

# Voting behaviour and public employment in Nazi Germany\*

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## Abstract

This paper analyses whether the German National Socialists used economic policies to reward their voters after coming to power in 1933. Using newly-collected data on public employment from the German censuses in 1925, 1933 and 1939 and addressing the potential endogeneity of the NSDAP vote share in 1933 by way of an instrumental variables strategy based on a similar party in Imperial Germany, I find that cities with higher NSDAP vote shares experienced a relative increase in public employment: for every additional percentage point in the vote share, the number of public employment jobs increased by around 2.1 percent.

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# 1 Introduction

To what extent can governments use their economic means to favour their supporters or to punish their adversaries? While a large empirical literature has successfully established the economic value of political connections for firms, the evidence for voters or more aggregated units of observation is much more scarce. In this paper, I try to fill this gap by analysing whether cities benefit from having voted for the "right", i.e. the winning political party. In particular, the meteoric rise of the German National Socialist party in the 1930s, its seizure of power in 1933 and the subsequently enacted programmes of large-scale public investments, racial and political discrimination, rearmament and expansion of the armed forces create a quasi-experimental situation that allows to identify the causal effect of a city's vote share on subsequent public employment. Between 1928 and 1933, the Nazi party grew from being one of many small and unimportant radical parties to representing the largest fraction in the parliament, making Adolf Hitler chancellor in January 1933 and, together with a coalition partner, achieving a parliamentary majority in March of the same year. In the following years, it used public investment first as a means to achieve full employment and then to finance the massive rearmament that Hitler needed to pursue his course of territorial expansion and, finally, war. At the same time, the party also enacted several laws that precluded for example Jews from holding public office. These policy measures together with the extremely rapid rise of the National Socialists create a unique possibility to estimate whether Hitler's government used public employment also in a way that favoured those cities that had helped him come to power.

On a firm-level, the value of political connections has been demonstrated convincingly by several papers. Fisman (2001) shows that rumours about the health of the Philippine dictator Suharto had a particular strong influence on the share prices of firms that were politically connected to Suharto's regime. Similar positive effects of being politically connected have been found by Johnson and Mitton (2003) for Malaysia, Khwaja and Mian (2005) for Pakistan and Jayachandran (2006) for the United States of America. Other studies compare companies across countries: Faccio et al (2006) show that around the globe, politically connected firms are more likely to be bailed out, while Faccio (2006) finds that political connections

occur particularly often both in more corrupt and in more transparent countries. Of particular relevance for this paper is the study by Ferguson and Voth (2008), who show that firms that had (directly or through their executives) supported the German National Socialists prior to their seizure of power experienced particular high stock market returns during the first two months of the Nazi regime: Between January and March 1933, connected firms outperformed non-connected ones by between 5 and 8%.

The potential benefits of political connections for individual voters have been analysed less, particularly due to data restrictions: While political connections of firm executives and firm's donations are often public, the average voter's political affiliations and convictions are most of the times neither known to the government nor to the researcher and hence cannot be analysed. One notable exception is the recent study by Hsieh et al (2011), who document evidence that Venezuelan voters who had signed a petition calling for a referendum against Hugo Chavez subsequently were subject to drops in both earnings and employment. The peculiarities of this referendum, where signers had to sign not only with their name, but were also required to provide their address and birth date, allowed Hsieh et al to identify the signers and to match them with data from the Venezuelan Household Survey. However, such detailed data on political affiliations are usually not available. One way out is to look at more aggregated units of observation such as cities, regions or electoral districts. Anderson and Tollison (1991), for example, present empirical evidence that US states with "influential" congressmen and senators (as measured by their tenure and their committee memberships) received more public funds during the New Deal era. Levitt and Snyder (1995) analyse the spending patterns of Federal programmes on a congressional district level and find that the Democratic majorities in the late 1970s have favoured districts with higher Democratic vote shares. Hodler and Raschky (2014) look at regions and show that in autocratic regimes, birthregions of political leaders benefit more from foreign aid than others. In this paper, I use cities as a "middle ground" between individual outcomes and larger units of aggregation. My paper adds to the existing literature by using a novel dataset to analyse whether cities with higher vote shares for the German National Socialists in 1933 experienced higher levels of public employment between then and 1939.

While I control for city fixed effects and time-varying effects of several control variables, the National Socialist vote share is still a potentially endogenous variable: Several previous studies (most recently King et al 2008) have highlighted the importance of the post-1929 economic crisis for the NSDAP's electoral results. Differential impacts of the economic crisis would likely lead to differences in public employment and also be correlated with the 1933 Nazi vote share. In order to address this concern, I employ a standard two-stage least squares estimation. As instrumental variable, I use the vote share of the "Economic Association" in 1912, a party alliance that tried to attract similar voters as the NSDAP later on. I find that cities with higher NSDAP vote shares indeed had higher relative levels of public employment in 1939; for every additional percentage point in the vote share, the number of public employment jobs increased by around 2.1 percent. When measured relative to the total population, a one standard-deviation increase in the 1933 vote share led to an increase in the share of public employment of a third of a standard deviation in the year 1925. The findings are robust to in- or excluding cities that underwent substantial changes in their population and territory during the period of observation and using the 1930 or 1932 elections instead of the 1933 one as explanatory variable. Taken all together, my findings indicate a significant positive effect of having voted for the National Socialists for cities, thus providing evidence that the Nazis did indeed use economic policy and public employment policies to reward more loyal cities or punish disloyal ones. In a broader context, this is further evidence that governments can have and use the ability to reward their voters or punish their adversaries, although some caveats to the representativity of Nazi Germany apply.

The structure of the remainder of this paper is as follows: Section 2 presents the historical background of Hitler's rise to power and the National Socialist economic policy between 1933 and 1939, while section 3 discusses the data and identification strategy used in the analysis. The results and robustness checks are presented in Section 4, and Section 5 concludes.

## 2 Historical Background

In the early 1930's, Hitler's National Socialist German Workers' Party (*Nationalsozialistische Deutsche Arbeiterpartei*, NSDAP) experienced a meteoric rise from being one of many small parties in Weimar Germany to the strongest fraction in the national parliament, the Reichstag. After an unsuccessful putsch in Bavaria in 1923, the party had been banned and could only run for the national election in May 1924 by being the junior partner in an alliance with the German Völkisch Freedom Party (*Deutschvölkische Freiheitspartei*), another nationalist and antisemitic party in Weimar Germany. The two parties received 6.5% of the votes and also ran together in the December 1924 election, albeit under the new name of Nationalsozialist Freedom Movement (*Nationalsozialistische Freiheitsbewegung*). This time, the alliance only achieved a vote share of 3%. Soon afterwards, the two parties separated and the NSDAP was re-formed in 1925. In 1928, it ran for the first time under this name at a national election, winning only 2.6% of the votes and 12 seats in the parliament. (Falter 1991, Chapter 2.1 and 2.2, Falter et al 1986, Chapter 1.3) In the following years, the NSDAP changed its appearance and, benefiting from the deep recession that befell Germany in the wake of the "Black Friday", grew stronger and stronger.<sup>1</sup> In September 1930, the National Socialists gained 18.3% of all votes, a share that they managed to even double two years later, when they came out of the July 1932 election with 37.4%, making them the strongest fraction in the Reichstag. They and the Communists held more than half of all seats in the Reichstag, rendering it impossible to form a coalition of democratic parties with a parliamentary majority. As a result, the chancellors had to rely more and more on the authority and legislative powers of the president via so-called "emergency decrees". After the demise of 3 chancellors (Heinrich Brüning, Franz von Papen and Kurt von Schleicher) within half a year, the associates of president Hindenburg managed to convince him to appoint Hitler to head the government, which happened on January 30, 1933. (Kolb 2005, Part C) The new chancellor was still far from being a dictator; at the time of his appointment, Hitler, like his predecessors von Papen and von Schleicher, had no parliamentary majority.

