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DO MERGERS OF LARGE LOCAL
GOVERNMENTS REDUCE
EXPENDITURES? – EVIDENCE FROM
GERMANY USING THE
SYNTHETIC CONTROL METHOD

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Do mergers of large local governments reduce expenditures? – Evidence from Germany using the synthetic control method*

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Abstract

States merge local governments to achieve economies of scale. Little is known to which extent mergers of county-sized local governments reduce expenditures, and influence political outcomes. I use the synthetic control method to identify the effect of mergers of large local governments in Germany (districts) on public expenditures. In 2008, the German state of Saxony reduced the number of districts from 22 to 10. Average district population increased substantially from 113,000 to 290,000 inhabitants. I construct a synthetic counterfactual from states that did not merge districts for years. The results do neither show reductions in total expenditures, nor in expenditures for administration, education, and social care. There seems to be no scale effects in jurisdictions of more than 100,000 inhabitants. By contrast, I find evidence that mergers decreased the number of candidates and voter turnout in district elections while vote shares for populist right-wing parties increased.

JEL classification: D72; H11; H72; R51

Keywords: Municipal mergers; Local government; Expenditures; Synthetic control method; Local elections; Voter turnout

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1. Introduction

For decades, states merge small and medium sized municipalities to achieve economies of scale in expenditures (Fox and Gurley 2006, Holzer et al. 2009, Bird and Slack 2013). The empirical evidence however is at least mixed. Reingewertz (2012), Blom-Hansen et al. (2014), and Welling Hansen et al. (2014) document that expenditures of merged municipalities in Israel and Denmark decreased. By contrast, Lüchinger and Stutzer (2002) and Fritz (2016) show that merged municipalities in Switzerland and South Germany increased expenditures. Moisiu and Uusitalo (2013), Allers and Geertsema (2016), Blesse and Baskaran (2016), Blom-Hansen et al. (2016), and Studerus (2016) do not find significant effects of municipal reforms on total public expenditures in Finland, in the Netherlands, East Germany, Denmark, and Switzerland.¹

Against the background of the evidence on consolidations of small entities, little is known to which extent mergers of large local governments affect public expenditures. However, politicians debate in many countries whether to merge county-sized administrations, for example, in Germany, the United States, Austria, or Ireland.² I examine the effects of mergers of large local governments covering more than 100,000 inhabitants on average. In 2008, the state government of the German state of Saxony reduced the number of districts (*Landkreise*) from 22 to 10 (see Figure 1). The average population of Saxon districts increased substantially from around 113,000 to 290,000 inhabitants. Because all Saxon districts were affected, I use the synthetic

¹ Blesse and Baskaran (2016) however show that compulsory municipal mergers reduced administrative expenditures, which however are only a minor share of overall municipal expenditures. Blom-Hansen et al. (2016) find cost reductions in some spending categories that are however compensated by increases in other categories.

² See, e.g., Germany: Die Zeit, “Neuer deutscher Größenwahn”, 15.07.2016, <http://www.zeit.de/2017/21/gebietsreformen-ostdeutschland-landkreise-populismus>; US: NBC15.com, “Lawmaker Wants to Merge Counties To Save Money”, 07.08.2007, <http://www.nbc15.com/home/headlines/9018942.html>; The State, “EXCLUSIVE: Merging Columbia, Richland County getting serious consideration”, <http://www.thestate.com/news/local/article90107087.html>, 16.07.2016; Austria: Der Standard, “Zusammenlegung der Bezirkshauptmannschaften startet”, 05.07.2016, <http://derstandard.at/2000040461646/BH-Zusammenlegung-der-Verwaltung-startet>; Ireland: The Irish Times, “Galway politicians split on plans to merge city and county councils”, <http://www.irishtimes.com/news/ireland/irish-news/galway-politicians-split-on-plans-to-merge-city-and-county-councils-1.2824077>, 10.10.2016.

control method and construct a synthetic counterpart to Saxony as a whole. Districts of ten other German states which did not merge districts for years constitute the donor pool. The results do neither show that mergers of large local governments reduce total expenditures per capita, nor expenditures in main expenditure categories such as social care, education or administration. These findings are in line with anecdotal evidence on the Saxon merger reform reporting that “great expectations changed into great disillusion”.³

[Figure 1 about here]

Yet, scholars did not examine scale effects in expenditures of large local governments by exploiting a merger reform.⁴ Prior studies investigate small entities such as municipalities. German districts, by contrast, have a population of around 190,000 inhabitants on average which roughly corresponds with the US county level. I confirm considerations of previous studies and surveys that suspect no further gains in efficiency in large local governments (Holzer et al. 2009). The results of this study do not show that there are any economies of scale in local governments beyond a population size of around 100,000 inhabitants. This finding holds true for total expenditures but also for expenditures in all main functions of German districts (administration including public order and safety, social care, and education). Mergers, by contrast, seem to bear some political costs. I provide evidence that the number of candidates and voter turnout decreased in merged districts while the populist right-wing gain support.

³ Translation by the author. Original in German language: “Die Erwartungen waren groß, heute ist es die Ernüchterung.” See RBB online, So lief die Kreisgebietsreform in Sachsen, 24.02.16, <http://www.rbb-online.de/politik/beitrag/2016/02/landkreisreform-sachsen.html>. Similar disenchantments are reported for the state of Mecklenburg-West Pomerania which experienced large-scale district mergers in 2011: “Even five years after the reform, reductions of costs have not been realized.” (Translation by the author. Original in German language: “Auch fünf Jahre später ist die Reform noch immer eine große Baustelle: Die erhofften Einsparungen lassen auf sich warten.”). See RBB online, So lief die Kreisgebietsreform in Mecklenburg-Vorpommern, 24.02.16, <http://www.rbb-online.de/politik/beitrag/2016/02/landkreisreform-mecklenburg-vorpommern.html>.

⁴ There are studies on consolidations of special-purpose entities such as school districts. For the seminal work see Brasington (1999). Further evidence is provided, e.g., by Duncombe and Yinger (2007), and Knight and Gordon (2008).

Prior studies usually compare merged and unchanged local governments within a difference-in-differences setup. I abstract from micro-level data and apply the synthetic control method to state-level aggregates. The synthetic control method is a powerful tool to evaluate policy reforms if the number of treated units is small, and only aggregated outcomes are observable (see also Abadie et al. 2015). I show that the method is superior to difference-in-differences estimations, when the common trend assumption seems to be violated (see also Kreif et al. 2016). Only a small number of studies in public finance employed the synthetic control method (e.g., Mukherji and Mukhopadhyay 2011, Koehler and König 2015, Falkenhall et al. 2015, Green et al. 2016, Pfeil and Feld 2016).⁵ As the most related study, Hämäläinen and Moisio (2015) use the synthetic control method to evaluate the implementation of a second layer of local government in one region in Finland while other regions do not change institutions. Hämäläinen and Moisio (2015) do neither report cost savings nor increases in expenditures, which is also in line with the results of this study.

2. Institutional background

2.1 Districts in Germany

Germany has a federal system with two layers of state government (national level, state level) and two layers of local government (districts, municipalities). The about 10,000 German municipalities (*Gemeinden*) are responsible for local public services such as public safety and order, waste disposal or cultural institutions and can set their own tax rates on property and local business. The 295 districts (*Landkreise*) constitute the upper-level local governments and roughly correspond with US counties in terms of population. Districts are mainly responsible

⁵ Most public economics studies using the synthetic control method evaluate regulations of tobacco (Abadie et al. 2010, Bharadwaj et al. 2014), alcohol (Marcus and Siedler 2015), and economic impacts of institutions (Zhou 2017).

for social care (youth and social welfare, accommodation costs of long-term unemployed), public safety and order, economic development, public transport, and parts of education. In education, for example, districts design the location of primary and other schools, maintain school buildings, and provide adult education centers and music schools.⁶ The functions of districts, however, differ across German states to some extent. In addition to the 295 more rural districts, about 107 large cities (*kreisfreie Städte*) exercise both district functions and municipal functions as one. I exclude large cities from the analysis because these municipalities are not comparable to districts in terms of functions and expenditures.

