ZEW Expert Brief

NO.08 // NOVEMBER 2022

// Zareh Asatryan (ZEW Mannheim), Friedrich Heinemann (ZEW Mannheim), and Justus Nover (ZEW Mannheim)

The Other Government: State-Owned Enterprises in Germany and Their Implications for the Core Public Sector

Leibniz Association

STRUBE STIFTUNG

ZEW

Acknowledgements: We thank Désirée Christofzik for helpful comments, the staff at the Research Data Centers of Baden-Württemberg and Berlin-Brandenburg for their assistance in processing the data, and gratefully acknowledge financial support of the Brigitte Strube Foundation.

Table of contents

Executive Summary

- This paper aims to raise the awareness and knowledge about state-owned enterprises (SOEs) in Germany – a sizable but often ignored part of the overall public sector which we, therefore, label the "other government" – to facilitate an informed debate about the full scale of fiscal activities and economic involvements of governments. Whereas SOEs are influenced by public decision makers in their agenda setting and are in principle part of the public sector, their role and activities are much less frequently discussed in public and scientific debates or official statistics which typically concentrate on governments' *core budgets*.
- We make two contributions: First, we document extensively the important trends underlying SOEs in Germany. We use micro-economic data to provide evidence on the economic relevance of SOEs in general and across economic sectors, as well as their dynamics over time, states, and government layers. Overall, we find that SOEs are of great and perhaps underappreciated economic relevance. We identify one risk related to such growth patterns in SOEs which has to do with the fact that, absence strong monitoring, the size and scope of SOEs can reduce the transparency of the public sector in Germany.
- Second, we focus on the debt and liabilities held by SOEs and ask whether it undermines the general sustainability of public finances in Germany. In particular, we study the question of whether core budgets use SOEs as a vehicle to circumvent fiscal rules such as the German constitutional debt brake. It is well known that fiscal rules often inspire creative accounting, and, given the issues of transparency with SOEs, we study the hypothesis of whether decision makers move public activities into those areas of the public sector which are not under strict scrutiny.
- Our empirical analysis relies on annual accounts data of the universe of commercial accounting SOEs in Germany over the period 2008 to 2019 from the Federal Statistical Office. SOEs are defined as all funds, institutions, and enterprises operating outside of the public *core budgets* but in which government units hold a majority share of more than 50 percent.
- Using this data, we document that SOEs are highly relevant for the German economy. When measured by the number of employees, they account for almost 40 percent of the overall public sector and hold 35 percent of public credit market debt. They are particularly prevalent at the local level where they employ as many people as the *core budgets* and hold 61 percent of public credit market debt.
- The above numbers are for 2019, while our analysis shows that SOEs are strongly growing in numbers over time with growth rates being especially high at the state but also the local government level. Further analyses document that most new SOEs operate in the energy provision sector, have a private legal form, and are classified as market producers – exemplifying a trend towards more independent SOEs.
- Eastern states manage a larger number of SOEs per capita but Western states are catching up. This heterogeneity poses a serious threat to the comparability of state-level statistics: As

long as outsourcing rates differ across states, statistics that only capture the *core budgets* will suffer from a bias. This is best illustrated by again looking at credit market debt: Whereas in Rhineland-Palatinate, 61 percent of local public debt is held by *core budgets*, this number is as low as 15 percent for the state of Baden-Württemberg (numbers for 2019).

- Besides the comparability issue, a widespread use of SOEs also reduces public sector transparency by adding complexity. With over one third of SOEs being held only indirectly, it is difficult for both governments and the public to keep track of all government activities. This may create a leeway for politicians to use SOEs in creative ways.
- Once having documented these trends underlying the SOE sector in Germany, we focus on the question of debt and liabilities held by SOEs. In particular, we explore the introduction of fiscal rules for the central level in 2016, when the debt brake became effective, and study changes in SOEs' economic activities through a closer empirical scrutiny.
- Increases in SOE categories that hint to a circumvention of the German debt brake by relying more heavily on SOEs not captured by the fiscal rule, turn out to be driven by local SOEs not captured by the debt brake. Regression models using a difference-in-difference approach to evaluate the impact of the debt brake becoming effective for the central government in 2016, do not provide clear evidence for an effect on central government SOEs.
- Overall, we conclude that there is no smoking gun evidence supporting the hypothesis that SOEs were used systematically as vehicles to circumvent fiscal rules around the 2016 implementation at the central government level. However, this analysis is bound to the short run after the imposition of rules, where the economy was doing relatively well. It cannot be excluded that the situation will reverse in the longer time horizon, especially when the economy finds itself on the negative side of the business cycle. The recent establishment and extension of SOEs like the "Sondervermögen Bundeswehr" or the "Klima and Transformationsfonds"– as clear examples of a circumvention strategy – call for a close monitoring and more research on this issue.

1 Introduction

State-owned enterprises (SOEs) constitute a large chunk of many economies. In Germany, they are comparable in size to the core budgets of some government sectors, for example, when measured by the number of employees they hire or the amount of outstanding credit market debt they hold (see Section 3.2). Recently, SOEs have gained in relevance even further with increasing levels of government intervention in the economy during the Covid-19 crisis (European Bank for Reconstruction and Development, 2020; OECD, 2020).

The mainstream economic rationale behind establishing state ownership includes the need to address market failures, for example in natural monopoly settings, to provide public goods, or on account of significant externalities from private goods, for example in health and education services, or network industries. In practice, however, SOEs have been established and continue to flourish for many other reasons, as evidenced by their existence in a wide range of sectors. In Germany, about half of all economic sectors have at least one enterprise with state ownership (OECD, 2020). The list of more than 20,000 German-based SOEs is highly diverse and includes airports and railway companies, universities, financial vehicles like the recent "Sondervermögen Bundeswehr", nursing homes and hospitals, energy suppliers, water supply and waste disposal services, funeral homes, and even wineries and breweries, among many others.

We take the heterogeneity, scope, and depth of the involvement of SOEs seriously, and set out to study the size and dynamics of SOEs in Germany. In so doing, we aim to facilitate a discussion about this "other government", and its relevance to the traditional public sector.

Our study proceeds in two steps. First, we provide a broad overview of the relevance, size, activities, and dynamics of SOEs in Germany. This is an important task, since it helps to answer the question of how different the public sector would present itself if public sector statistics were to fully and consistently account for SOEs. Our main contribution here is a methodological one: We use micro-economic data and document important trends that characterize the SOE sector in Germany. This contribution is then meant to serve as a starting point for more detailed analyses.

Second, we perform one specific application using the micro-economic data on SOEs described above. In particular, we ask the question of whether SOEs in Germany are used as a vehicle to circumvent fiscal rules. This is a relevant question especially in the current environment of rising levels of government debt and increasing political pressure to revise fiscal rules to make a leeway for more government spending. This question has recently moved closer to the center of attention in the (public) debate on the German debt brake (see, e.g., Blesse et al., 2021). The development was fueled by the emergence of the new "Sondervermögen Bundeswehr" which established a 100 billion Euro investment fund for the military outside of the debt brake as it was enshrined in the constitution (Federal Ministry of Finance, 2022a; Advisory Board to the Stability Council, 2022).

Our results show that SOEs are strongly growing in numbers with growth rates being especially high at the state but also the local government level. Moreover, Eastern states manage a larger number of SOEs per capita but Western states are catching up. For credit market debt, we document even more sizable differences between states. Including debt held by SOEs increases the per capita debt levels (for local and state governments combined) between 5.7 percent (Bremen) and 238.5 percent (Sachsen, in 2019). One takeaway from these findings is that the public sector would look both much larger and quite different if we were to include SOEs in commonly used statistics on public sector finances.

Our results regarding fiscal rules suggest that there is no clear evidence to claim that German governments relied on creative accounting techniques by systematically using SOEs to circumvent the debt brake. The descriptive analysis in Section 3 gives some indication of increased SOE activity and possible outsourcing behavior after the debt brake became effective for the central government in 2016. However, the data suggests that these patterns are rather due to SOEs owned by local governments that were not directly subject to a change in fiscal rules. In the regression analysis, we find no robust evidence for increased outsourcing activity after the 2016 debt brake's full effectiveness for the central level. At the same time, we cannot rule out this possibility and call for more research on the issue. Particular focus should be placed on adverse spillover effects on local governments which may experience a downward shift of public responsibilities from higher government levels due higher fiscal pressure at the central and state government level.

What our analysis shows is that the implementation of the German debt brake for the central and state governments coincides with a strong expansion of the SOE sector. It remains largely unclear what drives this strong growth in SOE activity. The political or economic reasons behind this trend should therefore be taken under closer scrutiny. What is certain, however, is that this development reduces public sector transparency and complicates both the effective steering of SOEs by their public owners as well as the monitoring efforts by scientists and independent counsels.

The economics scholarship on SOEs tends to primarily focus on the policy question of whether to privatize SOEs or not (for reviews, see, Megginson and Netter, 2001; Sheshinski and López-Calva, 2003; Barkley, 2021). The evidence that SOEs are inefficient compared to private enterprises is, in general, well established (see, among others, Atkinson and Halvorsen, 1986; Ehrlich et al., 1994; Hausman and Neufeld, 1991; La Porta and L´opez-de-Silanes, 1999). This particular aspect has fueled a wave of privatization of SOEs in the 1980s, which was further reinforced with the market transition processes of the 1990s following the dissolution of the Soviet Union (IMF, 2020). The economic literature of this period tends to focus on the political-economy reasons behind the question of why governments struggle to manage SOEs effectively, for example, highlighting the role of rent-seeking (Djankov and Murrell, 2002). More recently, the special case of China that combines extraordinary growth with the large presence of SOEs in its economy has generated renewed interest in SOEs among economists (Berkowitz et al., 2017; Fan

et al., 2007; Hsieh and Song, 2015; Storesletten and Zilibotti, 2014). In Germany, likewise, both the academic and policy debates have been rather narrowly focusing on the question of whether to privatize them or not.

This report is structured as followed. Section 2 provides the institutional background on SOEs, in particular defining what constitutes an SOE, and discusses the German debt brake as well as its relevance for SOEs. Section 3 presents a thorough descriptive analysis of SOEs in Germany from 2008 to 2019 including, as discussed, evidence on the economic relevance of SOEs in general and across economic sectors, their dynamics over time, states, and government layers. Section 4 presents our regression analysis on the consequences of the German debt brake on SOEs, in particular asking whether politicians used SOEs to circumvent the fiscal rule. Section 5 concludes.

2 Institutional background on state-owned enterprises in Germany

2.1 Definition and differentiation from the core budgets

According to the definition of the European System of Accounts (ESA 2010), state-owned enterprises (SOEs) describe all units in which governments hold a majority share of more than 50 percent in terms of capital or voting rights (Eurostat, 2013, items 2.38 and 2.39; Schmidt, 2011). From this property, it follows that public decision makers, rather than only markets, shape the decisions of SOEs. At the same time, SOEs operate outside of the *core* public sector and its *core* budgets.

In Germany, SOEs are termed "Öffentliche Fonds, Einrichtungen und Unternehmen", and they include not only enterprises but also public funds and institutions. They engage in many kinds of activities. Traditionally, the focus is on the provision of public goods and services that are outsourced from the *core budgets*, but SOEs also function as an instrument to facilitate economic activity more generally (Federal Statistical Office, 2022a).

Examples of SOEs at each government level and in different sectors of the economy help better illustrate the variety of activities they are engaged in. At the central government level, perhaps the most well-known SOEs is the Deutsche Bahn with its numerous subsidiaries. At least since the global financial crisis and the euro area debt crisis, the central government also heavily relied on SOEs as a policy instrument and stabilization tool. Examples include the "SoFFin" (Finanzmarktstabilisierungsfonds/FMS) or the "FMS Wertmanagement", better known as the *bad bank* which took over the portfolio of the financially distressed Hypo Real Estate Holding in 2010 (FMS Wertmangagement, 2022). Lately, the "Sondervermögen Bundeswehr" – the 100 billion financial vehicle to finance the expansion and modernization of the German army – joined the list of central government SOEs (Federal Ministry of Finance, 2022a).

At the level of the 16 states, examples of SOEs include public universities, cultural institutions, railway companies, and airports like the Berlin Brandenburg airport BER. They also include financial instruments comparable to those at the central government level to finance public projects provisionally or to promote the private economy.[1]

SOEs owned by local governments – in particular the more than 11,100 municipalities and districts (in 2019, Statistical Offices of the Federation and the Länder, 2022) – are much more focused on the provision of local infrastructure and services. Examples include municipal utilities, energy, water, and sewage companies, hospitals, special purpose associations to organize inter-municipal cooperation, real estate firms in charge of the management and rental of public property, among others.

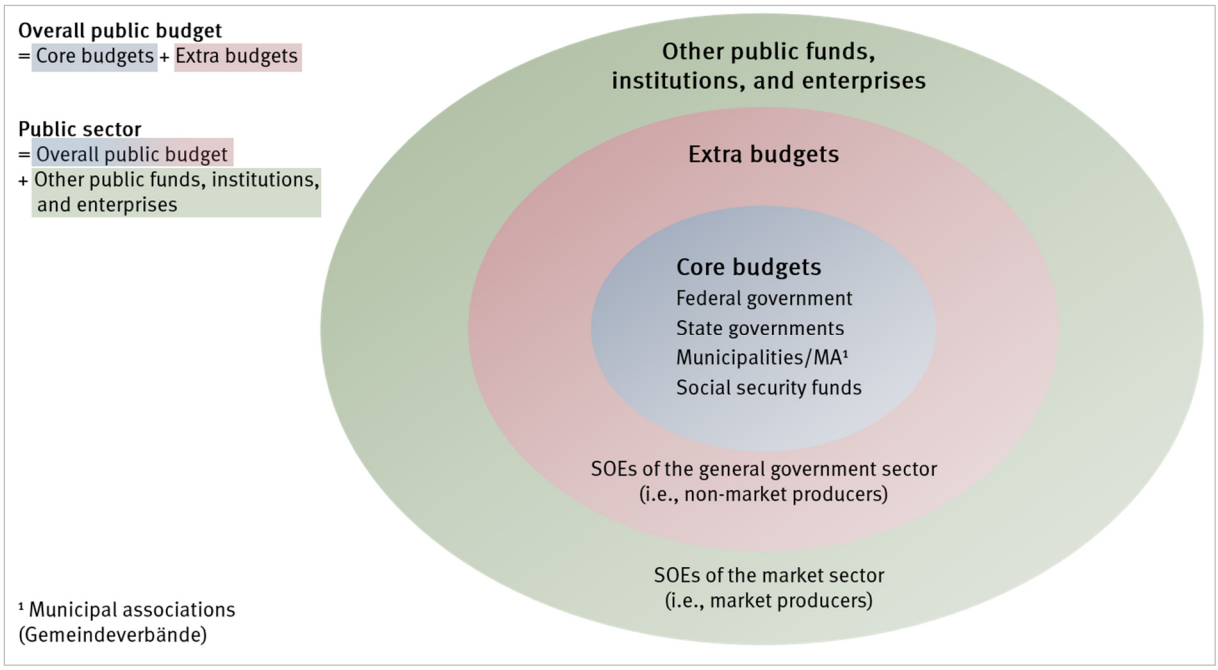
To be able to systematically quantify the different types of SOEs and the role they play in the overall public sector, we rely on a categorization scheme in financial statistics that is uniform across EU countries. In accordance with EU rules, government activities are classified according to government sector accounts (see Figure 1) to ensure a consistent classification of, for example, government spending or debt across countries. As depicted in Figure 1, this leads to the emergence of three government sector accounts (Eurostat, 2013). At the center there are the *core budgets*, whereas the two outer layers consist of all SOEs. The latter are classified as belonging either to the general government sector (so called *extra budgets* or *non-market producers*) or as being outside the general government sector (so called *other public funds, institutions, and enterprises* or *market producers*).

The distinction between *market-* and *non-market producers* is particularly important for the consistent calculation of public debt figures – and therefore for issues related to the compliance with fiscal rules – and is mostly based on whether SOEs' own revenues cover more than 50 percent of their production cost or not. The criteria for the classification of public institutional units (any institution or enterprise subject to some form of government involvement) according to government sector accounts are illustrated in Figure 2 below. Examples of *extra budget SOEs* are the "Sondervermögen Bundeswehr", the "Klima und Transformationsfonds",[2] most public universities (university hospitals being an exception), or tourism, city marketing, and public administration associations owned by local governments. In contrast, Deutsche Bahn or many local SOEs that provide energy, water, or sewage services – and therefore generating significant

[1] Examples include the „Finanzierungsgesellschaft für öffentliche Vorhaben des Landes Baden-Württemberg mbH", the „Bayernfonds", or the „Aufbaubanken" in Thüringen and Sachsen.

