursuing different macroeconomic policies: left-wing parties aim at higher employment and wage income, while conservative parties are more concerned with inflation (Hibbs, 1977). Given the information on party characteristics in the Weimar Republic, this hypothesis implies that rising unemployment or falling income should foster the left wing SPD and KPD, the parties with the most pronounced pro-labor orientation irrespective of whether they are incumbent or not.¹² In the present analysis, the incumbent's share comprises several parties, which in some cases also left the government during an interelectoral term (the same holds for the opposition with reversed sign). Therefore, it is not immediately obvious, what implication partisan behavior, if relevant at all, would have for the Weimar governments' electoral performance. Figure 3 shows the degree of government participation for the different parties in the period analysed (5/1928-3/1933). It can be seen that the two liberal parties, DVP and DDP, and the Catholic interest parties, *Zentrum* and BVP, stayed in government for the longest period.

Figure 3: Government participation in months (5/1928-3/1933)

¹² This is also true for decreasing inflation, because this would weaken the partisan appeal of conservative parties. In this analysis primarily labour market oriented variables are included and these probably affect the partisan element of the voting share for parties with an explicit labor orientation like the Communists or the Socialdemocrats. For capturing the partisan element in the voting share of e.g. the Liberals, variables on issues like budget deficit or tax burden would be more appropriate.



The responsibility and partisan hypotheses can have the same implications, if, for example, in a situation of rising unemployment the Social Democrats were the incumbents. Figure 3 shows that for about two thirds of the period analysed the SPD was an opposition party and for only about one third of the period participated in government. Therefore, and because the Liberals and the Catholic interest parties' programs had no clear reference to labor market issues, we can expect not to find any systematic relation between economic variables and the government's voting share due to the working of partisan oriented behavior of the electorate.

The following expectations can be formulated for the share of the opposition parties: since the NSDAP did not have an exclusive working-class orientation, its share of the vote should probably only be affected by economic variables in the way predicted by the responsibility hypothesis. However, for the share of the KPD and also that of the democratic opposition it is possible that, with respect to the income variable, the implications of responsibility and partisan hypothesis may superimpose, because the SPD was the largest single democratic opposition party for the major part of the analysed period.¹³ Against the background of increasing real income according to a punishment type of behavior, rising government popularity and declining support for the opposition parties would be predicted. Nevertheless, in terms of their party programs, the SPD and KPD must have been perceived as the parties most competent to improve the income situation of dependent labor still further. This meant that an income rise may have reinforced the existing partisan ties of the wage earners with the left-wing parties. Therefore, some voters may have stuck to their socialist or social democratic party choice instead of crediting the government with this improvement in their real income position.

In addition to these hypotheses concerning the direction of the vote, there are different views about how economic stimuli enter the utility function of voters. Normally, egoistic

¹³ With respect to the unemployment variable the partisan hypothesis implies the same sign as the responsibility hypothesis for left-wing opposition parties: When unemployment rises, the partisan ties towards the left-wing parties are reinforced.

motivations are assumed to be the basis for punishment type behavior, i.e. the support for government or opposition depends solely on private welfare: the individual in this case is an egotropic or 'pocketbook'-voter. Yet different studies have shown that, when variables reflecting both personal economic evaluations (e.g. being personally affected by unemployment) and collective economic evaluations (e.g. national or regional labour market deterioration without necessarily being unemployed) are included as electoral determinants, a different picture emerges. In this case, it turns out that the former category clearly loses influence and that the latter category is, in fact, the decisive factor for the voting decision. The relative weight found in previous studies of sociotropic factors relative to egotropic factors is about 80 % to 20 % (Nannestad and Paldam, 1994b, p. 1). This means that, empirically, sociotropic voting behavior is much more relevant than egotropically induced party choice. However, in order to distinguish completely between these two mechanisms, both micro (individual vote choice and personal perception of economy) and macro-level (aggregate unemployment rate) data have to be available. For the Weimar Republic however, only aggregated data are available.¹⁴ As a consequence, we only can analyse aggregated election results and not the individual voter choice. Because some voters act egotropically and others sociotropically, or the individual considers both personal and collective economic evaluations, the existence of a reliable relationship between unemployment and government vote share is consistent both with the egotropic and the sociotropic model (Kramer, 1983, p. 106).¹⁵ However, this distinction is not necessary for our analysis, since our aim is to measure the extent to which the Depression caused the voters to defect from the government and to radicalized. For this problem, whether people directly affected by unemployment or only indirectly affected voted for the NSDAP is only secondary- in either case mass unemployment was the prerequisite for the Nazi seizure of power. In other words, Hitler could have come to power because of unemployment without one unemployed person voting for him (Kirchgässner, 1984, p. 127).¹⁶

All in all, the responsibility hypothesis seems to describe well the twilight of the Weimar Republic. In the main, the government continuously lost voter support over the entire period of the Depression, whereas the radical parties especially clearly achieved substantial electoral gains (see figure 1 and figure 2). This was particularly true in case of the NSDAP.

¹⁴ Because of the intermediate degree of aggregation at the township level, it is more accurate to speak of meso rather than of macroeconomic data, and therefore of *regiotropic* rather than sociotropic voting behavior.

¹⁵ Another terminology for this distinction comes from discriminating between direct and indirect effects of economic variables (see generally Zintl, 1985, p. 48ff and with special emphasis on unemployment Rattinger, 1984, p. 102f).

¹⁶ This holds as long as the number of people still employed is at least as large as the total Nazi vote.

5. Dichotomy between cross-sectional and longitudinal evidence

When data on voting and economic performance are available in both the cross-sectional and longitudinal dimensions, the two kinds of evidence are often contradictory. Kramer (1983) demonstrates that this ecological inference problem can be explained by the fact that the former approach mainly captures the influence of structural factors, which vary geographically on the electorate - e.g. the higher propensity of blue collar workers to vote for left wing parties.¹⁷ By contrast, longitudinal evidence reflects the behavior of voters reacting to economic change, for example in turning away from the governing party in times of economic decline as implied by the responsibility hypothesis.

