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## The Persistency of Public Debt

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# The Persistency of Public Debt

## Abstract

This paper shows that geographic patterns in public debt can be highly persistent despite drastic external shocks. I compare pre-Nazi debt in 60 districts and 132 large cities of the German *Reich* with current local government debt. German local government debt completely defaulted after WWII. I find that 1932 and 2012 debt is highly correlated in cities which saw a re-installation of their pre-Nazi mayor by the Allies in 1945. Comparable cities without personnel continuity do not exhibit a robust correlation. Intertemporal personnel links thus constitute a main channel through which to explain long-term persistency in public finance.

JEL-Codes: H63, H74, N44, N94

Keywords: Public Debt, Fiscal Policy, Local Government, Persistency

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## 1. Introduction

This paper shows how geographic patterns of 1932 local government debt in Germany have been transferred to the present despite a total default of debt in 1948. I reveal intertemporal personnel links as a main channel through which to explain long-term persistency in public finance. In doing so, this paper contributes to a growing strand of literature that is concerned with the effects of long-gone times on present economic patterns. Dell (2010) shows the 1812 abolished *mita* slavery in Peru to be still visible in socio-demographics today. Other studies reveal a correlation of medieval anti-Jewish pogroms and 20th century Nazi violence in Germany (Voigtländer & Voth, 2012) or persistent geographic patterns in the entrepreneurship of 1925 and 2005 Germany (Fritsch & Wyrwich, 2014). Becker et al. (forthcoming) link present differences in trust and corruption in Central and Eastern Europe to former boundaries of the bureaucracy enforced by the Habsburg Empire. Little attention, however, has been paid to persistency in public finance, although the recent European sovereign debt crisis has triggered a large public debate over nations' differences in debt affinity. Zimmermann (2015) argues that a deep rooted mentality in fiscal behavior drives European countries' deficits. He finds remarkable parallels in nations' public financial attitudes of the 1960s and the post-medieval country profiles that were collected by Klock (1651). However, the underlying transmission channels of persistent regional patterns in fiscal policy have not thus far been examined.

This paper aims to fill this gap using the unique and sometimes fatal history of Germany in the 20th century. I compare pre-WWII local government debt aggregated at the level of 60 historical districts of the German *Reich* with 2012 local government debt in Germany. To make the figures comparable, I transform the current debt data to the out-of-date territorial status of 1932. The 80 years between 1932 and 2012 not only cover a total default of local government debt in 1948 but also cover the Nazi takeover in 1933, WWII, a large-scale influx of approximately 12

million German refugees from former Eastern territories, an entire re-shaping of state and district borders within Germany and 40 years of division into the socialist East and liberal-democratic West Germany. Despite this battery of shocks, I find highly persistent geographic patterns in local government debt in West Germany: A 1 % higher debt stock per capita in 1932 is associated with a 0.3 to 0.4 % higher debt stock in 2012. I show personnel continuity to be the main channel for this persistency. In West Germany, numerous mayors who were removed from office by the Nazis in 1933 were re-installed by the Allies after WWII. For example, Konrad Adenauer, the later chancellor of Germany, who served as mayor until 1933, was appointed by the US army on the 4th of May 1945 to take over the mayor's office in the city of Cologne again. Re-installed mayors transferred pre-Nazi traditions in fiscal policy to democratic post-war Germany. Afterwards, overlapping political generations of mayors who were socialized in the local administration or local council under their predecessors passed over fiscal behavior to present days. Evidence from a panel of the 132 largest West German cities in 1933 corroborates these considerations. The correlation between the 1932 and 2012 debt is quite high and significant for cities with a re-installed mayor after WWII. By contrast, I do not find a robust correlation in cities that did not see a re-installation of their pre-Nazi mayors. Furthermore, no correlation in local government debt can be observed for East Germany. Soviet occupation and the socialist regime of the German Democratic Republic (GDR) lead to a clear-cut personnel and mental disruption between 1949 and 1990. This discontinuity induced a definitive break in any links between 1932 and 2012 democratic East Germany.

The findings of this paper contribute to various strands of literature. First, I show that historical paths in fiscal policy are mediated by personnel continuity. This channel is directly related to the idea of behavioral transmission in economic development that was mentioned by Bisin and Verdier (2010) and Spolaore and Wacziarg (2013). The concept of behavioral transmission is that economic actions are based on observing, learning and imitating the strategies of other

individuals. Thus far, empirical studies have convincingly demonstrated the intra-familial transmission of values (see e.g., Dohmen et al., 2012) or living conditions (Bhalotra & Rawlings, 2011). However, politics as a point of socialization has not thus far been considered. Second, this empirical study corroborates experimental findings of public good games. Such experiments reveal a strong effect of word-of-mouth transmission from “laboratory parents” to their “children”. This indicates that social learning is an important driver in creating social norms (Schotter & Sopher, 2003; Chaudhuri, Graziano & Maitra, 2006). Third, the non-findings for East Germany give support to previous studies that show that the communist GDR induced a long-lasting re-shaping of preferences (Alesina & Fuchs-Schündeln, 2007; Brosig-Koch et al., 2011; Friehe & Mechtel, 2014; Necker & Voskort, 2014). I show that this also holds for preferences in public finance. Moreover, I present a personnel discontinuity of political leaders as a further explanation for the disruption in preferences and political actions. Finally, this paper shows that recent fiscal policy bears more history than has typically been presumed. Studies explaining the regional variation in municipal debt consider political business cycles (Veiga & Veiga, 2007), direct democratic institutions (Feld & Kirchgässner, 2001) or spatial dependency (Borck et al., 2015), but they do not cover a historical perspective. The results of this paper suggest that studies on political economy should pay more attention to aspects of cultural and personnel continuity.

## **2. Local government debt in Germany**

In Germany, local governments constitute the third layer of government beneath the federal and the state level. The legal framework of German local finance in 1932 and 2012 is highly comparable. In 1932, local governments existed in 14 subnational states (*Länder*). State boundaries, however, were entirely re-shaped after WWII into 13 new states (see Figure 6 in the Appendix). In addition, there were three city states in 1932 (Bremen, Hamburg, Lübeck) and 2012 (Berlin,

Bremen, Hamburg), which executed state and local government tasks as a single entity. For reasons of comparability, I exclude city states later on.

Local government in Germany has traditionally been characterized by large-scale autonomy in terms of fiscal policy and formally tough regulations by the states simultaneously. In 1932 and 2012, local governments could spend and borrow on their own behalf but have been subject to state-specific permanent reporting rules, budget approval requirements and intervention rights by state authorities. In addition, local authorities could set their own tax rates on property and local business. With some state-specific exceptions, two layers of local government existed in 1932 and in 2012 with municipalities as the lower- and counties as the upper-local level. Today, more than 10,000 municipalities are responsible for local public services such as public order or waste disposal, and the approximately 300 counties mainly execute social care and public transportation. In large cities, both layers of local government are integrated into one.

The relevance of local government in terms of public debt has changed considerably within the past 130 years. Figure 1 shows the evolution of general government debt (solid line) and local government debt (dashed line) in Germany between 1881 and 2012 in relation to GDP. In the pre-WWI and interwar period, local government debt not only constituted a substantial part of general government debt but also followed the trend of overall public debt. After WWII, local government debt rose again, and general government debt virtually stagnated until the 1970s. After 1975, this trend inverted. Federal and state debt increased sharply, and local government debt remained at a constant level of 5 to 7 % of the GDP. Today, local government debt constitutes only a minor part of overall public debt in Germany.

[Figure 1 about here]

However, Figure 1 shows another important fact of local government debt in Germany. After WWII, local government debt defaulted in the course of the currency reform of 1948 (see e.g.,

Giere, 1959). The municipal default led to a debt-to-GDP ratio of zero and an equal playing field in terms of fiscal policy after the war. By contrast, neither the federal nor the state level experienced a default. For local governments, however, former debt burdens can definitely be ruled out as a source of fiscal performance after WWII. This exclusion will be of great importance for the analysis further on.

### **3. Empirical strategy**

#### *3.1 Data*

Historical figures on the regional distribution of local government debt in Germany are rare. Fortunately, I am able to rely on two unique publications of the federal statistical authorities which cover German local government debt in 1932 and 2012. Both points in time inherit the tremendous impact upon public finances of a large-scale economic crisis three years prior (1929 and 2009). First, Statistisches Reichsamt (1933) provides the most geographically disaggregated figures on local government debt available before WWII. This dataset includes the outstanding debt of all layers of local government aggregated to the level of 60 subnational districts (*Verwaltungsbezirke*) (see Figure 6 in the Appendix). The publication covers local government debt in 1932, which was the year of the highest municipal debt-to-GDP ratio in German history (see Figure 1).<sup>1</sup> Second, the dataset of Statistische Ämter des Bundes und der Länder (2014) provides detailed information on the overall local government debt in 2012 at the level of all 11,904 local authorities of Germany. The data at this very local level are required for a transformation of the territorial status of 1932. Former state and district borders were soon abolished

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<sup>1</sup> As indicated by Figure 1, local governments received a large-scale bail-out after the Nazi takeover in 1933. However, local governments entirely lost autonomy under the highly centralized Nazi regime.

under Allied occupation after WWII. Geographical information system (GIS) technology allows me to match present municipalities with their former districts in 1932.<sup>2</sup> I thus aggregate 2012 micro-data on German local government debt to the 1932 district level. Both figures are highly comparable in terms of debt definition.<sup>3</sup>

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<sup>2</sup> I use QGIS Desktop 2.8.2 for this transformation. See Figure 6 for more details. I sum the per-capita debt of all layers of local government a municipality belongs to (municipality, municipal association, county).