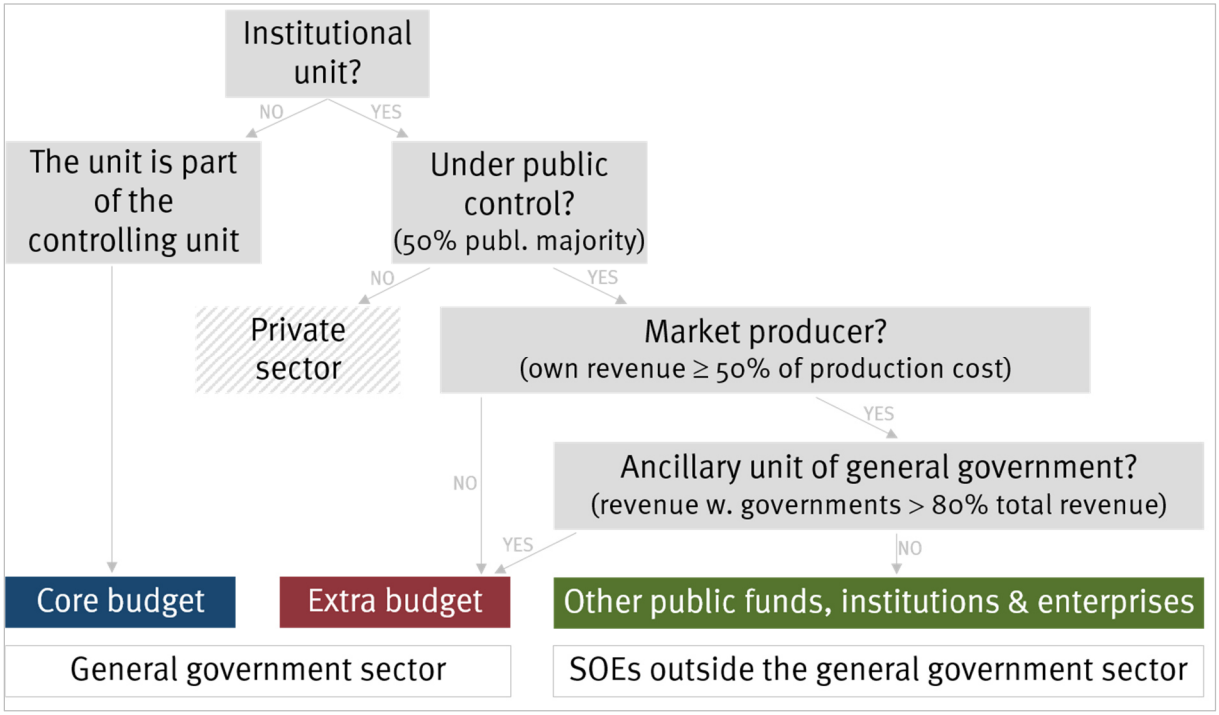
[2] The Klima und Transformationsfonds is a public fund, originally called "Energie und Klimafonds", to finance policy measures with the goal to meet the 2030 climate targets of the German government (Federal Ministry of Law, 2022).

Figure 1: Government sector accounts



Notes: Based own Federal Statistical Office (2019).

Figure 2: Categorization scheme for government sector accounts



Notes: Based on Schmidt et al. (2017). Ancillary units of general government are firms that generate more than 80% of their revenue by making business with government units.

own revenue – constitute *market producers*. Complete lists of all *extra budgets* and *other public funds, institutions, and enterprises* are available on the websites of the Federal Statistical Office.[3]

As the above discussion already reveals, an analysis of SOEs in Germany needs to take into account that the government sector is not only differentiated by sector accounts, but also vertically divided into four sub-sectors: the central government, the state governments, local governments, and social security funds (Eurostat, 2013). The social security funds are the institutions to implement and administer the compulsory social security branches in Germany[4], and they stand out next to the territorial entities at the local, state, and central government level. Importantly, each of the four subsectors can, and does, hold both types of SOEs – *extra budgets* and *other public funds, institutions, and enterprises.*

The reasons for governments to rely on SOEs are manifold. First, a mainstream economic rationale behind establishing state ownership includes the need to address market failures, for example in the provision of public goods or in natural monopoly settings, or on account of externalities from the provision of merit or specific private goods such as health or education services, or in the context of network industries. Second, the holdings or participations reports of the states or the central government prominently feature the argument of high flexibility and efficiency in the context of public services being provided via SOEs. Such efficiency and flexibility gains can range from less stringent wage-setting rules in SOEs compared to public *core budgets*, over the earmarking of user fees for particular expenditure categories,[5] to a stronger productivity and profit orientation of more privately organized structures as documented by the comprehensive public management literature (e.g., Atkinson and Halvorsen, 1986; Putniņš, 2015; Knutsson and Tyrefors, 2022). Another advantage can arise due to scaling and knowledge spillover effects when multiple territorial entities can join forces in the form of an SOE to collectively provide a public service like cross-regional public transportation.

On the contrary, there are also concerns related to a heavy reliance on SOEs. At a general level, one risk with off-budget activities is that government activities become intransparent and are partly even concealed if relevant data is not adequately captured. SOEs are therefore often termed "shadow budgets". The lack of transparency and complex owner-structures also constitute a real challenge for the effective steering of SOEs by the public owners. It is thus questionable whether SOEs always act in line with public interests and contribute to the common good (see, e.g., German Council of Economic Experts, 2017). From a competition perspective, the broad existence of SOEs across sectors also raises concerns as they compete with, and may

[3] For *extra budgets*, see: https://www.statistischebibliothek.de/mir/receive/DESerie_mods_00003423. The list of *market-producers* is available at: https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/Fonds-Einrichtungen-Unternehmen/Methoden/Downloads/liste-sonstige-FEU-2021-pdf.html.

[4] Notably, this includes the public unemployment insurance, the state-mandated health insurance, the nursing care insurance, the compulsory pension insurance, and the social accident insurance (Federal Statistical Office, 2019).

[5] Such earmarking practices deviate from the "Gesamtdeckungsprinzip" in the core budgets according to which all revenues finance all types of expenditures, meaning they are not used only for a specific purpose.

crowd-out, private companies which in certain sectors often operate more efficiently (e.g., Atkinson and Halvorsen, 1986; Knutsson and Tyrefors, 2022). Finally, in Germany there exist numerous companies in which government units are invested with less than 50 percent (not considered as SOEs and therefore also not captured by the analysis in this paper). The lack of a public majority in these firms to influence its agenda setting in the interest of the common good questions the reason behind such involvements.

A growing literature looks into the political-economy reasons behind the question of why governments struggle to manage SOEs effectively, for example, highlighting the role of rent-seeking (Djankov and Murrell, 2002; Boll and Sidki, 2021). A related concern which received significant attention in both public and scientific debates in the past years regards SOEs as potential instruments to circumvent national or international fiscal rules. The following subsection elaborates on this issue.

2.2 State-owned enterprises and the German debt brake

In this section, we briefly discuss the applicability of German fiscal rules on SOEs. This issue has been discussed previously by, for example, the German Council of Economic Experts (2017) or Feld et al. (2021). This institutional summary lays the foundation for our empirical analysis of the question of whether SOEs are employed as an instrument to circumvent the fiscal restrictions set by the debt brake.

According to Articles 109 and 115 of the German constitution, the Grundgesetz (GG), the structurally adjusted deficit of the central government is restricted to 0.35 percent of GDP since the fiscal year 2016. For the 16 states, the fiscal rule is even stricter in the sense that states need to comply with a zero structural deficit but have to do so only from 2020 onwards (see also Blesse et al., 2021). Only in times of natural disasters or exceptional emergency situations outside of government control (like the Covid-19 pandemic) can governments deviate from these deficit rules and are allowed to accumulate higher deficits (Art. 115, Par. 2 GG). Since Articles 109 and 115 GG do not explicitly clarify the applicability of these fiscal rules for SOEs, we need to rely on other sources like court rulings and legal expertise to understand the relevance and role of SOEs in this context.

Relevant sources on this issue include Reischmann (2014), German Council of Economic Experts (2017), Deutsche Bundesbank (2018), Deutscher Bundestag (2019), Hermes et al. (2020), Scholz (2021), Feld et al. (2021), Advisory Board to the Stability Council (2022), and a ruling of the Federal Constitutional Court (2011) which is also cited in the aforementioned reports. The consensus in these sources is that SOEs are covered by the German debt brake if they (i) lack own legal capacity (applies to so called Sondervermögen and Eigen-/Landes-/Bundesbetriebe)

and (ii) received credit authority after 2010 (see Art. 143d GG).[6] At the level of the central government, this includes only few SOEs. In addition, the emergency escape clause was used to setup or reform new SOEs like the "Klima und Transformationsfonds". These SOEs are equipped with significant financial reserves that are also supposed to finance measures outside of the restrictions of the German debt brake over the coming years and which are unrelated to the initial emergency situation and, hence, legally contentious with a case pending at the Federal Constitutional Court (Advisory Board to the Stability Council, 2022; Federal Constitutional Court, 2022). Such explicit circumvention strategies illustrate the potential of SOEs to avoid the restrictions of the debt brake for the *core budgets*.

At the level of the 16 states, the same rules as for the central government apply as long as states do not implement (more strict) own rules. As a result, some states like Baden-Württemberg, Bremen, or Rhineland-Palatinate also consider SOEs with own legal capacity in their debt brake calculations, but only under specific conditions (e.g., Scholz, 2021).

EU fiscal rules are also relevant to this debate. In contrast to the German debt brake, EU fiscal rules – in particular the Stability and Growth Pact and the European Fiscal Compact – also cover all *core budgets* (not only the central and state governments) as well as the universe of all *extra budgets* (see, e.g., Schmidt et al., 2017; Article 126 in the Official Journal of the European Union, 2016; Eurostat, 2013). Thus, EU fiscal rules have a wider applicability by covering a broader part of the public sector.

The above summary highlights the potential of SOEs to be used as circumvention vehicles in the context of German and EU fiscal rules. This circumstance has been extensively discussed by proponents as well as opponents of higher government expenditures and debt levels. The Advisory Board to the Stability Council (the latter is the official joint body of the German Federation and the federal states to monitor public finances in Germany; the Advisory Board is an independent fiscal council to monitor the Stability Council's assessments) concludes that outsourcing of public spending to SOEs makes fiscal surveillance ever more important and increasingly complex (Advisory Board to the Stability Council, 2022). Throughout the empirical analysis in this paper, we ask whether there is evidence for a systematic use of SOEs in circumventing fiscal rules.

[6] This creates significant leeway for the establishment of SOEs with own legal capacity as an opportunity to circumvent the debt brake. However, according to conventional legal opinion, new SOEs that have no other specific task than a financing function would constitute a misuse in the German fiscal rule framework (e.g., Scholz, 2021).

3 Descriptive analysis of SOEs in Germany (2008-2019)

3.1 The annual accounts dataset

The source for most analyses in this paper is the annual accounts dataset provided by the Statistical Offices of the Federation and the Länder.[7] It consists of the annual balance sheets as well as the profit and loss statements of SOEs in Germany. This dataset does not cover the universe of all SOEs in Germany, but only those with commercial accounting standards.[8] Therefore, a brief note on representativeness is necessary. For 2019[9], official sources list a total number of 23,123 SOEs, whereas the annual accounts dataset reports information on 19,009 SOEs in the same year (Federal Statistical Office, 2022b; 2022c). This implies a data coverage rate of 82.2 percent.[10] In terms of SOE employment, coverage of the annual accounts dataset reaches 92.7 percent (Federal Statistical Office, 2022d).

A comparison with official numbers on the universe of all SOEs by government sector account (see discussion of Figure 1) also allows us to make inferences regarding the question of which SOEs are less frequently captured by the annual accounts dataset. For 2019, the data shows that mostly SOEs categorized as *extra budgets* are underrepresented, whereas SOEs classified as *other public funds, institutions, and enterprises* exhibit a data coverage rate of 93.6 percent (in terms of the total number of SOEs) and 96.4 percent (in terms of SOE employment). Therefore, we think that this dataset can provide reliable insights on the activities of SOEs in Germany, in particular regarding the large group of *other public funds, institutions, and enterprises* that are more distant from the *core budgets* and are not captured by typical public finance statistics.

Box 1: Methodological limitations of the annual accounts dataset

Apart from the representativeness of the annual accounts dataset, two cautionary notes are necessary on the classification of SOEs by government sector of the owners in the annual accounts dataset.

First, whereas the actual firm-level data is only available via the research data centers of the Statistical Offices of the States (micro-data files), the Federal Statistical Office also publishes aggregate figures (macro-data files) on a selected set of variables (Federal Statistical Office, 2022e). While the macro-data files only offer limited insights and opportunities for user-specific

[7] Source: RDC of the Federal Statistical Office and the Statistical Offices of the Federal States. For more details see https://www.forschungsdatenzentrum.de/de/finanzen/jahresabschluss.

[8] According to the Federal Statistical Office, SOEs are considered to apply commercial accounting rules if they prepare their accounts according to Eigenbetriebsrecht, Landeshaushaltsrecht, HGB, KHBV, PBV, IAS/IFRS or other commercial accounting systems such as SVRV (German abbreviations, Burth and Hilgers, 2016).

[9] We consider the year 2019 as it allows to discuss the issue of representativeness, given data availability.

[10] Data coverage of the annual accounts dataset is almost the same across government sectors (i.e., the government layer of the SOE owner) with 82.3% for the local level, 81.1% for the state level, and 86.9% for the central government level.

analyses, they have the advantage of classifying SOEs according to whether they are owned by local, state or the central government, or social security funds. This distinction is not perfectly replicable in the micro-data files due to a missing variable that is not made available to data users of the research data centers. As a consequence, the categorization of SOEs according to the owner level must be proxied in the micro-data files which leads to a small classification error.[11]

Second, SOEs owned by social security funds are recorded separately only after 2010 also in the macro-data files whereas from 2008 to 2010 they are classified as state or central government SOEs. The numbers from 2010 to 2011 are therefore not comparable for these three government sectors.

To address the first limitation, we use the more accurate but less detailed macro-data files whenever possible and always state which data was used for a specific result. With regard to the second limitation, this has little impact on the analysis due to applying only to the first three years of the dataset and the small number of SOEs owned by social security funds, but we clearly communicate this limitation in all figures throughout the paper.

The descriptive analysis in Section 3 focuses on the annual accounts data with two exceptions. In Section 3.2, where we look at the relative size of the SOE sector in comparison to *core budgets*, we rely on data for the universe of all SOEs in Germany. This data is, however, only available for two outcome variables – employment and debt. For all other outcome variables we rely on the annual accounts dataset. Regarding the considered time period, we focus on the years 2008 to 2019 whenever possible as the most recent years available but are forced to work with a reduced sample period in some cases due to data availability issues.

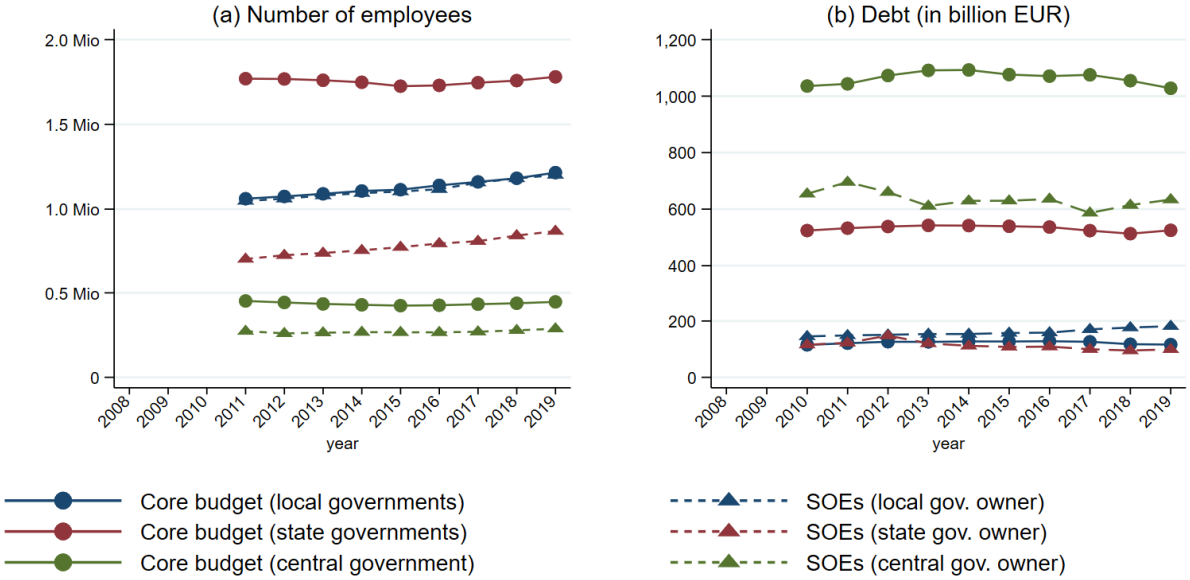
3.2 Economic relevance of SOEs

SOEs constitute a large chunk of many economies. In Germany, they are comparable in size to the *core budgets* of some government sectors, for example, when measured by the number of employees they hire or the amount of outstanding credit market debt they hold, as shown in Panel (a) of Figure 3 reveals that SOEs are particularly relevant at the local level and employ as many people as the *core budgets* (e.g., municipal administrations). In terms of debt (Panel b of

[11] For the period 2011 to 2019 we can compare the correct number of SOEs by government sector (information from the macro-data files) with the imperfect classification in the micro-data files: Whereas the number of state-level SOEs is almost identical in all years for both the macro- and micro-dataset, our classification based on the micro-data identifies more SOEs as being owned by the central government and less SOEs being owned by social security funds, compared to the macro-data. We therefore mistakenly classify some SOEs as having a central government owner when in fact they are instead owned by social security funds. Yet, the classification error has only little impact on the analysis as, e.g., investment trends (see Figure 12) are almost identical when based on the aggregate data (correct classification to government sectors) versus the micro-data. Note that SOEs owned by local governments are not affected by this issue and are perfectly identified in both the macro- and micro-data files.