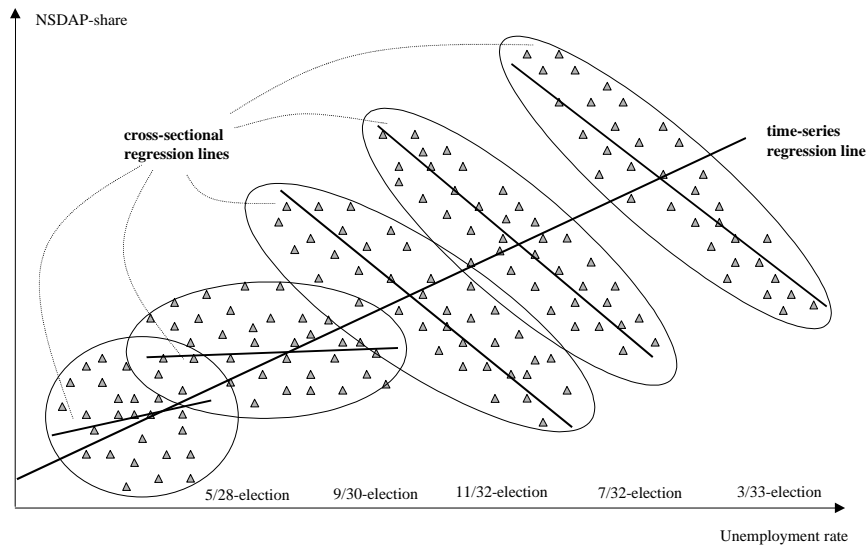
Figure 4 illustrates these two different processes for our data set. The five cross-sectional scatter plots reflect the bivariate distribution of the unemployment rate and the NSDAP share in the five *Reichstag*-elections.¹⁸ In the first election there was a positive relation between the two variables relation and in the second there was almost no relation. However, a clear negative correlation between the two variables emerged in the succeeding elections. For a single township, an increase in unemployment resulted in an outward shift of its position in the above graph. Given that a sufficient number of townships behave in this way, the cross-sectional scatter plots continue to shift outwards, even as they retain the negative tendency in the cross section.¹⁹ In addition, the position of a particular township relative to other townships in any of the scatter plots will tend to remain constant, since the socio-structural variables influencing the predisposition to vote radical remain unchanged. For example, some urban townships with high unemployment rates may have voted predominantly not for the NSDAP, but for the KPD, or some townships with a high proportion of Catholics may have mainly voted not for the NSDAP, but for the Catholic party *Zentrum*. This means that, at any point in time, across the German landscape there might well have been a negative correlation at the township level between the unemployment rate and the Nazi share of the vote. Nevertheless, over time unemployment generally increased, and

¹⁷ Kramer's original argument refers to the distinction between cross-sections of individual survey data in contrast to longitudinally available aggregated data. However, he points out that his contention can also be applied to the data types relevant to this paper (op. cit., p. 95).

¹⁸ Controlling for the influence of the other variables mentioned in section 2 the partial correlation coefficients between unemployment rate and Nazi vote share are: 5/28: .131*; 9/30: .061; 7/32: -.245*; 11/32: -.264*; 3/33: -.179* (*: significant at .01-level).

induced an across-the-board increase in the electoral success of the Nazi party. Thus, if the hypothesis is that the rise in unemployment caused the rise of National Socialism, clearly the latter process is decisive. In brief, we are interested not in the slope of the individual scatter plots, but in the change in their overall position over time (Kramer, 1984, p. 95).

Figure 4: Stylized cross-sectional and longitudinal relation between unemployment and NSDAP-share²⁰



If we want to avoid spurious regression results concerning the impact of the *Depression* on Weimar voting - as in Falter's analysis, where the negative relationship between unemployment and the Nazi vote at the cross-section is the determining factor - we have to use a regression specification which controls for the difference between the cross-sectional and longitudinal effects. Consequently, we estimate the impact of the Depression on voting behavior longitudinally for each of the 830 townships, i.e. we hold the structural composition of the township unit observed constant. The six observations we have for each township do not offer sufficient degrees of freedom for statistical inference for each township individually. Nevertheless, all values of the township-specific regressions can be regarded as realizations of a repeated sample, which, when taking an average over the observations, can give a reliable estimate of the behavioral coefficient of interest.

¹⁹ Note that since unemployment rate and NSDAP share decreased from 7/32 to 11/32, the scatter plot pertaining to the former election lies below the scatter plot of the latter.

²⁰ See Kramer (1983, p. 96) and Falter (1987, p. 196) for a similar figure.

6. Data, model and estimation strategy

We analyse the last five *Reichstag* elections²¹ taking place in the Weimar Republic for which both electoral and economic data are available at the local level of townships. Since the government and the democratic opposition in the Weimar Republic typically consisted of several parties, synthetic variables had to be constructed for which the shares of votes of the parties constituting the government or the democratic opposition at the respective election dates were combined.²² The unemployment series in the data set we used²³ does not start until December 1931. In order to obtain unemployment figures at township level for the election in September 1930 and May 1928, unemployment data for December 1931 were extrapolated backwards by splicing township data for December 1931 with unemployment figures at the regional level of the thirteen state labor exchange offices (*Landesarbeitsämter*) which are available for October 1930 and April 1928. The unemployment figures are augmented by our estimates of real weekly per capita income at the township level.²⁴

The hypothesis is tested with a micro-founded vote function used by Kirchgässner (1986).

$$\mathbf{y}_i = \mathbf{X}\boldsymbol{\beta}_i + \mathbf{y}_{i,t-1}\boldsymbol{\lambda}_i + \mathbf{e}_i \quad (1)$$

\mathbf{y}_i is the vector of township-vote-shares of party i ($i = \text{NSDAP, KPD, government, democratic opposition}$).²⁵ Matrix \mathbf{X} contains the independent variables - a constant and the

²¹ Because a lagged dependent variable is included, six observations in time are required for this.