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<sup>1</sup>For a recent review of key aspects of Germany's economy at the time of the crisis, see Ritschl (2012)

However, Hindenburg soon dissolved the Reichstag, and in the elections that followed in March, the NSDAP won 43.9% of the votes. Together with its coalition partner, the national conservative German National People's Party (*Deutschnationale Volkspartei*, DNVP), the National Socialists now also had a majority in the parliament. Subsequently, the Enabling Act (*Ermächtigungsgesetz*) was passed, giving legislative powers to the executive branch of the government. In the following months, Hitler used these powers to put the German states under the rule of centrally appointed "Commissars" (a process commonly known as "coordination" or *Gleichschaltung*), forbid trade unions and pressure all other parties until they dissolved. By July 1933, the NSDAP was the only remaining party in Germany and with the death of president Hindenburg in 1934, the last remaining non-Nazi source of power died, and Hitler and his party had now control over every aspect of government. (Kershaw 1999, ch. 10-12)

Not surprisingly, economic policy was an important item on the agenda of the newly-appointed chancellor Hitler. Already in May 1932, the NSDAP had demanded an "intermediate economic programme" (*Wirtschaftliches Sofortprogramm*) in order to address the unemployment issue. In particular, the party advocated to increase employment through large public investments that were, at least in parts, supposed to be financed through debt. (Barkai 1988, p. 42) In the following years, through massive military and non-military investment<sup>2</sup>, full-employment was achieved by 1936, a success that the general public attributed largely to Hitler. (Abelshauser 1998)

During the same time, the Nazis also enacted several important policies concerning the public sector. In 1933, the Law for the restoration of professional civil service (*Gesetz zur Wiederherstellung des Berufsbeamtentums*) was passed. It allowed to dismiss "non-Aryan" or politically "unreliable" civil servants.<sup>3</sup> A similar law was enacted for lawyers, and as far as "non-Aryan" professionals were concerned, both laws were made more strict with a reform of the citizenship act in 1935 that precluded Jews from holding public office. It is easily conceivable that this law would have decreased public employment in NSDAP strongholds much less than in cities

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<sup>2</sup>Robinson (1973) quotes a popular joke in Germany according to which "Hitler was planning to give employment in straightening the Crooked Lake, painting the Black Forest white and putting linoleum in the Polish Corridor"

<sup>3</sup>See Waldinger (2010, 2012) for some economic consequences of such dismissals.

whose electorate had withstood the new regime. In a similar vein, local folklore had it that the independent city of Lübeck<sup>4</sup> lost its independence due to its opposition against Hitler: Allegedly, the town council in 1932 had prevented Hitler from speaking within the city borders, and Hitler took revenge in 1937 by revoking the city's independent status and making it part of Schleswig-Holstein. While the overall credibility of this story is rather dubious (see Pressemitteilung der Stadt Lübeck 2012), its existence alone suggests that people believed that Hitler's policy was driven by such thoughts.

While these laws *ceteris paribus* led to a decrease in public employment, employment in the armed forces increased: Within two and half years, the strength of the German army increased fourfold to around 400,000 men in autumn 1935. While part of this had been achieved by integrating police units into the armed forces, the increase in size between 1933 and 1934 was to a large extent due to volunteers. The officer corps alone increased between October 1933 and October 1935 by nearly 3,000 men. With the re-introduction of national conscription in October 1935, the expansion of the army was advanced further. The navy and the air force, a completely new formation, experienced similar increases. (Deist 2003, ch. II) Obviously, this increased military force also required new installations. In this respect, it is noteworthy that the city of Coburg, a small town in Northern Bavaria with very high vote shares for the Hitler movement<sup>5</sup> that has been labeled "the first Nazi town" in a book by Hayward and Morris (1983), experienced a substantial amount of public construction after the Nazi's seizure of power: In 1934, several new military barracks were built, followed by a regional centre for the Hitler Youth in 1937. Other projects, such as a new monument to remember soldiers killed in action or a "thingstead", were planned, but never realised. (Nöth 2006)

Taken together, the clearly discriminating purpose of the Nazis' public employment laws and the anecdotal evidence above suggests that the Nazis, once in power, might have used public spending and the appointments of public servants to reward cities and regions that had been loyal to them and to punish those that

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<sup>4</sup>Three Länder in the Weimar Republic were merely city-states: Bremen, Hamburg and Lübeck, all of them former Hansa cities.

<sup>5</sup>In 1933, for example, the NSDAP received 55.8%, compared to the overall national result of 43.9%.

had been reluctant until the very last. If this were the case, one would expect to find a relative increase in public employment for cities with high NSDAP vote shares.

However, it should be noted that a priori, it is also conceivable that public spending could be particularly increased in more disloyal regions in order to "buy support" from former adversaries and thus stabilise the regime in its early days. An emerging economic literature has recently shown that local government spending has a positive causal effect on support for the government (see for example Manacorda et al 2011 and Litschig and Morrison 2012). Particularly important for the context of my study, Voigtländer and Voth (2014) find that areas traversed by newly-built motorways reduced their opposition to the Nazi regime between 1933 and 1934. If the NSDAP was distributing public funds and jobs in a way to broaden its support base, one would expect to find a relative decrease in public employment for cities with high NSDAP vote shares, or a relative increase for cities with low NSDAP vote shares.

## 3 Empirical Strategy

### 3.1 Data and Summary Statistics

In order to evaluate whether the Nazis allocated more public sector jobs to cities with high Nazi vote shares, I collected data on the number and fraction of people working in such jobs from the German Censuses of Occupation. Administered in 1925, 1933 and 1939, they contain fairly detailed data about the number of people working in different occupations and types of jobs. The definitions of jobs and occupations and the way of counting them vary somewhat over time, but by grouping several occupations, it is possible to obtain a good measure of "public employment". To be precise, I count people that fall into one of the following categories as being "publicly employed": Public administration, jurisdiction and legal counselling, armed forces, teaching professions, artists and other entertainment professions, church-related professions.<sup>6</sup>

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<sup>6</sup>It might seem odd to include artists and people working in the entertainment industry; the reason for doing it is that the 1925 census groups those workers together with the other categories.



In what follows, I will use the log of the number of public administration jobs (denoted *logadmin*) as main outcome variable. Since the German cities experienced considerable population growth between 1925 and 1939, I also examine the ratio of public administration jobs to total population (*adminpop*) and the ratio of public administration jobs to the labour force (*adminshare*). While the latter measure is robust to population changes, it is subject to another type of criticism: Public investment is likely to also have increased employment in other sectors (for example due to increased spending on construction or military equipment). In some cities, growth in these industries might have outpaced growth in public employment, leading to a decrease in *adminpop* or *adminshare*, even though the city might still have been benefiting from public investment. Put differently, a relative increase in *adminpop* or *adminshare* might just mean that the rest of the city's economy was doing relatively poorly, thereby increasing the share of public sector jobs. This is a valid concern and one that is hard to address, given the lack of data on public investment in general. However, it is not a concern for *logadmin*, which measures absolute, rather than relative, increases in public employment. Both the absolute and the relative measures therefore have their respective advantages and disadvantages; In practice, both lead to similar results, as will be shown below. The advantage of using public sector employment, on the other hand, is that most of the respective job categories are under the direct control of the central or regional government (e.g. the number of officers and non-commissioned officers in the armed forces) and less constraint by the pre-existing regional industry, making them a more natural outcome measure that also has closer resemblance to the individual-level outcome measure employed by, for example, Hsieh et al (2011). Data about this measure of public employment is available for nearly 300 cities; In particular, it is available for all cities with more than 20.000 inhabitants and for some few smaller ones that happened to be independent cities, not belonging to any other administrative district (*Kreisfreie Städte*). Figure 1 gives an impression on the geographical distribution of public employment growth over the sample period: specifically, it maps quintiles of the difference in *logadmin* between 1939 and 1925. As can be seen, the increases in public employment are spread relatively

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In order to have a consistent measure, I also include them for 1933 and 1939. For further details, see Appendix A.

evenly across the country, with maybe a small concentration of strong increases in Central Germany.