<sup>3</sup> As a minor difference to the 2012 figures, 1932 data only partially cover the debt of public enterprises. The debt of public enterprises is available only at the level of states (and Prussian provinces); see Statistisches Reichsamtsamt (1935). However, this limitation should not harm the results at all. In 1932, most public enterprises were part of the core budgets and are thus reflected in general debt figures; the debt of public enterprises accounts for only 13 % of the total local government debt in 1932. Both debt figures should therefore be highly comparable with regard to debt definition. Nonetheless, I set out a robustness check confirming that all results hold even after accounting for the province mean of public enterprise debt (see Table 8 in the Appendix).



Figure 2 provides an impression of the geographical distribution of local government debt in 1932 and 2012. With the exception of local governments in Schleswig-Holstein in the very North and in Saxony in the East of Germany, the regional patterns appear to be remarkably similar. Several parallels can be found, especially in West Germany (note the bold-drawn former East-West-German border line in Figure 2). However, there seems to be less systematic congruency in East Germany.

[Figure 2 about here]

I also transform the 2012 geographic, socio-demographic, economic and fiscal controls that may drive present fiscal performance from recent municipal to the 1932 district level. Table 1 shows the descriptives and sources of the entire dataset. Geographical and socio-demographic variables such as population density, degree of rurality (proxied by the agricultural share of total area) or the ratio of elderly to the working age population are included as important determinants of the local demand for public goods and expenditures. The dataset comprises information on religious denomination (share of catholic population) and political preferences (left-wing votes in the national election). Finally, I rely on a broad set of fiscal and economic variables that are potentially linked to regional fiscal capacity. These variables are the number of industrial firms per capita, the industrial wage level and the local business tax base and tax rate.

[Table 1 about here]

### 3.2 Regression design

I explain 2012 local government debt with present covariates and the historical debt stock of 1932. The OLS estimation model takes the following form:

$$\ln(d_{i,2012}) = \alpha + \beta \ln(d_{i,1932}) + X'_{i,2012}\gamma + \varepsilon_i \quad (1)$$

where  $\ln(d_{i,2012})$  denotes logarithmic 2012 local government debt level per capita of district  $i$  as the dependent variable.<sup>4</sup> On the right-hand side, I include the logarithmic local government debt per capita lagged by 80 years,  $\ln(d_{i,1932})$ . The equation comprises a constant,  $\alpha$ , and covariates that may drive present fiscal performance such as geography, socio-demographics, economic structure, religion and taxation-related controls ( $X_{i,2012}$ , see Table 1).  $\varepsilon_i$  is the error term. Later, I will further include fixed effects for the 2012 states and a dummy for the largest state of the German *Reich*, Prussia, which covered approximately 50 % of all districts in 1932. I employ Huber-White sandwich standard errors (see Huber, 1967; White, 1980).

#### 4. Results

Table 2 depicts the baseline OLS results. Columns (1) and (2) do not comprise any of the state fixed effects that are added stepwise to the models shown in Columns (3) to (5). The most simple specification includes a constant and the 80 years-lagged debt stock only (Column (1)). Column (5) presents the most saturated model with further controls and fixed effects for 1932 Prussia and the 2012 states. As a main result, I find a highly significant positive correlation of local government debt in 1932 and in 2012 throughout all specifications. The effect is rather substantial: A 1 % higher debt stock in 1932 is associated with a 0.3 to 0.4 % higher debt in 2012. A higher old-age dependency ratio, a larger share of agriculture and a stronger local business tax base are correlated with a lower debt stock (Columns (2) and (3)). A higher share of left-wing votes in national elections comes with a higher local government debt. However, alt-

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<sup>4</sup> I apply a logarithmic transformation to adjust the distribution of debt figures and to facilitate interpretations.

though most of the correlations vanish after adding fixed effects for the 13 states in 2012 (Columns (4) to (5)), the coefficient for the historical debt stock remains fairly robust in magnitude and significance in all specifications.<sup>5</sup>

[Table 2 about here]

All of the results hold under severe robustness checks. I excluded three 1932 German districts that only partially belong to 2012 Germany. Other parts of these districts have been assigned to Poland after WWII (Szczecin, Frankfurt an der Oder, Legnica). In these districts, the 1932 figures might be driven by municipalities that are no longer a part of Germany. However, all of the results remain robust to the exclusion of the divided districts (see Column (3) to (4) in Table 3). Second, I conducted estimations for West Germany (Columns (5) to (6)) and East Germany (Columns (7) to (8)) separately. All of the results hold for West Germany, where many democratic pre-Nazi institutions and human resources were re-implemented after WWII (see Section 5). For East Germany, by contrast, I found a negative correlation of the 1932 and 2012 debt, which amounts to a non-finding after controlling for geography, socio-demographics, and economic and fiscal variables. This result reflects the fact that state building in East Germany after WWII was highly disruptive with respect to pre-Nazi democratic Germany. As a last robustness check, I added the province mean debt per capita of public enterprises to the general debt per capita in 1932 (see Table 8 in the Appendix).<sup>6</sup> All of the results hold under this specification.

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<sup>5</sup> Note that the lack of further significant covariates in the setting with state fixed effects (Columns (4) to (5) in Table 2) should not be a subject of concern. The inclusion of 13 dummies into a setting of 60 observations absorbs a large amount of variation.

<sup>6</sup> For details see Footnote 3 above.

[Table 3 about here]

## 5. Channels for long-term persistency

Pre-war debt burdens cannot drive today's public finance directly because German local government debt entirely defaulted in 1948. Thus, more subtle channels must be investigated. I consider intertemporal personnel links, formal (budget) institutions and informal institutions as three different ways that could allow fiscal policy to survive for decades.

### *5.1 Intertemporal personnel links*

Intertemporal personnel links constitute a thus-far fairly unrecognized channel for long-term persistency in fiscal policy. With only a few exceptions, politicians do not start their careers in powerful positions, rather they undergo a long period of socialization within the political system before entering office. They first serve as backbenchers in the local council or as officials in the local administration and observe which of a mayor's instruments and strategies in public finance are locally customary and accepted. After entering the mayor's office, former "junior politicians" may rely on this knowledge and imitate the strategies of their predecessors. Traditions and attitudes toward public finance are then passed on to the next generation of politicians. This concept of overlapping political generations is identical to what Spolaore and Wacziarg (2013) call "behavioral transmission" through direct observation and imitation. Note that this idea fully abstracts from partisan differences and from family ties.<sup>7</sup> In the case of post-war Germany, Allied politics rather than family ties determined the extent of personnel continuity in politics. Table 4 depicts examples of democratically elected mayors who were expelled after

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<sup>7</sup> Studies on political dynasties have thus far focused on the latter. For instance, Dal Bó, Dal Bó & Snyder (2009) reveal family dynasties in the US Congress as a result of the perpetuation of political power.

the Nazi takeover in 1933 but were re-installed after the Allied liberation in 1945. For example, in the city of Cologne, Konrad Adenauer, who later became Chancellor of Germany, was appointed by the US army on the 4th of May 1945 to again take over the mayor's office. He had already served as mayor until 1933. Further prominent examples can be found in Frankfurt, Hamm and Brunswick and in numerous smaller municipalities. Hamburg provides another interesting example of personnel continuity. The British Military Governor of Hamburg appointed the brother of the last pre-Nazi mayor as the first post-war mayor. However, the Soviet zone differs substantially from the western part of Germany. The personnel policy of the Red army emphasized disruption rather than continuity. The Soviet occupation force preferred to install loyal and "fresh" partisans from the very left-wing; only a few examples of re-installed mayors can be reported for East Germany (Table 4, right-hand side). Furthermore, none of the large cities in East Germany (Leipzig, Dresden, Chemnitz, Halle, Magdeburg, Erfurt) underwent a re-installation of former prominent politicians.