²² Because, in the Weimar Republic, parties often left government during an interelectoral term, shares of votes of the parties in a coalition were weighted with the relative number of months in which a party was involved in government (see van Riel and Schram, 1993, p. 91). Since we wanted to analyse the electoral support of democratic vs. radical parties, we did not include the NSDAP, which, together with the DNVP, (see section 3) formed a government in January 1933, in the incumbent's vote share for the respective dates.

²³ The voting data were contained in the data set '*Wahl- und Sozialdaten der Kreise und Gemeinden des Deutschen Reiches von 1920 bis 1933*'. For a description of the data set, see Hänisch (1989). The unemployment series comes from another data set kindly made available to us by Jürgen Falter and Arthur van Riel.

²⁴ To calculate real income, we deflated our nominal income series by a consumer price index. Township-mean of weekly per capita income in *Reichsmark* for the 830 townships (first number gives nominal income, second number real income): 5/28: 30.96/30.96, 9/30: 32.72/32.88, 7/32: 25.57/31.80, 11/32: 26.19/33.11, 3/33: 25.24/32.52. The procedure of proxy construction follows broadly that of van Riel and Schram (1993). In contrast, for the calculation of weekly income we also considered information about labour utilization to take into consideration the effect of declining working hours due to partial lay-offs. Our procedure of proxy construction is available upon request.

²⁵ The vote share is calculated as votes obtained by a party expressed as a share of eligible persons and not as a share of votes cast. This formulation has the advantage of controlling variations in turnout without having to include an extra variable for turnout (see Falter, 1986, p. 190, fn. 42). An explicit consideration of turnout is problematic because of the simultaneity between turnout - for which the economic situation is also relevant (see e.g. Rattinger, 1991, p. 53f) - and voting.

time-varying variables unemployment rate and weekly, real per capita income. Vektor $\mathbf{y}_{i,t-1}$ ²⁶ is the lagged vote share of party i and \mathbf{e}_i is the vector of residuals; β_i and λ_i are regression coefficients.

Because it reflects the share of votes of a party in isolation from its variation given by the economic variables and the lagged vote share, the regression coefficient of the locational constant can be interpreted as structural, time-invariant (over the period of observation) vote reservoir which is determined by socio-structural or political factors (Kramer, 1983, p. 98). The behavior of a township's electorate in response to the economic crisis is expressed by the regression coefficients of the economic variables unemployment and real income. The temporally lagged vote share is included, because traditional ties, previous searches, and past experience imply an investment in a prior voting decision. Therefore, voting results exhibit temporal persistence or party loyalties (Galeotti and Forcina, 1991, p. 284). By including a lagged dependent variable $\mathbf{y}_{i,t-1}$ the partial regression coefficients of the other variables β_i only explain the amount of variation of the dependent variable \mathbf{y}_i which is not explained by the lagged dependent, i.e. the change of the vote share between to election dates ($\mathbf{y}_i - \mathbf{y}_{i,t-1}$). The regression coefficient λ_i thus reflects the degree of persistence in vote shares and therefore can be used to infer about the memory of voters. The lower λ_i , the more pronounced is their myopia, - or, in other words, the higher is the voters' rate of deduction (λ_i) on their previous voting decision -, because past events do not exert a substantial influence on the current voting decision (Kirchgässner, 1986, p. 426).²⁷

Longitudinal, township-specific perspective

As mentioned above, the only way to completely avoid the impact of cross-sectional effects on the coefficients of the economic variables is to use a time series perspective. However, the six *Reichstag*-elections in the period analysed clearly do not form a sample large enough to provide us with sufficient degrees of freedom for the estimators to achieve the desired asymptotic properties necessary for statistical inference at the township level. Nevertheless, the longitudinal analysis for each party and township yields 830 values for each regression coefficient, i.e. a sample large enough to draw plausible implications for their true

²⁶ Following van Riel and Schram (1993) we accounted for different interval lengths between elections by appropriately weighting the lagged vote share. The weighting term (\underline{n} / n) resulted from dividing the mean of interval length in months over the period of observation ($\underline{n} = 19,6$) by the respective interval n between two elections (12/24-5/28: 41 months; 5/28-9/30: 28 months; 9/30-7/32: 22 months; 7/32-11/32: 3 months; 11/32-3/33: 4 months).

²⁷ λ_i can also be formulated in terms of Nordhaus' political discount rate μ (Nordhaus, 1975, p. 182): $\lambda_i = \exp(-\mu)$. Empirically, voters seem to have a high degree of myopia. This indicates that voters on average do not have rational expectations. For a more detailed discussion of this topic see Kirchgässner (1985).

value in the underlying distribution. For a single party, the system to be estimated has the following form:

$$\begin{bmatrix} \mathbf{y}_1 \\ \mathbf{y}_2 \\ \vdots \\ \mathbf{y}_{830} \end{bmatrix} = \begin{bmatrix} \mathbf{X}_1 & 0 & \dots & 0 \\ 0 & \mathbf{X}_2 & 0 & 0 \\ \vdots & 0 & \ddots & \vdots \\ 0 & 0 & \dots & \mathbf{X}_{830} \end{bmatrix} \begin{bmatrix} \boldsymbol{\beta} \\ \boldsymbol{\beta} \\ \vdots \\ \boldsymbol{\beta}_{830} \end{bmatrix} + \begin{bmatrix} \mathbf{y}_{1,t-1} & 0 & \dots & 0 \\ 0 & \mathbf{y}_{2,t-1} & 0 & 0 \\ \vdots & 0 & \ddots & \vdots \\ 0 & 0 & \dots & \mathbf{y}_{830t-1} \end{bmatrix} \begin{bmatrix} \lambda_{1,t-1} \\ \lambda_{2,t-1} \\ \vdots \\ \lambda_{830t-1} \end{bmatrix} + \begin{bmatrix} \mathbf{e} \\ \mathbf{e} \\ \vdots \\ \mathbf{e}_{830} \end{bmatrix} \quad (2)$$