The main explanatory variable of interest is the NSDAP vote share in the election of March 1933. For this, I use the extensive database on social and electoral variables of Weimar Germany compiled by Dirk Hänisch and Jürgen Falter. This database also contains other socioeconomic variables that might be of interest when analysing NSDAP vote shares. In particular, I include the Jewish share of a city's population in 1925 and the unemployment rate at the time of the census in 1933.<sup>7</sup> In addition to these socioeconomic variables, I also control for longitude, latitude and an indicator for being in the Rhineland. These variables are included to control for potential geographic determinants of public, especially military employment. According to articles 42-44 of the Versailles treaty, Germany was not allowed to maintain or construct fortifications or assembly troops on the left (Western) bank of the Rhine or within 50km from its right (Eastern) bank. In 1936, Hitler violated this stipulation by "reoccupying" the Rhineland with armed forces. If being in the Rhineland is also correlated with voting behaviour, this could create a spurious correlation between public employment and vote shares. To avoid this concern, I control for a city lying in the "Rhineland" as defined by the Versailles Treaty.

One potential problem is the question whether a city in 1925 is the same city in 1933 and 1939- many German cities underwent changes in their territory and population, acquiring smaller surrounding towns and villages, merging with other cities and the like. The prime example for this is Wilhelmshaven, which more than quadrupled its population between 1933 and 1939 due to the acquisition of the neighbouring city of Rüstringen. Similar mergers occurred in the Ruhr area in 1928-1930. In order to evade problems due to these territorial restructurings, I excluded all those cities which experienced a substantial enlargement in their population between 1910 and 1925, 1925 and 1933 or 1933 and 1939.<sup>8</sup>

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<sup>7</sup>For Berlin, the data in the database are on the level of the city's administrative districts. I created an aggregated measure for Berlin by adding all districts and boroughs belonging to it. In order to assess the validity of this aggregation, I compared the aggregated population to the one from the censuses in 1925 and 1933. Some differences exist, but they are well below 5%.

<sup>8</sup>In particular, for all cities whose population growth between 1910 and 1925 or 1925 and 1933 or 1933 and 1939 exceeded the main growth rate by more than one standard deviation, I analysed whether this large population growth was due to territorial gains or changes that made

In addition, I use voting data from the 1912 Reichstag election, for which I have city-level data for all cities that had more than 10000 inhabitants in 1910. These were obtained from the official election results, published by the Statistisches Reichsamt in 1913. All in all, I end up with a sample of 220 cities for 3 years (1925, 1933 and 1939). Table 1 shows summary statistics of the explanatory and explained variables. As can be seen, both the number and shares of public employees increased from 1925 to 1933 and then decreased again. Given the large amount of public investment and the substantial increase of the German armed forces between 1933 and 1939, this might seem surprising. The most likely explanation is that public employment was driven up between 1925 and 1933 by general employment measures, since it was already used as a means of fighting unemployment before the Nazis came to power. Hitler’s predecessors von Papen and von Schleicher had already made credit and funds for public employment measures available (Golecki 1986, p.XXXIV-XL), and Blaich (1970) uses the example of Ludwigshafen to show how cities themselves tried to fight the economic crisis by employing otherwise unemployed workers in the construction of roads and sewerage systems. This pattern of a strong increase as a reaction to the economic crisis makes it even more difficult to uncover the causal effect of the NSDAP vote share using a standard OLS approach: Cities where more of these emergency projects were carried out would experience an increase in public employment between 1929 and 1933, followed by a decrease until 1939, when full employment had rendered these emergency measures obsolete.

### 3.2 The ”Economic Association” and its voters

It is unlikely that a simple OLS regression, even after controlling for city fixed effects and control variables, uncovers the causal effect of Nazi support on subsequent public employment. The main endogeneity concern in such a regression is due to the economic crisis in the years following 1929. For example, cities that were more adversely affected by the economic crisis might have been differentially

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the city grow by more than 25% alone. If this was the case, I excluded the city. For details, see Appendix B. As an alternative measure, I simply excluded all cities whose population growth between either 1910 and 1925, 1925 and 1933 or 1933 and 1939 exceeded the main growth by more than one standard deviation. The results are not sensitive to this, as shown in Section 4.2.

prone to vote for the NSDAP in 1933 and they might also be those with different public employment shares later on. The NSDAP vote share would then be correlated with the error term, and as a consequence, the estimate of  $\beta$  in such a regression will be inconsistent. Another potential problem could arise if public employees themselves are more or less likely to vote for the NSDAP, creating a reverse causality problem.

In order to address these issues of potential endogeneity, I instrument the 1933 NSDAP vote share by the vote share of another party, the "Economic Association" (*Wirtschaftliche Vereinigung*, henceforth EA) in the 1912 election. The EA was an alliance of several smaller parties, most notably the "Christian-Social Party" (*Christlich-Soziale Partei*) and the "German-Social Party" (*Deutschsoziale Partei*). Most of these parties had conservative, nationalist platforms that denounced both socialism and capitalism and tried to attract the votes of middle-class voters particularly in Protestant and rural areas. In addition, both the "Christian-Social Party" and the "German-Social Party" were openly antisemitic. (Gräfe 2012, Bergmann 2012) The constituent parties of the EA were not strong, and the alliance only obtained few seats in the 1912 election. However, there are strong parallels between the voters that the EA tried to attract, and the voters that in 1933 voted for the NSDAP.

While the NSDAP had started out using anti-capitalist and socialist rhetoric and catering to the preferences of blue-collar voters, it remarkably changed its approach as a result of its disappointing results in 1928. After 1928, the party focussed more on rural areas and presented itself less as a radical force against capitalism but rather as an ultra-nationalist, conservative party that advocated law and order and the fight against the treaty of Versailles. The aim was to attract more middle-class voters that heretofore had been repulsed by the party's more proletarian agenda. (Stachura 1978) This transformation was a successful one; By 1933, the NSDAP had become, in the words of Jürgen Falter (1991, p. 372), "a people's party with a middle-class belly" (*eine Volkspartei mit Mittelstandsbauch*) in which the middle classes were the largest fraction. Thus, after 1928, the NSDAP presented itself more as an ultra-nationalist party for the middle-class, with a particular focus on rural and Protestant voters, trying to attract the very voters that the EA before

World War I had tried to attract, and also sharing its antisemitism.<sup>9</sup> Because of this, the vote share of the EA in the 1912 election and the NSDAP vote shares after 1928 are significantly positively related (this is also shown more formally in the first-stage results below), and the former can be used as an instrument for the latter.