Figure 3), SOEs hold even more credit-market debt than the local core public sector. Moreover, both the employment and debt figures in Figure 3 suggest that SOEs constitute a large part of the overall public sector also at the central government level and to a somewhat smaller degree at the state level. Importantly, the activity of most of these SOEs is not captured by typical public finance statistics and is under-researched by economists as compared to the scholarship studying the traditional functions carried by governments. This is despite the fact that governments hold a majority in these enterprises or institutions and therefore do not only impact the agenda setting in these firms but are partly also tied to SOEs' liabilities (e.g., Feld et al., 2021).

Figure 3: Economic relevance of SOEs in comparison to core budgets – by government sector



Notes: Employment figures include the number of full-time employees and part-time employees. Source: Federal Statistical Office (2022d), own calculations. Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. Source: Federal Statistical Office (2022f), own calculations.

The analysis in this paper aims to make the relevance and dynamics of SOEs in Germany more transparent to facilitate a discussion about this "other government". While the SOE sector receives little attention in normal times – despite its significant size – it moved closer to the center of attention recently in the (public) debate on the German debt brake and, for example, on the new "Sondervermögen Bundeswehr" which established a 100 billion Euro investment fund for the military outside of the debt brake. In particular, the goal of Section 3 is not only to highlight the relative size of the SOE sector in Germany but also to discuss the role of SOEs as a policy instrument of governments by studying the economic sectors in which SOEs are particularly active, their economic performance and investment behavior, and whether or how these aspects changed over time.

With respect to the dynamics in SOE activity, Figure 3 already shows that in terms of employment, SOEs are growing at the local and state level. While employment in local governments is growing

at the same rate as local SOE employment, this is not the case for employment by state governments, implying that SOEs are growing in relative size at the state level when measured by employment. In contrast, debt figures are quite stable over the years for all government sectors. This speaks rather against concerns about SOEs being actually used to circumvent the debt brake of the central government and the 16 states.

3.3 Nature of SOE ownership

We continue by tracking the dynamics of the number of SOEs over several ownership categories. Figure 4 as the first piece shows that the vast majority of SOEs are owned by local governments which often outsource (public) tasks like energy and water provision, waste management, or social housing to SOEs. The high number of SOEs at the local level is not surprising given the large number of more than 11,100 municipalities and districts in Germany (in 2019, Statistical Offices of the Federation and the Länder, 2022). More interesting is the increase in SOE numbers for local governments which is particularly pronounced after 2015 and results in 25.9% percent more SOEs in 2019 compared to 2008 (Figure 4, Panel a). For SOEs with a state government owner, a similar pattern is observed. The increase at this government level is steadier and even results in 54.1% more SOEs in 2019 as compared to 2008 (Figure 4, Panel b).

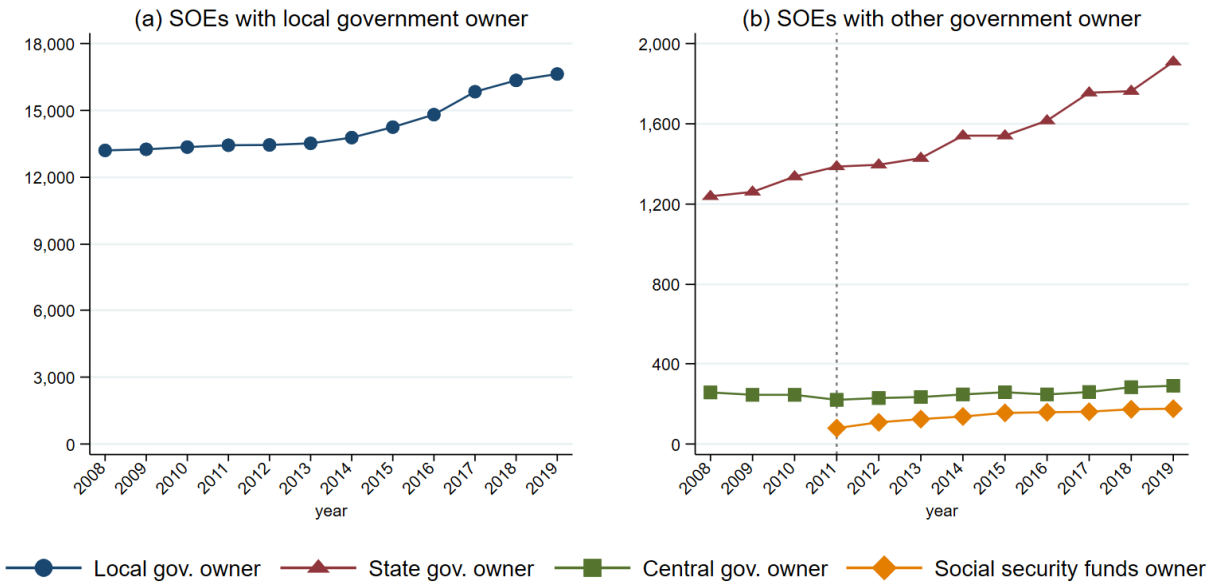
In contrast to these sharp increases, the number of SOEs with the central government as an owner is significantly smaller and more stable. The numbers also do not hint to an increase in the number of central government SOEs in and after 2016 when the debt brake became effective at the central government level. In fact, the increase in central government SOEs from 2015 to 2019 is somewhat smaller with 12.4 percent than the increase from 2011 to 2015 with 17.3 percent.

Figure 4 shows a clear trend at the local and state level to outsource (public) tasks to enterprises that are predominantly publicly owned but are under less public control and also less visible in the public debate as compared to core budgetary activities. One might wonder, however, whether the increase in the number of SOEs is to some extent a statistical artifact, given that the annual accounts data only capture SOEs using commercial accounting (see discussion in Section 3.1). Should SOEs switch to commercial accounting standards over time, this would explain at least some of the large increases in SOE numbers. As Appendix Figure A1 shows, this statistical effect can, if at all, only explain a fraction of the increase in SOEs with local or state government owners as it shows similar trends as Figure 4 but for the period 2013 to 2021 for which data on the total number of SOEs is available (not only SOEs applying commercial accounting).[12] In fact,

[12] Appendix Figure A1 shows the number of *extra budgets* (2013-2021) and *other public funds, institutions, and enterprises* (2018-2021) by government sector. The underlying data captures the universe of all German SOEs and therefore does not suffer from the potential data coverage issue in the annual accounts dataset due to SOEs switching to commercial accounting standards. From 2018 to 2019 the annual accounts dataset records increases of 8.3% (state) and 1.8% (local) as shown by Figure 4, whereas the true numbers depicted in Appendix Figure A1 are 6.4% (state) and

Appendix Figure A1 reveals that in particular the strong increase in SOE numbers at the state level continues until 2021.

Figure 4: Number of SOEs by government sector of the owner



Notes: Before 2011 (indicated by the gray-dotted line in Panel (b) the underlying data for SOEs with a state or central government owner also captures SOEs owned by social security funds (see discussion in Section 3.1). Source: Annual accounts data (macro-data files), own calculations.

The subsequent four figures investigate where the increase in the number of SOEs as identified in Figure 4 comes from to better understand the motivation for governments to shift more public activities to SOEs. In a first step, Figure 5 therefore also plots the number of SOEs by government sector account, depending on whether SOEs are classified as an *extra budget* or *other public funds, institutions, or enterprises*. This distinction is of interest as *extra budgets* are (partly) subject to German and EU fiscal rules, whereas the remaining SOEs are not (see discussion in Section 2.2 for details).

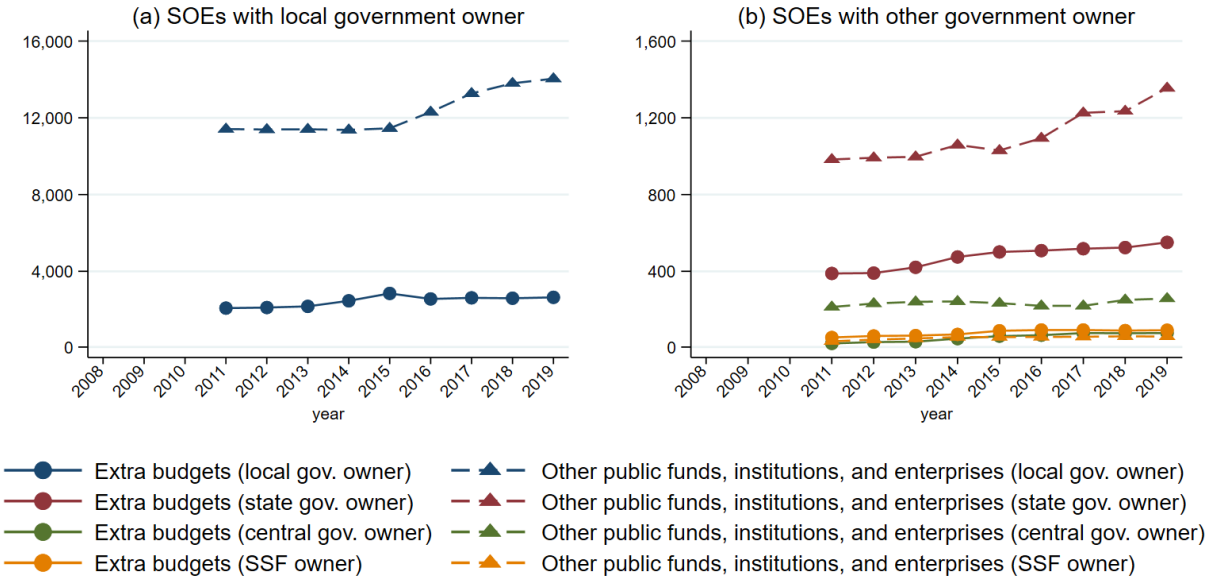
As depicted in Figure 5, the number of SOEs classified as *extra budgets* (i.e., *non-market producers*) is rather stable for local SOEs, whereas more independent SOEs classified as *other public funds, institutions, and enterprises* (i.e., *market producers*) are growing in numbers – particularly from 2015 onwards (Panel a). For SOEs owned by the 16 state governments (Panel b), the strong increase in overall SOE numbers is shown to be rooted mostly in higher numbers of *market producers* rather than *non-market producers*, although both categories gain over the years. In contrast to Figure 4, this pattern rather supports the hypothesis of SOEs being used to circumvent fiscal rules even though the total increase in SOE numbers comes mainly from the local level (no change in fiscal rules) and the state level (full effectiveness of the debt brake only

2.2% (local). This suggests that the annual account figures overestimate the increase in SOE numbers for the state level but underestimate it for the local level.

in 2020) as already shown in Figure 4. The subsequent figures and the analysis in Section 4 analyze this aspect further.

As with Figure 4, we can again compare the numbers from the annual accounts dataset with numbers from the Federal Statistical Office (2022b; 2022c) that capture the universe of all SOEs – independent of their accounting standards but for a reduced sample period – to evaluate whether the observed changes over time from Figure 5 might be due to firms switching from cash to commercial accounting. These numbers confirm the overall patterns already observable in the annual accounts dataset and show that the substantial increase in state-level SOEs continues until 2021. As the growth in *market producers* and *non-market producers* at the state level is quite similar in and after 2020 when the states' debt brake was implemented[13], this is rather evidence against circumvention strategies of the states using SOEs.

Figure 5: Number of SOEs by government sector account



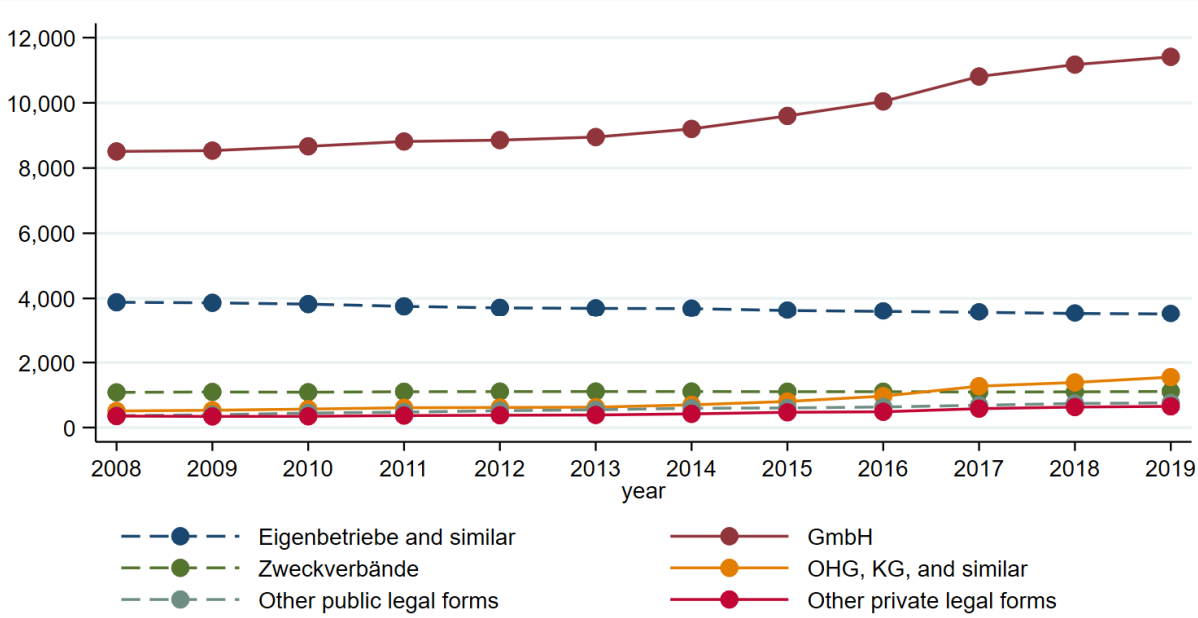
Notes: See the discussion of Figure 1 for the classification of SOEs as either *extra budgets* or *other public funds, institutions, or enterprises*. The figure captures SOEs with a local, state, or central government owner or social security funds owner. SSF: Social security funds. Source: Annual accounts data (micro-data files), own calculations.

Figure 6 conveys a similar picture as the previous one on the number of SOEs by government sector account. It shows the evolution in the number of SOEs by different legal forms. Not only do *GmbHs* (limited liability companies) by far constitute the largest share of SOEs but the number of SOEs with this legal form is also growing the fastest. SOEs that are more distant from the core public sector in terms of organizational structure and financial independence therefore gain the most in popularity. The second most frequent type of SOE is the *Eigenbetrieb* – a special legal

[13] From 2018 (two years before the debt brake implementation at the state level) to 2021 (the first two years after its implementation), the number of *other public funds, institutions, and enterprises* grew by 11.4%, whereas the growth rate for *extra budgets* at the state level was even slightly higher with 13.1%.

form for municipal SOEs without legal capacity that are therefore closely linked to the *core budgets* and also exists at the state and central government level.

Figure 6: Number of SOEs by legal form



Notes: The figure captures SOEs with a local, state, or central government owner or social security funds owner. SOEs with a public legal form are indicated by dashed lines. Source: Annual accounts data (macro-data files), own calculations.