In this equation \mathbf{y}_k , $\mathbf{y}_{k,t-1}$ and \mathbf{e}_k , $k = 1, \dots, 830$, are (5 x 1) vectors containing the vote share, the lagged vote and the residuals for the five election dates²⁸ and \mathbf{X}_k is a (5 x 3) matrix with the constant, the unemployment rate and income. The vectors of regression coefficients ($\boldsymbol{\beta}_k$ and $\lambda_{k,t-1}$) are constant over time but vary across spatial unit. This model was estimated for each of the four parties/party blocks that we analyse. Implementing this procedure for each party (4) and township (830) yielded in total estimates for 3320 vote functions.

There is a clear difference between this approach and the ones in previous studies mentioned in section 2 which use a different panel structure. In contrast to equation (2), where the components of the stacked vectors and matrix result from stacking the data for each township over time, the panel structure of those analyses has the following form:

$$\begin{bmatrix} \mathbf{y}_1 \\ \mathbf{y}_2 \\ \mathbf{y}_3 \\ \mathbf{y}_4 \end{bmatrix} = \begin{bmatrix} \mathbf{X}_1 \\ \mathbf{X}_2 \\ \mathbf{X}_3 \\ \mathbf{X}_4 \end{bmatrix} \boldsymbol{\beta} + \begin{bmatrix} \mathbf{e} \\ \mathbf{e} \\ \mathbf{e} \\ \mathbf{e}_4 \end{bmatrix} \quad (3)$$

In equation (3) \mathbf{y}_l , $\mathbf{y}_{l,t-1}$ and \mathbf{e}_l , $l = 1, \dots, 4$,²⁹ are (830 x 1) vectors containing the vote share, the lagged vote and the residuals for the four election dates and \mathbf{X}_l is a (830 x 6) matrix of independent variables (overall constant, Catholic share, share of agricultural employment, share of blue-collar workers, and turnout and unemployment rate). In contrast to equation (2), cross-sectional differences are not completely captured by township-specific dummies but are nevertheless captured imperfectly by socio-structural variables. In equation (3), the individual components of the stacked expressions are organized by spatial units. The vector of regression coefficients ($\boldsymbol{\beta}$) is constant both over time and space.

²⁸ The first observation on the vote share enters the equation only in lagged form.

By using a township-specific fixed-effects approach according to equation (2) the vote function is essentially estimated for each township individually. The differences between townships in socio-structural parameters, i.e. the long-term factors affecting the vote, are captured by, and amalgamated into, the location-specific constants. It is therefore guaranteed that no spurious term resulting from unobserved socio-structural factors overlays the relation between the economic variables and party share.

7. Voting behavior in a spatial context

Spatial context plays an important role in electoral geography for explaining voting behavior alongside the usual socio-economic indicators (Agnew, 1987, p. 45). Such contextual effects may turn on the varying effect of party organizations, extended social networks, the appeal of candidates beyond party attraction, local party campaigns, party competition or local political culture (O'Loughlin, Flint and Anselin, 1994, p. 352). These effects work simultaneously and therefore cannot easily be separated or measured. Consequently, context acts as a missing variable in vote functions and causes the residuals to be spatially autocorrelated.^{30 31}

In order to test whether the residuals of the vote function (2) of nearby townships are spatially correlated, we use the well known Moran's I statistic (see Cliff and Ord, 1973), expressed as:

$$I = \frac{\mathbf{e}' \mathbf{W} \mathbf{e}}{\mathbf{e}' \mathbf{e}} \quad (4)$$

\mathbf{W} is a square, spatial weights matrix with dimension n as number of spatial units. The element w_{ij} in \mathbf{W} assumes a value of one if township i and j are contiguous, e.g. if they share a common border. If they are non-contiguous, the corresponding value of w_{ij} would be zero. Vector \mathbf{e} denotes the residuals from equation (2). As a ratio of a spatial cross-product to a

²⁹ In the studies of Frey and Weck, and that of Falter described in section 2, only four elections are analysed. Although van Riel's and Schram's study uses more observation in time and a slightly different set of independent variables their panel structure accords with the studies mentioned above.

³⁰ For a concise introduction to the concept of spatial autocorrelation see Griffith (1992).

³¹ Contextual effects also result in spatial heterogeneity of the observations n . This is normally modeled by using several regional dummy variables j , where $j \ll n$. Since we use location-specific dummy variables ($j = n/5$), we have allowed for the maximum degree of spatial heterogeneity in our analysis.

variance, I is a global measure of spatial autocorrelation, which informs us about the extent to which a residual in a township is surrounded by similar residuals in adjacent townships.³² Line 2 in table 1 shows the values of this statistic for the four parties/party blocks. When comparing the values for the test statistic with its theoretical mean $-.001$, it becomes evident that, especially for the KPD and the democratic opposition, the residuals are highly autocorrelated, somewhat less for the NSDAP and the government.

In order to make such spatial patterns of residuals visible, one can use the G_i -statistic, a local measure of spatial association that can be computed for each observation in the data set, can be used:

$$G_i = \frac{\sum_j w_{ij} e_j}{\sum_j e_j} \quad (5)$$

The expression w_{ij} is again an element in the spatial weights matrix \mathbf{W} . G_i is the ratio of the sum of the residuals in the townships j neighbouring township i to the sum over all values. It indicates the extent to which the residual of a township is surrounded by like or unlike values. The significance of the G_i statistic can be judged by comparing its z-value which for large samples follows a standard normal distribution, with the corresponding probability in a standard normal table. In figure 4 the p -values of this statistic for the residuals coming from equation 4 are plotted on a map. Spatial clusters of residuals (both positive and negative) clearly can be seen there.