The basic idea of this instrument is to use variation in NSDAP vote shares that is not due to economic crisis post 1929, but due to persistent political attitudes of the local population such as antisemitism or extreme nationalism.<sup>10</sup> In order to be a valid instrument, the 1912 EA share has to satisfy the exclusion restriction. In particular, the identifying assumption of this strategy is that the 1912 EA share does not have an effect on public employment outcomes later on, other than through affecting support for the NSDAP. Several aspects make the 1912 EA vote share attractive in this respect: Firstly, dating more than 20 years prior to the 1933 election, using the 1912 EA share should not be susceptible to any reverse causation problems that might affect the 1933 NSDAP vote shares if public employees voted more or less for the Nazis. Secondly, using a vote result prior to the economic crisis that started in 1929 allows to purge the 1933 vote shares of any factors due to this crisis. One remaining concern, however, is that there might still be unobserved factors that are correlated both with the 1912 EA share and with the 1933 NSDAP share and that might also be relevant for the evolution of public employment over time. City's with high EA share might be fundamentally different from those with low or no EA votes, and these differences might also affect public employment patterns. The absence of such differences can not be tested or proved in a formal sense. However, I can at least examine whether the instrument is correlated with the evolution of relevant variables before 1933. In columns 1-3 of table 2, I run a "placebo test", examining whether cities with different 1912 EA vote shares experienced different evolutions of public employment between 1925 and 1933. Specifically, I regress my 3 outcomes (the ratio of public employment

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<sup>9</sup>After 1930, the NSDAP toned down its antisemitism considerably (see for example Voigtländer and Voth 2012). Still, it remained, in the words of Herbert (2000, p.18f.) "a receptacle" for Anti-Jewish elements.

<sup>10</sup>It is for this reason that I do not control for measures of long-term antisemitism that Voigtländer and Voth(2012) have constructed and used: If antisemitism led to increased votes for the EA in 1912, this is "good" variation that I want to use in my estimates, and not remove it by controlling for it.

to either the population or the labour force, and the natural logarithm of public employment) on the interaction between the 1912 EA share and an indicator for the year 1933, an indicator for the year 1933, city fixed effects and my control variables, each interacted with an indicator for the year 1933. The results from this exercise are encouraging: The 1912 EA vote share is never significantly associated with the development of public employment between 1925 and 1933, and the point estimates are small: For example, increasing the 1912 EA vote share by one standard deviation is associated with an increase in administration jobs as a ratio to total population of less than 3% of a standard deviation of the 1925 administration job ratio. Even more encouraging, in columns 4-6, I examine whether the 1912 EA share is correlated with the evolution of a city's economy as measured by the employment shares of three broadly defined sectors and again do not find any relationship: Between 1925 and 1933, cities with high or low 1912 EA vote shares did not experience different evolutions of employment in either agriculture, industry or commerce.<sup>11</sup>

One possible problem with the regressions in table 2 is that the 1933 occupational census was administered in May 1933, when the Nazis had already been in power for three and a half months. Thus, the 1933 numbers might already be partly affected by the Nazi rise to power, an issue I will also discuss for the main specification in section 4.2 below. To alleviate this concern, table 3 just runs a cross-sectional regression for 1925, relating the three public employment outcomes to the 1912 EA vote share. As can be seen, again there is no significant relationship, a result that is robust to the in- or exclusion of controls. Again as well, the estimates are not only insignificant, but also of small magnitudes. For example, according to the specification with controls, increasing the 1912 EA vote share by one full standard deviation would decrease the 1925 public administration jobs to population ratio by less than one percent of a standard deviation.

Another important question is whether cities with different 1912 EA vote shares were affected differentially by the economic crisis after 1929. For a coarse assessment, I regressed the 1933 unemployment share on the 1912 EA share. The results,

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<sup>11</sup>It should be noted that the measures employed differ for the 1925 and 1933 census, as the 1925 census does not contain the number of people employed in a given sector, but the number of people employed in a given sector and their family members. However, such uniform differences in measurement should be absorbed by the year fixed effect.

with and without additional controls, are shown in columns 1 and 2 of table 4. As can be seen, again, the 1912 EA share is not strongly related to unemployment in 1933. Columns 3 and 4 additionally examine the evolution of unemployment during the crisis, regressing the difference in the logs of unemployment in 1932 and 1930 on the 1912 vote share, again not detecting any sizable or statistically significant relationship.

The previous result strengthen the instrument's case for exogeneity: The 1912 EA share is not correlated with the evolution of public employment or employment in 3 major economic sectors between 1925 and 1933; Cities with high and low EA shares also do not differ in their levels of public employment in 1925. Finally, there is also no evidence that cities with high EA vote shares experienced different evolutions of unemployment during the economic crisis in the early 1930's. It is still possible that cities with high and low EA votes differed along other dimension, but the previous results seem to indicate that such differences, if present, were not very consequential in economic terms.

Based on this, I will employ a standard two-stage least square estimation procedure. The basic model of interest is

$$y_{it} = \beta \cdot NSDAPshare33_i \cdot Post1933_t + \tau \cdot Post1933_t + \gamma' \cdot X_i \cdot Post1933_t + c_i + u_{it} \quad (1)$$

where  $y_{it}$  represents the outcome, i.e. either *logadmin*, *adminshare* or *adminpop*.  $share33_i$  denotes the NSDAP vote share in the 1933 election in city  $i$  and  $Post1933_t$  is a dummy which is 1 for the year 1939. The city fixed effects  $c_i$  will account for time-invariant city characteristics that have a constant effect on the public employment share over time.  $X$  is a vector of time-invariant city-level controls, discussed in the previous section. To address the endogeneity problem arising from the likely correlation between the 1933 NSDAP vote share and the economic crisis, the variable of interest in equation 3.1 will be replaced by its prediction based on the same controls and the 1912 EA share:

$$NSDAPshare33_i \cdot Post1933_t = \eta \cdot EAshare12_i \cdot Post1933_t + \xi_i + \chi' \cdot X_i \cdot Post1933_t + \theta \cdot Post1933_t + \epsilon_{it} \quad (2)$$

These predicted values will then be used as regressors of interest in the second stage:

$$y_{it} = \beta \cdot (NSDAPshare33_i \cdot Post1933_t)^\wedge + \tau \cdot Post1933_t + \gamma' \cdot X_i \cdot Post1933_t + c_i + u_{it} \quad (3)$$

## 4 Results

### 4.1 Baseline estimates

Before turning to the instrumental variable estimation described in equations 2 and 3, table 5 presents the results of simple OLS estimations of equation 1. As discussed in the previous section, these regressions are based on the very strong assumption that the 1933 NSDAP vote share is exogenous, i.e. uncorrelated with the error term. This is not very likely, with the economic crisis after 1929 being a prime confounder. An extensive literature has analysed the reasons for the NSDAP's rapid electoral successes, which socioeconomic groups were more likely to vote for the National Socialists and why they did so (see, among others, Frey and Weck 1981, Falter et al 1983, Falter et al 1985, Falter 1991, van Riel and Schram 1993, Stögbauer 2001, King et al 2008). While some disagreement about certain issues still exists, there is a clear consensus that the economic crisis that affected Germany in the early 1930's was a prime driver of National Socialist vote shares. If cities that were affected more by the crisis were differentially likely to vote for the NSDAP in 1933, the OLS estimates here would be biased. The sign of the bias is unclear a priori: If cities that were affected more by the crisis were more industrialised and therefore more strongly connected to the communist parties, and public employment increased in these cities as a response to the crisis, the resulting OLS estimate could be downward biased. A similar negative bias could arise if public servants were more likely to vote for the NSDAP and cities with more public employment experienced slower growth in public employment (for example since they were less affected by the crisis and thus did not need large-scale investment programmes, or at least only smaller ones). On the other hand, if cities that were affected more by the crisis turned towards the Nazis, it is easily conceivable that



an upward bias might arise.<sup>12</sup> With these caveats in mind, the estimates of  $\beta$  in table 5 are negative, but typically not very sizable and not significantly different from zero. Taken at face value, this would mean that a city's NSDAP vote share in 1933 had no or a slightly negative effect on the city's public employment share in 1939. This could mean that if anything, instead of "favouring" loyal cities, the new government tried to "buy support" from more resistant cities, for example in an attempt to stabilise its power in the early days of the regime. However, due to the reasons above, OLS estimates should be viewed with caution and I next turn to the instrumental variable (IV) estimates discussed in section 3.2. By using an instrumental variable that significantly predates the 1929-1932 economic crisis, this approach avoids any correlation between the NSDAP vote shares and the intensity of the crisis.