Overall, the figure shows that it is only the private legal forms such as the *GmbH*, *OHG* (open trading companies), or *KG* (limited partnerships) that gain in popularity, whereas the number of SOEs with a public legal form such as *Eigenbetriebe* or *Zweckverbände*[14] is stable over time or even declining. The private legal forms typically offer more flexibility and independence in terms of, for example, hiring and firm structure (see discussion in Section 2.1). They are also much more often classified as *market-producers* (i.e., they are less frequently covered by fiscal rules). In particular the decrease of -10.0 percent from 2008 to 2019 in the number of *Eigenbetriebe* is interesting as this legal form is a major type of SOE that is not legally independent from their owners – a prerequisite for being subject to the debt brake (see discussion in Section 2.2). However, looking at the numbers by government sector (not shown) leads to the conclusion that the seemingly suspicious decline in the number of *Eigenbetriebe* in Figure 6 is entirely due to SOEs held by local governments who are not subject to the German debt brake. In contrast, the respective number of SOEs held by state governments is constant over the considered period.[15]

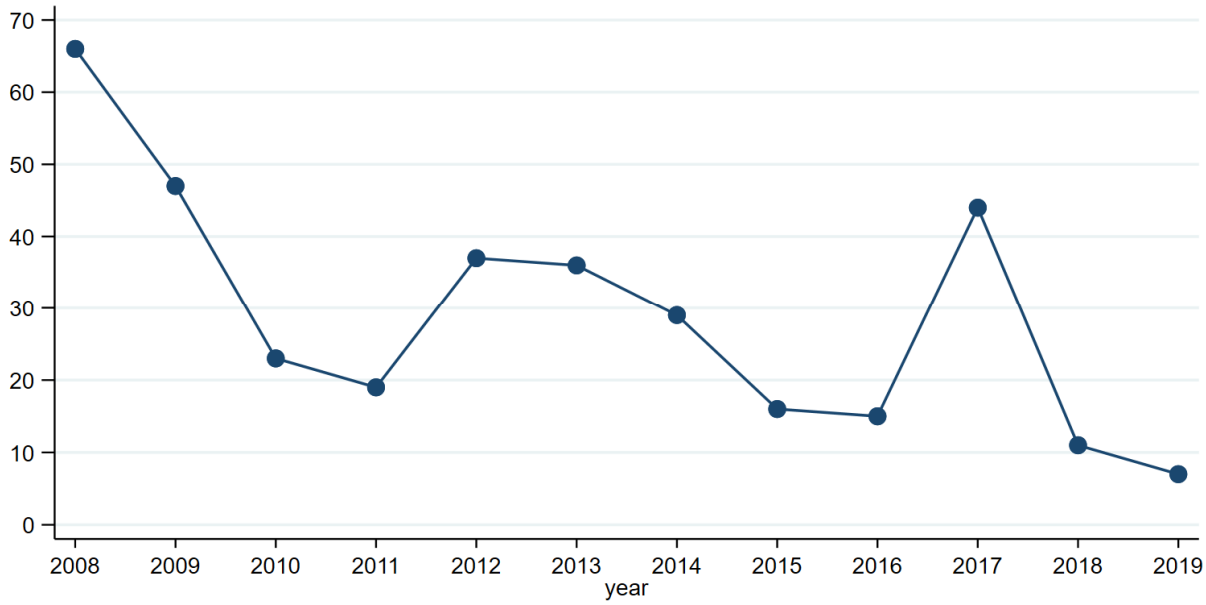
[14] Public legal form for special purpose associations between local governments.

[15] The number of SOEs without legal capacity and held by the central government increases from four (2008) to nine in 2015 and then slightly decreases again to eight (2018) and seven (2019) in the annual accounts data. Given these low numbers, this cannot be considered as credible evidence for an effect of the debt brake that was implemented in 2016 at the central government level.

Figure 7 delves deeper into the question of where the increase in the number of SOEs comes from and plots the number of newly-founded SOEs whose activities were previously part of the *core budgets*. As becomes evident from the numbers shown in Figure 7, spin-offs from the core public sector cannot explain the significant increase in SOE numbers documented in the previous figures as the number of spin-offs is low and tends to fall over time.

This leaves the formation of completely new firms (i.e., whose operational functions were not part of the *core budgets* before), the establishment of subsidiaries of existing SOEs, or the acquisition of previously private firms as explanations for the overall growth in SOEs. Unfortunately, the annual accounts dataset does not allow to distinguish between these alternatives but the large and particularly fast growing number of SOEs which are owned only indirectly by governments via other firms (see discussion of subsequent Figure 8) suggests that the public involvement in SOEs becomes ever more complex and intransparent.

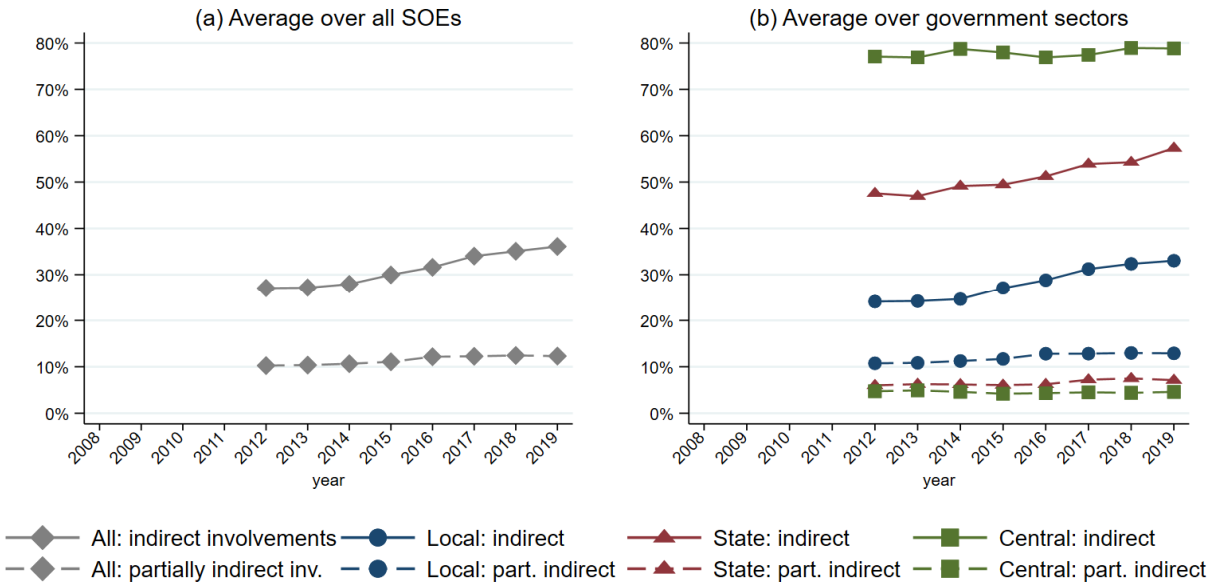
Figure 7: Number of SOEs founded as spin-offs from the core budgets



Notes: The figure captures SOEs with a local, state, or central government owner or social security funds owner.
Source: annual accounts data (micro-data files).

On the aspect of complexity, Figure 8 plots the share of SOEs that are owned only indirectly by governments via other firms. In this, we differentiate between entirely indirect involvements and those which are partly held indirectly but partly also directly by governments. Across all government levels, more than 35 percent of all SOEs are entirely owned only indirectly by the public owners. This share increases to almost 50 percent for the year 2019 when also taking into account partly indirect involvements and has been growing over the years (Panel (a) of Figure 8). Thus, it is not only the level of outsourcing – from core budgets to SOEs – which is increasing over time but the average SOEs also becomes more difficult to manage and monitor as more and more SOEs are held as indirect involvements.

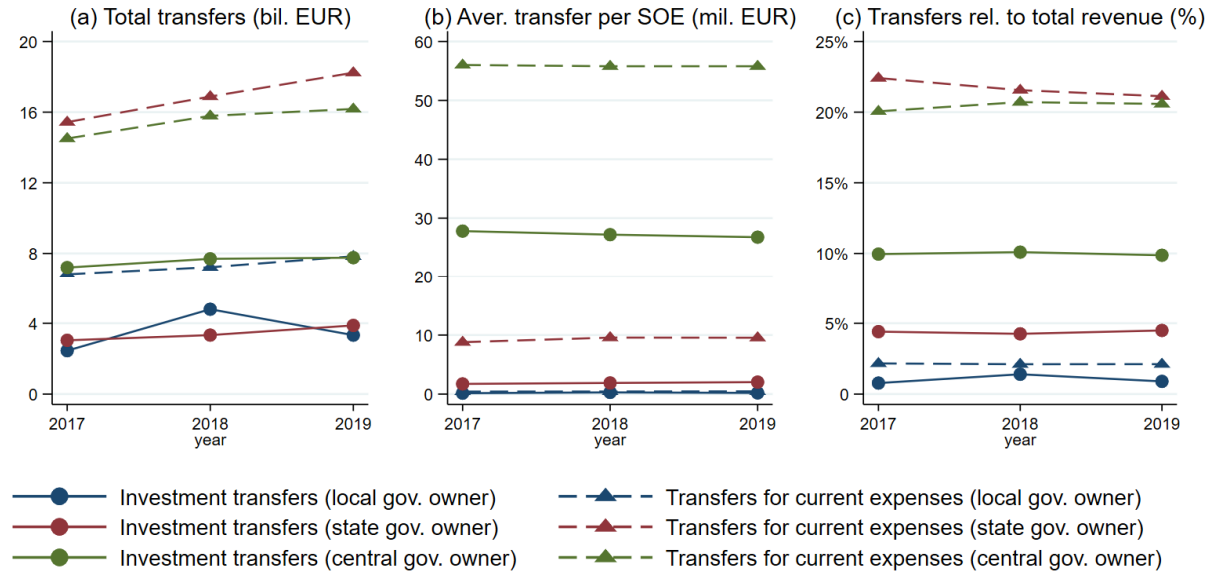
Figure 8: Share of indirect holdings



Notes: The figure captures SOEs that are held entirely or just partially by their public owner(s). The classification into SOEs owned by state governments or the central government suffers from a small classification error (see discussion in Box 1). Source: annual accounts data (micro-data files).

Regarding SOEs dependence on transfers, Panel (c) of Figure 9 shows that in particular state and central government SOEs rely quite heavily on transfers from their public owners as transfers for current expenses make up 20-25 percent relative to SOEs' sales revenue. Local SOEs on the other hand are more financially independent from this perspective and receive only few transfers relative to their own revenue.

Figure 9: Transfers from core budgets to SOEs by transfer type and government sector

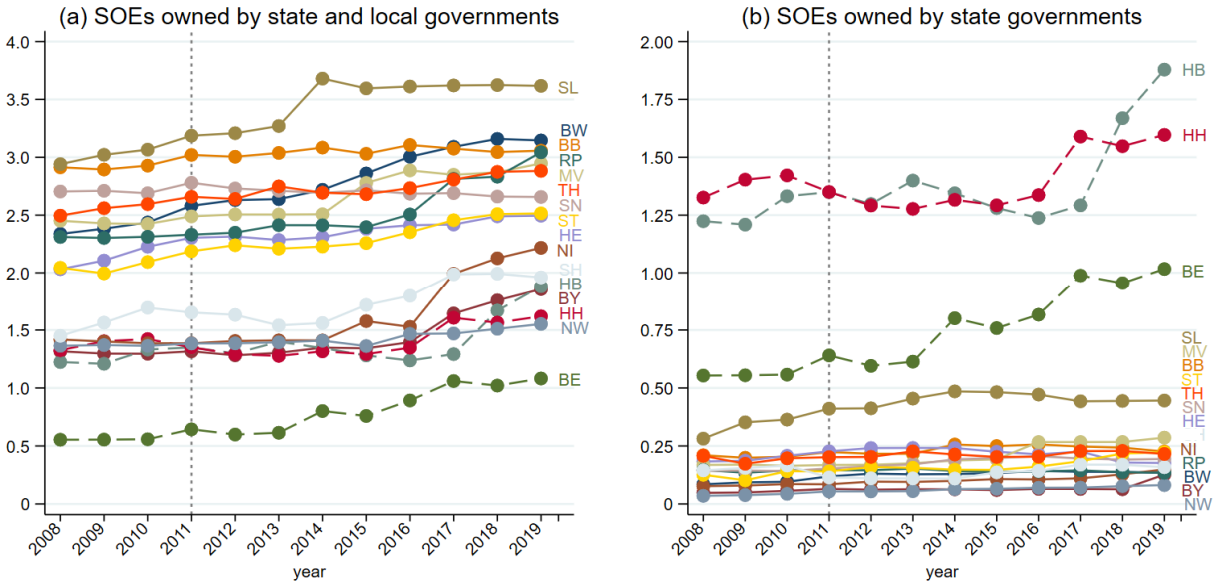


Notes: Information on transfers from *core budgets* is only available for the three years 2017, 2018, and 2019 in the aggregate dataset. Source: Annual accounts data (macro-data files), own calculations.

3.4 SOEs across states and industries

The political and financial motives to rely on SOEs for the provision of public goods and services or to correct market failures might not only change over time but could also differ across states due to differences in political preferences or economic and financial conditions. Figure 10 therefore plots the number of SOEs per 10,000 inhabitants per state – once considering SOEs at both the local and state level (Panel a) and once looking at the number of state-level SOEs only (Panel b). This heterogeneity analysis reveals two interesting results: First, area states from East Germany tend to have slightly more SOEs per capita than western area states[16] (but with exceptions, in particular Saarland). Second, growth rates in SOE numbers per capita are, however, significantly higher among the Western states (+31.3%) than among the Eastern states (+9.1%) over the period 2008-2019. These numbers are based on Panel (a) of Figure 10. Panel (b), which shows the dynamics only for SOEs at the state level, confirms the difference in levels between East and West and reveals that the growth differential is even higher when only considering state-level SOEs (+32.1% in the East and +59.0% in the West) even though the patterns are somewhat veiled due to the scaling of the figure.[17]

Figure 10: Number of SOEs per 10,000 inhabitants by state



Notes: The figure only captures SOEs owned by local or state governments. Before 2011 (indicated by the gray-dotted line) the underlying data also captures some of the SOEs owned by social security funds (see discussion in Section

[16] In 2019, area states from East Germany had 2.8 SOEs per 10,000 inhabitants, whereas area states from the West had 2.2 SOEs per 100,000 state inhabitants.

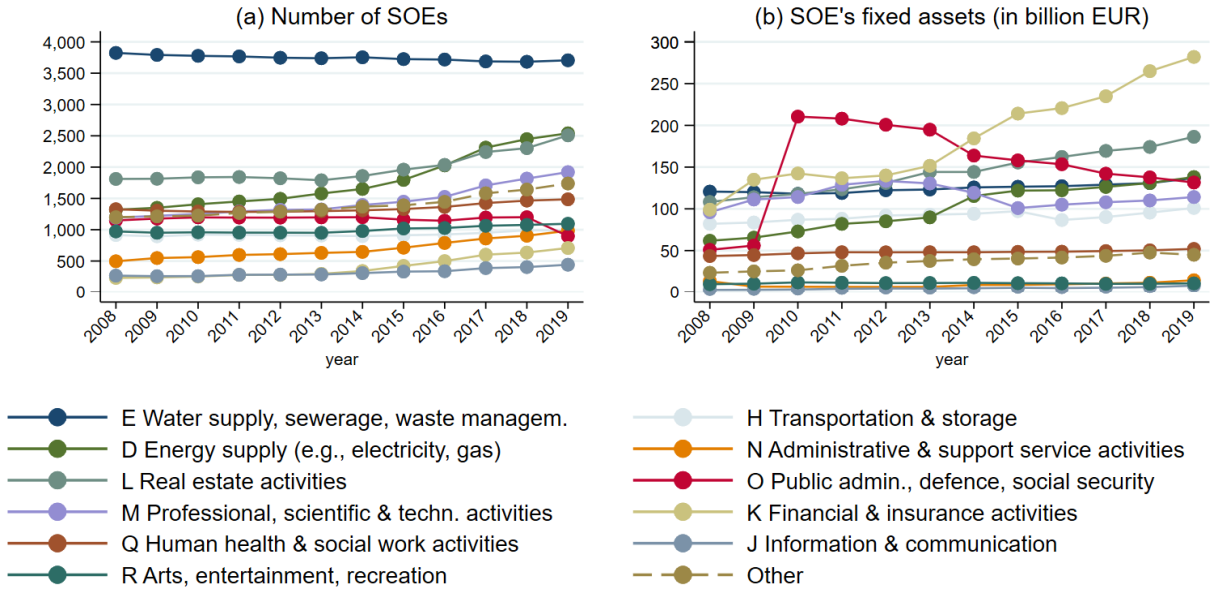
[17] Note that this pattern cannot be explained by municipalities from the Eastern states switching from cash to commercial accounting standards before the Western states and before the first year of the statistic as only four Western states which switched before 2010 (Christofzik, 2019). If mostly Eastern states were the first to adopt commercial accounting standards (likely causing their SOEs with a public legal form to do the same), this could explain why growth rates in SOE numbers of Western states picked up only later. However, the analysis in Christofzik (2019) suggests that this is not the case.

3.1). City states are indicated by dashed lines. Appendix Table A1 lists all 16 states with the respective abbreviation. Source: Annual accounts data (macro-data files), own calculations.

As in most statistics, the three city states Berlin, Bremen, and Hamburg stand out in comparison to the area states. With no clear distinction between the local and state level in the city states, a comparison with the other states is only meaningful in the context of Panel (a) of Figure 10 which looks at the combined number of SOEs owned by local and state governments. Here, the city states rank low with a position among the area states with a small number of SOEs per capita but all three states experienced a strong growth in SOE numbers in the more recent years.

In the final analysis of the pure number of SOEs, we consider the economic sectors in which SOEs operate to better understand what role they play in the German economy. For this purpose, we rely on the international classification according to NACE codes (German: Klassifikation der Wirtschaftszweige – WZ 2008, Federal Statistical Office, 2022g). Considering all SOEs in the dataset, the majority of them are active in the NACE sectors E (water), D (energy), and L (real estate), which shows a strong focus on the provision of local public infrastructure such as energy provision or sewage disposal facilities (see Panel a of Figure 11). Measured by the value of SOEs' fixed assets (Panel b of Figure 11), these economic sectors also rank high in terms of size but are superseded by sector K, which includes firms active in the financial and insurance sector. We elaborate on what types of SOEs belong to these sectors in the context of the subsequent Figure 11. Furthermore, SOEs classified as belonging to sector O: Public administration, public defense, and compulsory social security, experienced a drastic increase in fixed assets in 2010 which is due to public stabilization programs in the context of the EU sovereign debt crisis as will also become more explicit in the discussion of Figure 11.