Table 1: Moran's I for residuals (*Reichstag*-election 7/32) of Township-specific party vote functions

Moran's I	NSDAP	KPD	government	dem. opp.
spatially unfiltered	.529	.611	.544	.610
spatially filtered	.076	.108	.071	.013

$$E(I) = -1/(n-1) = -.001$$

³² The significance of this test can be judged by comparing the z-value which for large samples follows a standard normal distribution to its probability in a standard normal table. I can be viewed as a spatial analogue of a correlation coefficient, measuring in contrast to a traditional correlation coefficient the relation between the values of one variable at different (contiguous) sites and not the relation between two different variables at the same place. It is not centered around zero or restricted to the interval $[-1,1]$. The theoretical mean of I is $E(I) = -1/(n-1)$ and therefore is only a function of the sample size.

The substantial spatial residual dependence calls for the use of estimation techniques other than standard OLS, because spatial residual autocorrelation can lead to inconsistent results and biased inference (Anselin, 1988, p. 59). We assume a spatial autoregressive process in the residuals (cf. Ord, 1975, p. 122).

$$\begin{aligned} \mathbf{y} &= \mathbf{X}\boldsymbol{\beta} + \mathbf{y}_{t-1}\lambda + \mathbf{e} \\ \mathbf{e} &= \rho\mathbf{W}\mathbf{e} + \boldsymbol{\mu} \end{aligned} \tag{6}$$

\mathbf{W} again is a spatial weights matrix reflecting the patterns of contiguity in the data set. The residuals \mathbf{e} are composed of a component $\rho\mathbf{W}\mathbf{e}$ with non-diagonal covariance matrix and a well behaved part $\boldsymbol{\mu}$. The regression coefficients in this model can be calculated by applying a least-squares estimation on a spatially filtered data set, which is obtained by differencing the variable value in one township by the weighted average of the variable values in contiguous

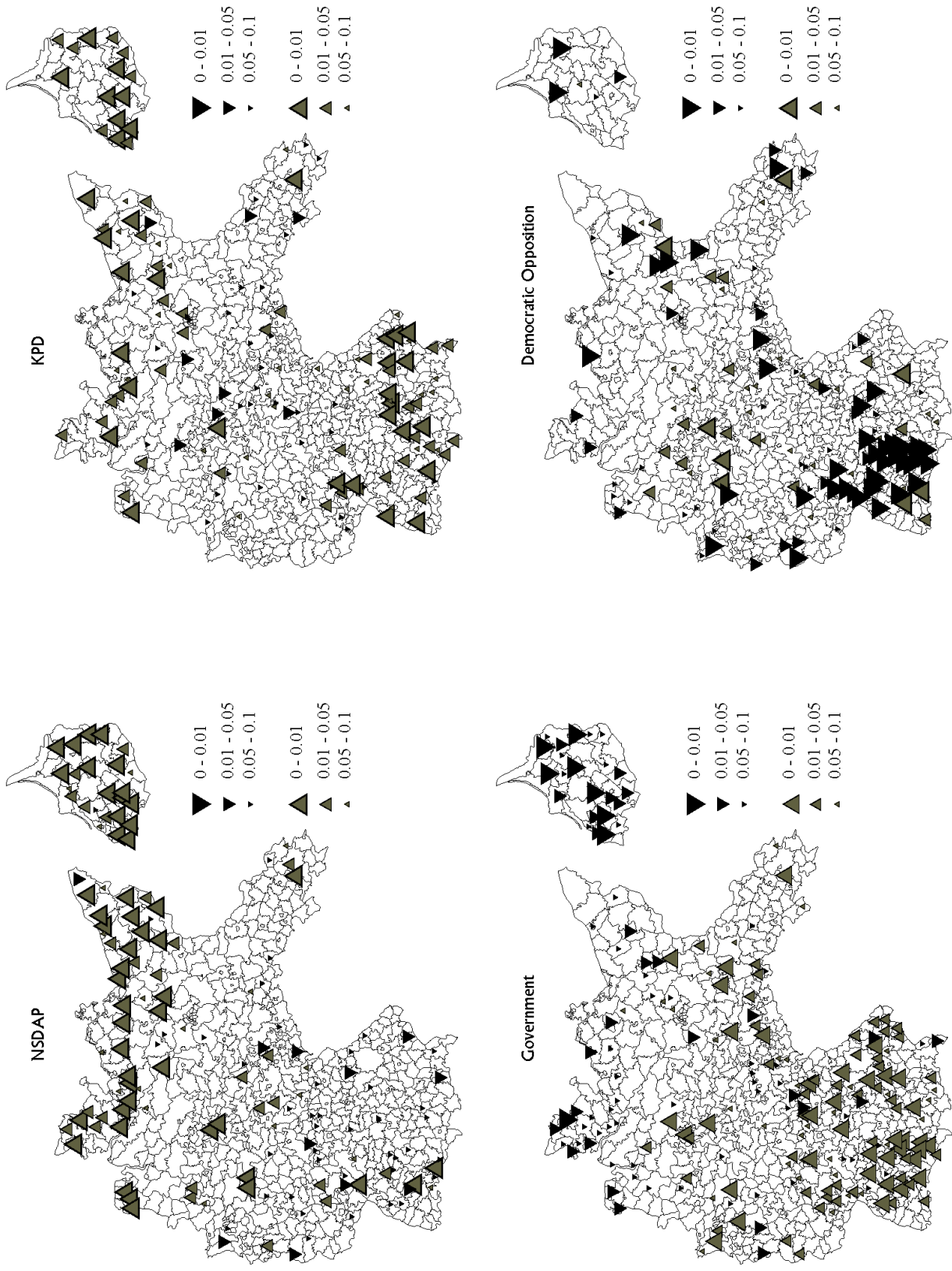
townships.³³ Essentially, this technique increases the efficiency of the estimates by using the information which is contained in the variable values of nearby observations.³⁴

The success of this measure becomes apparent when the Moran's I statistic of the spatially unfiltered data set is compared with its value when using the spatially filtered data set. Table 1 shows that spatial autocorrelation is substantially decreased by implementing the described procedure, especially for the democratic opposition. Although some autocorrelation is still present in the data, this low level can be accepted for the following estimation.