[Table 4 about here]

In cities with a re-installed pre-Nazi mayor, pre-war policies could be transferred to post-WWII Germany. Afterwards, the mechanism of overlapping political generations subsequently may transferred policy traditions to the present. Mayors in West Germany are usually followed in office by politicians who served in the administration or as a member of the local council under their predecessors. The Bavarian city of Munich provides a clear illustration of this mechanism (Figure 3). The conservative pre-Nazi mayor Karl Scharnagl was put into office after WWII by the US army. His left-wing successor, Thomas Wimmer, served as the vice mayor after 1945. Similarly, all of the democratic mayors with the exception of Georg Kronawitter (who served as a member of the state parliament representing Munich) served in the administration or council under their predecessors (gray bars). Even the temporary switch from a left-wing to a right-

wing mayor in 1978 did not interrupt the intergenerational transmission as Georg Kronawitter returned to office in 1984.

[Figure 3 about here]

Examples of overlapping political generations can be found in many more German cities. Figure 4 shows the city of Münster in North Rhine-Westphalia. In Münster, pre-Nazi mayor Karl Zuhorn was re-installed after 1945. All of the mayors up to the present had served in the local administration or council before taking office, with the exception of Tilman Pünder.<sup>8</sup> His later successor Berthold Tillmann had already become a member of the local council in 1980, “bridging” the potential gap in overlapping political generations and maintaining an unbroken chain from the end of the 1920s up to the present.

[Figure 4 about here]

The re-installation of pre-Nazi politicians was a necessary condition for the transmission of pre-Nazi fiscal behavior for post-WWII Germany. To test this channel empirically, I used data on all 262 German cities with populations that were larger than 20,000 in 1933 (Deutscher Gemeindetag, 1934). The dataset comprises data on local government debt per capita in 1933, which I merged with recent debt per capita and all of the control variables that are outlined in Section 3.1.<sup>9</sup> The dataset becomes smaller due to several restrictions. First, I dropped all of the

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<sup>8</sup> However, Pünder was born, grew up and was thus socialized in Münster.

<sup>9</sup> Note that 1933 figures are subject to three important restrictions. First, the figures cover only a set of very large municipalities. Second, in 1933, a partial bail-out occurred after the Nazi takeover. Third, the 1933 data do not comprise information on higher levels of local government or public enterprises. Finally, I cannot fully control for amalgamations because the data on (smaller) outer districts that were merged with larger cities are not available for 1933.

cities that constituted a city state in 1932 or today. Second, I excluded the cities in the Eastern territories that were assigned to Poland or Russia after WWII. Third, the cities of East Germany could not be candidates for personnel continuity and were dropped<sup>10</sup> as well as cities that were merged with other cities after 1933. The final dataset includes the 132 largest West-German municipalities in 1933 with an average of approximately 91,000 inhabitants. These cities cover around one third of West Germany's population. I collected information from direct correspondence and public sources to determine whether these 132 cities underwent a re-installation of their pre-Nazi mayors in 1945 by the Allies. Figure 5 shows that the Allies re-installed a pre-Nazi mayor in 21 of the 132 sample cities (colored blue), and in 111 cities, they did not (colored gray). Both of the city groups are highly comparable in terms of pre-Nazi characteristics.<sup>11</sup>

I applied the same regression strategy that was introduced in Section 3.2 at the city level. Table 5 shows the results for the overall sample (Columns (1) to (2)) and for the subsamples of cities with and without a re-installed mayor. The basic specification comprises the recent and historical debt stock only, the saturated specification includes controls and state dummies. The overall sample coefficient for historical debt is robust to an inclusion of control variables (Column (2)). However, Columns (3) to (6) show that the overall results are mainly driven by cities with a re-installed mayor after WWII. In these cities, a 1 % higher historical debt stock is significantly associated with a 0.5 to 0.6 % higher debt stock in 2012. By contrast, the correlation is weak

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<sup>10</sup> A regression of recent debt per capita on historical debt per capita for the 72 East German cities yields a non-significant coefficient of 0.03 (robust standard error: 0.12).

<sup>11</sup> I ran t-tests on the 1932 mean differences of the total population, population density, a Prussian dummy, the unemployment rate, five sectoral shares, the share of self-employed, catholic and protestant denominations, income tax revenue per capita, corporate tax revenue per capita and total debt. However, none of the t-tests yield a significant difference between both groups.

and unstable for cities that did not see a re-installed mayor after WWII (Column (5)), and it vanishes completely after adding further controls (Column (6)). The results for the covariates at the city level are quite similar to the baseline district results (Table 2).<sup>12</sup> These findings at the city level provide strong evidence for the channel of personnel continuity between pre-Nazi and post-war Germany.

[Table 5 about here]

### *5.2 Budget institutions*

Continuity in budget institutions might also be a channel for long-term persistency in fiscal outcomes. Budget institutions are formalized mechanisms and rules that shape budgetary process and constrain discretion in fiscal policy (Alesina & Perotti, 1999). These institutions are, e.g., numerical targets, approval requirements or transparency rules. Several cross-national studies (Alesina et al., 1999; Fabrizio & Mody, 2006; Dabla-Norris et al., 2010) and single-country studies (Alt & Lowry, 1994; Poterba, 1996) found budget institutions to significantly affect fiscal policy. As outlined in Section 2, one specific budget institution is of crucial importance for German municipalities: supervision (i.e., debt approvals) by higher levels of government. Local government supervision in Germany was assigned to the state level in pre-Nazi as well as in post-WWII Germany. Decentralized supervision induces variation in the rules on debt authorization between the 1932 German states as well as between the 2012 states.

In the following section, I consider whether the 1932 state differences in local government supervision may have survived until today and thus serve as a channel of persistency in fiscal

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<sup>12</sup> For example, a higher tax multiplier and a higher share of left-wing votes in the national elections come with higher local government debt at the district level and at the city level. Only the coefficient for the old-age dependency ratio inverts, which can be explained by city-rural differences in terms of demography and the costly social isolation of the elderly in the cities.



outcomes. I calculate the Borrowing Autonomy Index that was developed by IADB (1997) and Rodden (2002) for the 14 states of the German *Reich* in 1932 and for the 13 states of Germany in 2012 to measure the tightness of state supervision. The Borrowing Autonomy Index integrates information on formal budget rules (numerical constraints, limits in the purpose of debt or debt approvals by state authorities) into a single-dimensional index that ranges from 1 (strict regulation) to 5 (virtually full borrowing autonomy).<sup>13</sup> For 1932, I used the comprehensive overview on state budget rules that was provided by Statistisches Reichsamtsamt (1933). Local government debt was mainly accumulated under these rules, although uniform federal legislation overrode state law in December 1931. I constructed the 1932 Borrowing Autonomy Index based on previous state law. The 2012 Borrowing Autonomy Index was derived from a self-compiled comparison of the 13 municipal codes of the German states in 2012.

I end up with a 2012 German average of the Borrowing Autonomy Index of 3.1 (see Table 9 in the Appendix), which only slightly deviates from previous OECD calculations for German local governments of 2.5 (see Sutherland, Price & Joumard, 2005).<sup>14</sup> Remarkably, the average Borrowing Autonomy Index of 1932 also equaled 3.1. This indicates a high level of continuity in

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<sup>13</sup> More details are provided in the Appendix, Table 9.

<sup>14</sup> The difference between the calculations of the Borrowing Autonomy Index in Table 9 and the OECD calculations is mainly driven by the Authorization sub-index. Sutherland, Price and Joumard (2005) assume no approvals to be required. However, municipal codes constitute several state authority approvals for local government debt. For example, Article 71 of the Bavarian municipal code constitutes (author's translation): "The total amount of borrowings for investments and subsidies requires budget authorization [by state authorities]." In a previous work, Rodden (2002) calculates a Borrowing Autonomy Index of German local governments

local government regulation in Germany *as a whole*. However, the subnational differences are not as persistent. Table 6 gives the correlation of the Borrowing Autonomy Index in 1932 and 2012. I matched the 2012 state to the 1932 state, which provides the largest territorial overlap. A positive, significant correlation would indicate continuity in formal rules within states. However, neither the figures for Germany as a whole nor for West and East Germany separately point toward institutional persistency. The correlations between the 1932 and 2012 Borrowing Autonomy Index are small in absolute terms, and none are significant. This result also holds for the important Authorization sub-index of the Borrowing Autonomy Index, which measures the extent of municipal debt approval requirements by state authorities.

[Table 6 about here]

The historical facts support these non-findings. First, the federal legislation of December 1931, which overrode former state-level rules, constitutes a highly uniform framework for local finance regulation within Germany. Second, all of the remaining minor differences in state legislation were abolished by the centralized Nazi system between 1933 and 1945. Third, Ally-specific municipal codes were implemented in the entirely re-drawn German states after WWII in 1945. The codes of the Allies hardly consider the regional differences in pre-Nazi legislation. To summarize, the ties among formal institutions were clearly cut between 1932 and 2012, and they do not provide a reasonable explanation for persistency in local government debt.