German local governments can spend and borrow on their own behalf but are regulated by fiscal supervisors of the federal states (Roesel 2016a). In 2013, total expenditures of German districts amounted to 34 billion Euros (around 620 Euro per capita). This was about 25% of overall local government expenditures in Germany (large cities excluded). Social care was the most important expenditure category of districts, followed by administrative expenditures including public safety and order. Social and administrative expenditures account for about two third of total gross expenditures of German districts. Districts do not hold own tax competences. To finance expenditures, districts levy contributions from the municipalities, receive transfers from the states, and borrow. Contributions from municipalities are linked to fiscal capacity, and are substantial (for details see Baskaran 2014). In 2013, the share of municipalities' fiscal capacity transferred to the district level (i.e., the contribution rate) varied between 30% and 70% across federal states.

⁶ Employing teachers and designing school curricula, by contrast, are responsibilities of the states.

2.2 *District mergers 2008 in Saxony*

In Germany, the number of municipalities decrease year by year due to voluntary and compulsory mergers. District mergers, by contrast, are rare. There have been waves of district mergers in West Germany in the 1970s, and in East Germany in the 1990s after re-unification (see Figure 2). In 1994, the state of Saxony reduced the number of districts from 48 to 28. There were also 6 large cities which exercise district and municipal functions as one. In 1996, further district mergers (and one demerger) led to a number of 22 districts and 7 large cities in Saxony. The third wave of district mergers in Saxony in 2008 yielded 10 districts and 3 large cities.

The synthetic control method I propose later in this paper requires that the event of interest (here: 2008 Saxon merger reform) is somewhat exogenous and not driven by events in other units of observation which spilled over to Saxony (and vice versa). I argue that spillover are unlikely. First, and most importantly, the East states of Saxony-Anhalt and Mecklenburg-West Pomerania notwithstanding, Saxony was the sole German state that merged districts between 1998 and 2013. I exclude Saxony-Anhalt and Mecklenburg-West Pomerania from the analysis further on and stick to states without district mergers as the control group. Second, there is no specific East German trend in discussions on district mergers. The East German state governments of Brandenburg and Thuringia presented reform proposals, but also the West German state government of Rhineland-Palatinate commissioned a scientific report in order to evaluate large-scale district mergers. Lower Saxony merged two districts by January 2017. Political parties in Saarland and Schleswig-Holstein proposed district mergers in their 2017 state election manifestos. Thus, political discussions are not limited to East Germany only. Saxony, by contrast, was the only sample state taking policy actions. Even if there would have been some sort of “contagion” from Saxony to other states, it did not materialize in reform proposals.

[Figure 2 about here]

I now turn to the Saxon case. In late 2004, the state government of Saxony started a reform process in order to improve state and local administration (for details see Saxon Ministry of the Interior 2007). An expert commission was set up, and this commission advised to decrease the number of districts and large cities. In December 2005, the state government published key issues of the administration reform. The explicitly stated main targets were to cut back bureaucracy, to get the administration closer to the people, and to reduce administrative costs. In late 2006, a first draft of the reform act was presented and submitted to the state parliament in May 2007. The draft included a proposal for district mergers. The state government conjectured that the “new formation of districts will come with substantial cost reductions.”⁷ In January 2008, the state parliament enacted the reform. There was some uncertainty regarding the ultimate entry into force until the Saxon Constitutional Court rejected complaints of merged cities and districts in summer 2008. By August 01, 2008, the number of Saxon districts decreased from 22 to 10, and the number of large cities decreased from 7 to 3 (see Figure 1).

The 2008 district mergers were part of a general reform of state and local government administration (see Saxon Ministry of the Interior 2008). The reform included the re-assignment of functions from the state level to local governments and state agencies. Most relevantly, parts of public services such as road construction, and surveying and mapping were assigned to the districts. Mergers however do not touch administrative functions of districts. As the sole exception, some functions in environmental administration were assigned from the state level to the district level.⁸ I address the shifts of functions in three different ways. First, the extent of ad-

⁷ Translation by the author. Original in German language: „Durch die Neubildung der Landkreise ergeben sich so erhebliche Einsparungsmöglichkeiten.“ (Saxon Ministry of the Interior 2007, pp. 27).

⁸ This includes some former state-level tasks in environmental core administration (*Umweltfach- und Umweltvollzugsaufgaben*), land consolidation (*Flurneuordnung/Flurbereinigung*) and parts of forest administration (*hoheitlichen Forstaufgaben*).

ministrative re-assigned functions is small. Staff of re-assigned functions other than public services and environmental administration account only for less than 1% of total post-merger staff of Saxon districts.⁹ Therefore, results should not be driven by shifts of functions. Second, throughout the whole period of interest, all states including Saxony carried out (minor) shifts of functions between different layers of government. Most importantly, the main donor pool state, Thuringia, also shifted the environmental administration to the district level in 2008. I assume that there is no systematical difference between the donor pool units and Saxony in terms of decentralization and centralization. Thus, the synthetic control method should also capture the continuous re-assignment of functions. Third, for robustness exercises, I will investigate expenditure categories where I can rule out shifts of functions (e.g., social care, administration, education).

3. Empirical strategy

3.1 Identification

I employ the synthetic control method developed by Abadie and Gardeazabal (2003) and Abadie et al. (2010, 2015). The basic idea of this method is to construct a synthetic counterfactual for a treated unit by matching on the pre-treatment trend of the outcome variable of interest. The identifying assumption is that a treated unit would have evolved in the same manner as a pre-treatment close-fitting synthetic counterpart in the absence of the treatment. The counterfactual is a simple weighted average of untreated control units from a proper donor pool. The weights are derived in such a way that the pre-treatment outcome of the treated unit and the

⁹ Total Saxon district staff was 14,401 after the reform. Transferred staff from the state level to the district level accounts for 3,416 employees. Thereof, about 70 % were employed in public services, 25 % in environmental administration, and 5 % in other administrative branches. See Saxon Court of Auditors (2009).

outcome of the counterfactual fits best. Technically, the pre-treatment Root Mean Square Percentage Error (*RMSPE*) of the observed outcome and the counterfactual pre-treatment outcome is minimized:

$$\min RMSPE_i = \min \sqrt{\sum_{t=1}^T \left[\frac{(y_{it} - \hat{y}_{it})^2}{T} \right]} \quad (1)$$

where y_{it} is the observed outcome of unit i in pre-treatment period t . \hat{y}_{it} is the counterfactual outcome of i in period t , given by a weighted average of untreated units from the donor pool:

$$\hat{y}_{it} = \sum_{j \neq i} w_j y_j, \text{ with } \sum w_j = 1 \quad (2)$$

The counterfactual weights w sum up to unity and are chosen in the way that the *RMSPE* is minimized. Further (cross-sectional) matching predictors can be used to improve the comparability of the counterfactual and the treated unit (for details see Abadie et al. 2015). The results from the synthetic control method provide a causal interpretation if the synthetic counterfactual sufficiently follows the pre-treatment trend of the treated unit, further pre-treatment predictors match well, no further reforms were enacted, and the donor pool units were not affected by the treatment. If these assumptions are met, the method captures institutional as well as other unobservable differences.¹⁰

The 2008 district merger reform in Saxony is an excellent case in this point. First, average district population in Saxony increased from about 113,000 to 290,000 inhabitants. This is a drastic change in average population. Mergers however affected all Saxon districts; a within-

¹⁰ Abadie et al. (2015, p. 498) put it in a nutshell: “Only units that are alike in both observed and unobserved determinants of the outcome variable as well as in the effect of those determinants on the outcome variable should produce similar trajectories of the outcome variable over extended periods of time. Once it has been established that the unit representing the case of interest and the synthetic control unit have similar behavior over extended periods of time prior to the intervention, a discrepancy in the outcome variable following the intervention is interpreted as produced by the intervention itself.”

state counterfactual of merged districts is missing. Therefore, I rely on variation in district expenditures across German states. If mergers come with decreases in expenditures, also state-level aggregates should reflect cost reductions. Mean district population remain constant in ten other German states because there were no district mergers.¹¹ I construct a synthetic counterpart to the aggregate of Saxon districts.