³³ Because of the simultaneity implied by the spatial nature of the dependence, the spatial autoregressive coefficient ρ normally is estimated together with the regression coefficients by a numeric maximum likelihood approach. For the data set structure of equation (2), such a numeric search procedure would have been computationally too cumbersome. Therefore, a simplified method was implemented: instead of an iterative, we used a two-step EGLS procedure. We first estimated a spatial autoregressive model for pure cross-sections, i.e. 830 townships for each election i ($i = 5/28, 9/30, 7/32, 11/32, 3/33$) using a numeric maximum likelihood approach, which yielded five spatial autoregressive coefficients. Then, we spatially filtered the original variables using the estimated spatial autoregressive coefficients: $\mathbf{X}_i^{fil} = (\mathbf{I} - \rho_i \mathbf{W})\mathbf{X}_i$, $\mathbf{y}_i^{fil} = (\mathbf{I} - \rho_i \mathbf{W})\mathbf{y}_i$, $\mathbf{y}_{i-1}^{fil} = (\mathbf{I} - \rho_i \mathbf{W})\mathbf{y}_{i-1}$, where \mathbf{I} is a (830 x 830) identity matrix. Subsequently, we recombined these five cross-sectional data sets into the data set structure given in (2). Finally, we applied least squares according to equation (2) in order to obtain the township-specific regression coefficients. This procedure is equivalent to an instrumental variables estimation strategy, where the spatially filtered variables are the instruments. The autoregressive coefficients were calculated by the Matlab Spatial Statistics Toolbox 1.1 of Kelley Pace (1999).

³⁴ One can also view the townships as nodes of a network structure which is reflected in total by the spatial weights matrix \mathbf{W} . In this interpretation our approach resembles the information processing in a neural network, in which the output of a node is (exclusively) a function of the weighted inputs from other nodes. By contrast, in our approach the inputs from other nodes determine the output of a node only to some extent.

Figure 5: p -values of G_T -statistic (7/32)



Triangles represent significance (p-value) of z-values for the G_T -statistic; upward triangles (size increases with degree of significance) indicate clusters of townships with positive residuals, downward triangles the reverse.

8. Results and discussion

We are obviously unable to present the results for all of the 3320 vote functions which we estimated in this paper, but a summary of township-specific regression coefficients and elasticities is given in table 2.³⁵ With respect to the hypothesis to be tested, i.e. the influence of the economic crises on the political system of the Weimar Republic, the figures show that rising unemployment indeed delivered the death-blow to the Weimar Republic.

Table 2: Summary of coefficients of township-level vote functions³⁶

variable	NSDAP	KPD	government	dem. opp.
constant	.030	-.016	.058	-.018
unemployment rate	1.650 [0.787]	.130 [0.081]	-2.279 [-1.282]	1.587 [0.222]
real weekly income	-.003 [-0.608]	.003 [1.277]	.000 [0.433]	.018 [1.160]
lagged vote share	.033 [0.127]	.015 [0.047]	.163 [0.239]	-.057 [-0.202]

Figures in brackets give point-elasticities at mean of the respective variables; since variables are measured differently (income in *Reichsmark*, unemployed as share of labour force, votes as share of eligible persons), the relative impact of the regressors can be compared by elasticities.

For example: an increase of unemployment by 1 % increased the Nazi vote by .787 %.

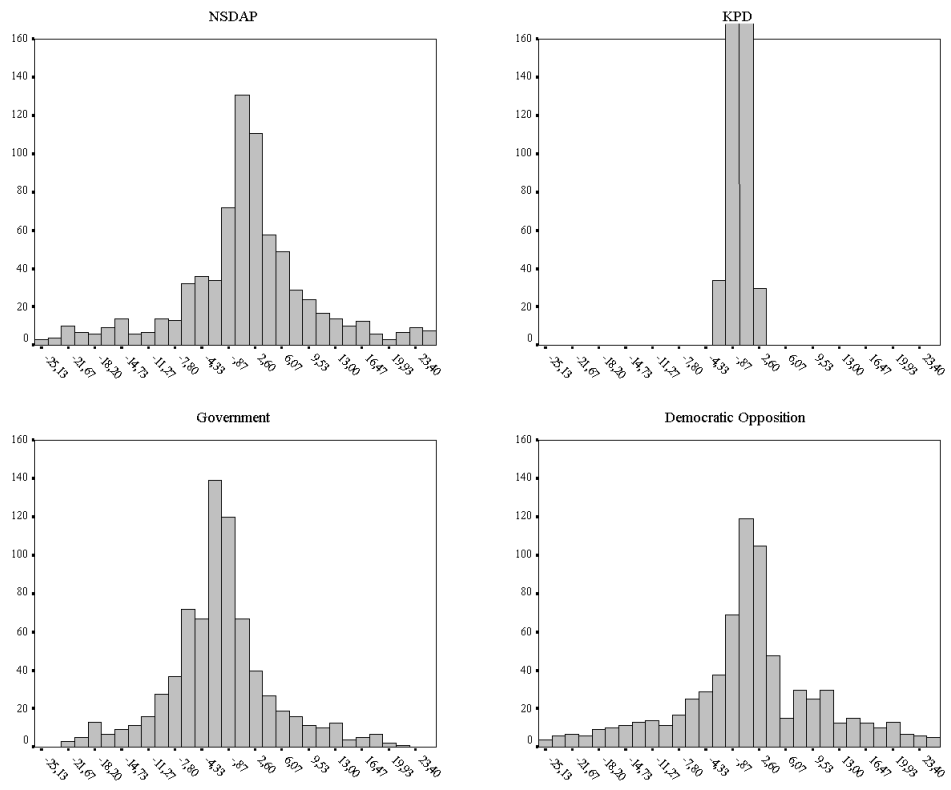
As an indication of the accuracy of the estimates, figure 6 shows the distributions of the township-specific regression coefficients. The estimates pertaining to the KPD show the smallest variation, the estimates related to the democratic opposition the largest.