Figure 11: SOE presence by NACE classification



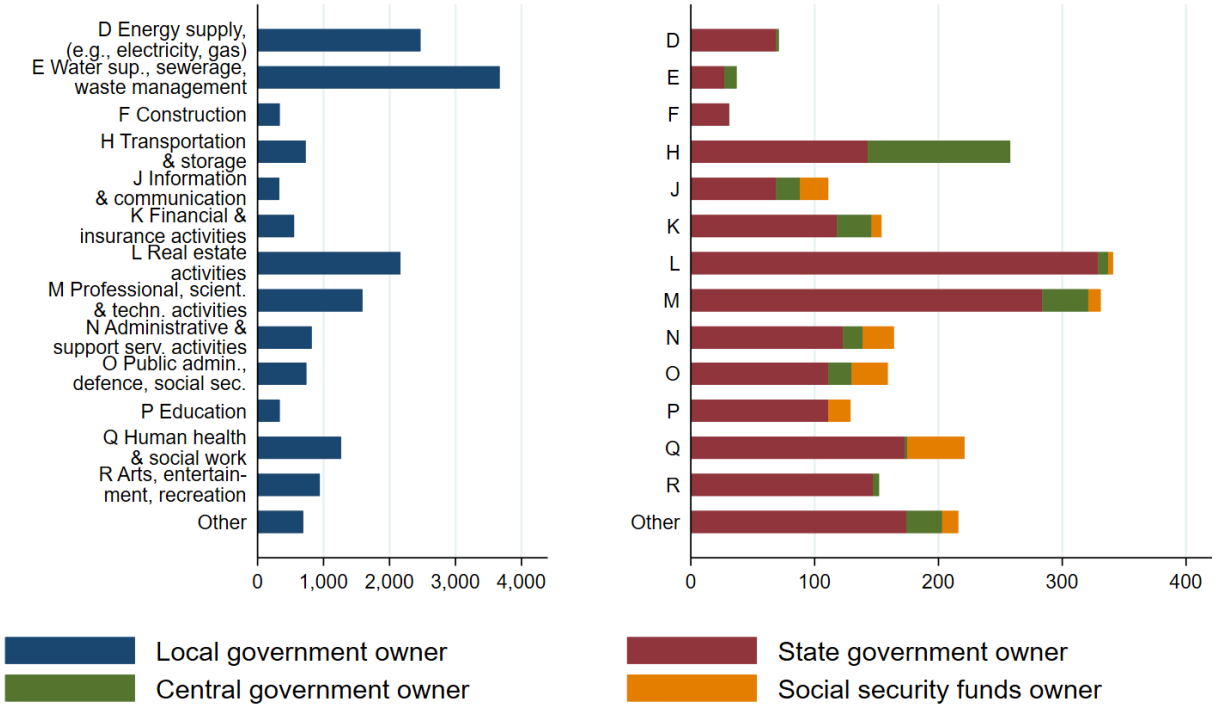
Notes: The figure captures SOEs with a municipal, state, central, or social security funds owner. Category *Other* includes: A Agriculture, forestry, fishing, B Mining & quarrying, C Manufacturing, F Construction, G Wholesale & retail

trade; repair of motor vehicles & motorcycles, I Accommodation & food service activities, P Education, and S Other service activities. Source: Annual accounts data (macro-data files), own calculations.

Figure 12 continues the analysis on the number of SOEs per economic sector but further distinguishes the observations by the government sector of the owner, concentrating on the year 2019. The figure confirms the dominant role of local SOEs when only considering the total numbers as became already visible in Figure 4. Moreover, the figure shows the overall prevalence of sectors D, E, and L to be due to the many SOEs in these sectors owned by local governments. For each of these three economic sectors, a detailed analysis of the 5-digit NACE codes reveals that local SOE activity is concentrated in quite specific subsectors: in sector D, this is the generation and distribution of electricity, in sector E, it is the collection and purification of water as well as sewerage activities, whereas in sector L, the management and rental of public real estate and parking areas dominate.

The right part of Figure 12 discloses sectors L (real estate activities) and M (professional scientific and technical activities) as the most common sectors for SOEs owned by state governments. The latter category includes in particular the management of companies and SOE holdings. Central government SOEs on the contrary belong mostly to the transportation sector (i.e., sector H). These SOEs include, for example, some of the regional cargo and people transportation companies and the numerous subsidiaries of the Deutsche Bahn AG of which the central government still holds a 100-percent share (Federal Ministry of Finance, 2022b).

Figure 12: Number of SOEs by NACE classification and government sector (in 2019)



Notes: Category *Other* includes: A Agriculture, forestry, fishing, B Mining & quarrying, C Manufacturing, G Wholesale & retail trade; repair of motor vehicles & motorcycles, I Accommodation & food service activities, and S Other service activities. Source: Annual accounts data (macro-data files), own calculations.

Appendix Figure A2 repeats the same exercise as Figure 12 but uses total fixed assets instead of the number of SOEs per economic sector and government sector. This shows the large share of fixed assets invested in sector K (financial and insurance activities) to be mostly due to local and central government SOEs.[18] For the central government, the more fine-grained 5-digit NACE codes reveal SOEs engaged in the consultancy and provision of financial services and guarantees – in particular the Kreditanstalt für Wiederaufbau (KfW) – to be responsible for the observed pattern in fixed assets. SOEs in the same economic category (i.e., K) but owned by local governments in contrast mostly provide voluntary insurance services such as own-occupation disability insurance contracts or pension plans. These are most likely due to holdings of so-called Sparkassen (savings banks) – a special type of public bank that is owned by local governments and only operates within a confined region (see, e.g., Hoffman et al., 2021).

After consultation with the statistical office, it was confirmed that Sparkassen are themselves generally not covered by official financial and personnel statistics – and are therefore also not part of the data at hand – whereas holdings of Sparkassen are covered.[19] Not only does this explain the high value of fixed assets in NACE sector K but it also constitutes a potential roadblock to transparency and cross-state comparisons based on the official financial statistics. Depending on the state and, for example, whether Sparkassen are held by single municipalities or multiple local governments (likely leading to larger Sparkassen), they might decide to outsource particular activities to subsidiaries or not. If Sparkassen use this opportunity extensively in one state and less so in another, this introduces a bias to the financial statistics due to activities of Sparkassen not being covered but activities of their holdings being taken into account. The size of this effect is difficult to assess and should be studied in future research.

Appendix Figure A2 further reveals that the high value of fixed assets in sector O (Public administration, public defense, and compulsory social security) is due to central government SOEs and mostly likely due to the *bad bank* called "FMS Wertmanagement" which was established in 2010 to rescue the Hypo Real Estate Holding and stabilize the financial markets. Since then, the portfolio of the *bad bank* was liquidated over the years (FMS Wertmanagement, 2022).

3.5 Debt held by SOEs

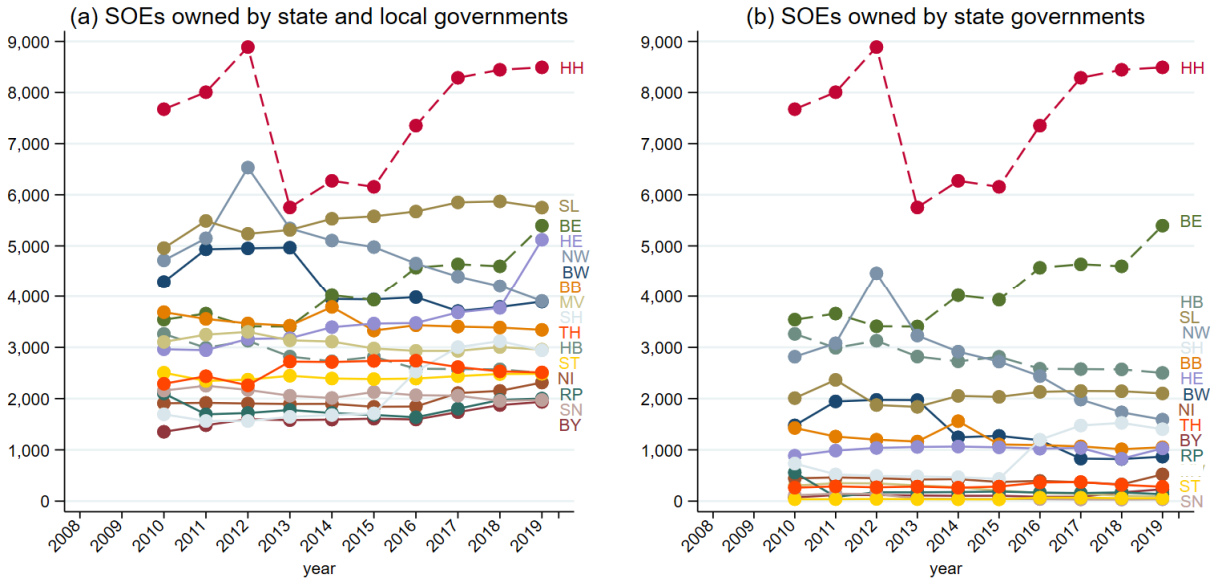
We now turn our focus on the analysis of credit market debt held by SOEs. Figure 13 depicts the per capita debt of SOEs by state – again once looking at state and local SOEs combined (Panel a) and once looking at SOEs at the state level only (Panel b). In combination, the two subfigures

[18] The strong increase in this economic sector, observable in Panel b of Figure 11, is particularly due to increased fixed assets of central government SOEs and to a smaller extent due to other SOEs, as additional analyses show.

[19] This somewhat peculiar approach is due to Sparkassen being already captured by the financial statistics of the Deutsche Bundesbank which is not the case for the holdings of Sparkassen. To avoid a duplicate capture of Sparkassen, they are consequently not part of the statistics by the Federal Statistical Office, whereas holdings of Sparkassen are covered (see also ra.de, 2006).

support two conclusions: First, there is no clear East-West differential when it comes to debt held by SOEs as it was observable for the overall number of SOEs per capita (see Figure 10). There is also only a low correlation between the number of SOEs per capita and per capita debt held by SOEs. Second, city states, who own only few SOEs per capita in comparison to the area states when considering the total numbers by local and state governments (see Figure 10), tend to have the highest per capita debt figures. This holds true in particular for Hamburg and Berlin, whereas the highly indebted state of Bremen ranks in the middle in comparison with all other 15 states. Maybe surprisingly, this speaks somewhat against the possibility of highly-indebted *core budget* institutions using SOEs to finance public expenditure or investment by taking on more debt outside of the *core budget*.[20] In line with this observation, the correlation between per capita debt numbers for the core public sector and the SOE sector by state (looking at both the local and state level) is positive but low at 0.21 over the considered period 2008 to 2019.

Figure 13: SOE debt per capita by state (in EUR)



Notes: City states are indicated by dashed lines. Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. Appendix Table A1 lists all 16 states with the respective abbreviation. Source: Federal Statistical Office (2022f), own calculations.

The following Figure 14 continues the descriptive analysis of debt in the context of SOEs and plots the share of outsourced debt by state for the year 2019.[21] The blue bars depict the share of public credit market debt held by the *core budgets* which is as high as 95 percent for Bremen or

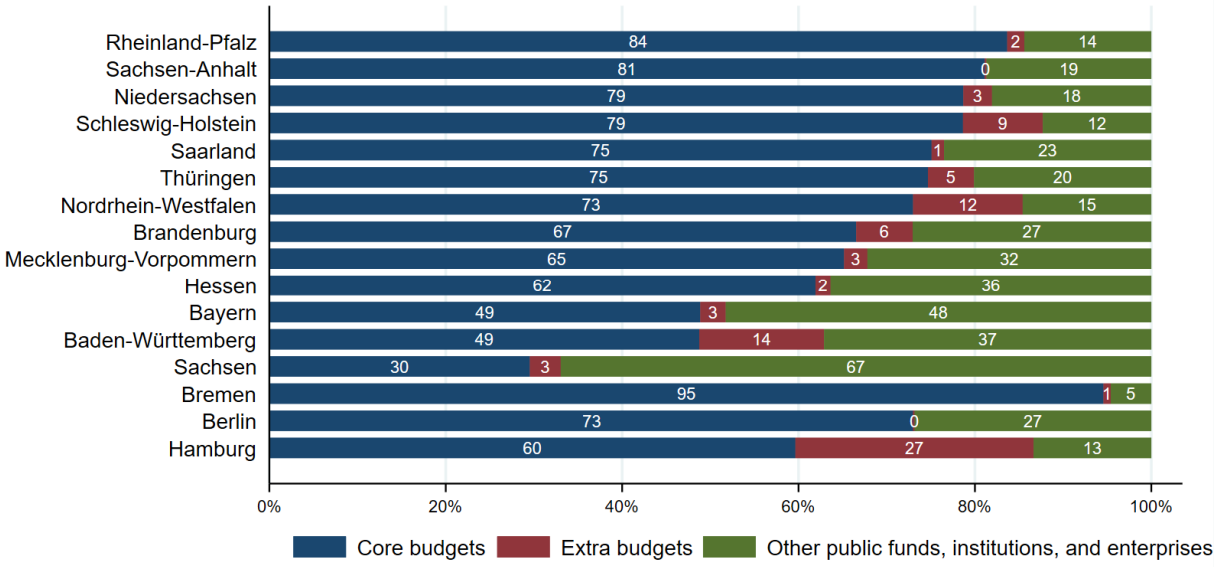
[20] In 2019, Bremen was by far the most indebted among all states with 43,669€ p.c., followed by Saarland (17,332€), Berlin (14,701€), and Hamburg (12,555€) – considering only credit market debt and looking at *core budgets* at the local and state level combined (Federal Statistical Office, 2022f).

[21] Note that the numbers on debt held by SOEs do not take into account that core budgets are sometimes invested with less than 100% in an SOE. Given that in these cases, the remaining shares are typically held by another public sector unit, this detail is rather relevant when looking at single core budget units and is only of minor relevance for the aggregate perspective we take in this study.

as low as 30 percent for the state of Saxony. Vice versa, this implies an outsourcing rate regarding public debt of only five percent for Bremen but 70 percent for Saxony. This might come as a surprise as Saxony usually ranks (next to Bavaria) as the state with the lowest public debt level (see, e.g., Blesse et al., 2022). Yet, as Figure 14 shows, this impression is potentially misleading as the *core budget* financial figures only capture a fraction of overall public debt in Saxony. Even though this does not affect Saxony's overall good position relative to the other states, the image remains incomplete when only considering the numbers for the *core budgets*.

Figures A3 and A4 in the Appendix repeat the analysis of Figure 14 but concentrate on the share of outsourced debt only at the state (Figure A3) and local government level (Figure A4). The figures reveal that outsourcing of debt is mostly an issue at the local level. Whereas states' *core budgets* account for 79 percent (Baden-Württemberg) to 99 percent (Saxony-Anhalt) of public debt among the area states, this rate is much lower at the local level with the highest value of 61 percent in Rhineland-Palatinate and the lowest value of 15 percent in Baden-Württemberg. This documents significant outsourcing of public debt by local governments in Baden-Württemberg. Moreover, the figures confirm the dominant role of *other public funds, institutions, and enterprises* (green bars) as opposed to *extra budgets* (red bars) as the type of SOE which accounts for the largest shares of outsourced debt.

Figure 14: Share of outsourced debt by state – State and local governments combined (in 2019)

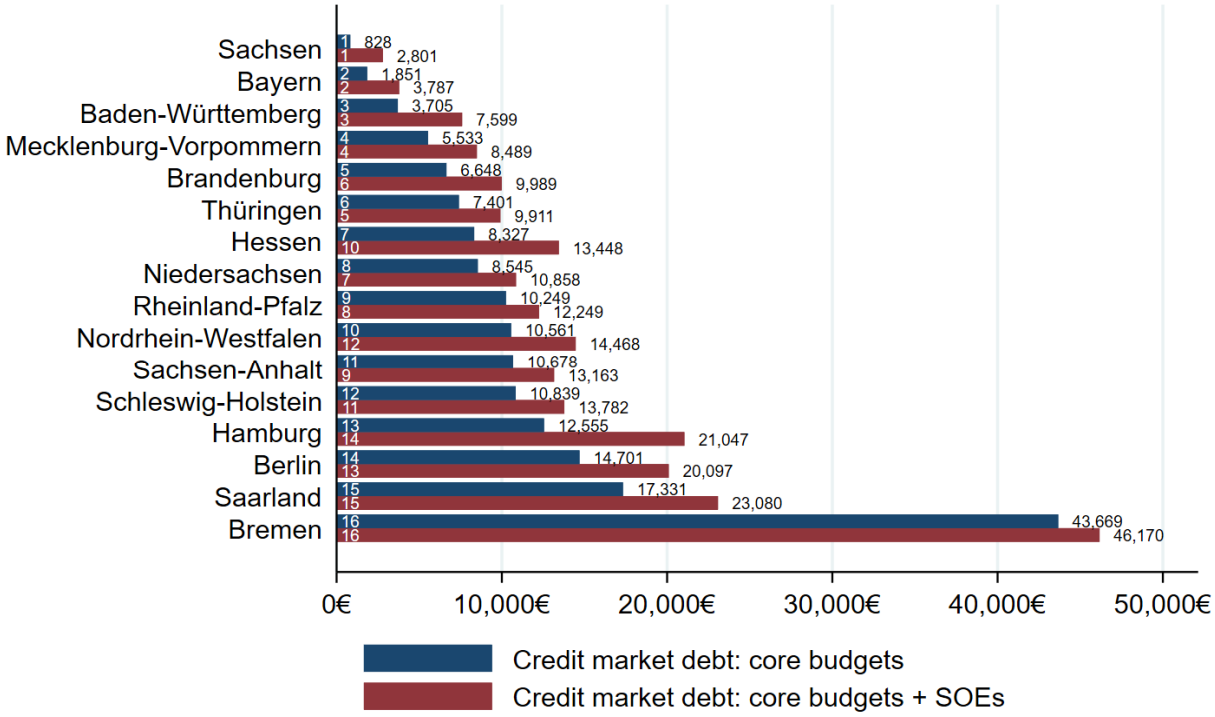


Notes: Shares in percent. Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. Source: Federal Statistical Office (2022f), own calculations.