Second, the selection of Saxon districts as the treatment unit was exogenous to considerable extent. After the 2004 state elections, the Conservatives party (CDU) and the Social democrats (SPD) formed a coalition. Neither the CDU nor the SPD addressed the issue of district mergers in their election manifestos and campaigns. Moreover, newspapers report that both parties agreed in the coalition negotiations *not* to merge districts.¹² Also the official coalition agreement does not include an explicit statement on district mergers. The issue of mergers entered the debate not before experts were commissioned to investigate the optimal size of Saxon districts in late 2004. However, neither 2004 expenditures per capita, the average district size, nor the number of districts predict the decision to merge districts in Saxony (see Table 1). Saxony ranked fourth out of the eleven sample states in terms of district expenditures per capita.¹³ Three other German sample states had an average district size which fairly corresponds with the Saxon level of 116,000 inhabitants per district in 2004 (Rhineland-Palatinate: 127,000; Bavaria: 126,000; Thuringia: 105,000).

[Table 1 about here]

¹¹ As single exceptions, the cities of Hannover (Lower Saxony) and Aachen (North Rhine-Westphalia) were merged to the surrounding districts in 2001 and 2009. The unique status of the formed “city districts” however bridges district and city features and should not harm the results at all.

¹² See, e.g., Dresdner Neueste Nachrichten, 28.10.2004, “Koalition will auf Kreisreform verzichten”.

¹³ Note that the German states assigned different functions to districts.

Third, Saxon district mergers in 2008 do not come with a substantial re-assignment of functions in administration. Being the exception, some functions in the environmental administration were assigned from the state to the district level. This changes however should not drive the results. I investigate important expenditure categories other than environmental administration for robustness exercises.

Fourth, district mergers in one state are also unlikely to have an impact on other states. There are also no reasons to believe that potential spill-overs in expenditures changed after the reform – compared to the pre-merger period.

Fifth, I can show that there is a synthetic counterpart that fits the pre-reform trend in expenditures of Saxon districts well (see Section 4.1 below).

In conclusion, the synthetic control method is well suited to study the effect of the 2008 district mergers in Saxony on expenditures. I construct “Synthetic Saxony” by adjusting pre-reform (1998–2007) real-term district expenditures per capita of the donor pool states to Saxon figures. I use further predictors for the period 2005–2007 which may affect district expenditures. Most importantly, I use the average population per district as the scale variable of interest. I further include GDP per capita, and the state-level price level (2013 = 1.00) to capture differences in wealth and prices. GDP per capita also reflects the potential tax base.¹⁴ Local government budgets in Germany mainly target young people (e.g., social and child care, education). I therefore include the young age dependency ratio as the population younger than 20 years by the working

¹⁴ Note that districts basically do not levy taxes. Contributions from municipalities and transfers from the state government, however, are considerably determined by the regional tax base.

age population (21 to 65 years).¹⁵ The unemployment rate¹⁶ and voter turnout in national elections reflect socio-economic conditions and social capital that may also drive public expenditures. Finally, aggregated vote shares for the CDU and SPD in district elections cover the local standing of the two coalition partners CDU and SPD that enacted district mergers in Saxony. “Synthetic Saxony” should neither differ from pre-merger Saxony in terms of expenditures per capita nor in the number of inhabitants and other predictors to draw a strong causal interpretation.

3.2 Data

I use state-level aggregates of district expenditures in Germany, which I obtained from the Statistical Office of Germany upon request.¹⁷ Additional information on population, elections, unemployment and GDP are collected from publications of the Statistical Office of Germany. Monetary data are deflated using the state-level GDP deflator (base year: 2013). I restrict data to the period from 1998 to 2013 because last district mergers in other sample states than Saxony came into force in January 1998, and large-scale migration from the Balkans and the Arab world toward Germany started in 2014 which heavily affected district expenditures. I compute district expenditures per capita as the sum of district expenditures within a state divided by the population living in districts of this state.

Large cities which execute municipal and district functions as one are excluded from all figures. These cities are not comparable to districts in terms of institutions and functions. I also exclude districts of the states of Saxony-Anhalt and Mecklenburg-West Pomerania because these two states enacted district mergers in 2007 and in 2011. The remaining 11 German states include

¹⁵ I also experiment with the old-age dependency ratio (ratio of population over 65 by population between age 18 and 65). Results for total expenditures do not change.

¹⁶ I use the share of unemployed of the working age population (21 to 65 years).

¹⁷ To make figures comparable, I use gross expenditures (*Bereinigte Ausgaben*). Note that expenditures of the four categories do not sum up to total expenditures because gross expenditures do not account for several clearings.

Saxony as the treated unit.¹⁸ Figure 3 gives an impression of the dataset: state aggregates of districts in 10 German states constitute the donor pool, the aggregate of Saxon districts is the treated unit.

[Figure 3 about here]

4. Results

4.1 Baseline

A “Synthetic Saxony” composed of 53.6% of the state of Thuringia, 32.9% Brandenburg, and 13.6% Saarland fits the Saxon pre-treatment trend in total district expenditures and further predictors best. On average, Saxony as well as “Synthetic Saxony” has total district expenditures of around 720 Euro per capita between 1998 and 2007, the unweighted sample mean (without Saxony) was 545 Euro per capita (see Table 2). Average district population, GDP per capita, the price level, young age dependency ratio, voter turnout in the 2005 national election, and CDU/SPD vote shares in district elections fits also well (lower panel of Table 2). The unemployment rate in “Synthetic Saxony” is somewhat smaller (10.7%) than in real Saxony (12.2%). The fitting procedures for the four main expenditure categories yield also comparable synthetic control units (see Section 4.2 later on). The donor pool weights for these expenditure categories are shown in Table 3.

[Table 2 about here]

“Synthetic Saxony” fits real Saxony also from a time series perspective. Figure 4, lower figure, shows that “Synthetic Saxony” (black dashed line) fairly reproduces the Saxon trend in district

¹⁸ The 11 sample states are: Baden-Württemberg, Bavaria, Brandenburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Schleswig-Holstein, Thuringia – and Saxony as the treated unit. The states of Berlin, Hamburg, and Bremen are city states without districts.

expenditures (solid black line) until 2008. Solid gray lines represent individual donor pool states. Real-term district expenditures of both, Saxony as well as its synthetic counterpart increase from around 700 Euro per capita in 1998 to roughly about 800 Euro per capita in 2007. Expenditures increase sharply in 2005 when accommodation costs of long-term unemployed were assigned to the districts in the course of a federal labor market reform. This reform however affects all German states simultaneously.

[Figure 4 about here]

Table 2, center panel, columns (1) and (2)) shows that the mean of district expenditures in Saxony after the reform (807 Euro per capita) hardly differ from synthetic counterpart expenditures of 805 Euro per capita. Against pre-reform expectations, the results thus do not indicate that district mergers result in cost reductions – at least in the first five years after the reform. These findings are in line with anecdotal evidence on the Saxon merger reform reporting that “great expectations changed into great disillusion”. In a similar vein, observers of the 2011 district mergers in another German state, Mecklenburg-West Pomerania, observers state that “even five years after the reform, reductions of costs have not been realized.”¹⁹

The absence of cost savings had far-reaching implications for public finances of districts and municipalities in Saxony. Expecting cost reductions, the state government cut transfers to the districts after 2008.²⁰ Because expenditures did not come down as expected, districts raised substantially higher contributions from the municipalities to compensate transfer cuts. Between 2000 and 2007, the contribution rates (share of municipal revenues transferred to the districts) in Saxony and “Synthetic Saxony” increased almost equally by 13% and 11%. After Saxon

¹⁹ See footnote 3 above.

²⁰ Therefore, the absence of changes in expenditure per capita is not result of persist transfers. If transfers do not change and expenditures follow revenues, expenditures are not likely to come down in the course of reforms.

district mergers (2009–2013), the contribution rate in “Synthetic Saxony” went up by 9%, but by 18% in real Saxony. Furthermore, Saxon districts issued debt to finance expenditures. Outstanding debt of Saxon districts increased by 4% between 2009 and 2013 whereas debt decreased before mergers (2002–2007: -14%). At the same time, debt decreased in “Synthetic Saxony” between 2009 and 2013 by -10% (before mergers: +12%). These developments leads the state government to withdraw cuts and to re-raise district transfers for the period after 2017.