³⁵ Since for the longitudinal, township-specific analysis sufficient degrees of freedom - which would have been necessary to provide the estimators the desired asymptotic properties necessary for statistical inference - were not available, only the regression coefficients are reported.

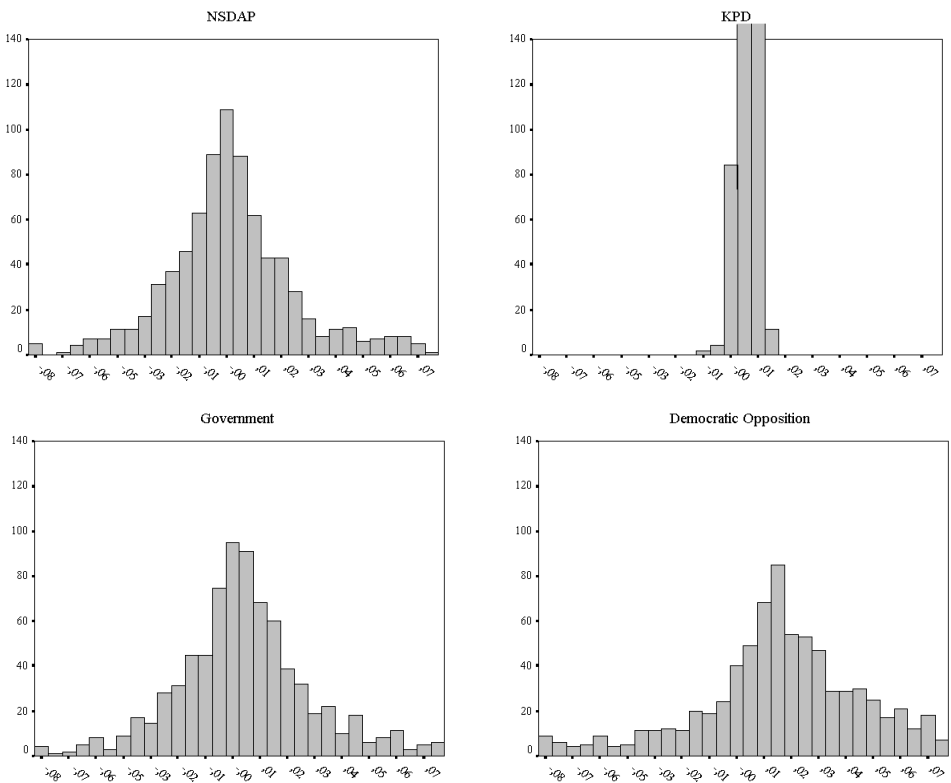
³⁶ The summary statistic used here is an M-estimator (Tukey-biweight estimator). M-estimators are robust alternatives for mean or median in order to estimate the middle of a sample when the sample contains extreme outliers, as was the case in this analysis.

Figure 6: Histograms for township-level regression coefficients pertaining to economic variables

unemployment rate



income



Economic influences

The effect of unemployment on voting patterns, and particularly on the swing to the extreme right-wing of the political spectrum, is unambiguous. Looking at elasticities, it becomes obvious that the NSDAP was clearly the main beneficiary of the drastic labor market deterioration with its vote rising by about .79 percent in response to a one percent increase in the number of people unemployed. The Communists also profited from unemployment, although clearly less spectacularly. The unemployment rate likewise increased the democratic opposition's vote share, however, the magnitude of this effect amounted to only somewhat less than one third of that of the NSDAP. With respect to the labor market deterioration, the clear negative effect of unemployment on government popularity shows that voters acted in accordance with the responsibility hypothesis by 'punishing' only the incumbents. This means that voters attributed the crisis not to the entire Weimar political system (government and democratic opposition), but only to the incumbent parties held responsible for the economic policy.

The reaction of party vote shares to changes in real income was less uniform than the reaction to changes in the unemployment rate. A responsibility type of behavior can be observed for the government, its vote share rising by about .43 percent in reaction to a one percent increase of real income. Real income therefore had a much weaker popularity effect than unemployment (about -1.28). With regard to the opposition parties both radical and democratic, only the NSDAP share accords with the responsibility hypothesis, i.e. rising real income exerted a negative influence on its vote share. In contrast to the NSDAP, the KPD and the democratic opposition benefited from the increase in real income (both with an elasticity above one). This positive relation clearly cannot be explained by the responsibility hypothesis which would require a sign opposite to that of the government. An explanation for this relation may be the fact that, in the period analysed, governments typically were minority ones. The politico-economic literature suggests that, in such a situation, the responsibility pattern may break down, because incumbents are not able to rule on their own and voters therefore also attribute economic outcomes to other parties (Nannestad and Paldam, 1994a, p. 233). Since the main aim of the KPD was to increase labor incomes, the partisan ties of KPD voters to the Communist party may have been reinforced by the improvement in their real income position. The similar relation between income and the democratic opposition's vote share may also be explained by this mechanism: for the period analysed the Social democrats,

who also advocated wage increases, were by far the largest single party in the block of the democratic opposition.