The 2SLS estimates based on using the 1912 vote share for the "Economic Association" as instrumental variable for the 1933 NSDAP vote share are presented in table 6. As can be seen from the first stage result, the 1912 EA vote share and the 1933 NSDAP vote share are indeed strongly and, as one would expect, positively related. The first-stage results indicate that a one percentage point increase in the 1912 EA vote share increases the 1933 NSDAP vote share by around .42 percentage points. Thus, the "translation" between 1912 EA voters and 1933 NSDAP voters is not one-to-one, which is not surprising, given that some members of the Economic Alliance joined other parties after 1918, in particular the German National People's Party, Hitler's coalition partner since January 1933 (Bergmann 2012).

Turning to the main results in Panel B, addressing the potential endogeneity of the 1933 vote shares uncovers a positive and significant effect of voting for the NSDAP on subsequent public employment. An increase in the 1933 NSDAP vote share of one percentage point would increase the number of public sector jobs by around 2.2%, a quite substantial increase. When looking at public employment as

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<sup>12</sup>The exact relationships between the economic crisis in the late 1920s and the rise of the NSDAP are still debated in the literature. The most recent study by King et al. (2008) finds that the most adversely affected groups reacted differently in their voting behaviour: While the "working poor" such as self-employed shopkeepers and professionals increasingly voted for the Nazis, the unemployed turned towards the communists. A priori, it is therefore not clear how adverse effects of the economic situation would correlate with the NSDAP vote share.

a share of population, the results indicate that a one percentage point increase in the 1933 NSDAP vote share is associated with a .07 percentage point increase in the ratio of public employment to total population. Put differently, an increase of one standard deviation in the 1933 vote share leads to an increase of around a third of a standard deviation in terms of the 1925 public employment share. The results for public employment as a share of the labour force are similar in magnitude. Taken all together, the results from 6 show that high 1933 NSDAP vote shares led to a subsequent increase in public sector jobs, both in absolute numbers and in ratios of the population. This pattern thus would not be consistent with the Nazi government buying support from opposing cities, but rather rewarding its strongholds via public employment.

Table 7 provides further evidence that the estimates in table 6 are based on government discrimination, rather than other economic forces at work. Here, I repeat the analysis above, but this time using the metal industry, a sector that contracted during the 1929 crisis and expanded during the pre-war buildup, but is not under direct government control, so I would not expect to find an effect here. This is also borne out by the estimates, which are not significantly different from zero.

## 4.2 Robustness

This section addresses several potential concerns with the findings from the IV regressions. As explained in Section 3.1, there were several mergers and restructurings of cities between 1925 and 1933. I tried to exclude all cities whose population growth was mostly driven by territorial enlargement. Still, a certain arbitrary element remains- when are territorial change so important that a city is not anymore comparable over time? In table 8, I repeat the analysis of table 6 for two different and somewhat "extreme" samples: In columns 1-3, I do not drop any cities, while columns 4-6 exclude all cities whose growth between either 1910 and 1925, 1925 and 1933 or 1933 and 1939 exceeded the respective mean by more than one respective standard deviation. For convenience, the first stage results are omitted and only the respective F statistic is displayed. As can be seen, the results do not change by much, both in terms of point estimates, significance and instrument strength. The

in- or exclusion of cities that underwent substantial territorial changes or strong population growth does not change any of the conclusions reached before.

The validity of using the 1933 NSDAP vote share as explanatory variable might also be questioned on several grounds. First of all, throughout the analysis, I have treated 1939 as the only year after the NSDAP rise to power, considering 1925 and 1933 to be "pre-treatment years". The reason for this is that the first large-scale public investment programme by the National Socialists, the Rheinhardt programme, started in June 1933, one month after the 1933 census data were collected, and the expansion of the armed forces occurred even later. Against this definition, however, one can argue that the National Socialists came to power already in January 1933 and had a parliamentary majority already after March 1933. As shown by Ferguson and Voth (2008), shareholders immediately reacted to this change in power, and so might have other economic variables. Moreover, the Nazis started a major prosecution of their political enemies after the Reichstag Fire in February 1933, which might also have had implications for public employment. Similarly, the "Law for the restoration of professional civil service" was also already passed in April 1933. Hence, treating 1933 as a pre-treatment year might be problematic, though if anything, it would most likely bias my estimates towards 0.

In table 9, I examine the effect of dropping the potentially confounded year 1933, only comparing 1925, a clear pre-treatment year, to 1939, a clear post-treatment year. The results are again very similar to the baseline results and if anything a bit larger, which would be in line with the 1933 numbers already being slightly contaminated by the Nazi rise to power.

Another potential concern with the 1933 election is that it was not the election that brought Hitler into power, it was only the one that gave him a parliamentary majority. Secondly, since the election happened after the Reichstag Fire and the subsequent prosecution of Communists, it is questionable whether this election was really a free one. In table 10, I therefore redo the analysis of table 6, but use different elections as main explanatory variables, in particular the ones in September 1930, July 1932 and November 1932. While data for the 1930 election are available for all cities in my sample, the results for the 1932 elections were unfortunately only reported at the district level. I therefore can run these regressions only on

a limited sample that includes cities that were also a district at the same time (*Stadtkreise*, as opposed to cities that were part of a *Landkreis*), which decreases the sample size by around one third. Still, the results from table 10 confirm the previous results, both in terms of sign and magnitude and indicate that there is a positive relationship between voting shares for the NSDAP and subsequent public employment. In addition, the First stage F statistics show that the relationship between the 1912 EA vote shares and the later NSDAP vote shares becomes stronger over time. This is consistent with the NSDAP becoming more and more attractive for the nationalist lower middleclass voters to whose preferences the constituent parties of the Economic Association had catered in Imperial Germany 20 years before.

## 5 Conclusion

Between 1928 and 1933, the NSDAP developed from a small and unimportant party in Weimar Germany into the strongest party in the German parliament, bringing its leader Adolf Hitler to the head of the German government by January 1933 and gaining a parliamentary majority by March of the same year. Subsequently, Hitler used this power not only to concentrate all political competences among his followers, but also to enact large public investment and rearmament programmes that not only helped to fight unemployment but were needed for his political long-term goals. In this paper, I document evidence that the public employment policies during the early Nazi era were not ideologically colour blind: Using the 1912 vote share of the Economic Alliance, a small party in Imperial Germany that catered to similar voters as the late NSDAP, as an instrumental variable for the 1933 NSDAP vote share, I find that the latter had a positive and significant effect on subsequent public employment: A one percentage point increase in the 1933 vote share caused the number of public employment jobs to grow by around 2.2 percent, a finding which is not driven by cities undergoing territorial changes, by the inclusion or exclusion of the potentially already contaminated census year 1933 or by the potentially worrisome and unfree 1933 election shares.