4.2 Robustness

I conduct different robustness tests.²¹ First, I study whether results are driven by certain donor pool units. Figure 5 presents the results of a leave-one-out procedure. The black lines reproduce the baseline results, gray thin lines show the synthetic control results when one individual state was dropped from the donor pool and the procedure was run with the remaining nine states in the donor pool. Repeating this drop-out procedure for all ten donor pool states yields ten different graphs that are depicted in Figure 5. The graphs derived by this procedure hardly differ from the baseline configuration. As the sole exception, the leave-out of the main donor pool state, Thuringia, yields somewhat *lower* counterfactual expenditures between 2009 and 2011 which however convert to the overall trend in 2012/2013. Post-merger expenditures of “Synthetic Saxony” are therefore at least as high as in real Saxony. The results are robust to the exclusion of individual donor pool states.

[Figure 5 about here]

²¹ I abstain from providing the conventional placebo tests because results are robust non-findings – independently of the chosen method, spending category, subsample, and donor pool sample.

Second, I examine whether results hold for the main expenditure categories of districts in Saxony. Figure 6 shows separate synthetic control method results for expenditures for a) administration including public safety and order, b) social care, c) education, and d) economic development, public transport, and environmental administration. Categories a) to c) were not affected by a re-assignment of functions, the pre-treatment trends of Saxon districts are captured well by the synthetic counterfactuals in these categories. Category d) includes all functions which are subject to shifts in the course of the administration reform (public services, environmental administration). The increase in expenditures for economic development, public transport, and environmental administration in Saxon districts from 2007 to 2008 reflects the shift of functions from the state to the districts level in the environmental administration (Figure 6, d)). Results suggest somewhat higher post-merger expenditures in Saxony (176 Euro per capita) compared to “Synthetic Saxony” (150 Euro per capita) (see Table 2). This increase, however, is a result of the switch of some administrative staff from the state level to the district level. In the following, I will refer to categories only that were not affected by a re-assignment of functions and where I can exclude artificial findings (categories a) to c)).

[Figure 6 about here]

On average, expenditures for administration amounted to around 140 Euro per capita in Saxony as well as in “Synthetic Saxony” before the 2008 mergers (Table 2, column (4)). Administrative expenditures which are a main target of district mergers however also hardly differ after the reform; Saxony exhibits mean expenditures of 158 Euro per capita, the counterfactual predicts also 158 Euro per capita in the absence of the reform. Expenditures for education do also differ to only small extent: the pre-reform difference between Saxony (103 Euro per capita) and “Synthetic Saxony” (107 Euro) was 4 Euro per capita. After the reform, the difference is at 5 Euro per capita (92–87 Euro). Figure 6 may imply some cost reductions in Saxony after 2011. This,

however, might also be a result of extensive school reforms in many states and of substantially lower birth rates in Saxony after re-unification.

Social expenditures as the quantitatively most important expenditure category in Saxon districts decrease by around 3% or 16 Euro per capita compared to the predicted counterfactual (see Table 2, column (4)). However, deviations in the pre-reform trend of Saxony and “Synthetic Saxony” in 2004 and 2007 may question whether the results for social expenditures are robust to the chosen method. All prior studies evaluating the effects of merger reforms apply difference-in-differences estimates by convention. Therefore, I follow Abadie et al. (2015) in comparing synthetic control group results to difference-in-differences estimates. I use the treatment unit Saxony and the full (unweighted) donor pool sample of 10 other German states. I estimate the following model with year and state fixed effects:

$$y_{it} = \alpha_i + \beta_1 Post-Mergers + \beta_2 (Treat \times Post-Mergers) + \delta_t + \varepsilon_{it} \quad (3)$$

y_{it} denotes expenditures per capita which is the dependent variable. *Post-Mergers* is a dummy variable which equals one for the period after 2008 and zero otherwise. *Treat* is a dummy for Saxony, but cancels out because state fixed effects are included. The coefficient of interest, β_2 , measures the merger effect. The equation includes state fixed effects (α_i) and year fixed effects (δ_t). ε_{it} is the error term. I exclude the reforming year 2008. I estimate the baseline difference-in-differences model with standard errors robust to heteroscedasticity (Huber-White sandwich standard errors – see Huber 1967, White 1980).

Difference-in-differences estimates for total expenditures, and for expenditures for social care fairly reproduce synthetic control method results (see Table 4, columns (1) and (3)). The coefficient for $(Treat \times Post-Mergers)$ does not turn out to be statistically significant in these specifications. This underpins the non-findings from the synthetic control method.

[Table 4 about here]

Results for expenditures for administration, education, and – to some extent – development, transport and environment (columns (2), (4), and (5)) however differ across methods. For example, difference-in-differences estimates imply a reduction in expenditures for administration of about 10 Euro per capita whereas the synthetic control group method suggests an increase in administrative expenditures of about 2 Euro per capita (see Table 4, column (2)). Similar pattern can be found for education expenditures. Difference-in-difference results indicate a small but significant increase for expenditures for development, transport and environment in the course of the merger reform. Note, however, that this increase may reflect a minor shift of functions in the environmental administration to the district level in Saxony (see section 2.2 for more details). Findings for this particular subcategory should therefore be treated with great caution.

In all three cases, however, the deviation is basically caused by a violation of the common trend assumption of the difference-in-differences method. The lower panel of Table 4 shows the growth rate of pre-reform district expenditures in Saxony, of “Synthetic Saxony”, and of the donor pool average. In the case of administrative expenditures, expenditures per capita decreased by 8% between 1998 and 2007 in Saxony but increased by 11% on donor pool average. In “Synthetic Saxony”, by contrast, administrative expenditures per capita decreased by 7% like in real Saxony. Thus, there seems to be no common trends in administrative expenditures of the donor pool average and Saxony. The same applies to education expenditures and to expenditures for development, transport and environment where difference-in-differences and synthetic control group results deviate. I conclude that the synthetic control method delivers at least similar results to the difference-in-differences method if the common trend assumption is

met (total expenditures, expenditures for social care).²² In these cases, I do not find a significant effect of mergers on expenditures. If pre-reform trends vary, the synthetic control group method is more reliable (Kreif et al. 2016). In these cases, the difference between synthetic control group method predicted expenditures and realized expenditures, i.e., the reform effect, is fairly small for administrative expenditures (2.27 Euro per capita) and education expenditures (-1.65 Euro per capita). Altogether, results do neither indicate effects of district mergers on total expenditures nor on expenditures any main function.

Finally, one may suspect that the amalgamation of four former large cities to their surrounding districts may bias fiscal outcomes after the reform.²³ I restrict the dataset to districts which are *not* merged to a large city in 2008.²⁴ Figure 7 shows that the results do not differ from the baseline setup. Quite the contrary, the fit of real and counterfactual Saxony is even closer after 2006. Thus, no effects on expenditures can be identified even in this homogenous subsample. Mergers of large cities therefore do not drive the results.

[Figure 7 about here]

5. Political effects of the merger reform

Merger reforms mainly target public finances but may also come with unintended political side-effects. For example, politicians tend to overspend in the period between the announcement and the realization of mergers. These common pool problems are well-documented phenomena (see, for example, Hinnerich 2009, Welling Hansen 2014, Saarimaa and Tukiainen 2015). There

²² The study of Becker et al. (2015) is also an excellent case in this point.

²³ The cities of Görlitz, Hoyerswerda, Plauen, and Zwickau were merged to the surrounding districts. After 2008, only the cities of Chemnitz, Dresden, and Leipzig constitute a district of their own.

²⁴ These are Erzgebirgskreis, Leipzig (Landkreis), Meißen, Mittelsachsen, Nordsachsen, Sächsische Schweiz-Osterzgebirge. I obtain district-level microdata of expenditures from the Statistical Office of Saxony.

are, however, also concerns that mergers may harm local democracy. First, increases in jurisdiction size may counteract the demand for local representation (Saarimaa and Tukiainen 2016). Studies show that the number eligible voters of a jurisdiction or constituency is decisive factor for voter turnout (see the survey by Cancela and Geys 2017). Fritz and Feld (2015) document that merger reforms in Germany decreased voter turnout in local elections. The authors also show a reduction in vote shares of non-partisan candidates at the lists of “free voter associations” (*Freie Wähler*) indicating an increase in ideological polarization in local politics in enlarged municipalities. Second, larger administrations may provide public goods less efficient if preferences are heterogeneous across space (Oates 1972). Welling Hansen (2015), for example, shows that satisfaction with the local administration and with local democracy decreased in the course of Danish municipal mergers. If mergers induce dissatisfaction, voters may abstain from the ballot box or may cast their vote in favor of populist parties that absorb frustration. Third, one may also conjuncture effects on the “political supply” side. Upscaling local politics may result in complexity of local politics and decreases in political efficacy (Lassen und Serritzlew 2011a, 2011b). Mergers may therefore crowd out travel and information cost sensitive candidates when jurisdictions become unwieldy large.