### *5.3 Informal institutions*

Informal institutions such as local-specific attitudes and culture move much slower than their formalized counterparts. Previous studies have shown that deep-rooted values and beliefs are

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of 1.7, which appears to be quite low with respect to the generally high level of autonomy in German local finance.

transmitted mainly within families and peer groups (see Dohmen et al., 2012; Necker & Voskort, 2014, among others). In terms of public debt, specific aspects of culture come into consideration such as risk attitude, intertemporal preferences or local idiosyncrasies in the perception and connotation of public debt. These debt-related attitudes are basically rooted in political preferences and local social capital. If these roots are found to be correlated with local government debt and to be as persistent as local government debt, they may serve as a transmission channel.

First, “social welfare culture”, which is often attributed to left-wing ideology, might be a root of debt mentality. Dyson (2014), p. 268 argues that “European social liberalism and social democracy drove the ideological process of associating debt with social justice and solidarity”. Moreover, left-wing affiliates prefer a larger public sector than their right-wing counterparts. Given the low level of tax autonomy at subnational levels in Germany, left-wing preferences on a higher spending level have to come with higher deficits and debt stocks (Rodden, 2006). Table 2 shows a positive and significant correlation of left-wing political preferences and public debt. I tested the level of persistency in political preferences by comparing the pre-Nazi and recent voting shares for left-wing parties in national elections at the level of the 60 German districts in 1932 (see Table 7, Row I). Political preferences are highly disruptive in East Germany. The correlation between left-wing votes in 1932 and 2012 is low (0.19) and not significant. In contrast, the correlation in West Germany is substantial (0.76) and significant at the 1 % level. Political preferences may thus constitute a transmission channel for the persistency of local public debt in Germany. Note, however, that this channel is covered by the inclusion of left-wing voting shares in the empirical models (e.g., Table 2). Party preferences thus constitute an additional channel *in addition to* personnel continuity.

[Table 7 about here]

Second, social capital may carry over pre-Nazi debt mentality to post-war times. Social capital describes the extent of resources that follow from interpersonal ties and networks. Previous studies have found social capital to improve fiscal performance of local governments (Coffé & Geys, 2005). Following Guiso, Sapienza and Zingales (2004), I measured social capital as the voter turnout in national elections and tested whether social capital is persistent in Germany. Table 7, Row II, shows that voter turnout in pre-Nazi Germany is neither correlated with current turnout in East Germany (correlation coefficient of -0.04) nor in West Germany (-0.20). In particular, the large-scale influx of refugees from the Eastern territories after WWII and the increasing level of mobility within the 20th and 21st centuries may break the link between pre- and post-war Germany in terms of social capital. Social capital can thus be excluded as a transmission channel of persistency in local government debt in Germany.

## **6. Conclusion**

I show that geographic patterns in public debt can be highly persistent despite the occurrence of defaults and drastic changes in formal institutions. Intertemporal personnel links provide a heretofore mainly undiscovered transmission channel. Policy outcomes in democratic systems depends heavily on inertial political networks and human resources. Most importantly, political leaders are often socialized by their predecessors. After entering a mayor's office, former local council members or local administration officers adopt strategies that they have learned under their predecessors. However, further research efforts should be undertaken for a better understanding of the interaction of slow-moving processes and external shocks in fiscal policy. Thus far, the sources of regional differences in attitudes are not well understood. What determines the *first* endowment of mentality that is then transmitted? Conceivably, historical shocks such

as municipal bail-outs may provide a valuable framework through which to investigate this issue in more detail.<sup>15</sup>

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<sup>15</sup> The study of Manes (1918) lists subnational defaults in the former German Empire. The region of Silesia went bankrupt in 1763, Prussia in 1807 and 1813, Westphalia in 1812, Hesse in 1814/1815 and Schleswig-Holstein went bankrupt in 1850. Remarkably, local government debt per capita in 1932 is quite high, especially in the defaulted regions of Schleswig-Holstein, Hesse and partially Westphalia. Cities also experienced defaults or received bail-outs. Gdansk cut two third of its debt in 1824, and the city of Halle cut its debt by 90 percent in 1717. Magdeburg defaulted in 1668. More examples are provided by Schmoller (1873).

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## Tables

TABLE 1. DESCRIPTIVES

<i>Variable</i>	<i>Year</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<b>Debt</b>						
<i>Local government debt 2012 (Euro per capita)</i>	2012	60	3,299.42	1,105.00	1,302.61	5,842.33
<i>Local government debt 1932 (Reichsmark per capita)</i>	1932	60	159.64	70.51	64.20	403.10
<b>Geography</b>						
<i>Population density<sup>a</sup> (in 1,000 inhabitants per km<sup>2</sup>)</i>	2012	60	0.15	0.06	0.06	0.31
<i>Agriculture share of total area</i>	2012	60	0.52	0.11	0.32	0.74
<b>Socio-demographics</b>						
<i>Old-age dependency ratio<sup>b</sup></i>	2011	60	0.39	0.04	0.33	0.49
<i>Share of catholic population</i>	2011	60	0.27	0.22	0.02	0.77
<i>Share of left-wing votes in national election<sup>c</sup></i>	2013	60	0.42	0.06	0.25	0.53
<b>Economic and fiscal structure</b>						
<i>Industrial firms per (1,000) capita<sup>d</sup></i>	2012	60	0.60	0.19	0.28	1.12
<i>Wage per industrial worker (in 1,000,000 Euro)<sup>e</sup></i>	2012	60	0.04	0.01	0.01	0.05
<i>Local business tax base per capita (in 1,000 Euro)<sup>f</sup></i>	2012	60	0.12	0.04	0.05	0.26
<i>Local business tax multiplier (in 100)<sup>g</sup></i>	2012	60	3.80	0.33	3.06	4.63

*Notes:* The table gives the descriptives of the dataset. All data are transformed to the 1932 territorial status (60 districts). a) Population per settlement area. b) Ratio of the population older than 65 years to the population between 25 and 65 years. c) Left-wing parties: SPD, Bündnis 90/Die Grünen, Die Linke. d) Mining and manufacturing firms. e) Wages per employee in mining and manufacturing firms. f) *Gewerbsteuergrundbetrag*. g) *Gewerbsteuerhebesatz*. National census and national election data are also provided the Federal Statistical Office.

TABLE 2. BASELINE RESULTS

	<i>Local government debt per capita 2012 (log)</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Local government debt per capita 1932 (log)</i>	0.32*** (0.11)	0.42*** (0.15)	0.43*** (0.15)	0.34*** (0.12)	0.35*** (0.12)
<i>Population density</i>		-2.02 (1.48)	-2.21 (1.66)	-0.49 (1.50)	-0.66 (1.76)
<i>Agriculture share of total area</i>		-0.97** (0.44)	-0.98** (0.44)	0.31 (0.44)	0.29 (0.43)
<i>Old-age dependency ratio</i>		-4.84*** (1.50)	-4.86*** (1.51)	0.55 (1.76)	0.57 (1.78)
<i>Share of catholic population</i>		-0.15 (0.27)	-0.12 (0.29)	0.11 (0.29)	0.13 (0.32)
<i>Share of left-wing votes in national election</i>		1.83** (0.81)	1.94** (0.86)	0.79 (0.90)	0.76 (0.92)
<i>Industrial firms per capita</i>		0.12 (0.26)	0.12 (0.27)	0.19 (0.25)	0.19 (0.26)
<i>Wage per industrial worker</i>		-1.05 (5.93)	-1.35 (5.99)	-3.13 (4.20)	-3.07 (4.32)
<i>Local business tax base per capita</i>		-2.13** (0.95)	-2.06** (1.02)	-1.08 (1.10)	-0.99 (1.20)
<i>Local business tax multiplier</i>		0.18 (0.16)	0.19 (0.18)	0.38** (0.17)	0.39** (0.18)
<i>Constant</i>	6.45*** (0.53)	7.48*** (1.17)	7.37*** (1.20)	4.56*** (1.30)	4.54*** (1.30)
<i>Obs.</i>	60	60	60	60	60
<i>1932 Prussia fixed effects</i>	No	No	Yes	No	Yes
<i>2012 state fixed effects</i>	No	No	No	Yes	Yes
<i>Adj. R-squared</i>	0.13	0.46	0.46	0.77	0.77

Notes: Dependent variable: Local government debt per capita 2012 (log). Definitions of the variables employed are given in Table 1. Significance levels (Robust standard errors in brackets): \*\*\* 0.01, \*\* 0.05, \* 0.10.