The results of this study thereby also shed additional light on the ability of governments to use economic policy as a means to reward and protect their voters

and supporters and/or to punish their political adversaries. Thereby, it adds to a vast literature that has documented such behaviour on a firm-level and, to a certain extent, also for individuals. Of course, some cautionary remarks apply. In particular, Germanys Nazi government had powers uncomparable to any modern democratic government. Being freed of the constraints usually posed by a parliamentary opposition, judicial review by courts and a free press, it seems reasonable to assume that the National Socialists ability to reward a citys loyalty was substantially larger than in most countries at most times. In addition, several questions remain: Through which mechanisms did the government allocate funds to its preferred cities, which where the channels through which the funds went to the beneficiaries? Are there any long-term effects of the increased public employment in the 1930's, i.e. did the economic reward for the cities survive the Second World War and persist longer than the Nazi government? And, in a broader context, what are the welfare implications of such favouring behaviour? In these respects, there is substantial scope for further research.

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## Tables and Figures

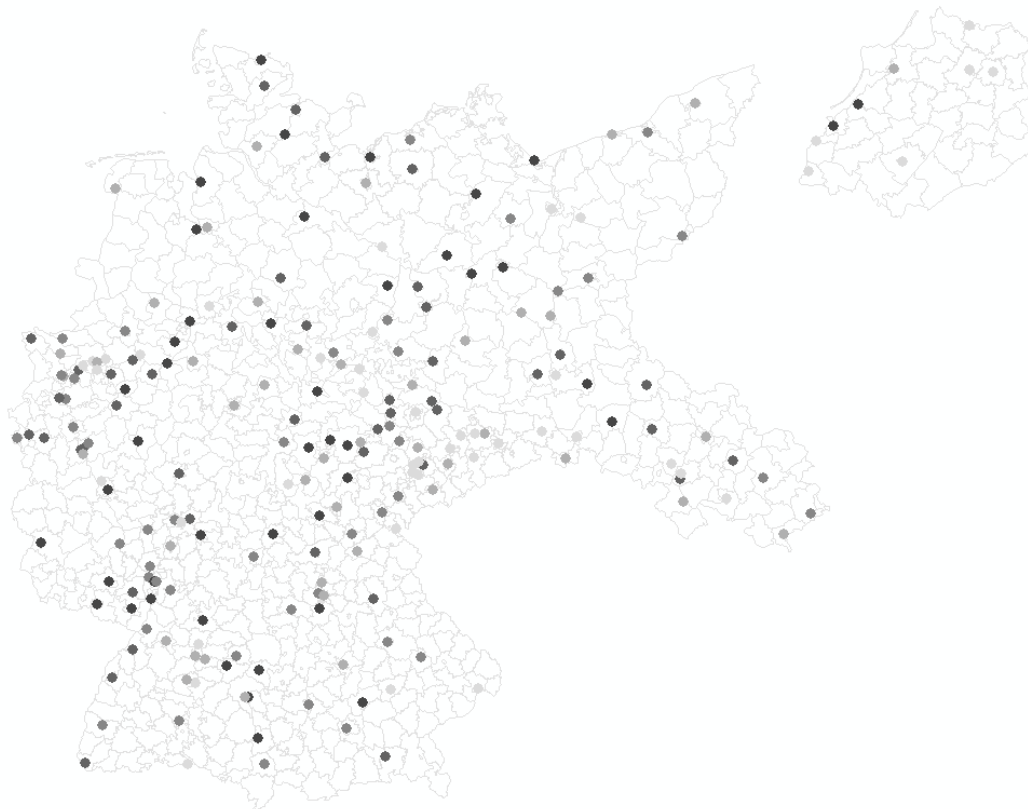


Figure 1: Quintiles of the change in  $\log_{admin}$  between 1939 and 1925. Darker colours indicate more pronounced increases.

Variable	Mean	Standard Deviation
Public Employment Level 1925	2821.564	(4766.206)
Public Employment Level 1933	3483.064	(6058.151)
Public Employment Level 1939	3017.909	(4685.461)
Public Employment as a ratio of population 1925	4.0007	(1.9083)
Public Employment as a ratio of population 1933	4.3699	(1.9469)
Public Employment as a ratio of population 1939	3.6941	(1.4957)
Public Employment as a ratio of the labour force 1925	8.685	(4.4704)
Public Employment as a ratio of the labour force 1933	9.7473	(4.5518)
Public Employment as a ratio of the labour force 1939	8.3873	(3.7976)
Population 1925	71874.26	(117140.4)
Population 1933	79029.12	(129830.7)
Population 1939	85600.11	(134788.7)
Labour Force 1925	34789.52	(59521.73)
Labour Force 1933	36919.66	(63611.96)
Labour Force 1939	39965.75	(66183.28)
NSDAP vote share 1933	42.0753	(8.7794)
Economic Association vote share 1912	1.299	(4.1915)
Unemployment rate 1933	22.2508	(6.0093)
Jewish population share 1925	.8721	(.8006)
Observations	220	

Table 1: Summary statistics

VARIABLES	(1) adminpop	(2) adminshare	(3) logadmin	(4) commshare	(5) indushare	(6) agrishare
wvg1912Xp	0.0127 (0.00834)	0.0609 (0.0399)	0.000913 (0.00179)	0.00442 (0.0610)	-0.0157 (0.0443)	-0.0105 (0.0107)
Observations	440	440	440	440	440	440
Number of cities	220	220	220	220	220	220

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for 1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude and an indicator for being in the Rhineland, all interacted with an indicator for 1933.

Table 2: Check for different trends in public employment and other sectors before 1933

VARIABLES	(1) adminpop	(2) adminpop	(3) adminshare	(4) adminshare	(5) logadmin	(6) logadmin
wvg1912	-0.0103 (0.0269)	0.00943 (0.0229)	-0.0354 (0.0634)	0.00667 (0.0569)	-0.00847 (0.0116)	-0.0196 (0.0170)
Controls		X		X		X
Observations	220	220	220	220	220	220

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Controls are longitude, latitude, an indicator for the Rhineland and the Jewish pop share in 1925.

Table 3: Check for different levels in public employments in 1925

VARIABLES	(1) unem33	(2) unem33	(3) unemdiff3230	(4) unemdiff3230
wvg1912	-0.0643 (0.0652)	-0.104 (0.0667)	0.00291 (0.00238)	0.00101 (0.00293)
Controls		X		X
Observations	220	220	184	184

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Controls are longitude, latitude, an indicator for the Rhineland and the Jewish pop share in 1925.

Table 4: Relationship between the instrument and the economic crisis

VARIABLES	(1) adminpop	(2) adminshare	(3) logadmin
share33*post33	-0.00636 (0.0116)	-0.00739 (0.0266)	-0.00217 (0.00286)
Observations	660	660	660
Number of cities	220	220	220

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude, and an indicator for being in the Rhineland, all interacted with post-1933.

Table 5: OLS estimates

	(1)	(2)	(3)
Panel A: First stage	Dependent variable: NSDAP Vote share 1933		
EA share 1912*post33		0.417***	
		(0.106)	
F-stat first stage		15.43	
Panel B: 2SLS estimation	adminpop	adminshare	logadmin
share33*post33	0.0728*	0.192*	0.0215*
	(0.0430)	(0.101)	(0.0123)
Observations	660	660	660
Number of cities	220	220	220

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude and indicator for being in the Rhineland, all interacted with post-1933.

Table 6: IV estimates

	(1)	(2)	(3)
VARIABLES	metalspop	metalsshare	logmetal
share33Xpost	-0.0795	-0.141	-0.000631
	(0.108)	(0.225)	(0.0123)
Observations	660	660	660
Number of id	220	220	220
F-stat first stage		15.43	

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933 and an indicator for being in the Rhineland, interacted with post-1933.