To date, there is only limited evidence for these political side effects of mergers. Therefore, I test whether Saxon district mergers affect four different political economy outcomes in district elections (*Kreistagswahlen*): the number of candidates, voter turnout, vote shares for non-partisan candidates, and vote shares for the populist right-wing.²⁵ I substantially extend the dataset collected by Blesse and Roesel (2017) who provide political economy data for district elections. The unit of observation are the six Saxon districts only that were not merged to large cities (see Figure 7) in the district elections of 2004, 2008, and 2014 when candidate data are available.

²⁵ Populist and extreme right-wing parties are NPD, Republikaner, DVU, Schill party, and the AfD.

Two different control groups apply. First, I use the 31 districts of the states of Brandenburg, and Thuringia which are the main synthetic counterpart states to Saxony in the fiscal baseline analysis.²⁶ Brandenburg and Thuringia are East German states that have held district elections at around the time of the Saxon district elections. Second, I use intra-state variation and compare the six Saxon districts to the three large cities of Saxony (Dresden, Leipzig, and Chemnitz) that were unaffected by district mergers as counterfactuals. This allows to exclude state effects that are beyond district mergers.

Because of the low frequency of election data, I apply difference-in-differences estimations instead of the synthetic control group method, and I use district-level data instead of state-level aggregates. I regress political outcome variables on a set of year and time fixed effects and further control variables. As controls I include the number of eligible voters which proxy population dynamics, GDP per capita to control for local income, and the number of candidates per seat to control for the level of political competition.

Table 5 presents the results for both control groups. Panel A refers to the districts of the neighboring states of Brandenburg and Thuringia as the control group, panel B shows the comparison of Saxon districts to unmerged large Saxon cities. First, I turn to the effects on the number of candidates. Survey-based results of Ems (2016) indicate that political participation in Saxon district councils after the 2008 mergers suffers to some extent from increased time-consuming travel costs and complexity.²⁷ Column (1) shows that the number of candidates decrease by 0.3 to 0.7 candidates per 1,000 eligible voters which is substantial given the average ratio of 2.0 candidates per 1,000 eligible voters in Saxony. Thus, district mergers seem to have crowded out time-sensitive candidates that do not run for local elections in enlarged districts anymore.

²⁶ Data for Saarland are not available.

²⁷ The author however conclude that effects are not substantial.

The effects are at least statistically significant at the 15% level which appears to be reasonable for the very small sample of 27 observations in panel B. A decrease of the number of candidates is in line with Lassen und Serritzlew (2011a, 2011b) documenting that citizens' internal political efficacy decrease in jurisdiction size.

Second, I investigate voter turnout (column (2)). I find a statistically significant decrease of around 3 percentage points in district election voter turnout in Saxony for both control groups. This is in line with the study of Fritz and Feld (2015) and further findings that voter turnout decrease in the population size (Cancela and Geys 2017). Third, I test non-partisan candidate vote shares. Results do not corroborate the findings of Fritz and Feld (2015); none of the effects presented in column (3) of Table 5 turns out to be significant. Non-partisan candidates are more present at the municipal level but play only a minor role at the district level which may explain the non-findings. Fourth, I document substantial effects of mergers on right-wing populist vote shares that increase by some 3 to 8 percentage points.²⁸ Right-wing populists do not have a clear agenda regarding municipal mergers. Therefore, a bunch of further more indirect channels comes into consideration. First, people feel to lose control over their local affairs in the course of merger reforms they may react with protest voting for populist movements. Second, if *local* identity erodes, movements that deliver *national* identity can be considered as a compensation. Third, observers worry that Saxon district mergers have damaged working democratic networks and institutions and increased the "political distance" between voters and districts politics.²⁹

²⁸ This is in line with descriptive findings for Austria and Germany where right-wing populist movements seem to benefit from municipal mergers in state elections. In Austria, the right-wing FPÖ stands against a merger reform in 2015 in the state of Steiermark (Roesel 2016). In the German state of Mecklenburg-West Pomerania, large-scale district mergers are said to be one of main driver for a AfD landslide victory in the state elections in 2016 (Roesel and Sonnenburg 2016).

²⁹ See, for example, the Saxon state minister for gender equality and integration, Petra Köpping, stating that district mergers in Saxony destroyed social networks and harmed the democracy (see *Sächsische Zeitung*, 14.11.2016).

Altogether, findings indicate that mergers of local governments may result in substantial political side effects. Given the low number of observations and stylized nature of the results, however, further research is required to understand the conditions and channels of these effects, especially the effects on right-wing populism.

6. Conclusion

I use the synthetic control method to identify the effect of mergers of county-sized administrations on public expenditures. The results of this study do not show that mergers of large local governments covering about 100,000 inhabitants result in scale effects. The findings neither indicate decreases in total expenditures, nor in main expenditure categories. Given the substantial political costs of mergers, e.g., decreases in voter turnout, net benefits of mergers of large local governments seem to be at least low.³⁰ This casts some doubt on further mergers of county-sized administrations as planned in many countries (e.g., Germany, the United States, Austria, or Ireland). From a methodological point of view, I show that the synthetic control method outperforms difference-in-differences when the common assumption is likely to be violated. The synthetic control group procedure may therefore accompany difference-in-differences estimations in order to improve counterfactual analyses.³¹

The results of this study, however, do not allow drawing conclusions regarding efficiency. If merged districts were able generate more output using the same inputs (expenditures), gains in efficiency would have been achieved. However, a concept of measuring local government output which would allow an efficiency analysis is still missing. Studies that use proxies are rather

³⁰ Voluntary mergers, by contrast, may suffer from an inefficient mapping due to competition avoiding politicians. See Hyytinen et al. (2014). Other studies discuss the effects of mergers on growth (Kauder 2016), public debt (Jordahl and Liang 2010), or political business cycles (Aaskoven 2017).

³¹ DeAngelo and Hansen (2014) propose as a similar strategy to use synthetic control weights as regression weights in difference-in-differences estimations.

inconclusive; papers document increases but also decreases of local government efficiency in population size (Narbón-Perpiñá and De Witte 2017). As a second drawback, the results of this study cannot be applied to other levels of local government such as municipalities. Municipalities differ from districts in functions, size and administrative capabilities. Furthermore, municipal mergers often come with adjustments of intergovernmental transfers and a decentralization of functions. Hence, further efforts should be undertaken to separate the effect of mergers on fiscal outcomes from other elements of local government reforms. Third, data constraints do not allow to take a long-term perspective. Future research may elaborate on the long-term effects of local government mergers on expenditures, on the quality of services, and on the political side effects in particular. The mechanisms behind the merger effect on right-wing populist vote shares are yet far from clear and deserves further attention.