TABLE 3. SUB-SAMPLE RESULTS

	<i>Local government debt per capita 2012 (log)</i>							
	<i>Full dataset (Baseline)</i>		<i>Divided districts excluded</i>		<i>West Germany</i>		<i>East Germany</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Local government debt per capita 1932 (log)</i>	0.32*** (0.11)	0.35*** (0.12)	0.32*** (0.11)	0.39*** (0.14)	0.46*** (0.10)	0.42** (0.18)	-0.37** (0.16)	-0.36 (0.27)
<i>Obs.</i>	60	60	57	57	43	43	17	17
<i>Further Controls</i>	No	Yes	No	Yes	No	Yes	No	Yes
<i>1932 Prussia fixed effects</i>	No	Yes	No	Yes	No	Yes	No	Yes
<i>2012 state fixed effects</i>	No	Yes	No	Yes	No	Yes	No	No
<i>Adj. R-squared</i>	0.13	0.77	0.13	0.78	0.25	0.77	0.23	0.92

*Notes:* Dependent variable: Local government debt per capita 2012 (log). Further controls: Population density, Agriculture share of total area, Old-age dependency ratio, Share of catholic population, Share of left-wing votes in national election, Industrial firms per capita, Wage per industrial worker, Local business tax base per capita, Local business tax multiplier. Definitions of the variables are given in Table 1. Columns (1)–(2) reproduces the results shown in Table 2, Columns (1) and (5). In Column (3)–(4), three districts that are mainly assigned to Poland after 1945 are excluded (Szczecin, Frankfurt an der Oder, Legnica). The model presented in Column (5)–(6) is restricted to districts located in West Germany. The specification in Column (7)–(8) comprises districts which are mainly located in the former GDR (East Germany). For reasons of degrees of freedom, 2012 state fixed effects have not been applied to the model in Column (8). Significance levels (Robust standard errors in brackets): \*\*\* 0.01, \*\* 0.05, \* 0.10.

TABLE 4. EXAMPLES OF PRE-NAZI MAYORS RE-INSTALLED AFTER WWII

<i>West Germany</i>				<i>East Germany</i>			
<i>City</i>	<i>Mayor</i>	<i>Party</i>	<i>State</i>	<i>City</i>	<i>Mayor</i>	<i>Party</i>	<i>State</i>
<i>Large cities</i>							
Aachen	Rombach, Wilhelm	CDU	NW				
Brunswick	Böhme, Ernst	SPD	NI				
Cologne	Adenauer, Konrad	CDU	NW				
Frankfurt	Schlosser, Karl <sup>a</sup>	SPD	HE				
Hamburg	Petersen, Rudolf <sup>b</sup>	CDU	HH				
Hamm	Schlichter, Josef		NW				
Heilbronn	Beutinger, Emil		BW				
Munich	Schamagl, Karl	CSU	BY				
Münster	Zuhorn, Karl	CDU	NW				
<i>Small and medium-size municipalities</i>							
Bamberg	Weegmann, Luitpold	CSU	BY	Dessau	Fritz Hesse	LDPD	ST
Bergedorf	Frank, Friedrich	SPD	HH	Mühlhausen	Neumann, Hellmut	SPD	TH
Börrstadt	Demmerle, Jakob	CDU	RP	Plauen	Schlotte, Max		SN
Büderich	Staßen, Johann Wilhelm		NW				
Heimstetten	Bartl, Josef		BY				
Hildesheim	Ehrlicher, Ernst		NI				
Hückeswagen	Leyhausen, Richard		NW				
Hütschenhausen	Rüb, Julius	SPD	RP				
Kaufbeuren	Volkhardt, Georg		BY				
Langendorf	Schärf, Ignatz		BY				
Marwede	Brese, Wilhelm	CDU	NI				
Mengerskirchen	Schneider, ...		HE				
Münstertal	Riesterer, Josef		BW				
Niederfischbach	Weitz, Albert		RP				
Norderney	Lührs, Carssen		NI				
Oerlinghausen	Reuter, August		NW				
Passau	Sittler, Carl		BY				
Rheinfeldern	Walz, Eugen		BW				
Röthenbach	Neuper, Fritz	SPD	BY				
Schadeck	Fink, Heinrich August		HE				
Schriesheim	Rufer, Georg	SPD	BW				
Taufkirchen	Laubhart, Balthasar		BY				
Todtenweis	Riß, Josef	CSU	BY				
Wipperfürth	Graf, Carl		NW				

*Notes:* The table depicts examples of mayors who were serving until the Nazi takeover in 1933 and were re-installed by the Allies after WWII in 1945. Blank cells denote unknown characteristics. State abbreviations: BW: Baden-Wuerttemberg, BY: Bavaria, HH: Hamburg, HE: Hesse, NI: Lower Saxony, NW: North Rhine-Westphalia, RP: Rhineland-Palatinate, SN: Saxony, ST: Saxony-Anhalt, TH: Thuringia. a) Vice mayor. b) Brother of the former mayor Carl Wilhelm Petersen.

TABLE 5. CITY-LEVEL RESULTS

	<i>Local government debt per capita 2012 (log)</i>					
	Full dataset		Cities with re-installed mayors		Cities without re-installed mayors	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Local government debt per capita 1932 (log)</i>	0.29** (0.11)	0.21* (0.12)	0.64*** (0.17)	0.50** (0.14)	0.24* (0.13)	0.08 (0.15)
<i>Population density</i>		-0.14 (0.93)		2.94** (0.90)		0.32 (1.11)
<i>Agriculture share of total area</i>		-0.31 (0.42)		-1.13*** (0.24)		-0.04 (0.49)
<i>Old-age dependency ratio</i>		2.78** (1.29)		6.53** (1.71)		2.99** (1.38)
<i>Share of catholic population</i>		0.41 (0.39)		3.59** (0.98)		0.33 (0.48)
<i>Share of left-wing votes in national election</i>		1.88* (0.97)		2.42 (2.62)		1.70* (1.02)
<i>Industrial firms per capita</i>		0.11 (0.23)		0.55 (0.39)		0.14 (0.25)
<i>Wage per industrial worker</i>		0.01 (3.68)		-15.31 (8.12)		1.45 (3.70)
<i>Local business tax base per capita</i>		-0.21 (0.50)		-0.34 (1.20)		-0.06 (0.52)
<i>Local business tax multiplier</i>		0.84*** (0.19)		1.31** (0.36)		0.97*** (0.21)
<i>Constant</i>	6.73*** (0.63)	1.70 (1.36)	4.74*** (0.97)	-3.89 (3.36)	7.02*** (0.72)	2.35 (1.44)
<i>Obs.</i>	132	132	21	21	111	111
<i>1932 Prussia fixed effects</i>	No	Yes	No	Yes	No	Yes
<i>2012 state fixed effects</i>	No	Yes	No	Yes	No	Yes
<i>Adj. R-squared</i>	0.05	0.44	0.38	0.98	0.03	0.47

*Notes:* Dependent variable: Local government debt per capita 2012 (log). The dataset comprises the 132 largest West German cities in 1933. Definitions of the variables are given in Table 1. Significance levels (Robust standard errors in brackets): \*\*\* 0.01, \*\* 0.05, \* 0.10.

TABLE 6. PERSISTENCE OF BUDGET INSTITUTIONS IN 1932 AND 2012

		<i>Full dataset</i>		<i>West German districts only</i>		<i>East German districts only</i>	
		I	II	I	II	I	II
		2012	2012	2012	2012	2012	2012
I	<i>Authorization Sub-index</i>	1932	0.04	0.19		-0.42	
II	<i>Borrowing Autonomy Index</i>	1932			-0.10		-0.13
		<i>Obs.</i>	14	14	9	9	5

*Notes:* The table shows the correlation between measures of budget institutions in 1932 and 2012 at the level of 14 states in 1932. I match the 2012 state to the 1932 state which gives the largest territorial overlap. The Borrowing Autonomy Index (row II) is adopted from IADB (1997) and Rodden (2002). The index combines information on local governments' *Ability to Borrow, Authorization, Borrowing Constraints, Limits on the Use of Debt, Subnational Government Banks and Public Enterprises*. More information are given in the Appendix, Table 9. The Authorization Sub-index (row I) is identical to the *Authorization* category and measures requirements such as obligations to disclose or to approve borrowing (Column (2) of Table 9). Significance levels: \*\*\* 0.01, \*\* 0.05, \* 0.10.