Structural and lagged vote share

Table 2 shows that the structural support for the NSDAP (about .03) amounted to only half that of the government (about .06). The inference is that a higher share of the Weimar electorate would have been inclined to support the government rather than the National Socialists, if their material aspirations had not been so utterly frustrated.³⁷

The regression coefficient of the temporally lagged dependent variable reflects persistence or party loyalties. The estimates show that the government had the most loyal voters. However, the effect of the economic crisis for the voting decision was obviously strong enough to overcompensate this pro-republican loyalty filter. The clearly lower value for the NSDAP and KPD suggests that their voters stuck much less to their previous party choice. Compared to the results of vote functions based on data for Germany after World War II, where the coefficient for the temporally lagged dependent mostly has values of clearly above .6 (e.g. Kirchgässner, 1986), our estimates show that the myopia of the electorate in the Weimar Republic on average was much more pronounced than in more recent periods.

Economic theory predicts that the coefficient of the lagged dependent variable is positive. For example, there is no logical sense in a rate of deduction on their previous voting decision higher than one that would hold in the case of a negative coefficient for the lagged dependent variable ($1 - (-\lambda_i) > 1$, for $\lambda_i > 0$). Therefore, the negative sign of the coefficient for the democratic opposition must be interpreted as an artefact of the procedure for constructing the share of the vote. The economic theory only refers to the case where the dependent variable does not change over time. However, in our analysis, the democratic opposition's vote share was calculated by amalgamating the vote share of different parties. As we have already pointed out, the SPD switched from government to opposition in the middle of the period analysed. The negative sign therefore is caused by the fact that, in each township, this made the democratic opposition's vote share increase instantaneously, whereby the lagged vote share systematically exhibits a lower value, because the SPD was still in government at this earlier point of time. Even though the government's share is also influenced by this shock, it does not effect such an antipodal variation in the current vote share compared to the lagged

³⁷ The negative values of the constant for the KPD and the democratic opposition cannot be interpreted substantially in the sense of structural vote reservoir. Nevertheless, our estimates indicate that the support for these parties/party blocks was clearly lower than for the NSDAP and the government.

vote share. The coefficient of the lagged vote share therefore exhibits the expected positive sign.³⁸

Comparison with previous findings

In order to relate our findings to the literature about the economic determinants of Weimar voting behavior, table 3 gives an overview of empirical results pertaining to the electoral impact of unemployment and income. Since the studies mentioned differ with respect to data set structure, included variables and estimation technique, the results can be expected to differ. In fact, the numbers show that there is a heterogeneous picture for the size, and even the direction, of the Depression's electoral influence. In our study, we have tried to remedy the shortcomings of earlier studies, such as

- very high level of regional aggregation (e.g. Frey and Weck)
- lack of explicit temporal dynamics and therefore consideration of only the direct and not the total effect (direct plus indirect) of the Depression on the vote share (e.g. Falter)
- ignoring spatial effects (e.g. Frey and Weck, Falter, van Riel and Schram)
- or isolated consideration of a single party (NSDAP) or party block (government) instead of the entire party system.

We think therefore that our estimates most accurately and comprehensively portray the impact of the economic crises on the political collapse of the Weimar Republic.

Summary

We use a pooled, fixed-effect regression approach with spatial autocorrelation in order to estimate the impact of the Great Depression on the radicalization of the Weimar political landscape. In addition to the direct impact of mass unemployment on the NSDAP share which was the topic of Falter's numerous papers, we measure the total effect (direct plus indirect). This is only possible by implementing an essentially longitudinal design rather than an essentially cross-sectional one. Our results show that voting behavior in the Weimar Republic can be described essentially by the classical responsibility hypothesis, i.e. voters clearly punished the incumbents responsible for mass unemployment and income loss. This supports,

³⁸ The fact that we had to use constructed figures for the government's and democratic opposition's vote share means that, with respect to the lagged vote share, we can only get a fuzzy impression of its impact on the current vote share. However, when there is in the main a responsibility type of voting behavior, this does not preclude our capturing the effect of economic events on the variation of the respective vote share.

in the main, the intuitively plausible conclusion that the dramatic rise in unemployment fuelled the fires of National Socialism. The quite unstable political system of the Weimar Republic was destabilized further by the economic problems faced by the fledgling democracy.

Table 3: Overview of empirical findings pertaining to economic variables in selected previous studies of Weimar-era voting

authors	data set structure	estimation technique	dependent variable	independent variables		
				economic variables		control variables ^a
				unempl.	real income	
Frey and Weck (1981)	panel (cross-section: $n = 13$, $t = 4$)	OLS	NSDAP	.59	-	- constant - Catholics
			KPD	.10	-	- blue-collar - agriculture - turnout
Falter (1985)	panel (cross-section: $n = 865$, $t = 4$)	OLS	NSDAP	-.17	-	- constant - Catholics - blue-collar - agriculture - turnout
Falter (1987)	cross-section ($n = 865$)	PLS	NSDAP	9/30: -.04 7/32: -.09 11/32: .04 3/33: -.05	-	- latent variables for electorate's socio-structural-composition - lagged dependent
van Riel and Schram (1993)	panel (cross-section: $n = 76$, $t = 8$)	WLS	government	-.94	.33 ^b	- constant - Catholics - blue-collar - agriculture - turnout - lagged dependent - regional dummies
Flint (1995)	cross-section ($n = 743$) for 9/30	WLS spatial autocorrelation	NSDAP _{7/32} - NSDAP _{9/30}	.13 ^c	-	- constant - Protestants - blue-collar (trade) - white-collar - spatial lag - regional dummies
this analysis	stacked data set ($n = 830$, $t = 5$) because of observation-specific fixed effects essentially longitudinal design	EGLS spatial auto-correlation location-specific fixed effects	NSDAP	1.65 ^d	-.61 ^d	- constant - lagged dependent (turnout indirectly)
			KPD	.08 ^d	1.28 ^d	
			government	-1.28 ^d	.43 ^d	
			democr. opposition	.22 ^d	1.16 ^d	

n denotes cross-sectional dimension, t longitudinal dimension

^a socio-structural variables are expressed as shares (normally as percentage of population or eligible persons)

^b union wages; note that in the calculation of the income variable used in this study, we additionally considered variations in weekly working hours

^c white-collar unemployment rate

^d elasticities

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