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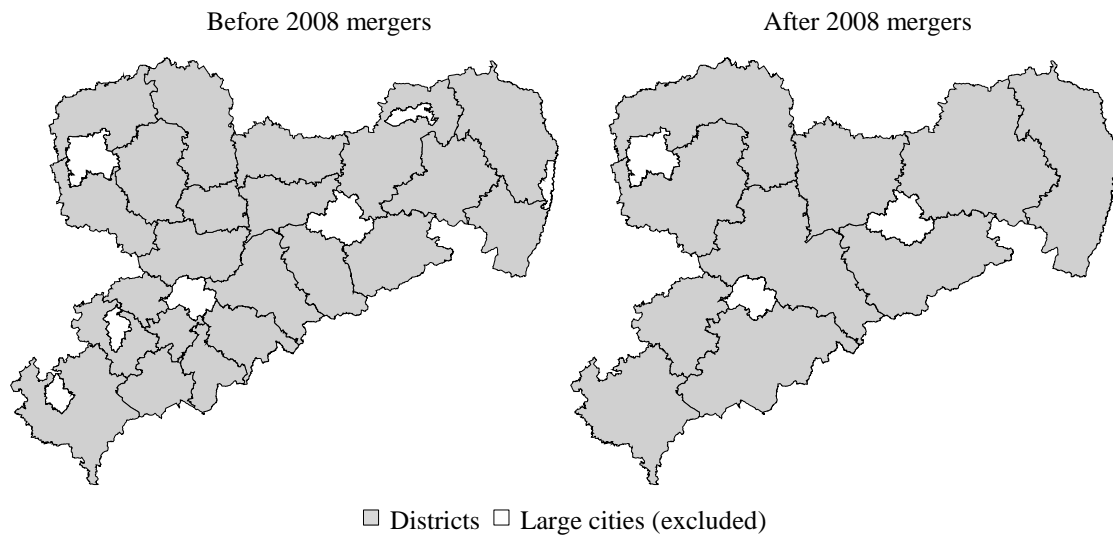
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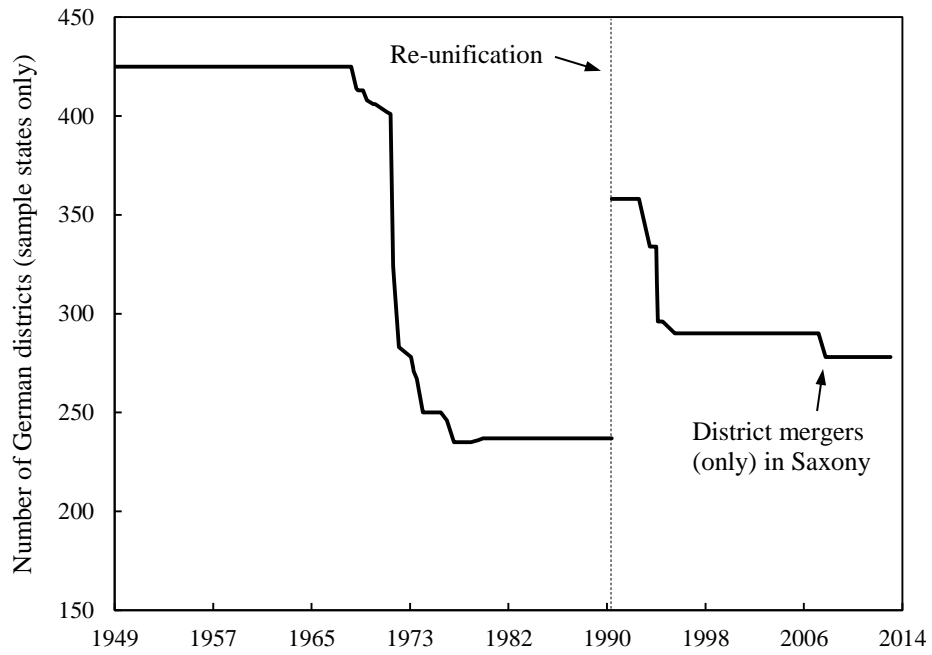
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FIGURE 1. DISTRICTS OF SAXONY



Notes: The maps show the districts (*Landkreise*) of the German state of Saxony before and after the 2008 mergers (gray). Large cities (*Kreisfreie Städte*, white) constitute districts of their own and are excluded from the analysis.

FIGURE 2. NUMBER OF DISTRICTS IN GERMANY



Notes: The figure shows the number of districts (*Landkreise*) in Germany (1949–1990: West Germany only, states of Mecklenburg-West Pomerania and Sachsen-Anhalt excluded).

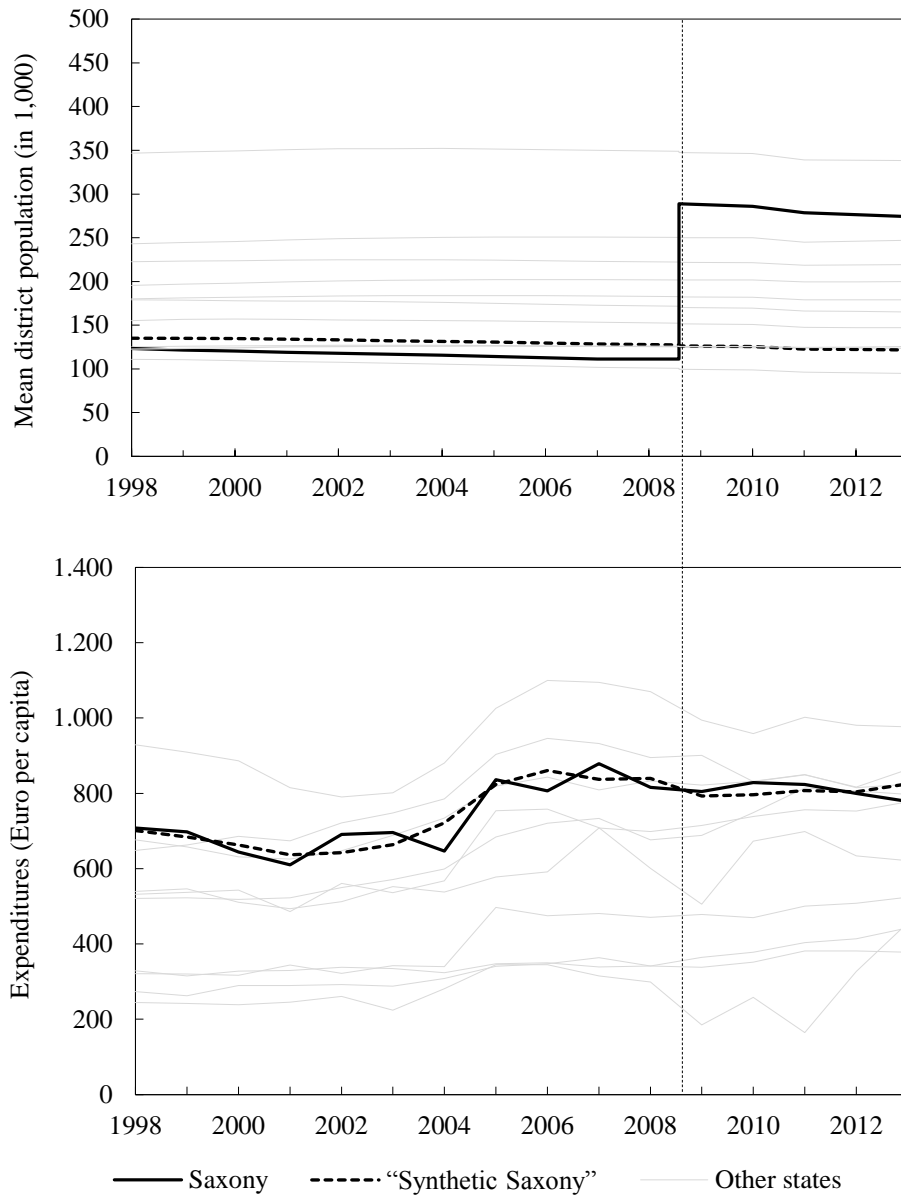
FIGURE 3. VISUALIZATION OF DONOR POOL AND TREATED UNIT



□ Donor pool ($n = 10$) ■ Treated unit (Saxony, $n = 1$) □ Large cities (excluded)