Overall, the observed differences in outsourcing rates across states are anything but negligible nor are they irrelevant. In fact, they pose a serious threat to cross-state comparisons for scientific research or policy making as they introduce a significant bias into these comparisons. Comparability of, for example key financial variables such as debt or investment, is only given if the statistics cover not only the core public sector but also the SOE sector in all states.

Figure 15 shows the per capita levels of state and local government debt by state in 2019, once for the core budget and once including debt held by SOEs. On average, the inclusion of SOEs increases the per capita levels of debt by 3,380 Euro or 43.8 percent. However, the implications of taking into account SOE debt vary widely across states. While in two states debt increases by less than 20 percent, in seven states it increases by more than 50%.

Figure 15: Per capita credit market debt by state – State and local governments combined (in 2019)



Notes: Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. The numbers in white denote the rank of the state when sorting states according to public debt levels from lowest to highest – highlighting that the ranking changes when excluding or including SOEs in the calculations. Source: Federal Statistical Office (2022f), own calculations.

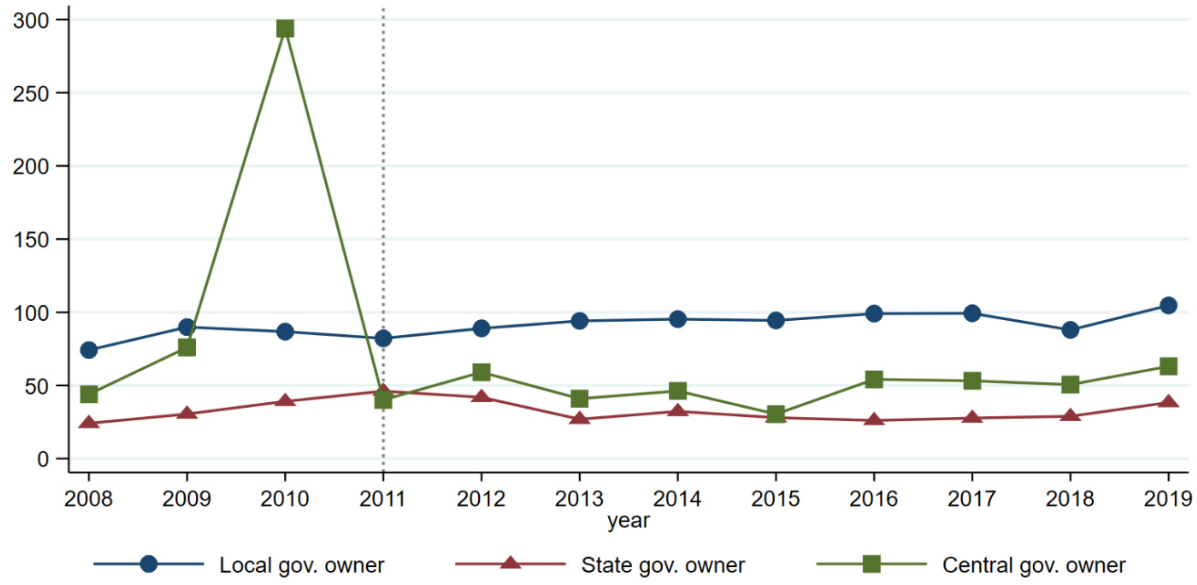
3.6 Performance of SOEs

In the final subsection of Section 3, we study the investment and other performance related activities of SOEs in Germany.[22] Figure 16 plots the total volume of SOE investment by the government sector of the owner. A first insight from the figure is the high share of SOE investment at the local level which mirrors the fact that for the general government sector (i.e., *core* and *extra budgets*), the local level also accounts for the largest share of public investment (Federal Statistical Office, 2022h). The state and central government level account for a somewhat smaller share of SOE investment. Overall, SOE investment is relatively stable with the exception of the central government level for which a pronounced spike is documented for the year 2010.

[22] We define investment as the annual change in real, financial, and immaterial assets (Federal Statistical Office, 2022e).

This corresponds to the establishment of the *bad bank* to stabilize financial markets during the public debt crisis as was already discussed in the context of Figures 11 and 12 and as will become more explicit in the subsequent figure.

Figure 16: SOE investment by government sector (in billion EUR)



Notes: Before 2011 (indicated by the gray-dotted line) the data for SOEs owned by states or the central government partly also captures SOEs owned by social security funds (see discussion in Section 3.1). Source: Annual accounts data (macro-data files), own calculations.

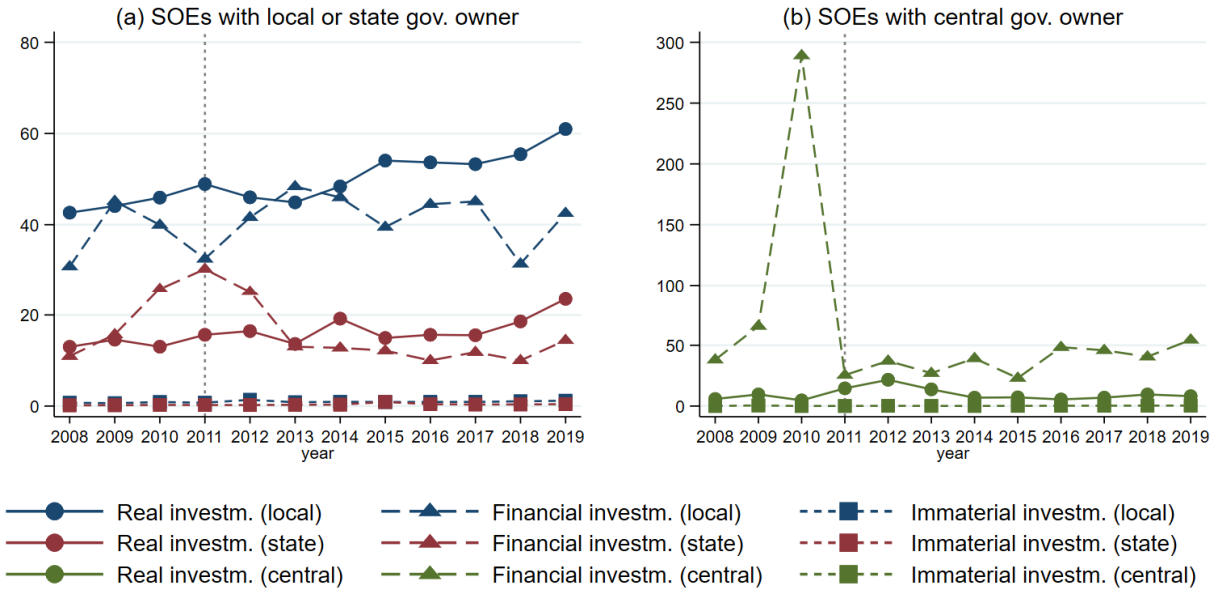
Figure 17 further differentiates SOE investment by investment categories – distinguishing between real investments, financial investments, and investments in immaterial assets. The latter category plays a very minor role for all government sectors as becomes evident from the figure. Real investments are the most relevant category at the state and local level and are increasing over time for both government sectors. Finally, financial investments – the most relevant category at the central government level – are quite volatile and seem to reflect stabilization efforts of the states and the central government during times of crisis. In particular the spike in financial investments of central government SOEs matches the establishment of the "FMS Wertmanagement" *bad bank* which took over the portfolio of the Hypo Real Estate Holding in 2010 which found itself in distress due to the global financial crisis and the European public debt crisis.[23]

After studying SOE debt and investment, we briefly look at two common performance indicators of companies. Figure 18 depicts the equity ratio (Panel a) and the overall profitability (Panel b) of SOEs by government sector. We calculate the equity ratio as the ratio of equity capital over total assets to measure SOEs' level of leverage or respectively the share of total assets financed by the owners versus external creditors. A higher equity ratio positively affects a company's

[23] For further details on SOE investment and its relevance for overall public investments, see Hesse and Starke (2017).

rating as it will likely remain solvent also in times of economic hardship. The ratio for SOEs owned by the states is more volatile and somewhat below the value of 30 in most years. In comparison with firms of the private sector, this puts them in a relatively good position (Reuter, 2008). The equity ratio of central governments is significantly lower and closer to the EU requirements for banks with banks having among the lowest equity ratios (cf., Deutsche Bundesbank, 2019).

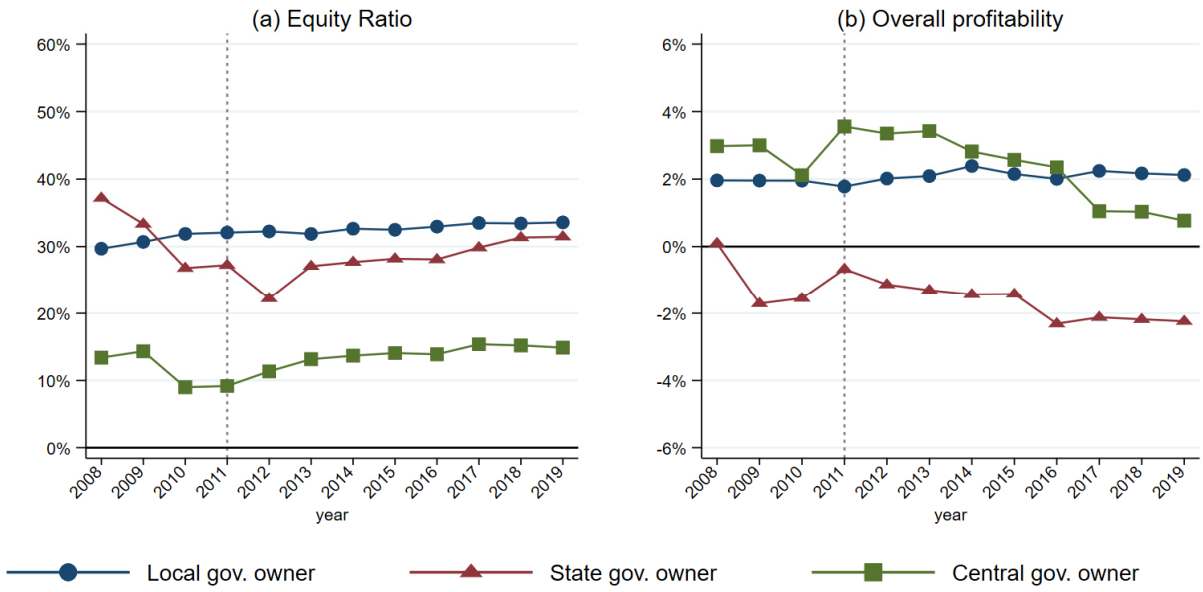
Figure 17: SOE investment by government sector and investment category (in billion EUR)



Notes: Real investments (Sachinvestitionen) include investments in tangible assets (Sachanlagen), properties and buildings (Grundstücke and Bauten), technical equipment and machinery (technische Anlagen und Maschinen), and operating and business equipment (Betriebs- und Geschäftsausstattung). Financial investments (Finanzinvestitionen) include investments in financial assets (Finanzanlagen) and shares & securities (Anteile, Beteiligungen und Wertpapiere). Immaterial investments include investments in human capital, R&D, or, e.g., patents and licenses. Before 2011 (indicated by the gray-dotted line) the data for SOEs owned by states (Panel a) or the central government (Panel b) partly also captures investments of SOEs owned by social security funds (see discussion in Section 3.1). Source: Annual accounts data (macro-data files), own calculations.

Profitability as an efficiency metric is measured by the sum of total profits or losses and interest costs divided by total assets. It gives an insight on the firm's ability to generate profit given the resources invested in the firm. Overall, average profitability of SOEs in Germany as depicted in Panel (b) of Figure 18 is relatively low and even negative for SOEs owned by the states – reflecting the circumstance that in contrast to purely private firms, SOEs typically pursue other goals than to generate profit (e.g., Knutsson and Tyrefors, 2022).

Figure 18: Performance indicators by government sector



Notes: Before 2011 (indicated by the gray-dotted line) the data for SOEs owned by states or the central government partly also captures SOEs owned by social security funds (see discussion in Section 3.1). Source: Annual accounts data (macro-data files), own calculations.

4 Regression Analysis: SOEs and the German debt brake

This section studies the impact of the debt brake introduced at the central government level in 2016 on SOEs. We investigate potential outsourcing behavior by the central government as a one way to comply with the new rules of the debt brake.

4.1 Identification methodology

For identification, we rely on a difference-in-difference approach (see, e.g., Angrist and Pischke, 2009). As this approach requires data points both before and after the treatment (i.e., the implementation of the debt brake) such a regression analysis is not yet feasible for the 16 state governments for whom the debt brake was implemented in 2020. Our focus is, thus, on the central government.

From a methodological perspective, in a difference-in-difference design we compare two moments: The first difference is along the time dimension and divides our sample period into a pre-treatment (i.e., before 2016 when the debt brake was not yet implemented) and post-treatment (i.e., in and after 2016). The second difference is along the cross-sectional dimension and compares the treatment group (i.e., SOEs predominantly owned by the central government) with a control group (i.e., SOEs that are **not** predominantly owned by the central government). By considering the difference between these two moments, we can disentangle the effect of the debt brake implementation from other factors that might have affected SOE activities over time. To study the "treatment" for the federal level in 2016 a natural candidate for the control group

are SOEs owned by the 16 states. However, as the difference-in-difference identification approach requires, *inter alia*, the assumption that the control group was not treated in any respect in 2016, using state-level SOEs might distort the results because they are themselves treated in 2020 and possibly already a few years earlier due to anticipation effects. As local SOEs are likely also not the ideal candidate for the control group, given their quite different fields of activities compared to central government SOEs, we estimate two specifications – once using state-level SOEs and once using local SOEs as the control group.[24] We estimate the following regression model:

$$y_{i,t} = \alpha + \beta_1 D2016_t + \beta_2 Dcentral_{i,t} + \beta_3 D2016_t * Dcentral_{i,t} + \beta'_4 \boldsymbol{X}_{i,t} + \gamma_i + \eta_t + \varepsilon_{i,t}, \quad (1)$$

where $y_{i,t}$ represents various outcome variables of interest at the firm level for SOE i in year t (2008-2019). $D2016$ is a dummy that is equal to 1 in 2016 and after and 0 otherwise. $Dcentral$ is also a dummy which is equal to 1 if SOE i is predominantly owned by the central government in year t and 0 otherwise. The regression includes all SOEs owned by the central government plus either all state or all local SOEs which will then constitute the control group. The coefficient of interest is β_3 which measures the effect of the debt brake implementation in 2016 on central government SOEs as compared to state or local SOEs. A statistically significant coefficient estimate for β_3 would hint to an effect of the debt brake, for example in the sense of more outsourcing of public debt from the *core budget* to SOEs.

To control for heterogeneity at the firm level, we include a number of covariates in $\boldsymbol{X}$.[25] Moreover, to control for unobserved characteristics of SOEs, we include firm fixed effects γ_i and finally year fixed effects $\eta_t$to take into account general time trends. As outcome variables we consider SOE employment, investment, total liabilities[26], and financial reserves to learn about how the spending and financing behavior of SOEs responds to the 2016 change in fiscal rules.

[24] Note that theoretically, one would like to estimate a difference-in-difference model where the treatment group consists only of central government SOEs without legal capacity that were founded after 2010 to closely match the criteria described in Section 2.2 on the applicability of the debt brake for SOEs. The control group would then consist of the remaining central government SOEs. However, as the year of establishment is not recorded in the data and we observe only few SOEs without legal capacity, we rely on the identification approach described in the main text as a second-best approach.

[25] In particular, we control for SOEs' sales revenue to measure firm size, whether they are owned by a single vs. multiple owners (dummy) to measure the degree of influence by government owner(s), their field of activity (measured by 21 dummies that capture SOEs' NACE codes), their legal form (six dummies which distinguish between SOEs' legal form as categorized in Figure 5), and whether they are classified as *extra budgets* or *other public funds, institutions, and enterprises*.

[26] Credit market debt is unfortunately significantly undersampled for central government SOEs in the annual accounts data (when compared to the numbers of the Federal Statistical Office, see Figure 2) such that we rely on the value of total liabilities as an alternative, yet imperfect, measure of debt.