Table 7: Metal industry

VARIABLES	(1) adminpop	(2) adminshare	(3) logadmin	(4) adminpop	(5) adminshare	(6) logadmin
share33Xpost	0.102* (0.0522)	0.241** (0.114)	0.0187* (0.0113)	0.0686 (0.0500)	0.172 (0.114)	0.0214 (0.0149)
Observations	750	750	750	579	579	579
Number of cities	250	250	250	193	193	193
F-stat first stage		15.18			10.45	

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude and an indicator for being in the Rhineland, all interacted with post-1933. Columns 1-3 do not drop any cities that underwent size changes during the period of observation, columns 4-6 exclude all cities whose growth between either 1910 and 1925, 1925 and 1933 or 1933 and 1939 exceeded the respective mean by more than one respective standard deviation.

Table 8: Robustness of the IV estimate: City size

VARIABLES	(1) adminpop	(2) adminshare	(3) logadmin
share33Xpost	0.0879** (0.0417)	0.265** (0.108)	0.0226* (0.0123)
Observations	440	440	440
Number of id	220	220	220
F-stat first stage		15.36	

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude and an indicator for being in the Rhineland, all interacted with post-1933.

Table 9: Robustness: Dropping 1933

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	adminpop	adminshare	logadmin	adminpop	adminshare	logadmin	adminpop	adminshare	logadmin
share30*post33	0.106 (0.0690)	0.279* (0.159)	0.0314 (0.0201)						
share32jXpost				0.0767** (0.0354)	0.181** (0.0872)	0.0227** (0.0102)			
share32nXpost							0.0844** (0.0394)	0.199** (0.0971)	0.0249** (0.0111)
Observations	660	660	660	450	450	450	450	450	450
Number of cities	220	220	220	150	150	150	150	150	150
F-stat first stage		8.447			11.52			12.62	

Robust standard errors, clustered at the city level, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All regressions control for city fixed effects, an indicator for post-1933, the Jewish population in 1925, the unemployment rate in 1933, longitude, latitude and an indicator for being in the Rhineland, interacted with post-1933.

Table 10: Robustness: Different elections



## Appendix A

The 1925 census of occupations groups the following occupations together (Occupation group "D"): Administration, Armed Forces, Church, Free professions (*Verwaltung, Heerwesen, Kirche, freie Berufe*). In 1933, some of these groups are reported separately: Occupation group 51 of the 1933 census reports the number of people working in jobs related to Administration, Armed Forces, Church, Education and others (*Verwaltung, Wehrmacht, Kirche, Bildung, Erziehung usw.*), while occupation group 54 deals with occupations connected to Theatre, Cinemas and Movie Recording, Broadcasting, Music, Sports and Showmen (*Theater, Lichtspiele und Filmaufnahme, Rundfunkwesen, Musikgewerbe, sportliche und Schaustellungsgewerbe*). Clearly, the latter group is not in the focus of my analysis; However, since these professions are contained in Occupation Group D of the 1925 census, I also included them for 1933 and added the Occupation Groups 51 and 54 of the respective census.

The 1939 census makes even finer distinctions: Occupation Group 61 deals with Administration and Armed Forces (*Berufe der öffentlichen Verwaltung und Rechtspflege, der Wehrmacht usw.*), Occupation Group 62 with teaching professions and artists (*Lehr- und Bildungsberufe, künstlerische Berufe*). Church-related professions are reported in Group 63 (*Berufe der Kirche, Mönche und Nonnen*), while Group 64 contains professions related to legal counselling (*Berufe der Rechts- und Wirtschaftsberatung*). Group 68 finally contains the entertainment industry (*Berufe des Unterhaltungsgewerbes (ausser Künstler)*). Again, a better measure would be to only count groups 61 and maybe 62 and 64, but due to the reporting schemes in 1925 and 1933, I added up the number of people working in groups 61-64 and 68.

## Appendix B

In order to address the problem caused by city mergers and restructurings, I analysed all cities whose growth rate between either 1910 and 1925, 1925 and 1933 or between 1933 and 1939 exceeded the respective mean growth rates by more than one standard deviation. For those cities, I examined whether they grew by

25% or more alone because of enlargements. Details about which cities or villages were added to the respective cities were obtained from Wikipedia unless stated otherwise; the names, population data and sources for the cities are given below: From 1925 to 1933, twenty-one cities exceeded the mean growth rate by more than one standard deviation. 15 of them were dropped for the following reasons: Beuthens population in 1925 stood at 62543. Newly added districts had a total population of 26080 in 1925 according to the *Statistisches Jahrbuch Deutscher Städte* 1928. Hence, Beuthen grew by 40% alone due to these acquisitions. Similarly, Bielefeld (population in 1925: 86062) received incorporations totaling a 1925 population of 27893 (*Statistisches Handbuch Deutscher Städte* 1932), representing a growth of more than 32%. Bochum (population in 1925: 211249) was enlarged through several rounds of incorporations that, according to the *Statistisches Jahrbuch Deutscher Städte* 1929 and 1931, totaled 156462 and made it being dropped from the dataset as well. Essen grew by 161977 people or nearly 35% relative to its baseline level of 470525 in 1925. (*Statistisches Jahrbuch Deutscher Städte* 1931). Hagen's incorporations were as large as 43900 or 44% of its 1925 population. Herne incorporated the towns Börnig, Sodingen, Cray, Oestrich, Bladenhort and Holthausen. The 1925 census gives the following numbers for Börnig, Sodingen and Holthausen, respectively: 7979, 8198, 5942. The other villages are not listed and hence must have been smaller than 2000 inhabitants. Still, even without them, the three larger ones totaled 22119 people, which represents a 32% increase in population for Herne. Neustrelitz, a town of 12260 inhabitants in 1925, was merged with Strelitz, thereby gaining 4687 inhabitants as of 1925, or 38%. Oberhausen incorporated several surrounding entities, totaling 84466 according to the *Statistisches Jahrbuch Deutscher Städte* 1931, or nearly 80% of the city's 1925 population. The towns Lennep and Lüttringhausen (together 27826 according to the 1925 census) were added to Remscheid, making it grow by 36%. Rheine had a 1933 population of 17732. According to the homepage of the administrative district of Münster (of which the city is part), the city acquired additional territory in 1929 that made its population grow by about 10000 inhabitants. Bad Salzemen (9998) and Frohse (2064, both numbers according to the 1925 census) were added to Schönebeck, which as a consequence grew by 56%. Solingen's 1925 population was more than doubled by the acquisition of Gräfrath, Höhscheid, Ohligs

and Wald, totaling 83799 inhabitants (Census of population 1925). Several towns were incorporated into Wiesbaden, making its 1925 population of 102737 grow by 30684 or nearly 30% according to the *Statistisches Jahrbuch Deutscher Städte* (1928). Witten's population in 1925 stood at 45295. Annen, Stockum, Düren, Langendreer and parts of Bommern were added to this. While Düren is missing from the 1925 census list and hence must have had less than 2000 inhabitants, Annen, Stockum and Langendreer had 1925 populations of 17822, 3196 and 27566, respectively. Zweibrücken received the villages of Bubenhausen and Ernstweiler. Bubenhausen's population as of 1925 was 3817, or 24% of Zweibrücken's in the same year. For Ernstweiler, the census contains no population data. However, even under a very conservative assumption of only 200 inhabitants, the two acquisitions would exceed the 25% threshold, so Zweibrücken was also dropped.