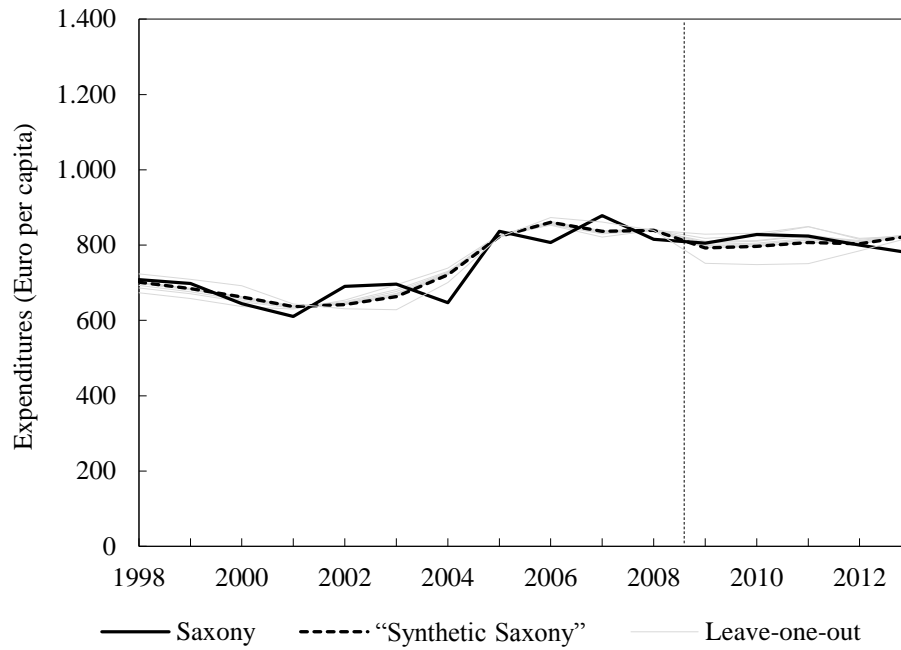
Notes: The map shows the 10 donor pool units in light gray (state-level aggregates of districts (*Landkreise*), large cities (*Kreisfreie Städte*) are excluded), and Saxon districts as the treated unit (dark gray). *) States of Mecklenburg-West Pomerania and Sachsen-Anhalt excluded.

FIGURE 4. EFFECT OF DISTRICT MERGERS ON TOTAL EXPENDITURES



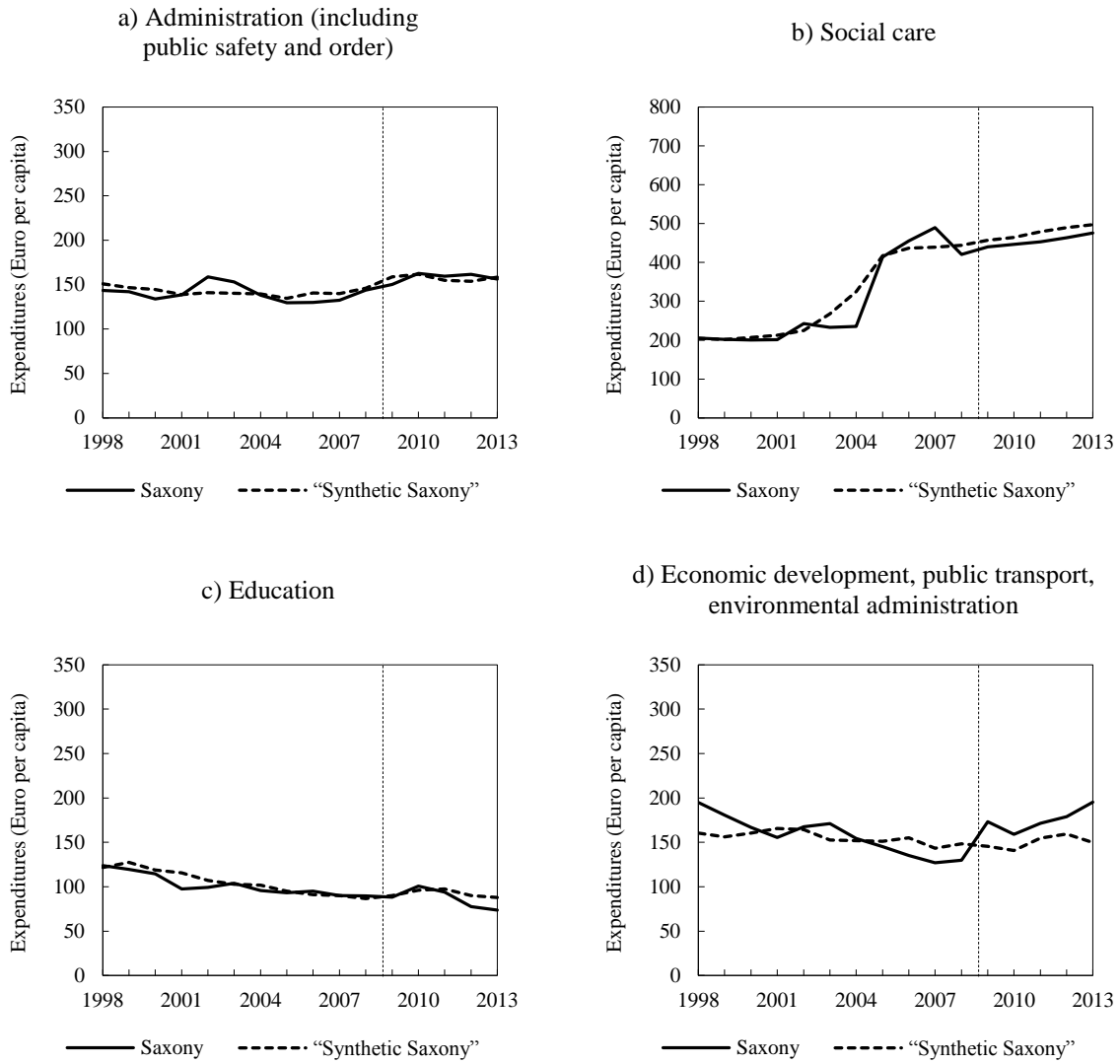
Notes: The upper figure shows the mean district population of districts in Saxony (black solid line), in the 10 German states (light gray), and in "Synthetic Saxony" (dashed black line) that is composed from these 10 states. Similarly, the lower figure shows per-capita expenditures. The vertical line depicts the district mergers in Saxony in August 2008. For the composition of "Synthetic Saxony" see Table 3.

FIGURE 5. LEAVE-ONE-OUT PROCEDURE



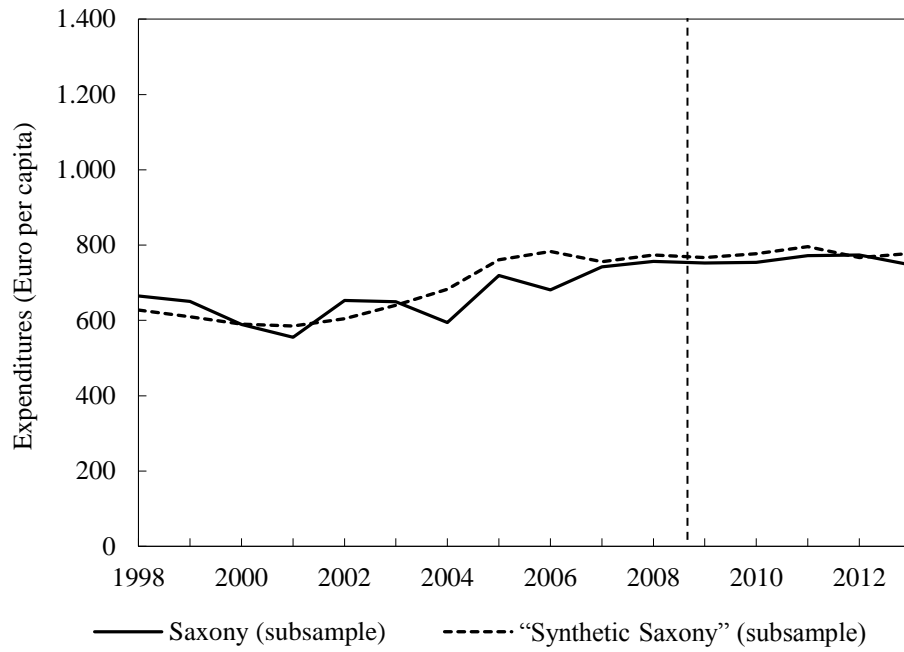
Notes: The figure per-capita expenditures of two main expenditure categories in Saxony (solid line) and "Synthetic Saxony" (dashed line). Gray lines show synthetic control method results, each excluding one state from the donor pool.

FIGURE 6. EXPENDITURES BY CATEGORIES



Notes: The figure shows per-capita expenditures of the four main expenditure categories in Saxony and “Synthetic Saxony”. Note the different scale of social expenditures. The vertical lines depict the 2008 district mergers in Saxony in August 2008. For the composition of “Synthetic Saxony” see Table 3.