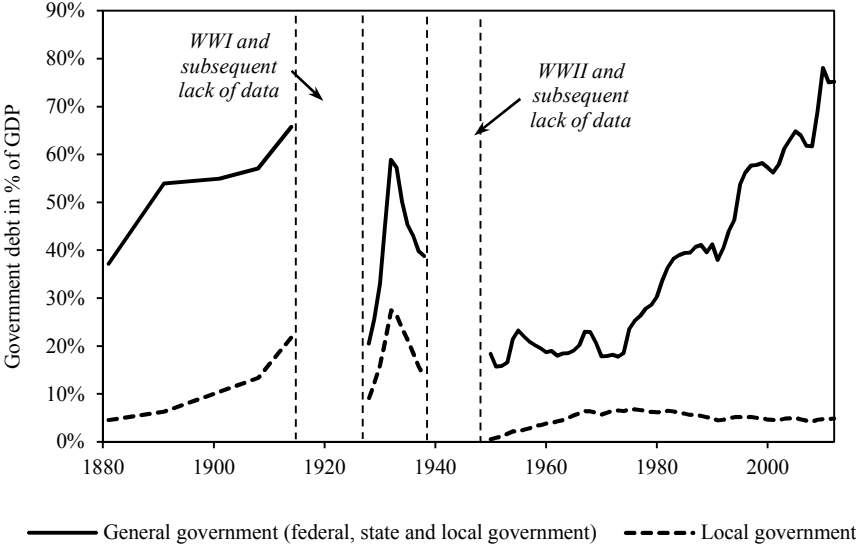
TABLE 7. PERSISTENCE OF INFORMAL INSTITUTIONS IN 1932 AND 2012

			<i>Full dataset</i>		<i>West German districts only</i>		<i>East German districts only</i>	
			I	II	I	II	I	II
			2012	2012	2012	2012	2012	2012
I	<i>Share of left-wing votes</i>	1932	0.63***		0.76***		0.19	
II	<i>Voter turnout</i>	1932		-0.20		0.14		-0.04
<i>Obs.</i>			60	60	43	43	17	17

*Notes:* The table shows the correlation between political attitudes in 1932 and 2012 at the level of 60 districts in 1932. Row I: *Voter turnout*: Voter turnout in the 1928 national election and the 2013 election. Row II: *Left-wing votes*: Share of SPD and KPD votes in the 1928 national election and share of SPD, Bündnis 90/Die Grünen and Die Linke votes in the 2013 election. Significance levels: \*\*\* 0.01, \*\* 0.05, \* 0.10.

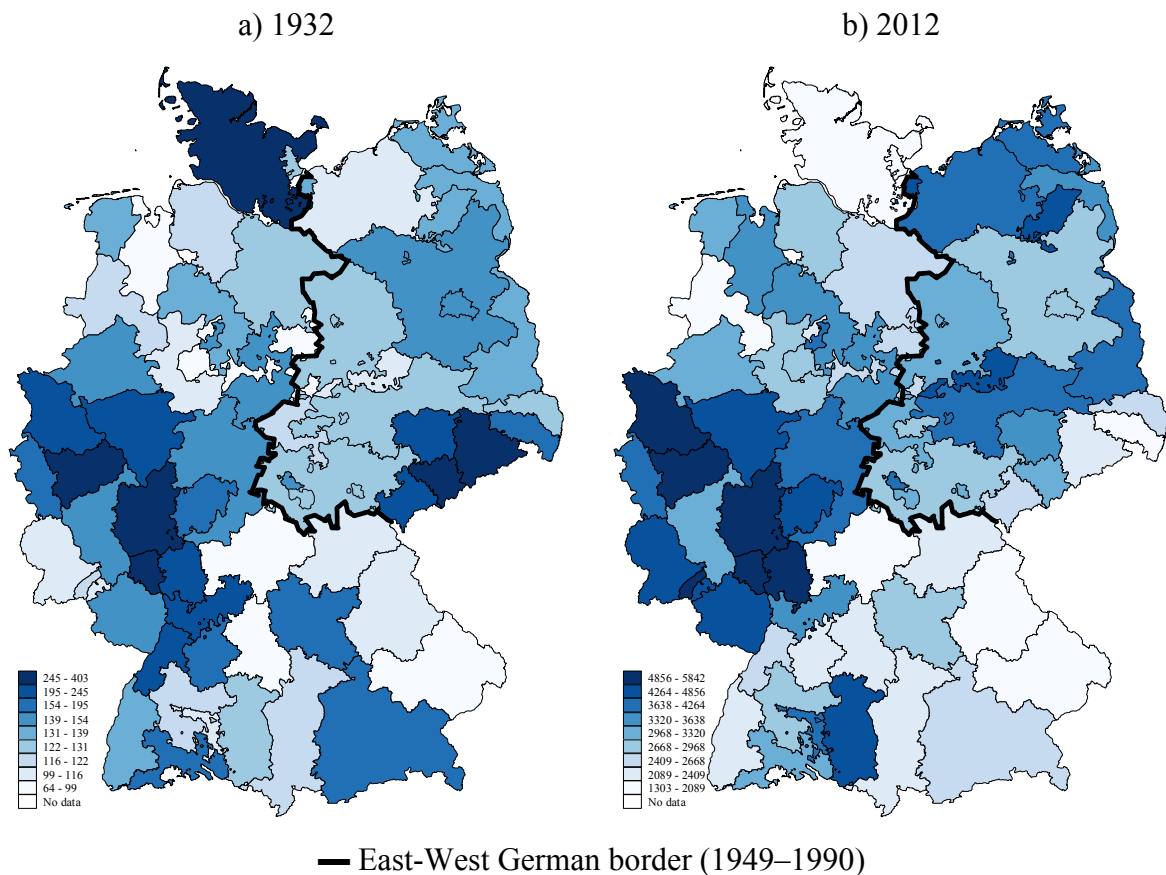
**Figures**

FIGURE 1. GENERAL AND LOCAL GOVERNMENT DEBT IN GERMANY, 1881–2012



*Notes:* The figure shows how public debt evolved in Germany between 1881 and 2012. The solid line represents general government debt (sum of federal, state and local level). The dashed line represents the evolution of local government debt. Data are missing for war and post-war periods (1915–1927 and 1939–1949). Public enterprises are excluded. *Data:* Hoffmann & Müller (2005), Sensch (2009), Statistisches Bundesamt (2012), Statistisches Bundesamt (2015).

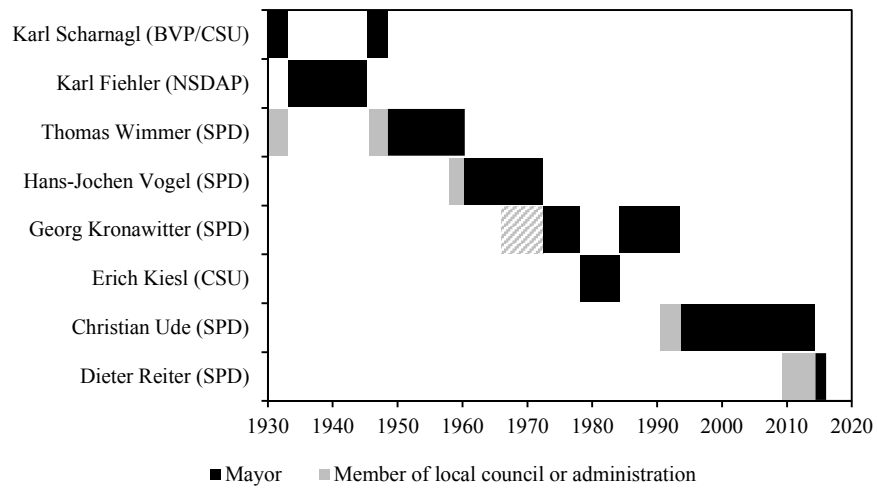
FIGURE 2. LOCAL GOVERNMENT DEBT PER CAPITA IN GERMANY, 1932 AND 2012 (TERRITORIAL STATUS OF 1932)



*Notes:* The figure shows 1932 local government debt in Reichsmark per capita (sub-figure a)) and 2012 local government debt in Euro per capita (sub-figure b)), each aggregated to the 1932 district level (*Verwaltungsbezirke*). Municipal-level data of 2012 have been aggregated to the 1932 district level using geographic information system (GIS) (see Appendix,

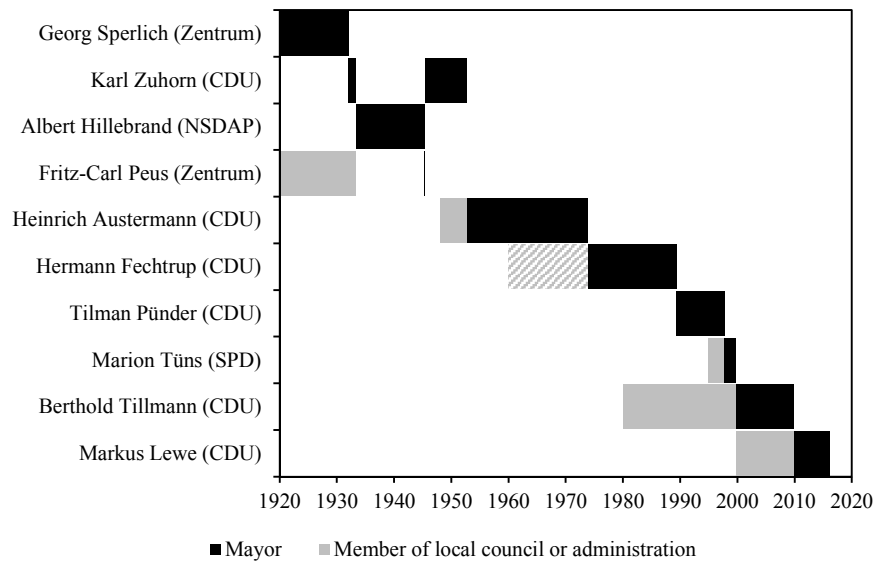
Figure 6). The bold line gives the former East-West German border. External border of 2012 (Saargebiet excluded).  
*Geodata:* Hubatsch & Klein (1975), MPIDR & CGG (2011), Bundesamt für Kartographie und Geodäsie (2013).  
*Data:* Statistisches Reichsamt (1933), Statistische Ämter des Bundes und der Länder (2014).