4.2 Results

Figure 19 summarizes the main insights of the regression analysis and plots the estimates for the coefficients of interest (i.e., β_3) with confidence intervals for all above-mentioned outcome variables. Taking into account that a non-negligible share of SOEs has zero investments (financial reserves), we also use two dummy variables equal to 1 if an SOE had positive investments (financial reserves), and 0 else. Considering, for example, the investment dummy, this variable allows us to study which share of SOEs switched from zero to positive investments (the extensive margin) in addition to the question whether those SOEs with positive investments increased their investment efforts (the intensive margin). In total, we therefore consider six outcome variables.

Regarding outcomes related to the expenditure side, we consider changes in SOE employment and investment. SOE employment at the central government level tends to increase after the debt brake became effective by 3.9 to 8.0 percent when compared to state-level SOEs (Panel a) or local SOEs (Panel b). However, the effect is statistically significant at the 5 percent level only in the latter regression with local SOEs as the control group. Investment on the other hand, does not respond to the 2016 change in fiscal rules with both the total volume of SOE investments as well as the share of SOEs with a positive investment amount not changing in and after 2016 according to our results. The results are therefore mixed and we find only little evidence for outsourcing behavior at the central government level that coincides with the debt brake becoming effective for the central government.

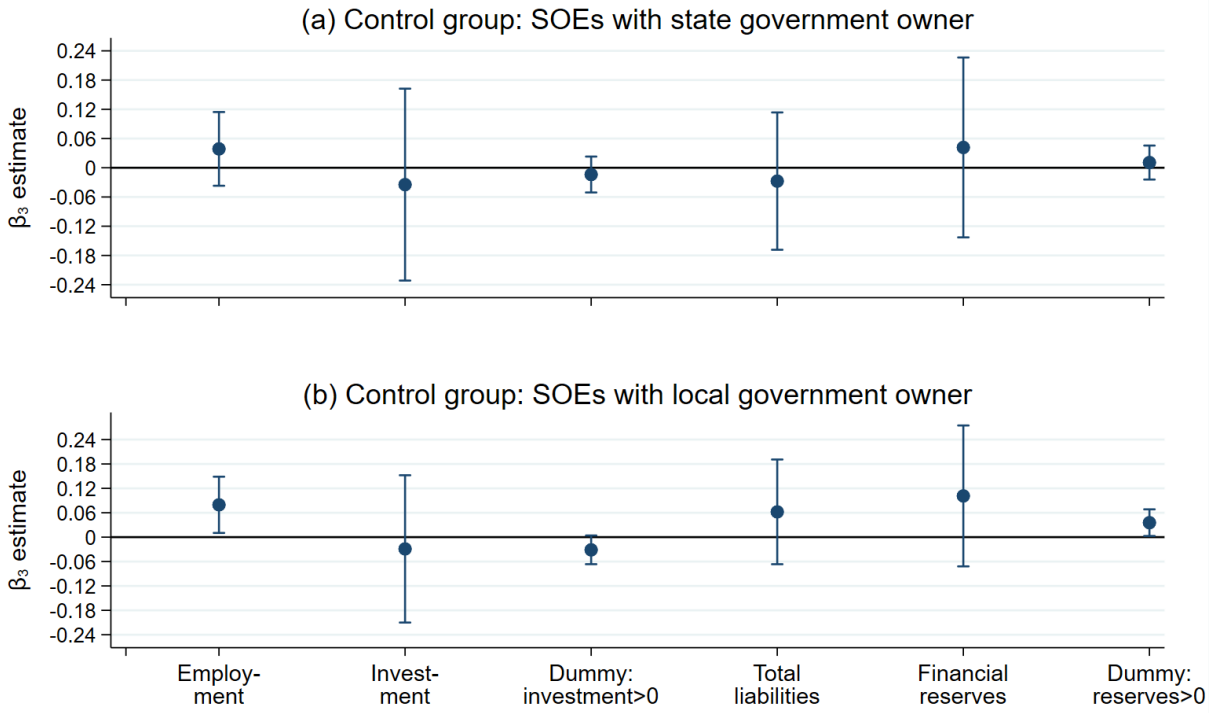
In a second step, we look into the financing of SOE activity – studying the effect on total liabilities and financial reserves as two indicators that might respond if public activities such as employment or investment are outsourced to central government SOEs. For the liability variable,[27] we document no effect of the debt brake with one negative and one positive statistically insignificant coefficient estimate, depending on the control group. The effect on the volume of SOEs' financial reserves is positive in both cases but quite imprecisely estimated and also statistically insignificant. In contrast, the share of SOEs with financial reserves increases slightly by 1.1 percent (compared to state SOEs) to 3.6 percent (compared to local SOEs) with the effect being statistically significant only in the latter regression. As any outsourcing activity to SOEs should intuitively lead to a reduction in financial reserves, if anything, the identified positive effect is rather evidence against a circumvention strategy by the central government in response to the 2016 debt brake implementation.

While the descriptive analysis in Section 3 found little evidence of increased SOE activity after the 2016 change in fiscal rules, the regression analysis in Section 4 set out to more cleanly identify a possible debt brake effect on central government SOEs. Using a difference-in-difference regression model, we find only mild evidence for increased SOE employment and

[27] This includes short- and longer-term liabilities such as credit market debt but also accounts payable or liabilities against affiliate institutions and firms.

some evidence for improvements regarding SOEs' financial reserves that would not be expected under the hypothesis of circumvention strategies by the central government. Overall, the regression results thus yield mixed and inconclusive evidence.

Figure 19: Regression results – Effect of the debt brake on central government SOEs



Notes: Coefficient estimates and 95% confidence intervals for β_3. Separate regression based on Equation (1). Labels on the x-axis denote the dependent variable. Employment, Investment, total liabilities, and financial reserves in logged values. The two dummy variables are equal to 1 if SOE investments or financial reserves are respectively strictly positive, and 0 otherwise. Source: Annual accounts data (micro-data files), own calculations.

It is important to point out the caveats of the regression analysis to better understand the implications of the empirical results. A first issue relates to the validity of the control group. As already pointed out in Footnote 24, ideally one would want to distinguish between central government SOEs that were affected or unaffected by the new fiscal rule based on the legal details to define a suitable control group. Due to a lack of detail in the data and sample size issues, this ideal approach cannot be implemented and we rely on state and local SOEs as a control group instead – even though they might be partially treated themselves. A second concern lies in the overall economic conditions at the time of the debt brake implementation. In 2016 the German debt-to-GDP ratio was at 69.0 percent and decreasing – reaching 58.9 percent in 2019 (Eurostat, 2022). At the same time, tax revenue at the central government level increased on average by 4.0 percent each year over the period 2016 to 2019 (Federal Statistical Office, 2022i). Put differently, the debt brake became fully effective at a time of economic prosperity and therefore had possibly only little bite. Taking such limitations into account, it should be clear that the presented regression analysis constitutes neither conclusive evidence in support of, nor

against the hypothesis of governments using SOEs as a circumvention vehicle in the context of the German debt brake. Instead, it offers first insights into this important topic and calls for more research once more data becomes available that, for example, allows to also study the debt brake taking effect at the level of the 16 states in 2020.

5 Concluding remarks

In this paper, we provide a thorough analysis of SOEs in Germany, a sizable but often overlooked part of the overall public sector which we, therefore, label the "other government". In so doing, we aim to facilitate an informed debate about the full and not just partial scale of governments' involvement in the economy. In particular, we exploit micro-economic data on German SOEs over time and make two contributions: First, we take stock of the relevance, size, activities, and dynamics of SOEs in Germany, and, second, we analyze whether SOEs are used as vehicles to circumvent fiscal rules like the German debt brake.

In our descriptive analysis, we document a substantial growth of the SOE sector in Germany over the period 2008 to 2019. This development is particularly pronounced at the state and local government level. Detailed analyses on growth rates for specific categories (e.g., legal form, government sector account, or industry classification) show that some of the developments are in line with a circumvention story in the context of the German debt brake. At the same time, there exist clear examples of single-SOE case studies at the central government (e.g., the "Klima- und Transformationsfonds" and the "Sondervermögen Bundeswehr") which finance significant public expenditures outside the restrictions of the debt brake and, hence, legally contentious with a case pending at the Federal Constitutional Court (Advisory Board to the Stability Council, 2022; Federal Constitutional Court, 2022). However, our more rigorous regression analysis does not substantiate the claim of a more systematic use of SOEs to circumvent the fiscal rule. This cannot be taken as conclusive evidence against circumvention practices as the analysis is bound to the short run and the debt brake became effective in times of relative economic prosperity, and it has yet to be tested when the economy enters a recession.

In sum, we cannot exclude that other factors – for example a tendency towards more functional decentralization and new public management – are driving the observed developments. One general implication of our result is that the substantial growth of the SOE sector comes at the cost of low transparency. This entails warnings both for budgetary policy and for empirical research. First, the increasingly complex ownership structures in connection with SOEs may hamper their effective steering by their owners as well as the monitoring capabilities of the public. The monitoring of SOEs is especially important since, given the broad presence of SOEs across many industries, SOEs are not just providers of public goods but participate in the market in ways that often go beyond the traditional functions of the government. Second, with the highly heterogeneous outsourcing rates of public activities from *core budgets* to SOEs across states, cross-state comparisons that rely on the commonly used *core budget* statistics suffer from a bias.

At the most basic level, our analysis suggests that the predominant focus in applied public and political economics research on *core budgets* increasingly overlooks that a relevant part of the music is playing elsewhere in the public sector.

References

Advisory Board to the Stability Council (2022). 18. Stellungnahme zur Einhaltung der Obergrenze für das strukturelle gesamtstaatliche Finanzierungsdefizit nach § 51 Absatz 2 HGrG.

Angrist, J. D. and J. S. Pischke (2009). Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.

Atkinson, S. E. and R. Halvorsen (1986). The Relative Efficiency of Public and Private Firms in a Regulated Environment: The Case of U.S. Electric Utilities. *Journal of Public Economics*, 29(3), 281-294.

Barkley, A. (2021). Cost and Efficiency in Government Outsourcing: Evidence from the Dredging Industry. *American Economic Journal: Microeconomics*, 13(4), 514-547.

Berkowitz, D., H. Ma, and S. Nishioka (2017). Recasting the Iron Rice Bowl: The Reform of China's State-Owned Enterprises. *Review of Economics and Statistics*, 99(4), 735-747.

Blesse, S. F. Heinemann, E. Janeba, and J. Nover (2021). Landtagspolitiker stehen zur Schuldenbremse bei wachsender Unterstützung für Investitionsklausel: Ergebnisse einer Umfrage zur grundgesetzlichen Schuldenbremse und möglichen Reformansätzen. ZEW Expert Brief No. 21-01.

Blesse, S., F. Heinemann, and J. Nover (2022). Bundesländerindex Stiftung Familienunternehmen, Standortfaktoren innerhalb Deutschlands im Vergleich. Stiftung Familienunternehmen, München.

Boll, D. and M. Sidki (2021). The Influence of Political Fragmentation on Public Enterprises: Evidence from German Municipalities. *European Journal of Political Economy*, 67, 101972.

Burth, A. and D. Hilgers (2016). Zur Bedeutung öffentlicher Unternehmen. Article on haushaltssteuerung.de, Accessed: 09.08.2022, https://www.haushaltssteuerung.de/weblog-zur-bedeutung-oeffentlicher-unternehmen.html.

Christofzik, D. I. (2019). Does Accrual Accounting Alter Fiscal Policy Decisions? Evidence from Germany. *European Journal of Political Economy*, 60, 101805.

Deutsche Bundesbank (2018). Länderfinanzen: Entwicklungen im Vergleich, Schuldenbremsen und Haushaltsüberwachung. Monatsbericht Oktober 2018.

Deutsche Bundesbank (2019). Eigenmittelanforderungen. Accessed: 15.08.2022, https://www.bundesbank.de/de/aufgaben/bankenaufsicht/einzelaspekte/eigenmittelanforderungen/eigenmittelanforderungen-597874.

Deutscher Bundestag (2019). Umsetzung der Schuldenbremse in den Bundesländern. Sachstand, verfasst durch die Wissenschaftlichen Dienste des Deutschen Bundestags, Aktenzeichen WD 4 - 3000 - 092/19.

Djankov, S. and P. Murrell (2002). Enterprise Restructuring in Transition: A Quantitative Survey. *Journal of Economic Literature*, 40(3), 739-792.

Ehrlich, I., G. Gallais-Hamonno, Z. Liu, and R. Lutter (1994). Productivity Growth and Firm Ownership: An Empirical Investigation. *Journal of Political Economy*, 102(5), 1006-1038.

European Bank for Reconstruction and Development (2020). The State Strikes Back. Transition Report 2020-21. London.

Eurostat (2013). European System of Accounts: ESA 2010. Accessed: 15.07.2022, https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-02-13-269.

Eurostat (2022). Data Browser: General Government Gross Debt. Online data code: SDG_17_40. Accessed: 24.08.2022, https://ec.europa.eu/eurostat/databrowser/view/sdg_17_40/default/table.

Fan, J. P. H., T. J. Wong, and T. Zhang (2007). Politically Connected CEOs, Corporate Governance, and Post-IPO Performance of China's Newly Partially Privatized Firms. *Journal of Financial Economics*, 84(2), 330-357.

Federal Constitutional Court (2011). Beschluss vom 22. November 2011 - 2 BvE 3/08. Accessed: 19.07.2022, https://www.bundesverfassungsgericht.de/SharedDocs/Entscheidungen/DE/2011/11/es20111122_2bve000308.html.

Federal Constitutional Court (2022). Ausgewählte Neueingänge des Jahres 2022, 2 BvF 1/22, Antrag auf abstrakte Normenkontrolle zum Zweiten Nachtragshaushaltsgesetz 2021 vom 18. Februar 2022.

Federal Ministry of Finance (2022a). Sondervermögen Bundeswehr. Accessed: 31.08.2022, https://www.bundesfinanzministerium.de/Web/DE/Themen/Oeffentliche_Finanzen/Bundeshaushalt/Sondervermoegen-Bundeswehr/sondervermoegen-bundeswehr.html.

Federal Ministry of Finance (2022b). Beteiligungsvermögen: Deutsche Bahn AG. Accessed: 22.08.2022, https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Bundesvermoegen/Privatisierungs_und_Beteiligungspolitik/Beteiligungspolitik/deutsche-bahn-ag.html.

Federal Ministry of Law (2022). Gesetz zur Errichtung eines Sondervermögens „Klima und Transformationsfonds“. Accessed: 02.09.2022, http://www.gesetze-im-internet.de/ekfg/index.html.

Federal Statistical Office (2019). Finanzen und Steuern – Fachbegriffe der Finanz- und Personalstatistiken. Accessed: 01.09.2022, https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/fachbegriffe-finanz-personalstatistiken-pdf.pdf;jsessionid=AACE812AEA61BF44BE3DC55BB15A9E49.live712?__blob=publicationFile.

Federal Statistical Office (2022a). Öffentliche Fonds, Einrichtungen und Unternehmen. Accessed: 29.08.2022, https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/Fonds-Einrichtungen-Unternehmen/fonds-einrichtungen-unternehmen.html.

Federal Statistical Office (2022b). Liste der sonstigen Fonds, Einrichtungen und Unternehmen. Accessed: 10.01.2022., https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/Fonds-Einrichtungen-Unternehmen/Methoden/Downloads/liste-sonstige-FEU-2021-pdf.html.

Federal Statistical Office (2022c). Liste der Extrahaushalte. Accessed: 10.01.2022, https://www.statistischebibliothek.de/mir/receive/DESerie_mods_00003423.

Federal Statistical Office (2022d). Personal des öffentlichen Dienstes – Fachserie 14 Reihe 6 – 2011-2019. Accessed: 10.01.2022, https://www.destatis.de/DE/Themen/Staat/Oeffentlicher-Dienst/Publikationen/_publikationen-innen-personal.html.

Federal Statistical Office (2022e). Öffentliche Finanzen: Fonds, Einrichtungen, Unternehmen. Accessed: 10.01.2022, https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/Fonds-Einrichtungen-Unternehmen/_inhalt.html.

Federal Statistical Office (2022f). Schulden des öffentlichen Gesamthaushaltes – Fachserie 14 Reihe 5 – 2010-2019. Accessed: 12.01.2022, https://www.destatis.de/DE/Themen/Staat/Oeffentliche-Finanzen/Schulden-Finanzvermoegen/Publikationen/Downloads-Schulden/schulden-oeffentlicher-haushalte-2140500207004.html.

Federal Statistical Office (2022g). Klassifikation der Wirtschaftszweige, Ausgabe 2008 (WZ 2008). Accessed: 12.08.2022, https://www.destatis.de/DE/Methoden/Klassifikationen/Gueter-Wirtschaftsklassifikationen/klassifikation-wz-2008.html.

Federal Statistical Office (2022h). Volkswirtschaftliche Gesamtrechnung: Arbeitsunterlage Investitionen. 1. Vierteljahr 2022.