FIGURE 7. SUBSAMPLE (NON-CITY MERGERS ONLY)



Notes: The figure shows synthetic control method results for Saxon districts which were *not* merged to a large neighboring city (Erzgebirgskreis, Leipzig (Landkreis), Meißen, Mittelsachsen, Nordsachsen, Sächsische Schweiz-Osterzgebirge). "Synthetic Saxony" consists of 87.9 % Thuringia, 12.0 % North Rhine-Westphalia, and 0.1 % Schleswig-Holstein.

TABLE 1. PROBABILITY OF DISTRICT MERGERS (PROBIT ESTIMATIONS)

	<i>Decision on district mergers in 2004 (yes=1)</i>			
	(1)	(2)	(3)	(4)
<i>Expenditures per capita 2004</i>	0.002 (0.003)			-0.008 (0.039)
<i>Population per district 2004</i>		-0.000 (0.000)		-0.000 (0.000)
<i>Number of districts 2004</i>			-0.012 (0.041)	-0.061 (0.195)
Constant	-2.360 (2.020)	4.324 (7.108)	-1.049 (1.080)	16.506 (61.279)
Obs.	11	11	11	11
Pseudo-R ²	0.05	0.35	0.01	0.39

Notes: The table shows probit estimations for the probability of a decision on district mergers in 2004. The dependent variable is dummy which equals one for Saxony and zero otherwise. Significance levels (Robust standard errors in brackets): *** 0.01, ** 0.05, * 0.10.

TABLE 2. DESCRIPTIVE STATISTICS

	<i>Saxony</i>	<i>“Synthetic Saxony”</i>	<i>Full sample (without Saxony)</i>	<i>Ratio Saxony/“Synthetic Saxony”</i>
	(1)	(2)	(3)	(4)
Before mergers (1998–2007)				
<i>Total expenditures</i>	722	723	545	100%
<i>Administration (incl. public safety)</i>	140	142	89	99%
<i>Social care</i>	288	294	381	98%
<i>Education</i>	103	107	116	96%
<i>Development, transport, environment</i>	160	156	100	102%
After mergers (2009–2013)				
<i>Total expenditures</i>	807	805	635	100%
<i>Administration (incl. public safety)</i>	158	158	117	100%
<i>Social care</i>	456	478	563	95%
<i>Education</i>	87	92	134	94%
<i>Development, transport, environment</i>	176	150	108	117%
Predictors^a				
<i>Population per district (2005–2007)</i>	112,889	129,656	189,454	87%
<i>GDP per capita (2005–2007)</i>	20,630	21,380	26,075	96%
<i>Price level (2005–2007)</i>	0.90	0.90	0.91	100%
<i>Young age dependency ratio (2007)</i>	21.16	21.41	27.97	99%
<i>Unemployment rate (2007)</i>	12.16	10.66	6.68	114%
<i>Voter turnout in national election (2005)</i>	76.33	75.98	78.54	100%
<i>CDU/SPD vote share in district elections</i>	55.60	60.05	48.40	93%

Notes: Expenditures: Euro per capita in 2013 constant prices, GDP per capita: Euro per capita in 2013 constant prices. For the composition of “Synthetic Saxony” see Table 3. a) Predictors of donor pool weights for total expenditures.

TABLE 3. DONOR POOL WEIGHTS

	<i>Expenditure categories</i>				
	<i>Total expenditures</i>	<i>Administration (incl. public safety)</i>	<i>Social care</i>	<i>Education</i>	<i>Development, transport, environment</i>
	(1)	(2)	(3)	(4)	(5)
Baden-Württemberg	0	0	0	0	0
Bavaria	0	0	0.170	0	0
Brandenburg	0.329	0.419	0	0.638	0.738
Hesse	0	0	0	0	0
Lower Saxony	0	0	0	0	0
North Rhine-Westphalia	0	0	0	0.362	0
Rhineland-Palatinate	0	0	0	0	0
Saarland	0.136	0	0	0	0.101
Schleswig-Holstein	0	0	0	0	0
Thuringia	0.536	0.581	0.830	0	0.161

Notes: The table shows the donor pool weights for the “Synthetic Saxony” in terms of total expenditures, administrative expenditures and social expenditures.

TABLE 4. DIFFERENCE-IN-DIFFERENCES ESTIMATIONS

	<i>Total expenditures</i>	<i>Expenditure categories</i>			
		<i>Administration (incl. public safety)</i>	<i>Social care</i>	<i>Education</i>	<i>Development, transport, environment</i>
	(1)	(2)	(3)	(4)	(5)
Synthetic control group					
<i>Pre-Post-Reform difference</i>	3.79	2.27	-16.16	-1.65	21.91
Difference-in-differences (<i>Treat × Post-Mergers</i>)	-4.83 (20.54)	-9.69** (4.15)	-13.90 (25.99)	-33.88*** (10.55)	7.38* (3.98)
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>State fixed effects</i>	Yes	Yes	Yes	Yes	Yes
<i>States</i>	11	11	11	11	11
<i>Obs.</i>	165	165	165	165	165
<i>Within R²</i>	0.69	0.74	0.82	0.21	0.19
Pre-merger growth (1998–2007)					
<i>Saxony</i>	24%	-8%	138%	-27%	-35%
<i>“Synthetic Saxony”</i>	19%	-7%	115%	-26%	-11%
<i>Donor pool average</i>	29%	11%	52%	1%	5%

Notes: The table compares results from difference-in-differences estimations (left-hand side) to synthetic control method results (right-hand side). Synthetic control method results are derived from Table 2 as the difference in before-after merger differences of Saxony and “Synthetic Saxony”. The difference-in-differences sample consists of the treated unit (Saxony) and all (unweighted) donor pool units. The dependent variable is district expenditures per capita. Significance levels (Robust standard errors in brackets): *** 0.01, ** 0.05, * 0.10.

TABLE 5. POLITICAL EFFECTS OF THE MERGER REFORM

<i>Control group: Districts of Brandenburg and Thuringia</i>				
<i>Panel A</i>	<i>Candidates per 1,000 eligible voters</i>	<i>Voter turnout</i>	<i>Vote share for non- partisan candidates</i>	<i>Vote share for right- wing populists</i>
	(1)	(2)	(3)	(4)
<i>(Treat × Post-Mergers)</i>	-0.699*** (0.118)	-3.039*** (1.059)	-2.304 (2.399)	3.118* (1.567)
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes
<i>State fixed effects</i>	Yes	Yes	Yes	Yes
<i>Further controls</i>	Yes	Yes	Yes	Yes
<i>Districts</i>	37	37	37	37
<i>Obs.</i>	111	111	111	111
<i>Within R²</i>	0.803	0.318	0.103	0.598
<i>Control group: Unmerged large cities of Saxony</i>				
<i>Panel B</i>	<i>Candidates per 1,000 eligible voters</i>	<i>Voter turnout</i>	<i>Vote share for non- partisan candidates</i>	<i>Vote share for right- wing populists</i>
	(1)	(2)	(3)	(4)
<i>(Treat × Post-Mergers)</i>	-0.300 [†] (0.177)	-3.611** (1.307)	1.670 (2.417)	8.305* (3.883)
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes
<i>State fixed effects</i>	Yes	Yes	Yes	Yes
<i>Further controls</i>	Yes	Yes	Yes	Yes
<i>Districts/large cities</i>	9	9	9	9
<i>Obs.</i>	27	27	27	27
<i>Within R²</i>	0.767	0.608	0.458	0.846

Notes: The table shows the results of difference-in-differences estimations using outcomes of district elections (*Kreistagswahlen*) as dependent variable. The unit of observation are the 6 Saxon districts without mergers with a large city (see Figure 7), and in panel A the districts of the neighboring states of Brandenburg (14) and Thuringia (17), and in panel B the 3 large cities of Saxony (Dresden, Leipzig, Chemnitz). Further controls are the number of eligible voters, GDP per capita, and the number of candidates per seat. Data cover district elections in 2003/2004, 2008/2009 and 2014. Significance levels (Robust standard errors in brackets): *** 0.01, ** 0.05, * 0.10, [†] 0.15.