Six cities were not dropped, although they experienced substantial territorial gains: Dortmund, with a 1925 population of 321743, received additional incorporations totaling 70491 according to the *Statistisches Jahrbuch Deutscher Städte* 1931, or 22%. Similarly, Eschweiler received the surrounding villages Nothberg, Hastenrath and Scherpenseel. Nothberg and Hastenrath are listed in the 1925 census as having populations of 2176 and 2187, while Scherpenseel had less than 2000 inhabitants. Even under the conservative assumption that it was exactly at this cut-off, the sum of the three gains would total only 6363, or 24% of Eschweiler's 1925 population. Ellguth-Zabrze (2205), Sosnitza (6453), Richtersdorf (3661) and Zernik (2083, all figures from the 1925 census) were made part of Gleiwitz, making its 1925 population grow by 17.5%. Heilbronn experienced substantial population growth between 1925 and 1933, but I could not find any evidence for territorial gains. Mainz acquired Bretzenheim (5692), Weisenau (6637), Ginsheim (4611), Bischofsheim (5438) and Gustavsburg (below 2000, all figures from 1925 census). Even if Gustavsburg's population had been at 2000, this would have resulted in growth of 22.5% relative to the 1925 level. Euren, Biewer, Kürenz, Olewig and a part of Pallien were made part of Trier (1925 population: 58140). The 1925 census gives the population of Euren and Kürenz as 3248 and 4268, respectively; Biewer, Pallien and Olewig are not listed and hence must have been smaller than 2000 inhabitants. However, even under the most conservative assumption that they each had exactly 2000 inhabitants, the sum of the added populations would

only reach 23% of Trier's 1925 population.

Between 1933 and 1939, thirteen cities exceed the mean growth rate by more than one standard deviation. Six of them were dropped:

Potsdam (1933 population: 73676) acquired several surrounding towns, including Nowawes (1933 population: 29229). Radebeul (1933 population: 12949) was merged with Kötschenbroda (1933 population: 18909). Weingarten (8385 according to the census of occupation 1933) was incorporated into Ravensburg (18930) in 1939, making the latter grow by 44%. Stolberg (17394) acquired parts of Büsbach, Eilendorf and Eschweiler, whose total is given as 12199 by the census 1933. In a curious reorganization, Rüstringen (48562 in 1933 according to the census) was added to Wilhelmshaven (1933: 28016). In a large-scale reorganisation, the cities of Altona, Wandsbek and Harburg-Wilhelmsburg were added to Hamburg (1129307). Their population as of 1933 stood at 400818.

Seven cities were not dropped:

For Neubrandenburg, Oranienburg and Swinemünde, I could not find any evidence of territorial gains. Landau acquired Queichsheim and Mörlheim, totaling 3013 inhabitants or 18% of Landau's 1933 population (all data from the 1933 census). Suhl (15477) acquired Heinrichs. Heinrichs' population as of 1925 was 2895, which would mean a growth of 18.7%. Even if Heinrichs experienced further growth between 1925 and 1933, it is very unlikely that it would exceed the 25% threshold, so I did not drop Suhl. Wittenberg incorporated Teuchen and Labetz in 1938. Both towns are not listed in the 1925 census and hence together cannot have exceeded 4000 inhabitants in 1925. Given Wittenberg's 1925 population of 23457, the two towns fell considerably short of the 25% threshold in 1925, and it is highly unlikely that they grew so fast as to exceed it in 1933, when Wittenberg's population stood at 24480. Zweibrücken was dropped already because of its large growth between 1925 and 1933.

Between 1910 and 1925, 30 cities exceeded the mean growth rate by more than one standard deviation. Nine of them were dropped:

Berlin experienced a massive increase in area and population due to the Greater Berlin Act of 1920. Gera (1910 population according to the census: 49276) acquired a vast number of surrounding towns and villages. Four of them alone (Debschwitz, Untermhaus, Pforten and Zwötzen) had a combined 1910 popula-

tion of 23967, leading Gera to be dropped. Greiz was enlarged by the acquisition of Pohlitz, Dölau and several smaller villages. The two former alone had a combined population of 6025, enlarging Greiz's 1910 population of 23245 by more than 25%. Hirschberg with its 1910 population of 20564 acquired several smaller towns and Kunnersdorf/Cunnersdorf according to Salomon and Stein (1928), which in 1910 had a population of 5411, making the city grow by more than 25% alone. Osterburg and Eversten were added to Oldenburg, boosting that city's population by more than 66% at 1910 levels. Pirna's population in 1910 stood at 19525. Between then and 1925, several towns and villages were incorporated into it, and the incorporation of Copitz and Neundorf alone added nearly 45% of the city's 1910 population to it. Similarly, Riesa incorporated Gröba, Oberreussen and Weida. While Oberreussen had less than 2000 inhabitants in 1910, Gröba and Weida had 4471 and 2119, respectively, or 43% of Riesa's 1910 population of 15287. Waldenburg incorporated several minor districts and villages and Altwasser, which by itself increased Waldenburg's population by 88% in 1910 terms. Wattenscheid was considerably enlarged after 1926. While the Hänisch-Falter database contains data for the enlarged city in 1925, the 1910 census and 1912 election results refer to the original, small city only, which was therefore dropped.

21 Cities were not dropped:

In the case of Ahlen, Bottrop, Datteln, Gladbeck, Herten, Marienburg, Recklinghausen, Schneidemühl and Siegburg, I did not find any evidence for territorial acquisitions, their growth seems to have been purely organic. Bochum, Essen, Solingen, Wiesbaden and Witten were already dropped due to their enlargements between 1925 and 1933 or 1933/39. Dortmund acquired Deusen, Dorstfeld, Evving, Huckarde, Kemminghausen, Lindenhorst, Rahm, Wischlingen, Brackel and Wambel, of which Deusen, Kemminghausen, Rahm and Wischlingen had fewer than 2000 inhabitants in 1910. Even under the extreme assumption that they had exactly 2000 inhabitants, the total growth due to the acquisition of all 10 towns would have amounted to only 23%, so Dortmund was not dropped. Similarly, Hannover acquired Linden, but thereby growing only by 24%. Mülheim am Rhein, Merheim, Flittard, Dünnwald, Dellbrück, Rath, Brück, Ostheim, Holweide and Worringen were all added to Köln. While exact population data are available for most of these towns, Rath, Brück and Ostheim had fewer than 2000 inhabi-

tants in 1910. Even with exactly 2000 inhabitants, however, all the acquisitions combined totalled only 20% of Köln's 1910 population. Schinkel was added to Osnabrück, resulting in an additional growth of 12% at 1910 levels, so I also did not drop Osnabrück. Similarly, Schweinfurt incorporated Oberndorf, but this only represented a growth of around 15% at 1910 levels. The two most difficult cases are Regensburg and Jena. Regensburg's population in 1910 stood at 52624. Between then and 1925, it acquired Stadtamhof (4369) and Steinweg (3575) as well as 5 villages that had fewer than 2000 inhabitants in 1910. If these 5 villages had a total population of more than 5212 inhabitants, Regensburg's anorganic growth would have exceeded 25% and I would have dropped the city. However, in the respective district of Oberpfalz, the 1910 census gives the average population of all villages below 2000 inhabitants as 395, so the 5 villages combined would have had to exceed this average by more than a factor of 2.5 to reach 5212 inhabitants, which seems unlikely. I therefore decided to not drop Regensburg. The case of Jena is similar: Its 1910 population stood at 38487, and it acquired 7 villages with fewer than 2000 inhabitants. If these totalled 9621 inhabitants, the 25% rate would be exceeded. However, the mean population among villages below 2000 inhabitants in the Grandduchy of Saxony (to which Jena belonged in 1910) was 350, so the 7 villages would have had to exceed this average by a factor of nearly 4 to reach this number, which seems even more unlikely, so again, I did not drop Jena.