FIGURE 3. MAYORS OF MUNICH, 1920–2015



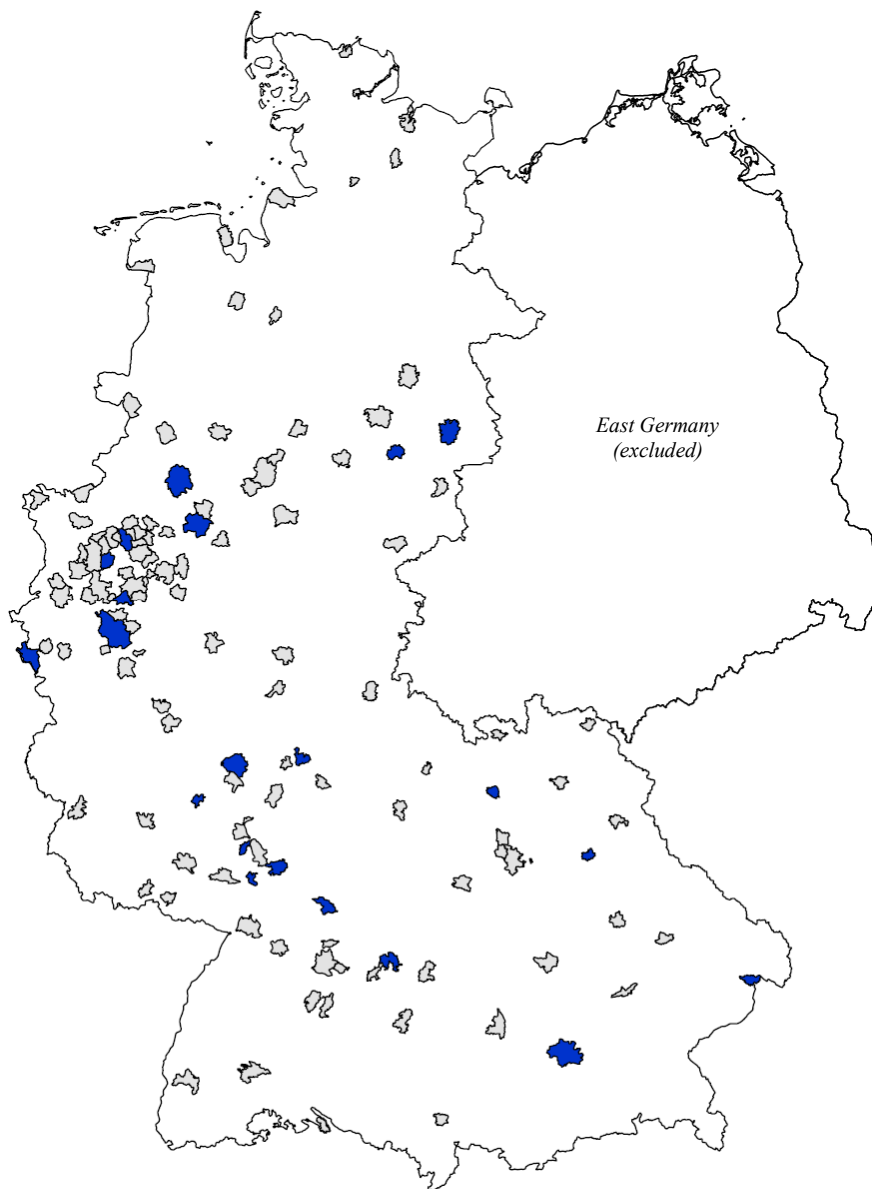
*Notes:* The figure shows the mayors of Munich since 1920 (black). The abbreviations in brackets give the mayor's party. Two mayors (Karl Scharnagl and Georg Kronawitter) served twice but interruptedly. Periods in gray indicate leading functions in the local administration (e. g., vice mayor) or membership in the local council. With the single exception of Erich Kiesl and Georg Kronawitter who served as a member of the state parliament (representing Munich) before becoming mayor, all democratic mayors served in the administration or council under their predecessor.

FIGURE 4. MAYORS OF MÜNSTER, 1920–2015



*Notes:* The figure shows the leader of the local administration (1946–1999: city manager, otherwise: mayor) of Münster since 1920 (black). The abbreviations in brackets give the mayor’s party. One mayor (Karl Zuhorn) served twice but interruptedly. The periods in gray indicate leading functions in the local administration (e. g., vice mayor) or membership in the local council. With the exception of Hermann Fechtrup, who served as the leader of the county government and thus as fiscal supervisor of Münster before becoming mayor, all of the democratic mayors served in the local administration or council under their predecessors. Tilman Pünder was the only mayor who was born in Münster and served in the administration of other municipalities up to 1989.

FIGURE 5. WEST GERMAN CITIES WITH POPULATION  $\geq 20,000$  (1933)



■ Cities with re-installed pre-Nazi mayor    ■ Cities without re-installed pre-Nazi mayor

*Notes:* The figures show all West German cities with a population of more than 20,000 in 1933 (2012 external borders). Blue colored cities underwent a re-installation of a pre-Nazi mayor after WWII, gray colored cities did not. *Geodata:* Bundesamt für Kartographie und Geodäsie (2013).

## Appendix

TABLE 8. EXTENDED DEBT DEFINITION

	<i>Local government debt per capita 2012 (log)</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Local government debt per capita 1932 (log)</i>	0.32*** (0.11)	0.40** (0.16)	0.43*** (0.16)	0.32*** (0.11)	0.34*** (0.11)
<i>Obs.</i>	60	60	60	60	60
<i>Further controls</i>	No	Yes	Yes	Yes	Yes
<i>1932 Prussia fixed effects</i>	No	No	Yes	No	Yes
<i>2012 state fixed effects</i>	No	No	No	Yes	Yes
<i>Adj. R-squared</i>	0.13	0.46	0.46	0.77	0.77

*Notes:* Dependent variable: Local government debt per capita 2012 (log). 1932 local government debt per capita is adjusted by 1933 province mean debt per capita of public enterprises (13 % of overall local government debt) because the district level figures are not available. I assume a constant ratio of general government and public enterprise debt in 1932 and 1933. Technically, I scaled the 1932 district debt aggregates by the province level ratio of 1933 total local government debt (the sum of general government debt and the debt of public enterprises) by general local government debt. Further controls: Population density, Agriculture share of total area, Old-age dependency ratio, Share of catholic population, Share of left-wing votes in national election, Industrial firms per capita, Wage per industrial worker, Local business tax base per capita, Local business tax multiplier. Definitions of the variables are given in Table 1. Significance levels (Robust standard errors in brackets): \*\*\* 0.01, \*\* 0.05, \* 0.10.