Federal Statistical Office (2022i). Statistik über das Steueraufkommen. Steuereinkommen: Deutschland, Jahre, Steuerarten nach der Steuerverteilung (Code: 71211-0002). Accessed: 24.08.2022, https://www-genesis.destatis.de/genesis/online?sequenz=statistikTabellen&selectionname=71211#abreadcrumb.

Feld, L., L. Nöh, W. H. Reuter, and M. Yeter (2021). Von der Corona-bedingten Schuldenaufnahme zur Wiedereinhaltung der Schuldenbremse. *Perspektiven der Wirtschaftspolitik*, 22(4), 330-349.

FMS Wertmanagement (2022). About us – Our task. Accessed: 24.08.2022, https://www.fms-wm.de/en/about-us.

German Council of Economic Experts (2017). Für eine zukunftsorientierte Wirtschaftspolitik. Jahresgutachten 2017/18. Wiesbaden.

Hausman, W. and J. L. Neufeld (1991). Property Rights versus Public Spirit: Ownership and Efficiency of U.S. Electric Utilities Prior to Rate-of-Return Regulation. *Review of Economics and Statistics*, 73(3), 414-423.

Hermes, G., L. Vorwerk, and T. Beckers (2020). Die Schuldenbremse des Bundes und die Möglichkeiten der Kreditfinanzierung von Investitionen – Rechtslage, ökonomische Beurteilung und Handlungsempfehlungen. IMK Study No. 70.

Hesse, M., T. Lenk, and T. Starke (2017). Investitionen der öffentlichen Hand: Die Rolle der öffentlichen Fonds, Einrichtungen und Unternehmen. Study for the Bertelsmann Stiftung, Gütersloh.

Hoffman, M., I. Stewen, and M. Stiefel (2021). Growing Like Germany: Local Public Debt, Local Banks, Low Private Investment. CESifo Working Paper No. 9496.

Hsieh, C.-T. and Z. M. Song (2015). Grasp the Large, Let Go of the Small: The Transformation of the State Sector in China. NBER Working Paper No. 21006.

IMF (2020). Fiscal Monitor: Policies to Support People During the COVID-19 Pandemic. Washington.

Knutsson, D. and B. Tyrefors (2022). The Quality and Efficiency of Public and Private Firms: Evidence from Ambulance Services. *Quarterly Journal of Economics*, 137(4), 2213-2262.

La Porta, R. and F. L'opez-de-Silanes (1999). Benefits of Privatization: Evidence from Mexico. *Quarterly Journal of Economics*, 114(4), 1193-1242.

Megginson, M. and J. Netter (2001). From State to Market: A Survey of Empirical Studies on Privatization. *Journal of Economic Literature*, 39(2), 321-389.

OECD (2020). The COVID-19 Crisis and State Ownership in the Economy: Issues and Policy Considerations. Paris.

Official Journal of the European Union (2016). Consolidated Versions of the Treaty on European Union and the Treaty on the Functioning of the European Union, 2016/C 202/01.

Putniņš, T. J. (2015). Economics of State-Owned Enterprises. *International Journal of Public Administration*, 38(11), 815-832.

ra.de (2006). Verwaltungsgericht Freiburg, Urteil vom 22. März 2006 – 1 K 1216/05. Accessed: 24.08.2022, https://ra.de/urteil/vg-freiburg/1-k-121605-2006-03-22.

Reischmann, M. (2014). Staatsverschuldung in Extrahaushalten: Historischer Überblick und Implikationen für die Schuldenbremse in Deutschland. Ifo Working Paper No. 175.

Reuter, M. (2008). *Eigenkapitalausweis im IFRS-Abschluss. Praxis der Berichterstattung*. Erich Schmidt Verlag GmbH & Co KG, Berlin.

Schmidt, N. (2011). Ausgliederungen aus den Kernhaushalten: Öffentliche Fonds, Einrichtungen und Unternehmen. *WISTA – Wirtschaft und Statistik*, 1, 154-164.

Schmidt, P., N. Heil, D. Schmidt, and J. Kaiser (2017). Die Abgrenzung des Staatssektors in den Volkswirtschaftlichen Gesamtrechnungen: Zuordnungskriterien für öffentliche Finanzen. *WISTA – Wirtschaft und Statistik*, 1, 35-48.

Scholz, B. (2021). Die grundgesetzliche Schuldenbremse und ihre Umsetzung durch Bund und Länder sowie die haushaltspolitische Umsetzung der Notlagenverschuldung in der Corona-Pandemie. Study on behalf of the DGB-Bundesvorstand, Berlin.

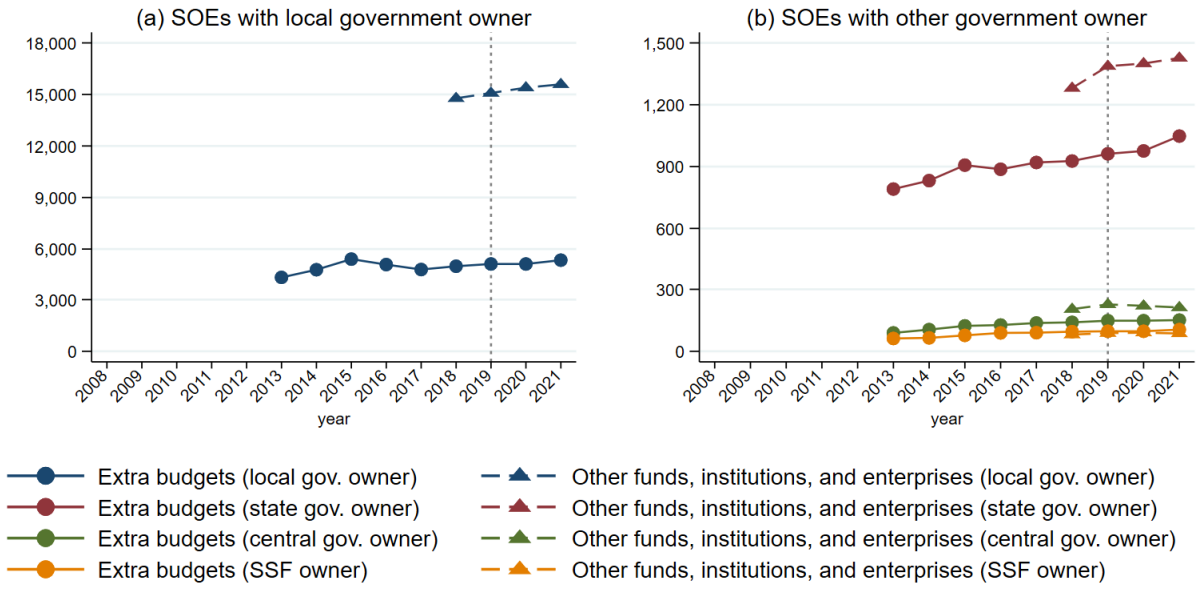
Sheshinski, E. and L. F. López-Calva (2003). Privatization and Its Benefits: Theory and Evidence, *CESifo Economic Studies*, 49(3), 429-459.

Statistical Offices of the Federation and the Länder (2022). Bevölkerung nach Geschlecht – Stichtag 31.12. – regionale Tiefe: Gemeinden (Code: 12411-01-01-5). Accessed: 14.07.2022, https://www.regionalstatistik.de/genesis/online/statistic/12411.

Storesletten, K. and F. Zilibotti (2014). China's Great Convergence and Beyond. *Annual Review of Economics*, 6(1), 333-362.

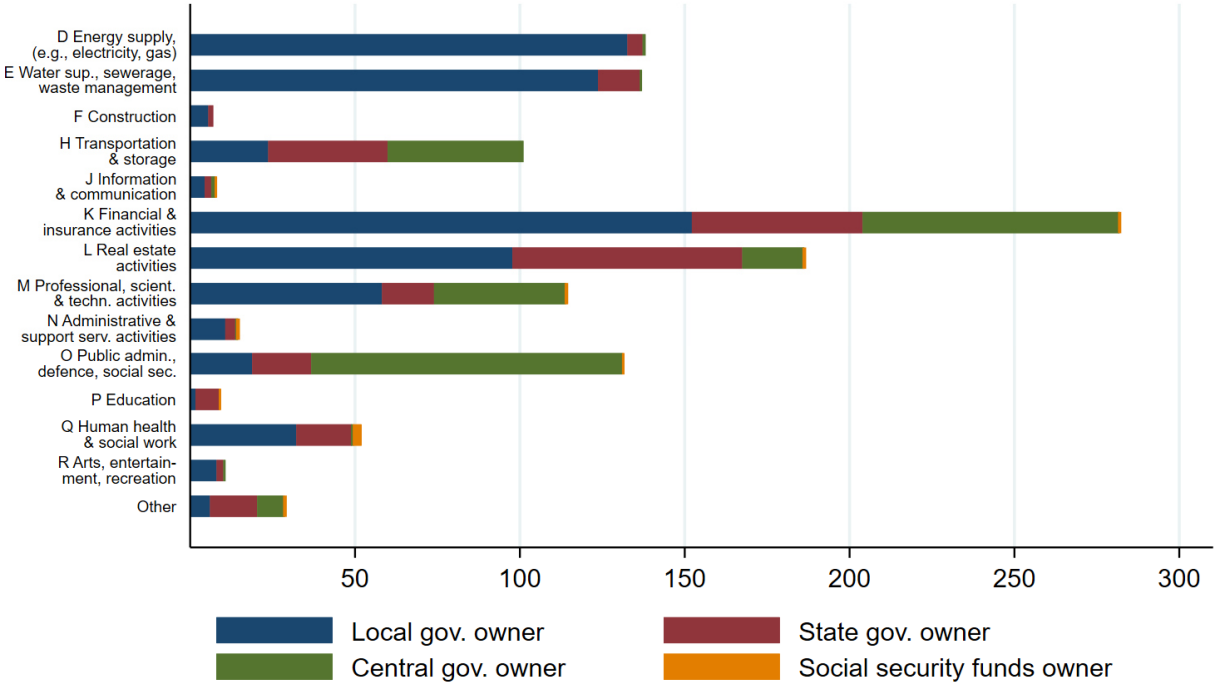
Appendix

Figure A1: Number of SOEs by government sector and sector account – all SOEs



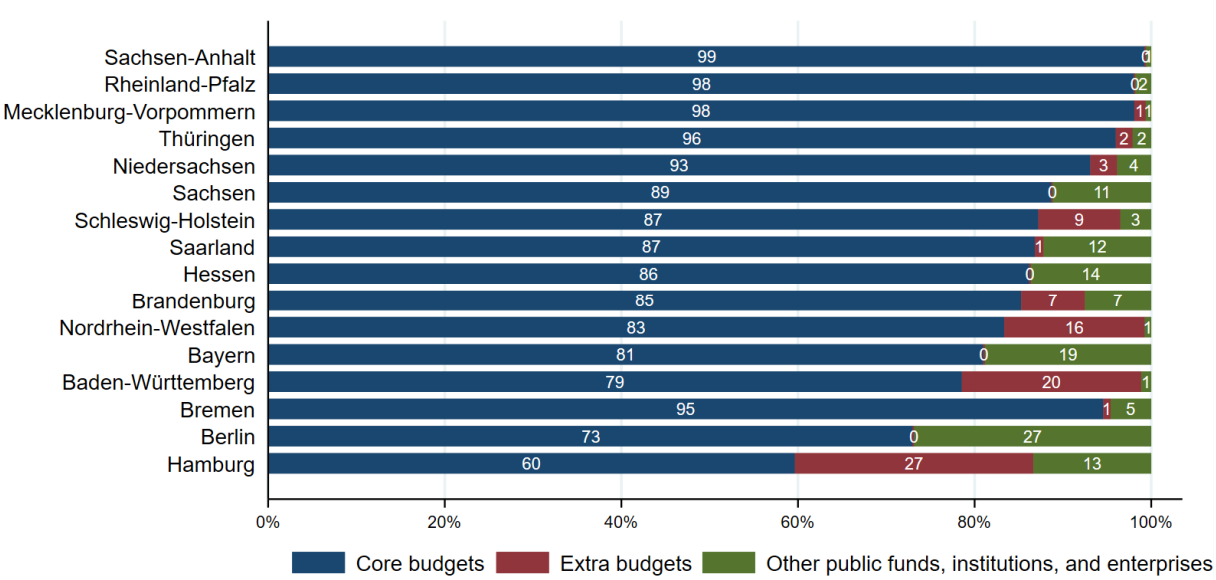
Notes: The dotted gray line indicates the last year available in the annual accounts dataset that is used in the main part of this paper. Data on the total number of *other public funds, institutions, and enterprises* is available only for a reduced sample period starting in 2018. SSF: Social security funds. Source: Federal Statistical Office (2022b; 2022c).

Figure A2: Total fixed assets of SOEs by NACE classification and government sector (in 2019)



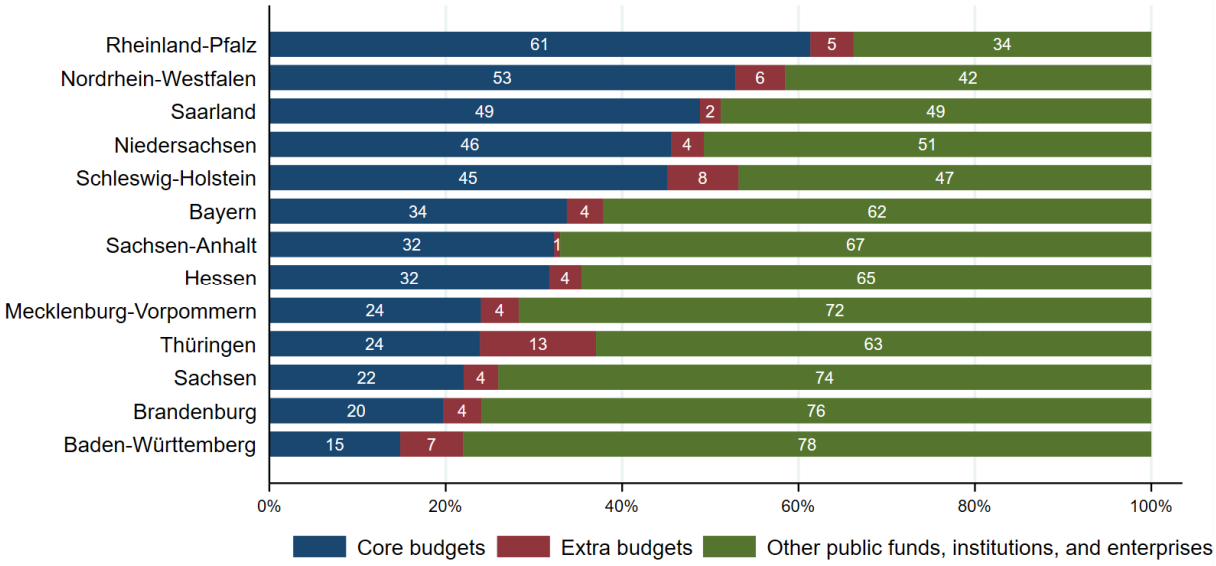
Notes: Category *Other* includes: A Agriculture, forestry, fishing, B Mining & quarrying, C Manufacturing, F Construction, G Wholesale & retail trade; repair of motor vehicles & motorcycles, I Accommodation & food service activities, P Education, and S Other service activities. Source: Annual accounts data (macro-data files), own calculations.

Figure A3: Share of outsourced debt by state – only state governments (in 2019)



Notes: Shares in percent. Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. Source: Federal Statistical Office (2022f), own calculations.

Figure A4: Share of outsourced debt by state – only local governments (in 2019)



Notes: Shares in percent. Debt figures only capture debt held by the private sector (credit market debt) and ignores debt held by other government units. Source: Federal Statistical Office (2022f), own calculations.

Table A1: State abbreviations

Abbreviation	State	Abbreviation	State
BW	Baden-Württemberg	NI	Lower Saxony
BY	Bavaria	NW	North Rhine-Westphalia
BE	Berlin	RP	Rhineland-Palatinate
BB	Brandenburg	SL	Saarland
HB	Bremen	SN	Saxony
HH	Hamburg	ST	Saxony-Anhalt
HE	Hesse	SH	Schleswig-Holstein
MV	Mecklenburg-Vorpommern	TH	Thuringia

Authors

Dr. Zareh Asatryan
ZEW – Leibniz Centre for European Economic Research
L 7, 1
68161 Mannheim
www.zew.de
zareh.asatryan@zew.de

Prof. Dr. Friedrich Heinemann*
ZEW – Leibniz Centre for European Economic Research
L 7, 1
68161 Mannheim
www.zew.de
friedrich.heinemann@zew.de
Tel.: +49 (0)621 1235-149

Justus Nover
ZEW – Leibniz Centre for European Economic Research
L 7, 1
68161 Mannheim
www.zew.de
justus.nover@zew.de

* Contact person for inquiries

ZEW Expert Brief

Publisher: ZEW – Leibniz Centre for European Economic Research
L 7, 1 · 68161 Mannheim · Germany · info@zew.de · www.zew.de/en · twitter.com/ZEW_en
President: Prof. Achim Wambach, PhD · Managing Director: Thomas Kohl
Editorial responsibility: Yvonne Bräutigam · cvd@zew.de