TABLE 9. BORROWING AUTONOMY INDEX OF LOCAL GOVERNMENTS BY GERMAN STATES, 1932 AND 2012

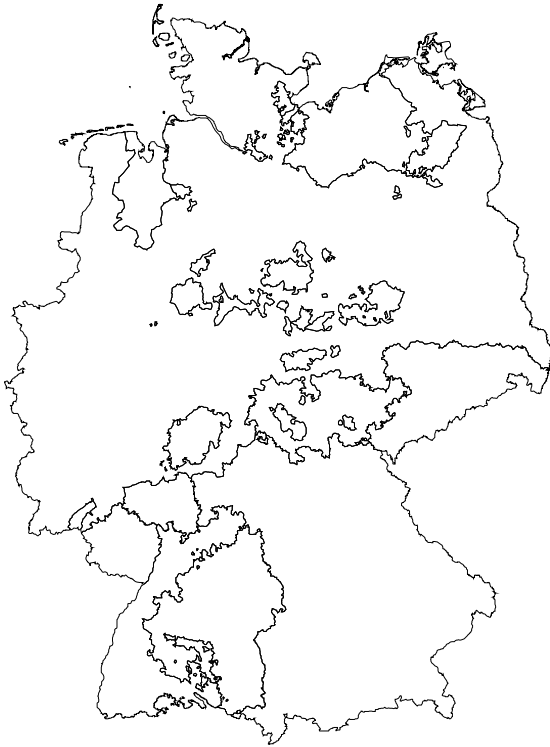
	<i>Ability to borrow</i>	<i>Authorization</i>	<i>Borrowing Constraints</i>	<i>Limits on the Use of Debt</i>	<i>Subnational Government Banks</i>	<i>Public Enterprises</i>	<i>Borrowing Autonomy Index</i>
	<i>Range 0–2</i>	<i>Range 0–1</i>	<i>Range 0–0.5</i>	<i>Range 0–0.5</i>	<i>Range 0–1.5</i>	<i>Range 0–0.5</i>	<i>Range 1–5</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>1932</i>							
Anhalt	0.0	1.0	0.0	0.5	0.5	0.5	2.5
Baden	0.0	0.4	0.0	0.0	0.5	0.5	3.6
Bavaria	0.0	0.4	0.0	0.5	0.5	0.5	3.1
Brunswick	0.0	0.0	0.0	0.5	0.5	0.5	3.5
Hesse	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Lippe	0.0	0.2	0.0	0.5	0.5	0.5	3.3
Mecklenburg-Schwerin	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Mecklenburg-Strelitz	0.0	0.2	0.0	0.5	0.5	0.5	3.3
Oldenburg	0.0	0.8	0.0	0.0	0.5	0.5	3.2
Prussia	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Saxony	0.0	0.8	0.0	0.0	0.5	0.5	3.2
Schaumburg-Lippe	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Thuringia	0.0	0.0	0.0	0.5	0.5	0.5	3.5
Württemberg	0.0	0.6	0.0	0.0	0.5	0.5	3.4
<i>2012</i>							
Baden-Württemberg	0.0	0.5	0.0	0.5	0.5	0.5	3.0
Bavaria	0.0	0.5	0.0	0.5	0.5	0.5	3.0
Brandenburg	0.0	0.4	0.0	0.0	0.5	0.5	3.6
Hesse	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Lower Saxony	0.0	0.6	0.0	0.5	0.5	0.5	2.9
Mecklenburg-West Pomerania	0.0	0.7	0.0	0.5	0.5	0.5	2.8
North Rhine-Westphalia	0.0	0.2	0.0	0.0	0.5	0.5	3.8
Rhineland-Palatinate	0.0	0.4	0.0	0.0	0.5	0.5	3.6
Saarland	0.0	0.3	0.0	0.0	0.5	0.5	3.7
Saxony	0.0	0.5	0.0	0.5	0.5	0.5	3.0
Saxony-Anhalt	0.0	0.5	0.0	0.5	0.5	0.5	3.0
Schleswig-Holstein	0.0	0.8	0.0	0.5	0.5	0.5	2.7
Thuringia	0.0	0.6	0.0	0.5	0.5	0.5	2.9

*Notes:* The Borrowing Autonomy Index is adopted from IADB (1997) and Rodden (2002). The overall index is calculated as 2 minus the sum of the points from criteria (1) through (4). The scores from criteria (5) and (6) and 1 are also added so that the final index varies between 1 and 5. *Ability to Borrow:* If the subnational government cannot borrow, 2 points. *Authorization:* This number ranges from zero to one. If all borrowing by the subnational government requires central government approval (or state government approval for local governments in federal systems), 1 point. If no subnational borrowing requires approval, zero points. If the authorization constraint only applies to certain kinds of debt, or if the approval requirement is not always enforced, a score between one and zero is given according to the level of constraint. *Borrowing Constraints:* If there are numerical constraints on borrowing, such as maximum debt service/revenue ratios, up to 0.5 points, according to the coverage of the constraints. *Limits on the Use of Debt:* If debt may not be used for current expenditures, 0.5 points. *Subnational Government Banks:* If subnational governments own banks, 1 point. If these banks have substantial importance, an additional 0.5 points. If subnational governments have special relationships with banks, but do not actually own them (as in the German Länder), 0.5 points. *Public Enterprises:* If subnational governments own important public enterprises, and these have liberal borrowing practices, 0.5 points. *Data:* Information for the 1932 index are obtained from Statistisches Reichsamts (1933). Data for the 2012 index are hand collected from states municipal codes. Further information on coding are provided upon request.

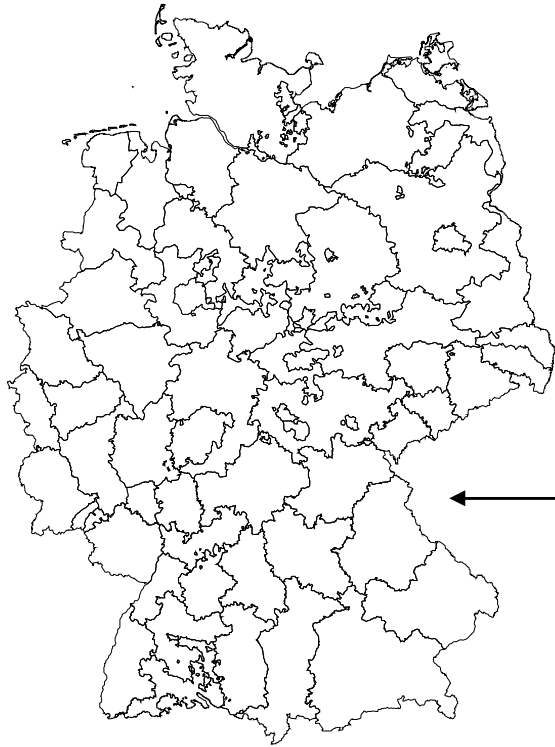


FIGURE 6. TERRITORIAL STATUS, 1932 AND 2012

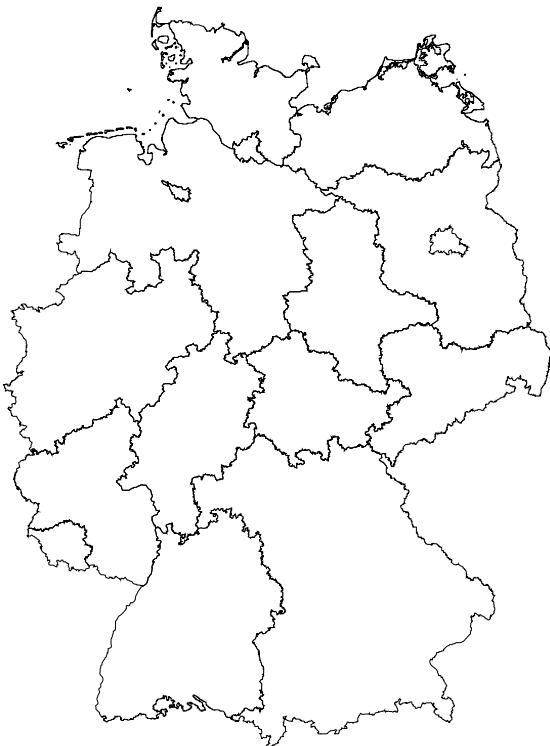
a) 1932 states (2012 external border)



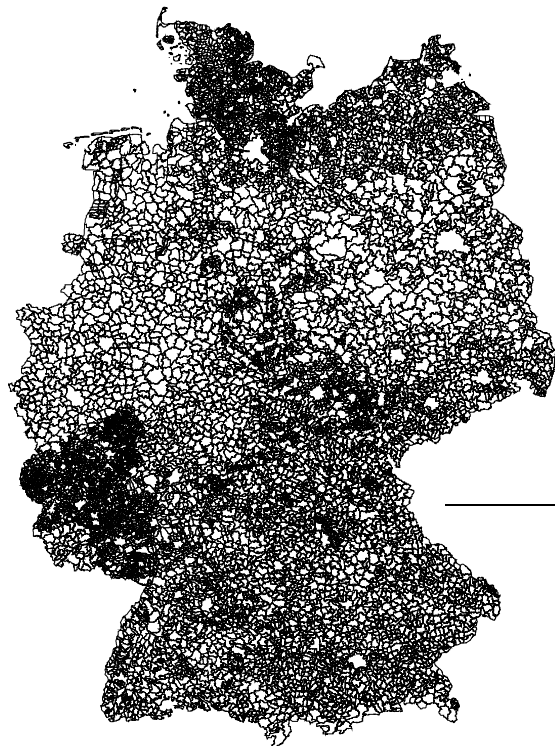
b) 1932 districts (2012 external border)



c) 2012 states



d) 2012 municipalities



Aggregation via GIS

*Notes:* The figures show 1932 and 2012 territorial units within Germany's 2012 external borders (exception: Saargebiet). Geographic information system (GIS) is used to aggregate 2012 data available at the municipal level (sub-figure d) to 1932 districts (*Verwaltungsbezirke*, sub-figure b). Sub-figures a) and c) give the 1932 and 2012 state level. *Geodata:* Hubatsch & Klein (1975), MPIDR & CGG (2011), Bundesamt für Kartographie und Geodäsie (2013).